

# Memorandum



**DATE:** February 13, 2009

**TO:** Honorable Mayor and Members of the City Council

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

On Wednesday, February 18, you will be briefed on the subject topic. Attached are the briefing materials for your review.

Please let me know if you have any questions.



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

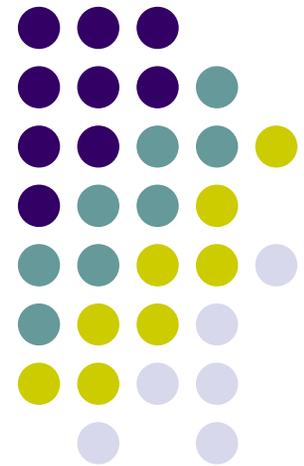
## Attachment

C: Mary K. Suhm, City Manager  
Deborah A. Watkins, City Secretary  
Thomas P. Perkins, Jr., City Attorney  
Craig D. Kinton, City Auditor  
Judge C. Victor Lander, Administrative Judge  
Ryan S. Evans, First Assistant City Manager  
Jill A. Jordan, P.E., Assistant City Manager  
A.C. Gonzalez, Assistant City Manager  
Forest E. Turner, Interim Assistant City Manager  
David K. Cook, Chief Financial Officer  
Mary Nix, Director, Sanitation Services  
Ade A. Williams, Director, Business Development & Procurement Services  
Helena Stevens-Thompson, Assistant to the City Manager

# Sanitation Fleet Efficiencies

## with Global Positioning System

**Briefing to City Council**  
**February 18, 2009**





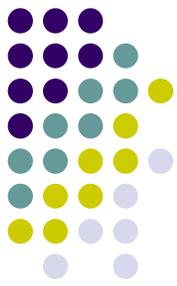
# BRIEFING PURPOSE

- Describe Sanitation fleet and how it is used
- Research leading to pilot a GPS program
- Cost of GPS and return on investment
- Expanding GPS from pilot to all SAN fleet
  - Council action – award agreement on 18 February
  - 36-month contract period (not-to-exceed \$697,059)



