

# Hub and Spoke Recycling in Rural New Mexico

Presented to the Colorado Department of Public Health and Environment  
Recycling Resources Economic Opportunity Grants Committee  
July 12, 2011



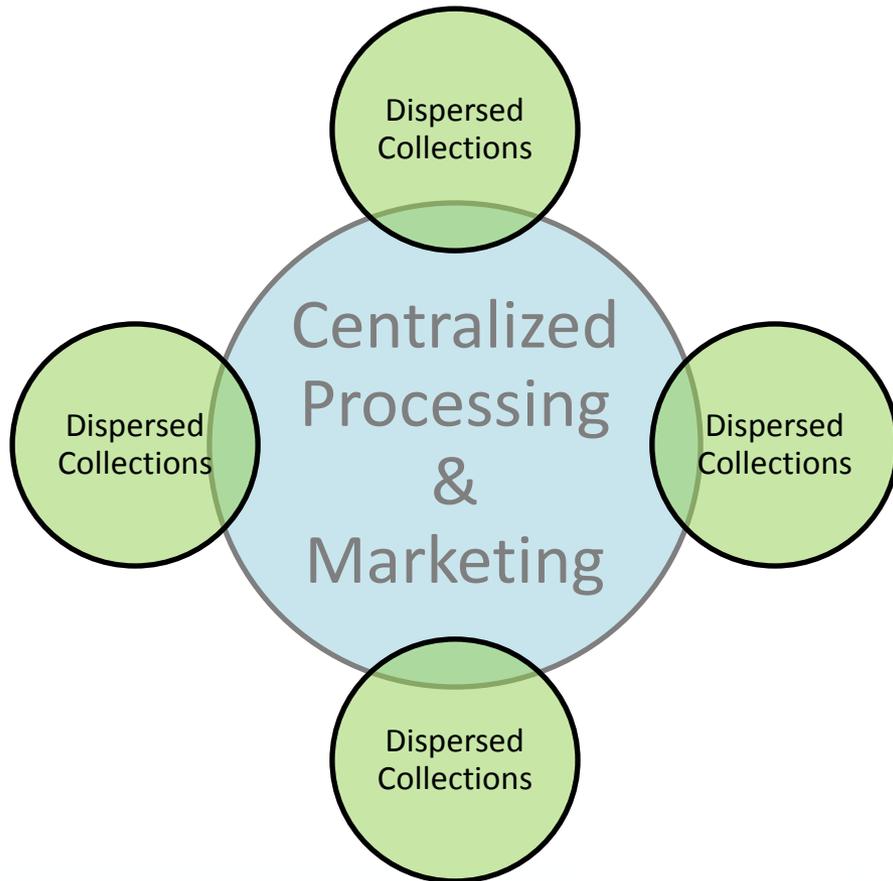
# Top Three Rural Recycling Challenges:

- Transportation
- Limited Material Volumes
- Capital Costs

# What is Hub and Spoke Recycling?

- Provides Access
- Concept Replicable
- Overcomes Rural Transport Issues
- Consolidates Marketable Volumes
- Hub = Recycling Processing Center
  - Revenue Covers Operations
- Spokes = Collection Points
  - Reduce Tip Fees and Hauling

