

Addressing Houston's Long-term Municipal Solid Waste Management Needs

City of Houston Integrated Resource Recovery Management Plan



Mayor's Advisory Task Force Meeting
August 29, 2019

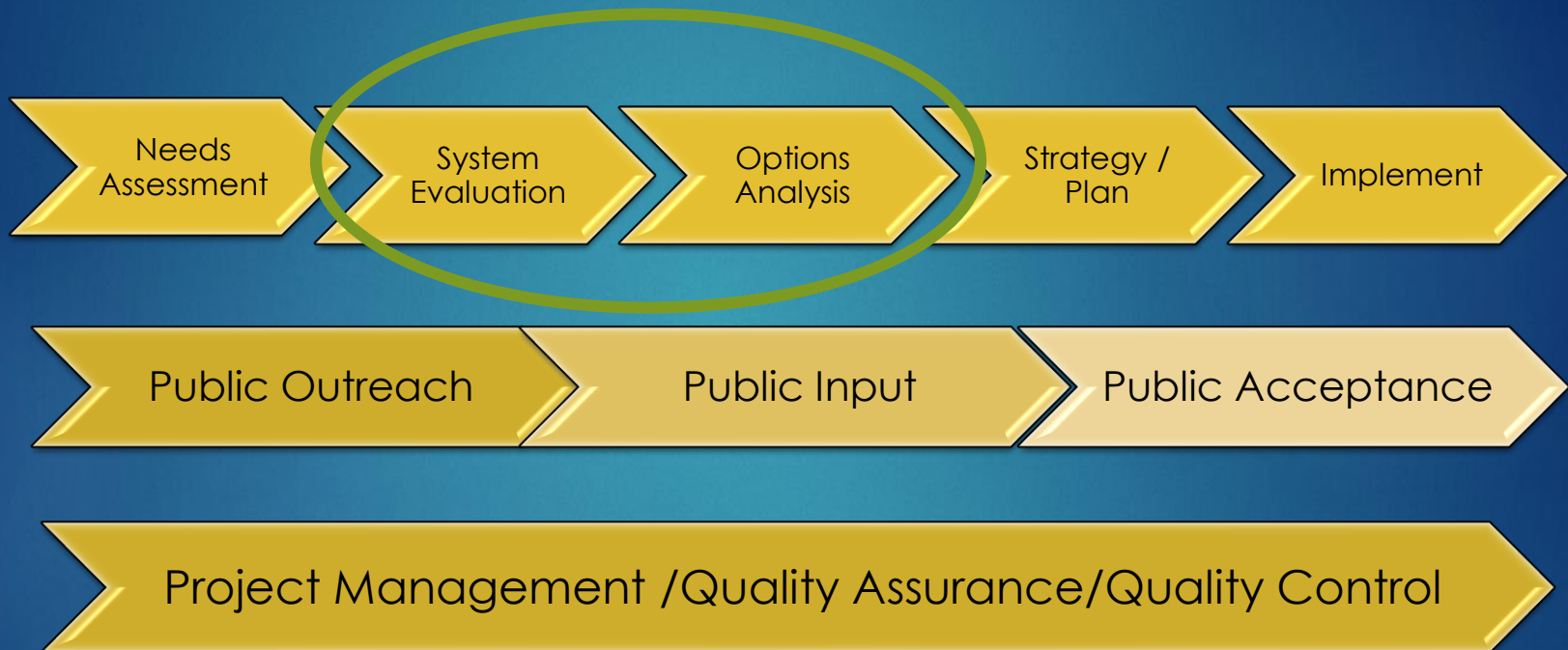


Task 5: Waste Management Activities Analysis

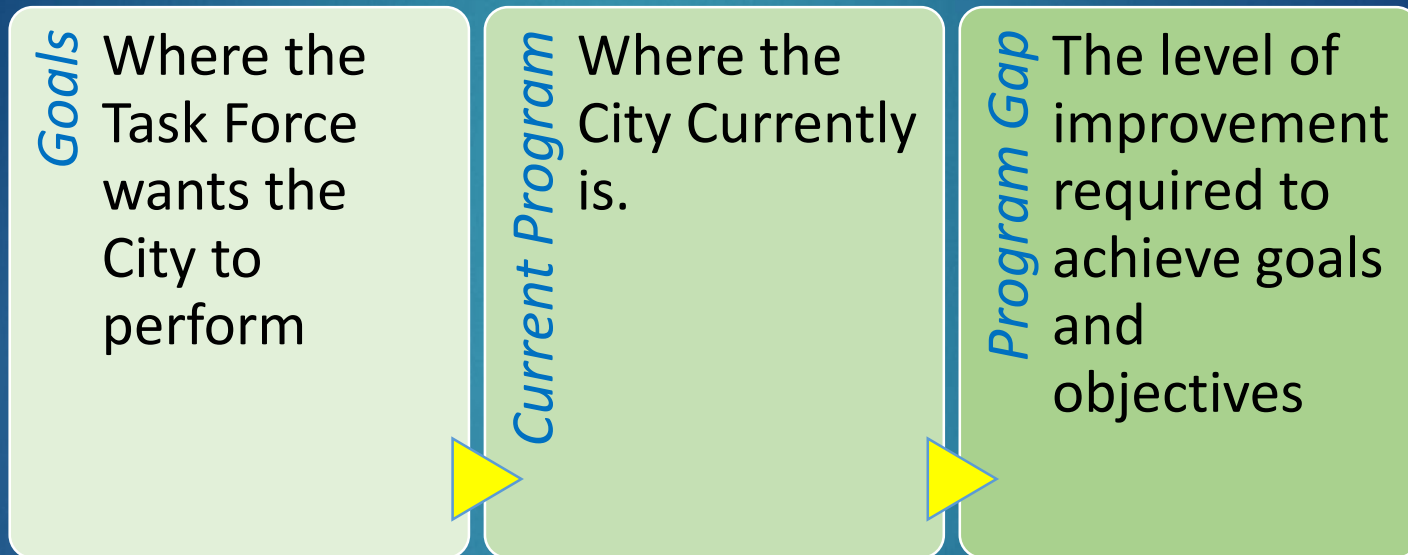
COLLECTION, ENERGY FROM WASTE, LANDFILL &
ILLEGAL DUMPING

Program Planning Process

3



Gap Analysis



Collection Services Goals & Objectives

Overall Objective: Provide quality and efficient collection of MSW and recyclables to Houston residents.

Specific Objectives / Strategies

1. Provide efficient once per week collection of municipal solid waste from residents. Address upcoming challenges associated with greater urban density, increased traffic and suburban sprawl.
2. Provide for the collection of recyclable materials in a manner that is both cost-effective and enhances the recovery of recyclable materials with low levels of contamination.
3. Provide for collection strategies that increase recovery of organics from residential and non-residential generators.