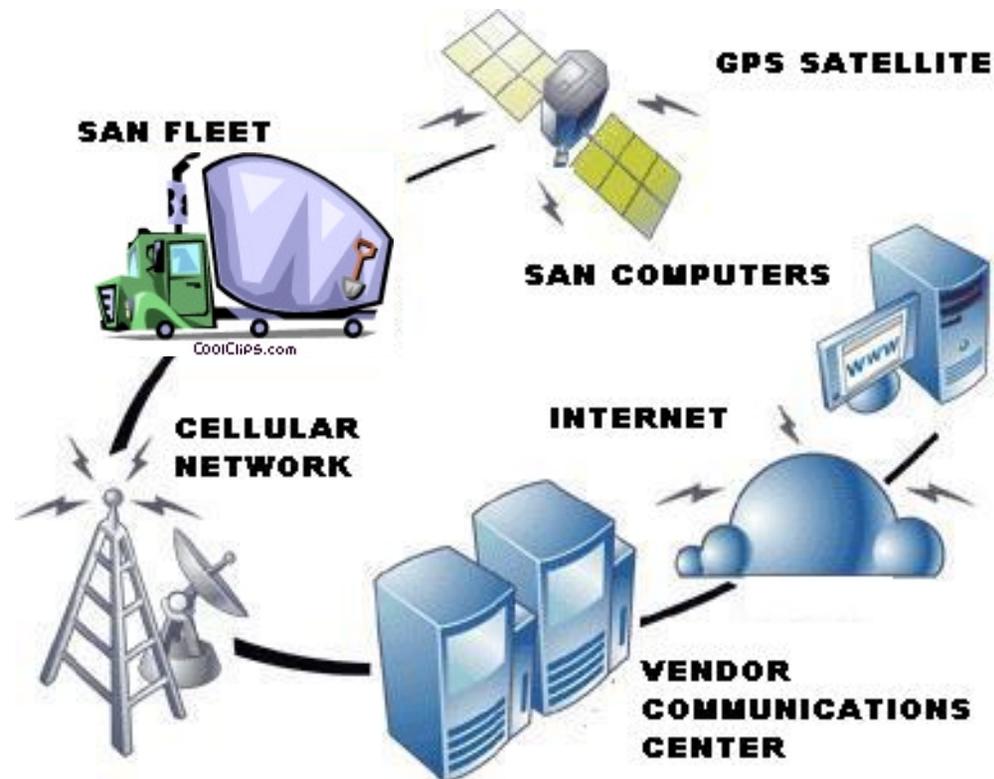
# Sanitation Services fleet

- Sanitation's fleet is 586 vehicle units (includes collection, transfer, disposal, and misc. services)
- Up to 400 vehicles are on-the-road each workday for waste collection work
  - Collection of garbage, recycling, brush
  - Transfer of waste to landfill
  - Support vehicles (light fleet, pickups, etc)
- Each SAN route supervisor oversees 12-16 route drivers
- SAN's FY08 fuel cost: \$6,294,140
- SAN's FY08 overtime cost: \$4,611,250



# HOW DOES GPS 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





# RESEARCH of GPS systems

## Users of GPS

### Cities

- Houston, TX
- Laredo, TX
- San Antonio, TX
- New York, NY (STS)
- Clemson, SC
- Long Beach, CA

### Private Haulers

- Allied Waste
- Moore Disposal
- Waste Management

## Others considering:

- Austin, TX
- New Braunfels, TX
- Garland, TX
- Mesquite, TX
- Waco, TX
- Oklahoma City, OK
- Bluebonnet Waste



# How does Waste Management use GPS

- Multiple systems across country
- Using Xora for City of Ft. Worth (and several others)
  - Cell-phone-based system (with Sprint)
  - **\$65 to \$70** per month for service
    - City of Dallas vendor proposed pricing: \$23.99 per month
- Approximately 150 units in Ft. Worth
- Service beginning August 2008
- Very satisfied with GPS



# RESEARCH of GPS systems

Many, many GPS service providers available  
Prepared our criteria using input from industry users, tailored to our specific fleet needs

Examples of GPS service providers:

- Zonar Systems
- Sprint
- Verizon Wireless
- Verizon Fleet Administrator
- RSI
- IIT
- @Road
- TrakPro, LLC
- Global Turnpike
- Waste Collection Tracking System
- Remote Dynamics
- Xora



## PILOTING GPS for SAN

To test its value, SAN started a pilot trial of GPS on 70 vehicles in October 2006 (17% of collection fleet)

### SAN learned:

- **Overall good driver behavior**
  - Drivers followed routes properly, safely
  - Occasional instances of speeding, idling, or extended break times, which led to counseling and then improved behavior
  - Drivers finished routes more timely
- **GPS effectively supports routing improvements**
- **Pilot provided good information** on how to best use this tool, how and what to procure for a full-fleet system

