



# Upper Valley Solid Waste and Recycling Analysis



Presentation by:  
DSM Environmental Services, Inc.

FINAL REPORT  
July 15, 2014

# Study Funded By:

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- ▶ Greater Upper Valley Solid Waste Management District
- ▶ Town of Hanover
- ▶ Town of Hartford
- ▶ City of Lebanon
- ▶ Town of Norwich



# Goal

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- ▶ Evaluate the potential for shared solid waste management services to increase efficiency and/or reduce costs



# Study Area

## Municipalities/Population Using Lebanon Landfill

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<b>NEW HAMPSHIRE</b>	<b>Population</b>
Canan	3,909
Enfield	4,582
Grafton	1,340
Grantham	2,985
Hanover	11,260
Lebanon	13,151
Lyme	1,716
Newbury	2,072
Orange	311
Orford	1,237
Plainfield	2,364
Sutton	1,837
<b>Total New Hampshire:</b>	<b>46,764</b>

<b>VERMONT</b>	<b>Population</b>
Bridgewater	936
Hartland	3,393
Norwich	3,414
Pomfret	904
Sharon	1,502
Strafford	1,098
Thetford	2,588
Vershire	730
West Fairlee	652
Woodstock	3,048
<b>Subtotal, GUVSWD:</b>	<b>18,265</b>
Fairlee	977
Hartford	9,952
<b>Total, Vermont:</b>	<b>28,217</b>



# Tasks Undertaken

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- ▶ Analysis of Lebanon Landfill Deliveries
- ▶ Evaluation of current HHW collection system
- ▶ Evaluation of current materials recycling activity and potential to increase
- ▶ Current organics diversion and potential to increase
- ▶ Regional options



# Limitations to Analysis

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- ▶ **Accurate data not available by municipality with the exception of municipal transfer stations**
  - ▶ This is especially true of recycling data
- ▶ **Lebanon landfill scale data heavily relied upon:**
  - ▶ There is no distinction between commercial and residential waste by hauler
  - ▶ Loads may be reported as from a single municipality when in reality they are from several different municipalities
  - ▶ Survey of haulers attempted to address this, but relied on reaching small haulers and on accurate hauler input
- ▶ **Most of the recycling activity occurs outside of the Lebanon landfill and municipal transfer stations**
  - ▶ Heavy reliance on the private sector to report whether recycling activity is from VT or NH, and from residential or commercial sector



# Lebanon Landfill

## Current Conditions

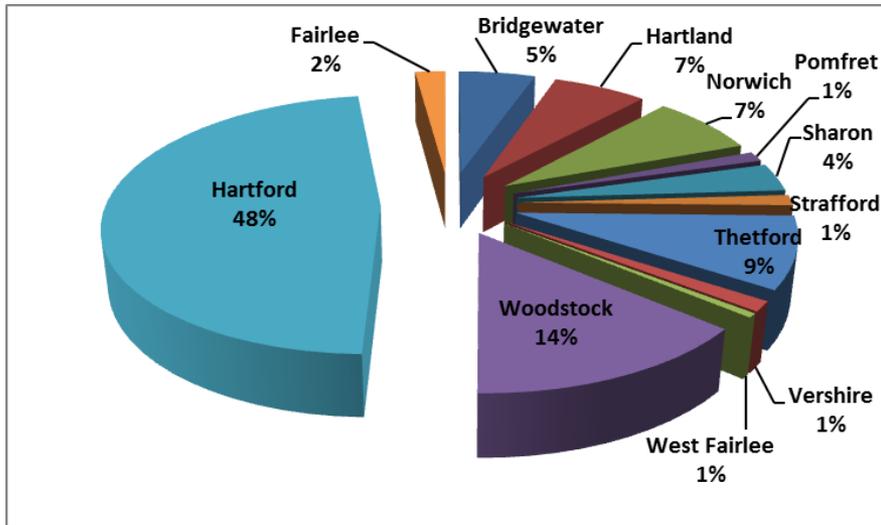
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- ▶ **MSW deliveries of 38,000 (rounded) tons in 2013:**
  - ▶ Roughly 3,000 tons went to other facilities that could have come to Lebanon (Grantham to Newport TS, Naughton – Sutton, Chris Witcher – Lyme, Able Waste - Bridgewater)
  - ▶ Capturing that waste would increase Lebanon LF revenues by roughly \$200,000, but not likely to occur
- ▶ **Anecdotally we know there are deliveries from individuals in non-permitted municipalities delivered as Lebanon tonnage**
  - ▶ But no estimate of quantities and probably not significant
- ▶ **Current Lebanon tipping fee (\$68.88) at the margin**
  - ▶ Spot market tip fees of \$50 (+/-) and \$15 - \$20 per ton transfer costs are approximately equal to Lebanon tip fee
  - ▶ We are aware of contracts for disposal in the low \$40's
  - ▶ Economists would say that Lebanon is maximizing “rent” – that is charging at the highest amount possible to maximize revenue
- ▶ **But many small businesses delivering waste to Lebanon could not find an alternative for less than \$85 to \$100 because they would have to use existing transfer stations (Casella - Newport at over \$100)**