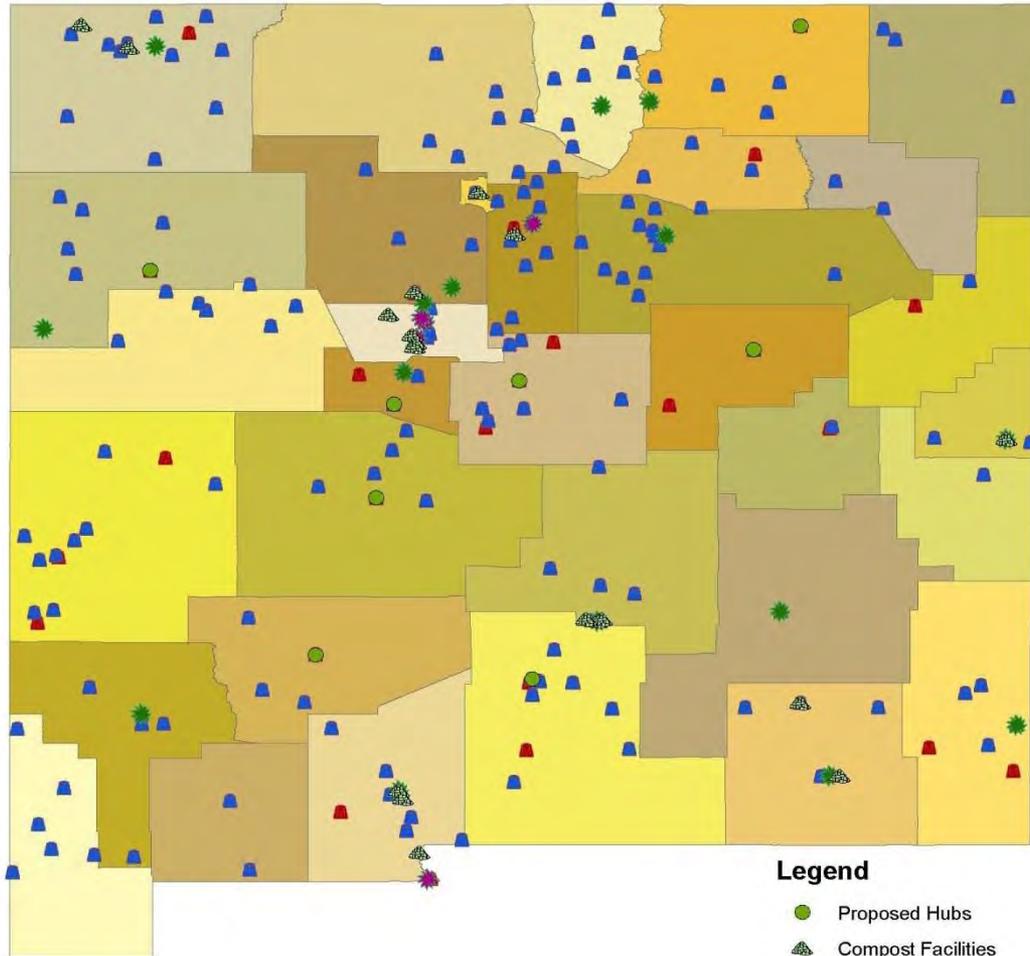
# Model for Success



- Achieves Economy of Scale
- Limits Capital Demands & Investment
- Focuses on Efficiency
- Provides Regionally Consistent Program

# Rural Recycling Strategic Development

- USDA Rural Utilities Solid Waste Management Grant 2008-2010
  - Mapping Project
  - Site Visits and Outreach
- NMED \$500,000 Stimulus Funding 2010
- NMRC \$2.8 Million Stimulus Funding '10-'13
  - Sub-Awarding 66%
  - Community Owns Equipment
- NM Has Limited Funding for Recycling



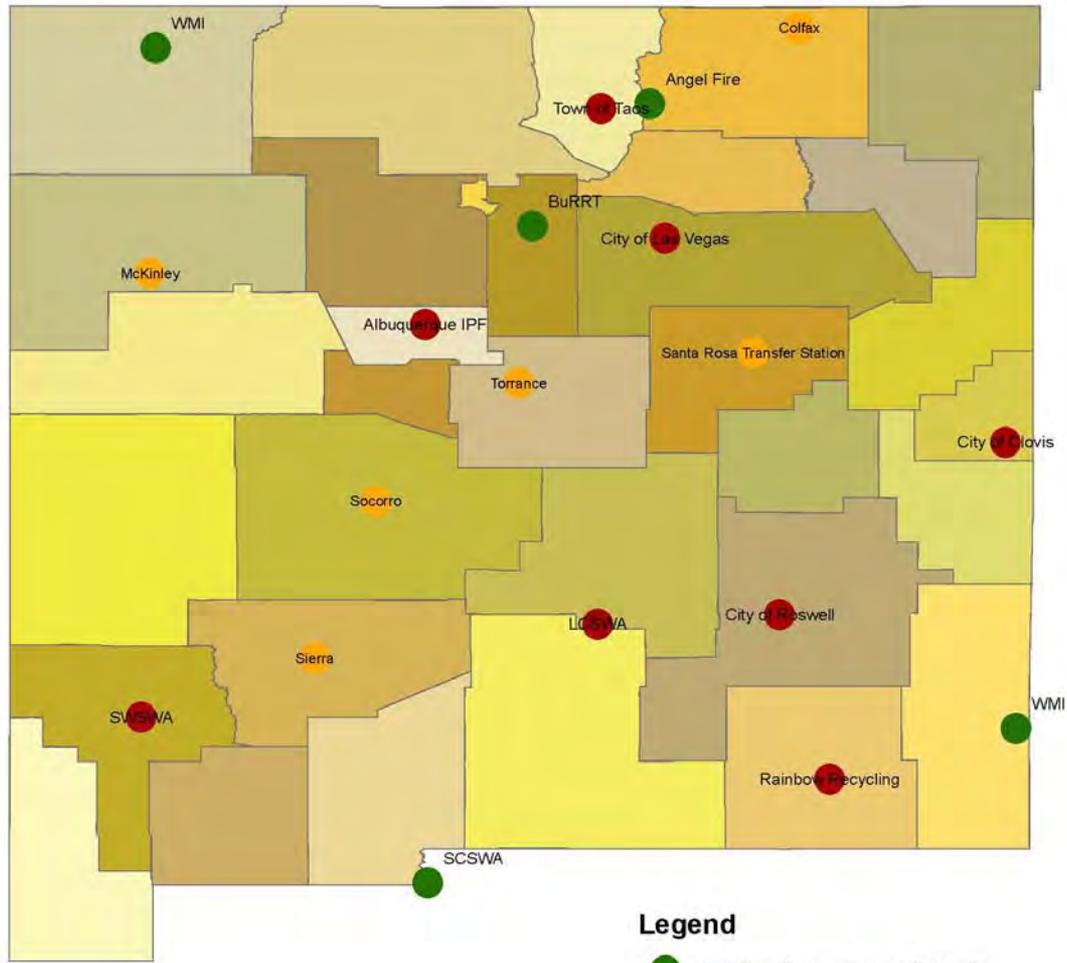
**Legend**

-  Proposed Hubs
-  Compost Facilities
-  Baling Facilities
-  Recycling Processors
-  Transfer Stations
-  Landfills



