



School Waste Composition Study

2010

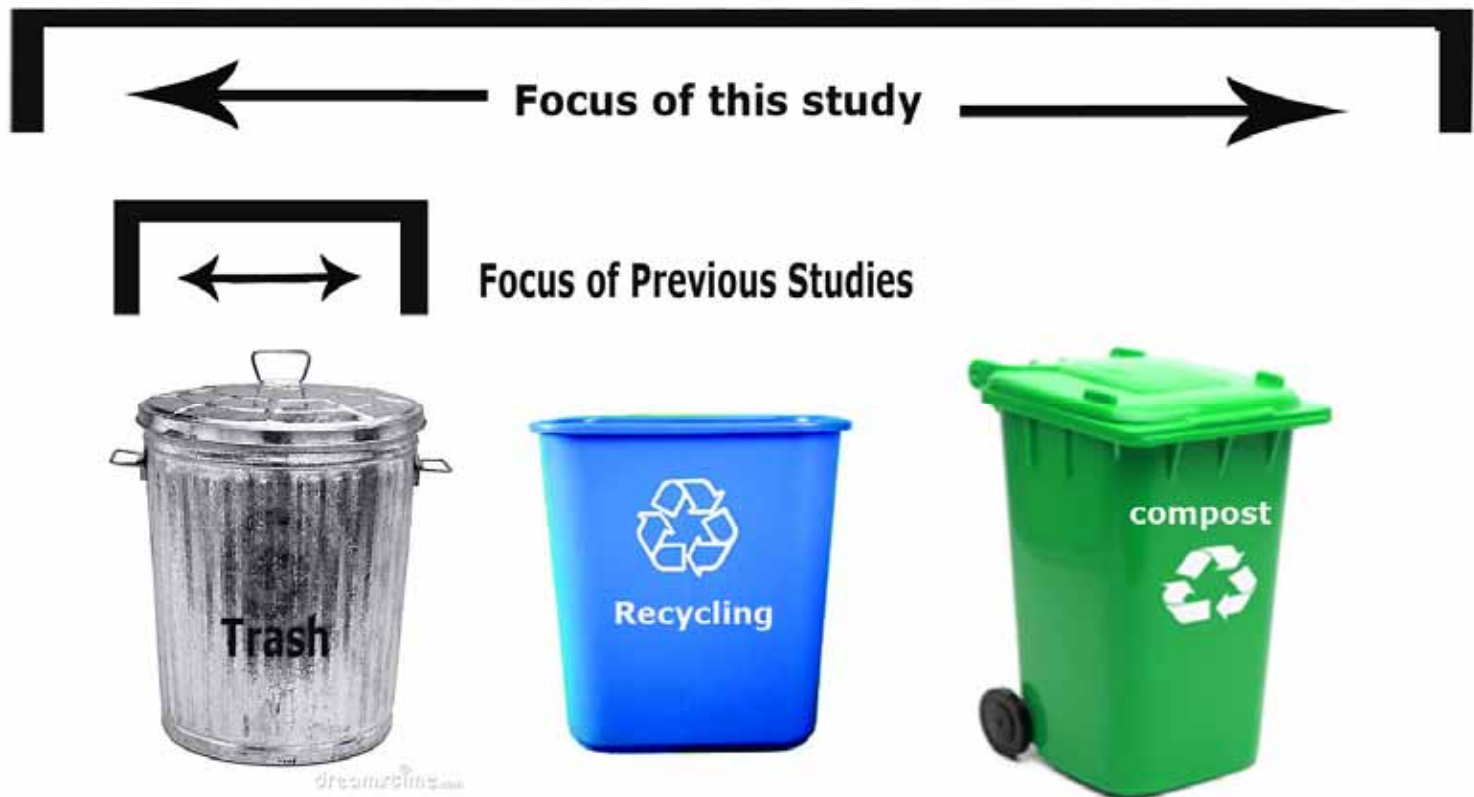
Purpose

This study was designed to answer several questions about waste generated at schools:

- How much waste (trash, recycling and organics) is generated by a school?
- How much of the waste generated at a school could be recycled?
- How much of the waste generated at a school could be composted? How much could be processed through a food-to-animals program?
- How much of the material currently handled as trash could be recycled or composted?
- What materials are found in the waste stream and which are the most prominent?
- How much contamination is there in recycling/composting containers?