# Vermont Wasteshed

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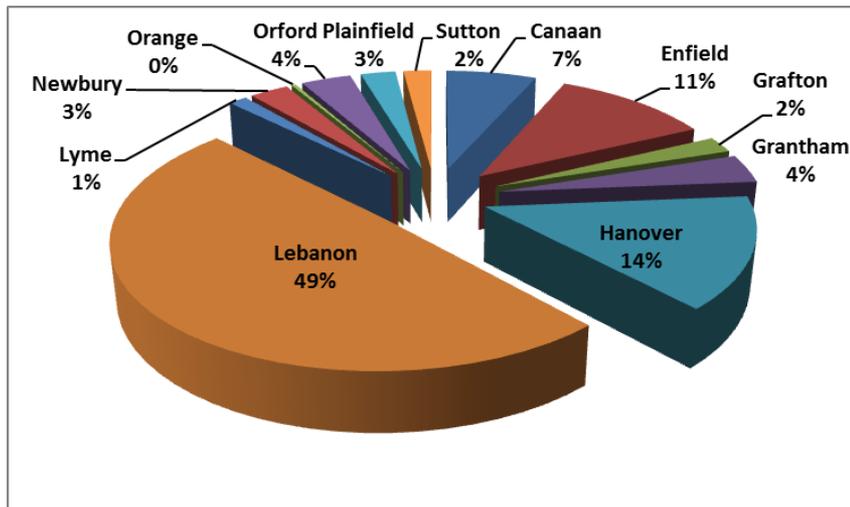


- ▶ Vermont Population of 29,200 :
  - ▶ 12,640 occupied households
  - ▶ Seasonally adjusted 13,500 households
- ▶ Generating an estimated 13,750 tons of MSW



# New Hampshire Wasteshed

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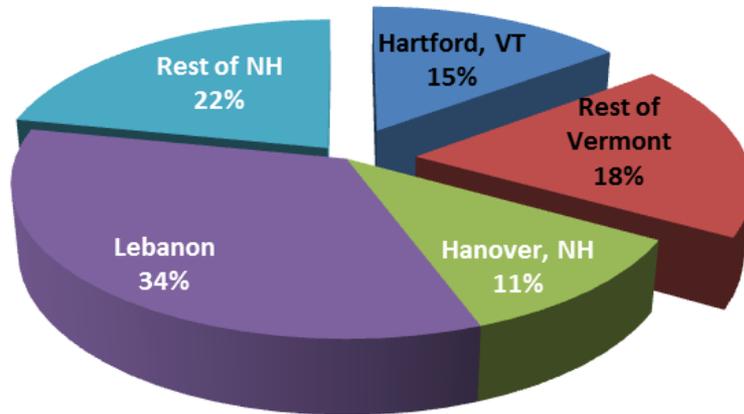


- ▶ Population of 46,800:
  - ▶ 18,671 occupied households
  - ▶ Seasonally adjusted 19,600 households
- ▶ Generating 27,600 Tons of MSW
- ▶ Note that Lebanon tons include some waste from outside Lebanon reported as Lebanon



