Memorandum

CITY OF DALLAS

DATE June 20, 2008

TO Honorable Members of the Quality of Life Committee: Pauline Medrano, Chair; Vonciel Jones Hill, Vice Chair; Carolyn R. Davis, Angela Hunt, Sheffie Kadane, David A. Neumann, Steve Salazar

SUBJECT **Sanitation Fleet Efficiencies with Global Positioning System**

Attached is the "Sanitation Services Fleet Efficiencies with Global Positioning System" briefing. This briefing will be presented to the Quality of Life Committee at noon on Monday, June 23, 2008.

Please let me know if you need additional information.

Ramón F. Míguez, P.E.
Assistant City Manager

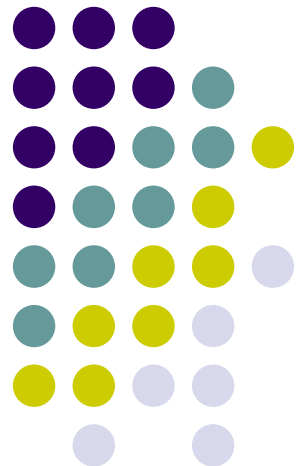
Attachment

C: Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Deborah A. Watkins, City Secretary
Thomas P. Perkins, Jr., City Attorney
Craig D. Kinton, City Auditor
Judge Jay E. Robinson
Ryan S. Evans, First Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
David O. Brown, Interim Assistant City Manager
A.C. Gonzalez, Assistant City Manager
David K. Cook, Chief Financial Officer
Mary Nix, Director, Sanitation Services
Helena Thompson-Stevens, Assistant to the City Manager

SAN Fleet Efficiencies
with Global Positioning System

Briefing to Quality of Life Committee
June 23, 2008

Mary Nix, Director
Sanitation Services



Key Focus Area
E3
Efficient, Effective, Economical Government

BRIEFING PURPOSE

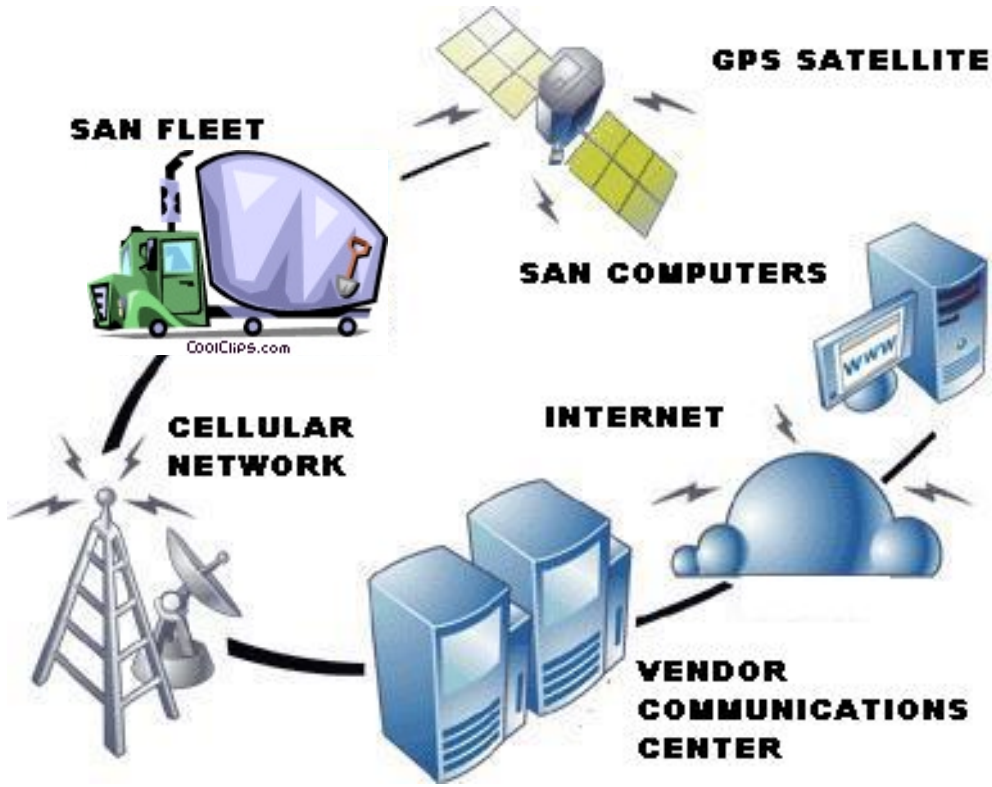
- Describe SAN fleet and future fleet needs
- Pilot GPS program
- Proposal for expanding GPS for all SAN fleet
  - Council action – award master agreement on 25 June
  - 36-month contract period (NTE $697,059)