# How Were Hubs Selected?

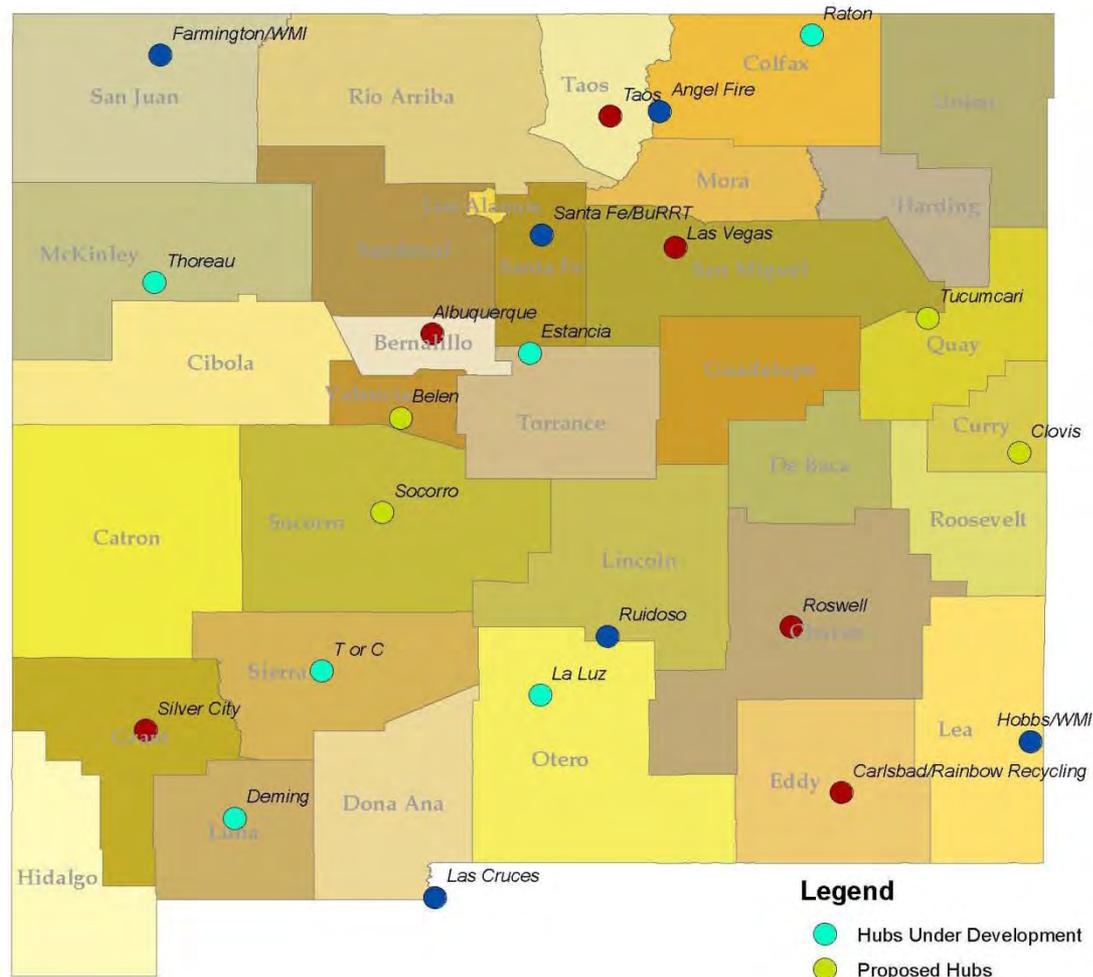
- Mapping Project
  - Followed Trash Flow
  - Assessed Existing Processing
  - 60-100 Mile Range
  - Political Boundaries
  - Geographic Boundaries



**Legend**

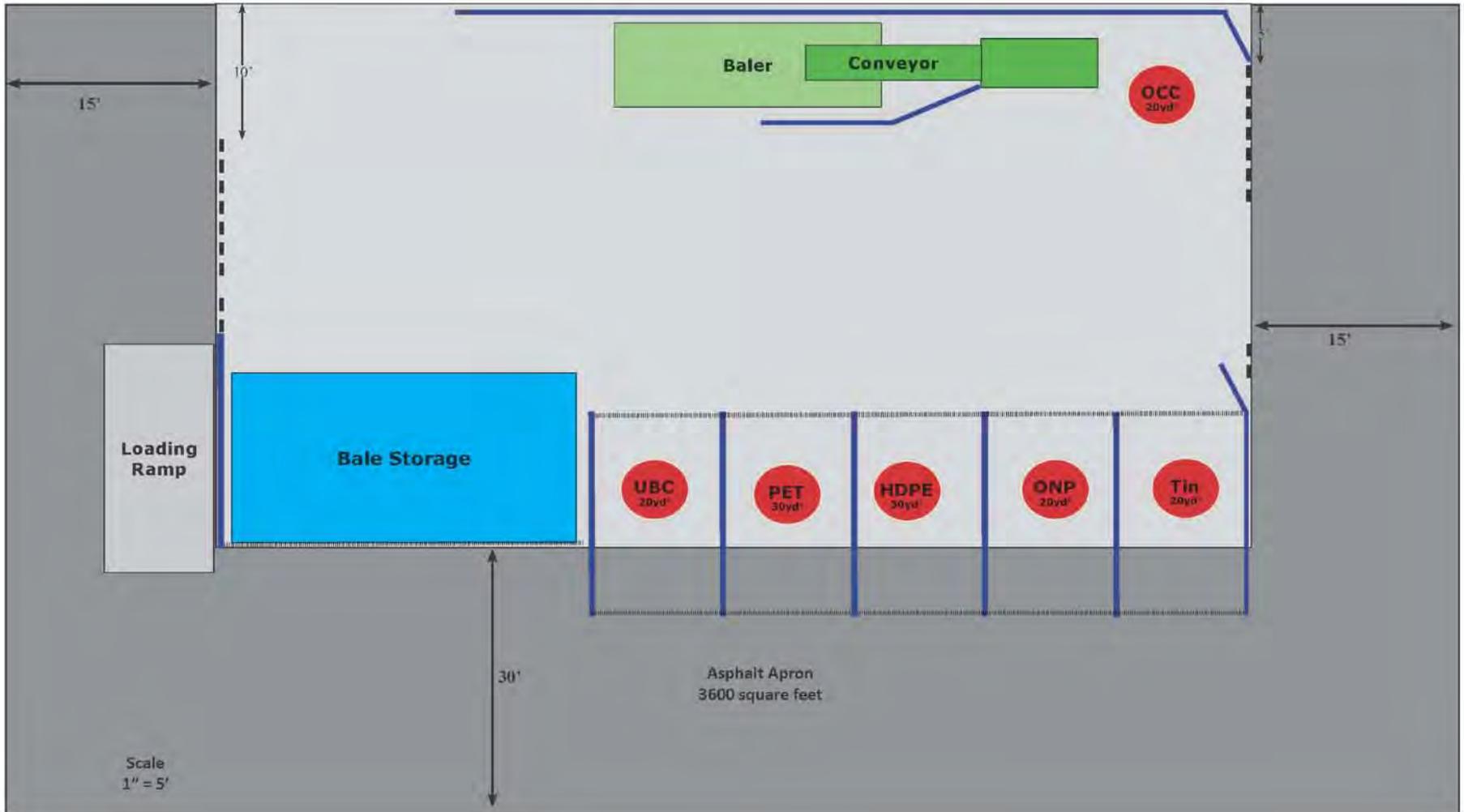
- Existing Processing w/ Capacity
- Existing Processing No Capacity
- Proposed Hubs





