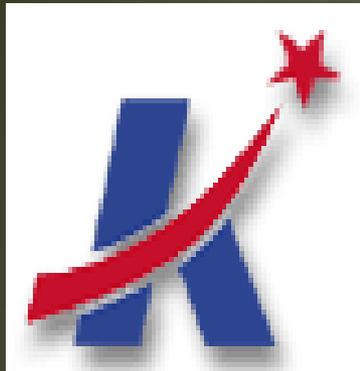


# February 2016 Briefing Regional Feasibility Study to Develop a Material Recovery Facility at Killeen Transfer Station



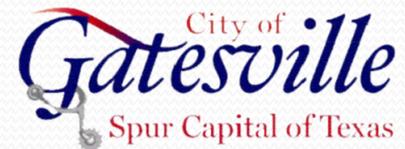
Presented by:  
Jeff Arrington, P.E.  
SCS Engineers  
February 2, 2016



# Background

# Fort Hood Recycling Study - 2011

- Cen-Tex Partnership
- Regional recycling feasibility study
  - Evaluate existing recycling center
  - Exporting recyclables outside region
  - New recycling center
- Pay-As-You-Throw and Single-Stream Recycling



# Master Plan Recommendation for MRF - 2015

- Analyzed Regional MRF in the Solid Waste Plan
- Consider adding Curbside Recycling to Replace Current Program
- Perform Feasibility Level Study for Joint MRF with Fort Hood
- New MRF would be Sized to Accommodate Modest Growth and Serve Cen-Tex Cities

# Project Overview

- *Participants*
- *Quantity Estimates*
- *Facility Planning*
- *Financial Analysis*
- *Conclusion & Recommendations*

# Current Recycling Programs

Recycling Programs					
Program Component	Fort Hood	Killeen	Copperas Cove	Harker Heights	Gatesville
<b>Sector</b>	Residential and Some Commercial	Residential and Some Commercial	Residential and Some Commercial	Residential	
<b>Collection</b>	Residential via private contract. Commercial via Fort Hood Crew	Manual Source-sorted Curbside	Single Stream Pilot	Manned Recycling Center	
<b>Collection Frequency</b>	Daily/Weekly	Once Weekly	Twice Weekly	N/A	
<b>Residential Curbside Container</b>	Carts	City-provided bins		None	None
<b>Participation</b>	Mandatory. Rate is not available	Subscription Service	Service provided to all households. Pilot Single Stream Program Implementation Phase	Varies	Unknown
<b>Equipment</b>	Collection vehicles, modular trailer, OCC baler, paper baler, conveyors, dumpsters, carts, bins	Collection vehicles, modular trailer, OCC baler, dumpsters, carts, bins	Collection vehicles, modular trailer, OCC baler, dumpsters, carts, bins	None	None

# Estimated City Quantities

Recyclable Materials	% of Total	Annual Tonnage		
		Killeen	Copperas Cove	Harker Heights
OCC	20%	1248	481.6	409.6
Mixed Paper	45%	2808	1083.6	921.6
Plastic	5%	312	120.4	102.4
Wood	5%	312	120.4	102.4
Ferrous and Nonferrous Metal/Cans	5%	312	120.4	102.4
Glass and Residual	20%	1248	481.6	409.6
<b>Total</b>	<b>100%</b>	<b>6240</b>	<b>2408</b>	<b>2048</b>

Fort Hood provided annual totals for most recent year: 5800 Tons

# Facility Planning

- **Single Stream Material Recovery Facility (MRF)**
- **44,800 SF Building**
- **Automated Sorting System**
- **Offices**
- **Located adjacent to Transfer Station**





# Horry County MRF



# Horry County MRF, cont.



# Horry County MRF, cont.



# Horry County MRF, cont.



# Horry County MRF, cont.



# Capital Costs

MRF Capital Costs	FY2016
Site Preparation	\$51,150
Earthwork	\$51,150
Utilities	\$184,140
Pavement	\$184,140
MRF Building	\$3,508,890
Offices	\$552,420
MRF Equipment	\$4,450,050
Mobile Equipment	\$818,400
Engineering/Testing	\$491,040
Contingency (15%)	\$1,543,707
<b>TOTAL</b>	<b>\$11,835,087</b>