Collection Services Goals & Objectives (cont.)

Overall Objective: Provide quality and efficient collection of MSW and recyclables to Houston residents.

Specific Objectives / Strategies

4. Provide for the cost-effective collection of bulky waste.
5. Reduce transportation costs associated with the collection and hauling of wastes and recyclable materials through efficient routes and strategic use of transfer stations.
6. Provide opportunities for the collection of recyclable materials at commercial and multi-family units.
7. Provide for the collection of household hazardous materials through City facilities and point-of-sale centers.
8. Provide for safe collection of municipal solid waste throughout the City.

Collection Services

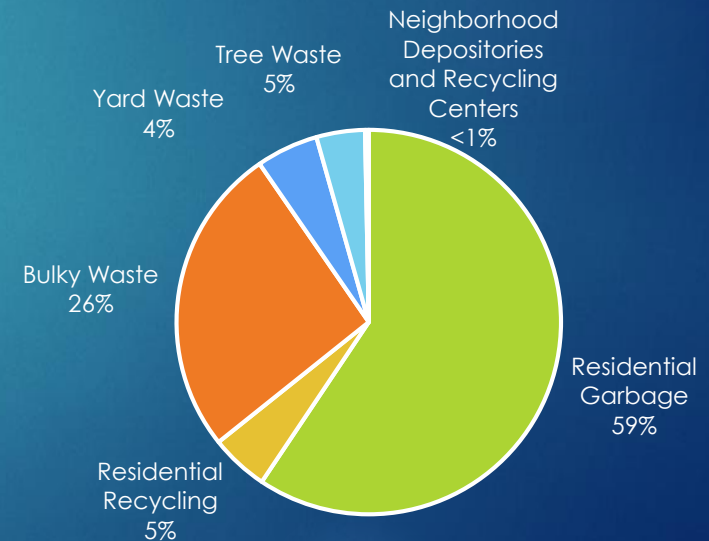
- ▶ City Services include:
 - ❑ Weekly residential collection of garbage
 - ❑ Weekly residential collection of yard waste
 - ❑ Once every two weeks collection of recyclables
 - ❑ Once every two months collection of brush and tree waste
 - ❑ Once every two months collection of bulky wastes
 - ❑ Maintenance and operation of depositories
 - ❑ Maintenance & operation of recycling centers
 - ❑ Maintenance & operation of environmental service centers
 - ❑ Tire collection program
 - ❑ Dead animal collections
 - ❑ Collection of illegally disposed materials

Residential Collection Service

- ▶ 390,000 Households receive garbage, recycling, yard/tree waste and bulky service
- ▶ 55,000 Households receive sponsorship services

Material	Tons / Year	% of Total
Garbage	445,397	59.4%
Bulky Waste	195,829	26.1%
Recyclables	36,595	4.9%
Yard Waste	30,612	4.1%
Tree Waste	39,157	5.2%
Depositories & Recycling	2,319	0.3%
Total	749,909	100%

Waste Collection Services by %



Other Collection Efforts

Type of Facility	Types of Waste or Recyclables
Depositories (6)	Junk waste, tree waste, used oil, fencing
Recycling Centers (5)	Recyclable materials
Environmental Service Centers (2)	HHW & BOPA Household hazardous waste and batteries, oil, paint and antifreeze
Illegally dumped waste	Illegally dumped waste

Needs & Gaps

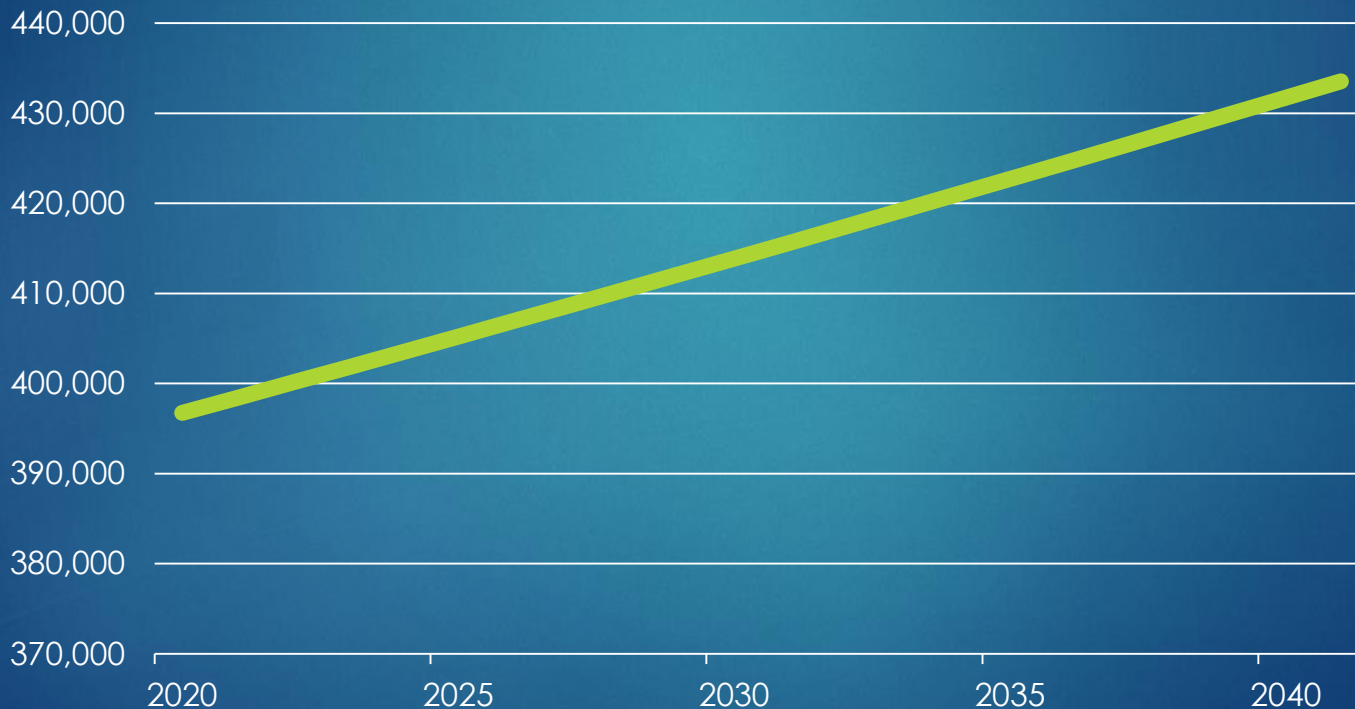
- ▶ The solid waste fleet is not sized to meet growing population and other factors such as travel times to either transfer stations or landfills.
- ▶ Houston SWMD is under-staffed to meet collection and other service demands, impacting staff morale and effectiveness.
- ▶ Changing nature of community poses new challenges for collection crews.
- ▶ Houston SWMD is underfunded to meet service demands, fleet requirements and adequate staffing.



