



Solid Waste & Recycling Collection Fleet Optimization



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Solid Waste & Recycling Collection Fleet Optimization

Solid Collections Stats

- ▶ 700+ Trucks
 - ▶ Automated Side Loaders
 - ▶ Front & Rear Loaders
- ▶ 1.3 Million Customers
 - ▶ 750,000 Curbside Residential Customers
 - ▶ 550,000 Private Service Customers
- ▶ 2.3 Million Containers -Three Types
 - ▶ Refuse - Black Containers
 - ▶ Yard Trimmings - Green Containers
 - ▶ Recycling - Blue Containers





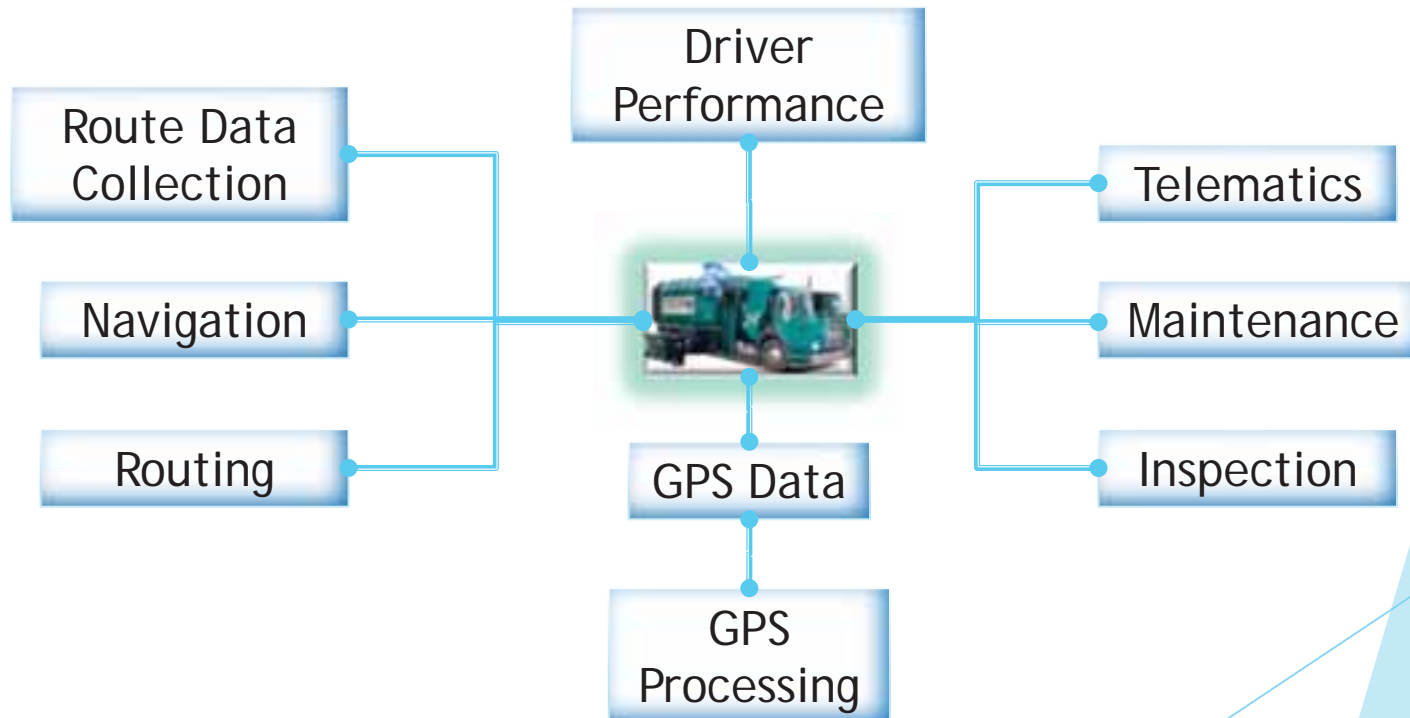
Solid Waste & Recycling Collection Fleet Optimization

Holistic approach

- ▶ Fleet
 - ▶ Real Time Use
 - ▶ Maintenance
 - ▶ Telematics
 - ▶ Driver
 - ▶ Routing
 - ▶ Navigation

Holistic approach

Real-Time Data Capture





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Real-Time GIS: Zonar Systems

- ▶ Application
 - ▶ On-board GPS
 - ▶ Real-Time communications
 - ▶ Capture GPS Truck Events
 - ▶ Automated Inspection system
 - ▶ Zonar Tablet
 - ▶ Integrated Web Application "GTC"
 - ▶ Real time data



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Real-Time GIS: Zonar Systems