# How can GPS help us with...

## CUSTOMER SERVICE?



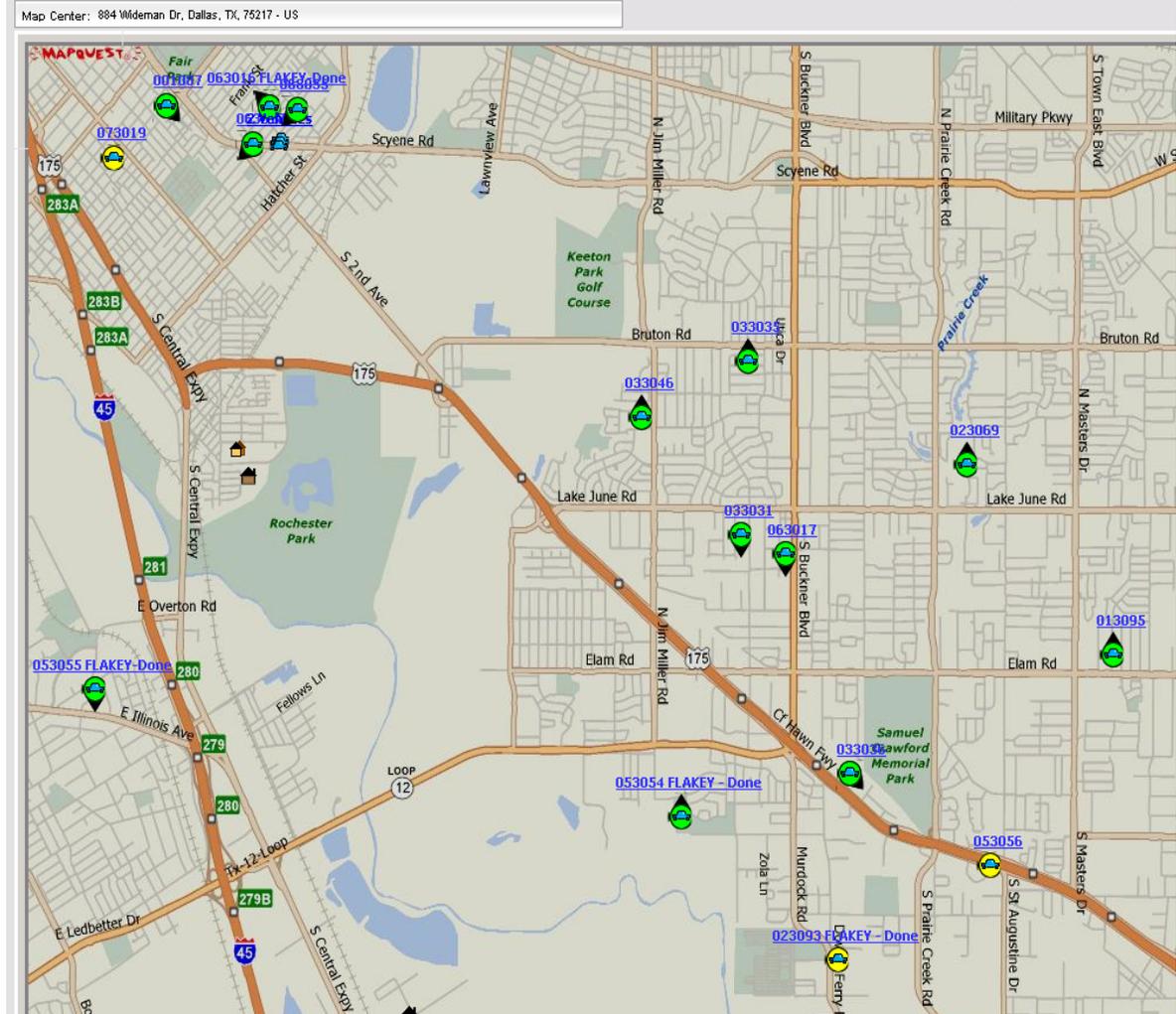
- **“Missed collection” calls**
  - Locate closest vehicle to respond to a “missed service” pick up
- **Routing** for Brush Busters and Animal collection trucks
- **Locating service needs**
  - broken roll carts and overgrown alleys