Growing Population

Increasing number of households to be served

PROJECTED NUMBER OF HOUSEHOLDS RECEIVING SWMD SERVICES



Houston Traffic

- ▶ Impacts on labor costs to get waste from point of collection to disposal site
- ▶ Impacts on equipment being on the road additional time
- ▶ Impacts cost of getting waste from transfer stations to landfills
- ▶ With anticipated construction it is going to get worse.


HOUSTON CHRONICLE

HOME LOCAL WEATHER POLITICS US & WORLD BUSINESS RENEW HOUSTON TEXAS SPORTS NATION SPORTS OPINION A&E

LOCAL // TRANSPORTATION

Houston commuters waste 75 hours a year in traffic, study finds

Dug Begley | Aug. 22, 2019 | Updated: Aug. 22, 2019 7:26 a.m.



Changing Development Patterns

13

- Increased density affects collection practices
- Households provided same level of service
- Room for bins and yard waste becoming a concern in some neighborhoods

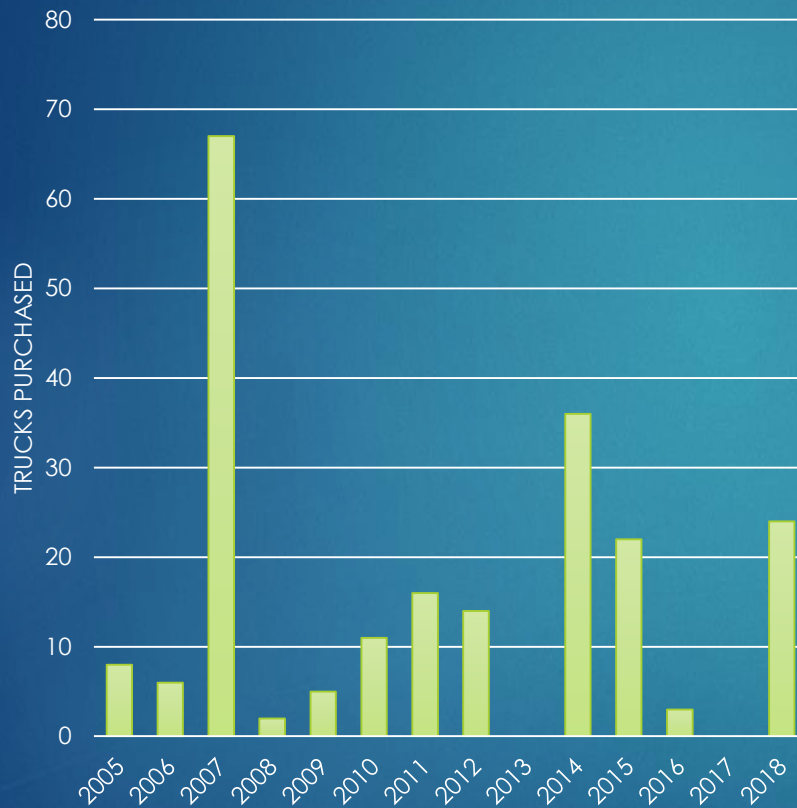


City of Houston Collection Guidelines



Age of Fleet

Operating Fleet Year of Purchase



The recent addition of 2019 vehicles will allow the City to retire 2005, 2006 and some 2007 vehicles

Trucks Older Than 7 Years

Approximately 107 (53%) of the 201 side loaders and rear loader vehicles were purchased between 2007 and 2012.

The addition of twenty 2019 vehicles allows the City to retire 2005 and 2006 vehicles.

The fact that 53% of the fleet is over 7 years old means the SWMD must maintain a reserve fleet that is more than the optimal 20% of total fleet.

In addition to garbage and recycling trucks, the City's brush and bulky fleet is also aging and needs replacement

Vehicle/Containers	# in Fleet	Older than 7 years
Tree Grapple Trucks	42	29
Trailer Land Management	70	63
Roll-off Truck	31	10
Truck Tractor	59	55
Roll-off Containers	70	56
Total	272	213

Labor – Staffing & Overtime

16



In FY 2017, because of Hurricane Harvey, the SWMD overtime budget had the equivalent of 86.4 FTE positions worth of overtime (19% of budgeted FTEs).

In 2018, the overtime budget has the equivalent of 37.5 FTE positions or 9% of total staffing (**actual is higher**). The cost of overtime pay is a considerable budget strain on the Department and affects staff morale.

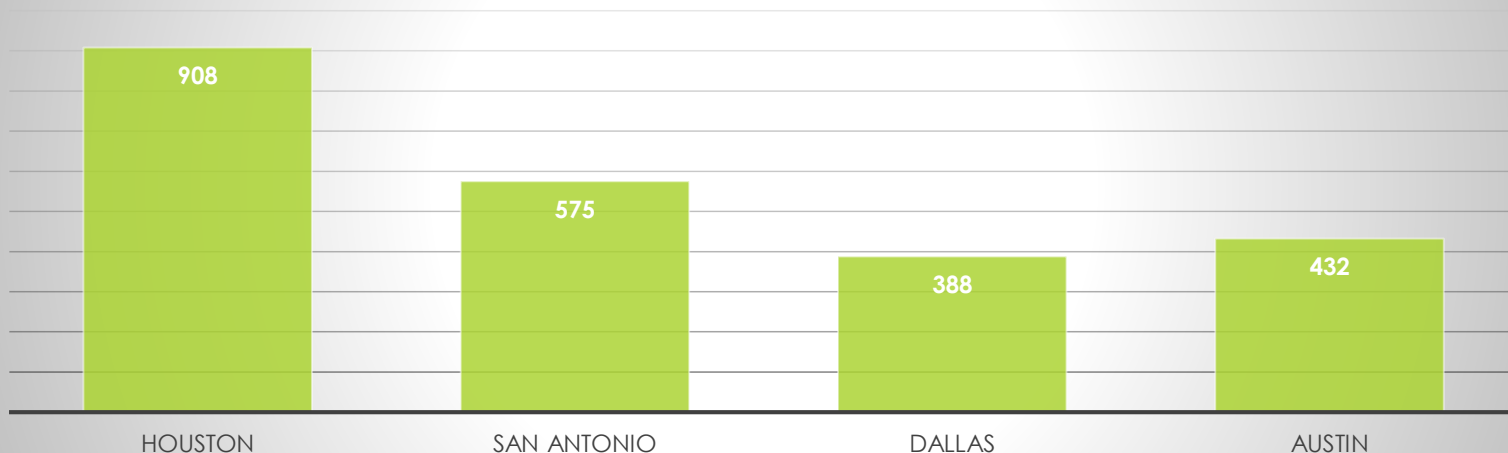
Staffing and Other Cities

17

City	Houston	San Antonio	Dallas	Fort Worth	Austin
Households Served	396,730	356,000	240,000	225,049	200,550
Full Time Employees	437	619	619	116	464
HH / FTE	908	575	388	NA	432

