Trashing the Idea of a Linear Economy in Gilbert

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INTRODUCTION

Did You Know?

- Americans produce more than 250 million tons of trash each year, enough to fill 2 stadiums a day.
- Creating products from recycled materials uses up to 98 percent less energy than producing things from new materials.
- 95% of food that can be composted ends up in landfills and incinerators.
- Recycling 1 ton of Aluminum cans conserves energy equivalent to 1024 gallons of gasoline.

Project Scope

- Refine Gilbert’s bulk waste program
- Research bulk waste best management practices (BMP)
- Reduce bulk waste volume and cost per ton or mile
- Repurpose bulk waste through innovative recycling
- Recommendations to mitigate impacts

It is important to transition into a circular economy to build a sustainable community.
CURRENT SCENARIO

237,000
68.2 mi²
Zones A - D
15 Rear Loaders
10 Tractors

BULK TRASH includes furniture, mattresses, dishwashers, yard waste, glass, and televisions

PROGRAMS
- Regular monthly pickups
- Haul It Yourself
- Cardboard drop off facility
- Bulk items donation
- Appliance Recycling Program

TRANSFER STATIONS
- Germann - 60%
- San Tan - 30%
- Cactus - 10%
WASTE CHARACTERIZATION

- Green Waste, 46.55%
- Trash, 28.38%
- Wood, 16.64%
- Cardboard, 4.84%
- Metal, 3.59%
- Trash, 28.38%
- Cardboard, 4.84%
- Metal, 3.59%
- Wood, 16.64%

71.62% Diversion
56.58 Lbs. of waste per home

RESEARCH DESIGN EXPERIMENTS

RESIDENT SATISFACTION SURVEY

How many BULK services by waste type do you utilize in a calendar year?

How interested are you in additional Town wide recycling programs (green environment) (1,200 responses)

How willing would you be to drop off your green waste or bulk waste at a facility? (1,200 responses)
Stakeholders and Components of the Waste Management Value Chain
**CITY WIDE BULK WASTE INITIATIVES**

**CITY OF CHANDLER**
- Trash to Treasure
- Christmas Tree Program
- Recycling Facility

**CITY OF PHOENIX**
- Curbside Green Organics
- Compost Facility
- Mattress Recycling Program

**CITY OF TEMPE**
- Building Materials Partnership with Stardust
- Green Organics Program

**CITY OF AVONDALE**
- Green Waste

**COMMON THEMES**
- Partnerships with non profits such as Stardust & Goodwill for bulk volume reduction
- Emphasis on green waste and composting organics
- Development of new infrastructure like composting and recycling facilities
- Initiatives targeted towards high volume items such as Christmas trees & mattresses
## INTER CITIES COMPARISON

### SERVICE LEVEL

<table>
<thead>
<tr>
<th>City</th>
<th>Weekly/Monthly Pickup</th>
<th>HHW Facility</th>
<th>Free Compost Bin</th>
<th>Free Appliance Pickup</th>
<th>Free Landfill Drop-off</th>
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### COST LEVEL

#### Monthly Residential Costs

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<tr>
<td>Gilbert</td>
<td>$16.00</td>
</tr>
<tr>
<td>Chandler</td>
<td>$15.97</td>
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</tbody>
</table>

### VEHICLE MIX

- **Front Loader**
  - Tempe: 6
  - Scottsdale: 11
  - Gilbert: 15

- **Side Loader**
  - Tempe: 19
  - Scottsdale: 30

- **Rear Loader**
  - Tempe: 11
  - Scottsdale: 8

### FUEL MIX

- **Diesel**
  - Tempe: 15
  - Scottsdale: 21
  - Gilbert: 12

- **CNG**
  - Tempe: 21
  - Scottsdale: 21

### FUEL COST

- **Tempe**
  - Diesel / GAL: 1.65
  - CNG / GAL: 0.70

- **Scottsdale**
  - Diesel / MILE: 0.70
  - CNG / MILE: 0.58

- **Gilbert**
  - Diesel / MILE: 1.06
  - CNG / MILE: 1.84

- **Tempe**
  - Diesel / MILE: 29 per mile
  - CNG / MILE: 156 per ton

- **Scottsdale**
  - Diesel / MILE: 70 per mile
  - CNG / MILE: 58 per mile

- **Gilbert**
  - Diesel / MILE: 106 per mile
  - CNG / MILE: 184 per mile
SHORT TERM RECOMMENDATIONS

- Partnerships with Non Profits
- Pre Sorting
- Item Specific Initiatives
- Education & Outreach

CNG FLEET

- Generation
- Segregation
- Collection
- Recovery
- Disposal

Bar chart showing Tons of Waste for 2016 and 2017.
LONG TERM RECOMMENDATIONS

Scheduling & Fleet Improvements

Scheduling
Ex: Chandler model

Strategic Partnerships

FY 16-17 TOTAL MILES

Miles

0
5000
10000

Truck #

AVERAGE MONTHLY IDLE TIME

Time (Hours)

0
50
100

Truck #

Scheduling
Ex: Chandler model

$72,155 - METAL
$15,826 - CARDBOARD
$2,878 – E-WASTE
• CurbUp, Oceanside (https://i.ytimg.com/vi/f1OGh9swn-U/hqdefault.jpg)
• Bring (http://www.bringrecycling.org/images/bring_logo.jpg)
• Humanity storage (http://moncountyhfh.org/wp-content/uploads/2012/11/IMG_4913.jpg)
• Dan Kulpinski. (n.d.) How to Reduce Your Carbon Footprint. National Geographic
  http://channel.nationalgeographic.com/channel/human-footprint/trash-talk2.html
• Environmental Protection Agency. "10 Fast Facts on Recycling." 2013
THANK YOU! – Nalini, Anne, Frank, Giao, Class

Happy Holidays!