# Objectives of Hub and Spoke Project

- Infrastructure Development
  - Hubs
  - Spokes
  - Recycling Center Improvements
- Cooperative Marketing Entity
- Pay-As-You-Throw and Rate Incentives
- Training (Local & National)



# Hub Efficiencies

- Storage Bunkers Right Sized
- Limited Handling of Material
- In-Pit vs Above Grade Conveyor
- Natural Sky-Lights = No Lighting
- Tip Direct to Storage
- Avoids Over Investment in Equipment
- Locate at Existing S.W. Facility
  - Utilize existing staff and equipment

# One Horizontal vs Multiple Vertical Balers

| Activity     | Horizontal Baler with Pit Conveyor  | Vertical Baler   |
|--------------|-------------------------------------|--|
| Operations   | One Machine to Maintain             | More Balers, Higher Cost of Ownership                                |
| Loading      | Push material into pit conveyor     | Manually load  |
| Productivity | 20 minutes for 1 cardboard bale     | Up to a day for 1 cardboard bale                                     |
| Materials    | Suitable for most commodities       | Cannot produce market spec bales of all materials, e.g. plastics     |
| Floor Space  | Baler requires 50' x 10' foot print | Multiple balers use less space, but increased loose storage required |



3 NMRC Hubs, \$309k each, Sept-Nov 2011

- Otero County = 62,776 population
- Deming (Luna + Hidalgo County) = 32,137
- Torrance County = 16,269

3 NMED Hubs, \$150k each, Sept-Nov 2011

- Raton (Colfax + Union Counties) = 14,642
- Truth or Consequences (Sierra County) = 12,437
- Gallup (McKinley + Cibola Counties) = 98,009

# NMRC Recycling Hub Budget

| Item   | Value     |
|--|-----------|
| Horizontal Baler with In-Pit Conveyor<br>(Excel EX63 With 3-Phase Converter) | \$97,689  |
| Fork Lift  | \$24,817  |
| Portable Loading Dock  | \$11,019  |
| Roll-Off Collection Equipment  | \$50,473  |
| Structure (3,000 sq ft)  | \$125,822 |
| TOTAL  | \$309,820 |

# NMED Baler and Trailer Budget

| Item   | Value            |
|--|------------------|
| Horizontal Baler with In-Pit Conveyor<br>(Gemini EX) | \$87,738         |
| Electrical and Concrete Work                         | \$3,102          |
| Roll-Off Collection Equipment                        | \$59,160         |
| <b>TOTAL</b>   | <b>\$150,000</b> |