# Total Wasteshed

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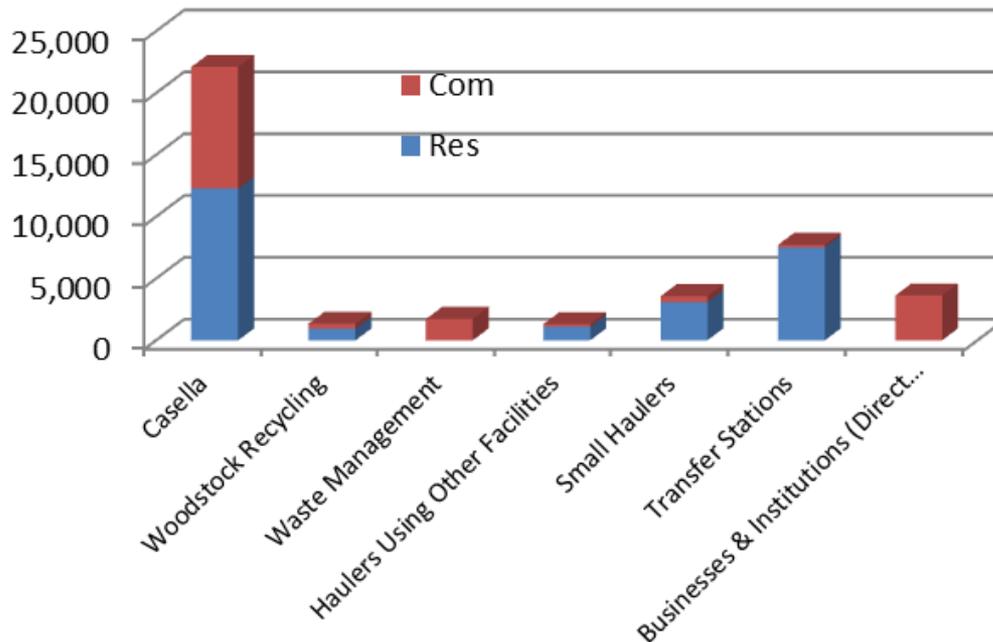


- ▶ **Total Population of 76,000 (Rounded)**
  - ▶ 31,300 occupied households
  - ▶ 33,100 seasonally adjusted households
- ▶ **MSW Generation of 41,000 tons**
  - ▶ Excludes C&D delivered to other sites and bio-solids disposed at Lebanon LF



# MSW Deliveries by Collection Type

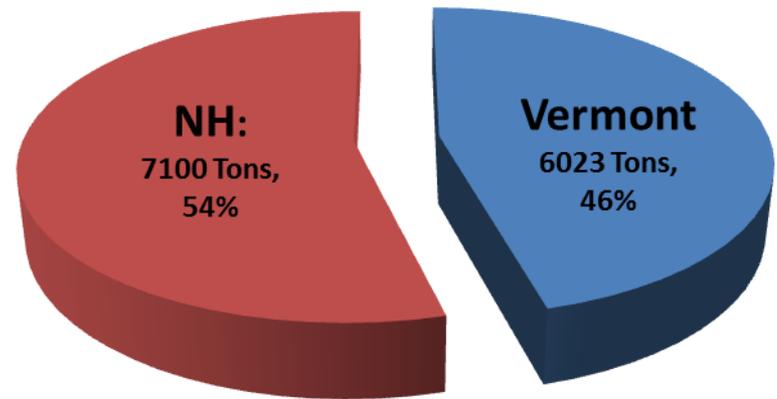
- ▶ Roughly 91.5% of MSW generated is delivered to Lebanon
- ▶ Casella collects over 50% of this material
  - ▶ Casella is critical to continued revenue generation
- ▶ Together, commercial haulers collect 73% of MSW
  - ▶ Significant changes in recycling and organics will depend on commercial haulers
- ▶ Municipal transfer stations and drop-offs collect 18.5%
- ▶ Businesses and institutions direct haul 8.5%



# Construction and Demolition Waste

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- ▶ Roughly 13,000 tons of C&D waste were generated last year
- ▶ Data are not readily available, except from Lebanon landfill deliveries which are minor
- ▶ C&D recycling activity in the Upper Valley is not tracked, and expected to be uncommon because there are no C&D recycling processing facilities



