

# MassDEP C&D Subcommittee Fall-2023 Webinar Series (2 of 3) Recycled Asphalt Shingle Markets

Via Zoom Webinar

October 16, 2023

9:00 AM to 11:00 AM



# Welcome to the Fall-2023 Webinar Series on C&D Materials Market Development (Wood, Shingles, Gypsum)

- Today's webinar is the second in a series of three monthly meetings of the MassDEP C&D Subcommittee Stakeholder Group that will focus on C&D Materials Market Development – Wood, Asphalt Shingles, and Gypsum Wallboard.
- Each meeting will explore optimization of existing markets and development of potential future markets.
- **October 31 re: Wood Markets:** [Meeting Materials](#)
- **November 16 re: Asphalt Shingle Markets:** [Register in advance for this meeting](#)
- **December 14 re: Gypsum Wallboard Markets:** [Register in advance for this meeting](#)

# 53 Registrants as of 11/15/2023

C&D Processors	Recyclers/Brokers	Construction/Svc.	Transporters	Consultants/Architects
Casella	ASR Systems	Columbia	All State Waste	JTC
Cavossa	Boston Building Reso	Costello Dismantl.	Commonwealth Waste	South Mountain
EL Harvey/Waste Con	Patriot Recycling/Car	STO Group		
J.R. Vinagro	USA Gypsum			
Republic Services				
ReSource Waste Services				
Waste Mgt./RSR				
WIN Waste Innov.				
Manufacturers	NGO/Trade Assoc.	Municipalities	State Agencies	Elected Officials
Certainteed	CDRA	Augusta	CT	Rep. Michelle Cicollo (Mass 15th Middlesex)
	Recycling Works/CET	Boston	MA	
		Bourne	ME	
		NYC	NH	
			RI	
			VT	

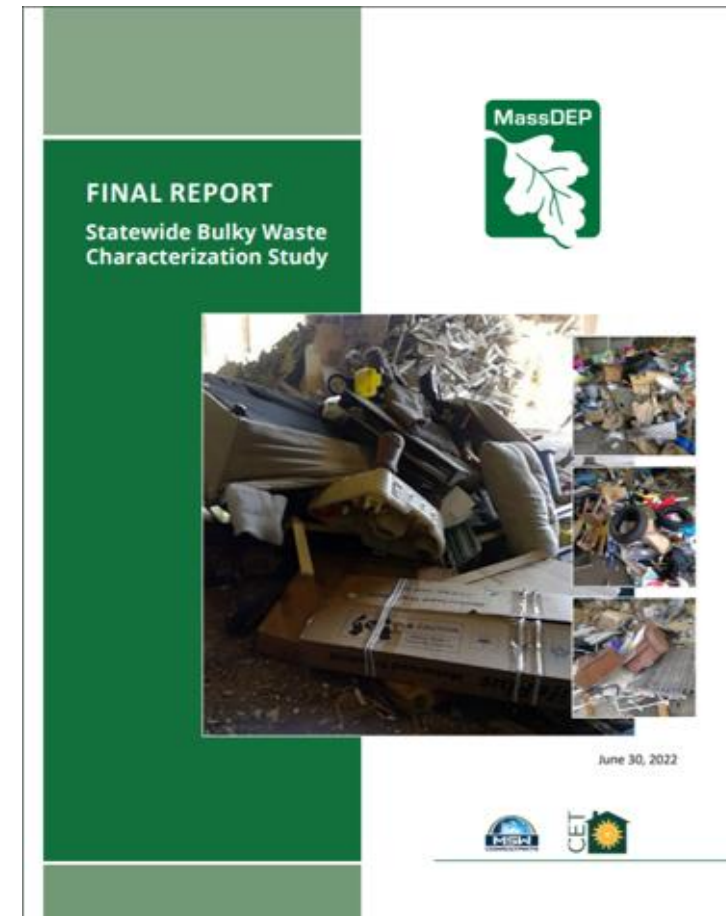
# Agenda

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- Welcome
- Waste Characterization Data and Estimate of Asphalt Shingle Quantities
  - MassDEP
- Overview of asphalt shingle recycling markets – existing and potential future processing technologies
  - Mr. Dan Horton, Founding Partner of ASR Systems
- MassDOT research re: binder blending and recycled binder ratios
  - Dr. Walaa Mogawer, UMass-Dartmouth Commonwealth Professor, Director, Highway Sustainability Research Center, P.E.
- Open discussion
- Announcements

# Estimated Potential Asphalt Shingle Quantities using the 2022 Bulky Waste Study

- 2022 Statewide Bulky Waste Characterization Study (June 2022)
- Surveyed 5 facilities across the state in May 2022
- Applied waste characterization data to C&D Facility Annual Report data to estimate potentially available asphalt shingle quantities