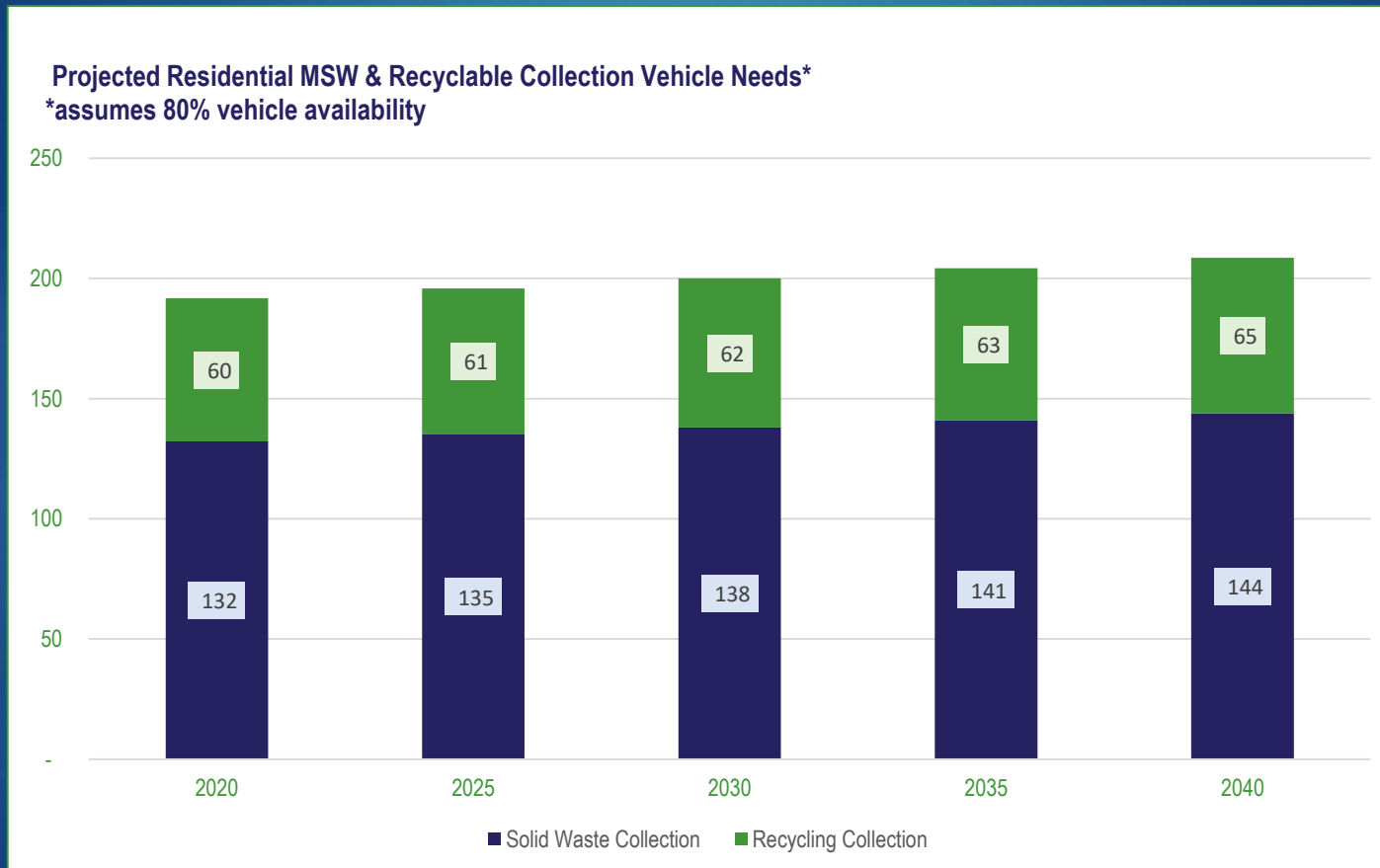
City of Fort Worth utilizes private sector for solid waste collection
City of Dallas staff also operate a landfill

