

Hub and Spoke Recycling




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THE RURAL RECYCLING TECHNICAL ASSISTANCE PROJECT

Rural Barriers


- Limited Volumes
- Dispersed Population
- No available capital for investment in diversion
- Historic dependence on disposal



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Rural Incentives

- Third party distant landfills
- Waste stream control
- Established drop-off systems for waste
- Limited diversion history
- Current availability of significant capital resources



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Sustainable Design

- Program design must consider long term success
- Efficiency must be cornerstone
- Partnerships are essential
- Follow the trash




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A Model for Success



- Achieves economy of scale
- Limits capital demands
- Focuses on efficiency
- Maximizes material value
- Provides regionally consistent program



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Waste Sheds




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Hub?

- **Source Separated Materials Processing**
 - Loose Material Storage & Receiving
 - Public users
 - Spoke communities
 - Baling
 - Bale Storage
 - Truck Loading



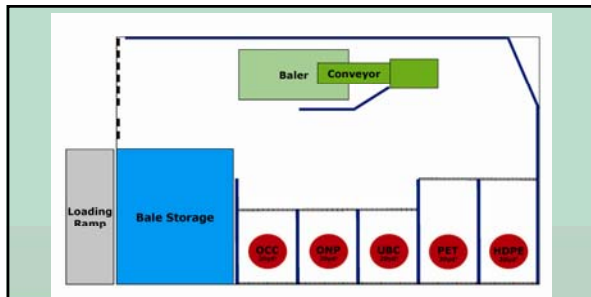
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Design Features

- Integrated drop-off area and processing system
- Collection/material storage matches bale volume demands (30 yd³ for storage when one bale = 30 yd³)
- 2,000 square foot 3 sided building
- Push walls to protect building and control loose materials
 - Sky lights to minimize lighting demands
 - One 10' wide x 12' tall rollup door
 - Integrated loading ramp
 - Interior bale storage

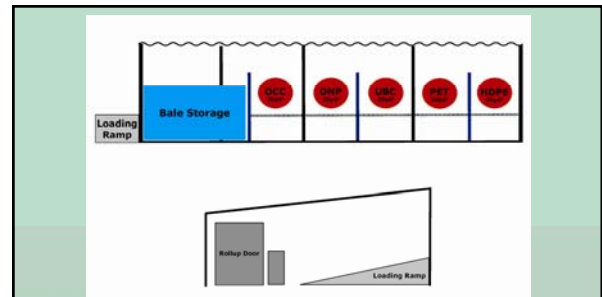


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Conceptual Hub Layout

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Hub Site Requirements

- 5 acres ideal to accommodate expansions
- 3 phase power in close proximity (+/- \$5 per foot)
- Central to ALL potential spokes
- Ideally at existing site (ie landfill)



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Hub Equipment

- Horizontal Baler
- Conveying System
- Skid loader and/or Forklift
 - ? Glass crusher
 - ? Waste oil heat
 - ? Wood chipper
 - ? HHW storage



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Equipment Details

- **Horizontal Baler**
 - Multi materials
 - Manual tie
 - Staged motors for efficiency
 - Auto Cycle



- **Conveying System**
 - Pit conveyor at grade
 - Controlled by baler



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Spoke

- Rural collection of source separated materials
- Match recycling and waste collections
- Recycling is not “new” material to be hauled



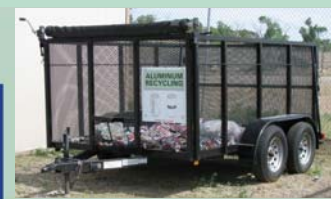
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Spoke Operations

- **Base Line Materials**
 - ONP#7 (mixed paper)
 - Plastic Bottles (#1 & #2)
 - OCC (cardboard)
 - UBC (aluminum cans)
 - Tin Cans
- **2nd Tier Materials**
 - Carpet padding
 - Lead acid batteries
 - Other paper grades
 - Glass
 - Phone Books
 - Green waste
 - E Scrap
 - Scrap metal
 - Tires



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Hub & Spoke Outreach

- Hub should establish outreach program
- Spokes follow the Hub’s program
 - Signage
 - “Language”
 - Brand
 - Accepted materials
 - Themes
 -
- A coordinated approach ensures users a consistent set of rules across several collection points.



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Operating Finances

- Operation is scalable to volume
- Reliance on existing staff is crucial
- New overhead costs include; electricity, diesel/propane, salaries & benefits, maintenance and baling wire



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Operating Income

- Based on marketed volumes
- Commodity prices are volatile so conservative estimates are essential
- Cost avoidance must be considered
- Tipping fee may be relevant for some commodities



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Additional Benefits

- Social
- Environmental
- Energy
- Sustainable Jobs



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