- ▶ Components
 - ▶ Inspections
 - ▶ Telematics
 - ▶ Maintenance (Integrated with AssestWorks)
 - ▶ Truck Telematics
 - ▶ Driver Performance
 - ▶ Event Notifications
 - ▶ Truck Sub-System
 - ▶ Arm Lift, Scale (load cells), and RFID reader



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Real-Time GIS: Zonar Systems

- ▶ GPS Data (Events)
 - ▶ Arm Lifts Reads
 - ▶ Scale reading
 - ▶ Container RFID Reads
 - ▶ Truck Telematics
 - ▶ Driver Performance

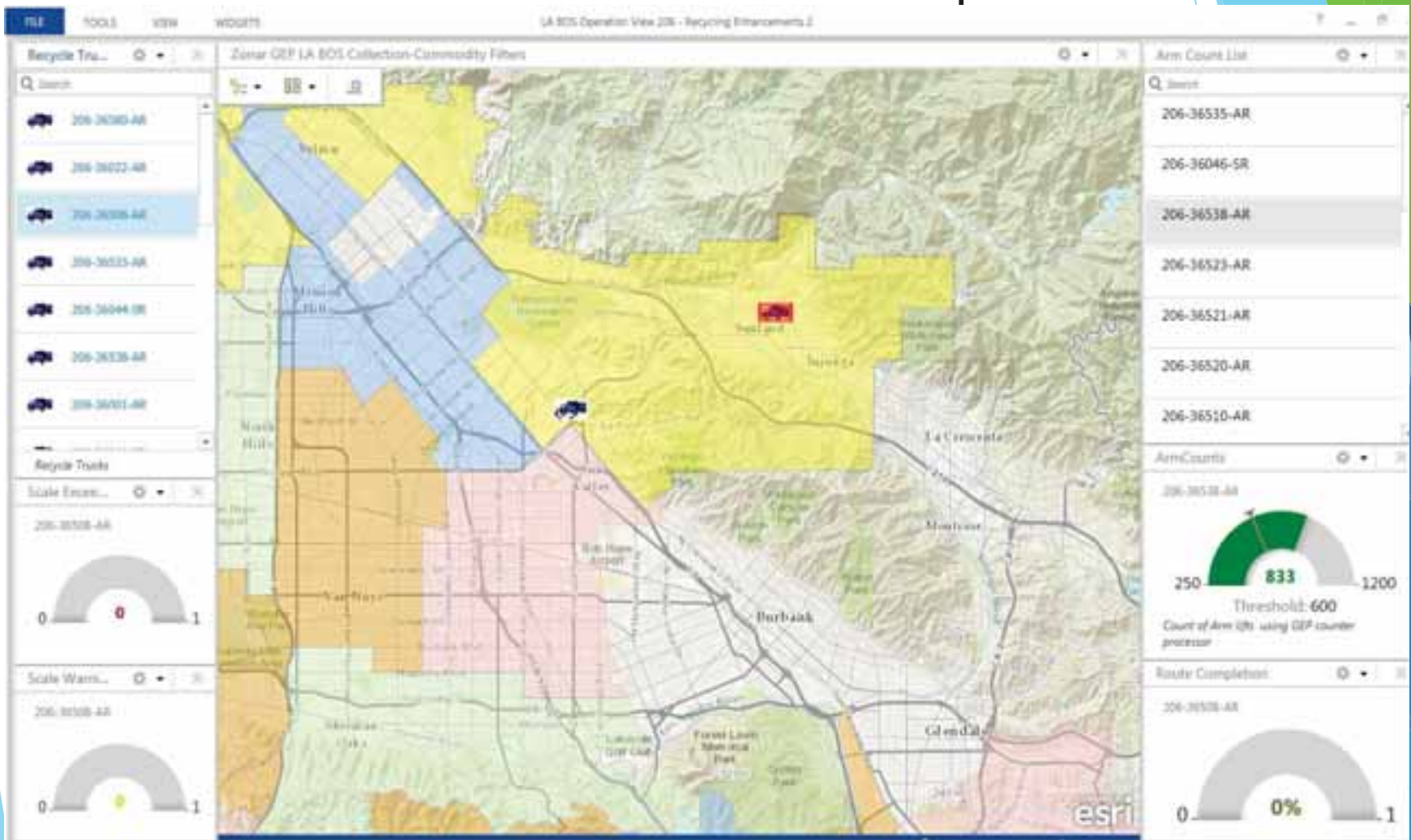


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Real-Time GIS: ESRI - GeoEvent Processor