BACKGROUND AND STATISTICS

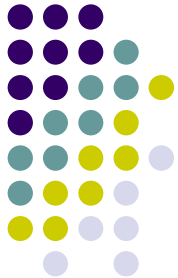
- SAN's fleet is 598 vehicle units (rolling stock)
- Up to 400 units are on-the-road each workday
- Each route supervisor has 12-16 route drivers to oversee
- SAN used 1,854,766 fuel gallons in FY07, costing $4,381,788
- SAN accrued 171,139 hours in overtime in FY07, costing $4,362,149
- To test value of GPS, SAN started a pilot trial of GPS on 70 vehicles in October 2006 (12% of fleet)

HOW DOES IT WORK?

- Vehicles are equipped with GPS communications equipment
  - GPS unit gets its location from satellite sources
- GPS unit transmits location info to vendor's Communications Center on continuous basis
  - Transmission via cellular tower network
- City staff accesses info via vendor-provided internet site



USING GPS …
WHAT CAN WE MEASURE?



- Idling Time
- Fuel Usage
- Driver Performance
  - Time on route
  - Number of households served
  - Speed control

IDLING TIME

- 6 minutes of idling time = 1 mile of travel
- City's Idling Ordinance (May 2008) prohibits idling over five minutes within the City Limits – includes all garbage fleet

					Travel Time (Travel Idle Time)	Time At Stop (Stop Idle Time)
11:45am	SOUTHWEST TRANSFER	2:00pm	SOUTHWEST TRANSFER	9.89 Miles	2 Hrs, 15 Min (5 Min)	10 Min → (10 Min)
2:10pm	SOUTHWEST TRANSFER	2:43pm	1316 Pierce St Dallas, TX 75211 - US	5.11 Miles	33 Min (0 Min)	31 Min → (31 Min)
3:15pm	1316 Pierce St Dallas, TX 75211 - US	3:43pm	343 Neches St Dallas, TX 75208 - US	3.94 Miles	28 Min (0 Min)	3 Min (3 Min)

FUEL USAGE

MEASURING OPERATING COST PER DAY

Vehicle Group: Dist 2 Side Loader

Idle periods >= 3 minutes are considered stops (Idling Stops)

Average Vehicle Miles Per Gallon: 10.00	Number of Work Days in a Month: 18.00
Cost of Fuel Per Gallon: $3.26	Number of Hours in a Work Day: 10.00
Equivalent Idle Minutes Per Mile: 6	Hourly Rate for Crew: $13.00
Vehicle's Monthly Cost: 3847.32	Percentage of Pay for Crew Overhead: 25.00

Summary for Vehicle - 073004 - Sensor

Trip count: 11	Fuel Cost: $27.43	Average Fuel Cost per trip: $2.49
Travel Time: 9 Hrs, 32 Min	Vehicle Cost: $206.82	Average Vehicle Cost per trip: $18.80
Travel Distance: 67.89 Miles	Crew Cost: $157.24	Average Crew Cost per trip: $14.29
Equivalent Idling Distance: 16.26 Miles	Total Cost: $391.49	Average Total Cost per trip: $35.58

