

Systems Analysis of the Impact of Act 148 on Solid Waste Management in Vermont

Final Report

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A - SINGLE STREAM MATERIAL LOSSES

B - SOLID WASTE MANAGEMENT ENTITIES FACILITIES AND PROGRAMS

C – COMPOSTING AND AD TECHNOLOGIES

D - REDEMPTION CENTER USER SURVEY DATA

E - BACKGROUND ANALYSIS OF LITTER DATA

implementation of the requirements of Act 148, and will need to be covered as part of overall system costs. For this reason, district administration costs are carried as separate rows in the cost analysis.

LITTER COLLECTION COSTS WITH ELIMINATION OF THE BOTTLE BILL

Comments received by ANR during the public review of the Interim Report in March, 2013, included statements that one of the most important benefits to the public associated with beverage container deposits is the positive impact container deposits have on litter, including broken glass bottles. The Project Team examined the data that are often cited in the literature to support the assumption that deposits reduce litter. A complete description of the Project Team's analysis is contained in Appendix E.

The Project Team's general conclusion from all of these studies is that there are no conclusive data that show deposit legislation has or does not have a significant impact on roadside litter. This should not be surprising because a comprehensive review of the literature on litter surveys will illustrate that there is not a uniform way to measure litter (by count, piece size and/or weight), and that factors such as roadside mowing, the frequency of litter collection, the volume of traffic and population, and open container laws all play a large role in litter generation and measurement.¹¹⁰ Studies controlling for all of these variables, and then controlling for the impact of deposit legislation have simply not occurred.

While deposits likely had some impact on litter when deposit legislation was first passed in most states some 30 years ago, the Project Team has found no data sets to support this conclusion today. As a result, no additional cost has been carried for additional litter collection under System 2 because it is not clear that the BB or EBB does, or will impact litter deposition in Vermont.

CAPITAL COSTS

There will be a need for investment in new trucks and containers associated both with the parallel collection requirement in 2015, and with adoption of the phased in ban on organics to landfill. The Systems Cost models add trucks as necessary to collect the increase in single stream material (and to service all households not currently serviced – estimated at 60,000 households). All trucks are added at an assumed capital cost of \$170,000. The Project Team does not know what decisions will be made by the wide range of private haulers serving Vermont. Small haulers may choose to purchase used, small packer trucks at costs significantly lower than \$170,000. Conversely, some haulers may choose to purchase large, automated collection trucks that could cost as much as \$300,000, and some haulers may choose to purchase split compaction trucks which might cost \$200,000 to \$220,000. Finally, some haulers may choose to purchase rendering type trucks for organics collection that cost \$140,000. Because of the wide range in costs and the uncertainty associated with how the private haulers will

¹¹⁰ See for example, *Analysis of Beverage Container Redemption System Options to Increase Municipal Recycling in Rhode Island*, Prepared for the Rhode Island Resource Recovery Corporation, Prepared by DSM Environmental Services, Inc., May 2009, p 18 -20.

choose to meet the requirements of Act 148, the Project Team has simply chosen a truck cost somewhere in the middle of the range as a placeholder for the model.

An attempt has been made in the model to account for the likely change to every other week collection of refuse and recyclables for some households with the addition of organics collection. For purposes of this analysis, it is assumed that beginning in 2020, a third of all households receiving organized and subscription curbside collection will switch to collection of refuse and organics one week and single stream recycling and organics the next week. This partially offsets the additional capital and operation costs associated with separate collection of food residuals and other organics.

It should be noted here that one of the reasons that the total system cost for System 3 (A), which assumes that a number of municipalities and districts don't switch to single stream collection or transfer, is higher than System 3 (which assumes that curbside single stream collection is adopted statewide) is that it will be extremely difficult to co-collect refuse and recycling or organics and recycling if the collection truck has to have two compartments for dual stream recyclables.

It is also assumed that carts will be purchased both for new parallel curbside collection of recyclables and for curbside collection of organics. One and two cubic yard dumpsters are also assumed to be necessary for front loader collection of organics. Finally, it is assumed that 12 new organics transfer compactors located at existing transfer stations will be necessary for organics in 2020.

The only recycling processing capacity necessary is proposed modifications to the Chittenden District MRF (reported to be \$1.9 million). There will, however, be significant new organics processing capacity required, as described in Section VII. This capacity is brought on line as the organics ban is implemented and tonnage ramps up.

It is important to reiterate here that the Project Team has assumed that one third of the new processing capacity for off-site organics management will be on-farm and low cost windrow composting at existing drop-offs and transfer stations. That reduces the total capital cost by 30 percent over what it would be if all organics were delivered to central processing facilities.

All capital costs are carried in the year they are constructed or purchased, with the sum of each year's new capital added to previous year's capital costs and reported in the Summary Tables.

SYSTEM COSTS

Table 51 below outlines the critical assumptions used in the system cost model to estimate baseline system costs, and to estimate future costs under the phase in of Act 148. As discussed at the beginning of this report the most important driver of system costs is collection. Two critical sets of assumptions combine to establish collection costs. The first is the route size, and the second is the annual, all-in cost to operate a truck. The Project Team made the assumption, confirmed by interviews with large, medium and small haulers that for most of Vermont the limiting factor to route size is the number of stops that can be made in a typical collection day, rather than the loaded capacity of the truck. This is because of the largely rural nature of much of Vermont which means that the truck drives long distances between stops when compared to urban areas.

TABLE 53. SYSTEM 2, USS COSTS, CAPITAL COSTS

CAPITAL INVESTMENT		Unit/Coefficient	BASE 2014	2015	2016	2017	2018	2019	2020	2021	2022						
CAPITAL COSTS	Parallel Recycling Collection																
	New Trucks	\$	170,000	\$	11,701,879												
	Transfer Capacity																
	Carts	\$65		\$	4,101,500												
	Organics Collection																
	New Trucks	\$	170,000				\$	2,334,100		\$	(5,113,175)						
	ICI Dumpsters (Tons/dumpster)	52	\$	18,539	\$	25,134	\$	33,231	\$	33,534	\$	36,860	\$	37,158	\$	38,914	
	ICI Carts (Tons/cart/yr)	5.2	\$	188,434	\$	183,319	\$	175,893	\$	175,445	\$	172,760	\$	172,321	\$	170,804	
	Residential Carts (\$/cart)	\$65											\$	5,095,350			
	Drop-Off Transfer Capacity	1,000											\$	968,456			
	Organics Processing																
	Facility Capital Cost	\$	20,000,000	\$	3,900,000	\$	2,000,000	\$	2,000,000		\$	4,000,000		\$	10,000,000		
	Sub-Total, Capital:			\$	4,106,973	\$	18,011,832	\$	2,209,123	\$	208,979	\$	6,543,720	\$	209,479	\$	11,160,348
												\$	42,450,455				
	Total, Annual and Capital:											\$	1,392,669,154				
Total, without Separate Trips:											\$	1,288,484,510					