This study examined all waste generated by schools



Study Design

- 6 Schools – 2 elementary, 2 middle, 2 high schools
- All waste generated over two days was sorted – ‘census’ method
- Waste tracked by: school of origin, date generated, material stream
- Waste sorted into 19 categories



Waste Sorting



- 28 Sorters & Coordinators: MPCA staff, county staff, city staff and many volunteers
- Sorters averaged sorting 22.68lbs of waste per hour (includes 45 min lunch break)
- 6,012lbs of waste were sorted over two days.
- 7,546 lbs of waste were collected from schools.

The Study Schools

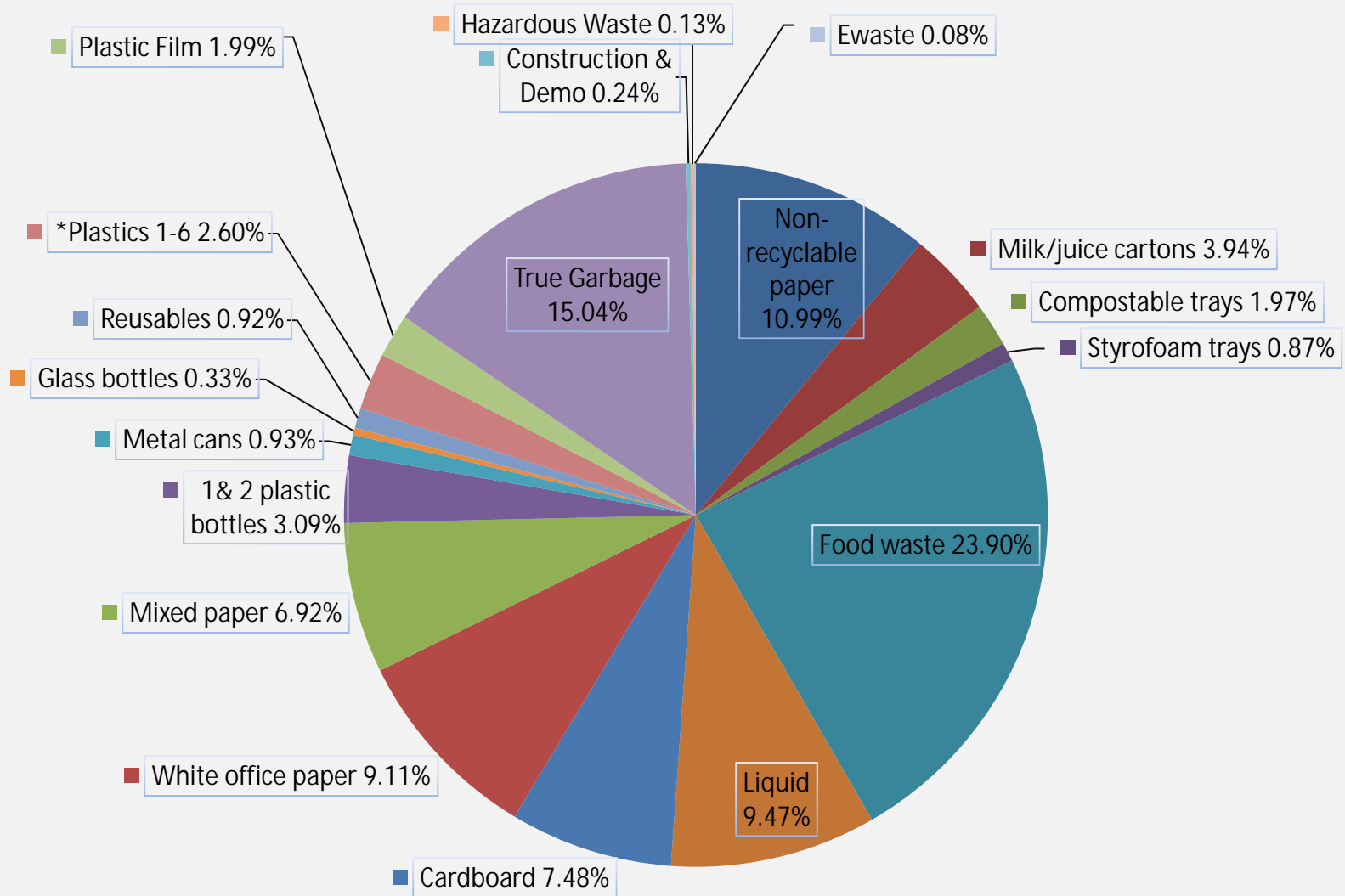
School	Total Population (Students & Staff)	Location	Grades	Recycling Program	Organics Program
Burroughs (elementary)	816.4	Minneapolis	K-5	Single Stream	Composting
Clear Springs (elementary)	681	Minnetonka	K-5	Dual Stream	Composting
Northeast (middle)	592.3	Minneapolis	6-8	Single Stream	Composting
West Junior (middle)	941	Hopkins	6-8	Dual Stream	Composting
Washburn (high)	925.1	Minneapolis	9-12	Single Stream	Composting
Minnetonka (high)	3,083.00	Minnetonka	9-12	Dual Stream	Composting