<https://www.mass.gov/doc/statewide-bulky-waste-characterization-study-june-2022/download>

# Study Included Both C&D and Bulky Waste Loads

- Total: 219 loads weighing 413 tons surveyed
- C&D Waste: 45 loads weighing 128 tons
- Bulky Waste: 116 loads weighing 165 tons
- Comparable weights of each waste stream
- Most recent state-wide data of materials handled by C&D facilities

Table 2-4 Load Survey Distribution by Facility

Facility Name	Bulky Loads	Mixed Loads	C&D Loads	Total Loads Surveyed
Stoughton Recycling (Win-Waste)	15	8	18	41
Trojan Recycling	29	17	27	73
Casella of Holyoke	30	13	0	43
Western Recycling	29	13	0	42
Raynham Regional C&D Processing	13	7	0	20
<b>Total Samples</b>	<b>116</b>	<b>58</b>	<b>45</b>	<b>219</b>

Table 2-6 Distribution of Visually Surveyed Tons by Truck Type

Truck Type	Bulky Loads	Mixed Loads	C&D Loads	Total Loads	Percent by Tons
Roll-off Open Top	131.3	113.5	103.1	347.9	84.1%
Box/Dump Truck	28.1	1.5	12.5	42.1	10.2%
Pickup Truck/Tow Trailer	4.9	6.0	12.5	23.4	5.7%
Rear Loader	0.5	0.0	0.0	0.5	.1%
<b>Total Tons</b>	<b>164.8</b>	<b>121.0</b>	<b>128.1</b>	<b>413.5</b>	<b>100%</b>

# C&D and Bulky Waste Composition Analysis: Results of 2022 BW Characterization Study

Table 4-4 Detailed C&D Composition

Material Category	Mean Percent	Margin of Error	Material Category	Mean Percent	Margin of Error
<b>Paper</b>	<b>1.4%</b>	<b>0.7%</b>	<b>C&amp;D Debris</b>	<b>52.8%</b>	<b>6.8%</b>
Uncoated OCC	0.5%	0.2%	Asphalt Pavement	0.0%	0.0%
Other Recyclable Paper	0.3%	0.2%	Brick/Block	2.6%	2.3%
Non-Recoverable Paper	0.6%	0.4%	Concrete	0.6%	1.0%
<b>Plastic</b>	<b>1.2%</b>	<b>0.3%</b>	Gypsum wallboard - CLEAN	1.0%	1.2%
Recyclable Plastic Containers	0.0%	0.0%	Gypsum wallboard - USED	6.6%	3.0%
Clean Film Plastic	0.1%	0.0%	Asphalt Shingles	13.4%	8.1%
5-gal Buckets and Plastic Toters	0.2%	0.1%	Carpet & Carpet Padding	1.6%	1.6%
Durable Plastics (Not Furniture)	0.1%	0.1%	Rock/Gravel/Dirt/Sand	0.4%	0.6%
Non-Recoverable Plastics	0.7%	0.3%	Porcelain/Plumbing Fixtures	5.8%	3.4%
<b>Metal</b>	<b>6.1%</b>	<b>2.4%</b>	Other C&D Materials	20.7%	5.0%
Recyclable Metal Containers	0.0%	0.0%	<b>Furniture</b>	<b>0.3%</b>	<b>0.3%</b>
Large Appliances (white goods)	0.0%	0.0%	Predominantly Wood	0.1%	0.2%
Ferrous/Non Ferrous Scrap	6.1%	2.4%	Predominantly Plastic	0.0%	0.0%
<b>Glass</b>	<b>0.7%</b>	<b>0.5%</b>	Predominantly Metal	0.0%	0.0%
Recyclable Glass Containers	0.0%	0.1%	Predominantly Upholstered	0.0%	0.0%
Non-Recoverable Glass	0.6%	0.4%	Predominantly Mixed	0.2%	0.2%
<b>Organics</b>	<b>1.0%</b>	<b>1.3%</b>	Mattresses	0.0%	0.0%
Land Clearing	0.0%	0.0%	Box Springs	0.0%	0.0%
Yard Waste/Green Waste	0.6%	0.7%	<b>Other Bulky</b>	<b>0.9%</b>	<b>0.6%</b>
Other Organics	0.4%	0.7%	CRTs	0.0%	0.0%
<b>Wood</b>	<b>31.3%</b>	<b>5.1%</b>	Vehicle Batteries	0.0%	0.0%
Untreated Dimensional Lumber	4.9%	1.9%	Tires	0.0%	0.0%
Engineered Wood	9.3%	2.1%	Textiles	0.3%	0.2%
Wood Pallets/Crates/Spools	2.4%	1.3%	E-Waste	0.0%	0.1%
Painted/Stained Wood	5.0%	1.2%	Other Bulky Materials	0.6%	0.5%
Treated Wood	7.5%	3.0%	<b>Mixed MSW</b>	<b>4.3%</b>	<b>2.1%</b>
Cabinetry/Countertops/Doors	2.2%	1.1%	Bagged and Loose MSW	4.2%	2.0%
			HHW/Universal Waste	0.1%	0.1%
<b>Grand Total</b>				<b>100%</b>	
<b>No. of Samples</b>				<b>45</b>	