# Preliminary Conclusions

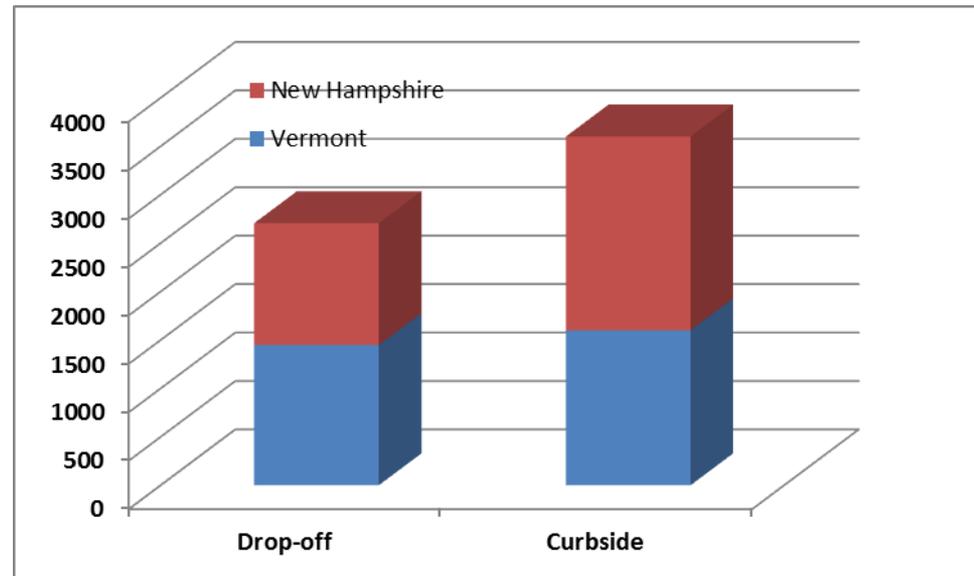
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- ▶ **Combined residential and commercial solid waste (MSW) generation is low:**
  - ▶ Region is 3 lbs./cap/day (2013)
  - ▶ Vermont Statewide is 3.62/cap/day (2011)
  - ▶ US (EPA) is 4.38 lbs/cap/day (2012)
  - ▶ CSWD is 3.08 lbs/cap/day (2013)
- ▶ **Residential MSW disposal is also low - estimated Residential MSW:**
  - ▶ 1380 lbs/household for Vermont towns in area
  - ▶ 1620 lbs/household for NH towns in area
  - ▶ Compares to 1850 lbs/household Vermont Statewide



# Residential Recycling

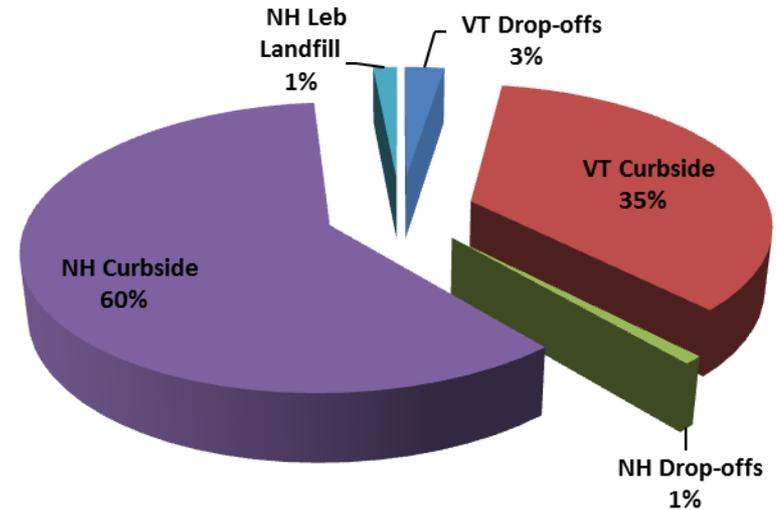
- ▶ Roughly 6,300 tons of paper and containers by residents:
  - ▶ Data relies heavily on Casella estimates which are rough at best
  - ▶ 430 lbs per VT household
  - ▶ 350 lbs per NH household



# Commercial Recycling

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- ▶ Roughly 5400 tons of commercial recycling locally diverted in the region
  - ▶ Excludes many large generators such as grocery stores and box stores
- ▶ Majority from NH
- ▶ Relies heavily on data from Casella