# Spokes Provide Access

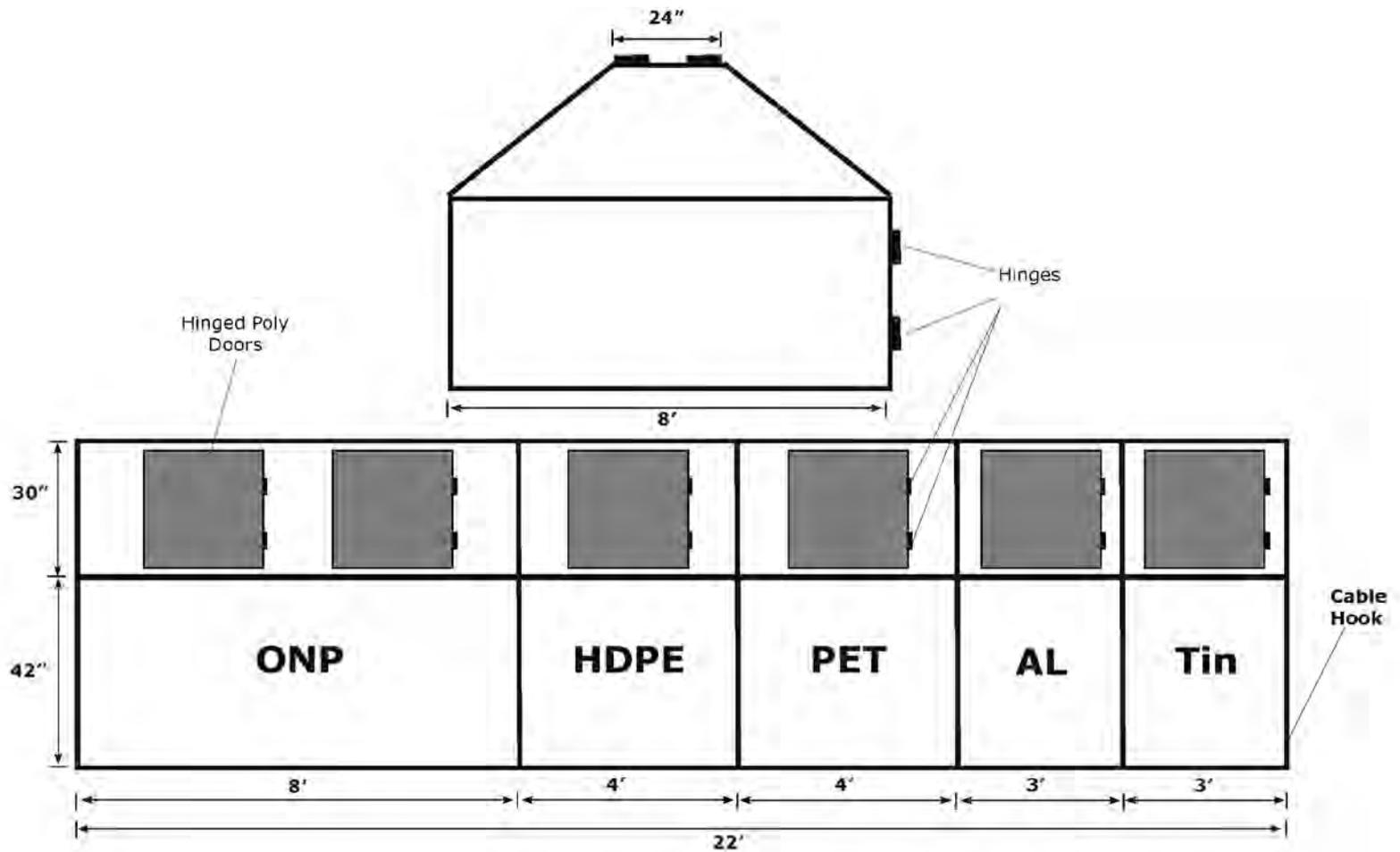




New Mexico Recycling Coalition



[www.recyclenewmexico.com](http://www.recyclenewmexico.com)



# Collection Equipment Efficiencies

| Activity     | Trailers  | Roll-Offs   |
|--------------|---|---|
| Hauling      | Standard pick-up truck can haul trailer.  | If roll-off truck already owned, roll-offs recommended  |
| Location     | Existing drop-off or secure urban   | Existing drop-off or secure urban   |
| Right-Sizing | One OCC and one 8-bin multiple material trailer allows for material capacity adjustments (e.g. 2 bays for ONP or PET). Movable signage. | Larger bay used for highest volume of material collected. Movable signage. OCC roll-off separate. |
| Security     | Wheel lock, bin locks, fencing  | Door locks, fencing   |
| Unloading    | Unload with standard fork lift attachment, OCC is gravity tip   | Can unload one commodity at a time  |
| Switch-Out   | Always recommended  | Always recommended  |



# Quality Material Signage

## Mixed Paper

### *Papel Mezclado*



**✓ YES**  
Office paper  
Junk mail  
Newspaper  
Magazines

  
*Papel de Oficina  
Correo de Chatarra  
Periódicos y Revistas*

**✗ NO**  
Phonebooks  
Cardboard  
Paper Board/  
Cartons

  
*Guia Telephonica  
Cartón Corrugado*

# Seven Funded Spoke Grants - May 2011

| Community           | Population Served | Equipment | # of Sets | Value     |
|---------------------|-------------------|-----------|-----------|-----------|
| Cibola County       | 27,285            | Roll-Offs | 10        | \$164,500 |
| Deming              | 9,906             | Trailers  | 2         | \$51,230  |
| Otero County        | 62,776*           | Mix       | 3         | \$65,680  |
| San Miguel County   | 28,558            | Roll-Offs | 7         | \$103,650 |
| Town of Springer    | 1,146             | Trailers  | 1         | \$25,615  |
| Village of Cimarron | 816               | Trailers  | 1         | \$25,615  |
| Village of Maxwell  | 249               | Trailers  | 1         | \$25,615  |
|                     |                   | TOTAL     | 25        | \$461,905 |

# Other Spoke Sites 2011

| Community       | Hub Funding Source | Equipment | # of Sets |
|-----------------|--------------------|-----------|-----------|
| Torrance County | NMRC               | Roll-Offs | 4-5*      |
| Deming          | NMRC               | Trailers  | 4-5*      |
| Otero County    | NMRC               | Mix       | 3-4*      |
| T or C          | NMED               | Trailers  | 2         |
| Gallup          | NMED               | Trailers  | 2         |
| Raton           | NMED               | Trailers  | 2         |
|                 |                    | TOTAL     | 20        |