DRIVER PERFORMANCE –

Time on Route, Households served, Speed control

Vehicle Status	Time	Location	Road Type	Speed
Moving	1:34pm	3319 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	4 MPH
Arm Down	1:34pm	3319 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	0 MPH
Can Dumped	1:34pm	3328 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	4 MPH
Arm Down	1:34pm	3330 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	1 MPH
Can Dumped	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	0 MPH
Moving	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	0 MPH
Arm Down	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	0 MPH
Can Dumped	1:35pm	3360 Poinsettia Dr, Dallas, TX, 75211 - US	Residential	0 MPH
Arm Down	8:59pm	COD CENTRAL SC	Residential	0 MPH	--	SE

Summary for Vehicle - 073017 - Sensor

Travel Distance:	89.60 Miles	Excessive Idles:	0	Interstate Speeding:	0 occurrences for a total of 0 Min
Travel Time:	12 Hrs, 49 Min	GeoFence Boundary Crossings:	0	Primary Speeding:	0 occurrences for a total of 0 Min
Idling Time:	1 Hr, 22 Min	Visits at Prohibited Sites:	0	Secondary Speeding:	0 occurrences for a total of 0 Min
Ignition Off Time:	20 Min	Sensor Events:	2486	Residential Speeding:	0 occurrences for a total of 0 Min
				Misc. Speeding:	0 occurrences for a total of 0 Min

WHAT CAN WE IMPROVE?

- Productivity
- Customer Service
- Fleet Maintenance Scheduling

PRODUCTIVITY

- Eliminate route discrepancies, extended breaks, unauthorized travel, side jobs and speeding

"Keeping Honest People Honest"

... continued for vehicle 033031

State	Departure Time	Departure Location	Arrival Time	Arrival Location	Ignition Off	Ignition On	Travel Distance	Travel Time (Travel Idle Time)	Time At Stop (Stop Idle Time)	Exceptions
	4:46pm	4280 Carpenter Ave Dallas, TX 75210 - US	4:48pm	4247 Carpenter Ave Dallas, TX 75210 - US	5:14pm	6:36pm	0.05 Miles	2 Min (0 Min)	1 Hr, 51 Min (30 Min)	ES
	6:40pm	4247 Carpenter Ave Dallas, TX 75210 - US	6:51pm	COD CENTRAL SC	--	--	2.65 Miles	11 Min (0 Min)	4 Min (4 Min)	
Stopped	6:55pm	COD CENTRAL SC	6:57pm	COD CENTRAL SC	6:58pm	--	0.11 Miles	2 Min (0 Min)	Overnight (1 Min) (Report End)	

PRODUCTIVITY continued…

"Honest, Officer, I didn't realize I was going that fast…"