- ▶ Real time analysis
 - ▶ Arm Lift Analysis
 - ▶ Route Analysis
 - ▶ Percentage Complete
 - ▶ Arm Counts
 - ▶ Adherence
 - ▶ Scale Reads
 - ▶ Route Monitor - Time Windows
 - ▶ ESRI Dashboards

GeoEvent Processor - Dashboard Sample



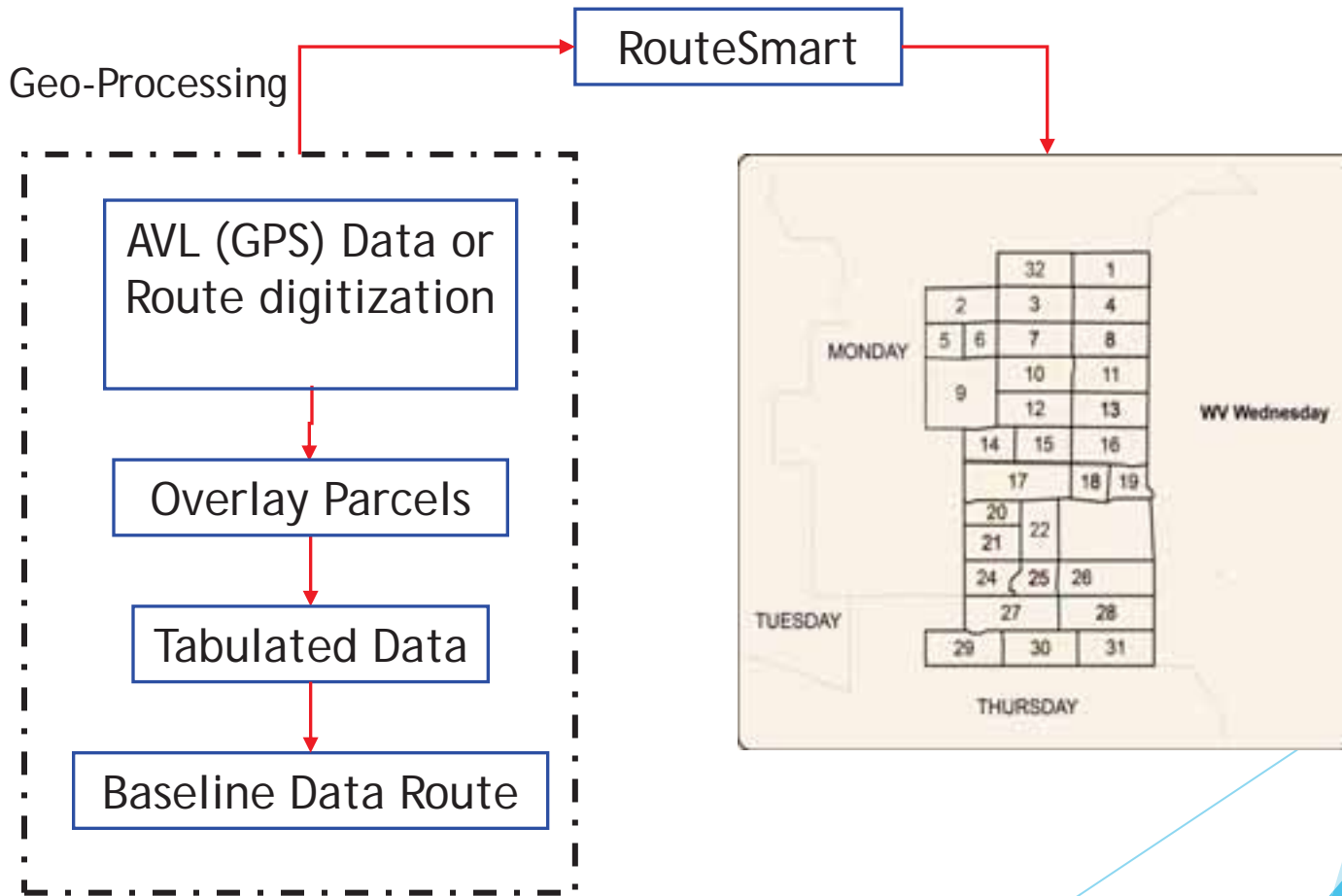


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Real-Time GIS: Navigation

- ▶ RouteSmart Navigator
 - ▶ Route Selection - Digital Route Map Books
 - ▶ Route Adherence - Stop Sequence
 - ▶ Route Simulation
 - ▶ Integrated with RouteSmart
 - ▶ Route Planner Integration - Pending
 - ▶ Route Data Collection
 - ▶ Damage Containers
 - ▶ Contaminated Containers

General Routing Process





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Questions