# CUSTOMER SERVICE cont'd...

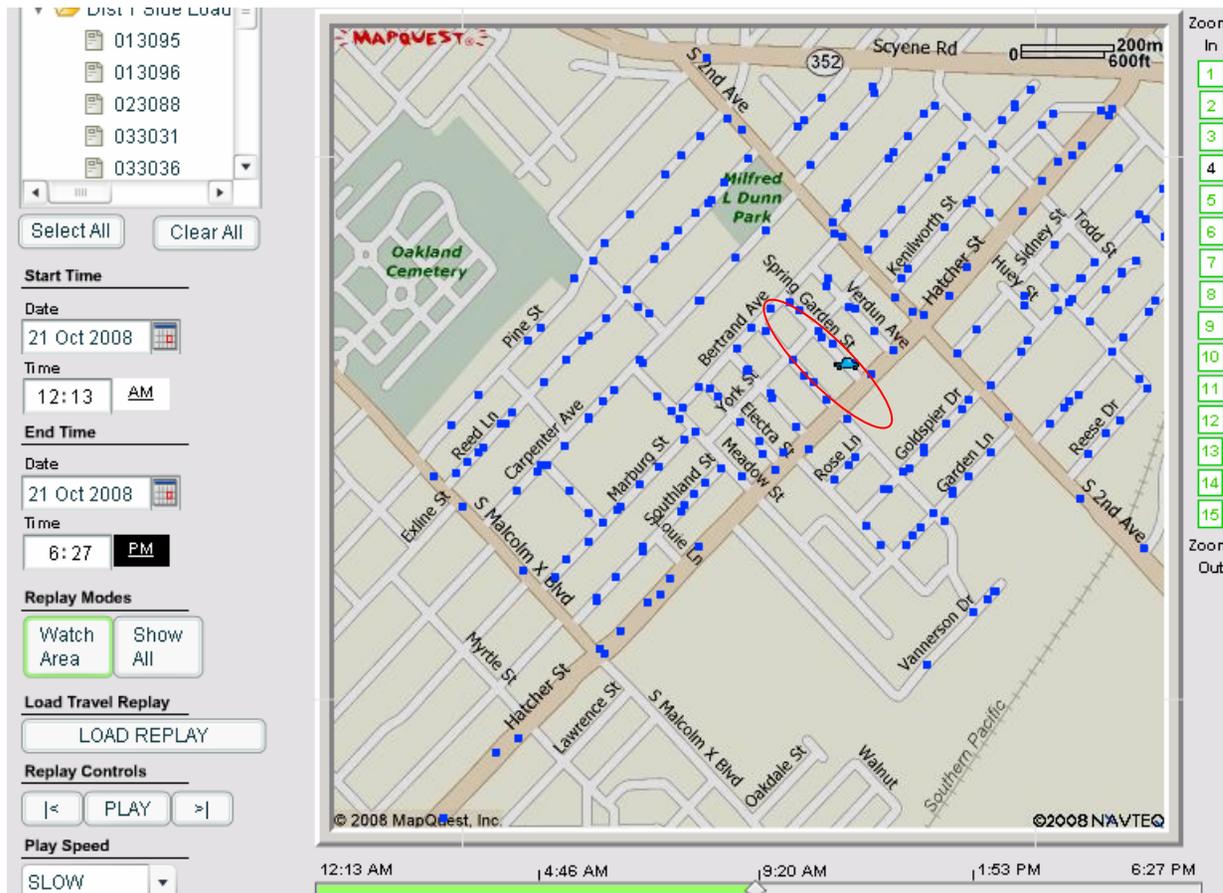
Where are they now?

GPS can provide real-time tracking of all fleet units



# CUSTOMER SERVICE cont'd

## Why do you keep missing my garbage pickup?



Real case example:

Missed Garbage 4600 block  
of Spring Garden St.

Customer Service Rep:

*“Ma’am, our GPS records show  
the garbage truck in your  
neighborhood around  
9:15am.”*

Customer:

*“Oh, I didn’t put out my garbage  
until 9:30am.”*

Customer Service Rep:

*“Don’t worry, Ma’am, we’ll be  
back to pick it up today.”*

Vehicle(s) In Replay 9:15 AM Tue, Oct 21, 2008

Vehicle	Tracks	Timestamp	Speed	State	Location
033046	<span style="background-color: blue; color: blue;"> </span>	9:14 AM Tue, Oct 21, 2008	0	Idling	4666 Spring Garden St, Dallas, TX, 75215 - US



# CUSTOMER SERVICE cont'd...

Assist  
supervisor  
to correct  
routes

Actions View Pointer Modes

Map Center: 2346 Hudspeth Ave, Dallas, TX, 75216 - US

Zoom In

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Zoom Out

© 2008 MapQuest, Inc. © 2008 NAVTEQ

# SUPPORT for Scheduling of FLEET MAINTENANCE



“When is my oil change due?”

City of Dallas Sanitation Services **REDIview**™  Powered by Remote Dynamics, Inc.

