

New Mexico Solid Waste and Recycling Conference – Albuquerque, NM

September 19, 2023

# Maximizing Opportunities and Managing Challenges in Residential Collection



Catelyn Scholwinski, Senior Consultant

# AGENDA

- Introduction to Avondale
- Purpose
- Approach
  - Field Observations
  - Survey and Interviews
  - Scenario Modeling
- Results
- Implementation





# INTRODUCTION TO AVONDALE

# PROFILE

- Phoenix metropolitan area
- 2021 population: 90,755
  - 2030 estimated: 101, 800
- Rapid growth
  - 6% 个 pop. 2019 to 2020 (1.4% 个 from 2020 to 2021)
  - 2.5% HH increase each year, next 5 years
  - As of 2020, 92% of permitted 8,805 households remain to be built out
- NASCAR Phoenix International Raceway



# CITY SOLID WASTE SERVICES



#### Public Works

- 24 FTE in Solid Waste; 8 in Fleet
- 23,000 households
- 90-gallon carts; ASL
  - Garbage and recycling; once per week
- Monthly brush and bulk collection
- On-site Fleet Maintenance
- Cart Management and Inspection

#### **Garbage Collection**

- MTW, once per week
- 24 to 33 routes per week (8 to 11 each day)



### **Recycling Collection**

- Th Fri, once per week
- About 18 to 22 routes per week (9 to 11 routes per day)



# BRUSH AND BULK COLLECTION

- Collected from the curb with modified tractors
- Loaded into rear-loader(s)
- Collected monthly









# PURPOSE OF THE STUDY



- "Recommendations for service enhancements and efficiencies"
- Strain on solid waste collection services
- Adapting to rapid growth
- CDL driver retainment
- Existing equipment maximization
- Interviews, ride-a-longs, route analysis, cost analysis



#### Field observations of routes



In-person interviews and surveys



Operational and financial modeling, with growth forecasting

# APPROACH

DATA NEEDS FOR ANALYSIS

- Route data
  - Customer counts, tonnage, time metrics
- Labor data
  - Overtime, personnel by job titles, salaries
- Operations data
  - Maintenance costs, fuel costs, miles per route
- Capital costs
  - Vehicles, other equipment

• Historical trends (3 to 5 years)



# FIELD OBSERVATIONS

# ON ROUTE OBSERVATIONS

- 5 days, 2 team members
- 4 garbage routes, 3 recycling routes, 3 bulk collection days
  - Pre- and post- trip efficiency
  - Routing processes and challenges
  - Staffing, overtime
  - Set-out rates
  - Time metrics
  - Mileage metrics
  - Tonnage



#### Avondale

#### Data Collection Form (Page 1)

Day:	
Date:	
Weather:	

Route # \_\_\_\_\_ Vehicle #: \_\_\_\_\_

Total Number of Households on Route: Driver:

Weather:		Vehicle Type: Driver:							
		FIRST LOAD		SECOND LOAD		THIRD LOAD		FOURTH LOAD	
ACTIVITY	(	TIME	MILEAGE	TIME	MILEAGE	TIME	MILEAGE	TIME	MILEAGE
Clock in:									
Start Pre-	Trip Inspection:								
Finish Pre	e-Trip Inspection:								
Leave yar	rd:								
Start rout	e:								
Leave rou	ite for facility:								
Arrive at s	scale:								
Scale We	Scale Weight:		lbs/tons		lbs/tons		lbs/tons		lbs/tons
Leave sca	ale for tipping area:								
Arrive at t	ipping area:								
Leave tip	ping area:								
Arrive bac	ck at yard:								
Post-trip (	refuel, inspect, paperwork, etc.):								
Clock-out									
Ор	Total Set Outs:								
Data	Total Pass By's:								
(From pg 2	) Total Out of Cart Set Outs:								
	Total Homes with Excess:								
Did drive	r help on another route?								
Route #:			_						
Start time	: Start mileag	je:							
End time:	End mileage	e:							
Reason:									-

#### Miscellaneous time:

Break:	Start time:	End time:	
Lunch:	Start time:	End time:	
Break:	Start time:	End time:	
Breakdown	Start time:	End time:	
Breakdown	Start time:	End time:	

Comments or problems (weather, traffic, road problems, vehicle breakdown, etc.)