Households / FTE



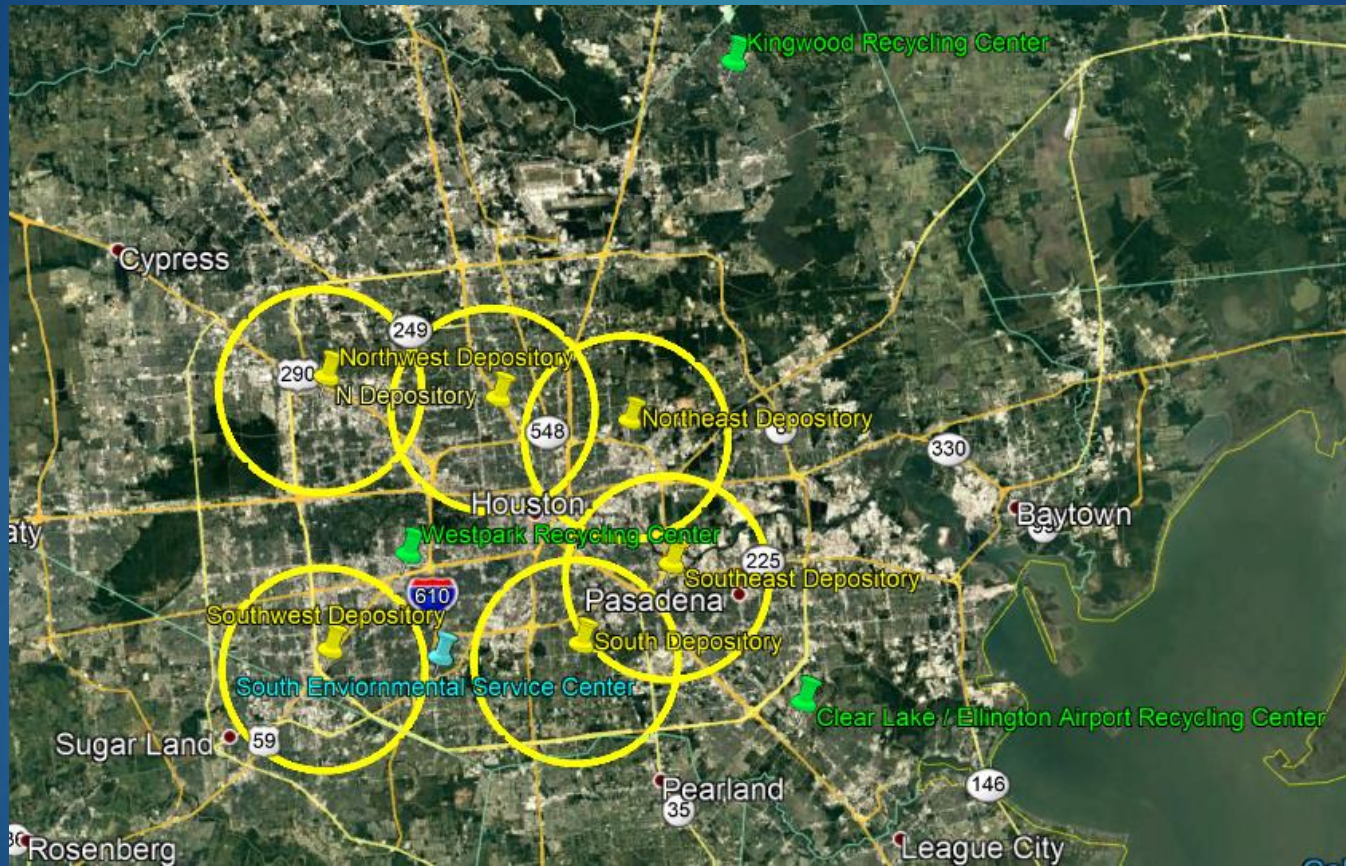
Right-sizing the Fleet

Proposed number of active collection vehicles for recycling & MSW collection



City is currently operating 91 MSW and 39 recycling routes

Location of Depositories & Recycling Centers



Circles denote 5-mile radius

Potential Actions

20

- ▶ Increase number of routes
- ▶ Replace older vehicles
- ▶ Enhance periodic maintenance of trucks
- ▶ Implement data management program for collection fleet
- ▶ Evaluate routing on a regular basis
- ▶ Enforce “Slow Down to Get Around”
- ▶ Evaluate conversion of fleet to CNG
- ▶ Enhance conversion of the fleet to improve air quality

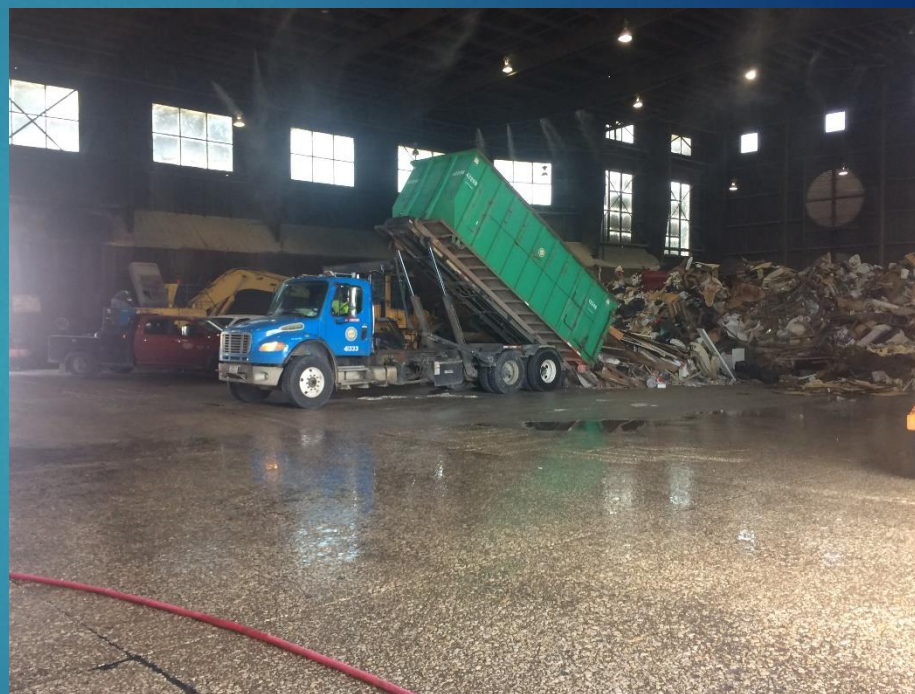
Potential Actions

- ▶ Enhance the number of depositories and recycling centers.
- ▶ Track performance of collection service (missed collections).
- ▶ As markets improve consider adding materials to recycling program.
- ▶ Evaluate managed competition as a possibility.
- ▶ Privatize certain sections of the City that are outside service belt.

Transfer Station Goals & Objectives

Specific Objectives:

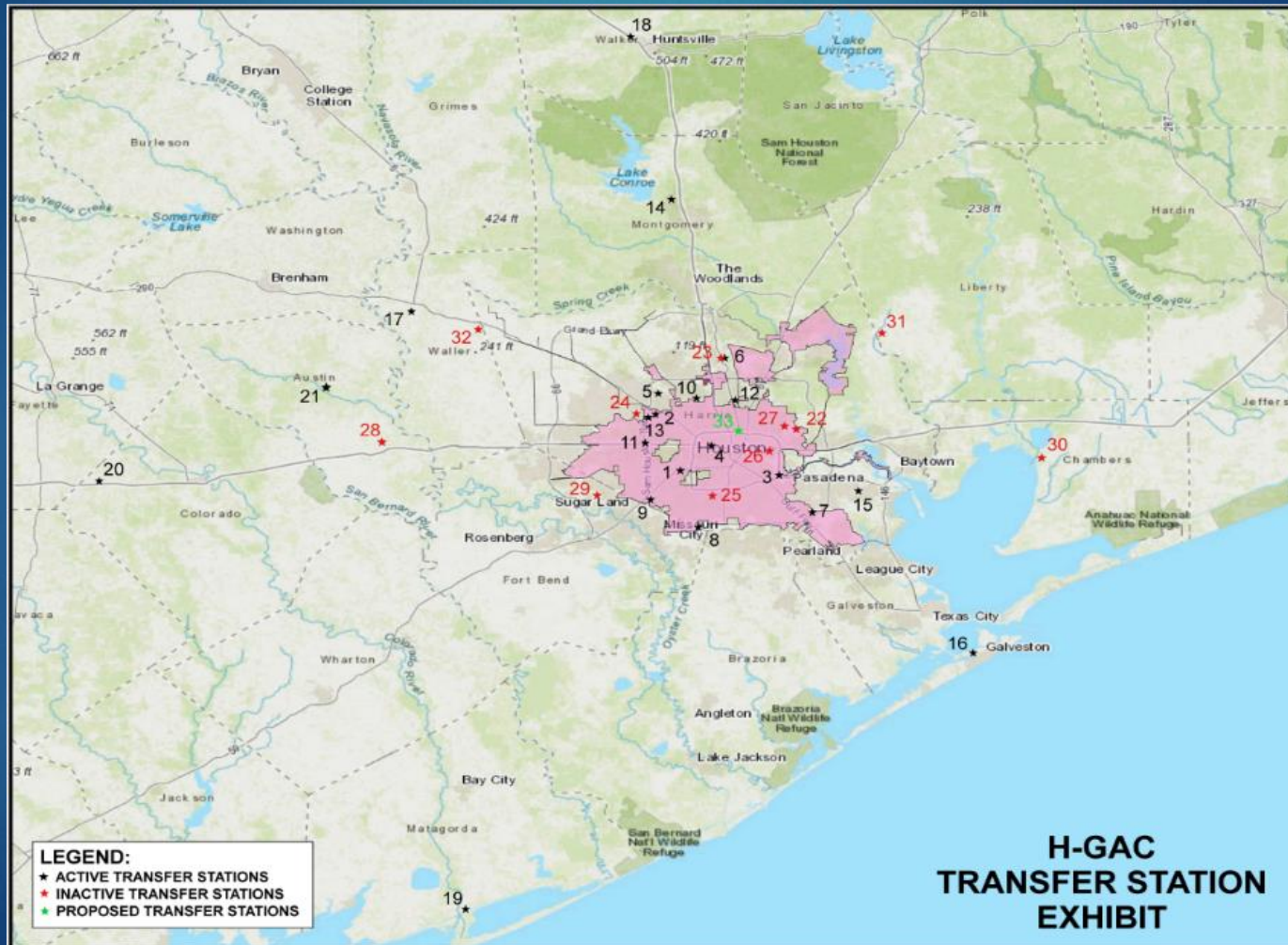
Reduce transportation costs associated with the collection and hauling of wastes and recyclable materials through efficient routes and strategic use of transfer stations.