# Cities Revenue

Cities Revenue	Revenue/ton (FY2015 \$) <sup>2</sup>	% of Throughput	Year				
			FY2016	FY2017	FY2018	FY2019	FY2020
Material Throughput (tons) <sup>1</sup>	-	100%	10,835	10,976	11,119	11,263	11,410
Waste Streams <sup>2</sup>							
OCC	\$95.00	20%	\$210,606.06	\$218,250.84	\$226,173.13	\$234,382.99	\$242,890.86
Mixed Paper	\$60.00	45%	\$299,282.29	\$310,145.94	\$321,403.92	\$333,070.57	\$345,160.69
Plastic	\$50.00	5%	\$27,711.32	\$28,717.22	\$29,759.62	\$30,839.87	\$31,959.32
Wood	\$2.00	5%	\$1,108.45	\$1,148.69	\$1,190.38	\$1,233.59	\$1,278.37
Ferrous and Nonferrous Metal/Cans	\$300.00	5%	\$166,267.94	\$172,303.30	\$178,557.74	\$185,039.20	\$191,755.94
Residual	(\$38.00)	20%	(\$84,242.42)	(\$87,300.34)	(\$90,469.25)	(\$93,753.20)	(\$97,156.34)
<b>TOTAL</b>	<b>-</b>	<b>-</b>	<b>\$631,569</b>	<b>\$654,242</b>	<b>\$677,734</b>	<b>\$702,076</b>	<b>\$727,299</b>

1 - Material Throughput for Killeen was based on FY2015 throughput 6,240 tpy. The other cities were based on CY2013 population estimates, a 5 lb/year waste generation rate, a 52% residential disposal, and 12% recycling rate. An average growth rate of 1.3% was used to determine FY2016 acceptance

2 - Pricing based on average recent market pricing for Houston Southcentral USA

	Waste	Population	lb/year/person	% Residential	% Recycled
Killeen	6,240 tpy				
Copperas Cove	2,408 tpy	42,293	1825	52%	12%
Harker Heights	2,048 tpy	35,969	1825	52%	12%

# Fort Hood Revenue

Ft. Hood Revenue	Revenue/ton (FY2015 \$) <sup>2</sup>	% of Throughput	Year				
			FY2016	FY2017	FY2018	FY2019	FY2020
Material Throughput (tons) <sup>1</sup>	-	100%	5,875	5,952	6,029	6,108	6,187
Waste Streams							
OCC	\$95.00	44%	\$251,240.33	\$260,360.10	\$269,810.91	\$279,604.78	\$289,754.15
Mixed Paper	\$60.00	34%	\$122,614.90	\$127,065.70	\$131,678.05	\$136,457.84	\$141,411.12
Plastic	\$50.00	5%	\$15,026.34	\$15,571.78	\$16,137.02	\$16,722.77	\$17,329.79
Wood	\$2.00	5%	\$601.05	\$622.87	\$645.48	\$668.91	\$693.19
Ferrous and Nonferrous Metal/Car	\$300.00	3%	\$54,094.81	\$56,058.40	\$58,093.26	\$60,201.99	\$62,387.26
Residual	(\$38.00)	8%	(\$18,272.02)	(\$18,935.28)	(\$19,622.61)	(\$20,334.89)	(\$21,073.03)
<b>TOTAL</b>	-	-	<b>\$431,181</b>	<b>\$446,695</b>	<b>\$462,771</b>	<b>\$479,429</b>	<b>\$496,689</b>

1 - Material Throughput based on FY2015 throughput of 5,800 tpy and an average growth rate of 1.3%

2 - Pricing based on average recent market pricing for Houston Southcentral USA

Ft Hood	5,800 tpy	Waste			
Killeen	6,240 tpy	Population	lb/year/perso	% Residential	% Recycled
Copperas Cove	2,408 tpy	42,293	1825	52%	12%
Harker Heights	2,048 tpy	35,969	1825	52%	12%
Gatesville	1,159 tpy	20,360	1825	52%	12%