8:37pm Tue, Aug 07, 2007	2570 Wright Ave, Dallas, TX, 75211 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 40 MPH.
3:47pm Wed, Aug 08, 2007	Hwy 20 at 9.43 mi SSE of Dallas, TX, 75241 - US	SP: Speeding on Interstate road for 3 Min. Reached a maximum speed of 72 MPH.
3:51pm Wed, Aug 08, 2007	0.22 mi SSE of Rylie, TX, - US	SP: Speeding on Misc. road road for 1 Min. Reached a maximum speed of 66 MPH.
3:52pm Wed, Aug 08, 2007	Hwy 635 at 4.67 mi S of Mesquite, TX, 75180 - US	SP: Speeding on Interstate road for 4 Min. Reached a maximum speed of 72 MPH.
3:56pm Wed, Aug 08, 2007	1.38 mi WNW of Mesquite, TX, - US	SP: Speeding on Misc. road road for 1 Min. Reached a maximum speed of 74 MPH.
3:57pm Wed, Aug 08, 2007	Hwy 635 at 2.03 mi NNW of Mesquite, TX, 75149 - US	SP: Speeding on Interstate road for 1 Min. Reached a maximum speed of 73 MPH.
3:59pm Wed, Aug 08, 2007	Hwy 635 at 4.02 mi N of Mesquite, TX, 75150 - US	SP: Speeding on Interstate road for 8 Min. Reached a maximum speed of 80 MPH.
4:07pm Wed, Aug 08, 2007	1.14 mi N of Bouchard, TX, - US	SP: Speeding on Misc. road road for 1 Min. Reached a maximum speed of 72 MPH.
4:08pm Wed, Aug 08, 2007	Hwy 635 at 10.00 mi N of Dallas, TX, 75243 - US	SP: Speeding on Interstate road for 2 Min. Reached a maximum speed of 76 MPH.
4:55pm Wed, Aug 08, 2007	0.36 mi S of Inwood, TX, - US	SP: Speeding on Misc. road road for 1 Min. Reached a maximum speed of 51 MPH.
4:56pm Wed, Aug 08, 2007	Preston Rd at 9.83 mi N of Dallas, TX, 75240 - US	SP: Speeding on Secondary road road for 1 Min. Reached a maximum speed of 57 MPH.
1:13pm Fri, Aug 10, 2007	Hwy 12 at 1.76 mi NNE of Irving, TX, 75061 - US	SP: Speeding on Interstate road for 1 Min. Reached a maximum speed of 69 MPH.
1:39pm Fri, Aug 10, 2007	2.53 mi SSE of Eagle Ford, TX, - US	SP: Speeding on Misc. road road for 2 Min. Reached a maximum speed of 61 MPH.
3:30pm Fri, Aug 10, 2007	Hwy 30 at 5.15 mi SW of Dallas, TX, 75212 - US	SP: Speeding on Interstate road for 1 Min. Reached a maximum speed of 66 MPH.
8:02am Mon, Aug 13, 2007	132 Pryor St, Dallas, TX, 75226 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 35 MPH.
10:21am Mon, Aug 13, 2007	Hwy 35E at 5.06 mi NNW of Dallas, TX, 75247 - US	SP: Speeding on Interstate road for 1 Min. Reached a maximum speed of 66 MPH.
3:27pm Mon, Aug 13, 2007	W Louisiana Ave at 4.43 mi S of Dallas, TX, 75224 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 53 MPH.
4:57pm Mon, Aug 13, 2007	886 3rd Ave, Dallas, TX, 75226 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 38 MPH.
10:34am Wed, Aug 15, 2007	5706 Reiger Ave, Dallas, TX, 75214 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 41 MPH.
10:44am Wed, Aug 15, 2007	E Northwest Hwy at 6.57 mi N of Dallas, TX, 75238 - US	SP: Speeding on Primary road road for 1 Min. Reached a maximum speed of 62 MPH.
2:25pm Wed, Aug 15, 2007	1675 E Overton Rd, Dallas, TX, 75216 - US	SP: Speeding on Residential road road for 1 Min. Reached a maximum speed of 37 MPH.

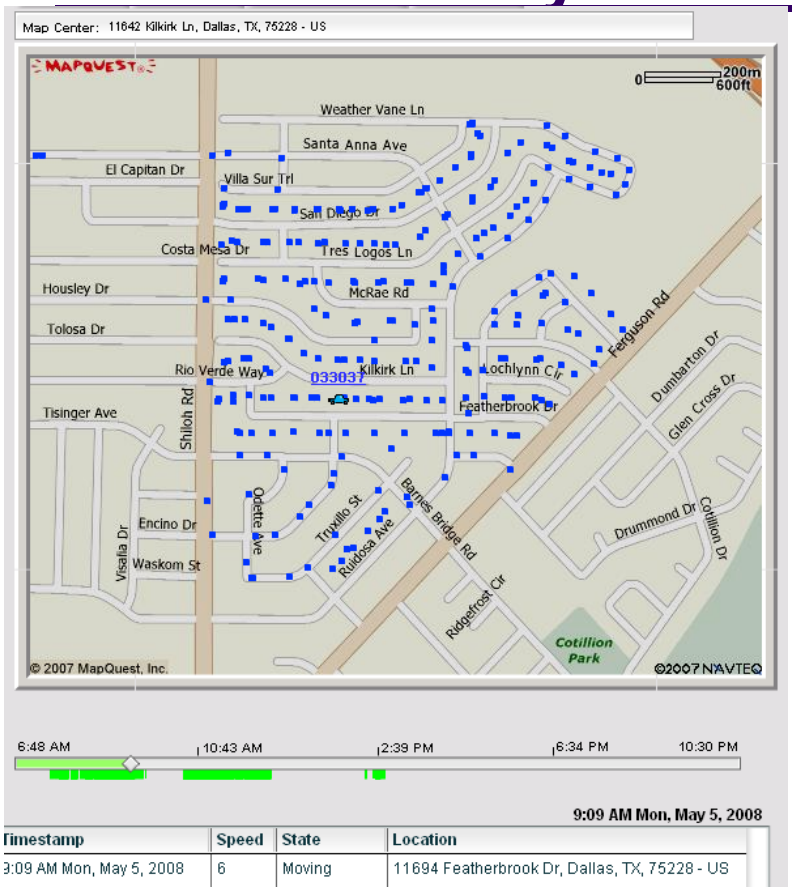
The road, road type, length of time speeding and max speed are recorded.