Table 4-2 Detailed Bulky Waste Composition

Material Category	Mean Percent	Margin of Error	Est. Annual Tons	Material Category	Mean Percent	Margin of Error	Est. Annual Tons
<b>Paper</b>	<b>3.1%</b>	<b>0.5%</b>	<b>9,608</b>	<b>C&amp;D Debris</b>	<b>10.0%</b>	<b>3.0%</b>	<b>30,943</b>
Uncoated OCC	1.4%	0.2%	4,328	Asphalt Pavement		Not Found	0
Other Recyclable Paper	0.8%	0.2%	2,374	Brick/Block	0.1%	0.2%	336
Non-Recoverable Paper	0.9%	0.2%	2,905	Concrete		Not Found	0
<b>Plastic</b>	<b>3.3%</b>	<b>0.4%</b>	<b>10,182</b>	Gypsum wallboard - CLEAN	0.1%	0.1%	205
Recyclable Plastic Containers	0.2%	0.0%	571	Gypsum wallboard - USED	1.1%	0.7%	3,431
Clean Film Plastic	0.0%	0.0%	152	Asphalt Shingles	0.6%	0.6%	1,880
5-gal Buckets and Plastic Toters	0.3%	0.1%	815	Carpet & Carpet Padding	3.6%	1.0%	11,134
Durable Plastics (Not Furniture)	1.2%	0.2%	3,671	Rock/Gravel/Dirt/Sand	1.0%	1.6%	2,961
Non-Recoverable Plastics	1.6%	0.2%	4,973	Porcelain/Plumbing Fixtures	1.5%	1.0%	4,501
<b>Metal</b>	<b>8.2%</b>	<b>1.5%</b>	<b>25,144</b>	Other C&D Materials	2.1%	1.2%	6,495
Recyclable Metal Containers	0.0%	0.0%	140	<b>Furniture</b>	<b>34.1%</b>	<b>5.3%</b>	<b>105,131</b>
Large Appliances (white goods)	0.3%	0.2%	876	Predominantly Wood	17.2%	3.3%	53,050
Ferrous/Non Ferrous Scrap	7.8%	1.4%	24,127	Predominantly Plastic	0.7%	0.2%	2,133
<b>Glass</b>	<b>1.3%</b>	<b>0.5%</b>	<b>3,908</b>	Predominantly Metal	3.5%	1.6%	10,732
Recyclable Glass Containers	0.1%	0.1%	214	Predominantly Upholstered	1.3%	0.4%	4,029
Non-Recoverable Glass	1.2%	0.5%	3,694	Predominantly Mixed	9.4%	4.0%	28,877
<b>Organics</b>	<b>3.6%</b>	<b>2.7%</b>	<b>10,974</b>	Mattresses	1.2%	0.3%	3,555
Land Clearing	0.0%	0.0%	75	Box Springs	0.9%	0.3%	2,755
Yard Waste/Green Waste	1.6%	1.4%	4,951	<b>Other Bulky</b>	<b>5.4%</b>	<b>1.3%</b>	<b>16,731</b>
Other Organics	1.9%	1.9%	5,948	CRTs	0.3%	0.3%	920
<b>Wood</b>	<b>18.6%</b>	<b>2.4%</b>	<b>57,308</b>	Vehicle Batteries		Not Found	0
Untreated Dimensional Lumber	1.8%	0.3%	5,667	Tires	0.3%	0.2%	803
Engineered Wood	6.3%	1.3%	19,344	Textiles	3.7%	1.1%	11,366
Wood Pallets/Crates/Spools	1.7%	0.7%	5,346	E-Waste	0.4%	0.4%	1,334
Painted/Stained Wood	2.8%	0.7%	8,756	Other Bulky Materials	0.7%	0.3%	2,308
Treated Wood	3.1%	0.6%	9,610	<b>Mixed MSW</b>	<b>12.4%</b>	<b>1.9%</b>	<b>38,198</b>
Cabinetry/Countertops/Doors	2.8%	0.7%	8,585	Bagged and Loose MSW	12.4%	1.9%	38,152
				HHW/Universal Waste	0.0%	0.0%	46
<b>Grand Total</b>				<b>100%</b>			<b>308,127</b>
				<b>No. of Samples</b>	<b>116</b>		

