



SOUTHWEST COLORADO COUNCIL OF GOVERNMENTS

Southwest Colorado Council of Governments Southwest Colorado Waste Study

Project Coordinator:

Miriam Gillow-Wiles

director@swccog.org

970-779-4592

Persons Completing Report:

Miriam Gillow-Wiles and Sara Trujillo

Miriam: director@swccog.org, 970-779-4592

Sara: sara@swccog.org, 505-290-0015

II. Work Plan

Deliverable	Completion Date	Comments <i>(if deliverable was not completed, please explain why and what progress has been made)</i>
Issue RFP	July 2014	
Review bids	July 2014	
Establish contract	August 2014	
Identify stakeholders	August/September 2014	
Manage meeting logistics & establish meeting schedule	Ongoing throughout Project	The project is completed, and meetings were set as necessary throughout the year.
Evaluate policy & education program components	September 2014 – May 2015	
Assist stakeholders with project needs/findings/next steps	February – May 2015	
Collect facility & program data	October-November 2014	
Confirm audit locations & organize audit logistics	September – November 2014	
Apply waste comp. data to population for recyclables & non-recyclables in waste stream	November 2014 - February 2015	
Project from 2015 to 2025	May 2015	
Compare region's future needs against the Durango's capacity	Spring 2015	
Compare against MRF proposals	Spring 2015	
Develop model with design features, facility sizing, capital & operating costs, revenues	Spring 2015	This aspect became less important with the development of a MRF prior to the beginning of the project. Further, the Taskforce wanted to focus on education

		vs information regarding developing models for facilities.
Specific equipment and/or facility components with design features, facility sizing capital & operating costs	Spring 2015	See above response
Executive-summary style report with detailed research findings and estimates included as appendices	June 2015	

III. Project Summary

1. Executive Summary

The Southwest Colorado Waste Study was conducted in late 2014 as a State of Colorado Recycling Resource Economic Opportunities grant project. The study was completed by the Southwest Colorado Council of Governments (SWCCOG), and encompassed the five-county region of Archuleta, Dolores, La Plata, Montezuma and San Juan Counties as well as the Southern Ute and Ute Mountain Ute Tribes. This area - with its mountainous terrain, agriculture, and wilderness areas coupled with population density of 15 persons/square mile - has unique waste diversion challenges for the region. Further complicating waste diversion for the region is the differing access to recycling opportunities.

2. Project Description & Overview of Work Completed

The focus of the study was diversion of the municipal solid waste (MSW) stream. The study was intended to create a level playing field and to catalyze regionalization by government and industry stakeholders to support improved programming, policy and infrastructure. The SWCCOG held 10 waste sorts throughout the region, at landfills, transfer stations, and private hauler facilities. To evaluate opportunities for increasing waste diversion in southwest Colorado, SWCCOG developed a Recycling Task Force comprised of governments and tribes, haulers, transfer and landfill operators, non-profit organizations and interested citizens. These stakeholders agreed that improving the economics of recycling was an important goal, and that regionalizing diversion activities, expanding public outreach, creating diversion incentives and providing better access to recycling collection were important components. Based on task force direction, a waste diversion coalition was evaluated that could provide:

- Leadership in a region that has not generally prioritized waste diversion
- Reduced workload for governments
- Increased efficiencies by centralizing activities
- More waste diversion programming
- Increased diversion of quality materials
- A neutral third party to buffer relationships between local jurisdictions, public, and private sectors and encourage a united versus competitive environment

With the addition of the AmeriCorps VISTA in August 2015, the Recycling Taskforce will be able to move forward with any number of these options.

3. Summary of Results

While the region has some communities that have robust diversion, the majority of the region does not have access to any diversion. As a result there are high amounts of commonly recyclable materials in the waste stream (see appendix 1). Based on data obtained from haulers, landfills, recyclers, material brokers, diversion facilities and food banks in the study area, it was estimated that approximately 107,000 tons of MSW was generated in 2014. Not surprisingly, these quantities closely mimic county populations. The waste generation rate was calculated to be about 5.9 pounds per capita-day (ppcd). This value is notably lower than the State of Colorado average of 8.8 ppcd⁶, but higher than the national average or 4.4 ppcd. The region has an overall diversion rate of 14%⁸. This rate is low compared to a State of Colorado diversion rate of 22%⁶ and national rate of 34%⁷. San Juan County reported the highest county diversion rate of 28% by weight.

However, Durango (La Plata County), which hauls residential and some commercial trash and recyclables, reported a rate of 32% and leads the region in waste diversion. While the initial RREO recycling study was intended to collect baseline data and support consideration of waste diversion obstacles and opportunities in southwestern Colorado, the SWCCOG realized the additional need for implementing study recommendations over the long-term. To accomplish this, the SWCCOG worked to develop a Recycling Task Force including key stakeholders in the region. These organizations provided baseline data and prior to the completion of this report attended three stakeholder meetings in 2015: January 27th (Durango), March 31st (Cortez) and April 1st (Durango). Additional meetings are expected in late 2015 and 2016. These service providers, policy makers and facility operators had different customer bases, services and profit goals and in some cases, were in direct competition with one another. Bringing this diverse group together was an important step for information sharing, open dialogue and collective brain-storming. There was ready agreement amongst all parties that improving the economics of recycling was important to all participants, and that once this was accomplished increased diversion would follow in a re-enforcing loop. However, the specific options and means for attaining improved economics varied widely. Stakeholders were able to identify, however, the need to evaluate:

- A regional waste diversion coalition to provide leadership and advocacy
- Regional education and outreach to provide consistency and efficient use of resources
- New waste diversion policies - suggestions included a cardboard disposal ban, glass storage in Montezuma County, hauler ordinances in urban areas and data collection requirements
- Expanded recycling access to remote areas (especially tribal and unincorporated areas)

4. Summary of Unanticipated Outcomes or Roadblocks

As this was a planning grant, there were very few roadblocks or unanticipated outcomes. If anything, the amount of recyclables in the waste stream was higher than expected.

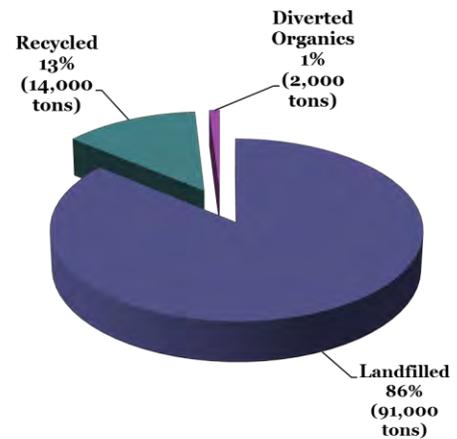


Figure 1 Regional Waste Diversion Quantities

5. Communication of Project Findings

After the waste audits and compilation of data, the WCCOG developed a Recycling Task Force comprised of governments and tribes, haulers, transfer and landfill operators, non-profit organizations and interested citizens. The SWCCOG held multiple meetings with the Task Force to communicate the waste audit findings, discuss policy, and generally how to drive waste diversion. Through the Task Force's input the SWCCOG was able to address waste diversion tactics. Miriam Gillow-Wiles, the Executive Director of the SWCCOG, presented at the June 2015 Colorado Association for Recycling Conference. In September, Miriam will present at Colorado Solid Waste Association of North America in Colorado Springs. Further, Miriam will present at the Green Business Roundtable in Durango in November.

6. Future Impact of the Project

The project will have a lasting impact in the policy development and communication between stakeholders in the region. The Task Force will continue to meet for the Phoenix Recycling RREO grant, as well as continue to address educational, policy, and diversion issues. The SWCCOG has also shared the format of the project and the outcomes with other regions and organizations throughout the state in hopes they are able to glean information and develop similar projects.

7. Financial Summary

Description	Grant Funds Spent	Matching/In Kind Amount (if any)	Total Amount
Personnel Salaries	\$23,060	\$7,028.25	\$30,088.25
Fringe Benefits	\$0.00	\$0.00	\$0.00
Tuition/Fees	\$0.00	\$0.00	\$0.00
Travel Costs	\$1,712.48	\$609.33	\$2,321.81
Materials/Supplies/Equipment(under \$5000)	\$2,826.93	\$0.00	\$2,826.93
Equipment Purchases (over \$5000)	\$0.00	\$0.00	\$0.00
Contractors/Subcontractors	\$0.00	\$0.00	\$0.00
Consultants	\$18,600.00	\$1,452.33	\$20,052.33
Training/Education	\$0.00	\$0.00	\$0.00
Marketing/Advertising	\$0.00	\$0.00	\$0.00
Other Direct Costs	\$0.00	\$1,491.60	\$1,491.60
Indirect Costs	\$0.00	\$0.00	\$0.00
Total Project Cost:	\$46,199.41	\$10,581.51	\$56,780.92

Total award amount: \$46,245

8. Conclusion

Southwest Colorado and other rural areas have greater diversion challenges than other parts of Colorado - we also have greater motivations such as protecting our pristine lands and clean air, and preserving tourist attractions and recreation areas. The Southwest communities, stakeholders, and the SWCCOG continue to and increase leveraging existing programming and the Recycling Task Force's work to foster collaboration over competition, rally political will and create a waste diversion system that is both environmentally and economically viable.

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS			
		RES 1	COM 2	RES 3	COM 4	RES 5	RES 6	RES 7	MIXED RES/COM		8				9
Recycling Program	COLORADO WASTE AUDIT AVERAGE^b	DOC (all materials); Elite (SS w glass separate; AYD (SS incl glass)		Expansive City collection (80% residential, some commercial) - SS w/o glass (glass DOC)		Drop-site only - Durango DOC (SS, OCC & glass) or Bayfield DOC (glass but no OCC, plastics, steel cans or paper other than ONP)			City collection (all materials except plastics)	BSI/FCRI DOCs (fiber & metals only)	See description below	Residential Average (5 samples)	Commercial Average (2 commercial)	Overall MSW Average (10 samples)	
Source		Pagosa Springs incl HH with YW, other organics & metal equipment	Area Near Wyndam (west end of PS) incl YW & restaurant FW (MacDs)	Southside neighborhood (older part of town) w YW, C&D (4 CY loose)	Downtown district incl concert venue incl OCC, C&D, Solo cups, restaurant waste (4+ CY compacted)	Load from E of Durango, W of Bayfield	Bayfield (1+ CY loose)	Ignacio (1+ CY loose)	Incl YW, other organics (3 CY compacted)	Unincorporated county mixed load w OCC (3-4 CY compacted)	Self-haul to LF w farm waste (2 CY loose)				
Hauler		Waste Mgmt	Waste Mgmt	City of Durango	City of Durango	Phoenix	Transit	Transit	City of Cortez	Baker Sanitation or Waste Mgmt	Self-Haul				
Other (weather, precip, etc.)		low, light breeze, sunny, 65F	low, light breeze, sunny, 65F	wet/damp no precip, cool temps	low moisture, no wind, sunny	dry & sunny	dry & sunny	dry & sunny	no moisture or wind	no moisture or wind	no moisture or wind				
MATERIAL															
GLASS	Glass Food & Beverage Containers	5.0%	0.0%	9.8%	6.0%	1.8%	7.3%	<u>17.0%</u>	<u>26.7%</u>	4.4%	8.2%	4.1%	<u>11.4%</u>	5.8%	<u>8.5%</u>
	Other Glass	0.5%	0.0%	2.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.3%
	Glass Totals	5.5%	0.0%	12.5%	6.2%	1.8%	7.3%	<u>17.0%</u>	<u>26.7%</u>	4.4%	8.2%	4.1%	<u>11.4%</u>	7.2%	<u>8.8%</u>
METALS	Alum Food/Beverage Containers, Foil & Pie Tins	1.0%	2.0%	2.2%	1.5%	2.2%	2.0%	1.3%	1.5%	1.0%	1.0%	1.0%	1.6%	2.2%	1.5%
	Steel/Tin Containers	1.0%	3.4%	1.2%	1.2%	0.1%	0.0%	2.1%	4.0%	1.6%	1.2%	1.4%	2.1%	0.7%	1.6%
	Other Metal	1.5%	<u>9.9%</u>	0.4%	<u>5.8%</u>	0.9%	0.0%	1.9%	2.0%	1.7%	<u>11.0%</u>	0.0%	3.9%	0.6%	3.4%
	Total Metals	3.5%	<u>15.3%</u>	3.8%	8.4%	3.2%	2.0%	5.2%	7.5%	4.3%	<u>13.2%</u>	2.4%	7.7%	3.5%	6.5%
	Plastic Bottles #1	1.5%	<u>5.4%</u>	3.0%	1.0%	3.5%	0.0%	1.3%	2.4%	2.1%	1.3%	1.4%	2.0%	3.3%	2.1%

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS				
		RES	COM	RES	COM	RES	RES	RES	MIXED RES/COM							
PLASTICS	Plastic Bottles #2	1.0%	1.2%	1.4%	0.4%	2.6%	1.3%	0.5%	1.8%	1.2%	0.9%	1.1%	1.0%	2.0%	1.2%	
	Rigid Plastic Containers #3-#7	1.5%	1.5%	3.2%	0.8%	0.9%	1.3%	1.0%	2.0%	0.7%	0.8%	0.3%	1.3%	2.0%	1.3%	
	Bags, Film, Wrap	4.0%	5.6%	8.5%	3.4%	1.6%	6.4%	3.9%	6.1%	3.6%	6.8%	1.0%	5.1%	5.0%	4.7%	
	Other Plastic	1.5%	5.1%	3.9%	2.3%	0.4%	2.6%	1.2%	6.1%	2.9%	2.3%	6.8%	3.5%	2.2%	3.4%	
	<i>Plastic Totals</i>	9.5%	18.8%	20.0%	7.8%	9.0%	11.6%	7.9%	18.4%	10.6%	12.2%	10.7%	12.9%	14.5%	12.7%	
PAPER	Cardboard/Brown Paper Bags	7.5%	1.6%	2.8%	2.2%	32.1%	1.2%	1.8%	3.1%	11.4%	10.7%	4.9%	2.0%	17.5%	7.2%	
	Newspaper	4.0%	1.6%	2.6%	0.4%	0.6%	0.9%	1.0%	0.2%	0.9%	0.3%	0.0%	0.8%	1.6%	0.8%	
	Office/School Paper & Shreds	2.5%	2.6%	0.2%	3.0%	0.2%	1.6%	4.7%	2.7%	0.8%	3.8%	0.1%	2.9%	0.2%	2.0%	
	Food Boxes/Paperboard	1.5%	8.3%	7.8%	3.4%	1.6%	4.6%	7.5%	2.8%	6.0%	2.9%	2.6%	5.3%	4.7%	4.7%	
	Junk Mail/Mixed	9.0%	7.4%	12.2%	2.1%	1.3%	6.5%	2.8%	2.0%	2.8%	3.0%	0.4%	4.2%	6.7%	4.1%	
				food wrappers (McDs), hotel mags & brochures												
	Magazines/Catalogues & Telephone Directories	1.5%	3.2%	8.0%	1.1%	2.9%	3.1%	4.6%	2.0%	1.5%	1.3%	0.4%	2.8%	5.5%	2.8%	
	Dairy/Juice Containers	0.5%	2.3%	0.0%	1.3%	0.0%	2.7%	0.0%	1.9%	0.0%	0.6%	0.1%	1.6%	0.0%	0.9%	
	Other Paper	8.5%	0.5%	0.0%	0.0%	1.2%	0.2%	0.2%	0.0%	0.0%	0.2%	14.0%	0.2%	0.6%	1.6%	
	<i>Paper Totals</i>	35.0%	27.3%	33.6%	13.5%	40.1%	20.8%	22.7%	14.8%	23.4%	22.8%	22.6%	19.8%	36.9%	24.2%	
ORGANICS	Food Waste	19.0%	22.6%	14.7%	19.9%	25.7%	20.6%	27.9%	9.2%	19.9%	15.0%	0.9%	20.0%	20.2%	17.6%	
	Yard Waste/Untreated Wood	6.0%	13.1%	7.9%	17.0%	0.1%	7.2%	1.4%	2.1%	3.7%	14.2%	1.5%	8.2%	4.0%	6.8%	
	Other Organics	8.0%	0.0%	2.6%	9.8%	1.1%	14.7%	16.2%	18.7%	29.1%	7.3%	31.1%	11.9%	1.9%	13.1%	

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS				
		RES	COM	RES	COM	RES	RES	RES	MIXED RES/COM							
O				High quantities textiles & carpet in some samples							Animal manure					
	Organics Totals	33.0%	35.7%	25.2%	46.8%	26.9%	42.5%	45.5%	30.0%	52.7%	36.5%	33.6%	40.1%	26.1%	37.5%	
OTHER / SPECIAL WASTE	Electronics	0.5%	0.6%	1.0%	0.2%	0.3%	6.1%	0.2%	0.0%	2.5%	0.9%	0.0%	1.4%	0.6%	1.2%	
	Other Consumer Products	see Other	1.4%	3.0%	1.6%	2.1%	0.0%	0.0%	2.6%	0.7%	2.7%	2.2%	1.1%	2.6%	1.6%	
	Motor Vehicle Waste	Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.1%	
	Construction/Demolition Debris	4.5%	0.0%	0.7%	15.2%	16.1%	9.7%	0.0%	0.0%	0.2%	3.4%	21.9%	5.0%	8.4%	6.7%	
					some concrete	DIY improve. project										
	Other Hazardous/Special Waste	6.2%	0.6%	0.0%	0.0%	0.0%	0.1%	1.4%	0.0%	0.1%	0.1%	0.0%	0.0%	0.4%	0.0%	0.2%
	Other / Special Waste Totals	11.2%	2.6%	4.8%	17.0%	18.5%	15.9%	1.6%	2.6%	4.4%	7.0%	24.1%	7.9%	11.6%	9.8%	
RESIDUE			0.3%	0.1%	0.3%	0.5%		0.1%	0.1%	0.2%	0.1%	2.5%	0.2%	0.3%	0.4%	
Total Weight in Lbs			88.7	102.0	574.5	870.4	146.2	107.4	92.8	617.9	631.6	100.2				
TOTALS			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Total Sample Weight (pounds) = 3331

Average Weight/Sample (pounds) = 333

^a Conducted by SWCCOG staff & Fort Lewis College interns between August and November 2014

^b Waste audits conducted at Chaffee County (2006), Eagle County (2009), Garfield County (2009), Lake County (2006), Pitkin County (2009), City of Glenwood Springs (2009) & Milner Landfill (2004) by LBA Associates; at Larimer County (2006) & Meeker/Rio Blanco Samples (2012) by others

^c Analysis completed by LBA Associates, Inc.

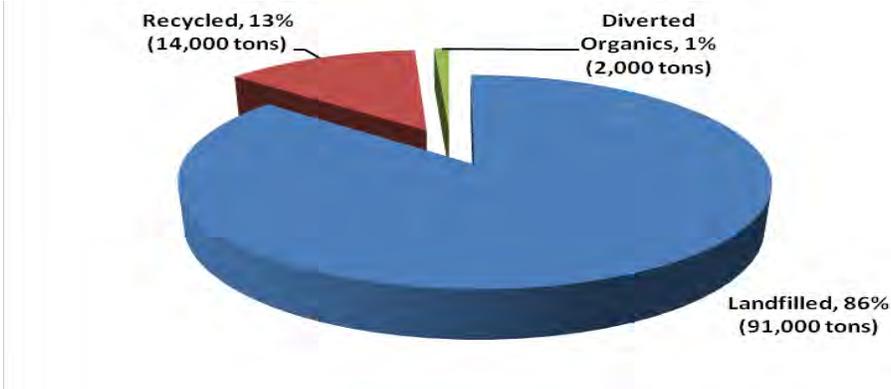
EXECUTIVE SUMMARY

The Southwest Colorado Waste Study was conducted in late 2014 as a State of Colorado Recycling Resource Economic Opportunities grant project. The study was completed by the Southwest Colorado Council of Governments (SWCCOG), and encompassed the five-county region of Archuleta, Dolores, La Plata, Montezuma and San Juan Counties as well as the Southern Ute and Ute Mountain Ute Tribes. This area - with its mountainous terrain, agriculture, and wilderness areas coupled with population density of 15 persons/square mile - has unique waste diversion challenges for the region. Further complicating waste diversion for the region is the differing access to recycling opportunities.

Background

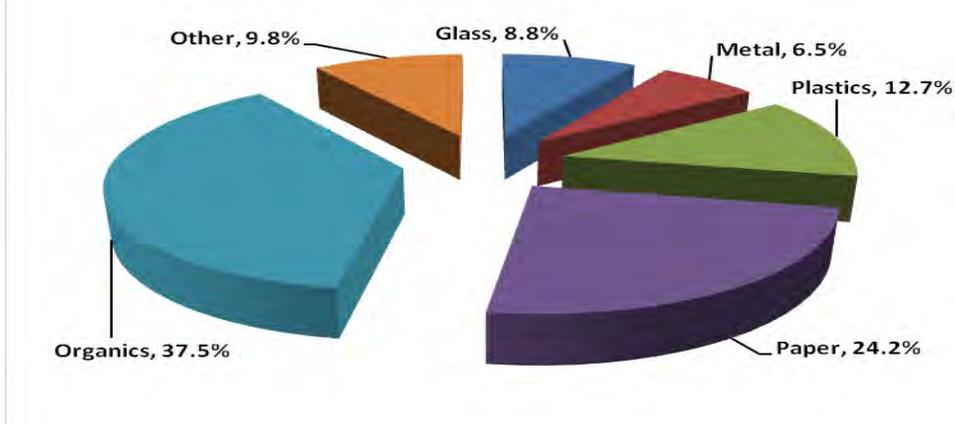
The study, which focused on municipal solid waste stream (MSW), found that recycling infrastructure beyond the cities of Cortez and Durango is limited and that organics recovery is also constrained. It is estimated that at least 107,000 tons of MSW is generated annually, and the diversion rate is approximately 14% (see Figure ES-1).

Figure ES-1 MSW Management (percent by weight)



Waste audits conducted during the study discovered that nearly 62% of landfilled materials included organics and paper - much of which could be diverted through recycling efforts (see Figure ES-2).

Figure ES-2 Waste Composition by Material Category (tons, percent by weight)



Of particular note, the audit results indicated that landfill waste samples included at least 7% by weight each of glass containers, cardboard, yard waste and food waste (food waste was nearly 18%). However, diversion of these materials was hindered by long hauls to processors and markets, low quality materials (especially single-stream recyclables) and low market pricing.

Future Waste Diversion Options

To evaluate opportunities for increasing waste diversion in southwest Colorado, SWCCOG developed a Recycling Task Force comprised of governments and tribes, haulers, transfer and landfill operators, non-profit organizations and interested citizens. These stakeholders agreed that improving the economics of recycling was an important goal, and that regionalizing diversion activities, expanding public outreach, creating diversion incentives and providing better access to recycling collection were important components.

Based on task force direction, a waste diversion coalition was evaluated that could provide:

- Leadership in a region that has not generally prioritized waste diversion
- Reduced workload for governments
- Increased efficiencies by centralizing activities
- More waste diversion programming
- Increased diversion of quality materials
- A neutral third party to buffer relationships between local jurisdictions, public, and private sectors and encourage a united versus competitive environment

A focused coalition consisting of key stakeholders can be expected to effectively direct grant funding to support an on-going public outreach, advocacy and policy efforts, address management of problem wastes and collect materials data. An initial cost-benefit analysis determined that these activities would create a new half-time position, while the economics may range from \$28,000/year net cost to \$321,000/year net revenue, depending on fund-raising success and material prices. The avoided landfill tip fee expenditures associated with diverted tons represents \$21,000/year in net savings.

Public education and outreach would be one of the coalition's more important functions and would form the foundation of future waste diversion in southwest Colorado. The program would require initial development of a regional diversion brand; messaging for the public, businesses and visitors; establishing consistent materials collection; and on-going program implementation. Advocacy efforts reinforce the importance and value of waste diversion among elected officials and government staff may culminate in policies that create incentives for diversion over disposal. Other activities, such as adding cost-effective rural recycling drop sites in unincorporated areas and tackling the diversion of glass and tires, will provide both technical assistance and infrastructure to a region currently lacking in both.

While the actual costs would be accrued by the coalition undertaking this work (which will significantly bolster the ability to increase diversion across the region), revenues will be earned by public, private and non-profit organizations that operate collection and processing programs. SWCCOG is ideally suited to host the coalition, given its non-profit nature, membership base and regional leadership role. SWCCOG has a strong fund-raising track record and a

membership dues structure that will allow it to cover costs as it supports operations by others across the five-county area.

