October 10, 2017 | 9:00 AM – 12:00 PM

A MSW Generation and Diversion Forecast for the H-GAC Planning Region

H-GAC

NewGen Strategies & Solutions

ECONOMICS STRATEGY STAKEHOLDERS SUSTAINABILITY

www.newgenstrategies.net

Workshop Agenda

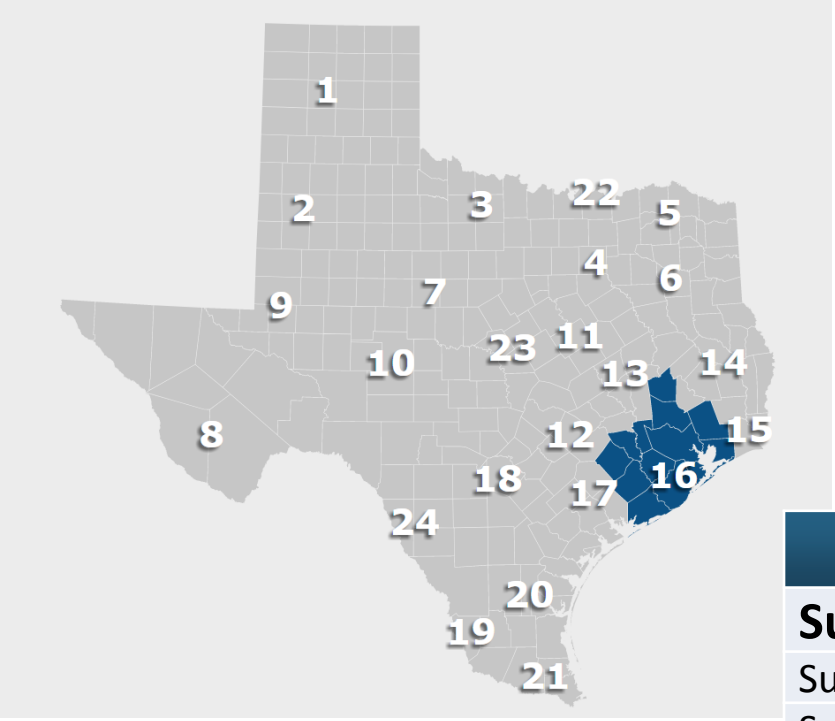
- Project Background
- Purpose of Project
- Data Sources
- Forecasts
- Analysis
- Findings and Recommendations
- Conclusion

Project Background

Project Background

- In 2005, H-GAC retained R. W. Beck, Inc. to conduct a *Regional Solid Waste Characterization Study* (2005 Study)
- In January 2017, H-GAC retained NewGen to conduct *A Municipal Solid Waste Generation and Diversion Forecast for the H-GAC Planning Region* (2017 Study)

H-GAC Subregions



H-GAC Subregions	
Subregion	**Counties**
Subregion 1	Montgomery, Walker
Subregion 2	Chambers, Liberty
Subregion 3	Galveston
Subregion 4	Brazoria
Subregion 5	Colorado, Matagorda, Wharton
Subregion 6	Austin, Waller
Subregion 7	Fort Bend
Subregion 8	Harris

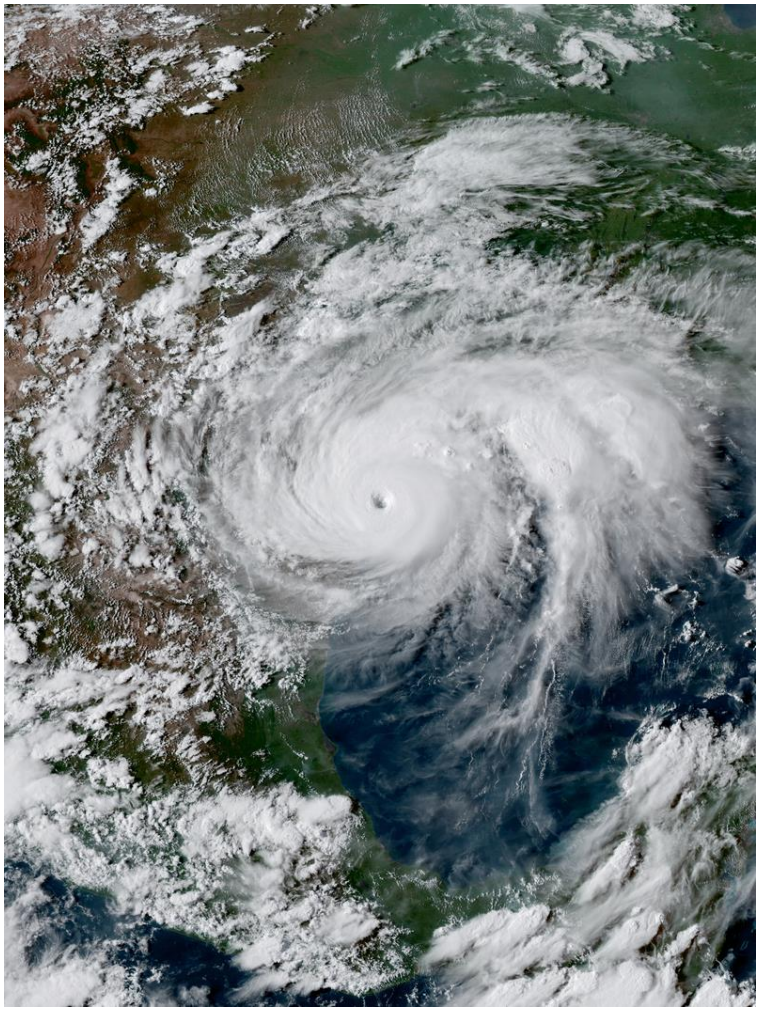
Purpose of Project

Purpose of Project

To provide H-GAC with a tool to aid in its effort to provide regional solid waste disposal capacity planning for the H-GAC region.

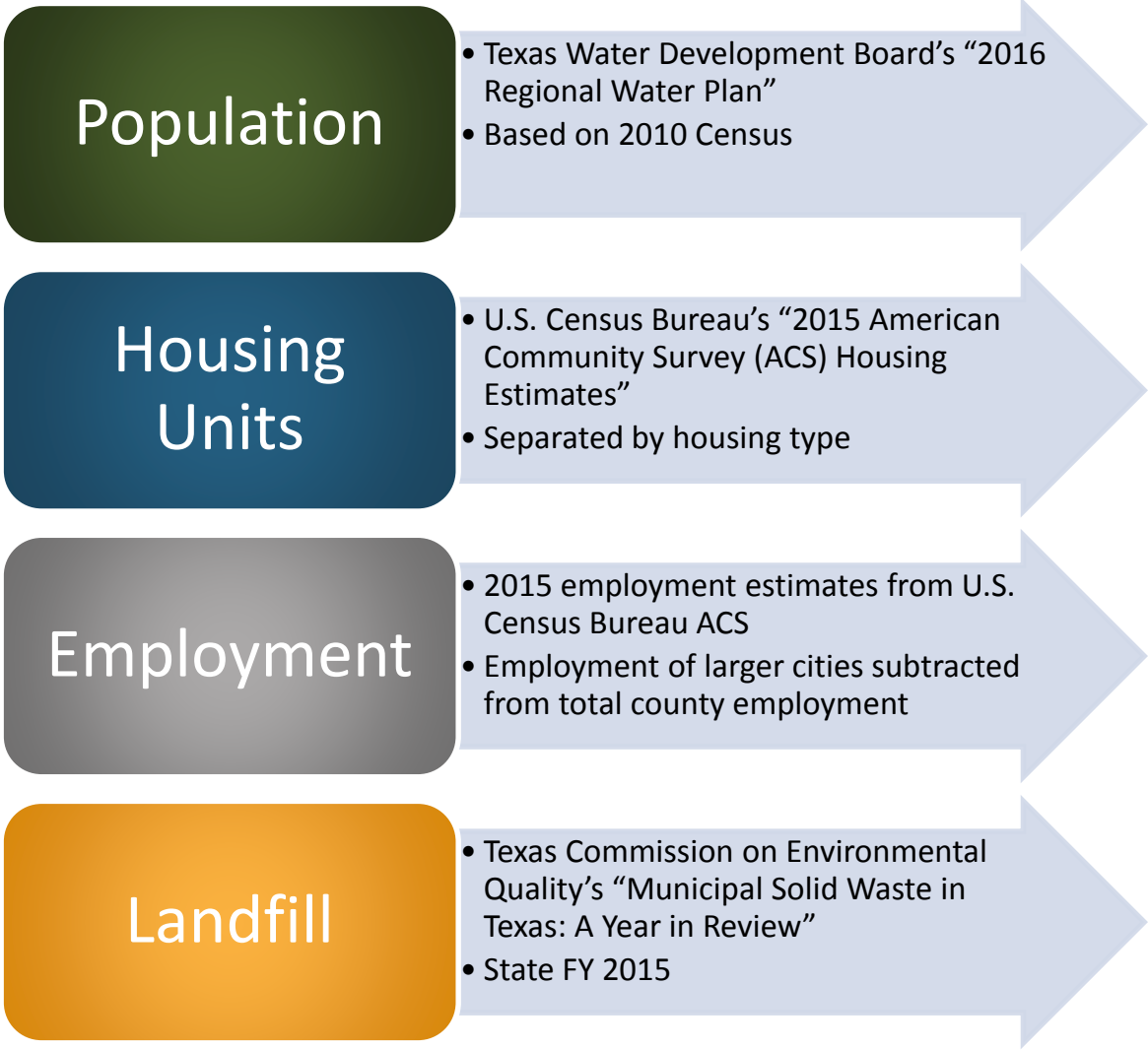
Disclaimer

The project forecasts and associated analyses were completed prior to Hurricane Harvey making landfall in Texas during late August 2017.



Data Sources

Data Sources – Overview



Data Sources – Population

	2005	2017
Population	▪ 8 major counties: H-GAC data ▪ 5 minor counties: Texas State Data Center (TSDC)	▪ Texas Water Development Board (TWDB) • Projections by City • Projections by County • 100% coverage, except for The Woodlands • (2016 population <1% difference between TWDB and TSDC estimates)

Data Sources – Housing

	2005	2017
Housing	▪ 8 major counties: H-GAC data ▪ 5 minor counties: U.S. Census Bureau: 2000 Census	▪ U.S. Census Bureau: 2015 American Community Survey (ACS) Housing Estimates ▪ Single-Family/Multi-Family by City ▪ Single-Family/Multi-Family by County ▪ 100% coverage

Data Sources – Housing (cont.)

2015 American Community Survey (ACS) Housing Estimates

- 1-unit, detached
- 1 unit, attached
- 2 units
- 3 or 4 units
- 5 to 9 units
- 10 to 19 units
- 20 or more units
- Mobile home
- Boat, RV, van etc.

EXAMPLE:
In 2015 Sealy had 1,895 occupied housing units categorized as single-family housing (versus a total of 2,263 total occupied housing units), which means approximately 83.74% of residents in Sealy live in single-family housing

Data Sources – Employment

	2005	2017
Employment	▪ 8 major counties: H-GAC data ▪ 5 minor counties: Texas Workforce Commission historical	▪ Census Bureau: 2015 ACS Employment Estimates ▪ Employment by City ▪ Employment by County ▪ 100% coverage

Data Sources – City Survey

Figure 2-1. H-GAC City Survey Introduction Screen

Data Sources – City Survey (cont.)

City Survey Distribution				
Alvin	Dayton	Houston	Liberty	Texas City
Angleton	Deer Park	Humble	Manvel	The Woodlands
Bay City	Dickinson	Huntsville	Missouri City	Webster
Baytown	El Campo	Jacinto City	Palacios	West University Place
Bellaire	Freeport	Jersey Village	Pasadena	Wharton
Bellville	Friendswood	Katy	Pearland	Willis
Cleveland	Galena Park	La Marque	Richmond	
Clute	Galveston	La Porte	Rosenberg	
Columbus	Hempstead	Lake Jackson	Seabrook	
Conroe	Hitchcock	League City	Sugar Land	

Data Sources – City Survey (cont.)

City Survey Responses	
Alvin	League City
Bellaire	Missouri City
Bellville	Pasadena
Dickinson	Seabrook
Houston	Sugar Land
Huntsville	Texas City
La Porte	The Woodlands

Forecasts

Forecasts – Population

- Population forecasts
  - Based on 2010 TWDB data (in 10-year increments)
  - Calculated compound annual growth rate (CAGR) for each city and county, for each 10-year period)
  - Austin County was 28,417 in 2010 and is projected to be 33,014 in 2020, which equates to a CAGR of 1.51%

AUSTIN COUNTY EXAMPLE:

((33,014 population 2020 ÷ 28,417 population 2010)^(1 ÷ 10 years)) – 1 = 1.51% CAGR for 2010 – 2020

Forecasts – Population (cont.)

Table 3-1
Total Residential Population Forecast

City	County	2016	2021	2026	2031	2036
Alvin	Brazoria	25,761	27,024	28,014	29,056	30,205
Angleton	Brazoria	18,983	19,078	19,150	19,221	19,288
Bay City	Matagorda	18,315	18,894	19,384	19,849	20,164
Baytown	Harris	74,110	75,884	76,869	77,878	78,948
Bellaire	Harris	17,022	17,278	18,012	18,779	19,582
Bellville	Austin	4,268	4,418	4,581	4,750	4,925
Small Cities & Unincorporated[1]	Waller	36,084	39,987	44,149	48,660	53,287
Small Cities & Unincorporated[1]	Wharton	21,719	22,480	23,293	24,091	24,743
H-GAC TOTAL		**6,787,681**	**7,393,712**	**7,821,751**	**8,265,379**	**8,663,781**

1 "Small Cities & Unincorporated" is the remaining population in each county, determined by subtracting the combined population of the cities above from their respective total county population in any given year.