# Hub and Spoke Relationships

- Usually, Spokes Haul Materials
- Hubs Must Accept Regional Materials
- MOU Outlines:
  - Maintenance Responsibilities
  - Who Hauls
  - Tip Fee at Recycling Center (rare)
  - Cost to Haul (if provided by hub)
  - Rules for Dropping Off at Center

# Recycling Center Improvements

- Upcoming Grant RFP
- Expanding Capacity at Existing Hubs
- Baler or Conveyor Upgrades, Docks
- Spoke Collection Equipment
- Approx. \$260k

# Hub and Spoke Evolution

- Sorted Drop-Off Locations with Horizontal Baler
- Business Cardboard Collections
- Organics Diversion Program
- PAYT and Rate Incentives
- **EXPANSION:**
  - Add Sort Line Conveyor and Increased Storage
  - Curbside Commingled – Denser Population Centers
  - Commingled at Rural Drop-Offs
  - Commingled Baled without Facility Upgrades

# Technical Assistance

- NMRC Partner Until Aug 2013
- Ensure Regional Spoke Development
- Build Citizen Recycling Group
- Education and Outreach
  - Launch Events
  - Brochures, Posters, Flyers, Events
  - Media Partnerships



## Phone Books

Residents may opt out of receiving phone books at [www.yellowpagesoptout.com](http://www.yellowpagesoptout.com). Look for seasonal collection drives of phone books at time of delivery.

## Plastic Bags

Finding an alternative to plastic bag use by bringing your own shopping bags is a first step. Plastic shopping and dry cleaner bags are accepted for recycling at many large retailers such as Wal-Mart and Albertsons.



## Tires



When you purchase new tires, ensure that the tire retailer will recycle your old tires. La Luz Transfer Station accepts tires free from residents (up to 5 a month) and charges \$1/each for business customers.  
✓ La Luz Transfer Station

## Fluorescent Bulbs

Compact Fluorescent Light Bulbs (CFLs) contain a small amount of mercury and must be disposed of properly. They come in many shapes and sizes, from the curly light bulb size to the long, circular tubes. Home Depot, Ace Hardware and Lowe's accepts CFLs in limited quantities.



The NM Environment Department has information on the proper disposal of this material at [www.nmenv.state.nm.gov/doc/fluorescent.html](http://www.nmenv.state.nm.gov/doc/fluorescent.html).

Visit [www.recyclenewmexico.com](http://www.recyclenewmexico.com) for more info!

This brochure is based on a similar flyer created by the Texas Commission on Environmental Quality and used with permission.

Acknowledgment: "This material is based upon work supported by the Department of Energy under Award Number DE-EE0003799."

Disclaimer: "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe upon privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

Printed September 2011

Printed on 100% recycled paper

## Drop-Off Locations

### Recycling Drop-Off Locations

- ✓ Alamogordo Habitat for Humanity, 1109 Tenth St., 575-437-0160
- ✓ Alamogordo Transfer Station, 2204 Levelle Rd, Mon-Sat 8-3:30, Sun 12-3:30
- ✓ Cloudcroft Convenience Center, xxx Name of Road, Hours
- ✓ La Luz Transfer Station, xxx Name of Road, Hours
- ✓ Mescalero Convenience Center, xxx Name of Road, Hours
- ✓ Tularosa Convenience Center, xxx Name of Road, Hours
- ✓ Weed Convenience Center, xxx Name of Road, Hours

### Private Recycling Collection Businesses

- ✓ Southwest Disposal, 575-434-1109
- ✓ Total Destruction, 575-434-1066

### Contact Information

- ✓ Alamogordo Solid Waste Department  
575-439-4250, [www.ci.alamogordo.nm.us](http://www.ci.alamogordo.nm.us)
- ✓ Cloudcroft Solid Waste  
Phone, Web
- ✓ Mescalero Solid Waste Management  
Phone, Web
- ✓ Otero County Solid Waste Department  
575-434-1538, [www.co.otero.nm.us](http://www.co.otero.nm.us)
- ✓ Tularosa Solid Waste  
Phone, Web

INSERT MAP HERE

# OTERO COUNTY Recycling Guide



## A Quick Guide to Recycling in the Region



Unsure where to take items for recycling or proper disposal? Be sure to visit [www.recyclenewmexico.com](http://www.recyclenewmexico.com) as the first step to locate a recycler.

## Household

### Appliances and Scrap Metal

Recycle scrap metal by contacting local scrap dealers and junk yards; check your local yellow pages under "Scrap Metals" or "Recycling". Scrap Metal is accepted at:

- ✓ La Luz Transfer Station
- ✓ Alamogordo Transfer Station
- ✓ What about landfill?



**Paper, Cardboard, Plastic Bottles and Cans**  
Mixed paper, cardboard, aluminum and steel cans, plastic #1 and #2 bottles are accepted at the following locations:

- ✓ La Luz Transfer Station
- ✓ Alamogordo Transfer Station
- ✓ Cloudcroft Convenience Center
- ✓ Tularosa Convenience Center
- ✓ Mescalero Convenience Center
- ✓ Weed Convenience Center

Mixed paper includes newspaper, office paper, magazines and junk mail. Glass and plastics #3-#7 are hard to recycle as there are few end markets in the region.

### Brush, Leaves and Lawn Clippings

Start a compost pile at home - download a copy of the state Backyard Composting brochure at [www.nmenv.state.nm.gov/swb](http://www.nmenv.state.nm.gov/swb). Bring yard debris to either station and take home some free mulch to use in landscaping.