Recommended Waste Diversion Strategy

It is important to understand that if the southwest Colorado region doesn't work to increase diversion, it will miss many important opportunities, such as taking advantage of state funding and the work completed to the Recycling Task Force; moving away from inefficient, decentralized programming; supporting private development of a new single-stream processing facility; and having a long-term, regional vision that prioritizes waste diversion as a solid waste management strategy.

If SWCCOG and the Recycling Task Force choose instead to move forward, recommended strategy steps include:

- Creating an effective waste diversion coalition within SWCCOG
- Obtaining grant funding to support a regional, on-going education and outreach program
- Supporting new MRF development by Phoenix Recycling and full-scale composting by Montezuma County
- Tackling glass and tire management with regional (and possibly beyond regional) solutions
- Establishing long-term, on-going operations to maintain these programs with updated goals/objectives, waste audit data and material quantities to monitor diversion programs

It will be important for the region to communicate to its public, governments, businesses and visitors that waste diversion is important to southwest Colorado. This message must acknowledge, however, that recycling isn't "free" - that it requires effort to collect and manage quality materials - but that both the measurable and immeasurable benefits are significant when compared to disposal.

Rural areas undoubtedly have greater diversion challenges than other parts of Colorado - they also have greater motivations such as protecting their pristine lands and clean air, and preserving tourist attractions and recreation areas. The southwest communities, stakeholders and SWCCOG have the opportunity to leverage existing programming and the Recycling Task Force's work to foster collaboration over competition, rally political will and create a waste diversion system that is both environmentally and economically viable.

TABLE OF CONTENTS

<u>VOLUME I REPORT</u>		<u>PAGE</u>
Executive Summary		i
Table of Contents		iv
Section 1	Introduction	1
	1.1 Purpose	2
	1.2 Background	2
Section 2	Existing & Future Solid Waste System	4
	2.1 2014 Baseline Waste Generation & Diversion	6
	2.2 Composition of Landfilled Waste	7
	2.3 Key Waste Diversion Obstacles & Opportunities	9
	2.4 Municipal Solid Waste Quantity Projections for 2025	10
Section 3	Future Waste Diversion Options	13
	3.1 Recycling Task Force & Need for Further Evaluation	13
	3.2 Waste Diversion Collaborative	13
	3.3 Regional Education & Outreach Program	18
	3.4 New Waste Diversion Policy	19
	3.5 Rural Recycling Drop-Site Access	20
	3.6 Other Potential Improvements	22
Section 4	Recommended Waste Diversion Strategy	23
	4.1 Consequences of No Further Action	23
	4.2 Strategy for Creating & Implementing an Effective Coalition	23
	4.3 Final Observations	26
 <u>List of Figures</u>		
Figure 1	SWCCOG Region & Study Area	1
Figure 2	Existing Colorado Facilities Used by SWCCOG Recyclers & Haulers	2
Figure 3	MSW Generation by County	6
Figure 4	MSW Management	7
Figure 5	Waste Diversion by County	7
Figure 6	Waste Composition by Material Category	8
Figure 7	Residential versus Commercial Composition	8
Figure 8	Waste Composition by Material Type	9
Figure 9	Cardboard Pricing 2001-2014	12
 <u>List of Tables</u>		
Table 1	Existing Policy, Services & Facilities	4
Table 2	Recyclables Accepted in Existing Collection Programs	5
Table 3	Key Factors Impacting Waste Diversion	9

Table 4	Projected MSW Generation & Estimate Diversion	11
Table 5	Potential Host Organizations	16
Table 6	Regional Waste Diversion Coalition Costs & Benefits	17
Table 7	Example Collaborative Models	18
Table 8	Existing E&O Programming	19
Table 9	Waste Diversion Policy Options	20
Table 10	Drop-Site Recyclables Collection	21
Table 11	Drop-Site Collection Costs & Benefits	21

VOLUME II APPENDICES

Appendix A	Waste Quantity Projections
Appendix B	Waste Audit Results
Appendix C	Stakeholder Contact Information
Appendix D	Recycling Task Force Meeting Materials
Appendix E	Glass & Tire Diversion Resources
Appendix F	Waste Collaborative Cost Estimate
Appendix G	CTRA Member Contract
Appendix H	"Changing How We Do Garbage" Article
Appendix I	Drop-Site Cost Estimate Model

LIST OF ABBREVIATIONS

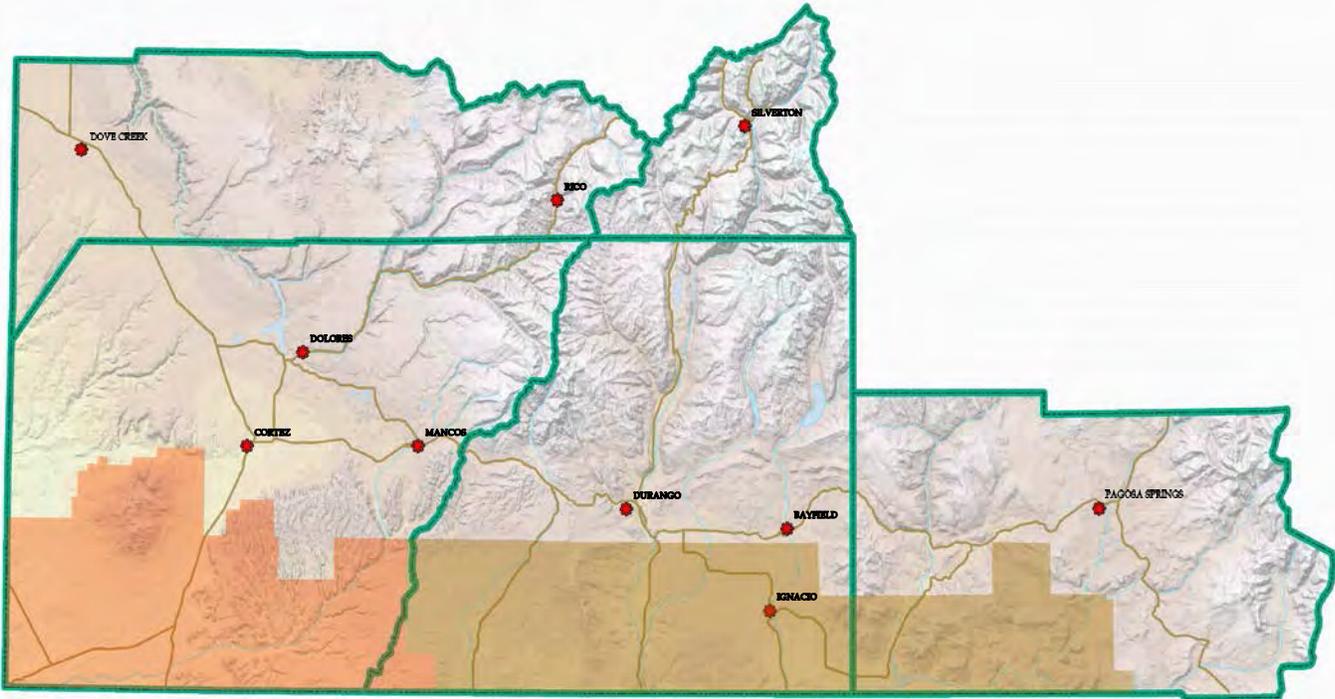
C&D	Construction & demolition	NMRC	New Mexico Recycling Coalition
CDPHE	Colorado Department of Public Health & Environment	O	Organics
COG	Council of Governments	PAYT	Pay-as-you-throw
CTRA	Central Texas Recycling Association	PPCD	Pounds per capita-day
CY	Cubic yard	R	Recycling
DOC	Drop-off site	RREO	Resource Recycling Economic Opportunity (Colorado grant)
DOLA	Department of Local Affairs (Colorado)	SDO	State Demography Office (Colorado)
E&O	Education & outreach	SFU	Single-family (residential) unit
FTE	Full-time equivalent	SINGLE	Single-stream recyclables collection
GAL	Gallon	SJBRA	San Juan Basin Recycling Association
HH	Household	SJRCD	San Juan Resource Conservation Development District
HHW	Household hazardous waste	SPRA	Southwest Public Recycling Association
LBA	LBA Associates, Inc.	SWCCOG	Southwest Colorado Council of Governments
LF	Landfill	T	Trash
MFU	Multi-family (residential) unit	TPY	Tons per year
MO	Month	TS	Transfer station
MRF	Materials recovery facility	UAACOG	Upper Arkansas Area Council of Governments
MSW	Municipal solid waste	US	United States
MULTI	Multi-stream recyclables collection	USDA	US Department of Agriculture
		VISTA	Volunteers in Service to America

SECTION 1

INTRODUCTION

The Southwest Colorado Waste Study was conducted in late 2014/early 2015 as a State of Colorado Recycling Resource Economic Opportunities (RREO) grant project. The study was completed by the Southwest Colorado Council of Governments (SWCCOG). It encompassed the five-county region of Archuleta, Dolores, La Plata, Montezuma and San Juan Counties, which includes all of the SCWWOG's partner governments¹ as well as several additional organizations. Figure 1 illustrates the boundary of the five-county study area².

Figure 1 - SWCCOG Region & Study Area



LBA Associates, Inc. (LBA) assisted in the completion of this work. Fort Lewis College also supported the study by providing student interns to conduct a waste audit.

¹ SWCCOG members include Archuleta County, Bayfield, Cortez, Dolores County, Dolores, Durango, Ignacio, La Plata County, Mancos, Pagosa Springs, San Juan County and Silverton - the Southern Ute and Ute Mountain Ute Indian Tribes are signatories.

² Map courtesy of the SWCCOG.

1.1 Purpose

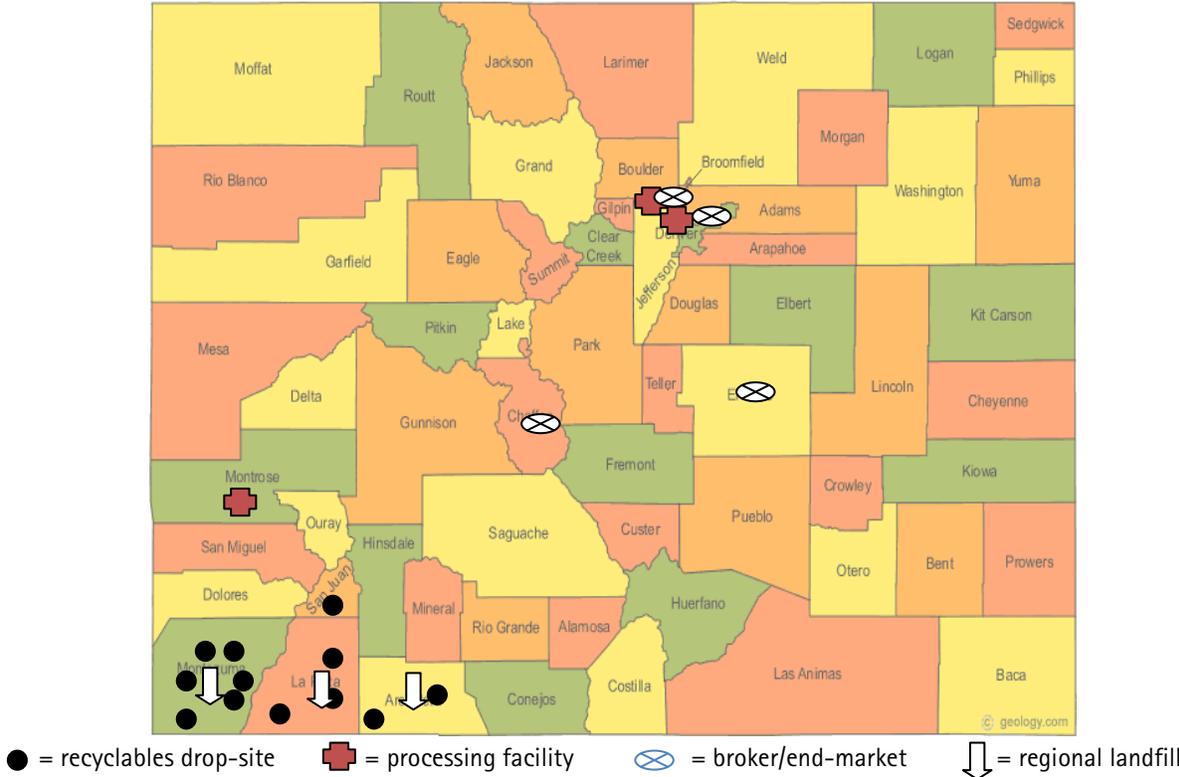
The focus of the study was diversion of the municipal solid waste (MSW) stream³. The study was intended to create a level playing field and to catalyze regionalization by government and industry stakeholders to support improved programming, policy and infrastructure.

1.2 Background

The northern parts of the region are mountainous, while the southern areas include several river basins. With the exception of Cortez and Durango, the region is rural: the 2014 population was estimated to be 99,000⁴ and the density is approximately 15 persons/ square mile. Archuleta, La Plata and Montezuma Counties account for 13%, 56% and 27% of the population, respectively (Dolores and San Juan Counties representing less than 5% combined).

The Southern Ute Indian Tribe and the Ute Mountain Ute Tribes are located in the southern half of the region. The region includes the Mesa Verde National Park and Chimney Rock State Park, as well as several national wilderness areas and monuments. The geography, diverse populations and recreation/tourist areas all present unique solid waste management challenges. These challenges are exacerbated by low population densities, long hauls to processing facilities and markets over mountainous terrain, and decentralized programming.

Figure 2 - Existing Colorado Facilities Used by SWCCOG Recyclers & Haulers



³ MSW is that waste generated by residences (homeowner) and commercial (business and institutional) entities.

⁴ Based on Colorado Division of Local Government data, State Demography Office, November 2013.

Figure 2 (previous page) identifies the location of in-state facilities commonly used by local recyclers for transfer, processing and final material sales. Trash collection is available in most areas of the region, and disposal is provided by three local landfills. Recycling collection is somewhat less available and recyclables are managed at a mix of public and private sector facilities, or hauled directly to distant end markets. Organics recovery suffers from a lack of collection and processing infrastructure at this time.

SECTION 2 EXISTING & FUTURE SOLID WASTE SYSTEM

Archuleta, La Plata and Montezuma Counties have the most developed solid waste management systems. Dolores County trash is hauled to and disposed at the Montezuma County Landfill, and has no consistent recycling program. San Juan County trash and recyclables are exported from the study region by a private contractor. Small amounts of trash generated in the unincorporated areas of La Plata and Montezuma Counties are exported to New Mexico and occasionally Utah, while most recyclables are exported from the region.

Table 1 summarizes the public policy, diversion services and municipal solid waste facilities in place in each county as well as the primary service providers. While diversion policy is implemented by local governments, services and facilities are operated by both public and private organizations. Non-profits - such as the Four Corners Recycling Initiative (FCRI) and the San Juan Basin Recycling Association (SJBRA) - also support diversion.

Table 1 - Existing Policy, Services & Facilities

Organization (est. 2014 population)	Diversion Policy	Diversion Services	Solid Waste Facilities/Policy
Archuleta County (12,800)		County DOC - Pagosa Springs, Arboles; Recyclables haulers - Elite & At Your Disposal	County TS; County LF
La Plata County (56,000)	County building recycling; County green purchasing	Recyclables haulers - Phoenix, Waste Mgmt, Transit Waste; Durango Compost Co.; County DOCs - Bayfield, Marvel; Recla metals recycling	Transit Waste TS, LF; Phoenix C&D recycling, document destruction; Southern Ute TS (with special waste); Ignacio/Bayfield contract waste collection
Durango (18,000)	Mandatory pay <7 hhs; MFU >7 hhs must have R; New development R space	City collection <ul style="list-style-type: none"> • T \$13-19.50/hh-mo • R \$3/hh-mo add'l; DOCs for commingled & glass <ul style="list-style-type: none"> • \$1/60-gal residents • \$3/cy commercial; R transfer (baling, no sorting)	Bi-annual HHW drop-site collection (with La Plata County); Weekly e-waste drop-site collection
Montezuma County (26,500)		Recyclables haulers - Baker, FCRI, Waste Mgmt, Evergreen; Belt Salvage metals recycling; County baling/transfer; County pilot compost; Ute DOC - Towaoc (all R)	LF (includes Dolores County tons); Ute Mountain Ute TS - Towaoc

Organization (est. 2014 population)	Diversion Policy	Diversion Services	Solid Waste Facilities/Policy
Cortez (8,600)	Mandatory pay <7 hrs	City collection (multi) <ul style="list-style-type: none"> T&R \$18/cart 	DOC at city service center (multi)
Cortez (8,600)	Mandatory pay <7 hrs	City collection (multi) <ul style="list-style-type: none"> T&R \$18/cart 	DOC at city service center (multi)
San Juan County (700)		DOC at Silverton TS - contracts with Bruin Waste (mixed containers/mixed paper/cardboard - hauled to Montrose County)	Silverton TS; Serves county (contracts with Bruin, hauls to Montrose County); Collects T, R, special waste <ul style="list-style-type: none"> \$22/hh-mo

See the List of Abbreviations on page iii.

Table 2 includes a listing of recyclables accepted for collection in the region. The list may need to be verified in the future as markets and programs are dynamic and website postings are not always up to date.

Table 2 - Recyclables Accepted in Existing Collection Programs

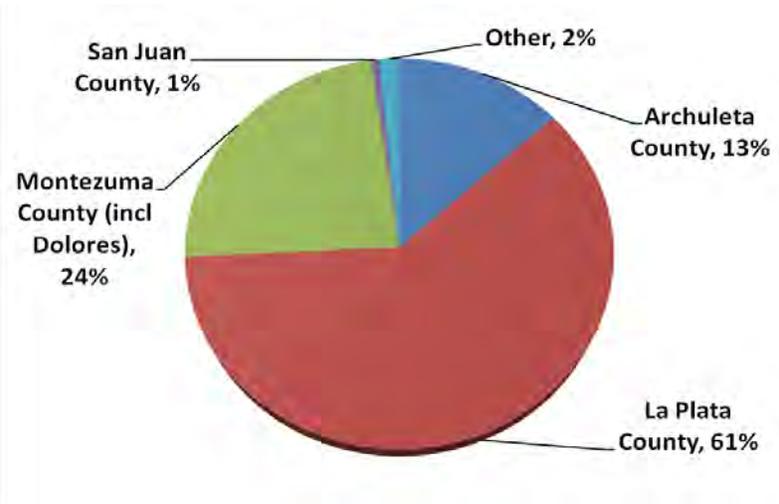
COLLECTION	TYPE	LEVEL of COMMINGLING	CARDBOARD	NEWSPAPER	MIXED PAPER	METAL CONTAINERS	PLASTICS	GLASS	OTHER
City of Cortez	Curbside	Multi-stream	X	X	X	X		X	Bulky, yard waste
	DOC	Multi-stream							
City of Durango	Curbside	Single w/o glass	X	X	X	X	1-7		E-waste, HHW
	DOC	Multi- & glass	X	X	X	X	1-7	X	
	DOCs (3)	Glass only						X	
Town of Silverton	DOC	Commingled containers	X	X	X	X	1-7	X	Scrap metal, C&D, e-waste
Archuleta County	DOCs (2)	Multi-stream	X	X	X	X	1-7	X	
La Plata County	DOCs (2)	Multi-stream		X		Alum		X	Motor oil/batteries, yard waste
Southern Ute Tribe	DOC		X						Scrap metal, oil, HHW
Ute Mountain Ute Tribe	DOC	Multi-stream	X	X	X	X	1/2	X	
FCRI	DOCs (4)	Multi-stream	X	X	X	X			
Phoenix	Curbside	Single w/o glass	X	X	X	X	1-7	X	C&D, shred
Baker Sanitation	DOCs (2)	Multi-stream	X	X	X	X			
Waste Management	Curbside	Single w/o glass	X	X	X	X			

See the List of Abbreviations on page iii.

2.1 2014 Baseline Waste Generation & Diversion

Based on data obtained from haulers, landfills, recyclers, material brokers, diversion facilities and food banks in the study area, it was estimated that approximately 107,000 tons of MSW was generated in 2014⁵. Figure 3 illustrates the proportion of tons generated in each county. Not surprisingly, these quantities closely mimic county populations. The waste generation rate was calculated to be about 5.9 pounds per capita-day (ppcd). This value is notably lower than the State of Colorado average of 8.8 ppcd⁶, but higher than the national average of 4.4 ppcd⁷. Appendix A includes a breakdown of current MSW generation estimates.

Figure 3 - MSW Generation by County (percent by weight)



Figures 4 and 5 (next page) consider the management of generated MSW for the overall region and by county, respectively, and illustrate an overall diversion rate of 14%⁸. This rate compares to a State of Colorado diversion rate of 22%⁶ and national rate of 34%⁷. San Juan County reported the highest county diversion rate of 28% by weight. However, Durango (La Plata County), which hauls residential and some commercial trash and recyclables, reported a rate of 32%⁹ and leads the region in waste diversion.

⁵ This value likely under-estimates total MSW generation levels slightly - while reasonable efforts were made to track waste generated and/or managed in the region, it is probable that some small waste streams were not counted (such as some household hazardous waste, electronic waste, and tire tons).
⁶ CDPHE Annual Solid Waste Diversion Totals, 2013.
⁷ USEPA Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2012.
⁸ This value reflects a 25% recovery of recycled paper, plastics, metal and glass materials; and 1% recovery of food/yard waste.
⁹ Durango's diversion rate pertains to wastes managed by the city and excludes commercial tons hauled by the private sector.

Figure 4 - MSW Management (percent by weight)

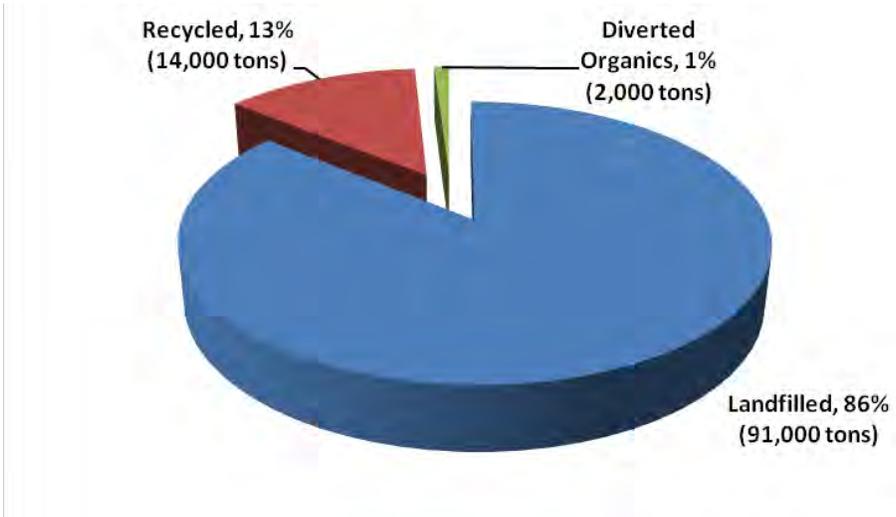
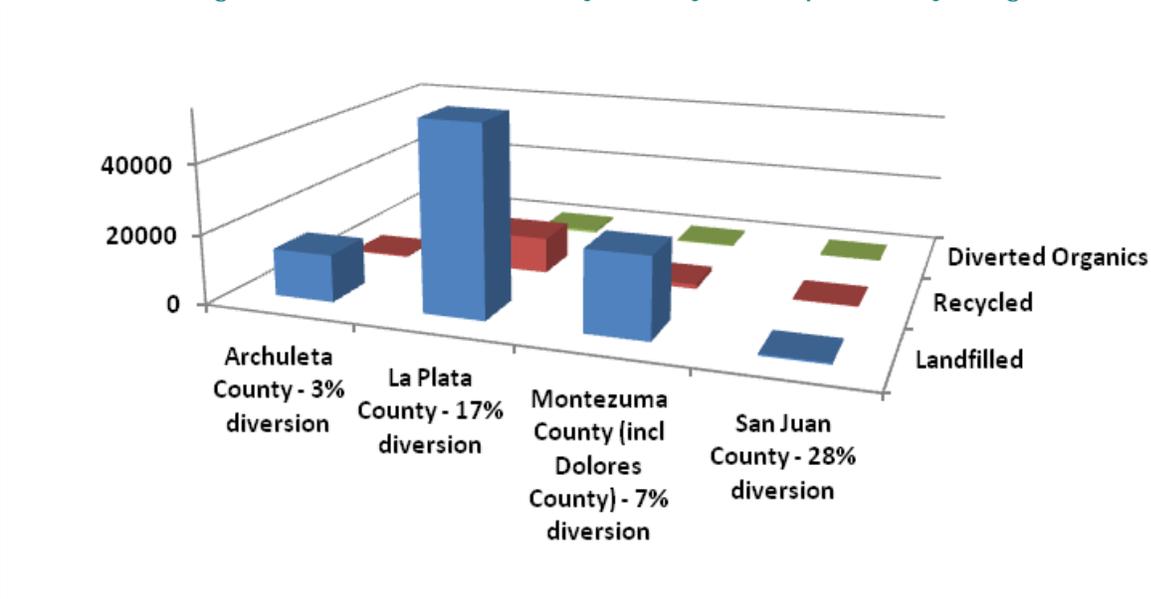


Figure 5 - Waste Diversion by County (tons, percent by weight)



2.2 Composition of Landfilled Waste

In an effort to identify the types and quantities of potential recyclables and organics in landfilled trash, the SWCCOG and several Fort Lewis College interns conducted a brief waste audit on ten trash samples during the fall of 2014. Spot residential and commercial samples were collected from Cortez, Durango, Bayfield, Montezuma County and Pagosa Springs. Appendix B includes sample-specific waste audit results.