Forecasts – Employment

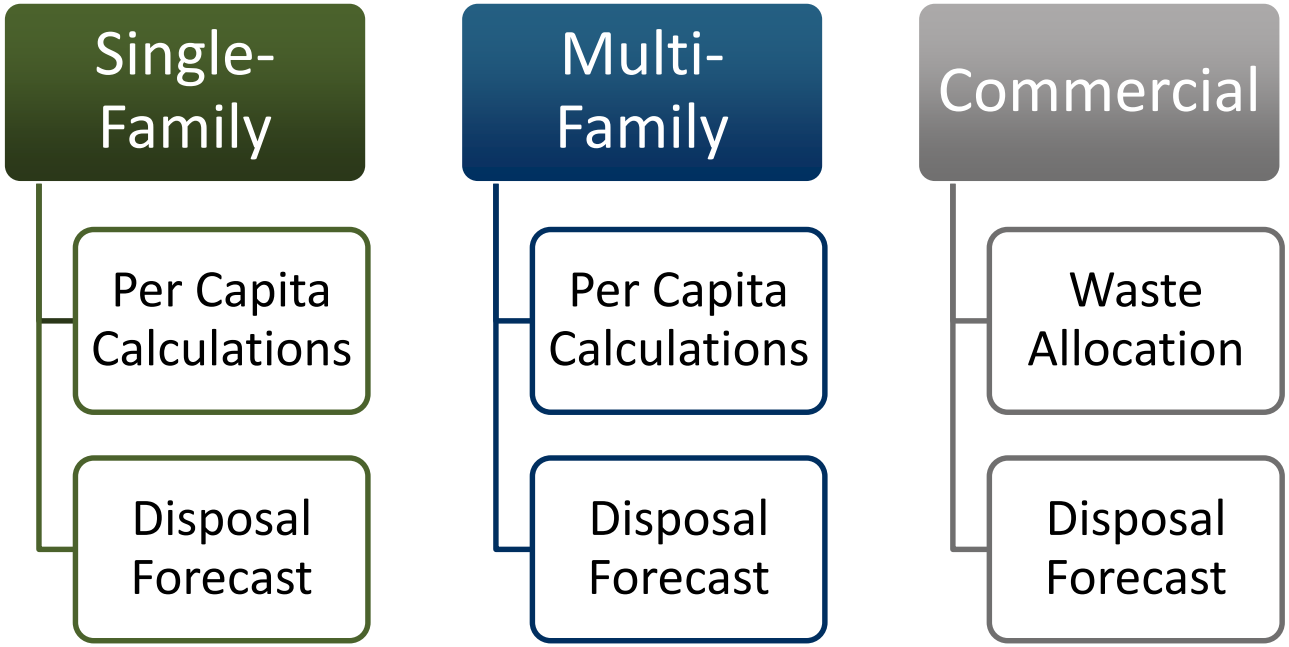
- 2015 employment estimates used to determine ratios of employment relevant to total population

Table 3-4
Employment Forecast for the H-GAC Region

City	County	Ratio	2016	2021	2026	2031	2036
Alvin	Brazoria	47.52%	12,241	12,841	13,312	13,807	14,353
Angleton	Brazoria	44.87%	8,517	8,560	8,592	8,624	8,654
Bay City	Matagorda	42.48%	7,779	8,025	8,234	8,431	8,565
Baytown	Harris	41.63%	30,851	31,590	32,000	32,420	32,865
Bellaire	Harris	50.43%	8,584	8,713	9,083	9,470	9,875
Bellville	Austin	46.35%	1,978	2,048	2,124	2,202	2,283
Unincorporated[1]	Waller	43.19%	15,586	17,272	19,069	21,018	23,016
Unincorporated[1]	Wharton	45.43%	9,866	10,212	10,581	10,944	11,240
H-GAC TOTAL		**46.03%**	**3,122,941**	**3,394,831**	**3,586,407**	**3,784,766**	**3,963,309**

1 "Small Cities & Unincorporated" is the remaining employment in each county, determined by subtracting the combined employment of the cities above from their respective total county employment in any given year.

Forecasts – Generation and Disposal



An important observation by NewGen between the time of the 2005 Study and the 2017 Study is the significant increase in composting and mulching facilities located within the H-GAC region, that were not in existence in 2005. This has had a significant impact upon the decrease in the disposal rate on a per capita basis.

Forecasts – Generation and Disposal (cont.)

Table 3-5
Surveyed Cities Single-Family Per Capita Calculations

City	SF Garbage (tons/year)	SF Brush (tons/year)	SF Bulky (tons/year)	SF Recycling (tons/year)	SF Total (tons/year)	2016 SF Population	Generation Per Capita[4]	Disposal Per Capita[5]
Bellville	2,736	58	64	202	3,060	3,509	**0.8722**	**0.7981**
Alvin[1]	6,213	-	631	1,501	8,345	18,488	**0.4514**	**0.3702**
Missouri City	14,945	2,079	839	2,101	19,964	71,944	**0.2775**	**0.2194**
Sugar Land	40,420[2]	8,388	-	15,655	64,462	85,693	**0.7522**	**0.4717**
Dickinson	10,600	250	-	1,200	12,050	15,950	**0.7555**	**0.6646**
League City	42,044	-	-	3,833	45,877	80,585	**0.5693**	**0.5217**
Texas City	15,851	4,061	7,500	978	28,390	36,274	**0.7827**	**0.6437**
Bellaire	6,318	1,579	157	1,958	10,012	16,101	**0.6218**	**0.4021**
Houston	385,660	54,479	287,064	58,036	785,239	1,038,448[3]	**0.7562**	**0.6478**
La Porte	11,999	7,827	15,213	6,225	41,264	29,563	**1.3958**	**0.9205**
Pasadena[1]	46,815	-	22,177	1,635	70,627	99,834	**0.7074**	**0.6911**
Seabrook	5,464	-	-	572	6,036	7,707	**0.7832**	**0.7090**
The Woodlands	33,391	2,073	-	14,087	49,551	91,141	**0.5437**	**0.3664**
Huntsville	5,845	327	510	1,449	8,130	21,945	**0.3705**	**0.2896**

1 Tonnage data for Brush and Bulky items were combined for these cities, NewGen assumed all tonnage was disposed in landfills due to the comingling of these categories.
2 Sugar Land SF Garbage tonnage includes Bulky tonnage.
3 Single-family population of Houston served by City, excluding private sector customers. City serves 386,628 single-family households out of the 431,666 total single-family households = approx. 89.57%. Total Houston single-family population in 2016 = 1,159,415 X 89.57% = 1,038,448 Single-family population served by City.
4 Total SF tonnage / 2016 SF Population = Generation Per Capita, shown in (tons/capita/year).
5 SF Garbage tonnage + SF Bulky tonnage / 2016 SF Population = Disposal Per Capita, shown in (tons/capita/year). NewGen assumed all Brush was diverted from landfills.

Any arithmetic differences are due to rounding.

Forecasts – Generation and Disposal (cont.)

- NewGen calculated a weighted average, single-family per capita disposal rate using the data provided by the 14 cities.

Table 3-6
Single-Family Disposal Per Capita in the H-GAC Region

	Tonnage	Population	Disposal Per Capita[5] (tons/capita/year)
Single-Family Garbage	628,300	1,617,182[3]	0.3885
Single-Family Brush[1]	-	-	-
Single-Family Bulky[2]	334,155	1,336,105[4]	0.2501
Single-Family Total			0.6386

1 NewGen assumed all brush tonnage collected on dedicated brush routes is diverted from the landfill.
2 Bulky tonnage includes some Brush tonnage due to the comingling of these materials in areas without dedicated routes for Brush pick-up.
3 Total single-family population of all 14 cities who returned tonnage data for single-family garbage.
4 Total single-family population of the 9 cities who returned tonnage data for single-family bulky.
5 Per Capita = Tonnage / Population.

Forecasts – Generation and Disposal (cont.)

Table 3-7
Single-Family Disposal Forecast (Tons)

City	County	2016	2021	2026	2031	2036
Alvin	Brazoria	6,844	7,180	7,443	7,720	8,025
Angleton	Brazoria	8,860	8,904	8,938	8,971	9,002
Bay City	Matagorda	8,414	8,680	8,905	9,118	9,263
Baytown	Harris	33,093	33,885	34,325	34,775	35,253
Bellaire	Harris	6,475	6,572	6,851	7,143	7,449
Bellville	Austin	2,800	2,898	3,005	3,116	3,231
Small Cities & Unincorporated[1]	Waller	21,517	23,845	26,326	29,017	31,776
Small Cities & Unincorporated[1]	Wharton	13,549	14,024	14,530	15,029	15,435
H-GAC TOTAL		**3,137,926**	**3,445,950**	**3,660,951**	**3,884,426**	**4,084,045**

1 "Small Cities & Unincorporated" is the remaining tonnage in each county, determined by subtracting the combined tonnage of the cities above from their respective total county tonnage in any given year.

Forecasts – Multi-Family

- Limited multi-family data available
- Assumed multi-family per capita
  - Single-family garbage + single-family bulky
  - NewGen assumed that brush/yard waste would be disposed/diverted by professional landscapers

Multi-Family Per Capita Disposal Rate: 0.6386 tons

Forecasts – Multi-Family (cont.)

Table 3-8
Multi-Family Disposal Forecast (Tons)

City	County	2016	2021	2026	2031	2036
Alvin	Brazoria	2,692	2,824	2,928	3,037	3,157
Angleton	Brazoria	3,263	3,279	3,292	3,304	3,316
Bay City	Matagorda	3,282	3,386	3,474	3,557	3,614
Baytown	Harris	14,235	14,576	14,765	14,959	15,164
Bellaire	Harris	370	376	392	409	426
Bellville	Austin	606	627	651	675	699
Small Cities & Unincorporated[1]	Waller	1,526	1,691	1,867	2,058	2,254
Small Cities & Unincorporated[1]	Wharton	321	333	345	356	366
H-GAC TOTAL		**1,122,859**	**1,191,597**	**1,244,525**	**1,298,804**	**1,349,023**

1 "Small Cities & Unincorporated" is the remaining tonnage in each county, determined by subtracting the combined tonnage of the cities above from their respective total county tonnage in any given year.

Forecasts – Commercial

- Commercial MSW is allocated based on employment

Table 3-9
City of Katy Commercial Waste Allocation

Katy Employment 2017	8,420
Total Employment H-GAC Region	3,179,732
Percentage of Total	0.26%
Total Commercial MSW Tonnage to be Allocated in 2017	4,812,250
Commercial MSW Tonnage Allocated to Katy	**12,743**

Any arithmetic differences are due to rounding.

Forecasts – Commercial (cont.)

Table 3-10
Commercial Disposal Forecast (Tons)

City	County	2016	2021	2026	2031	2036
Alvin	Brazoria	18,514	19,475	20,219	21,001	21,853
Angleton	Brazoria	12,882	12,982	13,051	13,118	13,176
Bay City	Matagorda	11,766	12,172	12,506	12,824	13,041
Baytown	Harris	46,662	47,911	48,605	49,313	50,039
Bellaire	Harris	12,983	13,215	13,797	14,404	15,035
Bellville	Austin	2,992	3,106	3,225	3,349	3,476
Small Cities & Unincorporated[1]	Waller	23,573	26,196	28,964	31,970	35,043
Small Cities & Unincorporated[1]	Wharton	14,922	15,488	16,071	16,646	17,113
H-GAC TOTAL		**4,723,400**	**5,148,780**	**5,447,405**	**5,756,838**	**6,034,325**

1 "Small Cities & Unincorporated" is the remaining tonnage in each county, determined by subtracting the combined tonnage of the cities above from their respective total county tonnage in any given year.

