Data Driven Decisions for Debris Management

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OBJECTIVES

Minimizing complexities in data collection facilitates efficient and effective collaboration

Keeping projects scalable allows an organization to deploy quickly at any level

Data driven decision-making allows cities to better serve citizens and spend public funds wisely
SUGAR LAND, TEXAS

- Population: 111,026
- Households: 35,000+
- Service Levels
  - Twice Weekly Trash
  - Weekly Recycling
  - Weekly Green Waste
  - Monthly Bulk Waste
- High Expectations on Contractor and City
After Winter Storm Uri, Sugar Land faced unprecedented debris volumes. High debris volumes caused the hauler, City staff, and eventually debris contractor to get behind schedule. Debris sat weeks after the initial freeze event.
HISTORICAL APPROACH

- No Real Way to Plan for Debris Management
  - Paper Maps
  - Contractor Running Assessments and Reporting Back
  - Debris Monitoring Vendor Managing Major Operations
- Focus was on Damage Assessments
- We Couldn't Trust the Data!
SOLUTION

- Collect Real Time Data
- Analyze Data Quickly
- Effectively Allocate Resources

Weaponized Data

This is where GIS came in!
DATA COLLECTION
| THE APP

With Survery123, we can easily collect the location and following information:

- Debris Type
  - Green Waste or Bulky Waste
- Amount
  - Question Based On Debris Type
- Assessment Zone
  - Predetermined Assessment Zones for Scheduling/Tracking
- Images
  - For Anything Interesting
DATA COLLECTION
| ASSESSORS

- Labor Pool
  - Mandatory for all City employees
- Quarterly Training
- Assessment Zone Planning
- Daily Briefs During Incident
  - Collaboration!!
- Under Impact Assessment Group
- Part of recovery
- Work starts when the incidents begins
  - Department Operations Center
DATA ANALYSIS | VISUALIZATION

Debris Assessment Dashboard filtered for current day.

Today Values

Bulk Waste

100

Green Waste

1,311

5,080 943.6

Number of Bags Cu Yd
Debris data is broken up by Service Day to allow for accurate planning.
The collected data, along with empirical data, is analyzed and presented to stakeholders.
DATA ANALYSIS | FOCUS AREAS

Subdivision Breakdown | 9/21

- ALDRE LAKE SECTION 2
- THE HIGHLANDS SECTION 1
- ALDRE LAKE
- LAKES OF EDGWARE SECTION 1
- SUGAR CREEK SECTION 15
- THE HIGHLANDS SECTION 3
- PLANTATION COLONY SECTION 2
- SUGAR CREEK SECTION 1
- MAGNOLIA PLANTATION SECTION 1
- CRIBSHIRE SECTION 1

Assessments | Completed Zones | Green Waste Days | Subdivision Breakdown | Green Waste Type
February Winter Event
Total Submissions: 18,728
Submissions per day: 1,337.71
Number of Days: 14
Est. Volume: 198.3k

Tropical Storm Nicholas
Total Submissions: 13,294
Submissions per day: 1,329.4
Number of Days: 10
Est. Volume: 68.9k
Number of bags
COLLABORATION

Since we’re operating in ArcGIS Online, we can share with our solid waste/debris contractors easily.

- Viewer account for contractors to view the data
- Replaces the need for our contractor to canvass the city so they can focus on pick up
- Data analysts attending debris tactics meetings
FIELD OBSERVATIONS

Reduced Expenses with Data Driven Decisions
- Standard Contract Services
- Enhanced Debris Services

Facilitated Efficient Resource Deployment
- City: Staff and Assessors
- Hauler: Staff and Equipment

Facilitated Comprehensive Impact Assessment Program Framework
- Infrastructure Damage
- Commercial Damage
- Residential Damage
- City-wide Debris
CONTINUED SUCCESSES

Cart Audit (in QuickCapture!)

Extra Can Tracker

Areas Outside the Solid Waste Realm (Sidewalk Assessments)
WAY AHEAD – WORK SMARTER, NOT HARDER

- Neighborhood-Based Analysis: Predict Hardest Hit Areas BEFORE Events Occur
- Integration with Workforce: Speeds Up Assessment Process
- Use of Drones to Complete Aerial Reconnaissance: Software Allows Us to Calculate Volume From the Sky
QUESTIONS & COMMENTS

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