Note: Est. Annual Tons shown in Table 4-2 are based on CY2021 AR Data

# C&D and Bulky Waste Compositional Analysis: Conversion of Mean % to Weight (for CY2022)

	CY2022 AR Data (tons)	RAS %Mean 2022 BW Study	Estimated Potential Available RAS (tons)
C&D Waste Loads	1,207,641	13.4%	161,824
Bulky Waste Loads	177,097	0.60%	1,063
Sum Total			<b>162,886</b>

CY2022 Total C&D Waste Loads Processed = C&D Accepted – Transferred = 1,545,305t – 337,663t = 1,207,641t

CY2022 Total Bulky Waste Loads Accepted = 177,097t

Estimated potential available RAS only considers loads accepted at 29 C&D Handling Facilities, not all solid waste facilities (e.g., excludes MSW Transfer Stations, MSW Combustors, and MSW Landfills); therefore, potentially available RAS is likely a conservatively low estimate.



# Existing RAS Markets in Massachusetts

## **Patriot Recycling/Carney Environmental in Raynham**

- Volume processed annually = ca. 20,000t
- Largest customer supplying RAS: Rooftop Recycling
- End-markets served: asphalt batch plants (ca. 10 plants)
- Challenges/opportunities: MassDOT establishing program to use RAS

Per 11/16/2023 email from Chris Carney

## **Rooftop Recycling in Boxborough**

- Volume processed annually: ca. 20-25,000t
- Largest customer supplying RAS: roofing contractors
- End-markets served: asphalt batch plants via Carney
- Challenges/opportunities: MassDEP Asbestos Regulation

Per 11/16/2023 phone call with Sean Anestis

# Overview of asphalt shingle recycling markets – existing and potential future processing technologies

Mr. Dan Horton, Founding Partner of ASR Systems

# MassDOT research re: binder blending and recycled binder ratios

Walaa Mogawer, Ph.D., P.E.(MA & RI), F. ASCE  
Commonwealth Professor, Civil and Environmental Engineering Department  
Director, Highway Sustainability Research Center  
University of Massachusetts Dartmouth

# Discussion about RAS Markets

# Announcements

# CDRA National Perspective



- NOI for EPA Grant
- OSHA Walk-around Regulation
- Annual Meeting

<https://cdrecycling.org/>

# Biden-Harris Administration Announces \$100 Million in Grants to Support Manufacturers of Cleaner Construction Materials as Part of Investing in America Agenda

<https://www.epa.gov/newsreleases/biden-harris-administration-announces-100-million-grants-support-manufacturers-cleaner>

- This [new grant program](#)—Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products—will **help businesses develop robust Environmental Product Declarations (EPDs)** which disclose environmental impacts across the life of a product. Embodied greenhouse gas (GHG) emissions—also called embodied carbon—refers to the amount of GHG emissions associated with the extraction, production, transport, and manufacturing stages of a product's life. EPDs facilitate the reliable tracking of emissions associated with construction materials and products to inform procurement decisions.
- EPA will **provide grants to businesses that manufacture, remanufacture, and refurbish construction materials** and products for developing and verifying EPDs, and to states, Tribes, and nonprofit organizations that will support such businesses. The EPDs generated through this grant program will make it easier for state and local governments—and other institutional buyers—to ensure the construction projects they fund are using low carbon construction materials.
- The deadline to apply to this grant competition is January 8, 2024. EPA requests the submittal of an optional Notice of Intent to apply by October 27, 2023, by sending an email to [embodiedcarbon@epa.gov](mailto:embodiedcarbon@epa.gov).
- Eligible entities include:
  - Businesses that manufacture, remanufacture, and refurbish construction materials and products, and
  - States, Tribes, and nonprofit organizations that will support such businesses.

# MassDEP is hiring!

- Consistent with a campaign pledge, the Healey-Driscoll Administration has allocated 1% of the state's operating budget for climate and the environment.
- This translates to close to 100 new vacancies at MassDEP across all programs
- Follow the MassCareers webpage if you are interested in starting a new career at MassDEP:  
<https://massanf.taleo.net/careersection/ex/jobsearch.ftl>



Any other business to  
discuss?

# For More Information:

## Point of Contact:

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