Total Annual Disposal Forecast

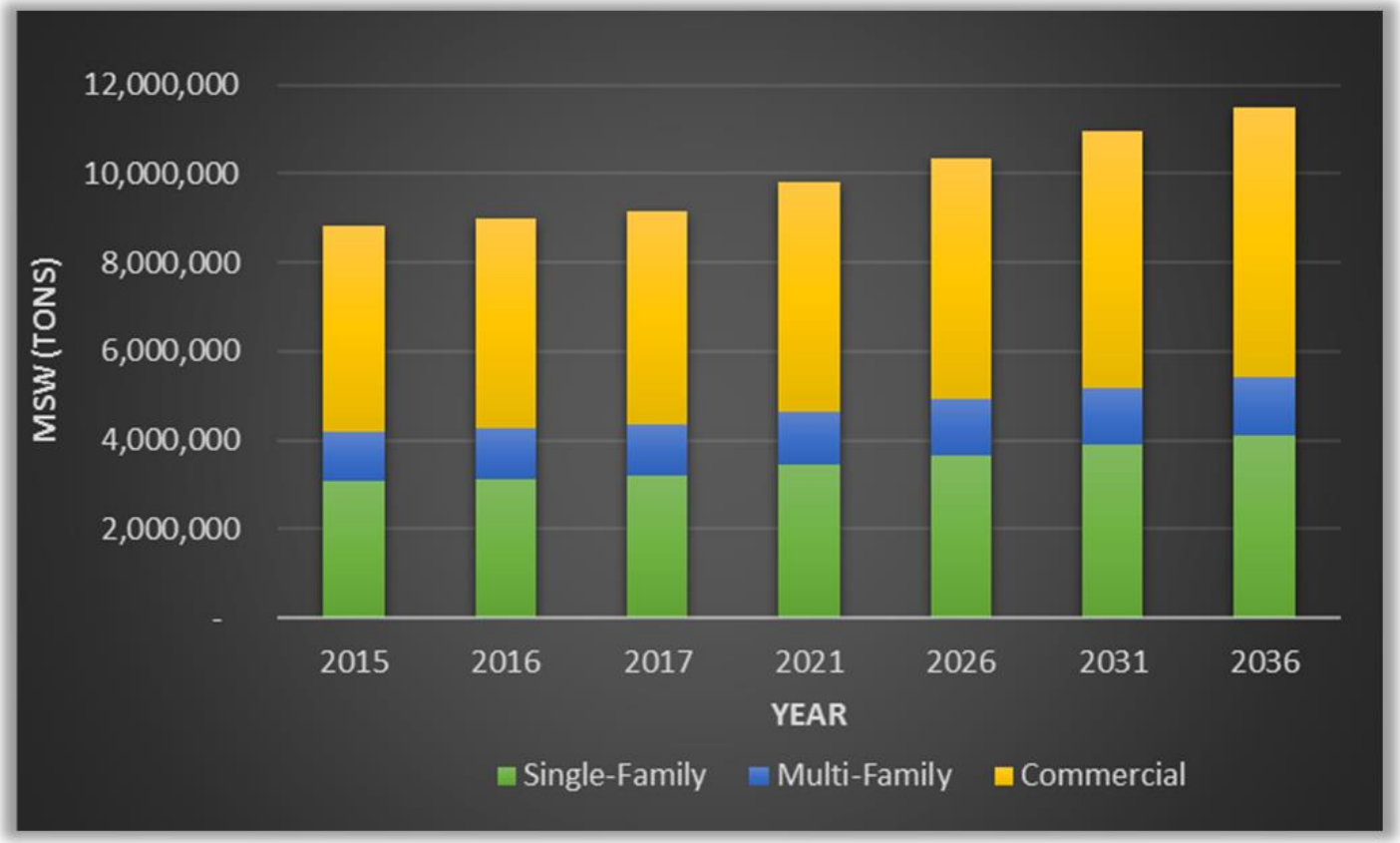


Figure 3-1: Total MSW Forecast

Total Annual Disposal Forecast (cont.)

Table 3-11
Total Disposal Forecast

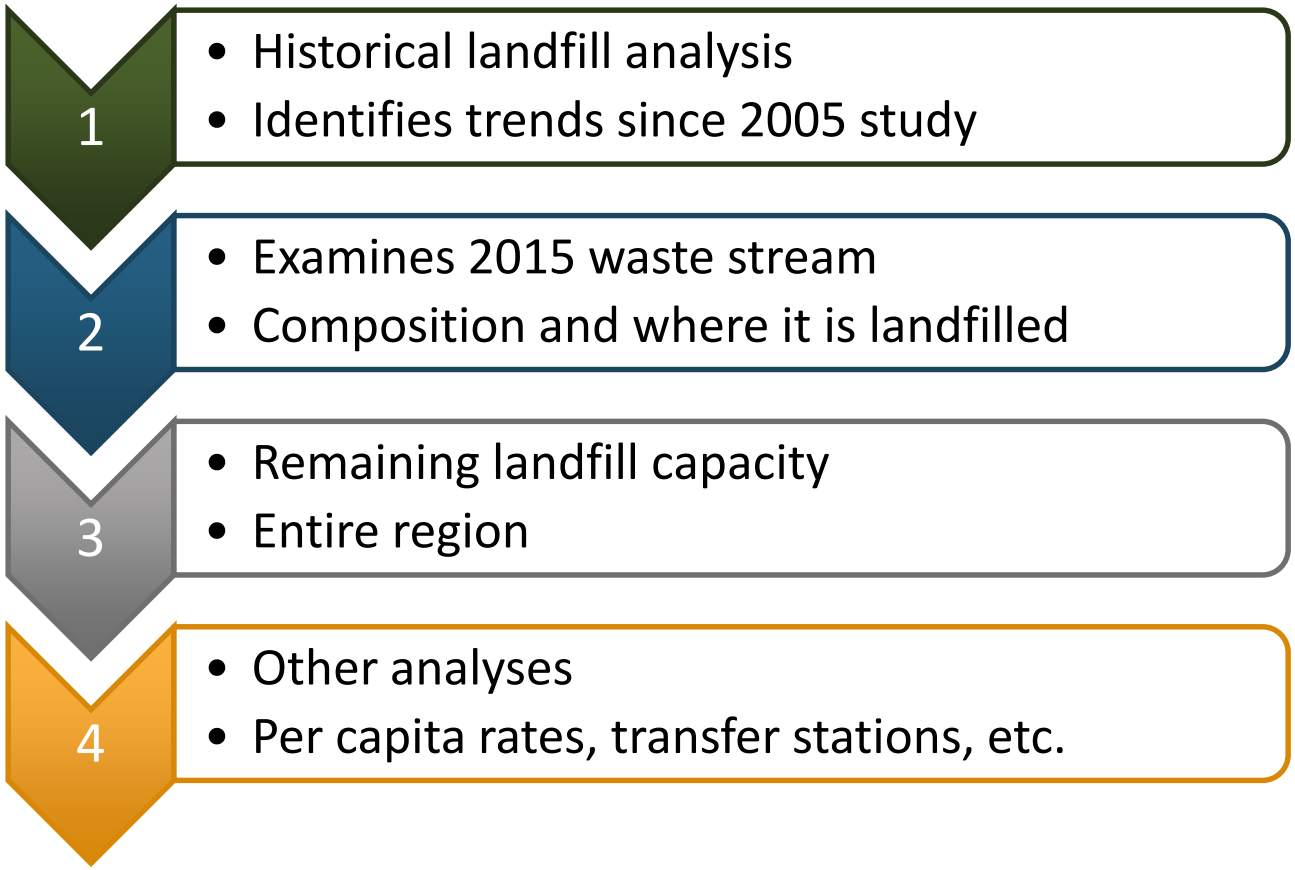
City	County	2016	2021	2026	2031	2036
Alvin	Brazoria	28,051	29,480	30,590	31,758	33,035
Angleton	Brazoria	25,005	25,166	25,280	25,393	25,494
Bay City	Matagorda	23,462	24,237	24,885	25,499	25,918
Baytown	Harris	93,989	96,372	97,694	99,047	100,456
Bellaire	Harris	19,829	20,163	21,040	21,956	22,910
Bellville	Austin	6,398	6,632	6,881	7,140	7,407
Small Cities & Unincorporated[1]	Waller	46,617	51,732	57,158	63,045	69,073
Small Cities & Unincorporated[1]	Wharton	28,793	29,844	30,946	32,031	32,915
H-GAC TOTAL		**8,984,184**	**9,786,327**	**10,352,881**	**10,940,068**	**11,467,393**

1 "Small Cities & Unincorporated" is the remaining tonnage in each county, determined by subtracting the combined tonnage of the cities above from their respective total county tonnage in any given year.

Analysis

Analysis

- Analyses performed by NewGen



Historical Landfill Analysis

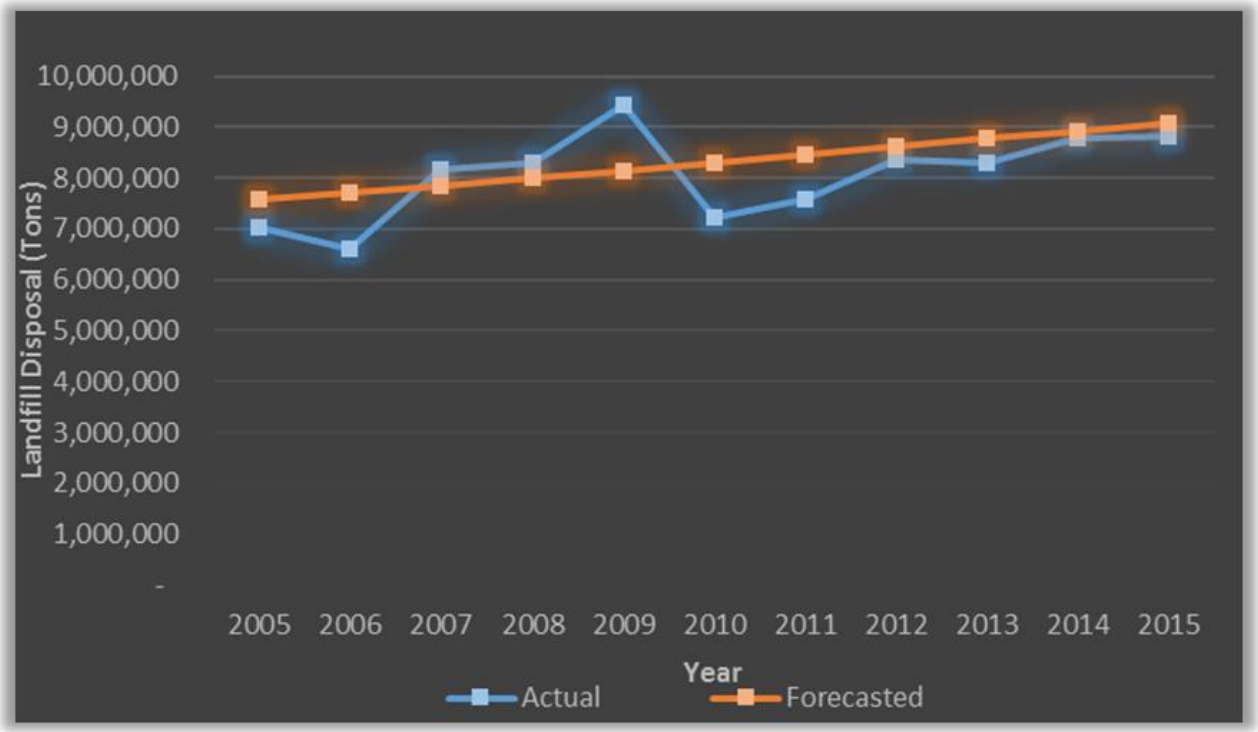


Figure 4-1: Forecasted 2005 Study Tonnage Disposed vs. Actual Annual Tonnage Disposed

The difference in actual tonnage versus forecasted tonnage fluctuates annually, but the cumulative forecasted tonnage was only 3.10% higher than the reported tonnage for the period of 2005 to 2015.

Historical Landfill Analysis (cont.)