### ROUTE OBSERVATION FORM



# SURVEY AND INTERVIEWS



# SURVEY RESULTS

- 10 responses (out of 17 operators)
- 80% : prefer to change to a 4-day, 10-hour workweek
- 20% : prefer to remain at a 5-day, 8-hour day workweek
- 50% : prefer to take off the same holidays as other City departments
- 50% : prefer to only take off holidays on the days the Landfill is closed

# SURVEY RESULTS

When asked to prioritize changes to improve operations, more drivers and more equipment was the highest priority, with more mechanics, and balanced routes close behind in importance.



# SURVEY RESULTS

Operators ranked the biggest challenges, the predominate issue was customer behavior hindering efficiency.





# SCENARIO MODELING

### AUTOMATED COLLECTION

Model Scenarios

Alternative 1: Rebalance Existing, 5/8s	Same collection schedule (5 days: 3 garbage, 2 recycling) with 8-hr workdays
Alternative 2: Rebalance Existing, 5/10s	Same collection schedule (5 days: 3 garbage, 2 recycling) with 10-hr workdays, rotating employees to work only 4-day weeks
Alternative 3: Rebalance, 4/10s	New collection schedule (4 days: 2 garbage, 2 recycling) with 10-hr workdays
Alternative 4: Dedicated, 5/8s	New collection schedule (5 days garbage, 5 days recycling) with 8-hr workdays
Alternative 5: Dedicated, 5/10s	New collection schedule (5 days garbage, 5 days recycling) with 10-hr workdays
Alternative 6: Dedicated, 4/10s	New collection schedule (4 days: 4 garbage, 4 recycling) with 10-hr workdays

#### BULK COLLECTION

Model Scenarios

Alternative 1: Rebalance Monthly, 5/8s	Same collection schedule (5 days), with 8-hour workdays and rebalanced routes; <b>monthly</b> collection per household					
Alternative 2: Monthly, 5/10s	Same collection schedule (5 days), with 10-hr workdays, rotating employees to work only 4-day weeks; <b>monthly</b> collection per household					
Alternative 3: Monthly, 4/10s	New collection schedule (4 days), with 10-hr workdays like other City departments; <b>monthly</b> collection per household					
Alternative 4: Quarterly, 5/8s	5-day workweek, 8-hour workdays; <b>quarterly</b> collection per household					
Alternative 5: Quarterly, 5/10s	5-day workweek, with 10-hour workdays, rotating employees to work only 4-day weeks; <b>quarterly</b> collection per household					
Alternative 6: Quarterly, 4/10s	4-day workweek, with 10-hour workdays like other City departments; <i>quarterly</i> collection per household					

# MODELING

- Observational data baseline
- Compared to alternatives
- Route, labor, operations, capit