# Preliminary Conclusions

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	Residential	Commercial
<b>Vermont</b>		
Recycling	3,794	2,109
Disposal	9,344	4,407
<b>Rate:</b>	<b>29%</b>	<b>32%</b>
<b>New Hampshire</b>		
Recycling	3,363	3,434
Disposal	15,878	11,735
<b>Rate:</b>	<b>17%</b>	<b>23%</b>

- ▶ Overall 23% paper and containers recycling rate in region (excludes scrap metal, textiles, etc.)
- ▶ Residential recycling in the area appears to be relatively high
  - ▶ Greatest opportunity to increase may be City of Lebanon, and NH and VT municipalities with drop-off only recycling
  - ▶ Will require parallel curbside collection – will be required in VT in 2015



# Current MSW and Recycling Costs

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- ▶ Rough estimate based on tons collected by method and the estimated per ton costs to collect in the region
- ▶ Does not include cost to household and businesses to deliver material to a transfer station which could add roughly \$700,000 per year



# Estimated Costs, MSW and Recycling

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	<b>Refuse</b>	<b>Recycling</b>	<b>Total</b>
<b>Residential</b>			
Curbside Collection	\$5,805,000	\$715,000	\$6,520,000
Transfer Stations	\$1,503,000	\$338,000	\$1,841,000
Tip Fees	\$1,740,000	\$18,000	\$1,758,000
<b><i>Subtotal:</i></b>	<b>\$9,048,000</b>	<b>\$1,071,000</b>	<b>\$10,119,000</b>
<b>Commercial</b>			
Curbside Collection	\$1,993,000	\$854,000	\$2,847,000
Transfer Stations	\$39,000	\$49,000	\$88,000
Tip Fees	\$1,114,000		\$1,114,000
<b><i>Subtotal:</i></b>	<b>\$3,146,000</b>	<b>\$903,000</b>	<b>\$4,049,000</b>
<b><i>Total Estimated Cost:</i></b>	<b>\$12,194,000</b>	<b>\$1,974,000</b>	<b>\$14,168,000</b>



# Household Hazardous Waste Management

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- ▶ **Two different organizations managing HHW:**
  - ▶ GUVSWD
  - ▶ UVLSC
- ▶ **Programs similar:**
  - ▶ Series of one day collections at transfer stations or other municipal locations
  - ▶ Rely on contractor to manage site
  - ▶ Contractor costs high percentage of costs



# HHW Volume and Costs

- ▶ If HHW Program were to be expanded would come at high additional cost, even if it were to be operated more efficiently
  - ▶ At \$47 per participant and 15% participation would spent about \$235,000 on the program
  - ▶ This compares to \$74,000 now, or an increase of \$160,000
  - ▶ Would require \$4.25 surcharge on existing Lebanon deliveries
  - ▶ Or per HH fee of \$4.80

	NH	VT	CSWD
<b>Gross Cost</b>	\$43,431	\$30,778	\$472,218
<i>Volume (lbs)</i>	45,940	34,344	581,750
<b>Participants</b>	731	329	10023
Households	731	329	9290
<b>Cost per Participant</b>	<b>\$59</b>	<b>\$94</b>	<b>\$47</b>
Volume/Participant	63	104	58
Total Households	19,580	13,509	62,267
Participation Rate	4%	2%	15%
<b>Projected Cost</b>			<b>Total</b>
CSWD Costs	\$138,746	\$95,727	<b>\$234,473</b>

# Organics Generation

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	<b>Residential</b>	<b>Commercial</b>	<b>Total</b>
<b>Vermont</b>	(tons)	(tons)	(tons)
Tons of MSW Disposed	9,025	4,726	<b>13,751</b>
<i>Food Waste</i>	1,509	531	<b>2,040</b>
<i>Mixed Yard Waste Leaves, Branches, &amp; Stumps</i>	288	138	<b>425</b>
<i>Fines / Dirt</i>	253	118	<b>371</b>
<i>Other Organics</i>	486	42	<b>528</b>
<b>New Hampshire</b>			
Tons of MSW Disposed	16,011	11,735	<b>27,746</b>
<i>Food Waste</i>	2,677	1,319	<b>3,996</b>
<i>Mixed Yard Waste Leaves, Branches, &amp; Stumps</i>	511	342	<b>852</b>
<i>Fines / Dirt</i>	449	293	<b>743</b>
<i>Other Organics</i>	861	105	<b>967</b>