- ✓ Brush is accepted at:
- ✓ La Luz Transfer Station
- ✓ Alamogordo Transfer Station



### Clothing, Toys, Household Goods, Etc.

Practice "reuse" by donating gently used items. Check with local charities and organizations to find a donation center.

### Computers, Printers, Televisions, Cell Phones, Electronics

Is there local electronics recycling collection???

If you buy a new piece of equipment, check to see if the manufacturer has a "Take Back" program where they cover the cost to have you ship the old equipment to them for recycling. Other retailers such as Office Depot, Best Buy, Staples and Radio Shack accept certain items. Goodwill has an electronics recycling program.



### Household Hazardous Waste (includes paints, cleaners, pesticides, etc.)

There are currently no Household Hazardous Waste (HHW) collection opportunities in the Otero County area.

It is legal for households to dispose of HHW materials. The most common HHW item is paint, which can be handled in several ways. If it is still usable, contact your local Habitat for Humanity Restore to see if they will take it. If there are no outlets, you should open the paint can, add cat litter, sand or dirt and allow to completely dry out. It is then safe to dispose of in the trash. For more information on how to purchase safer alternatives, go to <http://www.epa.gov/osw/conservematerials/hhw.htm>.



### Rechargeable Batteries

Rechargeable batteries commonly found in cordless power tools, cellular and digital phones, laptop computers, camcorders, cordless cameras, and remote-control toys should not be thrown in the trash. Local retailers such as Radio Shack, Home Depot and Lowe's accept these batteries for recycling. The Rechargeable Battery Recycling Corporation hosts a comprehensive online directory at [www.call2recycle.org](http://www.call2recycle.org). Regular (alkaline) batteries are not recyclable in most communities.



## Other Items

### Auto Batteries (Lead Acid)

Discarding or improperly disposing of a lead-acid battery is illegal in New Mexico. Most businesses that sell lead-acid batteries accept old ones for recycling.  
✓ Accepted at Alamogordo and Luz Transfer Stations

### Construction Materials

Whether remodeling or building new, many materials left over from construction projects are recyclable. The local Alamogordo Habitat for Humanity may be able to accept these materials. Please call first.  
✓ Alamogordo Habitat for Humanity

### Oil, Antifreeze & Used Oil Filters (including transmission fluids, brake fluids, power steering fluids and greases)

New Mexico law prohibits dumping used oil on land, into storm drains or waterways. It is illegal to dump more than 5 gallons at a landfill. Many auto service centers (listed in the yellow pages under "Oil Change & Lube") accept these fluids in quantities of less than 5 gallons. When bringing fluids for recycling, never mix fluid types.

- ✓ Motor Oil and Antifreeze accepted at Alamogordo and Luz Transfer Stations



# Cooperative Marketing Assistance

- NMRC Launches Coop Sept 2011
- Milk-Run Pick-Up of Commodities
  - Reduced On-Site Storage Requirements
  - Expanded Recyclable Materials
  - Overcomes Transport Issues – Coop Coordinates
- All Hubs Must Recycle:
  - Cardboard
  - Mixed Paper
  - Plastic # 1 and # 2 Bottles (Sorted)
  - Aluminum and Steel Cans (Sorted)

# Cooperative Marketing Assistance

- Reporting
  - Tonnage
  - Avoided Costs
  - Environmental Benefits
- Relieves Facility Operators from Marketing
- Domestic Mill Preference
- Fair Marketing via RFPs and Spot Quotes
  - One OCC mill in NM
- Quality Control Technical Assistance
- Education and Outreach

# Other Hub and Spoke Project Elements

- **Pay-As-You-Throw**
  - Assistance through 2013
  - Pilot Grant for Carts, Bags, Stickers
  - Only 1 PAYT NM Community
- **Landfill Rate Incentives**
  - Free Recycling Drop-Off
  - Reduced Rates for Organic Material
  - Reduced Rates for Sorted C & D

# Regional Stakeholder Development

- Elected Officials
- City/County Managers, Tribal Leadership
- Solid Waste Managers/Authority
- Citizens Groups
- Keep America Beautiful Affiliates
- Council of Governments
- Private Haulers
- NM Recycling Coalition
- NM Environment Department



# Value Proposition of Recycling

## Otero County - Recycling Diversion Estimates

|                               |  |
|-------------------------------|--|
| Population Served             | 62,776 (US Census, 2008 estimates, entire county)                                      |
| EPA Predicted MSW             | 51,555 (4.5 lbs/person/day)  |
| Disposed Tons                 | 54821 (actual, NM Environment Department Solid Waste Report 2008 figures, 2009 report) |
| Diverted Tons                 | 4710 (actual, NM Environment Department Solid Waste Report 2008 figures, 2009 report)  |
| Actual MSW Generation         | 59531 (actual, lines 4 + 5 added together)   |
| Landfill Tipping Fees Per Ton | \$15 (estimated tip fee, via Bill Lee Parker)  |
| MSW Hauling Fee Per Ton       | \$14 (estimate based on avg of 100 mile roundtrip haul)                                |