Results

Material	Elementary School Weighted Average	Middle School Weighted Average	High School Weighted Average	All Schools Overall Weighted Average
<u>Nonrecyclable paper</u>	12.67%	9.13%	10.2%	10.99%
Milk cartons	4.40%	4.63%	3.0%	3.94%
Compostable trays	0.77%	3.65%	2.3%	1.97%
Styrofoam trays	0.03%	0.00%	2.4%	0.87%
Food waste	26.99%	23.97%	20.4%	23.90%
Liquid	11.79%	7.58%	8.0%	9.47%
Cardboard	3.16%	8.11%	11.9%	7.48%
White office paper	9.39%	10.51%	7.9%	9.11%
Mixed paper	9.02%	6.32%	4.9%	6.92%
1 & 2 plastic bottles	1.18%	1.94%	5.9%	3.09%
Metal cans	0.94%	1.46%	0.6%	0.93%
Glass bottles	0.49%	0.17%	0.2%	0.33%
<u>Reusables</u>	1.14%	0.97%	0.6%	0.92%
Plastics 1-6 *	2.62%	2.77%	2.5%	2.60%
Plastic film	1.85%	2.47%	1.9%	1.99%
True garbage	13.32%	15.51%	16.7%	15.04%
Construction & demo	0.00%	0.70%	0.2%	0.24%
Hazardous waste (HW)	0.24%	0.05%	0.1%	0.13%
E-waste	0.01%	0.06%	0.2%	0.08%
Total	100.0%	100.00%	100.0%	100.0%

* Plastics 1-6; NOT 1 & 2 bottles with necks

Composition of Waste (all grade levels combined)



Most Prominent Categories

- Food Waste: 23.09%
- True Garbage: 15.04%
- Recyclable Paper: Combined total of 23.51%
 - Mixed paper 6.92%
 - White office paper 9.11%
 - Cardboard 7.48%
- Non-recyclable paper: 10.99%



Liquids

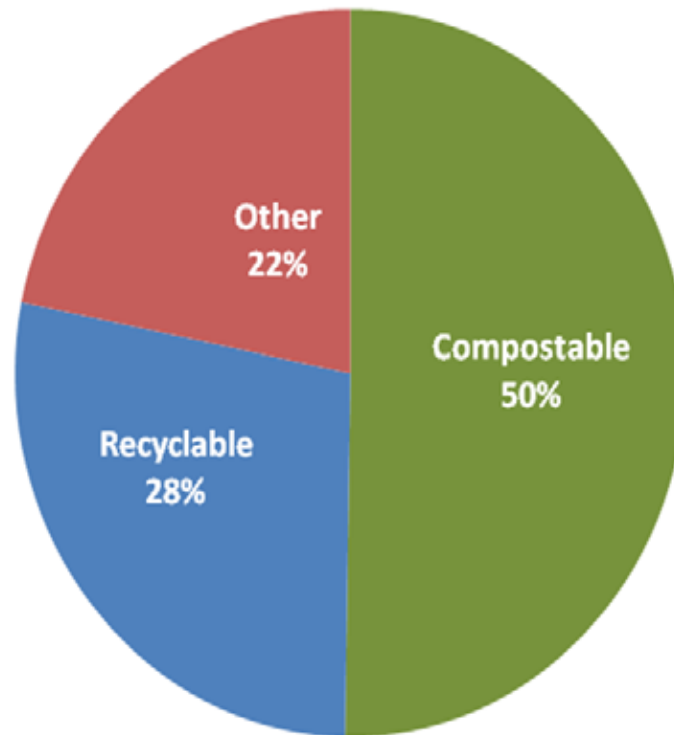


- All six schools pre-sorted liquid waste
- Even with pre sort, liquids accounted for 9.47%
- Many food to livestock programs encourage liquid waste to be placed in containers.
- Liquid is heavy, but does not take up lots of space.