Client Administrator - last logout: Fri, May 30, 2008 11:20am [You have 2 new alerts](#) [Help](#) [Personal Settings](#) [Log Out](#)

[Home](#)  
[Fleet Status](#)  
[REDIview Map](#)  
[REDIview Replay](#)  
[REDIview Detail](#)  
[Reports](#)  
**Asset Maintenance**  
[Overview](#)  
[Service Item Setup](#)  
[View by Service Item](#)  
[View by Asset](#)  
[Maintenance Reports](#)

Service Item:  [\(service details...\)](#)

**Service Assignments** | **Service History** | **Current Status**

Below is the list of assets assigned to this service item.

**Assigned Assets** [\[Edit Assigned Assets\]](#)

Asset	Asset Group	Current Odometer	Current Hour Meter
013020	Dist 2 Rear Loader	87,503 Miles	2,797 Hours
013142	Dist 2 Rear Loader	26,229 Miles	2,451 Hours
013143	Dist 2 Rear Loader	9,956 Miles	3,363 Hours
023090	Dist 2 Side Loader	56,866 Miles	1,867 Hours
033033	Dist 2 Side Loader	13,849 Miles	1,902 Hours
053008	Dist 2 Side Loader	45,073 Miles	2,580 Hours
053009	Dist 2 Side Loader	40,751 Miles	2,697 Hours
053011	Dist 2 Side Loader	61,792 Miles	2,788 Hours

- Track current odometer readings and engine hours
- Supports EBS' scheduling of preventative maintenance
  - triggers notification to SAN that matches EBS' notification (VDM)

# PRODUCTIVITY: fuel usage



## MEASURING OPERATING COST PER DAY

### Vehicle Group: Dist 2 Side Loader

Idle periods  $\geq$  3 minutes are considered stops (Idling Stops)

Average Vehicle Miles Per Gallon: 10.00

Cost of Fuel Per Gallon: \$3.26

Equivalent Idle Minutes Per Mile: 6

Vehicle's Monthly Cost: 3847.32

Number of Work Days in a Month: 18.00

Number of Hours in a Work Day: 10.00

Hourly Rate for Crew: \$13.00

Percentage of Pay for Crew Overhead: 25.00

### Summary for Vehicle - 073004 - Sensor

Trip count: 11

Travel Time: 9 Hrs, 32 Min

Travel Distance: 67.89 Miles

Equivalent Idling Distance: 16.26 Miles

Fuel Cost: \$27.43

Vehicle Cost: \$206.82

Crew Cost: \$157.24

Total Cost: \$391.49

Average Fuel Cost per trip: \$2.49

Average Vehicle Cost per trip: \$18.80

Average Crew Cost per trip: \$14.29

Average Total Cost per trip: \$35.58



# PRODUCTIVITY - driver performance

## Time on the route and households served

Vehicle	Time	Location
Status		
Moving	1:34pm	3319 Poinsettia Dr, Dallas, TX, 75211 - US
Arm Down	1:34pm	3319 Poinsettia Dr, Dallas, TX, 75211 - US
Can Dumped	1:34pm	3328 Poinsettia Dr, Dallas, TX, 75211 - US
Arm Down	1:34pm	3330 Poinsettia Dr, Dallas, TX, 75211 - US
Can Dumped	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US
Moving	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US
Arm Down	1:35pm	3350 Poinsettia Dr, Dallas, TX, 75211 - US
Can Dumped	1:35pm	3360 Poinsettia Dr, Dallas, TX, 75211 - US
Arm Down	1:35pm	3360 Poinsettia Dr, Dallas, TX, 75211 - US

Arm Down	8:59pm	COD CENTRAL SC	Residential
<b>Summary for Vehicle - 073017 - Sensor</b>			
Travel Distance: 89.60 Miles	Excessive Idles: 0	Interstate Speeding: 0 occur	
Travel Time: 12 Hrs, 49 Min	GeoFence Boundary Crossings: 0	Primary Speeding: 0 occur	
Idling Time: 1 Hr, 22 Min	Visits at Prohibited Sites: 0	Secondary Speeding: 0 occur	
Ignition Off Time: 20 Min	Sensor Events: 2486	Residential Speeding: 0 occur	
		Misc. Speeding: 0 occur	