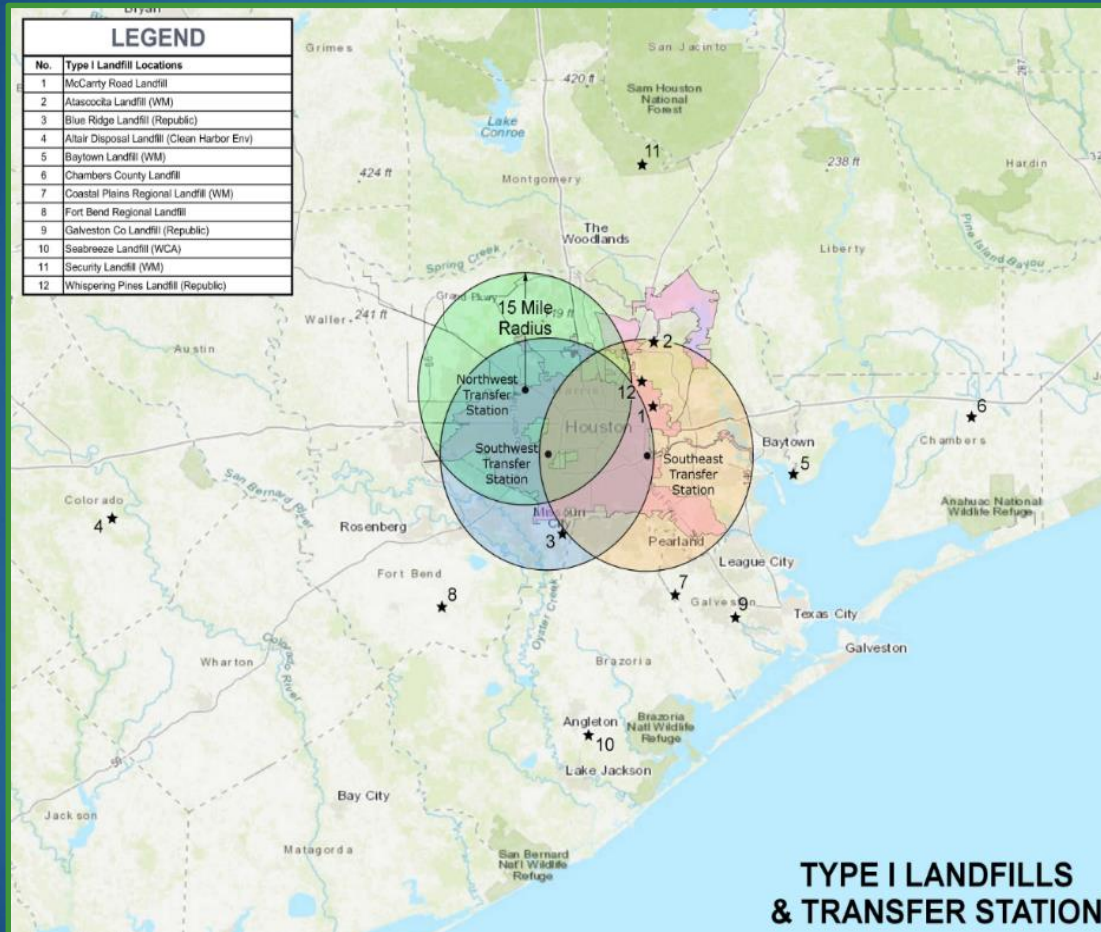
Transfer Stations

- ▶ City owns three transfer stations – permitted in 1999
- ▶ There are a total of 21 total active transfer stations in the region
- ▶ Critically important given Houston's traffic situation
- ▶ Operations contract is now being procured
- ▶ City's contract with FCC requires all recycled material to be sent to their NE Houston facility
- ▶ Nearby current landfill capacity could be depleted in mid-term – resulting in longer haul distances

Location of Transfer Stations



City Transfer Stations & Regional Type I Landfills



Needs & Gaps

26

- ▶ Facilities are aging and need of repair as well as traffic flow improvements – City facilities permitted in 1999
- ▶ Increasing amounts of waste are anticipated at these facilities in future years. Sites have available capacity, but increased waste may impact ability to manage large quantities of other waste which generates revenues
- ▶ Because of the contract with FCC, all materials need to be hauled to NE Houston. This causes longer haul times for recycling routes.
- ▶ There is no transfer capabilities in NE Houston. Once McCarty reaches capacity, there will be a need for additional transfer capabilities in this part of the City.