	Residential Garbage Collection Route Service									
ING	Line No. Description [1]	Current Case Summary	Alternative 1 Rebalance Existing 5/8's	Alternative 2 Rebalance Existing 5/10's	Alternative 3 Rebalance 4/10's	Alternative 4 Dedicated 5/8's	Alternative 5 Dedicated 5/10's	Alternative 6 Dedicated 4/10's		
ional data ->	2 Residential Garbago - Raw Data									
	3 <u>Customer</u> 4 Number of Collection Days per Week	3	3	3	2	5	5	4		
	5 Number of Collections hh/week 6 Set-out Rate 7 Garbage lbs. per house	1 92% 50.1	1 96% 50.1	1 96% 50.1	1 96% 50.1	1 96% 50.1	1 96% 50.1	1 96% 50.1		
ed to	8 <u>Truck</u> 9 Truck Load Limit (lbs.)	21,600	21,600	21,600	21,600	21,600	21,600	21,600		
ves	Avg on Route Time (hrs.)     Turn around time at facility (hrs.)     Avg Time Off Route not facility (hrs.)	5.81 0.66 2.18	5.16 0.66 2.18	6.82 1.00 2.18	6.82 1.00 2.18	5.16 0.66 2.18	6.82 1.00 2.18	6.82 1.00 2.18		
hor	14 Trips to Facility 15 Residential Garbage - Calculated Data	2.2	2	3	3	2	3	3		
	Stops/Homes           16         Stops/Homes           17         Number of Stops per Week           18         Stops Howes	20,628	21,488	21,488	21,488	21,488	21,488	21,488		
ns, capital	Avg Stops per Hour     Avg Stops per route     Average Homes per Route	825 895	796 829	1,023 1,066	1,074 1,119	716	860 895	1,074 1,119		
	21 <u>Weight</u> 22 Total Pounds per Route 23 Avg weight per Load (lbs.)	41,361 19,090	39,892 19,946	51,263 17,088	53,827 17,942	35,903 17,952	43,061 14,354	53,855 17,952		
	24 <u>Route</u> 25 Total Route Time (hrs.) 26 Trucks (#)	8.66	8.0 9	10.0 7	10.0 <b>10</b>	8.0 6	10.0 5	10.0 5		
	<ul><li>27 Stops per Day (all routes)</li><li>28 Total Homes per Day (all routes)</li></ul>	6,876 7,461	7,163 7,461	7,163 7,461	10,744 11,192	4,298 4,477	4,298 4,477	5,372 5,596		
	Route Ob - Res Garbage     Route S	Service ResSW Labor	ResSW Operati	ions ResSW Cap	oital ResSW Su	immary ResSW	🕂 🗄 🖣			
Customized for	Route Ob - Res Recycle Route Serv	rice Recycling	or ResRecycle	Operations Re	sRecycle Ca	apital ResRecycl	e Summary	ResRecycle		
each Service	Route Obs - Bulk&Brush Route	e Service Bulk	abor ResBulk	Operations	ResBulk C	apital ResBulk	Summary	/ ResBulk		

# MODEL RESULTS - BASELINE

- Incorporates field observations and City's data
- Bulk had the highest annual direct costs, followed by garbage and then recycling
- Highest cost for bulk was labor
- Highest cost for garbage and recycling was capital costs (vehicles and carts)



Annual Total Labor Costs

# GROWTH COMPONENT

Residential Garbage Collection

		Residential Garbage Collection Route Service 2023 - Garbage Collection, Route Service							
Line No.	Description [1]	Alternative 1 Rebalance Existing 5/8's	Alternative 2 Rebalance Existing 5/10's	Alternative 3 Rebalance 4/10's	Alternative 4 Dedicated 5/8's	Alternative 5 Dedicated 5/10's	Alternative 6 Dedicated 4/10's		
24 25 26	<u>Route</u> Total Route Time (hrs.) Trucks (#)	8.0 9	10.0 7	10.0 11	8.0 6	10.0 5	10.0 6		

		2025 - Garbage Collection, Route Service							
Line No.	Description [1]	Alternative 1 Rebalance Existing 5/8's	Alternative 2 Rebalance Existing 5/10's	Alternative 3 Rebalance 4/10's	Alternative 4 Dedicated 5/8's	Alternative 5 Dedicated 5/10's	Alternative 6 Dedicated 4/10's		
24	Route								
25	Total Route Time (hrs.)	8.0	10.0	10.0	8.0	10.0	10.0		
26	Trucks (#)	10	8	11	6	5	6		

		2027 - Garbage Collection, Route Service							
Line No.	Description [1]	Alternative 1 Rebalance Existing 5/8's	Alternative 2 Rebalance Existing 5/10's	Alternative 3 Rebalance 4/10's	Alternative 4 Dedicated 5/8's	Alternative 5 Dedicated 5/10's	Alternative 6 Dedicated 4/10's		
24	Route								
25	Total Route Time (hrs.)	8.0	10.0	10.0	8.0	10.0	10.0		
26	Trucks (#)	10	8	12	6	5	6		