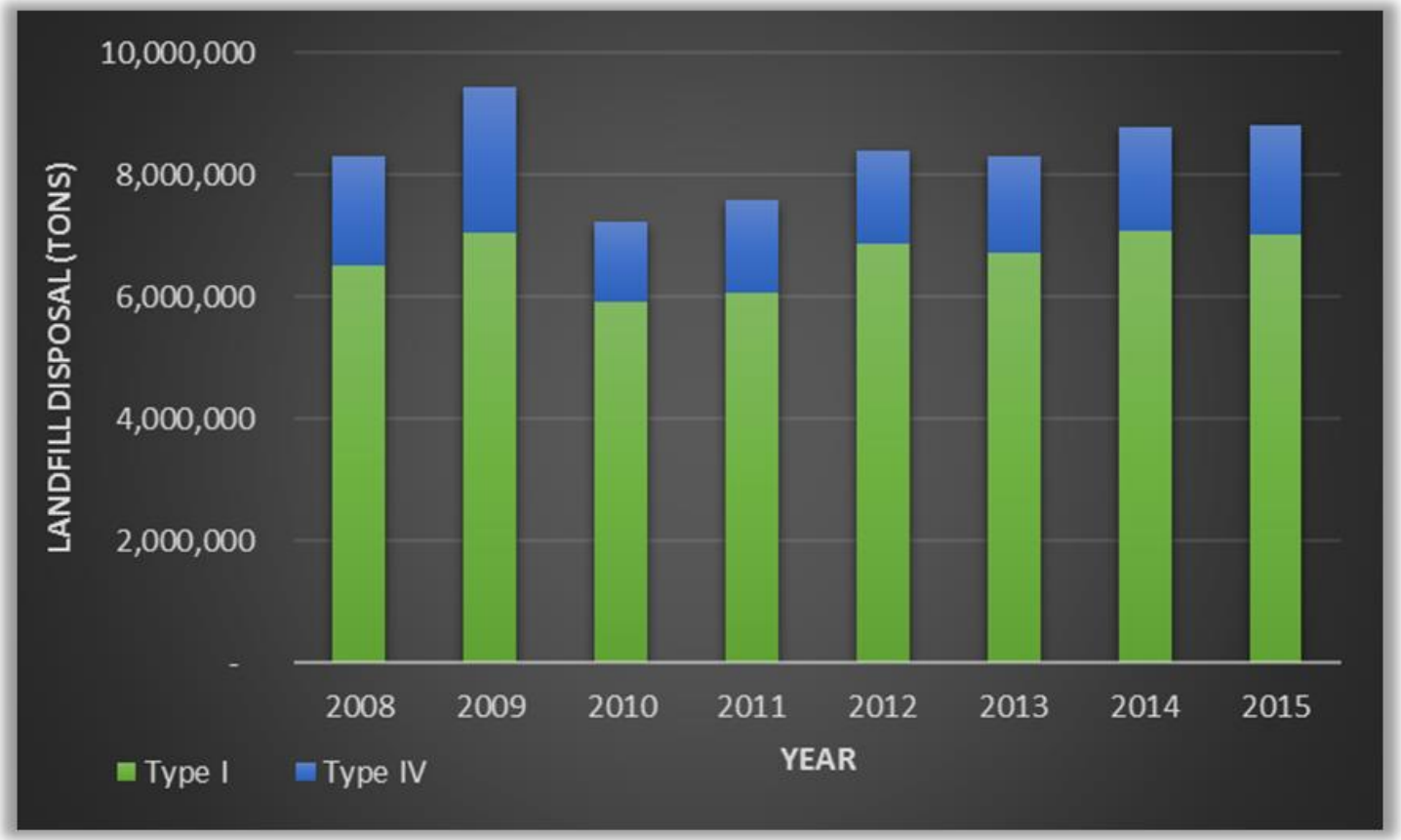


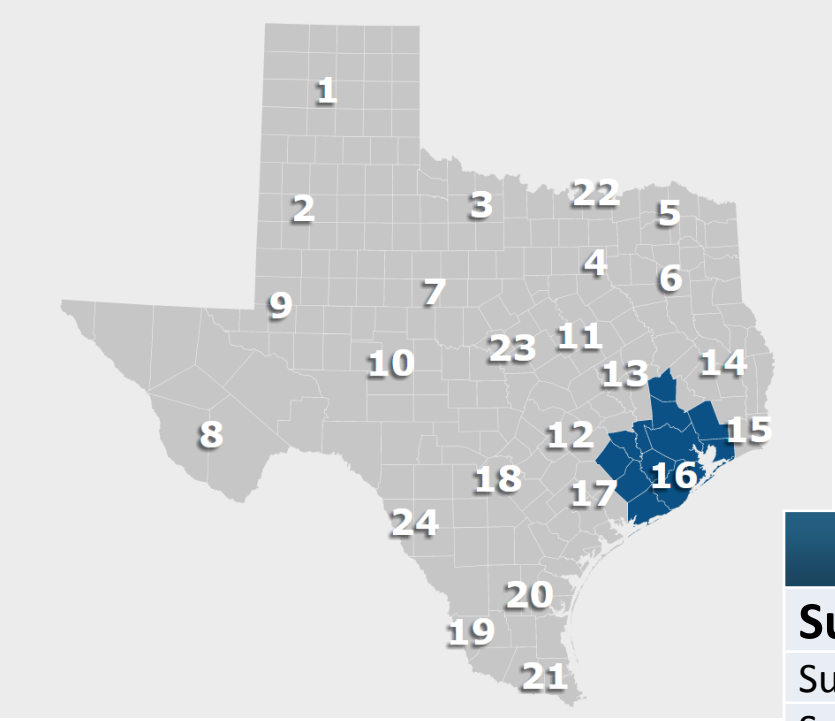
Figure 4-2: Tonnage Disposed in Type I vs. Type IV Landfills (2008-2015)

Historical Landfill Analysis (cont.)

Table 4-1
Breakdown of Total Waste Landfilled in the H-GAC Region

	2008	2009	2010	2011	2012	2013	2014	2015
Type I	78.57%	74.76%	82.18%	80.03%	82.01%	81.09%	80.74%	79.50%
Type IV	21.43%	25.24%	17.82%	19.97%	17.99%	18.91%	19.26%	20.50%

Just a reminder…



H-GAC Subregions	
Subregion	**Counties**
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Subregion 8	Harris

Historical Landfill Analysis (cont.)

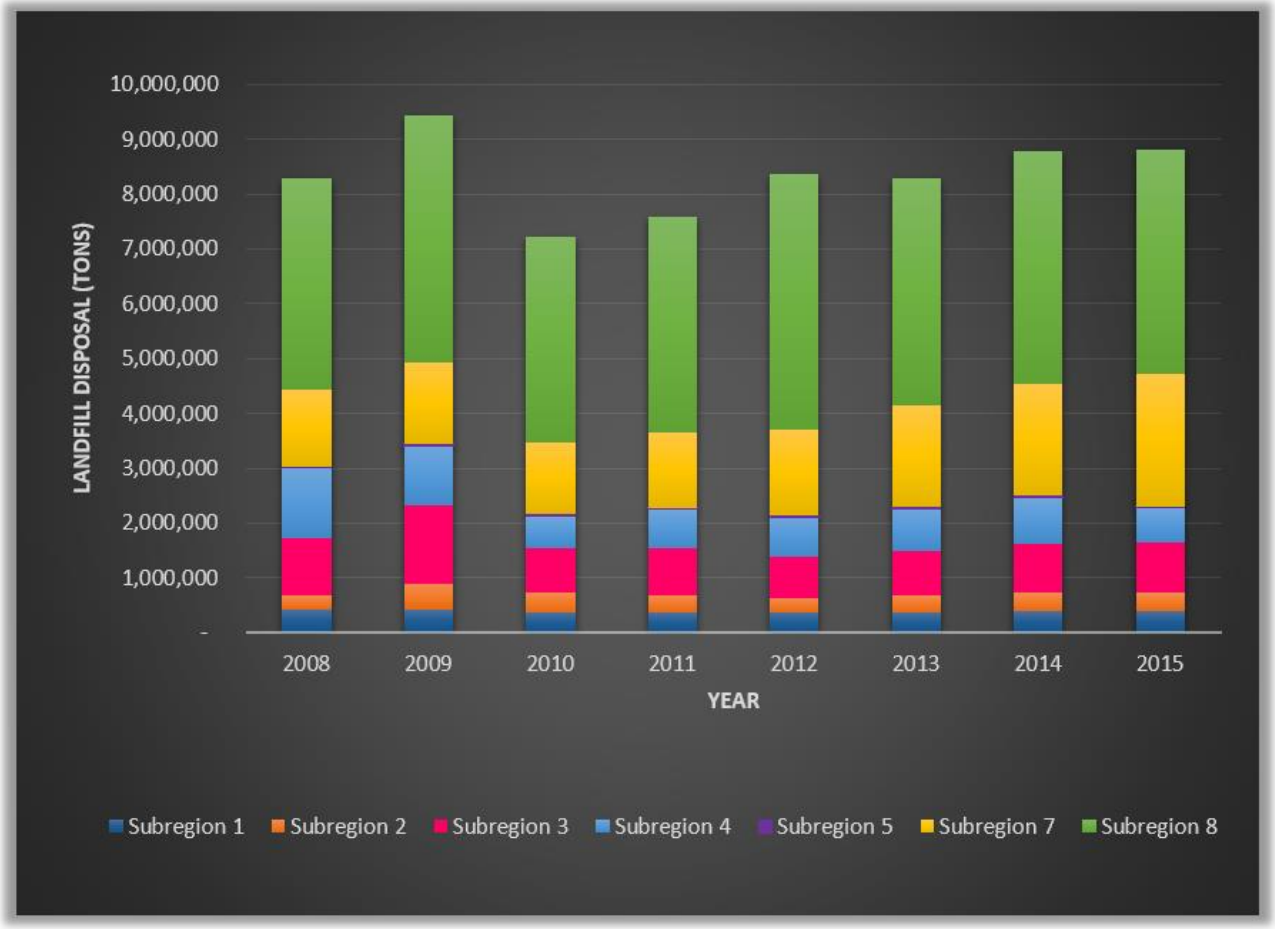


Figure 4-3: Total Tonnage Landfilled by Subregion

Subregion 6 (Austin and Walker counties) has no active landfills and has been omitted from the landfill analyses.