Due to logistical constraints, samples from Tribal and some unincorporated areas could not be obtained. While not fully representative of the entire region's waste stream, these audit results represent an initial screening of trash composition and provide an indication of future diversion opportunities. Additional auditing that includes Tribal and unincorporated area samples should be conducted to verify these results in the future. Figures 6 shows the overall waste composition for all samples - these categories of landfilled waste included both materials that could be diverted and non-divertable materials. Nearly two-thirds of the samples (61.7%) included organics and paper¹⁰.

Figure 6 - Waste Composition by Material Category (tons, percent by weight)

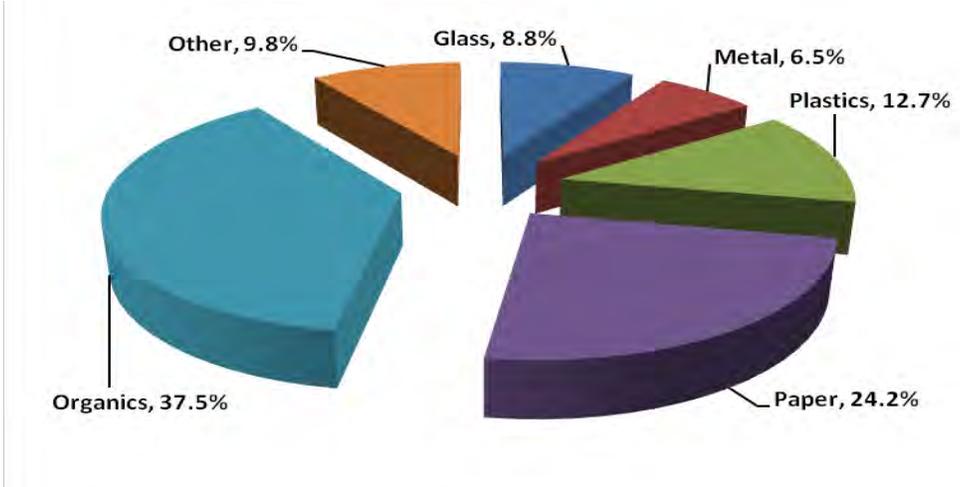
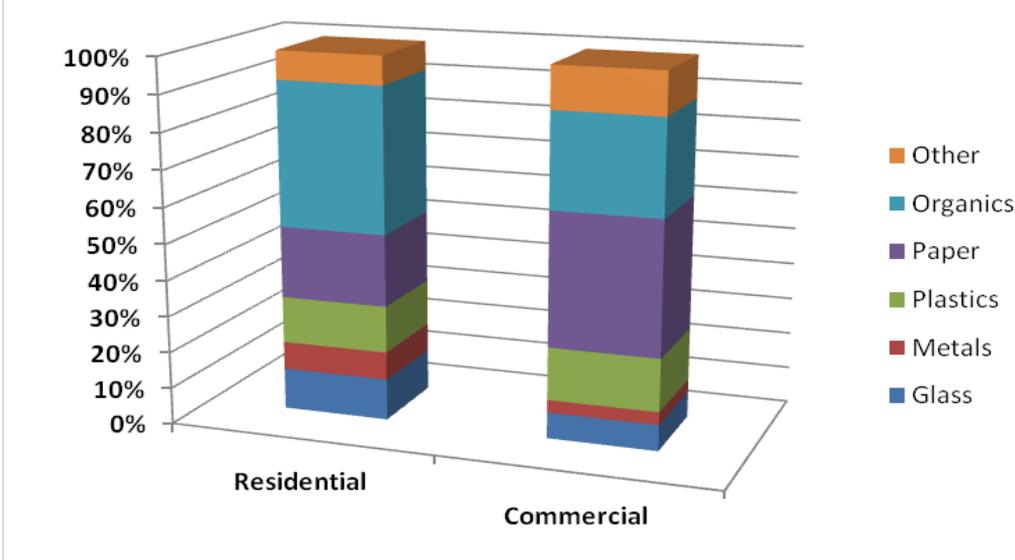


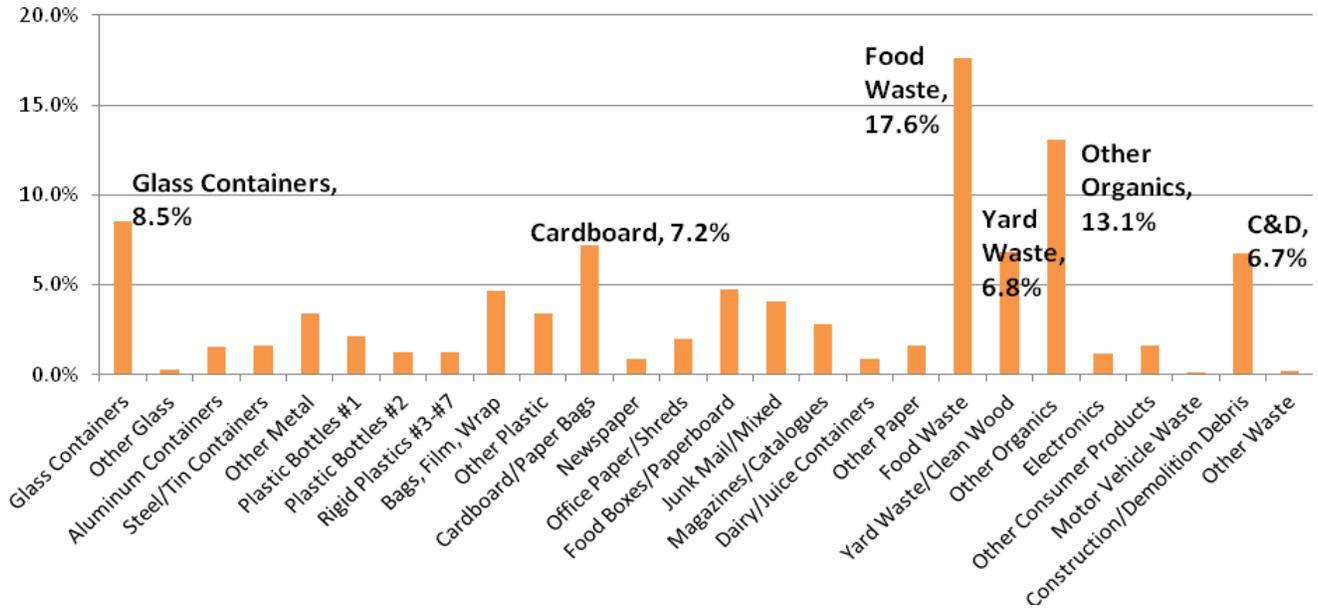
Figure 7 - Residential versus Commercial Composition (percent by weight)



¹⁰ These results show a notable decrease (over 11%) in total paper waste compared to earlier Colorado audits conducted by LBA (2006 through 2010), and illustrates the evolving solid waste stream that includes lower tons of high-value materials (i.e., less paper, more light-weighting and more non-recyclable packaging). Appendix B includes a summary of past audits for comparison.

Figure 7 (previous page) compares residential versus commercial waste composition and shows the difference between household waste (higher glass/organics generation) and business/institution waste (higher paper generation). Lastly, Figure 8 depicts the cumulative findings for each of 26 materials sorted out of the trash samples. Those materials present in levels greater than 5% by weight are called out in this figure¹¹.

Figure 8 - Waste Composition by Material Type (percent by weight)



2.3 Key Waste Diversion Obstacles & Opportunities

Several factors impact the success of waste diversion in southwest Colorado, as shown in Table 3.

Table 3 - Key Factors Impacting Waste Diversion

FACTOR	OBSTACLE	OPPORTUNITY
Low Population Density & Low Recycling Tons	Reliance on drop-site collection (typically drop sites generate less recyclables as they are less convenient to use)	Incentivize diversion through public policy & through broader & more consistent education & outreach programs (increasing tons will reduce unit costs)
	Less effective peer pressure to recycle - burning is more prevalent in rural areas	
	Fixed collection and processing costs spread over fewer tons - increasing unit costs (i.e., lower economy of scale)	
Long Hauls to Processors & End-Markets	High operating costs (both multi- and single-stream tons are shipped to markets ranging from 200 to 400 miles)	Implement local processing; Identify local markets (glass); Back-haul where possible
	Challenge obtaining transportation in rural areas (especially in winter)	
	Individual education efforts & messaging reflects immediate municipal, tribal and county program only (is not connected to	

¹¹ The waste audit noted relatively high Other Organics quantities (which are largely not divertable at this time) and high C&D tons, which were most likely generated from do-it-yourself projects (not contractors).

FACTOR	OBSTACLE	OPPORTUNITY
Long Hauls (continued)	neighbors or overall region)	Outreach program with consistent messaging; Encourage scrap metal dealers to take leadership role (scrap not collected in most programs)
	Waste audit results showed 8.5% glass overall; >5% #1/#2 plastics in Durango/Pagosa Springs; 7.2% cardboard overall (>17% in commercial samples); up to 11% scrap metal in residential samples) neighbors or overall region)	
Poor Quality Materials	Recyclables stream evolving to include lower tons of high-value materials (i.e., less paper, more light-weighting, more non-recyclable packaging)	Increase education about "recycling right"; Limit commingled to urban areas; Expand education about "recycling right"; Utilize temporary or staffed drop sites whenever possible
	Commingled recyclables typically have higher levels of contamination (especially when glass is included in the mix)	
	Unstaffed drop sites can also be contaminated by illegal dumping	
Low/Erratic Market Pricing	Domestic & international pricing outside control of regional recyclers ^a	Support private sector efforts to develop local MRF (increased tons improves market position); Evaluate local glass markets
	Lack of local processing for commingled materials	
	Lack of local end-markets	
Limited Organics Recovery	Waste audit results show 17.6% food waste (food bank donations represent most of diversion currently but data accuracy is marginal)	Support public/private efforts to evaluate feasibility for composting food/yard waste; Evaluate opportunities for diverting other organics (e.g., textiles can be 6% of waste)
	Lack of full-scale compost or alternative organics management facilities in region (organics diversion is under-developed in most of Colorado)	
Limited Diversion Policy	Only Cortez & Durango have effective policy measures ^b	All govts could incentivize recycling through policy; Cortez/Durango could increase hauler & commercial recycling requirements
Moderate Landfill Tip Fees & High Facility Capacity	Archuleta County tip fees = \$52/ton; Bondad tip fees = \$46/ton; Montezuma County tip fees = \$39/ton	Some communities have considered surcharging landfills to increase diversion & create funds for diversion programs
	Archuleta County = 20-30 years remaining life; Bondad >20 years; Montezuma County tip fees >100 years	

^a Due to China's Green Fence policy, the recently resolved U.S. west coast labor strike, the strong U.S. dollar and falling oil prices.

^b Both have residential PAYT/ mandatory pay recycling; Durango requires commercial recycling and discounts their customers.

2.4 Municipal Solid Waste Quantity Projections for 2025

Based on projected population increases for the five-county area¹², it is estimated that MSW generation could increase 130% between 2014 and 2025, to a generation rate up to 179,000 tons/year. Table 4 (next page) includes an estimation of 2015 and 2025 MSW generation by material category, as well a range of potential diversion levels selected to reflect current diversion (for the 2015 projection) and more aggressive rates (approximately doubling 2015 levels) for the 2025 projection. Note that each category includes both divertable and non-divertable materials - only those materials that can be diverted through conventional recycling and composting programs were considered in the diversion estimates. Appendix A details both the generation and diversion estimates.

¹² Colorado State Demography Office, 2013

Table 4 - Projected MSW Generation & Estimated Diversion (rounded to nearest 100 tons)

MATERIAL CATEGORY	PERCENT BY WEIGHT COMPOSITION ^a	2015		2025	
		PROJECTED TOTAL GENERATION ^b	ESTIMATED DIVERSION POTENTIAL ^c	PROJECTED TOTAL GENERATION ^b	ESTIMATED DIVERSION POTENTIAL ^d
Paper	24%	22,000-33,000	5,000 - 8,000	29,000 - 43,000	10,000 - 13,000
Plastics	13%	12,000 - 18,000	2,000 - 3,000	15,000 - 23,000	4,000 - 6,000
Glass	9%	8,000 - 12,000	2,000 - 3,000	11,000 - 16,000	4,000 - 5,000
Metals	6%	6,000 - 9,000	1,000 - 2,000	8,000 - 12,000	3,000 - 4,000
Organics	38%	35,000 - 52,000	1,000 - 3,000	45,000 - 67,000	13,000 - 18,000
Other/Special Waste	10%	9,000 - 14,000	0	12,000 - 18,000	0
<i>Total Tons Diverted</i>	<i>100%</i>	<i>92,000 - 138,000</i>	<i>12,000 - 19,000</i>	<i>119,000 - 179,000</i>	<i>34,000 - 46,000</i>
<i>Resulting Diversion Rate</i>	<i>-----</i>	<i>-----</i>	<i>11% - 16%</i>	<i>-----</i>	<i>23% - 31%</i>

^a Based on waste audits conducted during this study between August and November 2014.

^b Based on SDO projections, waste audit results and an assumed range of per-capita waste generation of 5.0 to 7.5 ppcd.

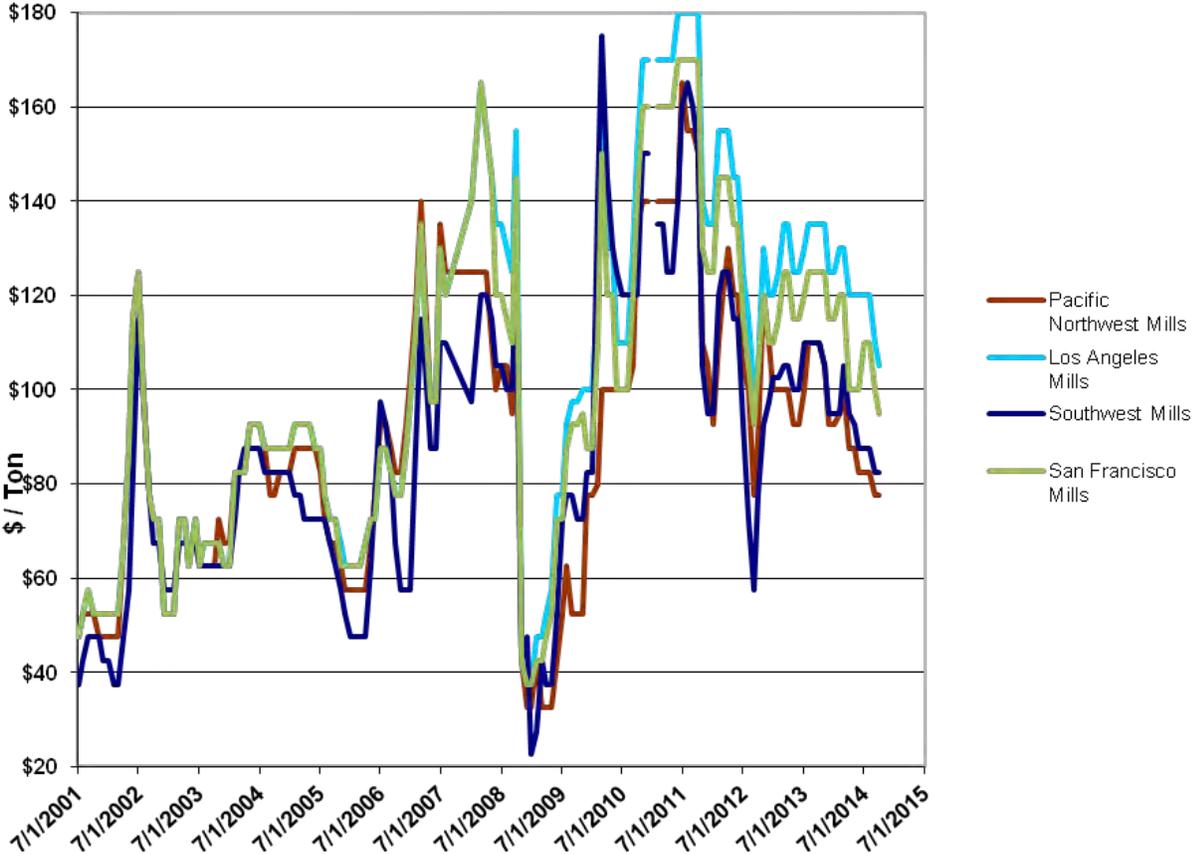
^c Assumed recovery for divertable recyclables/organics equal to those 2014 levels (i.e., about 25% recyclables and 1% organics).

^d Assumed recovery for divertable recyclables/organics 30%-40%; includes recycled textiles).

Future program, policy and infrastructure changes will affect the ability to double future diversion levels. One important change may be a new materials recovery facility (MRF) under development by Phoenix Recycling, a recyclables hauler, C&D recycler and confidential document shredder located outside of Durango. Phoenix's new facility (expected in 2016) will serve the entire region, sort commingled recyclables and accept source-separated materials. The availability of local processing is expected to increase revenues over current options used by regional recyclers, although specific pricing will not be quantified until the MRF is on-line.

It is also expected that current recyclable prices paid by end markets in late 2015/early 2016 will rebound somewhat from the low values of the last several months. This rebound will not likely return pricing to the levels seen in 2007/2008, however, due to a strong U.S. dollar against the euro, low oil prices, inventories remaining from the west coast labor strike and struggling domestic markets. Figure 9 (next page) illustrates how dynamic the secondary materials market is over time with an example of cardboard pricing from four domestic mill groups. Values reflect prices paid for delivered, baled cardboard meeting industry contamination standards.

Figure 9 - Cardboard Pricing 2001-2014



SECTION 3

FUTURE WASTE DIVERSION OPTIONS

3.1 Recycling Task Force & Needs for Further Evaluation

While the initial RREO recycling study was intended to collect baseline data and support consideration of waste diversion obstacles and opportunities in southwestern Colorado, the SWCCOG realized the additional need for implementing study recommendations over the long-term. To accomplish this, the SWCCOG worked to develop a Recycling Task Force including key stakeholders in the region. These organizations provided baseline data and prior to the completion of this report attended three stakeholder meetings in 2015: January 27th (Durango), March 31st (Cortez) and April 1st (Durango). Additional meetings are expected in late 2015 and 2016. Appendix C includes stakeholder information and Appendix D includes meeting materials.

These service providers, policy makers and facility operators had different customer bases, services and profit goals and in some cases, were in direct competition with one another. Bringing this diverse group together was an important step for information sharing, open dialogue and collective brain-storming. There was ready agreement amongst all parties that improving the economics of recycling was important to all participants, and that once this was accomplished increased diversion would follow in a re-enforcing loop. However, the specific options and means for attaining improved economics varied widely. Stakeholders were able to identify, however, the need to evaluate:

- A regional waste diversion coalition to provide leadership and advocacy
- Regional education and outreach to provide consistency and efficient use of resources
- New waste diversion policies - suggestions included a cardboard disposal ban, glass storage in Montezuma County, hauler ordinances in urban areas and data collection requirements
- Expanded recycling access to remote areas (especially tribal and unincorporated areas)

3.2 Waste Diversion Coalition

The concept of a waste diversion coalition is based on the over-arching need to collaborate on new/expanded waste diversion efforts to increase awareness and efficiencies, as well as provide regional leadership. Such a coalition would formalize pre-existing relationships the counties and municipalities have used to manage solid waste. The potential value of a coalition is many-fold:

- Leadership in a region whose governments do not generally prioritize waste diversion
- Reduced workload for those governments who are involved in solid waste management
- Increased efficiencies by centralizing activities
- More waste diversion programming (especially education and outreach)
- Increased diversion of quality materials
- Neutral third party to buffer relationships between local and county agencies, public and private sectors and encourage a united versus competitive environment

While the functions of a multi-government entity can vary widely, it is most likely that in southwest Colorado this collaboration would initially focus on advocacy and fund-raising to support additional diversion activities, and potentially grow into an organization with the ability to operate a specific program(s) and influence decision-makers on a regional level. In other words, it is likely to start slowly as the newly-formed Recycling Task Force and incrementally develop into an effective coalition as initial efforts demonstrate political and economic feasibility and value.

Short- & Long-Term Functions

The new regional coalition can have a wide range of responsibilities. Given the political uncertainty of new waste diversion priorities in the region, it is likely that short-term waste diversion collaborative activities may be limited to:

1. **Grant Funding** - New funding would be used to support early program development that is typically more resource-intensive than on-going program operation (which will ideally be self-sustaining). Funding options may initially focus around a regional education and outreach (E&O) program and could include;
 - USDA Solid Waste Management Grants - available for technical assistance and training in regions of small communities (<10,000 people); applications are accepted between October and December each year and the grant cycle extends from the following August through July
 - Colorado Department of Local Affairs (DOLA) - available to municipalities and council of governments (COGs) for planning and capitalization (could be used to supplement a USDA grant in support of early coalition activities); COG applications are accepted in October for funding the following year
 - Colorado Department of Public Health Resource Recycling Economic Opportunity Grants (used for this study) - available to fund capital expenditures/operations of waste diversion programs; applications due in March and the grant cycle extends from the following July to June

2. **Regional Education & Outreach** - Implemented on a regional level, this program could i) relieve municipal and county governments' current work load while providing materials that could supplement existing programs, and ii) provide broader and more efficient messages targeted directly to school, residential, commercial and tourist populations. Recommended components of this program are described in Section 3.3.

3. **Advocacy** - As an advocate for waste diversion in the region, the coalition should consider several tasks with a focus both internally to stakeholders and externally to promote waste diversion across the region;
 - Expanding the goal of increasing recycling economics with specific objectives that most stakeholders agree on
 - Helping other stakeholders understand the value of collaboration (most notably, Montezuma County and the Tribes)
 - Making a credible case for waste diversion - such as delaying the need for new landfill cell construction, creating jobs, meeting demands for more recycling by tourists/residents moving to the area, avoiding landfill tip fees and generate new revenues
 - Educating elected officials and senior staff about the facts-versus-fiction of waste diversion benefits and costs in southwest Colorado

- Assisting in policy development
4. **Problem Waste Management** - Glass and tires were identified by stakeholders as particularly difficult to manage economically. Glass is challenging to recycle due to its ability to contaminate other materials in a commingled mix and low revenue potential, and there are limited recycling options for old tires not accepted by dealers. Both of these materials could potentially be processed for local uses with existing equipment or mobile units shared within (and beyond) the region. Technical assistance to improve the sustainability of local diversion and reduce illegal dumping and stockpiles would be a valuable coalition role, and could be accomplished by working with new markets (glass) and with regional stakeholders and other counties to share equipment and resources (tires). Appendix E includes additional resources on these two materials.

The coalition could also help to regionalize the collection of household hazardous waste and electronic waste materials, which are currently managed primarily through collection events in some communities. Electronic waste is now banned from landfill disposal in Colorado, and paint is governed by a new product stewardship program, which involves new collection points at retailers throughout the state. The management of both materials could also be facilitated through a regional education effort (see Section 3.3).