# Current Organics Diversion

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- ▶ Through three facilities:
  - ▶ ROT, Acorn Hill Farm (Lyme) and Cookville Compost (Corinth)
- ▶ Total diverted estimated at 750 Tons:
  - ▶ 650 tons from NH Facilities, 100 from VT, some in Bradford
  - ▶ NH Diversion rate of *commercial organics* already at 30% if generation estimates are accurate
- ▶ Residential waste disposal estimates (and VT waste composition study) indicate backyard composting may already be in widespread use, particularly in Vermont



# Current Organics Costs

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- ▶ Since private sector handling all organics diversion, current costs are unknown but estimated at between \$200 - \$350 per ton (collection and processing)



# Costs to Do More

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- ▶ Low hanging fruit on recycling and organics already occurring
- ▶ Need parallel curbside recycling and organics collection for residential and small commercial generators
- ▶ Collection costs will be higher than currently experienced, unless organized
  - ▶ This is a key point!
- ▶ For example, Plainfield and Enfield experiencing much lower costs per household for parallel refuse and recycling collection services than those who subscribe for curbside service
  - ▶ We don't have reliable data on current subscription collection costs but would expect organized collection to be roughly 25 to 30 percent less based on extensive work DSM did for Chittenden District in 2012



	<b>Residential</b>	<b>Commercial</b>	<b>Total</b>
<b>Current</b>	(tons)	(tons)	(tons)
MSW	25,222	16,142	41,364
Recycling	6,834	7,191	14,024
<b>Total Generation:</b>	<b>32,056</b>	<b>23,332</b>	<b>55,388</b>
<b>Recycling Rate:</b>	<b>21%</b>	<b>31%</b>	<b>25%</b>
<b>Additional Diversion</b>			
MSW Recycling	3,100	2,100	5,200
Organics	3,000	1,100	4,100
<b>Total:</b>	<b>6,100</b>	<b>3,200</b>	<b>9,300</b>

## How Much More Diversion?

- Estimates of additional residential recycling based on average of 600 lbs/HH compared with current estimated average of 382 lbs/HH.
- Estimate of additional commercial recycling based on an increase from 31% to 40% recycling rate.
- Additional residential and commercial organics diversion based on 60 percent recovery rate, minus current off-site diversion.



# Regional Options: *Collection*

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- ▶ Private sector is key participant since they perform 73 percent of MSW collection, with Casella dominating:
  - ▶ Possible to organize collection across municipal lines, but significantly easier for individual municipalities to organize collection
  - ▶ Can be done through a franchise or municipal contract
  - ▶ Enfield is currently the “gold standard” in terms of organized collection in the region, with small carts for MSW and large carts for SS recycling
  - ▶ Similarly, Plainfield with PAYT refuse pricing and organized MSW and recycling collection
  - ▶ Hanover and Hartford have organized recycling collection but not organized MSW collection – and no PAYT pricing
- ▶ As recommended in DSM’s 2012 report to Hartford, the logical option for Hartford would be to create a single franchise or contract for collection of MSW and recyclables using carts for both MSW and recyclables
  - ▶ Hartford could combine this with PAYT financing – either bags or billed by MSW cart size, which will be required under Act 148 in 2015
  - ▶ Alternatively Hartford could simply allow the private sector to implement the requirements of Act 148 with no role by the Town but this will be more costly to residents



## *Collection* (continued)

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- ▶ If Hanover wants to move organics collection forward, organizing MSW collection to go with recycling collection would allow for eventual implementation of separate food waste collection
- ▶ Have not had any indication that Lebanon is interested in organizing collection - but this would be a key step toward increasing diversion from Lebanon households
  - ▶ And in reducing Lebanon HH costs
- ▶ Smaller municipalities in VT can assume that private haulers will meet the requirements of Act 148
- ▶ Smaller municipalities in NH could organize collection as Enfield and Plainfield have, or continue with current system