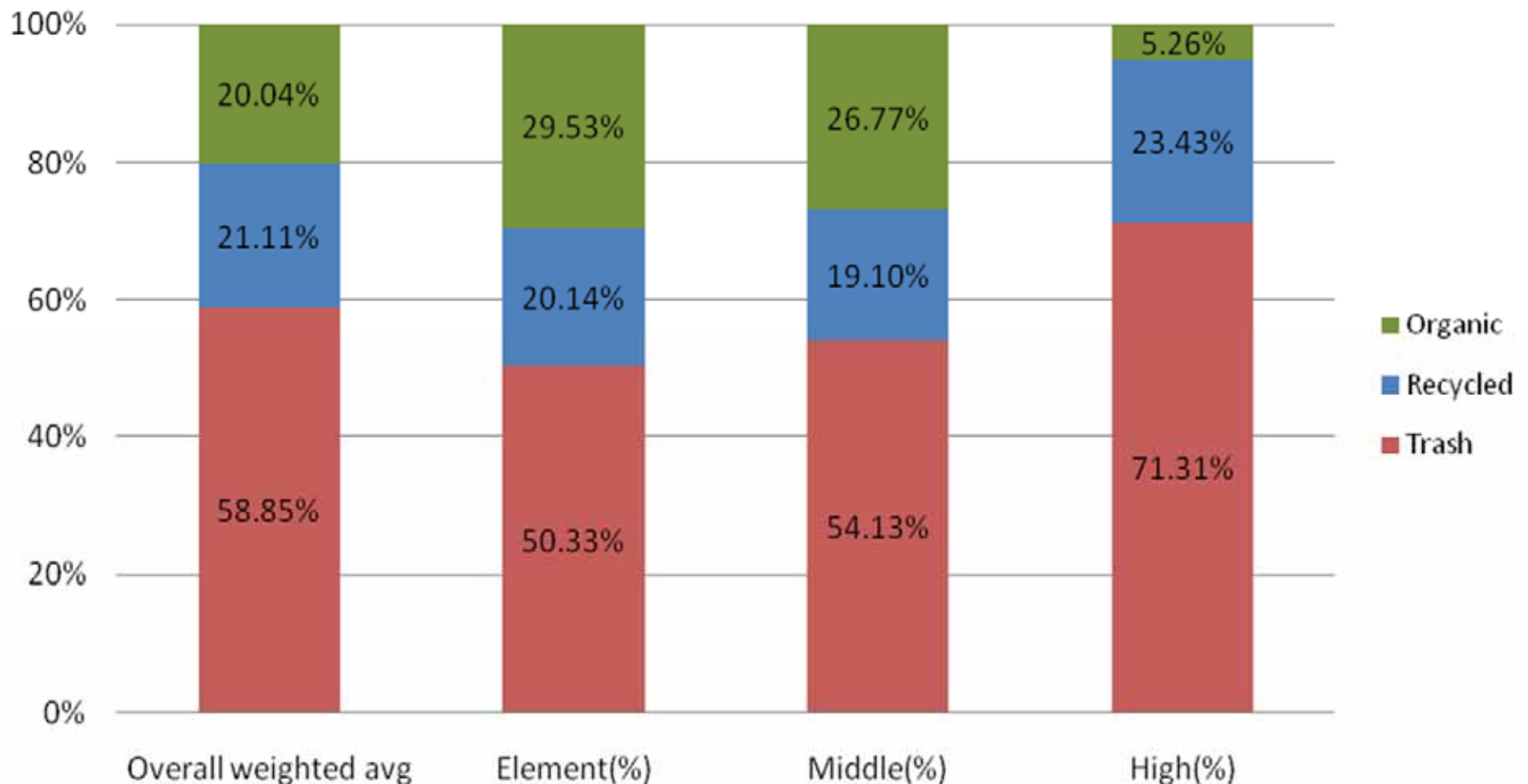
Recyclable and Compostable Components of School Waste