5. **Solid Waste Data System** - Quantifying waste generation, disposal and diversion levels on a regular basis is important to tracking progress and determining opportunities for improvement. Without this information, it can be challenging to convince the public that their diversion efforts are worthwhile, to justify program continuance to elected officials and to obtain additional funding. Quantification efforts will require surveys of local landfills, recycling and compost facilities, haulers who take materials out of state, grocery stores/food banks and others who manage additional waste streams. At a minimum, data should include total annual quantities, but tons by sector and number/types of customer accounts are also helpful. Sources for developing a data system include:
- 2014 baseline review conducted for this study - this assessment should be expanded to monitor miscellaneous waste streams such as tires, household hazardous waste and electronic waste
 - CDPHE's annual landfill quantities report (by individual facility) and recyclable/organics diversion report (aggregated state-wide)¹³
6. **Other Activities** - An additional opportunity is liaising between stakeholders and the regional recycling hub(s). This could be informal (limited to general communications) or more formal (e.g., a contractual relationship that commits tons to the hub in exchange for set pricing/revenues). The objective of the later would be to ensure an economy of scale to the hub to in turn yield better revenues for recycling programs, and will likely be applicable to the new Phoenix MRF and full-scale Montezuma County compost operations.

Other coalition activities may also include technical assistance for collection programs, development of remote drop sites and encourage the development of compost operations. Examples of these activities by collaborative organizations are provided below.

¹³ www.colorado.gov/pacific/cdphe/categories/services-and-information/environment/waste-management-and-recycling

Organizational Development

Given the need to start small and minimize resource requirements, it would be reasonable for the coalition to be formed as part of an existing (host) organization that has a compatible mission. Based on the findings in Table 5, which identifies potential host options in southwest Colorado, the SWCCOG appears to be the best partner for a waste diversion coalition. It is possible that the SWCCOG could partner in this endeavor with SJBRA to allow involvement by private service providers and other non-profits.

Table 5 - Potential Host Organizations

ORGANIZATION	ADVANTAGE	DISADVANTAGE
Southwest Colorado Council of Governments <i>501c(3)</i> <i>based in Durango - members include majority of regional governments</i>	Existing structure with strong public/private/non-profit relationships, visibility and credibility; Existing knowledge of waste diversion; Existing skills/resources for group decision-making, interacting with elected officials, advocacy & fund-raising; Involvement in current recycling study and development of Recycling Task Force; Other Colorado COGs actively involved in waste management (Upper Arkansas Area COG collects/markets recyclables)	New staff will be needed; Mission, vision, bylaw revisions may be required
San Juan Basin Recycling Association <i>operates as part of SJRCD (fiscal agent) - serves 5-county area</i>	Many SJBRA members have been involved in Recycling Task Force; Members include private sector service providers Active in waste diversion (members have appropriate expertise)	Not a stand-alone organization; Volunteer-based (no staff); Largely dormant last few years
Four Corners Recycling Initiative <i>501c(3)</i>	Provides education and recycling to Dolores & Montezuma County; Obtained previous CDPHE grant funding; Strong relationships with haulers and counties	Recently suspended Dolores County drop site; No activity in eastern region; Volunteer-based (no staff) Did not participate in study

Costs & Benefits

Table 6 (next page) includes a summary of anticipated new diverted tons, start-up and annual program costs, avoided disposal costs and revenues earnings associated with a new regional coalition that focuses on i) obtaining grant funding, ii) developing/ implementing a regional education and outreach program, iii) leading a volunteer-based advocacy effort, iv) providing technical assistance for developing local glass and tire processing/end use, and v) quantity data tracking. Appendix F includes additional detail on the cost/revenue estimates. As noted:

- Table 6 identifies costs for all programs - but shows the impact of obtaining grant funding to cover start-up costs for developing a regional E&O program
- Net costs could vary greatly based on material revenues earned - revenues will be a function of the level of commingling, haul distance, recycler/broker relationships and even global economics (the development of a

new local MRF is expected to improve revenues, but this benefit cannot be quantified until this facility is on-line next year)

- Net savings (i.e., avoided net tip fee costs) reflect the difference between avoided landfill tip fees and recycling facility tip fees and may also vary widely - these savings are not considered in the bottom line net cost/revenue estimate (but do illustrate the improved economics of recycling over disposal)
- The entity that incurs the costs described in Table 6 (i.e., the waste coalition host organization) will most likely not be the entity who receives earnings from material sales (i.e., the public, non-profit and private organization that hauls and/or recycles directly) unless the coalition expands its role into brokering
- Equivalent¹⁴ net start-up costs range from \$0.30 to \$0.70/capita with an annual range of \$0.30 (cost) to \$3.20/capita-day (revenue) - as noted above, market revenues are not expected to accrue to the coalition, however
- Job creation may include up to 0.5 total full-time equivalents (FTEs) during start-up - and up to 0.2 FTEs on an on-going basis (see Appendix F for staffing information)

Table 6 - Regional Waste Diversion Coalition Costs & Benefits
(rounded to nearest 1,000 tpy and \$1,000)^a

	START-UP	ON-GOING ANNUAL (2015)
New Diverted Tons ^b <i>(includes diversion from E&O program, increased glass & tire diversion)</i>	-----	4,000 tpy
Costs		
With E&O grant funding ^c	(\$31,000)	(\$9,000)
Without E&O grant funding	(\$69,000)	(\$28,000)
Avoided Net Tip Fees Costs ^d	-----	\$21,000
Revenues ^e	-----	\$0 - \$330,000
Net Costs/Revenues <i>(excludes avoided tip fee benefit)</i>	-----	
With E&O grant funding	(\$31,000)	(\$9,000) - \$321,000 or (\$2/ton) - \$80/ton
Without E&O grant funding	(\$69,000)	(\$28,000) - \$302,000 or (\$7/ton) - \$76/ton

^a Values in (red) are costs, values in black are revenues.

^b Assumes 30% increase in overall diversion from E&O and expanded glass/tire recycling.

^c Ideally, grant funding (\$38,000) will be obtained for start-up of the E&O program.

^d Assumes net benefit of \$5/ton (average regional landfill tip fees are \$45/ton and recycling fees can be as high as \$40/ton in Montezuma County).

^e Assumes a range of revenues (net of transportation) of \$0/ton (single-stream materials) to \$80/ton (multi-stream materials) based on current revenues earned by Cortez, Durango and Archuleta County. Organizations that incur costs may not be same as those that earn revenues.

Once the waste coalition is in place and operating effectively, the net benefit for the region will be increased waste diversion and potential revenues.

¹⁴ Based on the estimated 2014 regional population of 99,142 (see Appendix A).

Coalition Examples

Table 7 includes four waste diversion cooperatives that - while they don't precisely model the type of coalition that may ultimately be developed for southwest Colorado - provide some operating and organizational examples that could be used during start-up¹⁵. Appendix G includes an example coalition member contract.

Table 7 - Example Coalition Models

EXAMPLE	DESCRIPTION
Upper Arkansas Area Council of Governments Recycling Program (UAACOG)	Inter-governmental authority with county members (Custer & Fremont Counties); Provides DOC collection & marketing (competes with other haulers); Charges member counties \$0.79/capita-year
Southwest Public Recycling Association (SPRA) <i>Served AZ, CO, NM, NV, TX & UT</i>	Formed in 1991 & headquartered in Tucson, AZ; Provided cooperative marketing for rural public/private/non-profit members located in remote areas; Supported market development & encouraged buying recycled content products; Provided training & technical assistance; Was disbanded several years ago due to financial difficulties
New Mexico Recycling Coalition (NMRC)	Used federal funding to establish hub-and-spoke system; Previously provided design, procurement & operation (hauling) assistance; Previously developed regional solid waste organizations to implement; Cooperatively marketed hub materials (no longer needed); Currently offers consulting services in/out of New Mexico
Central Texas Recycling Association (CTRA)	Has 60 partnerships & 500 community members; Founded to bring recycling to rural areas (improve cost-effectiveness by increasing the economy of scale); Provides on-going technical assistance & cooperative marketing (contracts with single hauler/processor); Focus is growing quality & pricing over quantity; Accepts multi-stream only through staffed DOCs & requires baling when >1 hr from MRF; Use member contracts with no membership dues (instead earn 10% brokerage fees) - offset costs & expenses associated with 1.5 full-time staff

3.3 Regional Education & Outreach Program

Table 8 (next page) provides a general summary of existing outreach materials from within the region currently. A regional E&O program could be developed to build on these materials and provide expanded breadth and services to collect a greater quantity of higher quality recyclables, including:

- Work with stakeholders to establish a core list of recyclables collected in every program (whether multi-stream or commingled, drop-site or curbside) - to make recycling consistent and easy
- Develop a simple brand for regional recycling efforts to increase awareness and streamline/standardize materials - with a logo and signage format for all regional communications as well as for stakeholders to use as they augment/modify their existing E&O materials

¹⁵ Both NMRC and CTRA are available for consulting services associated with coalition start-up.

- Develop messaging or recycling "campaign" content for regional and stakeholder use - messaging should be modified to target students, residents, businesses, tourists and other groups as identified over time (e.g., senior citizens, garden clubs, chambers of commerce, etc.)
- Establish and maintain a comprehensive list of recycling services and facilities
- Develop and implement training materials for students, the public and elected officials - which may include presentations and tours

Table 8 - Existing E&O Programming

COMMUNITY	WEBSITE	TOURS	LOGO	MISCELLANEOUS	INFO FOR OTHER SERVICES/PROVIDERS
Cortez	X			brochure	X
Durango	X	X		X	X
Archuleta County	X				
La Plata County	X				
Ute Mountain Ute Tribe	X				X
FCRI	X			on-line discussion forum (dormant)	

Private businesses also have websites describing their services.

The estimated cost of developing and maintaining an effective E&O program was described as part of an overall waste collaborative in Section 3.2. Given the current low pricing for recycled commodities and the issues producing quality single-stream materials, a comprehensive education and outreach program that is efficient and effective in raising awareness and encouraging diversion is expected to have a notable impact on recycling in southwest Colorado.

3.4 New Waste Diversion Policy

Policy is typically implemented at the municipal level but some county-wide policy has also proven effective (e.g., hauler licensing and disposal bans). Policies can be incentive- or mandate-based and can target either the trash or diverted waste stream to drive recycling and/or organics recovery. Table 9 (next page) includes a summary of potential policies reviewed by the Recycling Task Force.

The suitability of the policy components listed in Table 9 (next page) will likely vary for each government agency. For example, Cortez and Durango already have several recycling incentives in place for their waste generators, and may instead consider requiring private trash haulers to provide recycling service to commercial customers. More rural regions who rely on trash drop-sites may evaluate the feasibility of a pre-paid bag pay-as-you-throw (PAYT) policy. Other policies, such as a cardboard disposal ban, could be implemented by individual municipalities, counties or region-wide.

Table 9 – Waste Diversion Policy Options

POLICY COMPONENTS	PROS	CONS	EXAMPLES
Hauler Policy (basic)			Fort Collins (\$100/vehicle-year license); Aspen (fee based on number of employees); Loveland (\$100/vehicle-year); Larimer County (\$25/year)
Annual licensing	Insurance, vehicle safety standards	Minor administrative burden for haulers	
Data reporting	Ability to track progress	May be proprietary data	
Required recyclable materials	Consistency for customers		
Education & outreach	Augments regional E&O	Costs passed on to customers	
Hauler Policy (advanced)			PAYT cities with hauler contracts – Edgewater, Golden, Lafayette; PAYT cities with public collection – Loveland, Thornton; PAYT cities with open collection – Aspen, Fort Collins, Vail; Cities with bundled commercial pricing – Aspen, Vail
Required recycling	Increased access to recycling	Potential hardship for small, trash-only haulers	
PAYT residential trash pricing	Creates incentive & increased diversion; Customer control of fees; Many ways to implement (bags, cans, carts) & pay (pre-pay, at collection/disposal points)	Need to adjust billing; May need different container inventory; Hard to implement in unincorporated areas	
Bundled commercial pricing	Increased access & diversion	Overall pricing may be hardship for some generators	
Disposal Ban (Cardboard)			
Generator applicability	Applicable to all sectors	Must have universal recycling access first; Harder to implement in unincorporated areas	Fort Collins (since March 2013) – increased commercial recycling accounts by 95% & tons diverted by 19%
Penalties	Need enforcement for policy credibility	Cost of enforcement	

^a It is estimated that as much as 6,000 tons of cardboard is landfilled in the region annually at a cost of \$280,000 (landfill tip fees).

Even for incentive-based ordinances, policy development is often challenging because it means changing the status quo. Using a sound strategy that includes sufficient research, preparation of elected officials, broad stakeholder involvement and incorporating flexibility as well as enforcement is important for any rule-making effort (Appendix H includes an informative article for tackling policy development at the community level). Also critical is the ability to identify the full facts both for and against any new ordinance to build credibility and trust with the public and council/commission members. Resources needed for advocacy efforts associated with policy development were included under the waste coalition estimates discussion in Table 6 and Appendix F.

3.5 Rural Recycling Drop-Site Access

Determining regional need for additional drop sites is difficult due to limited data (the 2014 baseline task was successful in obtaining most quantities disposed and diverted at management facilities, but individual program and collection point data was not universally available). Additionally, the cost of serving remote areas is difficult to justify in many communities. Table 10 (next page) summarizes the advantages and disadvantages of drop-site recycling.

Existing recyclable drop sites included a mix of dumpsters and roll-off containers. These sites are operated by non-profit, public and private owners, but all are hauled by the private sector. Most are unstaffed, with the exception of Durango's Recycling Center, which accepts residential and commercial materials.

Table 10 - Drop Site Recyclables Collection

PROS	CONS
Can serve low populations	If unstaffed, illegal dumping can degrade material quality & increase maintenance costs
Typically collects multi-stream materials (higher quality if illegal dumping is controlled)	Hauling from remote areas is costly (can be minimized by storing/hauling semi-trailer loads)
Materials are essentially market-ready	Specialized equipment may be required to service dumpsters and roll-offs
Can be used as temporary collection point (reducing contamination/illegal dumping potential)	Sporadic hours reduces convenience (& ultimately diversion) by users

As an alternative to existing facilities, a towable drop site system was evaluated¹⁶. This system utilizes 21-cubic yard roll-off containers, which can be configured into one- to six-compartments with appropriate openings. But instead of being hauled by a roll-off truck, these containers can be serviced by a simple trailer with a hydraulic lift that can be pulled by a 3/4-ton pick-up truck. The advantage of this system is the avoidance of specialty collection equipment (the trailer can be used for multiple drop sites and nearly every fleet includes pick-up trucks) and suitability for both rural and temporary collections¹⁷. This system may be most suitable where new, stand-alone collection sites are needed in the future, but would also be compatible with existing operations (the roll-off containers can be managed with conventional roll-off hoists).

Table 11 - Towable Drop-site Collection System Costs & Benefits (rounded to nearest \$1,000)^a

	START-UP	ON-GOING, ANNUAL
Diverted Tons		
"Small" service area (500 people)	-----	38 tpy
"Large" service area (1,500 people)	-----	13 tpy
Costs		
Trailer	(\$21,000)	-----
Roll-off box (each)	(\$7,000)	-----
Hauling - small area	-----	(\$1,640) or (\$131/ton)
Hauling - large area	-----	(\$3,880) or (\$103/ton)
Avoided Net Tip Fees Costs ^b	-----	\$100 (small) - \$200 (large)
Revenues ^c	(\$21,000)	up to \$1,000 (small) up to \$3,000 (large)
Net Costs/Revenues (excluded avoided tip fee benefit)	(\$7,000)	up to (\$640) (small) up to (\$880) (large)

^a Values in (red) are costs, values in black are revenues - excludes site development and maintenance costs.

^b Assumes net benefit of \$5/ton (average regional landfill tip fees are \$45/ton and recycling fees can be as high as \$40/ton in Montezuma County).

^c Assumes a range of net revenues of \$0/ton (single-stream materials) to \$80/ton (multi-stream materials) based on current revenues earned by Cortez, Durango and Archuleta County.

¹⁶ ProTainer's Pro Roll-Off system is one example - see <http://protainer.com/>.

¹⁷ Temporary drop sites can be "staffed" by the pick-up driver to minimize contamination and illegal dumping.

Table 11 (previous page) includes a summary of anticipated diversion potential, program costs, avoided disposal costs and revenue earnings for a towable drop-site configuration¹⁵ in two rural service area scenarios. Appendix I provides additional details. As noted, there are expected to be net costs for this system even when net revenues are factored in. Because of these revenues, however, the cost of drop-site recycling is likely to match or be lower than drop-site trash for the same service areas.

3.6 Other Potential Improvements

Among the remaining improvements that could be implemented in the region, enhanced composting infrastructure to support organics recovery and provide soil amendment for this semi-arid region would likely be the biggest "bank for the buck" in terms of waste diversion. Figures 6 and 8 showed that 37.5% of landfilled waste is organics, and that two-thirds of this category is food and yard waste (or about 22,000 tons every year). The waste diversion coalition should regularly evaluate Montezuma County's ability to serve the overall region when its pilot facility becomes a full-scale operation, as well as ancillary considerations such as back-haul opportunities between Cortez and organics generation points, inclusion in a regional E&O program and policy needs to incentivize organics recovery as well as recycling.

SECTION 4

RECOMMENDED WASTE DIVERSION STRATEGY

4.1 Consequences of No Further Action

Although the SWCCOG and stakeholders have made important strides towards identifying the needs for waste diversion in southwestern Colorado, it is important to understand the consequences of not building on this progress. While the worst of these may well be the continued reliance on landfill disposal to manage the waste stream (a majority of which can be recycled or composted), the missed opportunities may be the biggest loss for the region as they are numerous and far-reaching:

- Failure to take full advantage of Colorado RREO grant funding and the work completed to date by key waste management stakeholders
- Failure to move away from decentralized programming that serves immediate audiences only with a limited economy of scale and net revenues
- Failure to cost-effectively divert some of the most easily recyclable material such as residential glass and commercial cardboard (let alone special wastes such as tires, electronics and household hazardous materials)
- Failure to support a new single-stream processing MRF that could otherwise reduce the cost of recycling for the region, create local jobs and support private-sector waste management
- Failure to access shared equipment that individual communities cannot afford on their own (e.g., tire shredder, glass crusher)
- Failure to leverage the public to help increase diversion levels as well as the value of those materials
- Failure to brainstorm creative solutions (such as back-hauling single-stream recyclables and organics between the Montezuma County Landfill and Durango facilities)
- Failure to have a long-term, regional vision that anticipates recycling a continually evolving waste stream and organics recovery

To turn these potential failures resulting from no action into opportunities with the real potential for increasing cost-effective waste diversion in the region, an effective strategy is required (see Section 4.2).

4.2 Strategy for Creating & Implementing an Effective Coalition

Basic to any other waste diversion activities will be the need to help the existing Recycling Task Force 1) clarify what they want to accomplish as it evolves into a waste diversion coalition, and 2) adopt a collaborative versus a competitive relationship. In addition to the long list of waste diversion obstacles identified in Table 3, any multi-jurisdictional region struggles with aligning their efforts under a common goal and set of actions. Individual organizations will look at a future coalition differently:

- Communities vary in terms of how advanced their waste diversion systems are and as a result need different levels of services - for example, at one end of the spectrum Cortez and Durango have aggressive multi-sector programs while at the other end the Tribes' waste diversion focus is primarily on schools (both programs are valid and appropriate for their organizations' current status but have different future growth needs)

- Organizations have different financial objectives - public agencies typically seek cost-neutral programs while private companies need to make a net profit
- Competition is inherent - landfills compete with recycling programs for MSW tons, all private haulers compete with one another for customers (public agencies can also resist collaborating as they protect the short-term resources of their citizenry)
- Transition - there are several transitions occurring that may make decision-making difficult in the short-term (i.e., development of a new processing MRF in Durango, possible change in Montezuma County's collection strategy, new glass markets on the Front Range and turbulent recyclables pricing)

Focus the Recycling Task Force (2015) - The first important step will be working with the initial Task Force to move from the "talking phase" to the "action phase" of making improvements. Recommended actions include:

1. **Refine the Task Force Membership** - for fair representation and appropriate group discussion:
 - Include one to two (maximum) number of representatives from each organization
 - Include a mix of senior staff, management, elected officials¹⁸, Tribal leaders, executive directors and owners
2. **Goal-Setting** - During the course of this study, the stakeholders generally agreed that there is a common goal (or "problem statement"): *improving the economics of waste diversion in the region*. There was little agreement, however, as to what objectives and actions make sense for achieving that goal. In order to pursue this broad goal, the following sub-goals or objectives should be adopted:
 - Increase diverted tons from the residential, commercial, institutional and tourism sectors
 - Maximize recyclables quality (e.g., single-stream with glass separate)
 - Have more "spokes" and less "hubs" - to create the best economy of scale for processing, transporting and selling as a valuable commodity
 - Maximize benefits to the private sector so that public/private (and non-profit) relationships flourish
3. **Determine Specific Short-Term Activities & Plan for Implementing** - These are expected to include those activities discussed in Section 3.2 (i.e., grant funding, E&O program development, advocacy, problem materials management and quantity data collection). This action should also include confirmation of activity costs and benefits. While this report includes an initial estimate of costs based on assumptions related to which activities will be prioritized, programs and services in transition, staff costs and others, final costs will need to be refined as assumptions are verified.

While these actions will be challenging for diverse stakeholders, the focus should be on two or three objectives that most stakeholders can agree on in the short-term. Once the Task Force/waste coalition make some progress and are able to demonstrate successes, stakeholder support will be easier to obtain. It is expected that the SWCCOG will lead

¹⁸ If SWCCOG is the ultimate host organization, elected officials are members of the COG board.

these first strategy steps given its current leadership of the recycling study and possible future role as a host organization.

Establish Waste Coalition (2015/2016) - Armed with a specific initial strategy, the stakeholders can pursue launching a regional waste diversion coalition as part of a host organization with the existing resources, relationships, credibility and neutrality necessary to effectively make change. As noted in Section 3.2, the SWCCOG appears to be the optimal host for a new regional coalition. To accomplish this, several actions are needed:

4. **Conduct Internal Advocacy** - This should consider the membership of the SWCCOG such that the coalition members have an equal say and equal responsibility;
 - Not all governments on the Recycling Task Force members are currently members of the SWCCOG (e.g., Montezuma County, Dove Creek and Rico) - the Task Force should advocate the value of waste coalition membership to these communities
 - Non-local government agencies such as the National Park Service should also encouraged to participate
 - The Southern Ute and Ute Mountain Ute tribes are not full members of the SWCCOG - again the coalition may be able to advocate full membership
 - Non-profit and private businesses are not members of the SWCCOG - this could potentially be addressed through a partnership agreement with SJBRA
 - Advocacy efforts should help the Tribes and non-profits consolidate their resources in their own organizations to more efficiently participate in the waste coalition and avoid disconnects between stakeholders (especially where trash and recyclables are managed by different departments)

5. **Develop Compelling Argument for the SWCOG Board of Directors** - This argument should present the initial waste coalition strategy, staffing, membership, cost and revenue expectations. As shown in Table 6, start-up costs are expected to range from \$31,000 to \$69,000. Annually, however, the range may fluctuate from \$28,000/year net costs to \$321,000/year net revenues (although gross revenues will not likely accrue to the SWCCOG). Cost implications will include;
 - The SWCCOG may be able to conduct some of the activities described in Section 3.2 without new revenues¹⁹ - this may included efforts associated with focusing the stakeholders, establishing the waste coalition and development of a successful grant application(s) in late 2015/early 2016
 - Successful grant funding efforts will ideally cover the E&O program development - and possibly initial development of a quantity data collection process
 - Other costs are likely to require new revenues, which could be generated through the SWCCOG membership dues - this will require re-evaluating the dues structure and assessing which communities participate in waste diversion, along with varying the Tribal and non-profit rates

¹⁹ The SWCCOG has obtained a new AmeriCorps VISTA volunteer for 2015/2016 who could be partially allocated to coalition work.

As activities are implemented, waste diversion levels are expected to increase, generating cost savings (associated with tip fees) for generators and haulers as well as revenues from material sales. These revenues will not likely accrue to the host organization, however, and should be considered in evaluating the SWCCOG cost implications (above).

Short-Term Actions (2016) - Short-term projects should focus on achieving one or two early successes to build credibility and support from all parties. These may include:

6. **Obtain E&O Grant Funding** - Funding should support a comprehensive program with region-wide benefits.
7. **Support New Local MRF/Composting Development** - Support continued collaboration between regional stakeholders and Phoenix as the company develops its single-stream sorting MRF to maximize service capabilities (additional Recycling Task Force meetings have been tentatively scheduled for late 2015). This collaboration should also be applied to Montezuma County's compost facility, as applicable.
8. **Tackle Glass and Tire Management Solutions** - These problem wastes are a universal issue for stakeholders and may have some low-tech solutions that can be implemented in the short-term.