2015 Detailed Waste Stream Analysis

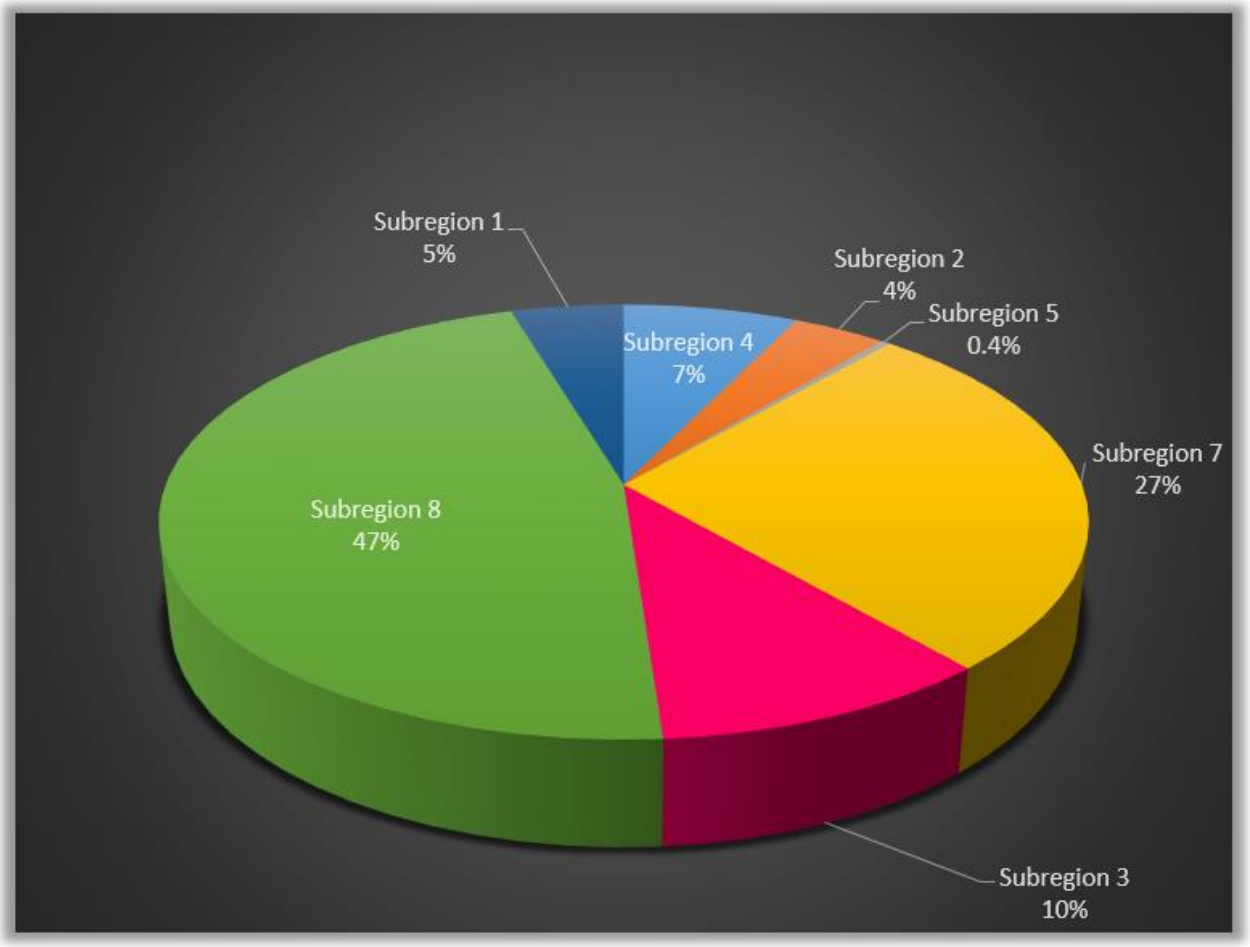


Figure 4-6: Where Waste is Disposed in the H-GAC Region

2015 Detailed Waste Stream Analysis (cont.)

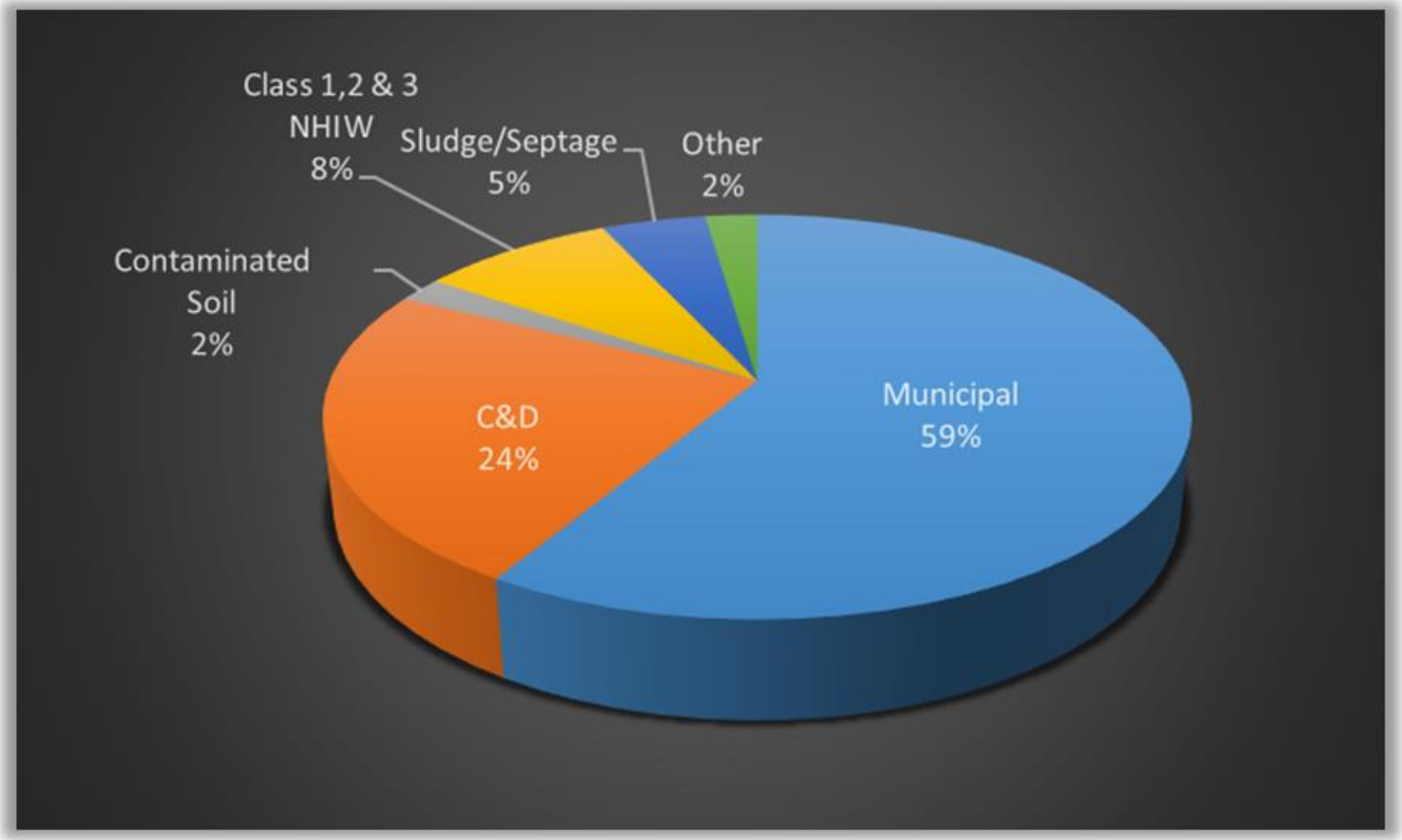


Figure 4-7: FY 2015 Waste Stream Composition

Landfill Capacity

Table 4-3
Remaining Landfill Capacity

Permit	Type	County	Permittee/ Registrant	2015 Remaining Capacity		Expansions (tons)	2015 Remaining Capacity with Expansions (tons)[1]
				Cubic Yards	Tons		
1539A	1	Brazoria	Seabreeze LF	24,107,207	21,588,004	-	21,588,004
1502A	1	Chambers	Chambers County LF	17,625,309	10,575,185	-	10,575,185
1535B	1	Chambers	Baytown LF	9,524,792	6,286,363	-	6,286,363
203A	1	Colorado	Altair LF	682,901	409,741	-	409,741
1505A	1	Fort Bend	Blue Ridge LF	146,734,412	92,295,945	-	92,295,945
2270	1	Fort Bend	Fort Bend LF	38,446,737	33,640,895	-	33,640,895
1149B	1	Galveston	Galveston County LF[2]	15,868,808	10,655,905	18,580,258	29,236,163
1721A	1	Galveston	Coastal Plains RDF	12,994,698	10,395,758	-	10,395,758
261B	1	Harris	McCarty Road LF	23,714,739	26,252,216	-	26,252,216
1193	1	Harris	Whispering Pines LF	10,902,343	10,902,343	-	10,902,343
1307D	1	Harris	Atascocita RDF	41,325,341	31,820,513	-	31,820,513
1752B	1	Montgomery	Security Landfill RDF	13,591,254	9,649,790	-	9,649,790
TYPE I SUBTOTAL				**355,518,541**	**264,472,658**	**18,580,258**	**283,052,916**

Landfill Capacity (cont.)

Permit	Type	County	Permittee/ Registrant	2015 Remaining Capacity		Expansions (tons)	2015 Remaining Capacity with Expansions (tons)[1]
				Cubic Yards	Tons		
1708	4	Brazoria	Dixie Farm Road LF	2,079,645	915,044	-	915,044
1797A	4	Fort Bend	Sprint Fort Bend LF	14,908,965	7,245,757	-	7,245,757
1849B	4	Galveston	North County LF	3,689,442	3,929,256	-	3,929,256
1301	4	Harris	Addicks Fairbanks LF	470,444	319,902	-	319,902
1403	4	Harris	Casco LF	1,621,642	729,739	-	729,739
1540A	4	Harris	Greenshadows LF	2,807,774	2,498,919	-	2,498,919
1565B	4	Harris	Fairbanks LF[3]	50,080	41,316	14,755,950	14,797,266
1586A	4	Harris	WCT Greenbelt LF	3,341,565	2,506,174	-	2,506,174
1599B	4	Harris	Greenhouse Road LF[4]	5,924,756	2,962,378	3,536,500	6,498,878
1921A	4	Harris	Cougar LF	69,396	57,252	-	57,252
2185	4	Harris	Hawthorn Park LF	201,024	136,696	-	136,696
2240B	4	Harris	Ralston Road LF[5]	768,062	576,047	758,334	1,334,381
2304	4	Harris	Tall Pines LF[6]	2,707,956	2,030,967	11,332,824	13,363,791
2344	4	Harris	Lone Star RDF	12,273,118	7,977,527	-	7,977,527
TYPE IV SUBTOTAL				**50,913,869**	**31,926,974**	**30,383,608**	**62,310,582**
TOTAL				**406,432,410**	**296,399,632**	**48,963,866**	**345,363,498**

1 This column shows capacity (**permitted and pending**) as of 2015, assuming all expansions occur.

2 Galveston County Landfill expansion permitted December 2015, remaining capacity at FYE 2016 = 28,878,670 tons, with 357,493 tons disposed during FY 2016.
FY 2015 Remaining Capacity with Expansion = 28,878,670 + 357,493 = 29,236,163 tons. Expansion Tons = 29,236,163 – 10,655,905 = 18,580,258 tons.

3 Fairbanks Landfill expansion permitted February 2016, expansion included an additional 17,886,000 cubic yards of disposal capacity.
Fairbanks Expansion Tons = (17,886,000 / 2,000) x 1,650 estimated compaction rate = 14,755,950 tons.

4 Greenhouse Road Landfill expansion is pending, expansion would include an additional 7,073,000 cubic yards of disposal capacity.
Greenhouse Road Expansion Tons = (7,073,000 / 2,000) X 1,000 estimated compaction rate = 3,536,500 tons.

5 Ralston Road Landfill expansion permitted March 2017, expansion included an additional 1,011,112 cubic yards of disposal capacity.
Ralston Road Expansion Tons = (1,011,112 / 2,000) x 1,500 estimated compaction rate = 758,334 tons.

6 Tall Pines Landfill expansion is pending, expansion would include an additional 15,110,432 cubic yards of disposal capacity.
Tall Pines Expansion Tons = (15,110,432 / 2,000) x 1,500 estimated compaction rate = 11,332,824 tons.

Disposal Forecast vs. Capacity

Entire Region

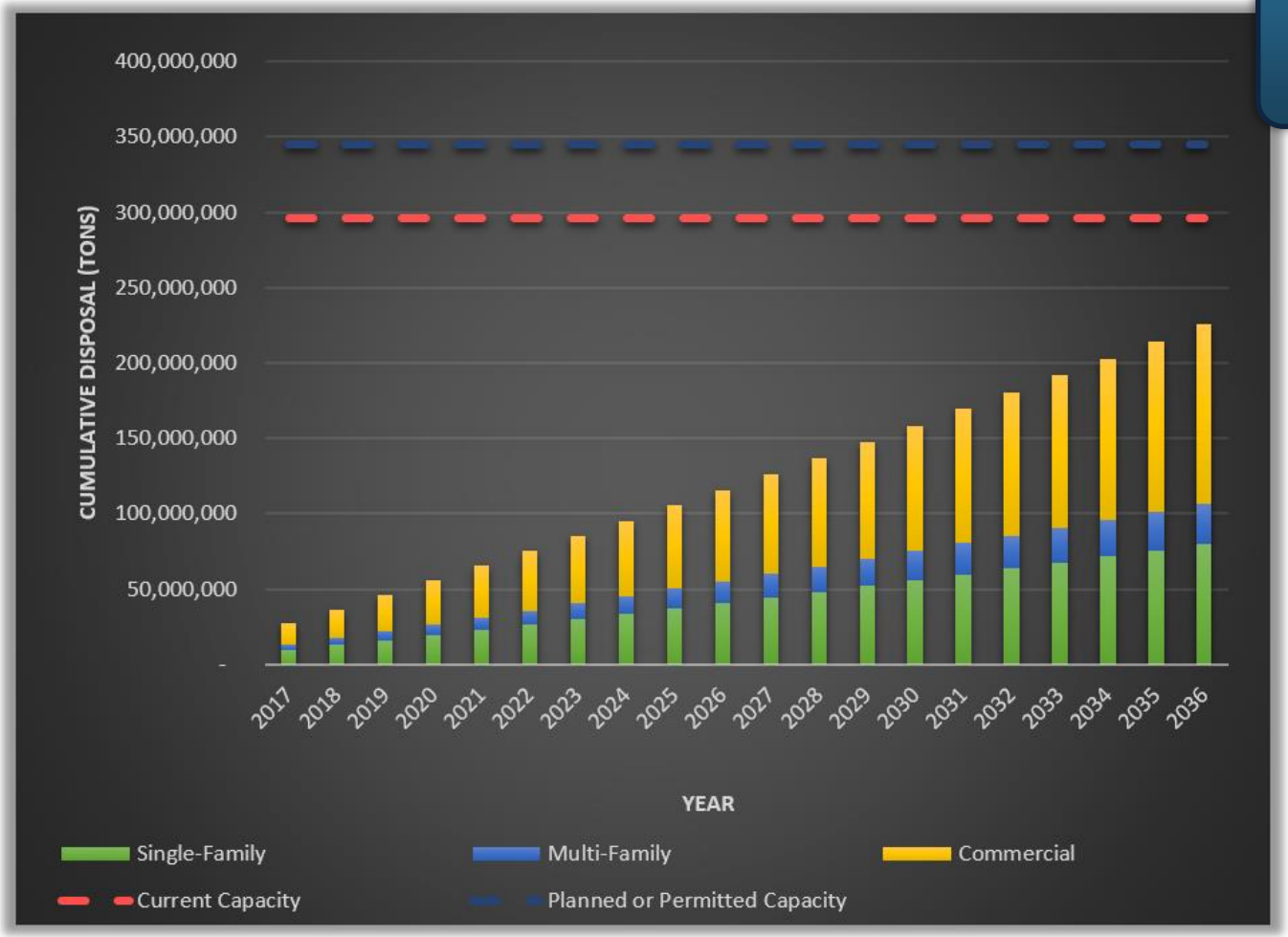


Figure 4-12: MSW Disposal Forecast vs. Disposal Capacity in the H-GAC Region

Disposal Forecast vs. Capacity (cont.)

Subregion 1

Montgomery
Walker

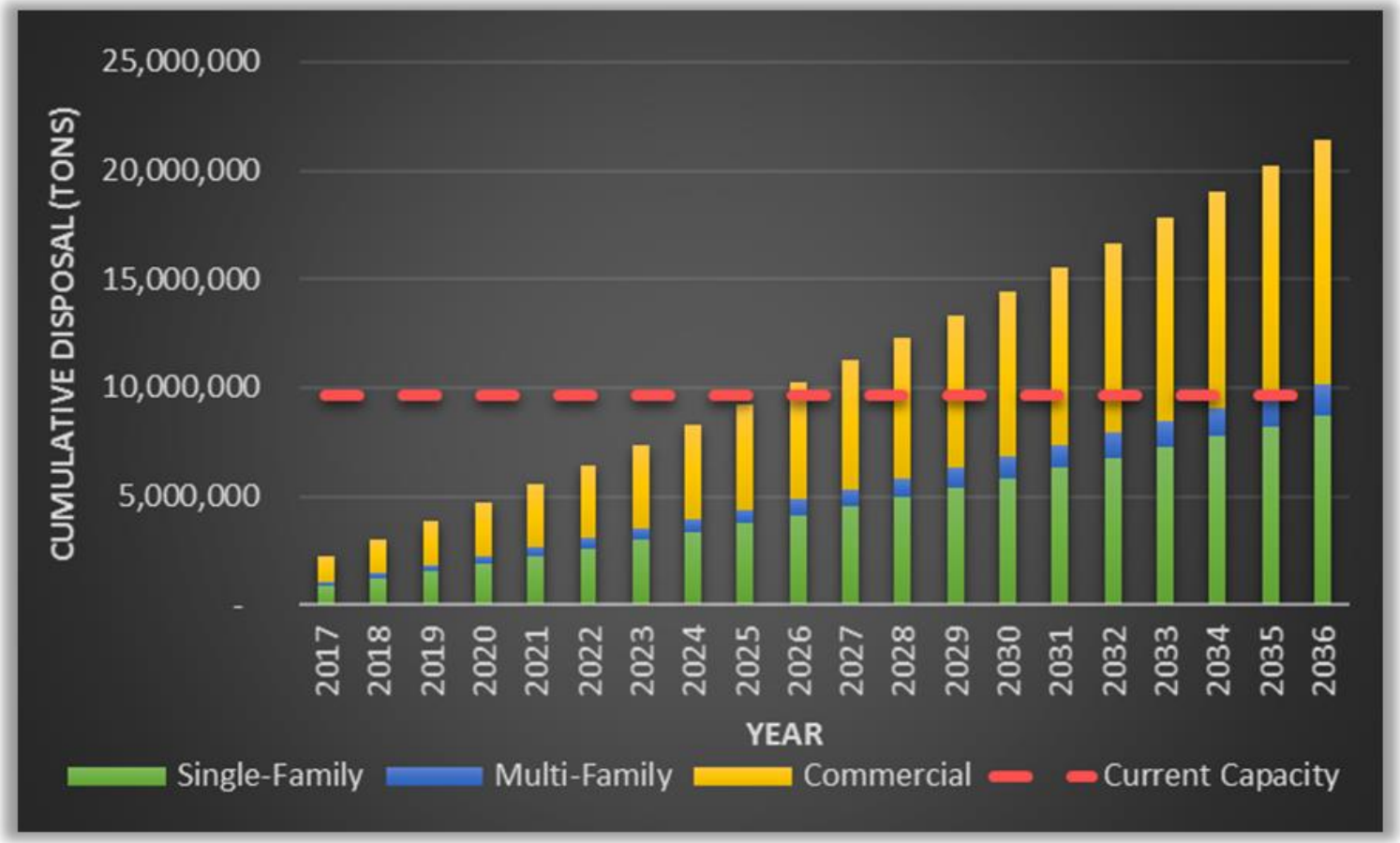


Figure 4-13: Subregion 1 Disposal Forecast vs. Disposal Capacity

Disposal Forecast vs. Capacity (cont.)