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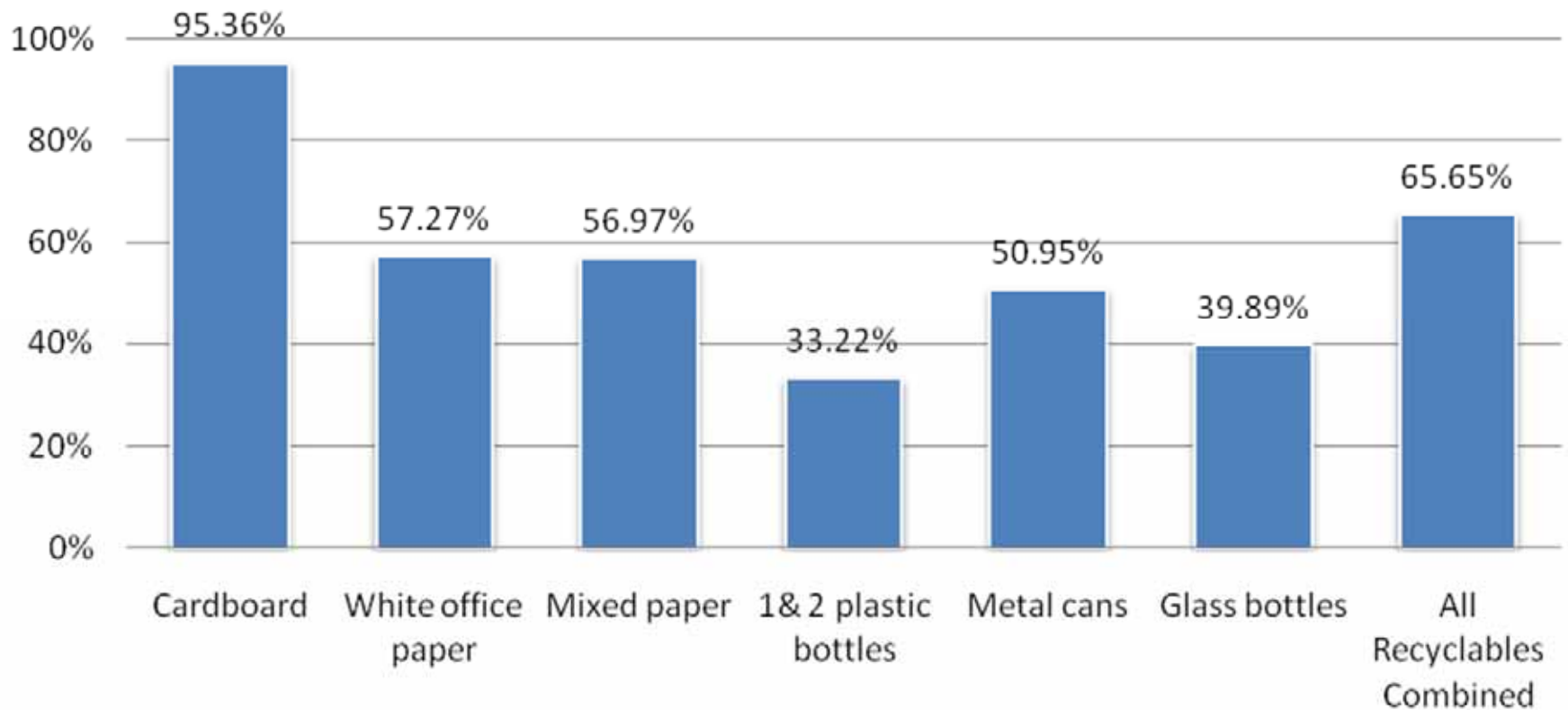
Current Recovery Rates:

Recycle Rate by School Tier



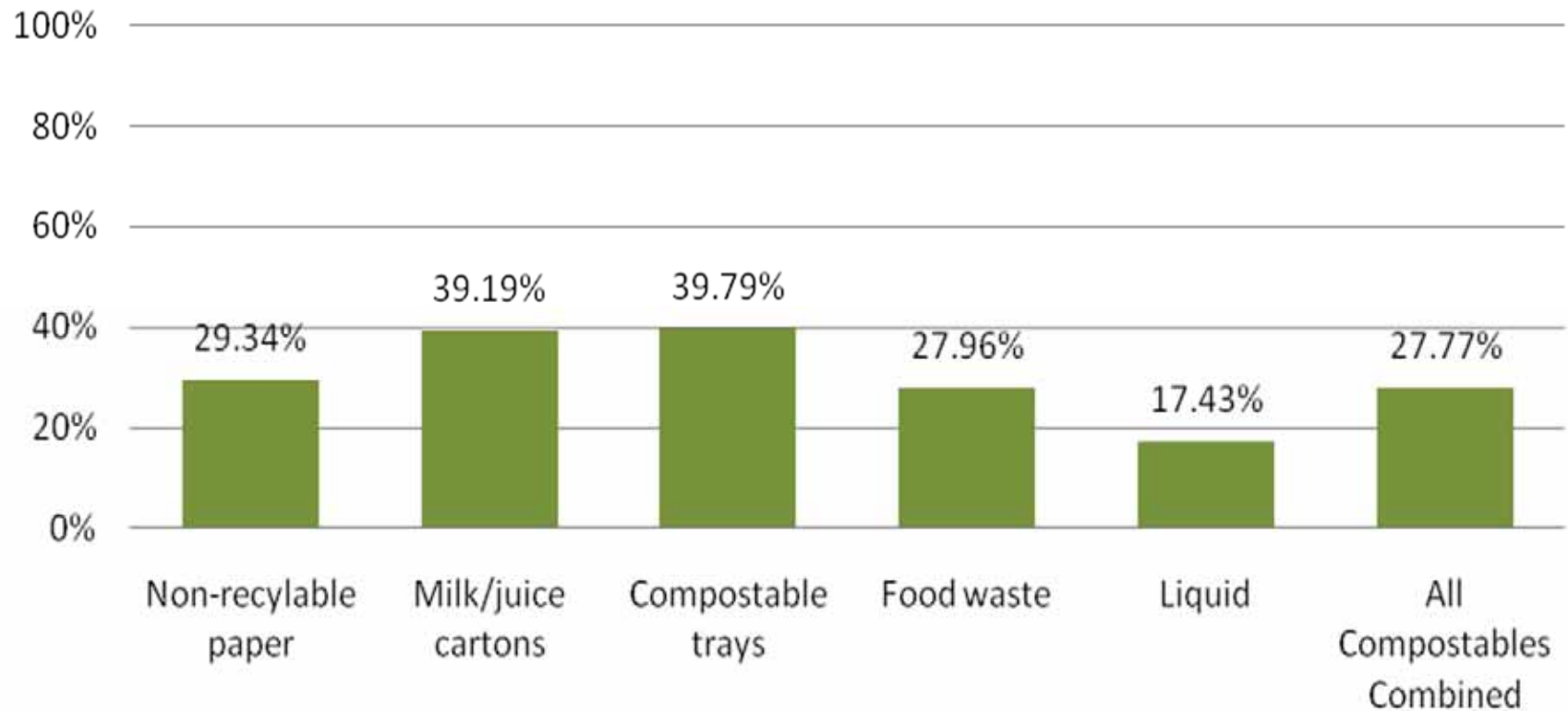
Recycling Capture Rates

Capture Rates for Recyclables



Capture Rates for Compostables

Capture Rate for Compostables



Waste Generated at Study Schools

					Waste Sort Data ***	Hauler Data****
	Number of Students (April1)	Number of Staff (April 1)*	Total Population	Waste Generated (lb)**	Daily Per Capita Waste (lb)	Daily Per Capita Waste (lb)
Burroughs (elementary)	762.0	54.4	816.4	574.20	0.35	0.30
Clear Springs (elementary)	584.0	97.0	681.0	845.46	0.62	Not Available
Northeast (middle)	519.0	73.3	592.3	739.73	0.62	0.65
West Junior (middle)	856.0	85.0	941.0	864.00	0.46	Not Available
Washburn (high)	818.0	107.1	925.1	1255.62	0.68	0.66
Minnetonka (high)	2,775.0	308.0	3,083.0	3267.30	0.53	Not Available

* Full-time Equivalent staff – includes teachers, administrators and non-licensed staff.