Long-Term Projects (2017 & Beyond) - Projects that will most likely build on early successes and include:

9. **Implement the E&O Program.**
10. **Continue Efforts to Address Problem Wastes** - Expand efforts to include HHW and electronic waste, also evaluate the feasibility of recycling textiles across the region.
11. **Develop a Process for Quantity Data Collection** - This should target 2016 data and will be a reasonable next step to the 2014 baseline data provided in this report (continue data collection annually thereafter).
12. **Policy Development** - Provide advocacy and technical assistance as appropriate for local waste diversion policy.
13. **Other** - Miscellaneous actions should include;
 - Update waste composition data with more comprehensive audits that target all generator wastes
 - Evaluate greenhouse gas emissions from both landfill disposal and recycling to further clarify the advantages of diversion
 - Revise waste coalition goal, objectives and actions at least every other year

4.4 Final Observations

While environmental sustainability through recycling and organics recovery (as well as source reduction, reuse and re-purposing) is critical to any region, the economic sustainability of these diversion strategies must be simultaneously

considered. Recycling and composting are not only not "free" (as much of the public believes they should be), but are capital-intensive - in some rural areas, they are nearly as expensive as landfilling because of long haul distances and contamination. That said, many of the economic advantages of waste diversion cannot be fully quantified - these encompass avoided disposal costs, avoided greenhouse gas emissions, local and global benefits of avoided virgin material mining/production, and even changes in consumer and waste generator habits.

The goal of any diligent and forward-thinking government organization should be to create a waste diversion strategy that successfully balances the environmental and economic aspects to support long-term systems. While this is typically more of a challenge in rural areas than urban, rural stakeholders and elected officials often have greater incentives: protection of pristine lands and clean air; preservation of tourist and recreational spots; and job creation.

Southwest Colorado has the opportunity to utilize an existing platform maintained by the SWCCOG and built on early stakeholder enthusiasm to consolidate the efforts of numerous public, private and non-profit entities into a centralized approach that provides leadership and effective action for waste diversion across the region. The growth of the existing Recycling Task Force into a credible, inclusive and effective waste diversion coalition will require political will, the ability to consider the overall waste management system and a spirit of cohesion over divisiveness. Once accomplished, however, southwest Colorado may well develop a regional network of sustainable programs and infrastructure that is not only economically viable, but is a state leader in terms of rural solid waste management - clearly a preferable outcome to the consequences of no further action.

TABLE OF CONTENTS

VOLUME II APPENDICES

Appendix A	Waste Quantity Projections
Appendix B	Waste Audit Results
Appendix C	Stakeholder Contact Information
Appendix D	Recycling Task Force Meeting Materials
Appendix E	Glass & Tire Diversion Resources
Appendix F	Waste Collaborative Cost Estimate
Appendix G	CTRA Member Contract
Appendix H	"Changing How We Do Garbage" Article
Appendix I	Drop-Site Cost Estimate Model

APPENDIX A

WASTE QUANTITY PROJECTIONS

POPULATION PROJECTIONS^a

		2010 POPULATION ^b	PROJECTED POPULATION ^b	
			2015	2025
	Archuleta County	12,060	13,237	18,159
	<i>Pagosa Springs</i>	<i>1,724</i>		
	Dolores County	2,060	2,103	2,505
	La Plata County	51,441	57,850	76,200
	<i>Durango</i>	<i>16,906</i>		
	Montezuma County	25,532	27,085	33,271
	<i>Cortez</i>	<i>8,481</i>		
	San Juan County	709	702	747
	County Total	91,802	100,977	130,882
	Increase Over 2015	na	na	130%

Notes:

^a *Results are estimates only - accuracy should not be assumed beyond the nearest 1,000 people*

^b CO State Demography Office, October 2013 (2010 actuals) & November 2013 (projections)

ACTUAL SWCCOG MUNICIPAL SOLID WASTE QUANTITY TOTALS^a (tons unless otherwise noted)

		Landfill	Recyclables	Organics	Subtotal	Comments
Archuleta County						
	Archuleta County ^b	13,600	398	0	13,998	Recyclables brokered out of county LF tons incl 260 tons glass used for construction
	At Your Disposal	see County	120	0		R incl cardboard only (brokered out of county) Other R in Durango tons
La Plata County						
	City of Durango	see Bondad	4,240	50	4,290	City's 9,063 tons trash incl in Bondad LF total R incl 106 tons ewaste, HHW by city & county Incl R tons from Pagosa/LaPlata County haulers
	La Plata County	see Bondad	see Durango	not available	not available	
	Phoenix Recycling	see Bondad	276	625	901	R incl shreds only (rest in Durango tons) O incl wood chips (estimated at 500 #/CY)
	Durango Compost Company	0	0	1	1	Incl coffee grinds only (vermi-composting)
	CO State Demography Office, October 20	0	5,927	0	5,927	Incl ewaste
	Bondad Landfill	54,100 ^b	0	0	54,100	Incl T from Southern Ute Tribe
Montezuma County						
	Montezuma County ^c	23,118	287	294	23,699	Incl FCRI R & ewaste tons Incl T from Ute Mtn Tribe, NPS, etc.
	City of Cortez	see County	343	35	378	Organics chipped only
	Aramark (NPS concessionaire)	see County	37	0	37	
	Belt Salvage	0	710	0	710	UBCs, appliances
Other						
	Bruin Waste Mgmt (San Juan County) ^b	456	180	0	636	R incl scrap metal, ewaste T to Broad Canyon LF, R to Montrose MRF
	Waste Mgmt (Montezuma County)	219	214	0	433	T to Crouch Mesa LF, single-stream R to Four Corner EcoCenter at San Juan County LF
	National Grocery Stores ^d	0	1,000 (est)	see Food Banks	1,000	Cardboard managed outside region
	Food Banks ^e	0	0	700 (est)	700	Food donated by grocery stores & others
	MSW GENERATED	91,493	13,732	1,705	106,930	
	MSW GENERATION^f				5.9	pounds/capita-day
	DIVERSION FROM RECYCLING ONLY				13%	
	DIVERSION FROM RECYCLING & ORGANICS				14%	

T = trash, R = recyclables, O = organics

a Results are estimates only - accuracy should not be assumed beyond the nearest 1,000 tons

- excludes industrial waste (i.e., Ska Brewery's diversion of 3,600 tons spent grain waste/NPS' 3,600 recycled C&D tons not included)

b Volume to weight conversion based on CDPHE (e.g., 1 ton MSW = 3.333 cubic yards) & national data for recyclables

c Includes tons from Dolores County managed at the Montezuma County Landfill

d Approximation based on cardboard bale quantity recycled by Durango Albertson's (pro-rated for other communities) - excludes plastic film recycling

e Approximation based on Durango & Manna Food Banks (pro-rated for other communities) - excludes donation to farmers, feedlots

f Based on 2010/2015 state populations pro-rated for 2014 (estimated) = 99,142

PROJECTED TOTAL SOLID WASTE GENERATION DIVERSION

- 2015 QUANTITIES^a (tons/year)

	ASSUMED WASTE COMPOSITION ^b (by weight)	PROJECTED GENERATION		PROJECTED DIVERSION from RECYCLING ^e		
		Low Generation ^c	High Generation ^d	20%	25%	30%
				Material Recovery (based on average low/high generation)		
Paper						
Cardboard & Kraft Paper	7.2%	6,634	9,951	1,659	2,073	2,488
Office Paper with Shreds	2.0%	1,843	2,764	461	576	691
Newsprint	0.8%	737	1,106	184	230	276
Magazines & Catalogues	2.8%	2,580	3,870	645	806	967
Mixed Paper, Junk & Phone Directories ^e	4.1%	3,778	5,667	944	1,181	1,417
Chipboard/Paperboard ^e	4.7%	4,331	6,496	1,083	1,353	1,624
Aseptic Packaging ^e	0.9%	829	1,244	207	259	311
Other Paper (waxy cardboard, etc.)	1.7%	1,566	2,350	na	na	na
Total Paper	24.2%	22,298	33,447	5,183	6,479	7,774
Plastics						
PET #1 Bottles & Containers	2.1%	1,935	2,902	484	605	726
HDPE #2 Bottles & Containers	1.2%	1,106	1,659	276	346	415
#3-7 Bottles & Containers	1.3%	1,198	1,797	299	374	449
Plastic Film/Wrap/Bags	4.7%	4,331	6,496	1,083	1,353	1,624
Other Plastics (Styrofoam, PLA, etc.)	3.4%	3,133	4,699	na	na	na
Total Plastic	12.7%	11,702	17,553	2,142	2,678	3,213
Glass						
Glass Containers	8.5%	7,832	11,748	1,958	2,448	2,937
Other Glass	0.3%	276	415	na	na	na
Total Glass	8.8%	8,108	12,163	1,958	2,448	2,937
Metals						
Aluminum (cans, foil, pie plates)	1.5%	1,382	2,073	346	432	518
Tin Cans	1.6%	1,474	2,211	369	461	553
Other Metals	3.4%	3,133	4,699	783	979	1,175
Total Metals	6.5%	5,989	8,984	1,497	1,872	2,246
Organics^e						
Food Waste	17.6%	16,217	24,325	1,014	1,520	2,027
Yard Waste/Untreated Wood	6.8%	6,266	9,398	392	587	783
Other Organics	13.1%	12,071	18,106	na	na	na
Total Organics	37.5%	34,553	51,830	1,405	2,108	2,810
Other / Special Waste						
Electronics	1.2%	1,106	1,659	na	na	na
C&D Debris	6.7%	6,173	9,260	na	na	na
Other Waste	2.4%	2,211	3,317	na	na	na
Total Other/Special Waste	10.3%	9,491	14,236	0	0	0
TOTAL SOLID WASTE	100.0%	92,142	138,212			
MRF RECYCLABLES				10,781	13,476	16,171
TOTAL DIVERSION FROM RECYCLING				9%	12%	14%
ORGANICS (without paper)				1,405	2,108	2,810
TOTAL DIVERSION FROM ORGANICS RECOVERY				1%	2%	2%
TOTAL RECYCLABLES + ORGANICS				12,186	15,583	18,981
TOTAL DIVERSION				11%	14%	16%

PROJECTED TOTAL SOLID WASTE GENERATION DIVERSION - 2015 QUANTITIES^a (tons/year)

Notes

^a *Results are estimates only - accuracy should not be assumed beyond the nearest 1,000 tons/year*

Shaded quantities reflect materials targeted by SWCCOG study - other materials may be diverted through other programs

^b Based on waste audits conducted by SWCCOG & Fort Lewis College interns between August and November 2014

^c Assumed low generation (based on 2014 SWCCOG rate of 5.9 ppcd) =

5

^d Assumed high generation (based on 2014 SWCCOG rate of 5.9 ppcd) =

7.5

^e Assumed material recovery for organics =

5% (low)

7.5% (medium)

10% (high)

**PROJECTED TOTAL SOLID WASTE GENERATION DIVERSION
- 2025 QUANTITIESa (tons/year)**

	ASSUMED WASTE COMPOSITION ^b (by weight)	PROJECTED GENERATION		PROJECTED DIVERSION from RECYCLING ^e		
		Low Generation ^c	High Generation ^d	30%	35%	40%
				Material Recovery (based on average low/high generation)		
Paper						
Cardboard & Kraft Paper	7.2%	8,599	12,898	3,225	3,762	4,299
Office Paper with Shreds	2.0%	2,389	3,583	896	1,045	1,194
Newsprint	0.8%	955	1,433	358	418	478
Magazines & Catalogues	2.8%	3,344	5,016	1,254	1,463	1,672
Mixed Paper, Junk & Phone Directories ^e	4.1%	4,897	7,345	1,836	2,142	2,448
Chipboard/Paperboard ^e	4.7%	5,613	8,420	2,105	2,456	2,807
Aseptic Packaging ^e	0.9%	1,075	1,612	403	470	537
Other Paper (waxy cardboard, etc.)	1.7%	2,030	3,045	na	na	na
<i>Total Paper</i>	24.2%	28,902	43,353	10,077	11,756	13,436
Plastics						
PET #1 Bottles & Containers	2.1%	2,508	3,762	941	1,097	1,254
HDPE #2 Bottles & Containers	1.2%	1,433	2,150	537	627	717
#3-7 Bottles & Containers	1.3%	1,553	2,329	582	679	776
Plastic Film/Wrap/Bags	4.7%	5,613	8,420	2,105	2,456	2,807
Other Plastics (Styrofoam, PLA, etc.)	3.4%	4,061	6,091	na	na	na
<i>Total Plastic</i>	12.7%	15,168	22,751	4,165	4,859	5,553
Glass						
Glass Containers	8.5%	10,152	15,227	3,807	4,441	5,076
Other Glass	0.3%	358	537	na	na	na
<i>Total Glass</i>	8.8%	10,510	15,765	3,807	4,441	5,076
Metals						
Aluminum (cans, foil, pie plates)	1.5%	1,791	2,687	672	784	896
Tin Cans	1.6%	1,911	2,866	717	836	955
Other Metals	3.4%	4,061	6,091	1,523	1,777	2,030
<i>Total Metals</i>	6.5%	7,763	11,644	2,911	3,396	3,881
Organics^e						
Food Waste	17.6%	21,020	31,529	7,882	9,196	10,510
Yard Waste/Untreated Wood	6.8%	8,121	12,182	3,045	3,553	4,061
Other Organics ^f	13.1%	15,645	23,468	2,553	2,978	3,404
<i>Total Organics</i>	37.5%	44,786	67,179	13,481	15,727	17,974
Other / Special Waste						
Electronics	1.2%	1,433	2,150	na	na	na
C&D Debris	6.7%	8,002	12,003	na	na	na
Other Waste	2.4%	2,866	4,299	na	na	na
<i>Total Other/Special Waste</i>	10.3%	12,301	18,452	0	0	0
TOTAL SOLID WASTE	100.0%	119,430	179,145			
MRF RECYCLABLES				20,960	24,453	27,947
TOTAL DIVERSION FROM RECYCLING				14%	16%	19%
ORGANICS (without paper)				13,481	15,727	17,974
TOTAL DIVERSION FROM ORGANICS RECOVERY				9%	11%	12%
TOTAL RECYCLABLES + ORGANICS				34,441	40,181	45,921
TOTAL DIVERSION				23%	27%	31%

PROJECTED TOTAL SOLID WASTE GENERATION DIVERSION - 2025 QUANTITIESa (tons/year)

Notes

^a *Results are estimates only - accuracy should not be assumed beyond the nearest 1,000 tons/year*

Shaded quantities reflect materials targeted by SWCCOG study - other materials may be diverted through other programs

^b Based on waste audits conducted by SWCCOG & Fort Lewis College interns between August and November 2014

^c Assumed low generation (based on 2014 SWCCOG rate of 5.9 ppcd) = **5**

^d Assumed high generation (based on 2014 SWCCOG rate of 5.9 ppcd) = **7.5**

^e Assumed material recovery for organics = **30%** (low) **35.0%** (medium) **40%** (high)

^f Assumes textiles diverted by 2025 USEPA 2012 MSW Facts & Figures found that textiles = **5.7%** of MSW stream

APPENDIX B

WASTE AUDIT RESULTS

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS			
		RES 1	COM 2	RES 3	COM 4	RES 5	RES 6	RES 7	MIXED RES/COM		8				9
Recycling Program	COLORADO WASTE AUDIT AVERAGE^b	County DOC (all materials); Elite/AYD curbside (SS w & wo glass)		Expansive City collection (80% residential, some commercial) - SS w/o glass (glass DOC)		Durango DOC (SS, OCC & glass); Bayfield & Marvel DOCs (ONP, plastics, metal, glass only); Phoenix curbside (SS wo glass)			City collection (all materials except plastics)	BSI/FCRI DOCs (fiber & metals only); BSI & WM curbside (source-separated)		Residential Average (5 samples)	Commercial Average (2 commercial)	Overall MSW Average (10 samples)	
Source		Pagosa Springs incl HH with YW, other organics & metal equipment	Area Near Wyndam (west end of PS) incl YW & restaurant FW (MacDs)	Southside neighborhood (older part of town) w YW, C&D (4 CY loose)	Downtown district incl concert venue incl OCC, C&D, Solo cups, restaurant waste (4+ CY compacted)	Load from unincorporated area E of Durango, W of Bayfield	Bayfield (1+ CY loose)	Ignacio (1+ CY loose)	Incl YW, other organics (3 CY compacted)	Unincorporated load E Montezuma/W La Plata - mixed load w OCC (3-4 CY compacted)	Self-haul from unincorporated area to LF w farm waste (2 CY loose)				
Hauler		Waste Mgmt	Waste Mgmt	City of Durango	City of Durango	Phoenix	Transit	Transit	City of Cortez	Baker Sanitation or Waste Mgmt	Self-Haul				
Other (weather, precip, etc.)		low, light breeze, sunny, 65F	low, light breeze, sunny, 65F	wet/damp no precip, cool temps	low moisture, no wind, sunny	dry & sunny	dry & sunny	dry & sunny	no moisture or wind	no moisture or wind	no moisture or wind				
MATERIAL															
GLASS	Glass Food & Beverage Containers	5.0%	0.0%	9.8%	6.0%	1.8%	7.3%	17.0%	26.7%	4.4%	8.2%	4.1%	11.4%	5.8%	8.5%
	Other Glass	0.5%	0.0%	2.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.3%
	Glass Totals	5.5%	0.0%	12.5%	6.2%	1.8%	7.3%	17.0%	26.7%	4.4%	8.2%	4.1%	11.4%	7.2%	8.8%
METALS	Alum Food/Beverage Containers, Foil & Pie Tins	1.0%	2.0%	2.2%	1.5%	2.2%	2.0%	1.3%	1.5%	1.0%	1.0%	1.0%	1.6%	2.2%	1.5%
	Steel/Tin Containers	1.0%	3.4%	1.2%	1.2%	0.1%	0.0%	2.1%	4.0%	1.6%	1.2%	1.4%	2.1%	0.7%	1.6%
	Other Metal	1.5%	9.9%	0.4%	5.8%	0.9%	0.0%	1.9%	2.0%	1.7%	11.0%	0.0%	3.9%	0.6%	3.4%
	Total Metals	3.5%	15.3%	3.8%	8.4%	3.2%	2.0%	5.2%	7.5%	4.3%	13.2%	2.4%	7.7%	3.5%	6.5%
										incl mini refrigerator					

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS				
		RES	COM	RES	COM	RES	RES	RES	MIXED RES/COM							
PLASTICS	Plastic Bottles #1	1.5%	<u>5.4%</u>	3.0%	1.0%	3.5%	0.0%	1.3%	2.4%	2.1%	1.3%	1.4%	2.0%	3.3%	2.1%	
	Plastic Bottles #2	1.0%	1.2%	1.4%	0.4%	2.6%	1.3%	0.5%	1.8%	1.2%	0.9%	1.1%	1.0%	2.0%	1.2%	
	Rigid Plastic Containers #3-#7	1.5%	1.5%	3.2%	0.8%	0.9%	1.3%	1.0%	2.0%	0.7%	0.8%	0.3%	1.3%	2.0%	1.3%	
	Bags, Film, Wrap	4.0%	5.6%	8.5%	3.4%	1.6%	6.4%	3.9%	6.1%	3.6%	6.8%	1.0%	5.1%	5.0%	4.7%	
	Other Plastic	1.5%	<u>5.1%</u>	3.9%	2.3%	0.4%	2.6%	1.2%	6.1%	2.9%	2.3%	6.8%	3.5%	2.2%	3.4%	
	Plastic Totals	9.5%	18.8%	20.0%	7.8%	9.0%	11.6%	7.9%	18.4%	10.6%	12.2%	10.7%	12.9%	14.5%	12.7%	
PAPER	Cardboard/Brown Paper Bags	7.5%	1.6%	2.8%	2.2%	32.1%	1.2%	1.8%	3.1%	11.4%	10.7%	4.9%	2.0%	17.5%	7.2%	
	Newspaper	4.0%	1.6%	2.6%	0.4%	0.6%	0.9%	1.0%	0.2%	0.9%	0.3%	0.0%	0.8%	1.6%	0.8%	
	Office/School Paper & Shreds	2.5%	2.6%	0.2%	3.0%	0.2%	1.6%	4.7%	2.7%	0.8%	3.8%	0.1%	2.9%	0.2%	2.0%	
	Food Boxes/Paperboard	1.5%	8.3%	7.8%	3.4%	1.6%	4.6%	7.5%	2.8%	6.0%	2.9%	2.6%	5.3%	4.7%	4.7%	
	Junk Mail/Mixed	9.0%	7.4%	12.2%	2.1%	1.3%	6.5%	2.8%	2.0%	2.8%	3.0%	0.4%	4.2%	6.7%	4.1%	
				food wrappers (McDs), hotel mags & brochures												
	Magazines/Catalogues & Telephone Directories	1.5%	3.2%	8.0%	1.1%	2.9%	3.1%	4.6%	2.0%	1.5%	1.3%	0.4%	2.8%	5.5%	2.8%	
	Dairy/Juice Containers	0.5%	2.3%	0.0%	1.3%	0.0%	2.7%	0.0%	1.9%	0.0%	0.6%	0.1%	1.6%	0.0%	0.9%	
	Other Paper	8.5%	0.5%	0.0%	0.0%	1.2%	0.2%	0.2%	0.0%	0.0%	0.2%	14.0%	0.2%	0.6%	1.6%	
	Paper Totals	35.0%	27.3%	33.6%	13.5%	40.1%	20.8%	22.7%	14.8%	23.4%	22.8%	22.6%	19.8%	36.9%	24.2%	

SWCCOG RECYCLING STUDY WASTE AUDIT RESULTS^a (% by weight)

MSW TRASH SAMPLE DESCRIPTION		PAGOSA SPRINGS AREA		CITY OF DURANGO		LA PLATA COUNTY			CORTEZ	MONTEZUMA COUNTY		SUMMARY ANALYSIS				
		RES	COM	RES	COM	RES	RES	RES	MIXED RES/COM							
ORGANICS	Food Waste	19.0%	22.6%	14.7%	19.9%	25.7%	20.6%	27.9%	9.2%	19.9%	15.0%	0.9%	20.0%	20.2%	17.6%	
	Yard Waste/Untreated Wood	6.0%	13.1%	7.9%	17.0%	0.1%	7.2%	1.4%	2.1%	3.7%	14.2%	1.5%	8.2%	4.0%	6.8%	
	Other Organics	8.0%	0.0%	2.6%	9.8%	1.1%	14.7%	16.2%	18.7%	29.1%	7.3%	31.1%	11.9%	1.9%	13.1%	
					High quantities textiles & carpet in some samples								Animal manure			
	Organics Totals	33.0%	35.7%	25.2%	46.8%	26.9%	42.5%	45.5%	30.0%	52.7%	36.5%	33.6%	40.1%	26.1%	37.5%	
OTHER /SPECIAL WASTE	Electronics	0.5%	0.6%	1.0%	0.2%	0.3%	6.1%	0.2%	0.0%	2.5%	0.9%	0.0%	1.4%	0.6%	1.2%	
	Other Consumer Products	see Other	1.4%	3.0%	1.6%	2.1%	0.0%	0.0%	2.6%	0.7%	2.7%	2.2%	1.1%	2.6%	1.6%	
	Motor Vehicle Waste		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.1%	
	Construction/Demolition Debris	4.5%	0.0%	0.7%	15.2%	16.1%	9.7%	0.0%	0.0%	0.2%	3.4%	21.9%	5.0%	8.4%	6.7%	
					some concrete	DIY improve. project										
	Other Hazardous/Special Waste	6.2%	0.6%	0.0%	0.0%	0.0%	0.1%	1.4%	0.0%	0.1%	0.0%	0.0%	0.4%	0.0%	0.2%	
	Other / Special Waste Totals	11.2%	2.6%	4.8%	17.0%	18.5%	15.9%	1.6%	2.6%	4.4%	7.0%	24.1%	7.9%	11.6%	9.8%	
RESIDUE			0.3%	0.1%	0.3%	0.5%		0.1%	0.1%	0.2%	0.1%	2.5%	0.2%	0.3%	0.4%	
Total Weight in Lbs			88.7	102.0	574.5	870.4	146.2	107.4	92.8	617.9	631.6	100.2				
TOTALS			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Total Sample Weight (pounds) = 3331

Average Weight/Sample (pounds) = 333

^a Conducted by SWCCOG staff & Fort Lewis College interns between August and November 2014

^b Waste audits conducted at Chaffee County (2006), Eagle County (2009), Garfield County (2009), Lake County (2006), Pitkin County (2009), City of Glenwood Springs (2009) & Milner Landfill (2004) by LBA Associates; at Larimer County (2006) & Meeker/Rio Blanco Samples (2012) by others

^c Analysis completed by LBA Associates, Inc.