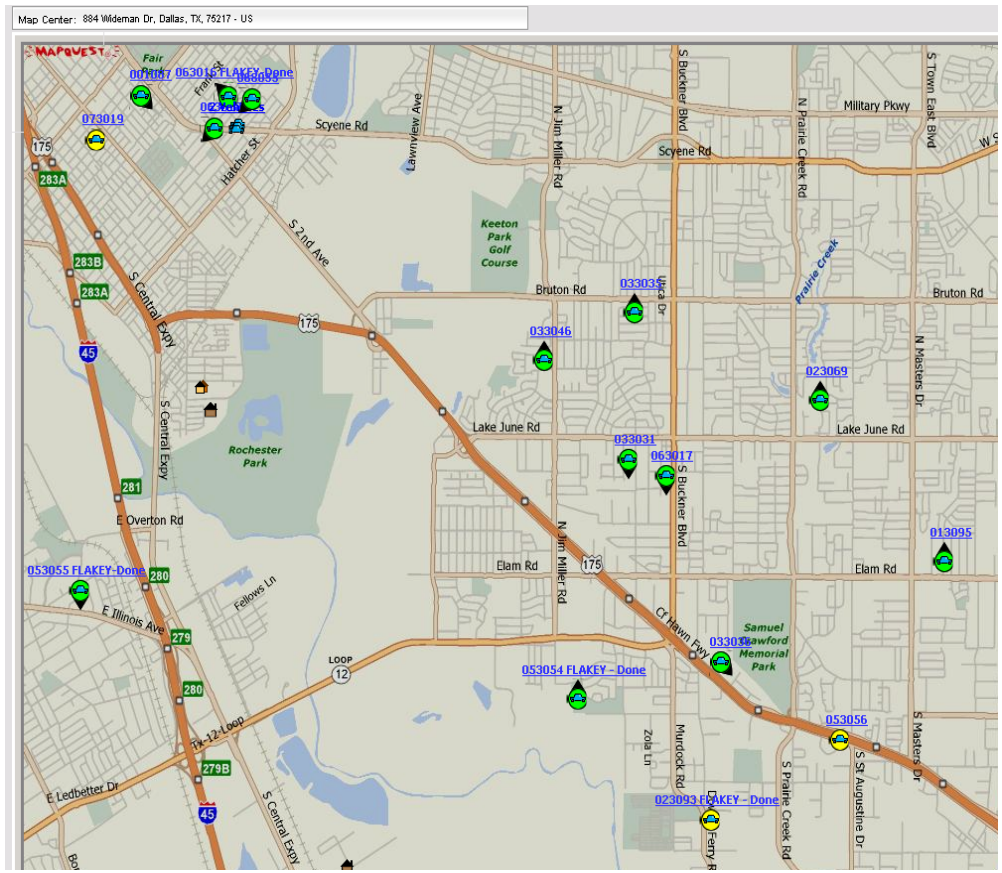
CUSTOMER SERVICE

- **“Missed collection” calls**
  - Locate closest vehicle to respond to missed service pick up
  - Determine if service was really missed – by checking time that SAN vehicle was at location
- **Routing** for Brush Busters and Animal collection trucks

CUSTOMER SERVICE cont'd…

Where have they been and where are they now?