© 2023 NEWGEN STRATEGIES AND SOLUTIONS, LLC

### GROWTH COMPONENT (CONT.)

Residential Large Brush and Bulky Items Collection

			Residential Large Brush and Bulky Items Collection 2023						
Line No.	Description	Alternative 1 Rebalance Monthly (5/8's)	Alternative 2 Monthly 5/10's	Alternative 3 Monthly 4/10's	Alternative 4 Quarterly 5/8's	Alternative 5 Quarterly 5/10's	Alternative 6 Quarterly 4/10's		
24	Route								
25	Total Route Time (hr.)	8.00	10.00	10.00	8.00	10.00	10.00		
26	REL Trucks (#)	4	3	3	2	2	2		
27	Brush Trucks (#)	N/A	N/A	N/A	N/A	N/A	N/A		
28	Tractors (#)	3	2	2	1	1	1		

		Residential Large Brush and Bulky Items Collection 2027						
Line No.	Description	Alternative 1 Rebalance Monthly (5/8's)	Alternative 2 Monthly 5/10's	Alternative 3 Monthly 4/10's	Alternative 4 Quarterly 5/8's	Alternative 5 Quarterly 5/10's	Alternative 6 Quarterly 4/10's	
24	Route							
25	Total Route Time (hr.)	8.00	10.00	10.00	8.00	10.00	10.00	
26	REL Trucks (#)	4	3	4	2	2	2	
27	Brush Trucks (#)	N/A	N/A	N/A	N/A	N/A	N/A	
28	Tractors (#)	3	2	3	1	1	1	



# RESULTS

# **RESULTS – AUTOMATED COLLECTION**

- Most cost-effective approach to collection of garbage and recycling is Alternative 2
  - Rebalancing existing routes with a rotating schedule of five days per week, ten hours per day.
- Total estimated annual direct costs for garbage and recycling in this scenario is approximately \$1.9 million
  - Estimated annual savings of nearly \$500,000
  - Requires a total of 7 vehicles and drivers (instead of 9)



■ Garbage ■ Recycling

# RECOMMENDATIONS – BULK COLLECTION

- Standardize program materials
- Communication and enforcement needed to improve collection and reduce route time





# **RESULTS – BULK COLLECTION**

- Most cost-effective approach to collection of bulk trash is any of the *quarterly* alternatives (Alternatives 4, 5, and 6)
  - One tractor paired with a rear-loader and one floating rear-loader could complete the work
- Total estimated annual direct costs for bulk trash in these scenarios is approximately \$885,000
  - Estimated annual savings of nearly \$800,000
- Of the alternatives with *monthly* collection, the *ten-hour day* alternatives are more cost effective (Alternative 2, 3)



Annual Total Labor Costs

- Annual Total Vehicle Operating Costs
- Annual Total Vehicle Capital Costs



# IMPLEMENTATION

# **REQUESTED CHANGES TO COLLECTION**

- 5-day 10-hr workweek for garbage and recycling
- Rebalanced, monthly collection for bulk, with 5-day 10-hr workweeks
- PW met with other departments prior to Council presentation
- The recommended changes were presented to City Council in January 2023
  - Implementation of changes began in April for ASL
  - Began new work schedule in July for bulk crews
- Revised City Code for Sanitation was adopted in July

# ROTATING SCHEDULE

#### June 2023



- 5 groups (A E)
- 3-4 operators in each group
- Each group has one, 4-day weekend a month
- Change included collecting on observed holidays that were previously collection holidays (i.e., Memorial Day)

# CITY PERSPECTIVE



- Outreach methods coordinated effort
- Despite all outreach efforts, about 25% of the community claimed to be unaware (influx in customer service calls)
- "You have to stick with it"



# QUESTIONS?

Catelyn Scholwinski, Senior Consultant cscholwinski@newgenstrategies.net