APPENDIX C

STAKEHOLDER CONTACT INFORMATION

SWCCOG RECYCLING STUDY STAKEHOLDERS

	NAME	ORGANIZATION	PHONE		E-MAIL
ARCHULETA COUNTY					
	Dave Sterner	Archuleta County Solid Waste	308-325-4015	cell	dsterner@archuletacounty.org davesterner@yahoo.com
	Greg Schulte	Town of Pagosa Springs	970-264-4151, x-236		gschulte@pagosasprings.co.gov
	Chris Tanner	Elite	970-731-2012		tanner@pagosarecycles.com
	Mark & Kathryn Young	At Your Disposal	970-731-4892		atyourdisposal13@yahoo.com
LA PLATA COUNTY					
	Susan Hakanson	LaPlata County Sustainability	970-382-6212		susan.hakanson@co.laplata.co.us
	Damian Peduto	LaPlata County Planning			damina.peduto@co.laplata.co.us
	Dan Murphy	LaPlata County Planning	970-382-6263		dan.murphy@co.laplata.co.us
	Mark McKibben	LaPlata County General Services	970-382-6471		mark.mckibben@co.lapalata.co.us
	Mary Beth Miles	City of Durango	719-580-0960 970-375-5063	cell office	marybeth.miles@durangogov.org
	Joey Medina	City of Durango	970-375-4834		joey.medina@durangogov.org
	Levi Lloyd	City of Durango	970-375-4999		levi.lloyd@durangogov.org
	Gloria Kaasch-Buerger	City of Durango			gloria.kaasch-buerger@denvergov.org
	Amber Blake	City of Durango			amber.blake@denvergov.org
	Mark Thompson	Phoenix Recycling	970-759-2076	cell	mark@phoenixrecycling.com
	Amanda Saunders	Phoenix Recycling	970-759-2076		kamandasauanders@gmail.com
	Tim Wheeler	Durango Compost Company	970-799-7614		info@durangocompost.com
	Bill Rose	WCA Corporation	505-947-4189	cell	wrose@wcamerica.com
	Matthew Alvarez	Recla Metals	970-249-7922		matt@reclametals.com
	Mike Bacus	Recla Metals	970-375-6330		mike@reclametals.com
	Greg Fulks	Recla Metals	970-769-0598		greg@reclametals.com
MONTEZUMA COUNTY					
	Shak Powers	Montezuma County Landfill	970-565-9858 970-739-6718	office cell	spowers@co.montezuma.co.us shak@q.com
	Larry Don Suckla	Montezuma County Commissioner	970-759-3940		lsuckla@gmail.com
	Phil Johnson	City of Cortez Recycling	970-565-8575		pjohnson@cityofcortez.com
	Eddy Vialpando	City of Cortez Recycling	970-565-7320		evialpando@cityofcortez.com
	Colby Earley	City of Cortez Recycling	970-565-7320, x-3352		cearley@cityofcortez.com
	Deborah Barton	FCRI	605-390-3096 970-564-1380	cell home	balegal.debby@gmail.com
	Loren Workman	Baker Sanitation	970-749-6135	cell	admin@bakersanitation.com

SWCCOG RECYCLING STUDY STAKEHOLDERS

	NAME	ORGANIZATION	PHONE		E-MAIL
			970-565-1212	office	
	Chris Belt	Belt Salvage	970-565-3059		belt.salvage@yahoo.com
	Kelly Belt	Belt Salvage	970-749-9757		belt.salvage@yahoo.com
DOLORES COUNTY					
	Ernie Williams	County Commissioner	970-677-2383		dcdolocnty@fone.net
	Julie Kibel		970-739-3306		dolocnty@centurytel.net
SAN JUAN COUNTY					
	Chris Tookey	Silverton	970-387-5522		chris@frontier.net
	Willy Tookey	San Juan County	970.387.5766	office	sanjuancounty@frontier.net
	Chris Trosper	Bruin Waste Services	970-428-1246 970-864-7531	cell office	chrisbruinwaste@aol.com
OTHERS					
	Pam Starr	San Juan RCD	970-392-9371		sjrkd@hotmail.com
	Ben Walsh-Mellett	Fort Lewis College			ben.walsh.mellett@gmail.com
	Dave Thibodeau	Ska Brewery	970-247-5792		dave@skabrewing.com
	Travis Apodaca	Waste Management	505-975-5355	cell	tapodaca@wm.com
	Steve Miceli	Waste Management	505-433-6053 505-974-1947	office cell	smiceli@wm.com
	Mickey & Jerrica Barry	Angel of Shavano Recycling	719-207-1197		shavanorecycling@gmail.com
	DanaLee Barton	Evergreen Cleaning	970-442-0183	office	cleaningevergreen@gmail.com
	Larry Gibson	Rocky Mountain Recycling	801-808-0863	cell	lgibbons@rockymountainrecycling.com
	Janalee Hogan	San Juan Basin Recycling	970-382-6430	office	janalee.hogan@co.laplata.co.us
	Bruce Valdez	Southern Ute Tribe/Utilities	970-749-1391	cell	bvaldez@sugf.com
	Haryes Briskey	Southern Ute Tribe/Utilities	970-563-5515		hbriskey@suitutil.com
	Julian Baker	Southern Ute Tribe/Utilities			
	Phillip Martinez	Southern Ute Tribe/Envir Program	970-563-0135		
	Graham Stahnke	Southern Ute Tribe/Growth Fund	970-764-6484		gstahnke@sugf.com
	Chuck Farago	Southern Ute Tribe/Growth Fund	970-563-5006		cfarago@sugf.com
	Tom Johnson	Southern Ute Tribe/Envir Program	970-563-0100, x-2229		
	Scott Clow	Ute Mountain Ute Tribe			sclow@utemountain.org
	Rachel Landis	Fort Lewis College	(970) 247-7091	office	rlandis@fortlewis.edu
	Cliff Spencer	Mesa Verde NP	(970) 529-4465	office	cliff_spencer@nps.gov
	Allan Loy	Mesa Verde NP Program Manager	970-529-5067		allan_loy@nps.gov
	Jim Broersma	Aramark (NPS)	970-903-7503	cell	broersma-jim@aramark.com

SWCCOG RECYCLING STUDY STAKEHOLDERS

	NAME	ORGANIZATION	PHONE	E-MAIL
	Cathy Lurie	PaintCare	720-481-8858	clurie@paint.org
	Kurt Schneider	4Core - Interim ED	970-259-1916 x113	kurt@fourcore.org

APPENDIX D

RECYCLING TASK FORCE MEETING MATERIALS



SOUTHWESTERN COLORADO RECYCLING STUDY

Southwest Colorado Council of
Governments & LBA Associates, Inc.
January 2015

LBA Associates, Inc.

Today's Agenda

- 1. Introductions**
- 2. Welcome**
 - Miriam Gillow-Wiles, SWCCOG Executive Director
- 3. Study Findings & Observations**
 - Laurie Batchelder Adams, LBA Associates
 - Ben Walsh-Mellett, Fort Lewis College
- 4. New Programs/Initiative from Audience**
- 5. Group Discussion**
- 6. Wrap-Up**

LBA Associates, Inc.

So who is this SWCCOG?

- **Partners:**
 - Archuleta County
 - Town of Bayfield
 - City of Cortez
 - Dolores County
 - Town of Dolores
 - City of Durango
 - Town of Ignacio
 - La Plata County
 - Town of Mancos
 - Town of Pagosa Springs
 - San Juan County
 - Town of Silverton



LBA Associates, Inc.

What does the COG do?

- **Goals**
 - Aging
 - Environment
 - Housing
 - Telecommunication
 - Transportation
 - Tourism



LBA Associates, Inc.

How we got here

- **Identified Need/Desire**
- **Funding**
- **Recycling Task Force**
- **Intros**
- **Feb to June**



LBA Associates, Inc.

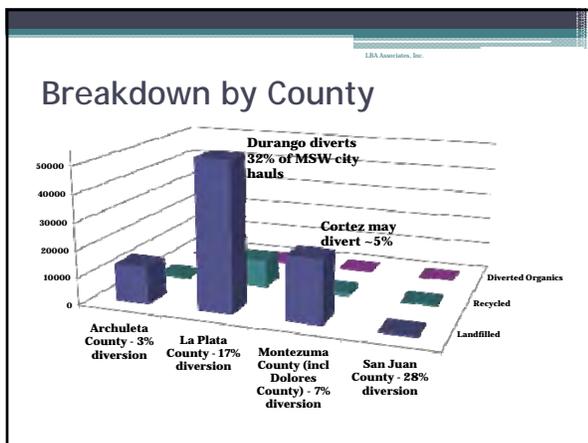
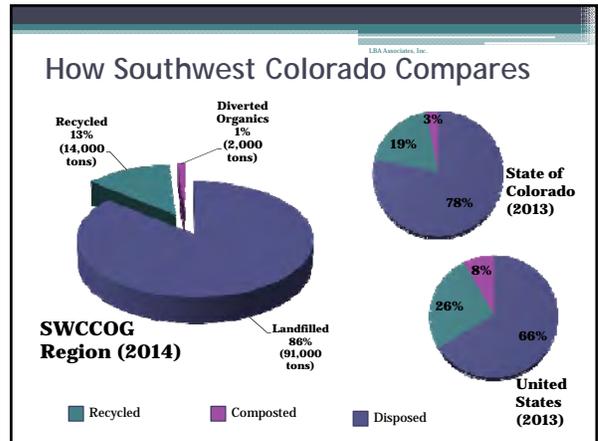
Why Are We Here Today?

- **Clarify what we want to accomplish**
- **Identify ways to improve diversion economics**
- **Consider a regional approach**
- **Decide how best to deploy a regional Recycling Task Force**





Organization	Diversion Policy	Diversion Services	Solid Waste Facilities
Archuleta Cty (12,800)		Other stakeholders • Elite • At Your Disposal	• DOC (multi) • Landfill/transfer
La Plata Cty (56,000)	• Government recycling • Green purchasing		• 2 DOCs (multi) • SUIT DOC (multi)
Durango	• Mandatory pay up to 7 hrs • MFU > 7 hh must have R • New development R space	Curbside SS w/o glass • T \$13-19.50/hh-mo • R \$3/hh-mo add'l Other stakeholders • WCA (TS, LF) • Phoenix (SS) • Waste Management	• DOC for city & region (SS, multi) • R transfer
Montezuma County (26,500)		Other stakeholders • Four Corners • Baker Sanitation • Belt Salvage • Evergreen, WM	• FCRI, Cortez baling • Pilot YW compost • Landfill (incl Dolores County tons)
Cortez	• Mandatory pay up to 7 hrs	Curbside multi • T&R \$18/cart	DOC at city service center
San Juan County (700)		Other stakeholders • Bruin Waste (T to Naturita, SS R to Montrose)	• Silverton TS for county • Collects T, R, other(S) • \$22/hh-mo



LBA Associates, Inc.

Waste Audit - La Plata DRO Commercial

LBA Associates, Inc.

Waste Audit - La Plata DRO Residential

LBA Associates, Inc.

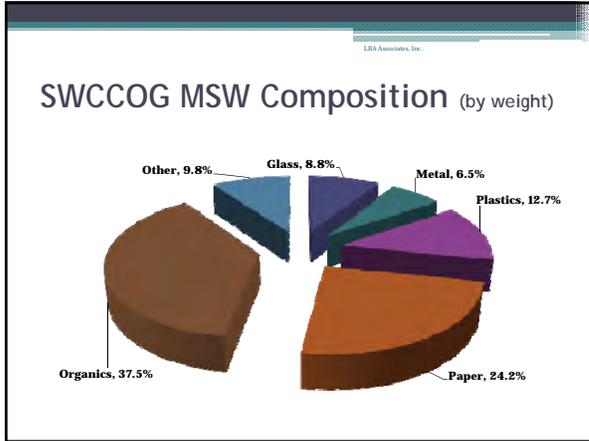
Waste Audit - La Plata Bayfield, Ignacio, and Phoenix

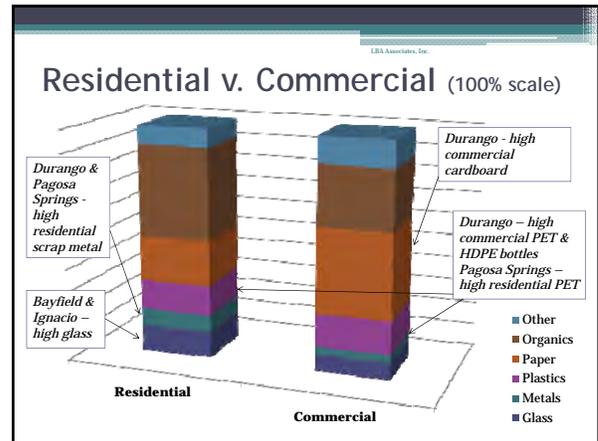
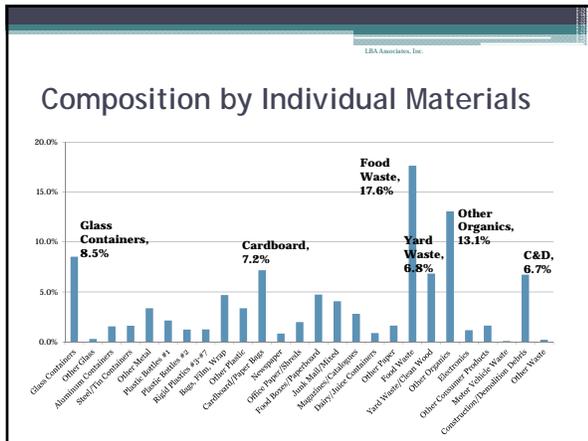
LBA Associates, Inc.

Waste Audit - Montezuma County

LBA Associates, Inc.

Waste Audit - Montezuma County, Cortez





LBA Associates, Inc.

LANDFILL NUMBERS

- **Tip Fees for MSW***
 - Archuleta = \$52/ton
 - Bondad = \$46/ton
 - Montezuma = \$39/ton
- **Landfill Capacities**
 - Archuleta – 20 to 30 years
 - Bondad – at least 20 years
 - Montezuma – over 40 years (full build-out)

* Fees converted to \$/ton as needed

LBA Associates, Inc.

What We're Up Against

LBA Associates, Inc.

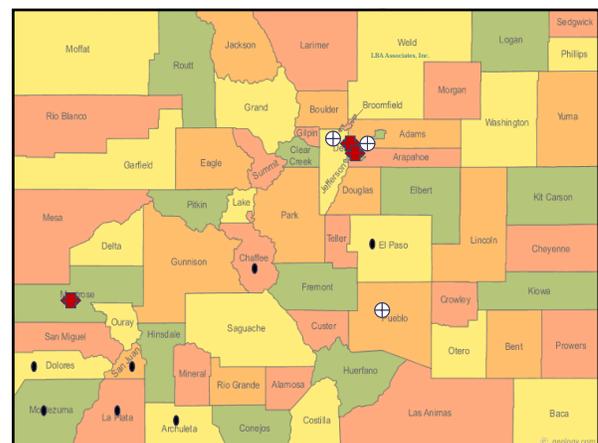
Every Rural Area Struggles with . . .

Low Recyclables Tons

- Low population/density
- Lack of policy incentives
- High unit costs

Long Hauls

- Higher costs/lower revenues for recyclers
- Bigger environmental footprints



LBA Associates, Inc.

Lotsa Small Programs . . .

Decentralized Programs

- Even fewer tons/higher unit costs
- Reinventing the wheel - inefficient use of resources
- Every program
 - Collects different materials
 - Gives different messages
 - Uses different markets

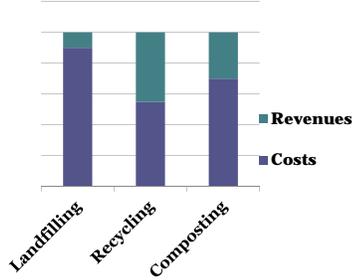
Confused Public

- Frustrated by variability
- Inadequate motivation to participate



LBA Associates, Inc.

Challenging Communications



Program	Costs	Revenues
Landfilling	High	Low
Recycling	Low	High
Composting	Medium	Medium

LBA Associates, Inc.

Those "Tough" Materials . . .

Glass

- Public expects glass will always be recycled
- Heavy weight helps data goals
- Breaks easily – contaminates other materials
- Limited Colorado market (at least for now) – use as LF cover in many communities



Organics

- Compost permits onerous
- Seasonal - high acreage req'd
- Insufficient local markets
- Need for tip fee
- 3% of CO organics recovered



LBA Associates, Inc.



Options for Getting Out From Under

LBA Associates, Inc.

Name of Game = Increasing Tons

Why

- Meet sustainability goals
- Improve system economics
- Improve stability & longevity of both public & private sector services

How

- Policies that drive diversion
- Regionalize
- Effective public education & outreach (both residential & commercial)
- Organics recovery

LBA Associates, Inc.

Diversion-Targeted Policies



- PAYT
- Disposal bans (e.g., cardboard, yard waste)
- Litter bans (cigarettes!)
- Fee programs (e.g., single-use bags)
- Universal residential collection (cities)
- Mandatory commercial recycling &/or food waste recovery

LBA Associates, Inc.

Implement "Hub & Spoke" Features

Establish Fundamentals

- Infrastructure capacity & change
- Program uniformity
- Improve material quality
- Increase marketing clout & pricing
- More consistency in terms of program services & pricing

Resource Sharing Benefits

- Program development
- Equipment purchase
- Collection
- Outreach materials



LBA Associates, Inc.

Education & Outreach

"Soft" Program Packs a Punch

- **Outcomes**
 - Debunk myths
 - Explain incentives
 - Encourage participation
- **Components**
 - Initial & on-going "campaigns"
 - Outreach materials – signage, brochures, website, messages on collection vehicles
 - Branding



LBA Associates, Inc.

Considerations for Organics Recovery

- **Materials – yard & food waste**
- **Management options**
 - Food waste donation
 - Chipping/mulching
 - Composting
 - Anaerobic digestion, etc.
- **End-markets**



LBA Associates, Inc.

Colorado Success Stories

- **Fort Collins**
 - PAYT w/SS recycling
 - Cardboard disposal ban
 - ~45% diversion rate
- **Loveland**
 - PAYT w/SS w/o glass
 - Mandatory pay <3 units
 - Residential diversion 55%

- **Aspen**
 - SFU = PAYT w/SS
 - MFU & commercial = T+R pricing bundled
 - Yard waste disposal ban
 - 30% diversion rate
- **Upper Arkansas Area COG (Chaffee, Custer, Lake, Fremont Counties)**
 - UAR Recycling Program – DOC collection
 - IGA w/ counties
 - \$0.79/capita-year

LBA Associates, Inc.

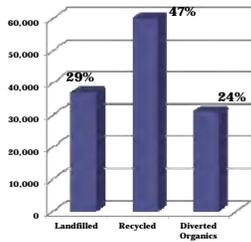


Are We Ready for Change?

LBA Associates, Inc.

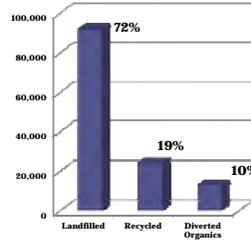
What SWCCOG Can Achieve By 2025

If All Recyclables & Organics Recovered . . .



Category	Percentage
Landfilled	29%
Recycled	47%
Diverted Organics	24%

If Current Recovery Levels Are Doubled . . .



Category	Percentage
Landfilled	72%
Recycled	19%
Diverted Organics	10%

Today's Agenda

- 1. Introductions**
- 2. Welcome**
 - Miriam Gillow-Wiles, SWCCOG Executive Director
- 3. Study Findings & Observations**
 - Laurie Batchelder Adams, LBA Associates
 - Ben Walsh-Mellett, Fort Lewis College
- 4. New Programs/Initiative from Audience**
- 5. Group Discussion**
- 6. Wrap-Up**

Discussion Questions

- 1. What are common diversion goals?**
- 2. How do we improve diversion economics?**
- 3. What would regional collaboration look like?**
- 4. What should Recycling Task Force's objectives goals be?**

Southwest Colorado Council of
Governments



Miriam Gillow-Wiles
(970) 779-4592
director@swccog.org

Ben Walsh-Mellett
Fort Lewis College
ben.walsh.mellett@gmail.com

LBA Associates, Inc.



LBA ASSOCIATES

Laurie Batchelder Adams
(303) 733-7943
laurie@lbaassoc.com

Photo Credits

- Stephanie Latimer photograph
- www.clearintentions.glass
- www.alorganics.com
- www.ontopofrealestate.com
- www.light.sa.gov.au
- Miriam Gillow-Wiles
- vaughnmerlyn.com
- feedthething.org
- dolumbus.org
- hdwallpapersfactory.com
- Various Microsoft PowerPoint Clip Art & Laurie Batchelder Adams photographs



SOUTHWESTERN COLORADO RECYCLING STUDY

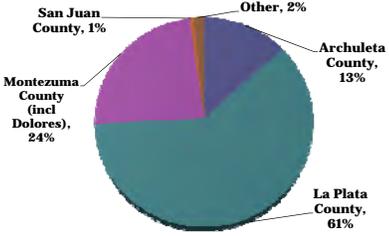
Southwest Colorado Council of
Governments & LBA Associates, Inc.
March/April 2015

Workshop Agenda

- **Baseline Findings Summary**
- **Drop-Site Needs**
- **Education & Outreach Opportunities**
- **Policy Potential**
- **Regional Waste Diversion Function**
- **Next Steps**

Baseline Findings: 2014 Municipal Solid Waste Stats

- **99,000 people**
- **107,000 total tons MSW**
- **5.9 pounds/capita-day (ppcd)**



County	Percentage
La Plata County	61%
Montezuma County (incl. Dolores)	24%
Archuleta County	13%
Other	2%
San Juan County	1%

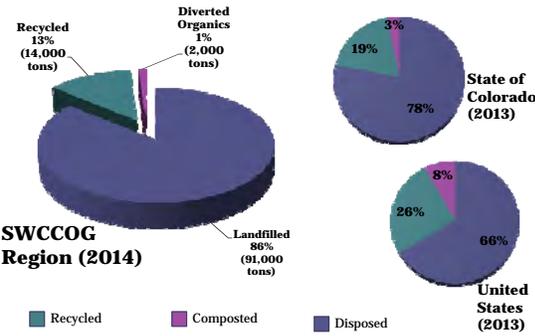
LANDFILL NUMBERS

- **Tip Fees for MSW***
 - Archuleta = \$52/ton
 - Bondad = \$46/ton
 - Montezuma = \$39/ton
- **Landfill Capacities**
 - Archuleta – 20 to 30 years
 - Bondad – at least 20 years
 - Montezuma – over 40 years (full build-out)



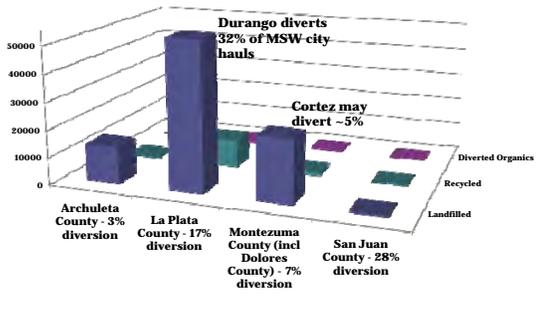
* Fees converted to \$/ton as needed

How Southwest Colorado Compares

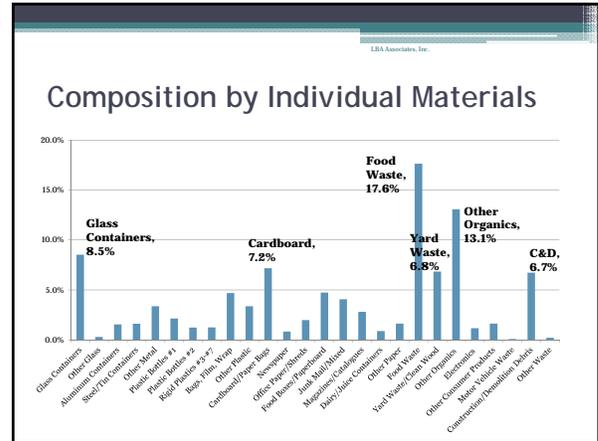
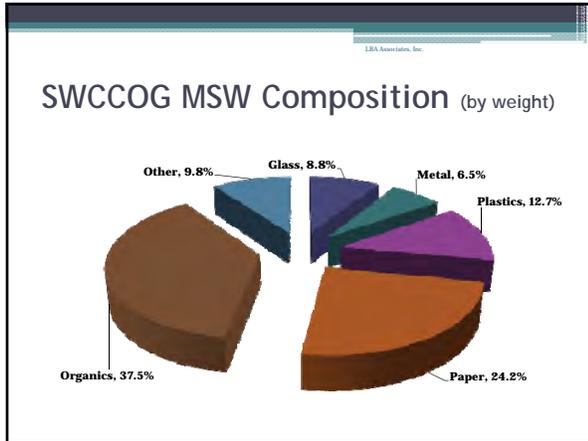


Entity	Year	Recycled (%)	Diverted Organics (%)	Landfilled (%)
SWCCOG Region	2014	13%	1%	88%
State of Colorado	2013	19%	3%	-
United States	2013	26%	8%	-

Breakdown by County



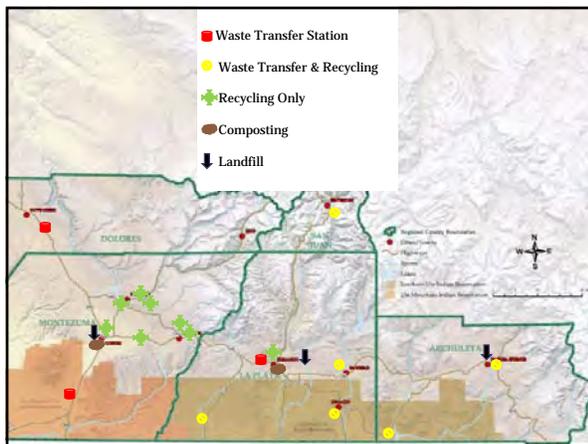
County	Diversion Percentage
Archuleta County	3%
La Plata County	17%
Montezuma County (incl. Dolores County)	7%
San Juan County	28%
Durango	32% of MSW-city hauls
Cortez	may divert ~5%



LBA Associates, Inc.