Subregion 5

Colorado
Matagorda
Wharton

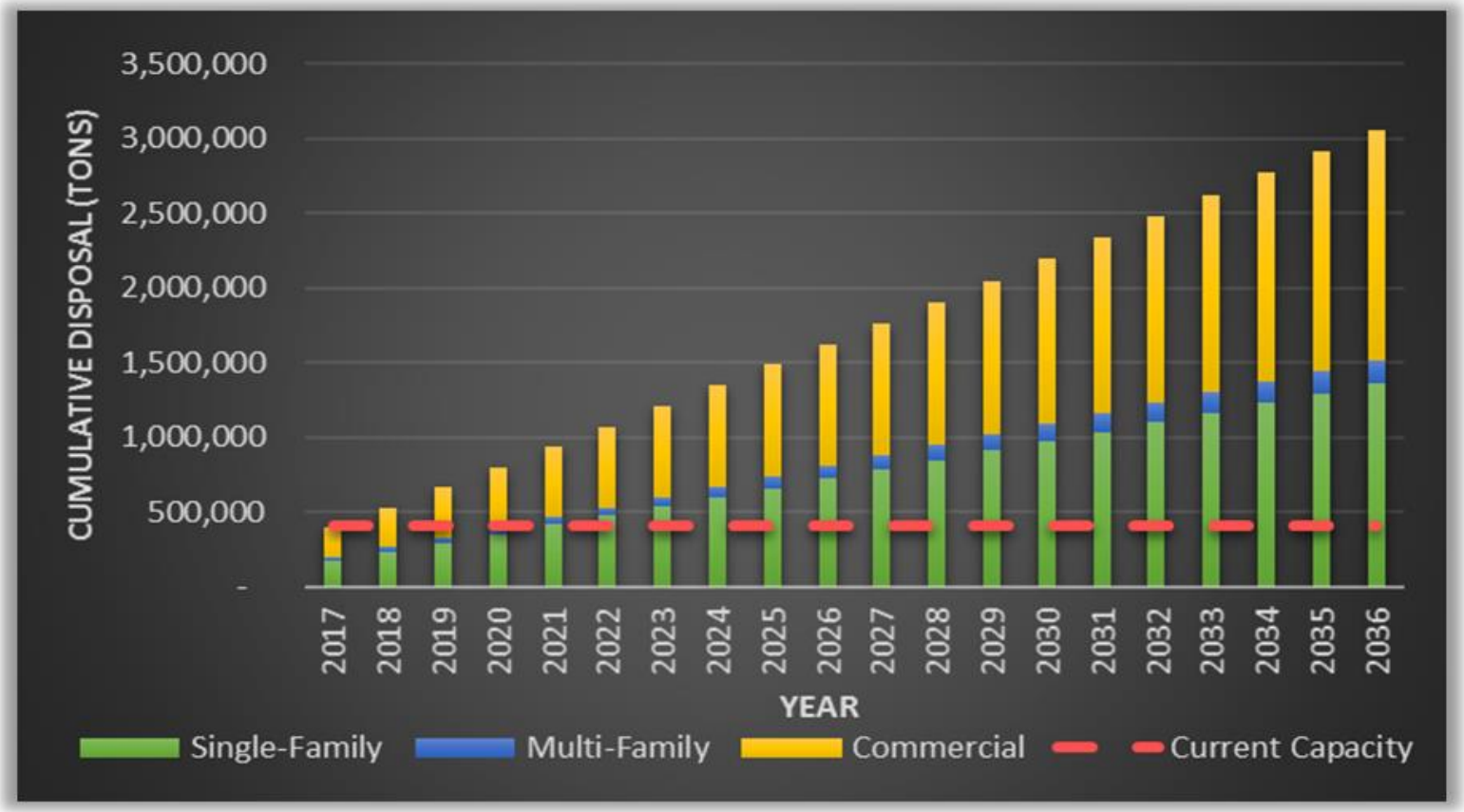
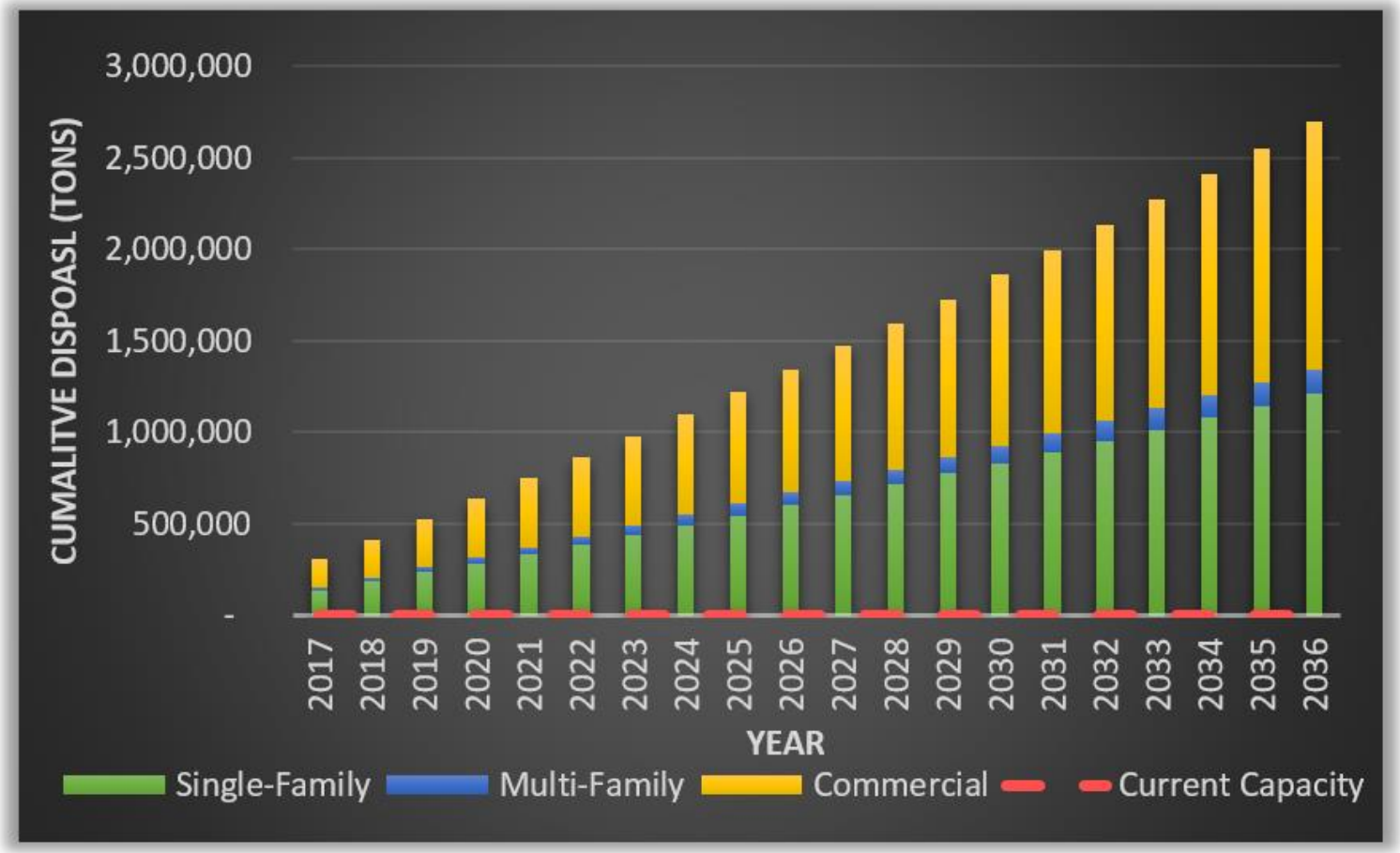


Figure 4-17: Subregion 5 Disposal Forecast vs. Disposal Capacity

Disposal Forecast vs. Capacity (cont.)



Subregion 6

Austin
Waller

Figure 4-18: Subregion 6 Disposal Forecast vs. Disposal Capacity

Disposal Forecast vs. Capacity (cont.)

Subregion 8

Harris

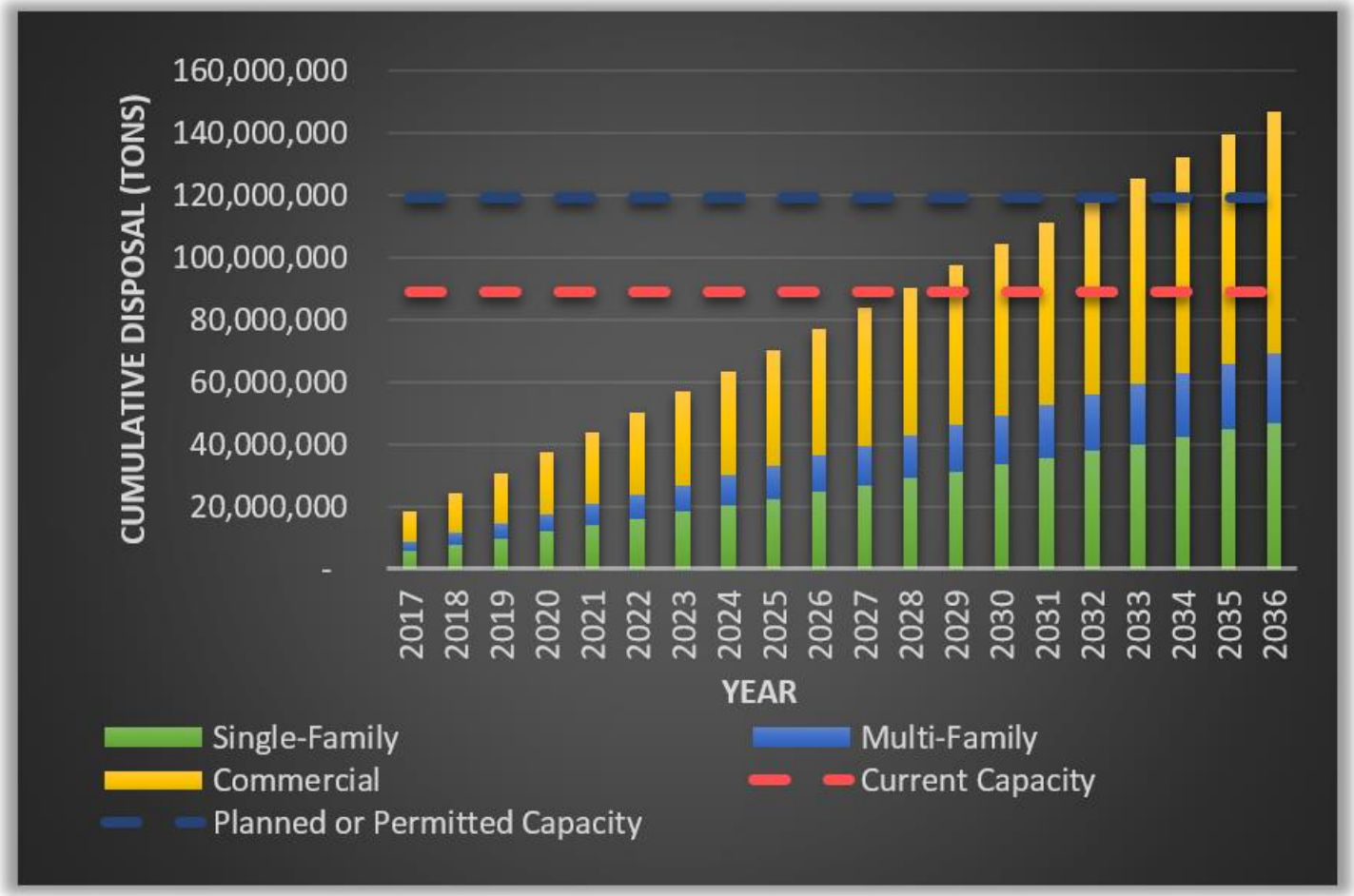


Figure 4-20: Subregion 8 Disposal Forecast vs. Disposal Capacity

Other Analyses

- Single-Family Per capita comparison

Table 4-4
Per Capita Comparison

	2005 Study (tons/capita/year)	2017 Study (tons/capita/year)	% Change	2005 Study (lbs/capita/day)	2017 Study (lbs/capita/day)
Single-Family Garbage	0.7667	0.3885	-49%	4.20	2.13
Single-Family Brush	0.1198	0.0000	-100%	0.66	-
Single-Family Bulky	0.1078 [1]	0.2501	132%	0.59	1.37
Per Capita Disposal Rate	**0.9934**	**0.6386**	**-36%**	**5.45**	**3.50**
Recycling	N/A	0.0677	N/A	N/A	0.37

1 Initial single-family bulky tonnage data in 2005 for Houston was .23, prior to being adjusted downward.

Other Analyses (cont.)