# Regional Options: *Materials Processing*

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- ▶ There is insufficient volume of recyclables in the Upper Valley to justify investment in a modern Materials Recovery Facility
  - ▶ Industry trend is to develop large Single Stream processing facilities with long distance transfer of materials to these facilities
    - ▶ Casella is the example, with transfer capacity in WRJ
  - ▶ But Casella is not only option (\$1.706/loaded mile = 9.5 cents per ton per mile)
    - ▶ Chittenden District owns Williston, VT facility and sets rates, operated by Casella
    - ▶ Waste Management Facility in Billerica, MA
    - ▶ Eco-Maine Facility in Portland, ME
    - ▶ Willimantic Waste, Willimantic, CT
    - ▶ Waste Management Facility, Springfield, MA
    - ▶ ReCommunity Facility, Hartford, CT
  - ▶ Hartford facility could be modified for transfer of SS materials collected in the Upper Valley – requires transfer in 100 yard walking floor trailers (+/- 18 tons per load)
  - ▶ Lebanon could also be modified for regional transfer
  - ▶ Facilities like Lebanon that currently bale materials may find it cost effective to continue to do so
  - ▶ It is DSM's professional opinion that it is highly unlikely investment in new baling and sorting equipment at other facilities will be worth it
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# Regional Options: *Organics Processing*

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- ▶ Construction of a single compost facility to serve region could cost \$2 to \$3 million
  - ▶ Perhaps \$750,000 to \$1 million for smaller facility to start
  - ▶ But don't be lured into low cost options that end up with odor and site management issues
- ▶ Residential collection of organics could cost an additional \$4 to \$8 per month per household
  - ▶ Lower end depends on Single Stream collection of recyclables and every other week MSW collection
- ▶ Costs to collect institutional and commercial organics are highly dependent on the individual business or institution
  - ▶ In general, collection costs will be more for organics collection than for MSW collection (perhaps \$75 per ton more) but tipping fees will be slightly lower (\$20 per ton), and the business or institution may save on MSW collection once heavy food waste is removed



# Regional Options: *Disposal*

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## ▶ Underlying Reality

- ▶ There is currently excess disposal capacity in NE
- ▶ Transfer Station in MA reported to DSM one year disposal contract with WTE facility in the upper \$30's
- ▶ Landfill in northern NH reportedly offering disposal capacity in low \$40's
- ▶ Casella landfills accepting waste in low \$50's
- ▶ Ohio landfills in mid-\$20's
- ▶ **Current Lebanon landfill business plan shows sufficient capacity through 2030 without need for more expensive expansion to south**
- ▶ **GUV landfill could provide capacity after that**
  - ▶ A comparative analysis of GUV development costs versus expansion costs for Lebanon after 2030 have not been done



# Regional Options:

## ***Regional Acquisition of GUV Site***

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- ▶ District owes roughly \$2.6 million through three bond issues (house/office, Twin State land, Bridge)
  - ▶ One bond payment ends in 2014, second in 2028, third in 2031
  - ▶ Would free up GUV to operate Hartford TS, providing permanent HHW collection site and acting as a drop-off for other materials
- ▶ A \$5 surcharge on current tonnage at Lebanon in 2015, falling to \$4 by 2024 (declining principal) would cover bond payments
  - ▶ Could potentially lower surcharge by stretching out payments but complicates matters:
    - ▶ Want to avoid default or need for vote on new bond issue
    - ▶ Could potentially do it through capital lease finance – doesn't require regional vote
- ▶ Other Options:
  - ▶ More tons from Southern Windsor County to Lebanon landfill with revenue used to fund lease purchase
    - ▶ Weathersfield paying \$79 per ton currently to Casella
    - ▶ Small Windsor County haulers interested in alternative disposal location
  - ▶ Assess a per HH surcharge on entire population using Lebanon Landfill
    - ▶ Roughly \$6.30 per HH in 2015 falling to \$4.50 in 2025 and \$1.30 by 2031
    - ▶ Less if assessed on all property (residential plus ICI)
  - ▶ Municipalities add it to their general fund and fund it through property taxes



# Shared Services: *Hartford TS*

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- ▶ Hartford TS pays for itself only as long as ground C&D can be delivered to Lebanon at no cost
  - ▶ If not, then (using 2011 cost data) net cost - \$220,000
- ▶ If GUV landfill debt service (\$215,000 in 2015) covered some other way could consolidate labor and administration and pay for it through GUV surcharge
- ▶ The Hartford TS could then be used for a permanent HHW collection site, and for all of the other activities currently provided to Hartford residents and residents of the GUV towns
- ▶ If Hartford moves to organized, parallel curbside collection, TS hours could be reduced