If the goal is to increase the economics of recycling, southwest Colorado needs to:

- Increase tons from residential, commercial & tourism sectors
- Treat recyclables as prized commodity
- Have more spokes & less hubs (i.e., collaborate versus compete)
- Maximize benefit for private haulers/processors & public programs



LBA Associates, Inc.

Alternative Drop-Site Concept

- Towable container configuration
 - Shared trailer for most/all sites
 - Towable by ¾-ton pick-up truck
 - Configure each box with up to 6 compartments

Pro-Tainer Pro Roll-Off System

LBA Associates, Inc.

TOWABLE TRAILER COSTS

- **Costs**
 - Capital equipment costs
 - New trailer = \$21,000
 - Each roll-off box = \$7,000
 - Annual hauling – multi-stream materials
 - 500-person service area (13 tpy) - \$131/ton
 - 1,500-person service area (38 tpy) - \$103/ton
 - Landfill versus recycling dollars
 - Conservative estimates = approx \$5/ton avoided net tip fees & range of materials revenues (\$0-\$80/ton)
 - Net annual cost \$640 to \$880 per site

LBA Associates, Inc.



Education & Outreach

LBA Associates, Inc.

**SOUTHWEST
COLORADO
RECYCLES!**

- Wolf Creek to Hovenweep
- Ouray through Silverton!! to Durango
- Pagosa Springs to Chama
- Colorado to Utah & New Mexico . . .

LBA Associates, Inc.

POSSIBLE E&O COMPONENTS

- Constant, regular message
- Consistent signage, websites
- Consistent list of materials collected
- Training/outreach –
 - Schools presentations
 - Campaigns for tourists, residents & businesses
- Toolkits for grass-roots support – civic groups, garden clubs, senior citizen groups, chambers of commerce

LBA Associates, Inc.

TOURISM IMPLICATIONS

- 90% of U.S. travelers surveyed said they would chose "green," environmentally-conscious lodging (2010 TravelZoo survey)
- 93% of those surveyed felt that travel destinations should be responsible for protecting the environment (2011 Conde Nast Traveler)

COSTS

- Annual \$40,000
- If recycling increased by 25% = 3,500 tpy
 - Avoided net tip fees = \$17,500
 - \$0 - \$280,000 revenues

LBA Associates, Inc.



Waste Diversion Policies

LBA Associates, Inc.

Hauler Ordinance (basic)

POTENTIAL COMPONENTS	PROS	CONS
Annual registration	Insurance, vehicle safety standards	Minor admin for haulers
Annual data reporting (add HHW/e-waste)	Data for tracking progress	Haulers often feel this is proprietary information
List of recyclables for collection	Consistency for customers	
Offer recycling collection to all trash customers	Increases access to recycling	Potential hardship for small, trash-only haulers
Education/outreach to new & on-going customers	Augments municipal/regional E&O	Costs will be passed on to customers

*Issues = lack of scales, combined loads, voluntary v. mandatory
Other data needs = periodic/seasonal waste audits*

LBA Associates, Inc.

Hauler Ordinance w PAYT (advanced)

POTENTIAL COMPONENTS	PROS	CONS
Use PAYT trash pricing (can increase diversion by upwards of 100%) – residential tactic	Increased diversion Customer control “Good” recyclers pay less Many ways to implement (bag, tag, hybrid)	May need to adjust billing May need different container inventory Harder to implement in unincorporated areas
PAYT trash pricing for drop sites (pre-paid bag system)	Works well for public or private (best at staffed sites)	Need to retail bags Changes to existing system
Bundle trash & recycling - commercial tactic	Increased access Increased diversion	Overall pricing may be hardship for generators

If increase commercial diversion by 25% or 1,750 tpy - \$44,000 net benefits

LBA Associates, Inc.

Hauler Ordinance Examples

<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Fort Collins</p> <ul style="list-style-type: none"> Collection license (\$100/veh-yr) Trash + recycling Annual reporting – quantity, accounts, pricing Collection frequency & container requirements <p style="background-color: #d9e1f2; padding: 2px; margin: 5px 0;">Others</p> <ul style="list-style-type: none"> Loveland – hauler license \$100/vehicle-year Larimer County – hauler license (\$25/year) & recycling requirements for urban growth areas Vail – registration, 2x/year reporting 	<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Aspen</p> <ul style="list-style-type: none"> Business license & occupational tax (\$150-\$750/year based on # employees) Trash + recycling Annual quantity reporting Haulers may leave recyclables with 15% of more contamination
---	---

LBA Associates, Inc.

PAYT/Bundled Ordinance Examples

<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Contract Collections</p> <ul style="list-style-type: none"> Edgewater - PAYT Golden – PAYT (70%) Lafayette – PAYT (100%) w/ yard waste <p style="background-color: #d9e1f2; padding: 2px; margin: 5px 0;">Public Collections</p> <ul style="list-style-type: none"> Loveland – PAYT (100%) Thornton – PAYT (same sized carts) 	<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Open Collections</p> <ul style="list-style-type: none"> Aspen <ul style="list-style-type: none"> PAYT - SFU (100%) Bundled T/R – MFUs, biz Fort Collins <ul style="list-style-type: none"> PAYT – SFU (100%) Vail <ul style="list-style-type: none"> PAYT – SFU (80%) Bundled T/R – MFUs, biz Private Grand County transfer station <ul style="list-style-type: none"> PAYT trash (\$5/bag) Free recycling
---	---

LBA Associates, Inc.

Cardboard Disposal Ban

POTENTIAL COMPONENTS	PROS	CONS
Applicability to all generators (responsibility on generators)	Level playing field	Everyone must have access to reuse, recycling and/or compost options
	Good in towns	Hard to enforce in unincorporated areas
Establish conditions of violation & penalties	Without, policy has not credibility	Cost of enforcement
Couple with strong outreach	See E&O discussion	

Estimate 8,300 tpy cardboard in region's trash – represents \$208,000 net benefits

LBA Associates, Inc.

Disposal Ban Examples

<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Fort Collins (Cardboard)</p> <ul style="list-style-type: none"> 2 years (March 2013) Applies to all sectors Penalties \$100 to \$1,000 Increased diversion <ul style="list-style-type: none"> Increase in # of commercial accounts by 95% Commercial tons up 19% Residential tons up 12% Overall tons up to 65% & waste generation down to 4.85 ppcd 	<p style="background-color: #d9e1f2; padding: 2px; margin: 0;">Other Disposal Bans</p> <ul style="list-style-type: none"> Aspen – yard waste Cedar Rapids/Linn County, IA (cardboard) Durham, NC – recyclables (alum, steel, glass, newspaper, cardboard) Massachusetts – recyclables, yard waste, white goods, C&D, e-waste, motor vehicle waste
---	--

LBA Associates, Inc.



Regional Waste Diversion Function

LBA Associates, Inc.

To Do What & Why?

Benefits	Possible Functions
<ul style="list-style-type: none"> • Increase efficiencies • Reduce workload of individual communities • Expand programming beyond existing level • Increase quality tons to single hub • Neutral third party 	<ul style="list-style-type: none"> • Rural drop-site collection • Regional education & outreach • Data collection & reporting • Planning & policy development support • Support hub MRF & establish prices by committing tons • Grant & foundation funding • Technical assistance

LBA Associates, Inc.

Issues to Consider



- Who would be “in charge? COG? New org?”
- If MOU or IGA – how many local govts would join? How flexible would membership be?
- Would members cover costs? How?
- How would revenues be shared?
- Short-term or indefinite life span?

LBA Associates, Inc.

Similar Models

<ul style="list-style-type: none"> • New Mexico Recycling Coalition <ul style="list-style-type: none"> ◦ Used federal SS for H&S with technical assistance ◦ Encouraged regional solid waste organizations ◦ Cooperative marketing of hub materials – but now stopped • Upper Arkansas Area COG (Chaffee, Custer, Lake, Fremont Counties) <ul style="list-style-type: none"> ◦ DOC collection – compete with other haulers ◦ Markets materials ◦ IGA w/ county members – at cost of \$0.79/capita-year 	<ul style="list-style-type: none"> • Central Texas Recycling Assoc <ul style="list-style-type: none"> ◦ 60 partnerships & 500 community members ◦ Founded to bring recycling to rural areas (improve SS) ◦ On-going technical assistance ◦ Focus is growing quality & pricing over tons <ul style="list-style-type: none"> • NO single-stream • Staffed drop sites • Bale whenever >1 hr from MRF • Member contract ◦ Cooperative marketing – contract with one processor ◦ Earn 10% brokerage fees – off-set 1.5 staff/travel costs
--	---

LBA Associates, Inc.

Potential Organizational Costs

- **Start-up E&O and data collection**
 - Approx \$40,000
 - Approx 0.3 FTE
 - Supported by grants (USDA, DOLA, etc.)
- **On-going E&O and data collection**
 - Approx \$20,000
 - Approx 0.2 FTE

LBA Associates, Inc.



Photo by Job Wallace-Brodour

LBA Associates, Inc.

Other Considerations

- **Organics recovery**
 - Biggest “bang for the buck” (37.5% of trash stream)
 - Montezuma County pilot program soon to be full-scale
 - Back-haul opportunities between Cortez & Durango?
- **Glass to Montezuma County?**
 - Haul costs about 20% less than other recyclables
 - \$20/ton revenues (Durango)
- **Tire management?**
 - Montezuma County / Alamosa County shredder?
- **E-waste management?**
- **Solid waste diversion goals?**

LBA Associates, Inc.

Next Steps

- **SWCCOG/LBA**
 - Translate baseline findings & workshop input into waste diversion strategy
 - Finalize report
- **SWCCOG Members & Regional Business Partners (i.e., all of you)**
 - Implementation = ?

LBA Associates, Inc.

<p>Southwest Colorado Council of Governments</p>  <p>Miriam Gillow-Wiles (970) 779-4592 director@swccog.org</p>	<p>LBA Associates, Inc.</p>  <p>LBA ASSOCIATES</p> <p>Laurie Batchelder Adams (303) 733-7943 laurie@lbaassoc.com</p>
---	---

APPENDIX E

GLASS & TIRE DIVERSION RESOURCES

Glass - Glass containers are generated at a rate of about 9,800 tons/year in the five-county area. The material is challenging to recycle due to its ability to contaminate other materials and low revenue potential. Glass contamination is currently minimized in regional programs by collecting it separately. However, there are no local glass markets, requiring shipment to the Denver metro area¹. As all stakeholders struggle with glass, the collaborative could work to support the development of local processing and end use.

Considerations for processing glass locally will include equipment selection to match end-use needs (may be as minimal as a landfill compactor to provide cursory crushing, or could require a specialized crusher or pulverizer with capital costs in excess of \$50,000); whether adequate quantity/quality is available (many uses will require a consistent quantity and minimum level of contamination); opportunities for backhaul within the region²; and overall economic sustainability as compared to existing revenues.

One current glass use is in landfill cell construction: both Archuleta and Montezuma Counties currently use in their leachate collection systems. Montezuma County alone estimates the need for 50,000 cubic yards - or roughly 18,000 tons³ - for future expansion (at the region's current diversion rate, it would take several years to meet this single demand). Glass is also used commonly on landfill roads to provide drainage and traction. Other glass uses may include;

- Filtration - drainage, backfill, septic fields (many drainage and backfill applications can use a high percentage of cullet sometimes approaching 100%)
- Aggregate - embankments, landfill cover, oil spill clean-up, bedding (Bruin Waste uses a glass crusher to provide utility bedding for Mountain Village in San Miguel County)
- Glassphalt - base/surface course in roads, parking lots, driveways (may use 30% of less glass in these applications)
- Abrasives - sandblasting, sandpaper
- Landscaping - weed control, walkway aesthetics
- Miscellaneous glass products - bottles, fiberglass, art products, etc.

There are many other glass recycling resources - a sampling includes:

- Local Use of Glass Recycling Guide - New Mexico Recycling Coalition (May 2013); includes several pertinent case studies)
- Andela Products (glass processing equipment) - www.andelaproducts.com
- Clear Intentions (glass recycler) - www.clearintentions.glass
- Momentum Recycling (glass recycler) - www.momentumrecycling.com

¹ Durango is currently netting about \$20/ton after transportation to the Rocky Mountain Bottling Company in Wheat Ridge. Two new glass recyclers (Clear Intentions in Denver and Momentum Recycling in Broomfield) have recently started up, however, and may increase available revenues.

² Arranging freight in the region has been a struggle (especially over the last several months). However, brokers are now observing increased truck availability (as the season changes and shipments are moving out of the west coast ports), and lower freight costs than paid during the summer/fall of 2014 (Sage Recycling - April 6, 2015).

³ Montezuma County is currently considering the purchase of a glass crusher which could potentially be a regional resource.

- Bruin Waste - Chris Trospen, 970-428-1246, chrisbruinwaste@aol.com

Tires - Tire generation in the region estimated to exceed 1,000 tpy⁴. Banned from landfill disposal, there are limited recycling options for old tires not accepted by tire dealers, resulting in illegal dumping and stockpiles. There are many uses for baled tires, shredded tires and crumb rubber (requires further processing shreds) including retaining walls, rubber-modified asphalt, reclamation project and numerous civil engineering applications (including alternative daily landfill cover in facility-specific instances). Options for local processing (or transportation to processors) include;

- Existing balers - in Durango, Archuleta and Montezuma Counties (possibly Phoenix Recycling in the near future)
- Alamosa County mobile tire grinder⁵ - available to any party at cost of about \$175/hour plus mobilization (staff estimate at least 15,000 tires are needed for this unit to be cost-effective)
- Local tire dealers/recyclers - as well as CDPHE-registered tire haulers in the region (i.e., Just Like the Master in Pagosa Springs; Model Tire Store in Durango; and Williams Boyz Salvage in Dove Creek)

Note that some mobile tire shredders can also part of a shredder/wood chipper unit, providing additional capacity. Key to the shared use of a mobile unit is the accurate assessment of end-use requirements, quantity and quality, and appropriate ownership/operation responsibilities and costs⁶.

Additional tire resources include:

- Alamosa County (tire shredder availability and pricing) - Tim DeHerrera (719-588-5248)
- Montezuma County - Shaq Powers (970-565-9858, spowers@co.montezuma.co.us)
- CDPHE Waste Tire & Hauler Registries - www.colorado.gov/pacific/sites/default/files/HM_sw-list-waste-tire-registrants.pdf; www.colorado.gov/pacific/sites/default/files/HM_sw-list-tire-hauler-registrants.pdf

⁴ Based on the generation of 1 tire/person-year and 21 pounds/tire.

⁵ Originally purchased by 22 member counties under the Colorado Counties Waste Tire Authority, this tire shredder/wood chipper unit produces 6" shreds. Due to inadequate funding to cover maintenance and repair, the authority disbanded in 2010 and is currently managed by Alamosa County alone.

⁶ The Colorado Counties shredder/chipper cost about \$250,000 in 2005 - these units can approach a \$500,000 purchase price.

APPENDIX F
WASTE COLLABORATIVE COST ESTIMATE

WASTE COLLABORATIVE COST ESTIMATE^a

OPTION	START-UP									ON-GOING ^b								
	General Duties	Mid-Level		Mgmt Staff		Legal		Ex-penses ^c	Sub-total	General Duties	Mid-Level		Mgmt Staff		Legal		Ex-penses	Sub-total
		hrs	\$45	hrs	\$85	hrs	\$150				hrs	\$45	hrs	\$85	hrs	\$150		
Grant Funding	Obtain initial grants (2 applications) for E&O, problem waste management	80	\$3,600	32	\$2,720	0	\$0	\$0	\$6,320	Miscellaneous (1 every 2 years)	20	\$900	8	\$680	0	\$0	\$0	\$1,580
Regional Education & Outreach^b	Help standardize accepted materials, logo/signage format, messaging for multiple targets, maintain service/facility list, training materials	633	\$28,485	0	\$0	0	\$0	\$9,515	\$38,000	Sporadically update messages; answer web queries; school tours	317	\$14,265	0	\$0	0	\$0	\$4,735	\$19,000
Advocacy	Lead volunteers - identify/support diversion objectives, develop diversion argument, educate officials/staff, assist with policy development	100	\$4,500	50	\$4,250	4	\$600	\$500 for miscellaneous travel, presentation materials	\$9,850	Continue start-up	50	\$2,250	25	\$2,125	4	\$600	\$500 for miscellaneous travel, presentation materials	\$5,475
Technical Assistance for Problem Waste Management^d	Include hiring contractor, liaising with other counties	40	\$1,800	16	\$1,360	4	\$600	\$8,000	\$11,760	Minor assistance only	8	\$360	4	\$340	2	\$300	\$0	\$1,000
Quantity Data Collection	Standardize reporting & data analysis	40	\$1,800	8	\$680	4	\$600	\$0	\$3,080	Annual data collection	24	\$1,080	4	\$340	0	\$0	\$0	\$1,420
Totals																		
	Without E&O^e	260	\$11,700	106	\$9,010	12	\$1,800	\$8,500	\$31,010	Wo E&O^e	102	\$4,590	41	\$3,485	6	\$900	\$500	\$9,475
	All Programs	893	\$40,185	106	\$9,010	12	\$1,800	\$18,015	\$69,010	All Pgms	419	\$18,855	41	\$3,485	6	\$900	\$5,235	\$28,475

Notes:

a Hourly rates based on SWCCOG's 2015 labor categories (more conservative than those used by Montezuma or La Plata Counties) - all costs in 2015\$

b On-going costs do not include salary increases for future years - assume 75% is salary for mid-level staff

c Based on assumed minimum \$1/hh-year for start-up/new campaigns; minimum \$0.50/hh-year for 38,000 hhs (rounded for 2015) (SWANA;s "Manager of Recycling Systems Training Manual," 2009)

d Assumed contractor assistance 80 hours at \$100/hour (start-up only)

e Ideally grant funding will be obtained to cover start-up E&O costs

APPENDIX G
CTRA MEMBER CONTRACT

Membership Agreement Cooperative Teamwork & Recycling Assistance and “Seller”

This agreement is entered by and between the Cooperative Teamwork & Recycling Assistance ("CTRA") and “Seller” as Parties. **The terms of this agreement will apply to the recyclable materials, which are checked below:**

METAL

Aluminum Used Beverage Cans (UBC)
 Steel/Tin Cans

RECHARGEABLE BATTERIES
 ELECTRONICS

PLASTICS

PET #1
 HDPE #2 Natural
 HDPE #2 Colored
 HDPE #2 and PET #1(Mixed)
 LDPE #4

PAPER

Corrugated (OCC)
 Newspaper #8
 High-grade SOP (Sorted Office Paper)
 White Ledger
 Mixed Paper (Catalogs, Phone Books, Magazines, Junk Mail)

The following is understood and agreed by both parties:

CTRA shall be the exclusive agent for the “Seller” in the marketing and sale of the recyclable materials as indicated above. Monthly prices offered by CTRA shall be based on an index amount defined by standard regional prices published in the first monthly issue of *Recycling Manager, The Yellow Sheet, or other indices identified through contractual arrangements with the Recycling Contractor*. The price of certain baled recyclable material will not drop below indicated floor prices during the life of the contract. If volumes of plastic, paper or steel are sufficient, CTRA may market those commodities separately to receive the best prices. In return for the marketing and sale of the “Seller” commodities and other member services, CTRA will receive ten percent of the total revenue received through the sale of any recyclable materials under this agreement.

When available from the Recycling Contractor, CTRA will provide, at no charge, Gaylord boxes and pallets for the transportation of loose materials to be marketed and sold under this agreement. Should the “Seller” require additional Gaylord boxes for collection, storage, staging of recyclable materials, and/or shipping CTRA will attempt to facilitate such arrangements at a minimal cost to “Seller”.

“Seller” will be responsible for meeting standard contamination requirements, as described in Appendix A, in the collection of recyclable materials and for keeping all fiber recyclable materials (except corrugated cardboard) dry.

“Seller” will be responsible for transporting all recyclable commodities to the pickup point designated and agreed upon by “Seller” and CTRA, at its expense. CTRA will be responsible for scheduling transportation for the selected recycling commodities from the designated pickup point to the buyer.

“Seller” will notify CTRA one week before a desired pickup date. Pickups will be scheduled by CTRA based on achieving full loads and shared transportation costs with other CTRA members. Every effort will be made through scheduling to avoid a negative revenue situation where the transportation costs exceed the revenue generated from the sale of recyclable materials. If the recyclables loaded from “Seller” do not constitute a full load the transportation cost will be shared proportionately between all customers whose recycling materials are being transported. If transportation costs are incurred which exceed the revenue from the sale of the recyclable materials, the responsibility for paying these costs shall be the “Seller”.

CTRA shall reimburse “Seller” for the total revenue received from the sale of any recyclable materials under this agreement minus the above referenced administrative fee and any agreed upon transportation costs. The cost to “Seller” shall be calculated based on actual CTRA transportation costs and the amount of recyclable materials loaded from “Seller” proportionate to the total truckload to be sold.

CTRA will perform all negotiations regarding the above referenced recyclable materials for the “Seller” and shall pay the “Seller” for said recyclable materials according to shipping records and this agreement. Such payment shall be made to “Seller” within forty-five (45) days from the end of the month in which “Seller” commodities were sold. CTRA will, upon request, provide a certificate of destruction for all confidential papers.

The term of this agreement shall be two years (the “initial term”). Either party may discontinue this agreement with thirty (30) days written notice stating the reasons for cancellation.

The parties agree that CTRA is undertaking obligations set forth in this agreement for, and on behalf of “Seller”. “Seller” shall hold CTRA harmless and indemnify CTRA, to the extent permitted by law, against any and all claims, damages, demands, losses, or liabilities of any kind or nature, including but not limited to negligence, including all expenses of litigation, which the CTRA or its officers, agents, employees, or representatives may sustain or incur, or which may be imposed upon CTRA because of, or arising out of or in any manner connected with action(s) attributed to the “Seller”.

CTRA shall hold the “Seller” harmless and indemnify “Seller”, to the extent permitted by law, against any and all claims, damages, demands, losses, or liabilities of any kind or nature, including but not limited to negligence, including all expenses of litigation, which “Seller” or its officers, agents, employees, or representatives may sustain or incur, or which may be imposed upon “Seller” as a result of, or arising out of or in any manner connected with action(s) attributed to CTRA.