- NewGen identified several significant trends that supports the decrease in per capita disposal rates since the 2005 Study:
  - The H-GAC per capita disposal rate has decreased 9% since the 2005 Study, based on TCEQ data
    - Per capita disposal rate of 7.74 pounds per person per day in 2003 TCEQ “MSW in Texas: A Year in Review” has decreased to 7.08 pounds per person per day in the 2015 edition of the TCEQ report
  - There has been a significant increase in brush/yard waste diversion
  - There has been a large increase in recycling programs in communities and increased movement from dual-stream to single-stream recycling program
  - A decrease in packaging content associated with consumer goods

Other Analyses (cont.)

Table 4-5
Transfer Stations in the H-GAC Region

Permit	County	Permittee/ Registrant	Active in 2005 Study?	2015 Tonnage
40191	Austin	Country Waste	Y	7,959
2106	Colorado	City of Weimar TS	Y	35,889
40264	Fort Bend	Stericycle	N	2,801
164	Galveston	City of Galveston	Y	90,164
1355A	Harris	Ruffino Hills TS	N	422,691
1471	Harris	Sam Houston Recycling Center	Y	169,183
1483A	Harris	Koenig Street TS	Y	157,777
1578	Harris	Hardy Road TS	Y	405,600
1697	Harris	City of Deer Park	Y	16,092
40098	Harris	BFI Wastes Services of Texas	Y	-
40131	Harris	Houston Southeast TS	Y	219,022
40132	Harris	Houston Southwest TS	Y	292,856
40133	Harris	Houston Northwest TS	Y	226,364
40189	Harris	Egbert Type V TS	Y	56,282
40211	Harris	Sprint Recycling Center Northeast	N	128,800
40217	Harris	Tanner Road Facility	N	54,961
40236	Harris	Excell Disposal Waste Containers	N	17,516
40249	Harris	Lone Star Recycling & Disposal	N	199,983
40028	Matagorda	Matagorda County	Y	5,462
40056	Walker	City of Huntsville TS	Y	39,512
40014	Waller	City of Hempstead TS	Y	127
40282	Colorado	City of Weimar TS (New)	N	(1)
2387	Walker	City of Huntsville TS (New)	N	(1)
TOTAL TONS TRANSFERRED				**2,549,040**

1 Will replace/expand existing facilities on this list.

Other Analyses (cont.)

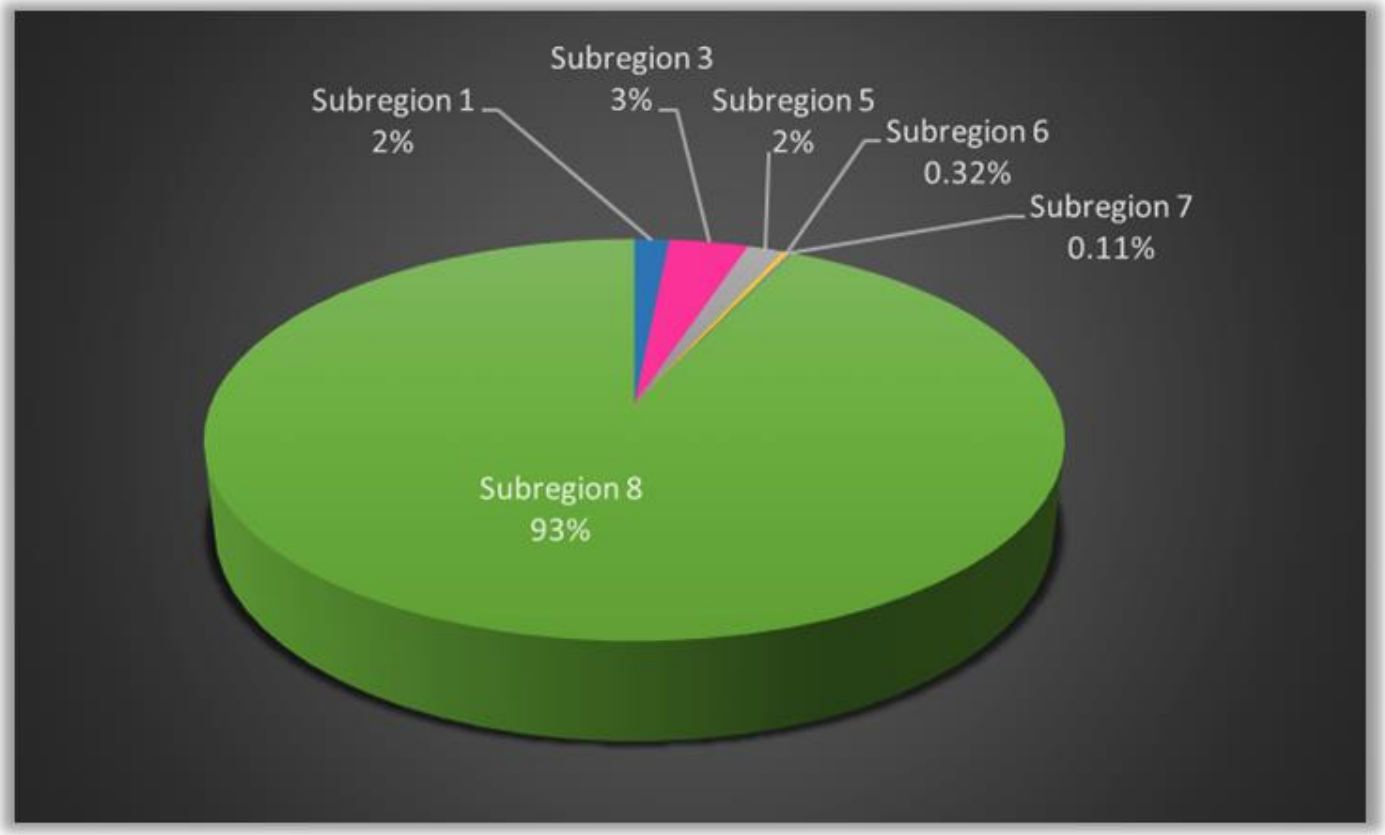


Figure 4-21:Transfer Station Tonnage by Subregion

Other Analyses (cont.)

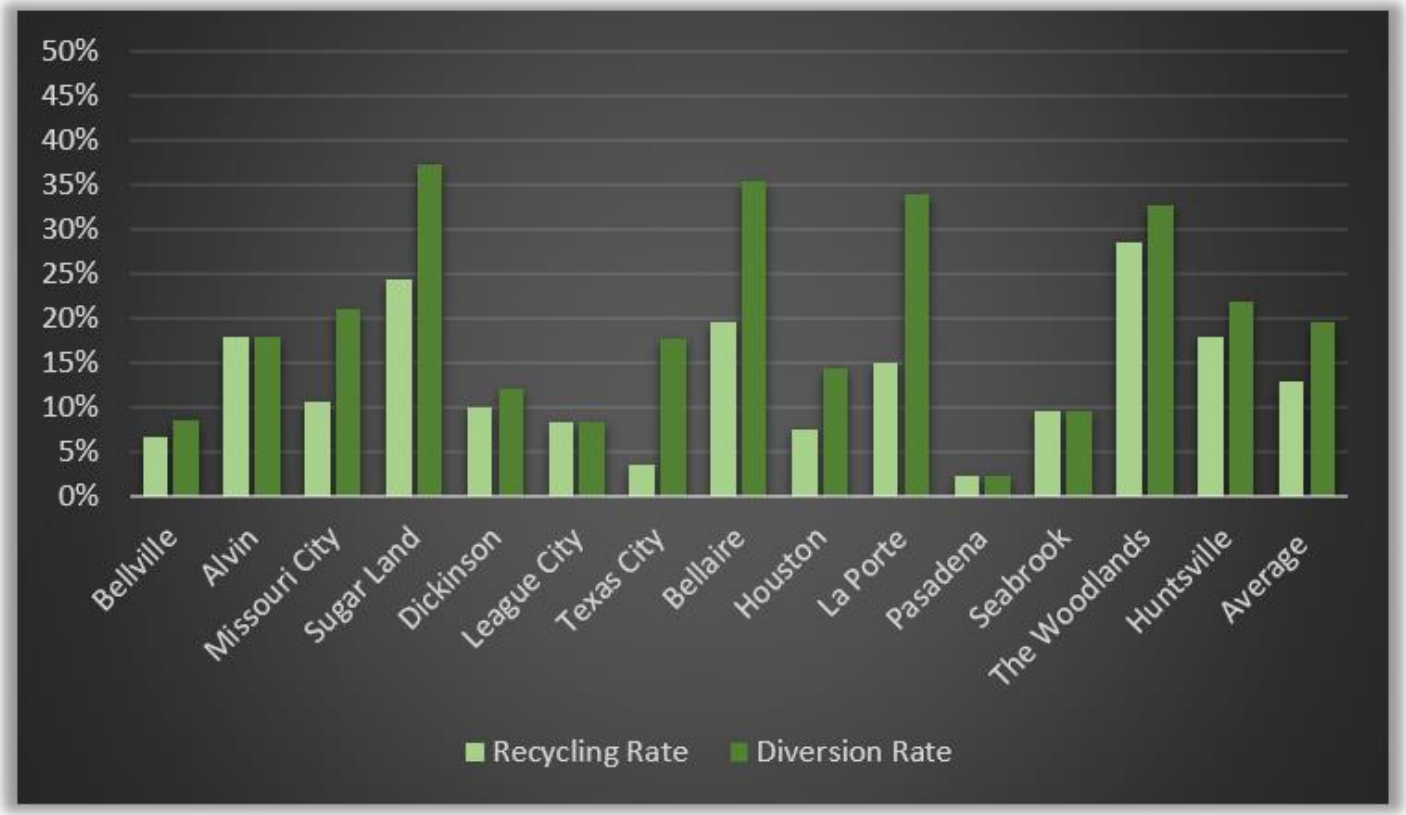
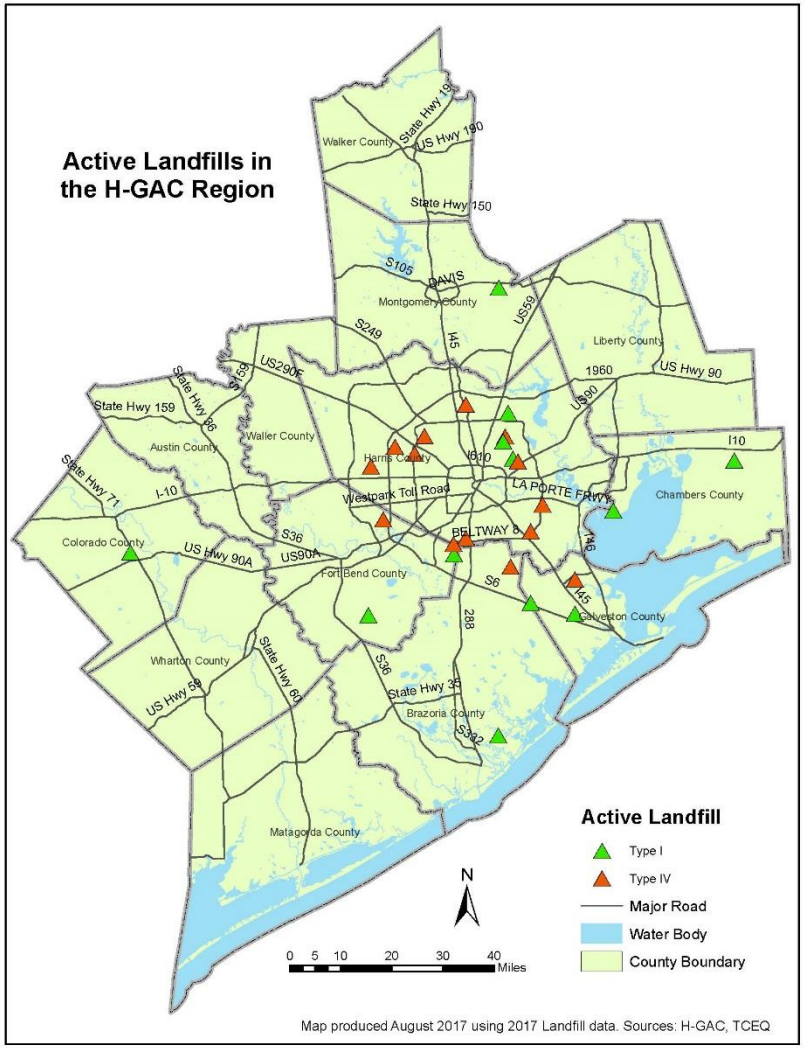