Potential future actions

27

- ▶ Recyclable material transfer capabilities
- ▶ Invest in ongoing site improvements and maintenance
- ▶ Build a Northeast transfer station
- ▶ Evaluate the potential to provide transfer capabilities for organic waste to improve composting economics
- ▶ Evaluate Rail – Haul Transfer Station options

Energy from Waste Goals & Objectives

- ▶ **Overall Objective: Utilize environmentally acceptable and technologically feasible measures for resource recovery and energy from waste.**
- ▶ **Specific Objectives:**
- ▶ Encourage the utilization of energy from waste in the form of landfill gas utilization throughout the region as a means of generating useful energy and reducing air emissions associated with municipal solid waste landfills.
- ▶ Invest in environmentally sound alternative technologies for resource recovery as technologies evolve and the cost-effectiveness of these technologies improve.

Energy from Waste

Recovery of energy from waste - three scenarios

Landfill gas to energy

Mass Burn and Refuse Derived Fuels

Pyrolysis, Gasification & Anaerobic Digestion

Landfill Gas to Energy

30

Facility	County	Gas Processed (million cubic ft)	Gas Distributed Off-Site (million cubic ft)	Power Generated and Sold (million kWh)	Power generated and used onsite (million kWh)
Security Landfill Gas to Energy Facility	Montgomery			22.4	22.7
Blue Ridge Landfill Gas Compressor Station	Brazoria	1,347	0	42.3	2.2
Fort Bend Landfill Gas Treatment Facility	Fort Bend	410	225	0	0
Coastal Plains Landfill Gas to Energy Facility	Galveston	0	0	25	26.7
McCarty Road Landfill Gas Recovery Facility	Harris	2,493	1,401		
Atascocita Landfill Gas to Energy Facility	Harris				
Ameresco McCarty Energy Landfill Gas to Energy facility	Harris	1,045	1,045		
Total		5,295	2,671	89.7	51.6

Potential Future Actions

- ▶ Encourage landfills in the region that are not capturing gas to invest in recovery options
- ▶ Continuously evaluate progress in energy from waste and chemical recycling as ways to reduce landfill needs while protecting air, land and water resources

Assuring Disposal Goals and Objectives

- ▶ **Overall Objective: Assure Long-term Disposal Capacity, maintaining a minimum of 25 years disposal capacity for waste generated by City residents and businesses.**
- ▶ Specific Objectives:
 - ▶ Encourage efficient operation of landfills throughout the region.
 - ▶ Require landfill facilities to meet all state and federal regulations through local ordinances and contracts for service.
 - ▶ Assure environmental justice is taken into consideration for new landfill locations and expansions.

Landfill

- ▶ 13 MSW Landfills in the Region with 30-40 years capacity
- ▶ 15 C&D Landfills in the Region with 20-30 years capacity
- ▶ Approximately 75% of waste generated in region goes to a landfill (assuming state recycling rates apply to Houston)



Photo Source: Houston Chronicle

Currently Houston's landfills are privately owned and operated

Advantages	Disadvantages
Reduces City operating risks	Reliance on private sector to meet long-term disposal needs
City does not have to finance capital projects	City may have some environmental liabilities for operations they don't control
Privates are responsible for addressing all TCEQ requirements	City has limited control over costs

Needs & Gap Analysis

36

- ▶ Remaining capacity for Type I Landfills is 30-40 years.
- ▶ McCarty Road Landfill has 10-15 years remaining capacity.
- ▶ Type IV remaining capacity is between 20 – 30 years
Once they reach capacity, waste will be sent to Type I facilities unless additional Type IV capacity is added.
- ▶ The ability to site and permit a new landfill takes time and is politically difficult to accomplish.
- ▶ The City has no control over the operation or closure of existing regional landfills (with the exception of landfills it maintains contracts with). Even that only provides limited control.

Capacity in H-GAC Region



In 2017, the H-GAC Region disposed of 9.1 million tons of waste. As population increases, tonnages will also increase.

Schedule & Site Requirements

Activity	Years														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Site Selection	█	█	█												
Procurement				█											
Permitting (two years for hearing if required)					█	█	█	█	█						
Construction										█	█	█	█		

- Location Restrictions: Airport, Waters of US, Wetlands, Geologic Conditions
- County Site Ordinances: Brazoria, Chambers & Fort Bend Counties
- Size: Approximately 600 to 1500 acres
- Access: Good access
- Surrounding Land Uses: Compatible land use
- Environmental Justice: Not focused on low-income or minority areas

Landfill Ownership & Operations Options

	Public Ownership / Public Operations	Public Ownership / Private Operations	Private Ownership/ Private Operations
Austin			X
Arlington		X	
Corpus Christi		X	
Dallas	X		
El Paso	X		
Fort Worth		X	
Garland	X		
San Antonio			X
Houston			X

Potential Future Actions

- ▶ Continuously monitor landfill capacity in the region.
- ▶ Contract for disposal capacity through both the transfer station contract and landfill disposal contract. Contract for long-term disposal services. Terms must include requirement for compliance with TCEQ and other regulations.
- ▶ Select a site for a potential future landfill should capacity reach low levels.
- ▶ Contract for the selection, permitting and construction of a new privately or publicly owned landfill in the region for City use.

Potential Future Actions

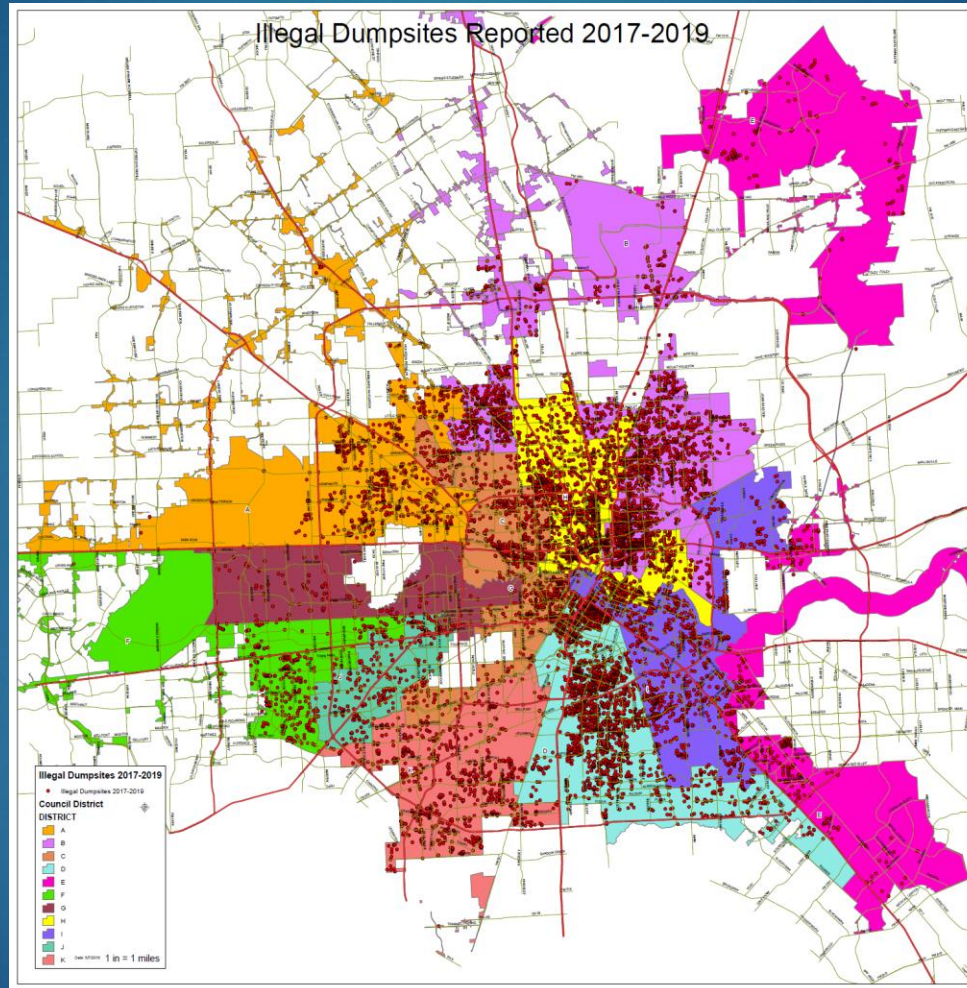
- ▶ Negotiate long-term disposal contracts for facilities outside the region.
- ▶ Evaluate the potential of constructing a multi-modal transfer station to allow for access to landfills outside the region.
- ▶ Build financial reserves for construction of new facilities and more trucks required to deal with longer distances to new facilities.
- ▶ Monitor new landfills in the City for Environmental Justice.