# WHAT WILL IT COST FOR FULL FLEET?

## **Year 1 cost estimate**

Equipment and installation	\$180,290
Monthly service fees	\$137,361
<u>Training and Warranty</u>	<u>\$ 5,130</u>
<b>Year 1 Total</b>	<b>\$322,781</b>

## **Year 2 cost estimate**

Equipment and installation	\$ 10,598
Monthly service fees	\$ 144,591
Equipment Maintenance and Warranty	\$ 27,975
<u>Contingency for additional equipment, etc.</u>	<u>\$ 3,974</u>
<b>Year 2 Total</b>	<b>\$ 187,138</b>

**Year 3 cost estimate** **\$ 187,138**

**TOTAL** **\$697,058**

# WHAT CAN WE SAVE?



- Pilot findings allow for full-fleet projections
- Non-monetary benefit
  - Better customer service – responding to calls
- Reduce Overtime cost by 5%
  - FY08 cost: \$4,611,250
  - Savings over a 3-year contract period: **\$691,687**
- Reduce fuel consumption by 1% (with routing efficiencies)
  - FY08 cost: \$6,294,140
  - Savings over a 3-year contract period: **\$188,824**

# RETURN ON INVESTMENT



- Three-year cost of system: \$697,058
- Three-year savings:
  - Overtime: \$691,687
  - Fuel: \$188,824

**Three-Year ROI = 1.26**

# **RECOMMENDED ACTION**



- **Support the contract award on the February 18 agenda**
  - **36-month master agreement**
  - **Not-To-Exceed amount of \$697,058**
  - **Vendor: Remote Dynamics, Inc.**

# APPENDICES



- A: Procurement of GPS services
- B: Alley conditions; SAN truck maintenance
- C: Stormwater fees
- D: Labor costs vs. GPS expenditures

# Appendix A - Procurement



## Procurement Process

- Business Development and Procurement Services (BDPS) advertised the Request For Bids (RFB) for GPS/Mobile Resource Management Program on March 13 & 20, 2008
- As part of the vendor notification process, 138 electronic notices were sent by the City's web-based procurement system
- Additionally, notifications were sent by BDPS ResourceLINK Team (RLT) to 25 chambers of commerce, and 2 advocacy groups (i.e. DFW Minority Business Council and Women's Business Council-Southwest)

# Appendix A - Procurement



## Procurement Process (cont'd)

- **Pre-proposal conference March 27, 2008, six firms represented:**
  - 6 companies were represented:
    - Radio Satellite Integrators
    - Enterprise ESP Service Provider, LLC
    - Remote Dynamics
    - TrakPro
    - Verizon Wireless
    - USAT Corp.
- **Among the topics discussed at pre-proposal meeting:**
  - equipment
  - reporting requirements
  - web hosting
  - expected system capabilities
  - data storage
- All questions asked during the pre-proposal meeting were posted on the City's bid web site, per standard procedure

# Appendix A - Procurement



## Evaluation process

- Six proposals were received on April 9, 2008, which were distributed to the evaluation committee for review of the minimum requirements
- The evaluation committee consisted of staff from various departments within the City:
  - Sanitation (2)
  - Equipment & Building Services (2)
  - Communications & Information Services (1)

# Appendix A - Procurement



## Specifications (Scope of Work)

- 1.1– Introduction
  - “ This Request For Competitive Sealed Proposal (“RFSCP”) contains a description of the mobile resource management (MRM) service requirements that Provider must address to be considered for award of the contract. Please note that the specifications included herein are the minimum requirements and are not intended to constrain Provider’s creativity in formulating a responsive proposal.”