Figure 4-22: Recycling and Diversion Rates of Surveyed Cities

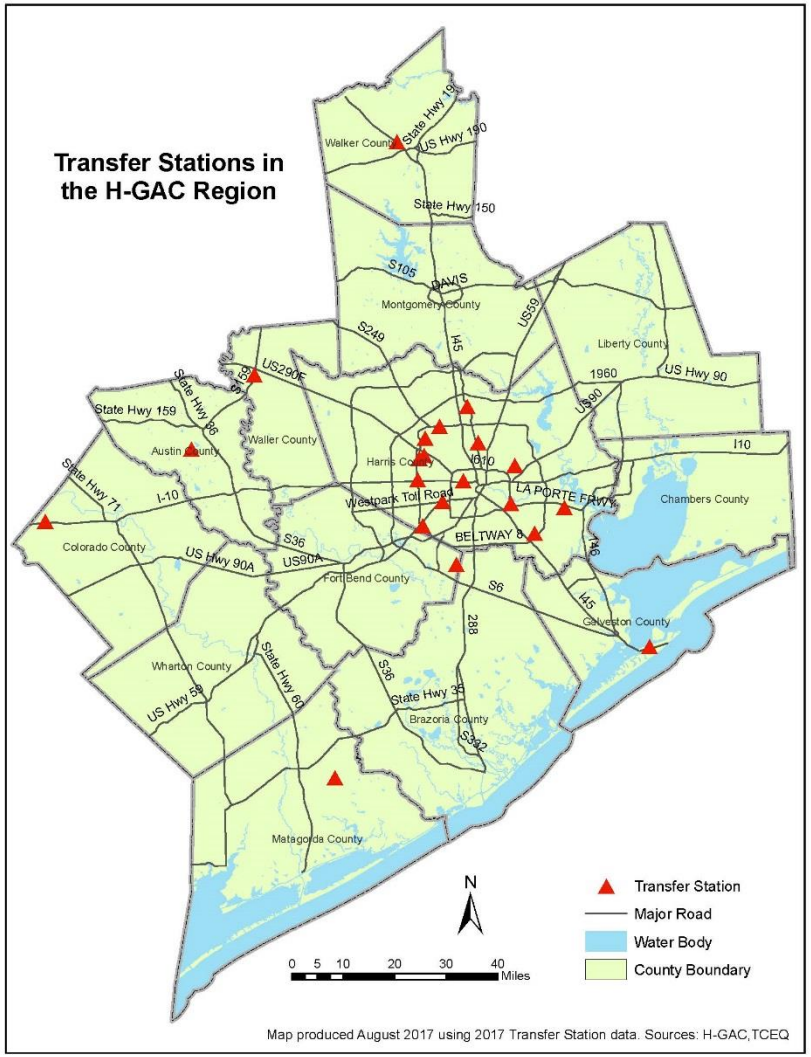
Planning Region Maps

1. Active Type I and Type IV Landfills
2. Transfer Stations
3. Citizens' Collection Stations
4. Material Recovery Facilities
5. Composters

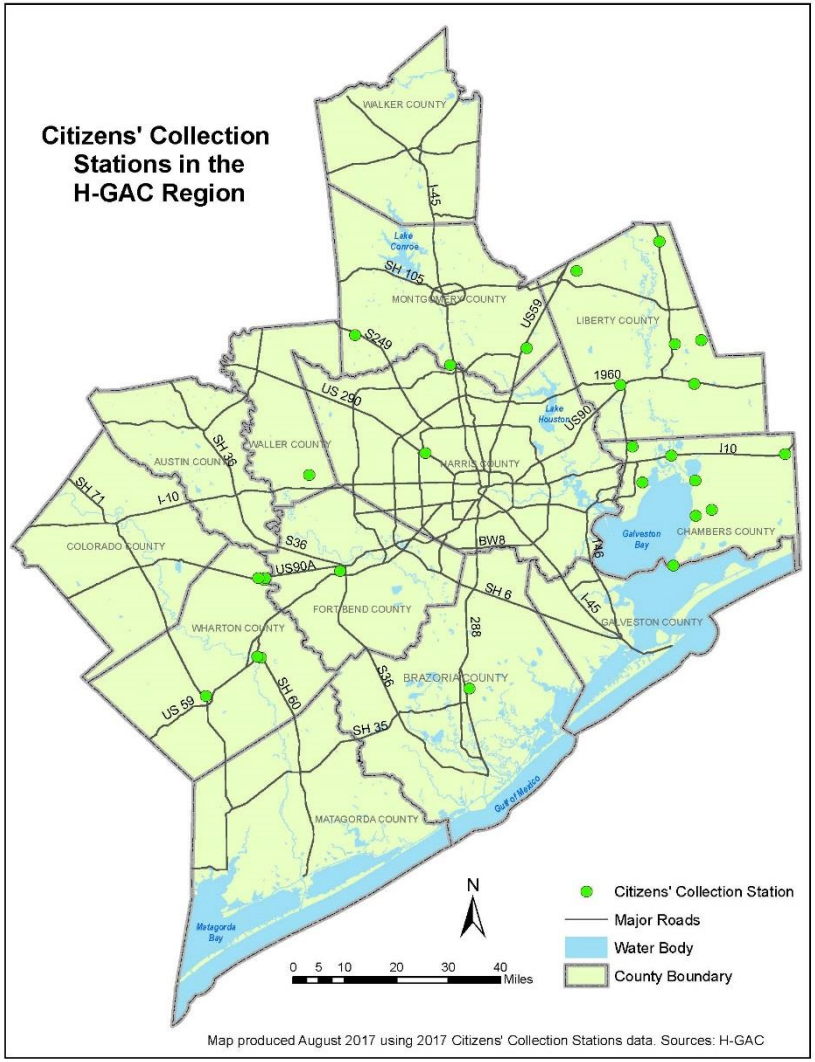
Active Landfills



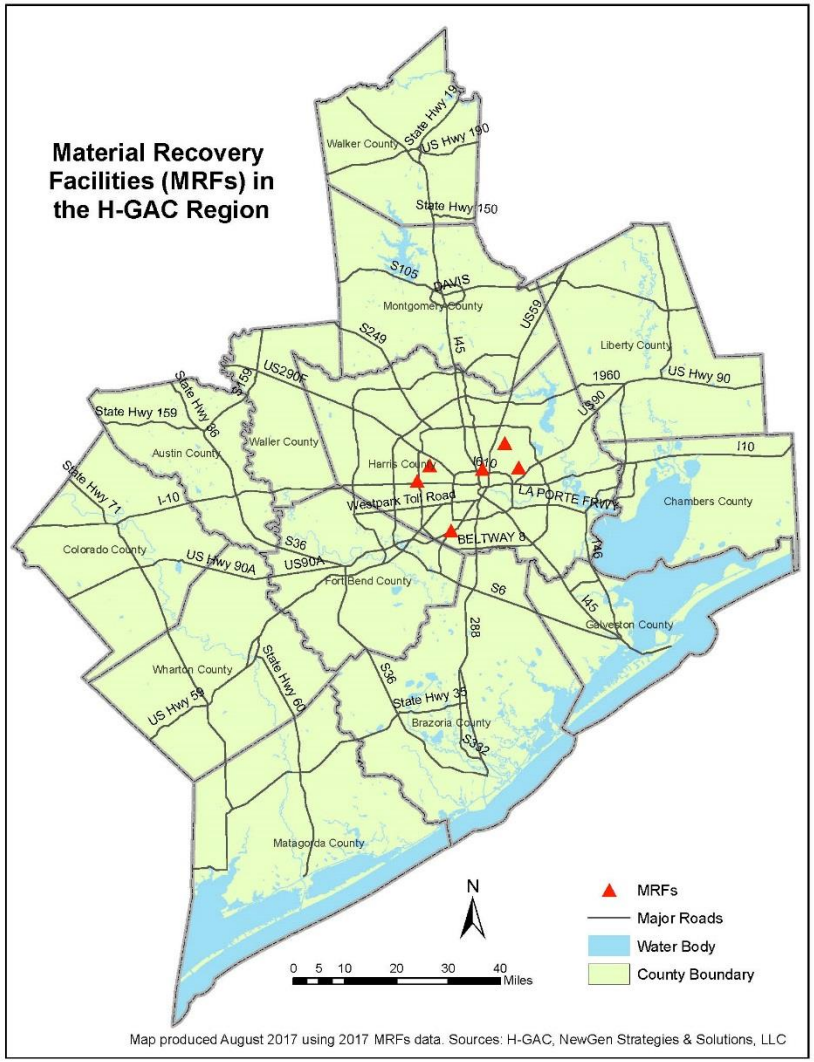
Transfer Stations



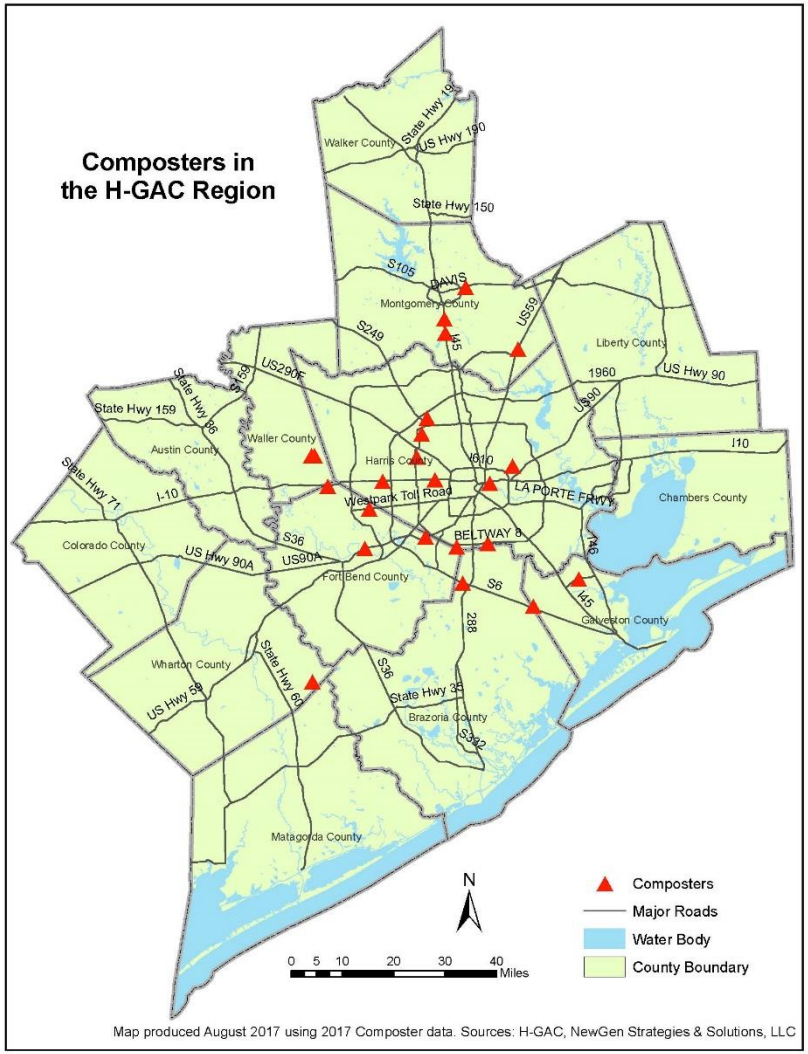
Citizens' Collection Stations



Material Recovery Facilities



Composters


Composters in the H-GAC Region
Walker County
State Hwy 19
US Hwy 190
State Hwy 150
S105
DAVIS
Montgomery County
S249
I45
US59
Liberty County
1960
US Hwy 90
US290
State Hwy 99
State Hwy 159
Waller County
Austin County
Harris County
I610
I10
State Hwy 6
State Hwy 71
I-10
Westpark Toll Road
LA PORTE FRWY
Chambers County
S36
BELTWAY 8
Colorado County
US Hwy 90A
US90A
Fort Bend County
S6
I45
Galveston County
288
Wharton County
State Hwy 60
US Hwy 59
S36
State Hwy 35
Brazoria County
S342
Matagorda County
N
0 5 10 20 30 40
Miles
Composters
Major Roads
Water Body
County Boundary
Map produced August 2017 using 2017 Composter data. Sources: H-GAC, NewGen Strategies & Solutions, LLC

Findings and Recommendations

Findings and Recommendations

- **Conduct brush and yard waste analysis.**
- **Identify cities** with above average recycling rates.
- **Survey cities** every two years to calculate their generation, disposal and diversion rates.
- **Analyze the impact of Hurricane Harvey** on landfill capacity in two to three years when data is available.
- **Subregion 1 (Montgomery, Walker).** It is projected Subregion 1 cumulative disposal will surpass current permitted capacity in 2026, H-GAC should examine opportunities to expand landfill capacity in the region or ensure adequate transfer stations are in place.

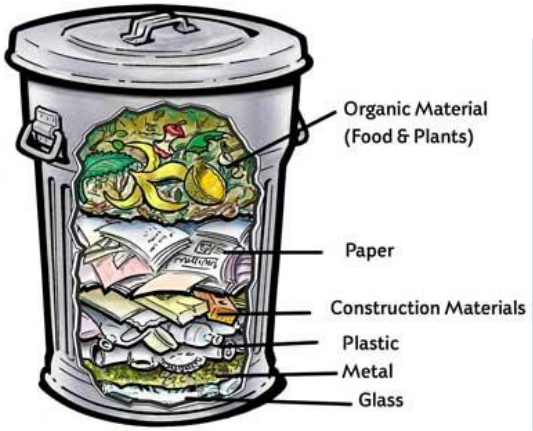
Findings and Recommendations (cont.)

- **Subregion 5 (Colorado, Matagorda, Wharton).** It is projected Subregion 5 cumulative disposal will surpass current permitted capacity during the forecast period. Further transfer station and landfill expansion in the subregion should be evaluated.
- **Subregion 6 (Austin, Waller).** This Subregion contains no active landfills. As a result, further transfer station analysis should be evaluated to ensure adequate resources for the Subregion.
- **Subregion 8 (Harris).** It is projected Subregion 8 cumulative disposal will surpass current permitted capacity during the forecast period. Further transfer station and landfill expansion in the subregion should be evaluated.

Conclusion

Conclusion

- In order to analyze the long-term disposal capacity for the H-GAC region, it is important to understand:
  - the source of the municipal solid waste (MSW) stream,
  - how the population and employment factors will change in the region over the next 20 years (2017–2036), and
  - the ultimate impact on the waste stream.







Questions or Comments?

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