** Total waste generated over two days

*** Calculated based on waste generated over two days

**** Data provided by Minneapolis Public Schools for five months of waste generations (November 2009 - March 2010).

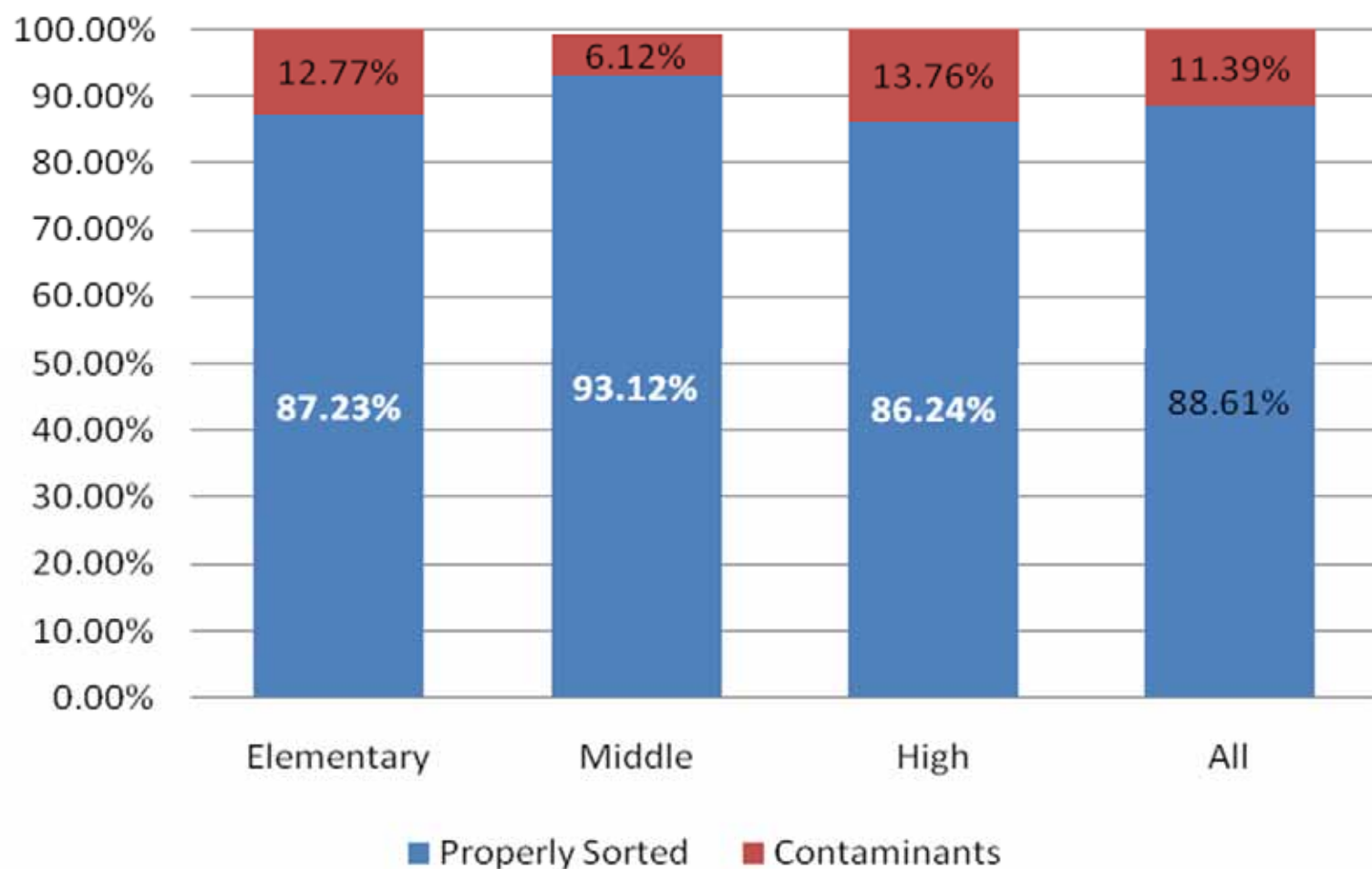
Waste Generated at Schools Statewide

	Per capita/ day (lb)	MN population of school tier*	Waste Generated Statewide Per School Day (lb)
Elementary (K-5)	0.47	413,401	195,969
Middle (6-8)	0.52	206,001	107,732
High (9-12)	0.56	309,711	174,746
Total	0.52	929,113	483,520