# Shared Services: HHW, C&D

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- ▶ Could re-open the Hartford permanent facility and create a regional system similar to Chittenden District
  - ▶ Might boost participation to 15% of HH's
  - ▶ Will cost more – roughly \$160,000 per year over and above what municipalities are spending now on HHW
  
- ▶ Hartford and Lebanon only see about 15% of C&D material
  - ▶ Insufficient quantities to organize C&D processing facility
  - ▶ Limited value in mixed C&D – only about 11% is clean wood



# Regional Organization

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- ▶ The following institutional arrangements could be used to further regional cooperation, in order of potential difficulty
  - ▶ Inter-municipal agreements to share services
  - ▶ Creation of a Regional Refuse Disposal Agreement on the NH side with associated governing body to manage solid waste
    - ▶ Sullivan County Regional Refuse Disposal District had broad powers to implement solid waste facilities
  - ▶ Addition of Hartford to Greater Upper Valley Solid Waste District
    - ▶ Political difficulties, especially concerning landfill and bridge debt
  - ▶ Adoption of an Interstate Compact allowing the two districts to jointly manage solid waste
    - ▶ Language may still exist on VT side, but has been repealed on NH side meaning adoption of NH legislation, and the Congressional and US EPA approval
    - ▶ Difficult but perhaps not as hard as it sounds if the plans are not actively opposed



# Purpose of Regionalization

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- ▶ Joint financing of acquisition of GUV landfill site
- ▶ Creation of a single permanent HHW facility (either in Hartford, or in Lebanon) for use by residents and small businesses of member municipalities
- ▶ Transfer of management and long-term closure commitments of Lebanon landfill to the users of the landfill
  - ▶ In theory the contracts between Lebanon and sending municipalities already do this
- ▶ Inter-municipal contracts with the private sector for collection and processing of refuse, recyclables or organics



# Regionalization (DSM's Observations)

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- ▶ While it is certainly possible to create a single regional entity to coordinate all of the potential solid waste and materials management tasks, it is not clear that there are sufficient benefits to endure the costs
- ▶ Instead, working within the framework of existing municipal governments could yield similar results at lower political cost
  - ▶ For example, capital lease financing of GUV landfill
    - ▶ Will require legal review for NH and VT municipalities
  - ▶ Contracts between member towns to implement joint facilities or projects
    - ▶ Will require legal review if cross state lines
  - ▶ Unilateral action by municipalities to organize collection of refuse, recyclables and/or organics
    - ▶ By contract or franchise
- ▶ But remember that 73% of waste collected by private haulers
  - ▶ Casella dominates



# DSM Observations

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- ▶ **Regional cooperation already exists**
  - ▶ Lebanon landfill is a de-facto regional facility
  - ▶ GUV already exists and owns a potential landfill site
- ▶ **Many of the activities necessary to improve diversion, increase landfill life and reduce carbon emissions can occur unilaterally by municipalities**
  - ▶ Parallel collection of waste and recycling and implementation of unit based pricing
  - ▶ This is probably the activity that would have the greatest impact on diversion
- ▶ **There are two important impediments to further regionalization**
  - ▶ Debt service of GUV landfill site
    - ▶ Prevents regionalization of Hartford Transfer Station
    - ▶ Makes it difficult to fund capital cost of regional organics facility
  - ▶ Maximized tipping fee at Lebanon landfill
    - ▶ Prevents the addition of surcharge to fund new materials or organics programs or expand HHW collections
- ▶ **Resolving this issue will depend on buy-in by City of Lebanon**
  - ▶ Question is “What is in it for Lebanon”?
    - ▶ Ability to close Lebanon landfill after 2030
    - ▶ Risk of losing Casella and/or sufficient waste to fund General Fund contribution
    - ▶ Desire to significantly expand diversion of materials and organics through regional cooperation



# Next Steps/Questions

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- ▶ Is there a desire to pursue regional initiatives?
  - ▶ GUV landfill
  - ▶ Regionalization of Hartford TS
  - ▶ Organics processing facility
  - ▶ Permanent HHW facility
- ▶ Do individual municipalities want to increase diversion and/or reduce household costs by organizing collection and implementing PAYT pricing?
  - ▶ DSM has not seen savings associated with jointly bidding collection services
- ▶ Questions/Comments