# O & M Summary

MRF O&M <sup>1</sup>	Year				
	FY2016	FY2017	FY2018	FY2019	FY2020
Personnel <sup>2</sup>	\$941,160	\$962,807	\$984,951	\$1,007,605	\$1,030,780
Equipment Maintenance <sup>3</sup>	\$267,003	\$273,144	\$279,426	\$285,853	\$292,428
Equipment power <sup>4</sup>	\$57,145	\$58,460	\$59,804	\$61,180	\$62,587
Utilites (Building electric, water, etc.)	\$20,460	\$20,931	\$21,412	\$21,904	\$22,408
Supplies and Fuel	\$40,920	\$41,861	\$42,824	\$43,809	\$44,817
Building Maintenance	\$10,230	\$10,465	\$10,706	\$10,952	\$11,204
<b>TOTAL</b>	<b>\$1,336,918</b>	<b>\$1,367,667</b>	<b>\$1,399,124</b>	<b>\$1,431,304</b>	<b>\$1,464,224</b>

1 - Increase from FY2015 by 2.3% Inflation

2 - 23 Personnel @ \$40K/year in FY2015

3 - 6% of Equipment Capital Costs in FY2015

4 - Electricity Based on 230 HP (173KW motors), 60% power usage, \$0.12/KWh (2015), 3,012 hrs/yr + Baler  
Based on 200 HP (150KW motors), 80% power usage, \$0.15/KWh (2015), 2,080 hrs/yr

# Summary of Revenue and Cost Estimates

MRF Summary	Year				
	FY2016	FY2017	FY2018	FY2019	FY2020
O&M	(\$1,336,918)	(\$1,367,667)	(\$1,399,124)	(\$1,431,304)	(\$1,464,224)
Debt Service	(\$832,729)	(\$832,729)	(\$832,729)	(\$832,729)	(\$832,729)
Revenue	\$1,062,750	\$1,100,937	\$1,140,506	\$1,181,505	\$1,223,988
<b>TOTAL</b>	<b>(\$1,106,898)</b>	<b>(\$1,099,460)</b>	<b>(\$1,091,348)</b>	<b>(\$1,082,528)</b>	<b>(\$1,072,965)</b>

# Curbside Collection Costs

Curbside Collection Costs	Year
	FY2016
Equipment O&M	\$252,000
Labor	\$220,646
Truck Amortization	\$333,667
Cart Amortization - Single Cart Program	\$265,650
Cart Amortization - Multi Cart Program	\$414,920
Public Education	\$50,000
City Administrative Overhead - Single	\$428,785
City Administrative Overhead - Multi	\$549,555
<b>Total Expenses - Single Cart Program</b>	<b>\$1,550,748</b>
<b>Total Expenses - Multi Cart Program</b>	<b>\$1,820,788</b>
Avoidance Costs <sup>1</sup>	(\$237,120)
<b>Total Expenses - Single Cart Program</b>	<b>\$1,313,628</b>
<b>Total Expenses - Multi Cart Program</b>	<b>\$1,583,668</b>

1 - Based on a \$38/ton disposal fee, City of Killeen's Throughput, 1.3% growth, and 2.3% inflation.

# Institutional Arrangements

- Inter-local agreement
- Revenue/Cost sharing between participants
- Waste Authorities
- Tipping Fees



# Financing and Funding

- COG
- Bonds
- Other



# Conclusions

1. Estimated capital cost to develop MRF – \$11.8 mil
2. Estimated annual operating costs exceed revenues expected from sale of materials
3. Potential to increase revenues in future

# Recommendations

- Determine if the City and Fort Hood are committed to implementation of a regional MRF
  - Develop agreements between Fort Hood and City
  - Implement curbside recycling in the City
- Consider expanding commercial recycling as an alternative to curbside recycling and MRF

*Thank You!*

# Questions?



**Jeff Arrington, P.E.**

**SCS Engineers, Bedford, Texas  
(817) 571-2288**