# Appendix A - Procurement

## Committee Evaluation

- All six proposals were reviewed by the evaluation committee to determine responsiveness to the minimum requirements in accordance with the Scope of Work. The following vendors were excluded from further consideration based on this review:
  - Teletrac
  - Verizon
  - Enterprise ESP Service Provider, LLC
  - TrakPro
- Radio Satellite Integrators, Inc. and Remote Dynamics, Inc. were invited to present to the evaluation committee based on written material submitted in their proposals
- Proposers were then scored based on their written proposals and information delivered during presentations
- Scores were used to determine the most advantageous proposer for Council consideration



# Appendix A - Procurement

## Why was Enterprise ESP Service Provider, LLC deemed non-responsive?

- After the initial review by the evaluation committee, Enterprise ESP Service Provider, LLC.'s proposal was found to be non-responsive due to not meeting the minimum requirements in three areas
  - **Min. Requirements:** 3.4.2 Reporting - "At a minimum, the reports should provide.... the status of user identified vehicle preventive maintenance tasks (oil changes, etc.), ...
    - **ESP Proposal** – "Currently there is no support for vehicle prevention maintenance. Oil change report is based on number of miles that can be support. This functionality will require 40 hours to implement @ \$150.00 per hour."
  - **Min. Requirements:** 3.4.2.5 Reporting - "Ability to provide a "breadcrumb" trail of route taken in (1) map format and (2) report format."
    - **ESP Proposal** – "Platform supports this functionality. The reports does not include maps."
  - **Min. Requirements:** 3.4.3.10 Mapping - "Ability for web user to batch upload landmark data using a comma delimited table of addresses or latitude/longitude information."
    - **ESP Proposal** – "Currently not import support. Assuming the user provides a file in CSV format with our template it will take approximately 15 hours to develop."



# Appendix A - Procurement

## Investment Protection

- Purchased equipment is not proprietary
- Equipment will become the City's property upon installation, testing and payment
- The City will not release payment until equipment is fully installed, tested and accepted
- Source Code to be placed in escrow
  - Negotiated during Best and Final Offer
- Historical data to be transferred to City database monthly
  - Negotiated during Best and Final Offer

# Appendix B – Alley Conditions



## **Alley conditions briefed to Quality of Life Committee on February 9, 2009**

- Code Compliance to submit bid during FY09-10 budget development for dedicated alley clearing resources and proactively sweep alleys in winter months.
  - Annual cost is estimated at \$1.54 million
- Code will continue targeted sweeps with community organizations and City departments

# Appendix B – Alley Conditions



- Sanitation's collection automated trucks are 9.6 ft from mirror to mirror
- At current count, there are 2,035 alleys across the city which are impaired by vegetative growth.



# Appendix B – Truck Maintenance



- Summer 2008, 64 of 168 (38%) Sanitation trucks used for daily collection were reported as not having properly maintained air conditioners
- EBS mechanics worked over a several week period to inspect the 64 units and made all necessary repairs
- EBS has formulated a plan to ensure all air conditioners in the Sanitation fleet continue to operate properly before start of 2009 summer season
  - All units will be re-inspected during the non-summer season and by the end of March 2009
  - Any necessary repairs will be completed by the end of April 2009

# Appendix C – Stormwater fees



- **As indicated most recently in the August 2008 Council Briefing on Stormwater Fees, the revenue generated from the fee is designated for activities that help the City comply with its stormwater quality regulations and permits and maintenance of our drainage system.**
- **The October 2008 fee increase was the first in four years and allowed rates to remain the same for over 75% of all accounts.**
- **Staff is re-visiting the fee structure with particular focus on the larger residential and undeveloped properties this year in the course of development of the 2009/10 budget.**

# Appendix D – Labor costs vs. GPS expenditures



**Annual cost of GPS (3-yr average) = \$232,353**

	<u>SAN Drivers</u>	<u>Day Laborers</u>
Amount of GPS funding	\$ 232,353.00	\$ 232,353.00
No of Drivers/Operators	317	180
Hourly pay rate	\$ 13.96	\$ 7.25
Distributed to each	\$ 732.97	\$ 1,290.85
Hourly equivalent	\$ 0.25	\$ 0.62
Increase %	1.8%	8.6%

Assumes:

- Average hourly rate for SAN drivers and 28% OT hours
- Day Laborer rate as effective July 2009, with OT hours