Any amendments or changes to this agreement must be mutually agreed upon by both parties and must be in writing.

In the event CTRA or “Seller” shall be prevented from collecting, receiving, transporting, selling or buying any recyclable materials, or in the event CTRA or “Seller” shall be prevented from complying with the terms and conditions of this agreement due to governmental or administrative prohibitions, labor difficulties, acts of God, acts of public enemy, riot, accidents, breakdown of equipment, weather conditions, delivery interruptions or other causes beyond the control of CTRA or “Seller” as the case

may be, the party so prevented shall, upon notice to the other party, be thereafter released from its obligations hereunder so long as such causes continue.

Should the final judgment of a court of competent jurisdiction invalidate any part of this agreement, the remaining parts of this agreement shall be enforced, to the extent possible, consistent with the intent of the parties as evidenced by this agreement. This agreement is binding upon and shall inure to the benefit of the successors and assigns of the parties.

This agreement constitutes the entire agreement and understanding of the parties, it being understood that all other prior or contemporaneous agreements, negotiation memoranda, correspondence, and conversations between the parties hereto are terminated and superseded by this agreement. No subsequent modifications or amendments to this agreement shall be effective unless by written consent and signed by the parties.

Authorized representatives of the Parties hereby execute this agreement.

**Authorized Representative of
“Seller”**

Date

Print Name, Title

**Rachel M. Hering, Executive Director
Cooperative Teamwork & Recycling Assistance**

Date

Attached: Appendix A

“Seller” Contact Information:

Name

Phone/Fax#

Address/Mailstop

Email

APPENDIX A

FIBER GRADE DESCRIPTIONS

COMPUTER PRINTOUT PAPER (CPO)

Consists of one-part, continuous form sulphite paper printed on an impact printer (dot matrix, not laser or ink jet). Typically solid white paper but may include green, blue, or orange bars. Does not include carbonless (NCR), carbon interleaf, groundwood (recycled) papers, or pre-printed forms. Must be free of binders, Post-It notes, tapes, tabs, and any other papers. Paper clips and staples are OK.

WHITE LEDGER (Post Consumer)

Consists of typical single sheet, white bond office letterhead and copy paper. May contain laser printing and colored printing. This grade should be free of coated, treated, groundwood, carbonless, carbon interleaf, padded, or heavily printed stock. Computer paper may be included in the grade. Must be free of binders, Post-It notes, tapes, tabs, and colored papers. Paper clips and staples are OK.

SORTED OFFICE PAPER/WASTE (High Grade Office)

Consists of paper typically generated in offices. Contains primarily white and colored groundwood free paper, free of unbleachable fibers, (not brown boxes & wrappers & dark colored file folders). Includes carbonless paper, fax paper, envelopes, brochures, and **manila** file folders. May include 1% or less groundwood computer paper and newspaper. Must be free of binders, tapes, tabs, and plastic sheets. Paper clips and staples are OK. Pressure sensitive labels (postage stamps, post-it-notes) limited to trace amounts.

NEWSPAPER (DE-INK QUALITY #8)

Dry newspapers, not sunburned, including advertising inserts that are natural to newspaper distribution. Does not include magazines, junk mail, or other papers. No plastic or Kraft (grocery) bags, string, or tape.

MIXED PAPER

Old newspapers include those newspapers that are sunburned, old, or have been wet. May include magazines, junk mail, office/copy paper, and Kraft (brown grocery) bags.

OLD CORRUGATED CONTAINERS (OCC)

Empty Kraft corrugated boxes, including the staples, tape, and labels that may be on them. Does not include waxed boxes. May include other Kraft papers such as brown wrapping paper and Kraft envelopes. Minimum amounts of chipboard (like shoeboxes) are acceptable and less than 10% of in-ported containers.

CONTAMINANTS

The following items should not be included in any grade:

Paper Food Containers	Carbon Paper	Plastic (all)	Household Garbage
Paper Food Wrap	Paper Cups	Plastic Food Wrap	Metal
Photographs	Plastic Cups	Glass	Paper Towels
Plastic Food Containers	Tyvek Envelopes	Tissue Paper	Wood

PLASTIC GRADE DESCRIPTIONS

POLYETHYLENE TERAPHTHALATETE (PET #1)- Clear soft drink & water bottles, some shampoo

HIGH DENSITY POLYETHYLENE(HDPE Colored #2)- Thick colored plastic, examples- detergent bottles, household cleaners

HIGH DENSITY POLYETHYLENE (HDPE Natural #2)- Milk bottles/gallon jugs

LOW DENSITY POLYETHYLENE (LDPE #4)- CLEAN grocery, produce, dry cleaning, ice and bread bags

APPENDIX H
"CHANGING HOW WE DO GARBAGE" ARTICLE

Changing How We Do Garbage



Not surprisingly, solid waste decisions facing local governments have trended through multiple phases. In past decades, cities and counties worried about having enough landfill capacity. More recently, they focused on collection systems and facilities for diverted recyclable and organic materials. While governments still have these worries, today they are spending more and more time on policy. Policies to ensure that infrastructure and programming will be economically as well as environmentally sustainable require incentives—be they sticks, carrots, or both—that provide steady flows and continually foster waste diversion practices in our communities.

There are almost as many types of policy options and permutations as there are acronyms in the waste industry. More policies are implemented by municipalities than other governments (due to limitations on statutory policing powers and the need for states to address such broader issues as diversion goals, grant programs, bottle bills and disposal bans). A sample of policies that can be applied to different stakeholders at the local level include the following:

- **Collection/disposal bans**—for materials with mature markets (some cities who don't have control of landfill operations have successfully implemented this: e.g., Fort Collins, CO has a collection ban on both e-waste and cardboard).
- **Commingling levels for sorting**—such as single- versus dual-stream recyclables collection or even mixed-waste streams.
- **Hauler rules for open market systems**—such as requiring trash haulers to collect diverted materials, establishing minimal list of recyclables and organics or requiring customer education (more aggressive hauler policies can include franchising and flow-control-like requirements).
- **Waste generator rules**—such as required recyclables and organics collection service or mandatory program participation.
- **Construction/demolition policy**—many cities have developed green building

programs that establish minimum levels of green construction and deconstruction (and can include audit and reporting requirements, refundable deposits, penalties for lack of compliance, etc.).

- **Diversion incentives**—such as PAYT, rebates, subsidies, recycling space in new construction, award programs, etc.
- **Policy to fund infrastructure and programs**—can include facility and/or system user fees, material use fees (like those on plastic bags), taxes, revenue sharing, or other mechanisms (one unique approach that earns \$1.7 million per year for Boulder, CO, is an occupational tax on haulers).

The good news is that many policies are low-cost for governments to enforce once they are implemented (think PAYT or mandatory collection services tied to utility bills). Some policies incur new or expanded enforcement expenses, of course, but these tend to be low compared to the investments needed for facility construction or collection fleet operation.

The bad news is that policies do have an initial implementation “cost.” This may be limited to staff time needed to research other city programs, educate local leaders, undertake public outreach, and conduct inter-agency coordination. However, these seemingly basic efforts are often fraught with skeptical stakeholder groups, funding obstacles, and nervous council members. As a result, they can include multiple false starts. Additionally, many governments do not have solid waste staff trained in policy development and public facilitation. As a result, their ability to skillfully and effectively start-stop-start this process can be limited.

The growing focus on policy issues surrounding solid waste management and waste diversion in general will require governments to develop better ways to change how we, well...change. Listed below are several key strategies this author has observed and participated in that both improve policy development success and reduce frustration levels for government staff and politicians.

Determine the policy goal—Even though staff and city council may have a good idea of what specific policy components they'd like to see implemented, the most important decision will probably be why this policy is needed, i.e., what the outcome should be. A more successful, less-contentious public process will likely result from a “what”-based platform that says, “Here's what we need to achieve; how can we collectively figure out how to get there?” as opposed to one that leaves no room for true stakeholder exchange on finding, compromising, and creating the right “hows.”

Research similar policy efforts by other cities—“How do others do it?” will inevitably be a question that council or savvy stakeholders will ask, so be prepared. Identify a reasonable cross-section of cities that have successfully—and unsuccessfully—attempted similar policy (ideally with similar demographics to your community). Many cities researched will likely have gone through the same process. Staff may be able to piggyback on their efforts and minimize research.

Draft policy language with flexibility—Once the general policy content has been sketched out, be mindful of the need for flexibility that allows exemption for hardship conditions and targets appropriate audiences. Examples include allowing multifamily property owners/managers to be exempted from diversion if they prove that excessive cost would be incurred, and setting applicability thresholds for C&D policies (such as valuation or size level below which projects are not subject to regulation).

Educate and prepare political leadership early and throughout the process—The importance of this step cannot be over-emphasized. To the extent possible, allocate plenty of time to work with city council members before policy development becomes a public debate. This leadership step should focus on the following:

- **Fully educating the council** on all facts supporting and opposing the policy, implementation details from other

communities, estimated impacts (e.g., potential tons diverted, city capital/operating costs as well as user costs, job creation, greenhouse gas reductions, etc.)—this step will support consensus-building within the council, and provide individual members with a level of comfort in adopting a position they can maintain throughout the public process.

- **Identifying the range** of less-than-total-truths and myths that are part of most public processes—this will prevent council from being blind-sided and allow members to stay on-point with respect to their perspectives and positions.
- **Prepare members** for the overall process, which can be highly emotional and more protracted than most expect—the ability of council to fairly, firmly and consistently address stakeholder questions and reactions lends valuable credibility to the process.
- **Finally, help the council understand** that opposition to new policy will likely come from a very vocal but usually small portion of their constituency. Chances are good that an equal or larger portion of the community will be in favor of the proposal (most will be unaware or just plain ambivalent). But it's human nature to be much more passionate about changes we oppose than those we support. As a result, opponents may overwhelm proponents and appear to be the only voice in the process. Leadership should anticipate this dynamic and not be misled about the level of policy support.

Lafayette, CO, took these steps when it moved from an open to single-hauler contract system. According to Doug Short, Lafayette's public works director, "The public process significantly helped smooth the political process and allowed our council to make a clear decision that supported change." Another Colorado Front Range city initiated a study to evaluate a potential move from an open-market to single-hauler system without spending time preparing their elected leaders. Council aborted the study shortly after the project was started following a barrage of opposition from small haulers and their customers.

Hire a good facilitator—Facilitating an onerous public process requires special skills and good experience with creative and effective strategies for defusing emotional dialogues, encouraging even-handed involvement from all stakeholders, and moving to constructive discussions. Jody Erikson, a

senior mediator/facilitator with JSE Associates, advocates an approach that moves the process from an "us versus them" conversation to one that unites stakeholders in a "how can we figure this out together?" environment. Specifically, she notes that a focus on interests versus positions is an important basis for the process; in other words, why something is important (interest) versus a favorite solution (position). For example, when stakeholders simply assert their overall position (e.g., "I'm against any change in the status quo"), staff and council don't have much to work with in terms of discussion and compromise. If the conversation is moved toward what stakeholders' specific interests are, however (i.e., "I am on a fixed income and worried this policy will increase my monthly fees"), there will be more information for discussing and negotiating policy options with less negative impacts.

Provide timely and regular feedback to stakeholders—This step should include a process for sharing documentation (e.g., meeting notices; meeting summaries, documents and presentations; draft policy and report language) and obtaining feedback between public meetings (through hotlines,

periodic teleconferences, or other means). This will allow stakeholders to keep current, verify that their input was registered and have a real say in the overall process. The Western Greater Yellowstone Consortium's Regional Recycling Study (currently ongoing in northeastern ID/northwestern WY) has used multiple project liaisons, website postings and regular teleconferences between face-to-face meetings to successfully keep a four-county stakeholder group active and engaged in the project.

For the unprepared, local solid waste policy development and associated stakeholder involvement may, at best, be overwhelming and frustrating with elusive results chased over a prolonged period. A well-strategized public process can be pivotal to new policy that is not only successfully implemented within a reasonable budget and schedule, but leaves staff, council and stakeholders in a frame of mind that is more receptive to the real change process that begins with the final council vote. **MSW**

Laurie Batchelder Adams is president of LBA Associates Inc. and currently serves as president of the Colorado Association for Recycling.

WANTED Solid Waste Experts



Consider yourself the Einstein of solid waste?
Bring expertise and entertainment to the table?
Apply today to join our faculty of solid waste experts!

Become a speaker at

FORESTERUNIVERSITY.NET

APPENDIX 1

DROP-SITE COST ESTIMATE MODEL

Project:	Southwest Colorado Recycling Study
Technology:	Recycling Drop Site - Recyclables
Date:	March-15
Cost Estimate Basis:	2015\$ - Cost assumptions from vendors, costing manuals & project data
Location:	SWCCOG Region, Colorado
Worksheet:	INPUTS

Revise items in red for program and site specific information.

GENERAL INPUT ASSUMPTIONS

Interest Rate	5%	
Annual Escalation Rate	3%	
Labor Categories & Rates - U.S. Bureau of Labor Statistics for Colorado		
Equipment Operator	na	per hour
Recycling Collection Vehicle Driver	\$20.00	per hour
General Laborer	na	per hour
Maintenance Labor	\$20.00	per hour
		Labor Fringe Benefits = 25.0%
MRF/Recycling Processing Tip Fee	\$0.00	per ton

DROP SITE ASSUMPTIONS

Serves Residential Only - Service Area
 Co-located with existing acceptable facility or land donated for use.

Recycling Trailer Type:	Qty*	Avg Price	
Roll-off Trailer	1	\$20,000	Budgetary quotes, delivered, from Pro-Tainer
Roll-off Boxes (21 CY)	2	\$7,000	
Gravity Trailer (20 CY)	0	\$11,000	
Bin Trailer (20 CY)	0	\$20,000	
Pro-Tilt Trailer (18 CY)	0	\$12,000	

* Adjust for type selected.

** Each trailer assumed to have 3 to 6 compartments. Determine quantity need to handle multiple material groups.

Spare Trailers (stored off-site) =	0	
Min. Area Required for Drop-Site =	800	Sq. Ft. per trailer/roll-off bo. (Allows for box, truck-trailer, maneuvering, etc.)
Assumed Trailer/Roll-Off Box Size:	21	CY Adjust for actual trailer type
Typical % Full at Collection =	90%	
Average Recyclables Density =	200	lbs/CY Adjust for actual local data, if available
Assumed hook-up & unload time =	15	min per haul Increase to 45 minutes if gravity or forklift bin trailer

Pick-up Truck:	Qty*	Avg Price	
Heavy-duty pick-up truck (4 WD, 3/4 ton, with trailer hitch)	1	\$40,000	range \$35K-\$40K, new truck price from Kelley Blue Book

Drop-Site Surfacing:	For site development/improvements
Gravel/Crushed Rock	NO Insert NO if current site surfacing adequate
Concrete	NO
Asphalt	NO
Access Stairs/Platforms?	NO
Site Lighting?	NO
Additional Security Fencing?	NO NO - assumes existing sufficient
	0 LF If YES, identify lineal feet required
Video Surveillance Package?	NO
Personnel Convenience Building?	NO NO - assumes adjacent to existing facilities or unstaffed

Multi-Drop Site Input:

	Site #1	Site #2	
No. of Covered Recycling Trailers	2	2	
Area Required (SF)	1600	1600	
* Distance to Durango Hub MRF (mi)	60	60	
Average Speed to Facilities (mph)	45	45	
Tonnages:			
Drop-Site Service Population	1500	500	Do not include population served by curbside collection
Recyclables (avg lbs/capita/yr)	50	50	Can range from 25 to 75 lbs/capita/yr
Estimated Recovery per Drop-Site:			
Commingled Recyclables (tpy)	37.5	12.5	

* Distance is one-way miles.

Project:	Southwest Colorado Recycling Study
Technology:	Recycling Drop Site - Recyclables
Date:	March-15
Cost Estimate Basis:	2015\$ - Cost assumptions from vendors, costing manuals & project data
Location:	SWCCOG Region, Colorado
Worksheet:	CAPITAL COST SITE #1

Revise items in red for program and site specific information.

DROP-SITE CAPITAL COST Site #1

Item	Quantity	Units	Unit Cost	Total
Land Purchase (1)	0.04	Acres	\$0	\$0
Final Grading (2)	0	SY	\$8	\$0
Concrete Pad (2)	0	CY	\$450	\$0
Asphalt Pad (2)	0	SY	\$35	\$0
Wooden Rails (3)	2	sets	\$50	\$100
Crushed Rock/Gravel (2)	0	SY	\$20	\$0
Access Stairs/Platform	0	EA	\$3,000	\$0
Site Lighting (4)	0	EA	\$5,000	\$0
Drop-Site Signage	2	EA	\$500	\$1,000
Security Fencing (5)	0	LF	\$27	\$0
Video Surveillance System - Basic	0	EA	\$4,000	\$0
Personnel Convenience Building (6)	0	EA	\$12,000	\$0
Subtotal Site Improvements				\$1,100
Contingency (10%)				\$100
Drop-Site Improvements				\$1,200

Mobile Equipment - Trailer/Containers (8):

Covered Recycling Trailer				
Roll-off Trailer	1	EA	\$21,000	\$21,000
Roll-off Boxes (21 CY, 3-4 compa)	1	EA	\$7,000	\$7,000
Gravity Trailer (20 CY)	0	EA	\$11,000	\$0
Bin Trailer (20 CY)	0	EA	\$20,000	\$0
Pro-Tilt Trailer (18 CY)	0	EA	\$12,000	\$0
Spare Recycling Trailer	0	EA	\$20,000	\$0
Subtotal Mobile Equipment				\$28,000
Contingency (10%)				\$2,800
Mobile Equipment				\$30,800

Total Drop-Site Capital Cost \$32,000

Assumptions:

- 1 Land assumed to be existing city/county property or donated use.
See INPUTS sheet for area requirements.
- 2 Assumes existing site surface is adequate or improved by Owner. See INPUTS sheet.
- 3 Assumes wooden rails (4x4) under front of roll-off boxes to mitigate freezing.
- 4 Assumes site lighting provided by co-location.
- 5 Perimeter 6-ft chain link fence and gate. Assumes security provided by co-location.
- 6 Pre-fabricated convenience building (8'x8') installed. Electricity assumed available at site(s) selected.
No convenience building if unstaffed and/or co-located with existing facilities. See INPUTS sheet.
- 7 Unit price assumes compartmentalized recycling trailer such as Pro-Tainer Inc.

Project: Southwest Colorado Recycling Study
 Technology: Recycling Drop Site - Recyclables
 Date: March-15
 Cost Estimate Basis: 2015\$ - Cost assumptions from vendors, costing manuals & project data
 Location: SWCCOG Region, Colorado
 Worksheet: **OPERATIONS & MAINTENANCE COSTS**

Revise items in red for program and site specific information.

Item Description	Quantity	Units	Unit Cost	Total
LABOR				
Job Classification	Qty	Labor Rate	Hrs/Yr (1)	Total
Collection Driver	1	\$25	26 hrs	\$ 700
Subtotal				\$ 700
Notes:				
Existing personnel/driver checks drop-site and performs minor clean-up at specified # hrs per week =				1 hrs/week
Labor rate assumes fringe benefits				25.0%
SITE MAINTENANCE & UTILITIES				
Item	Quantity	Unit Price	Total	
Site Maintenance	2%	\$1,200	\$	-
Equip/Trailer Maintenance	3%	\$30,800	\$	900
Building Repair & Depreciatio	3%	\$0	\$	-
Electricity	000 kwh	\$0.10	\$	-
Heating (Bldg Space Heater)	000 kwh	\$0.10	\$	-
Sanitary Service	0 port-a-let service/month	\$500 /month	\$	-
Water	0 Existing on-site water/bottled water provide		\$	-
Mobile Phone	0 phone	\$100 /month	\$	-
Subtotal				\$ 900
Notes:				
Site co-located with existing facility; no separate building or utilities.				
Buildings at Drop-Site	0			
Building lighting based on	1.66 watts/sf		2080 hours/year	
Site Lighting	0 1000W Lights		620 hours/year	
ANNUAL TOTAL O&M per Drop-Site				\$ 1,600

Project: Southwest Colorado Recycling Study
 Technology: Recycling Drop Site - Recyclables
 Date: March-15
 Cost Estimate Basis: 2015\$ - Cost assumptions from vendors, costing manuals & project data
 Location: SWCCOG Region, Colorado
 Worksheet: **HAULING COSTS**

Drop-Site Collection	Drop-Site #1 Drop-Site #2		Comments
	MRF	MRF	
No of Recycling Roll-offs/Trailer:	2	2	From INPUTS sheet
Container Payload (tons):	1.9	1.9	Trailer/box CY, % full, density from INPUTS sheet
Tonnages (tpy):	38	13	
Hook-Up & Unload Time (minutes):	15	15	
One-Way Distance (miles)	60	60	
Average Speed (mph):	45	45	
Average Trips/Year:	20	7	
Average Trips/Month:	1.7	0.6	
Average Trips/Week:	0.4	0.2	
Hours Per Trip	2.9	2.9	
Weekly Freight Hours:	1.2	0.6	
Wkly Prorated Veh Inspect/Breaks:	0.2	0.1	Ratio wkly freight hrs to Total wkly inspectns/breaks
Annual Freight Hours:	60.7	30.3	Freight hours only for vehicle fuel, oil & grease cost
Total Miles/Yr	2,400	840	

Annual Costs Assumptions:

Fuel, Oil & Grease

Fuel Cost per Gallon	\$4.00	\$4.00	US Energy Information Rocky Mtn diesel price 10/14
Miles per Gallon	7	7	Estimate based on pick-up hauling trailer
Oil & Grease (\$/freight hour)	\$0.25	\$0.25	Note: Federal mileage at \$0.575/mile

Tires

New Tires Price	\$500	\$500	For pick-up truck
# New Tires Per 40,000 Miles	4	4	
Trailer Tires	\$400	\$400	For recycling trailer
# Tires Per 25,000 Miles	4	4	

Maintenance & Repairs

Mechanic Labor annual salary	\$41,600	\$41,600	See INPUTS sheet
Mechanic Labor % per Truck	1%	1%	
Parts, Repairs, Overhaul (\$/mile)	\$0.20	\$0.20	Note: Federal mileage at \$0.575/mile

Driver Labor

Driver % (based on freight time)	3%	1%	
Driver annual salary	\$41,600	\$41,600	See INPUTS sheet
Fringe benefits (% of salary)	25.0%	25.0%	Benefits included in annual cost calculation

Truck Amortization

Capital Cost	\$40,000	\$40,000	See INPUTS sheet
Resale Value (% of truck \$)	20%	20%	
Replacement Miles	150,000	150,000	
Replacement Schedule (years)	7	7	
Interest Rate	5%	5%	See INPUTS sheet
Capital Recovery Factor (A/P,i,n)	0.1728	0.1728	

Recycling Trailer Purchase

Capital Cost -- Trailers/Roll-offs	\$0	\$0	Included in capital cost
Replacement Schedule (years)	10	10	
Interest Rate	5%	5%	See INPUTS sheet
Capital Recovery Factor (A/P,i,n)	0.1295	0.1295	

Insurance (per yr/truck) @ 2.5% \$

	\$1,000	\$1,000	Estimate % of capital cost
--	---------	---------	----------------------------

License Fees (per yr/truck)

	\$300	\$300	Estimate - varies by community ordinance
--	-------	-------	--

Pro-Rated % of Time	4%	2%	
---------------------	----	----	--

Annual Drop-Site Haul Costs:	Drop-Site	Drop Site	Comments
	#1	#2	
Fuel, Oil & Grease	\$1,390	\$490	Mileage & Time Based
Tires	\$200	\$70	Mileage Based
Maintenance & Repairs	\$500	\$180	Mileage & Time Based Pro-Rated
Driver Labor	\$1,520	\$760	Time Based
Truck Replacement*	\$220	\$110	Pro-Rated
Trailer Amortization	\$0	\$0	Included in Capital Cost
Insurance	\$40	\$20	Pro-Rated
Licensing & Taxes	\$10	\$10	Pro-Rated
Drop-Site Haul Cost	\$3,880	\$1,640	
Avg Haul Cost per Trip	\$194	\$234	

Avg Haul Cost per Ton \$103 \$131

* Assumes new pick-up truck used for all drop-sites and other county uses; pro-rated replacement contribution.