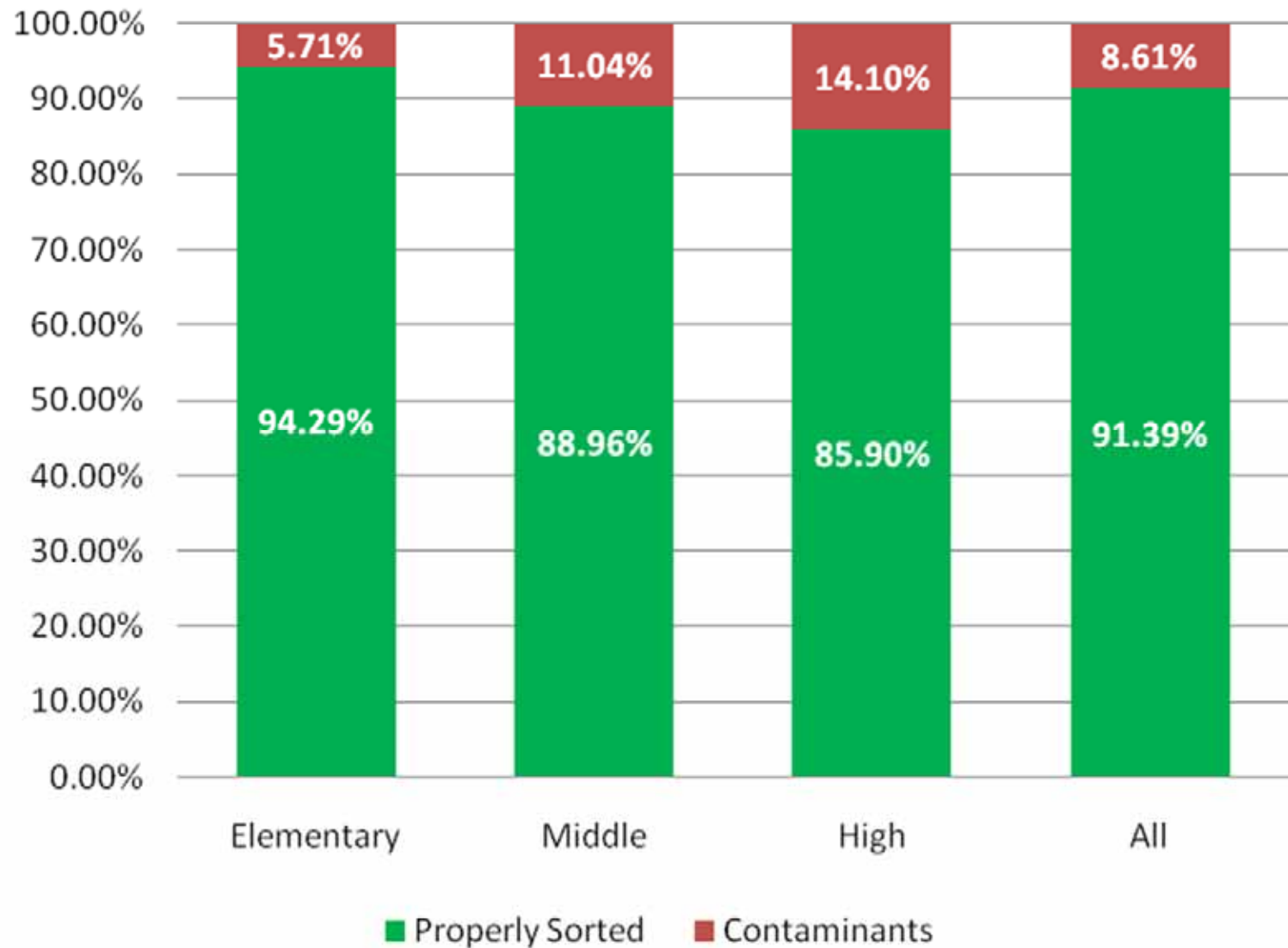
* Statewide student and staff population data: Minnesota Department of Education

- Assuming 180 School days per year – schools generate more than 43,516 tons of waste annually.
- 64 of Minnesota's 87 Counties reported generating less than 43,516 tons of waste in the 2008 SCORE Report

Contamination in Recycling by Grade Tier



Contamination in Compost by Grade Tier



Using All Available Space



With loosely packed cafeteria trays, the capacity of a 96-gallon cart was 114 trays, or 4.4 lb of waste



With neatly stacked cafeteria trays, the capacity of a 96-gallon cart was 920 trays or 37.8 lb of waste

Lesson's learned

- Over 78% of what is generated at schools could be recycled or composted.
- Schools generate a significant amount of waste
 - Combined the state's ~2000 public schools generate more waste annual than 64 of MN's 87 Counties
- Schools that successfully increase recycling and composting capture rates have the potential to reduce trash service (which could save money)
- There are many opportunities for schools to reduce overall waste generation.



Digging Deep Through School Trash

A waste composition analysis of trash, recycling and organic material discarded at public schools in Minnesota



Minnesota Pollution Control Agency

September 2010

Find the full
report online
at:

www.pca.state.mn.us/schoolwaste



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**Minnesota Pollution
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