Illegal Dumping Goals and Objectives

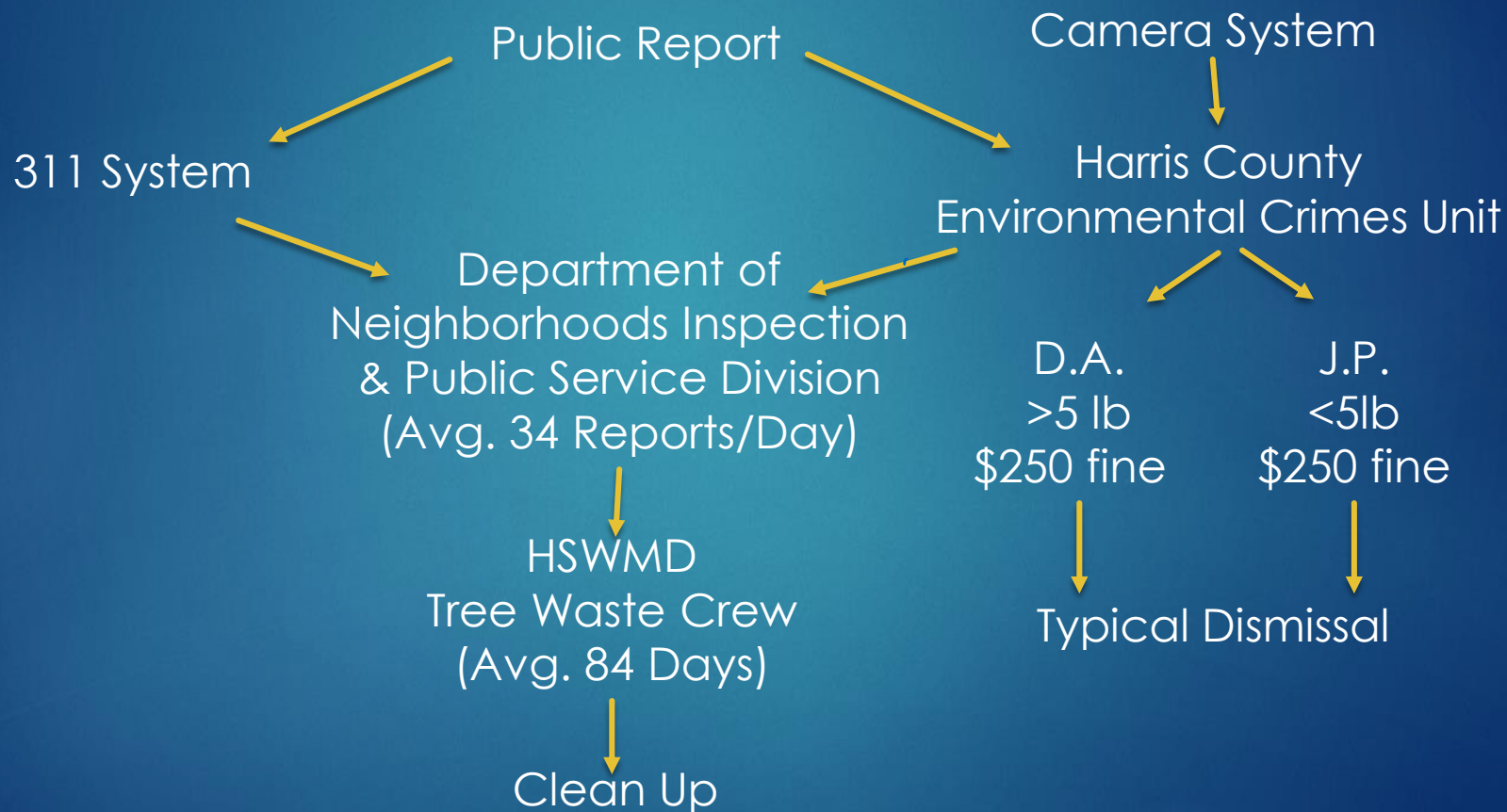
42

- ▶ Clean up illegal dumps within 30 days of report
- ▶ Reduced number of illegal dumps

Illegal Dumping



Illegal Dumping & Enforcement Process



Needs and Gaps

45

- ▶ Average time from report to cleanup is 84 days
- ▶ High number of illegal dumps – averaging 34 reported per day
- ▶ Lack of Enforcement/Deterrence
- ▶ Lack of public understanding of proper waste management alternatives that are available
- ▶ Current ordinance precludes use of billboards for public education

Potential Future Actions

46

- ▶ Dedicated trucks and crews
- ▶ Increased staffing at Depositories to increase hours of operation and access
- ▶ Increased staffing for Harris Co. Env. Crimes Unit Camera System (6 additional)
- ▶ Ongoing multi-lingual public education, e.g. billboards, public events, radio, social media, etc.
- ▶ Mow medians and vacant lots
- ▶ Consider involving Houston Police Department Differential Response Unit (Community Policing)
- ▶ Authorize Code Enforcement and/or Differential Response Unit to issue citations