|                         | Percent of MSW <sup>1</sup> | Tons Generated | Estimated Capture Rate | Recovered Tons | Estimated \$/Ton (low market) | Gross Value | Avoided Landfill Tipping Fees | Avoided MSW Hauling Costs | Combined Value & Avoided Costs | Bale Wt | No. Bales | Tons/Hr | Total Hrs |
|-------------------------|-----------------------------|----------------|------------------------|----------------|-------------------------------|-------------|-------------------------------|---------------------------|--------------------------------|---------|-----------|---------|-----------|
| <b>Low Capture Rate</b> |                             |                |                        |                |                               |             |                               |                           |                                |         |           |         |           |
| Cardboard (OCC)         | 11.00%                      | 6,548          | 15%                    | 982            | \$65                          | \$63,847    | \$14,734                      | \$13,752                  | \$92,333                       | 0.6     | 1,637     | 2       | 491       |
| Mixed Paper (ONP#7)     | 10.00%                      | 5,953          | 15%                    | 893            | \$65                          | \$58,043    | \$13,394                      | \$12,502                  | \$83,939                       | 0.7     | 1,276     | 2       | 446       |
| Aluminum Cans (UBC)     | 0.42%                       | 250            | 10%                    | 25             | \$900                         | \$22,503    | \$375                         | \$350                     | \$23,228                       | 0.5     | 50        | 2       | 13        |
| Tin                     | 1.00%                       | 595            | 25%                    | 149            | \$50                          | \$7,441     | \$2,232                       | \$2,084                   | \$11,757                       | 0.7     | 213       | 2       | 74        |
| #1 PET Plastic Bottles  | 1.50%                       | 893            | 10%                    | 89             | \$200                         | \$17,859    | \$1,339                       | \$1,250                   | \$20,449                       | 0.4     | 223       | 2       | 45        |
| #2 HDPE Plastic Bottles | 1.50%                       | 893            | 10%                    | 89             | \$200                         | \$17,859    | \$1,339                       | \$1,250                   | \$20,449                       | 0.4     | 223       | 2       | 45        |
|                         |                             | 15,133         |                        | 2,228          |                               | \$187,552   | \$33,415                      | \$31,187                  | \$252,154                      |         | 3,622     |         | 1114      |

|                          | Percent of MSW <sup>1</sup> | Tons Generated | Estimated Capture Rate | Recovered Tons | Estimated \$/Ton (low market) | Gross Value | Avoided Landfill Tipping Fees | Avoided MSW Hauling Costs | Combined Value & Avoided Costs | Bale Wt | No. Bales | Tons/Hr | Total Hrs |
|--------------------------|-----------------------------|----------------|------------------------|----------------|-------------------------------|-------------|-------------------------------|---------------------------|--------------------------------|---------|-----------|---------|-----------|
| <b>High Capture Rate</b> |                             |                |                        |                |                               |             |                               |                           |                                |         |           |         |           |
| Cardboard (OCC)          | 11.00%                      | 6,548          | 25%                    | 1,637          | \$65                          | \$106,412   | \$24,557                      | \$22,919                  | \$153,888                      | 0.6     | 2,729     | 2       | 819       |
| Mixed Paper (ONP#7)      | 10.00%                      | 5,953          | 25%                    | 1,488          | \$65                          | \$96,738    | \$22,324                      | \$20,836                  | \$139,898                      | 0.7     | 2,126     | 2       | 744       |
| Aluminum Cans (UBC)      | 0.42%                       | 250            | 25%                    | 63             | \$900                         | \$56,257    | \$938                         | \$875                     | \$58,070                       | 0.5     | 125       | 2       | 31        |
| Tin                      | 1.00%                       | 595            | 50%                    | 298            | \$50                          | \$14,883    | \$4,465                       | \$4,167                   | \$23,515                       | 0.7     | 425       | 2       | 149       |
| #1 PET Plastic Bottles   | 1.50%                       | 893            | 25%                    | 223            | \$200                         | \$44,648    | \$3,349                       | \$3,125                   | \$51,122                       | 0.4     | 558       | 2       | 112       |
| #2 HDPE Plastic Bottles  | 1.50%                       | 893            | 25%                    | 223            | \$200                         | \$44,648    | \$3,349                       | \$3,125                   | \$51,122                       | 0.4     | 558       | 2       | 112       |
| Glass Bottles and Jars   | 4.00%                       | 2381.24        | 25%                    | 595            |                               |             |                               |                           |                                |         |           |         |           |
|                          |                             | 15,133         |                        | 4,527          |                               | \$363,586   | \$58,980                      | \$55,048                  | \$477,614                      |         | 6,521     |         | 1966      |

<sup>1</sup> Illinois & Georgia Waste Characterization Study's

<sup>2</sup> International Baler LD-60-SD-9



# How Can Colorado Implement Hub & Spoke?

- Identify Existing and Needed Recycling Processing
- Host Regional Stakeholder Meetings in Target Areas
  - Assess Viability of a Hub and ID Location(s)
  - Build Interest
- Release Funds to Build or Improve Recycling Centers
- Release Funds to Develop Spokes
- Assess Need for Marketing Coop
- Provide Ongoing Technical Assistance

# How Can NMRC Assist?

- Building Template, Sample Engineer Drawings
- RFP for Hubs, Spokes and Improvement Grants
- Equipment Specifications
- Hub/Spoke MOU Template
- Coop Membership Agreement
- Contractual Technical Assistance

# Acknowledgments

This material is also based upon work supported by the Department of Energy under Award Number DE-EE0003799 and the Department of Agriculture, Rural Utilities Program.

Disclaimer: "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."



English Bird  
Executive Director  
NMRC

[english@recyclenewmexico.com](mailto:english@recyclenewmexico.com)

505-983-4470

*Copyright 2011 New Mexico Recycling Coalition*

New Mexico Recycling Coalition



[www.recyclenewmexico.com](http://www.recyclenewmexico.com)