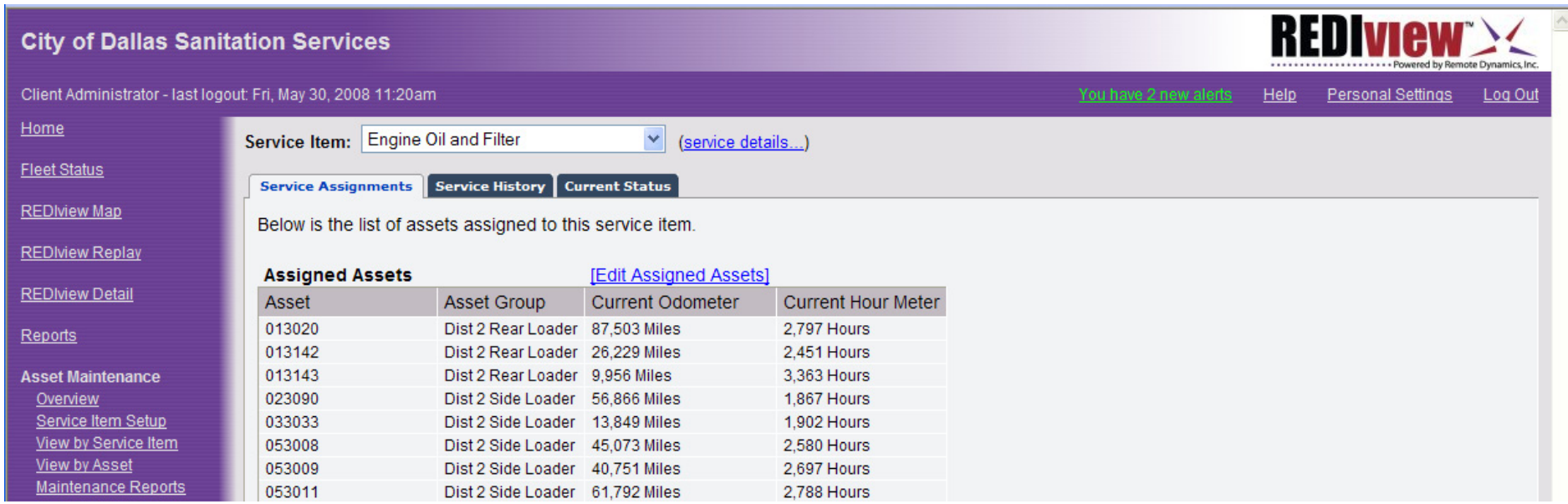


Breadcrumb trail notating travel path and time at location

Real-time tracking of all fleet units

FLEET MAINTENANCE SCHEDULING

"When is my oil change due?"



- Track current odometer readings and engine hours
- Simplify scheduling for Preventative Maintenance

WHAT WILL IT COST?

FY08 cost estimate

Equipment and installation	$180,290
Monthly service fees	$ 11,446
(estimated at 1 month with a Sept rollout)	
Training and 36 mo. Warranty	$ 53,569
FY08 Total	**$245,305**

FY09 cost estimate

Equipment and installation	$ 10,598
Monthly service fees	$ 144,591
Maintenance (deinstall/reinstall)	$ 4,375
FY09 Total	**$159,564**

WHAT CAN WE SAVE?

- Overtime cost savings of $218,107 per year by reducing overtime usage by 5%
  - equating to $654,322 over 3-year period
- Fuel consumption saving by reducing idle times and improving efficiencies of routing
  - estimate of 1%, or $131,451 over 3-year period
- Non-monetary benefit
  - Better customer service – responding to calls

WHAT DID PILOT REVEAL ?

- Overall good driver behavior
  - Instances of speeding, idling, or excessive break times – led to counseling and improved behavior
  - Drivers became more conscious of route efficiencies, aware of supervisor oversight
- GPS empowers SAN supervisors and managers to monitor crews more effectively
- Pilot provided good info – but need comprehensive info for entire SAN fleet to realize savings
- Provide all supervisors with computer skills

RECOMMENDED ACTION

Support contract award for 25 June Council agenda

- **36-month master agreement**
- **Not-To-Exceed amount of $697,058**
- **Vendor: Remote Dynamics, Inc.**