

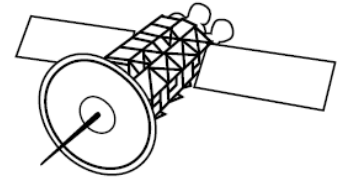


**Big Brother Is Watching:  
AVL Pays Off**

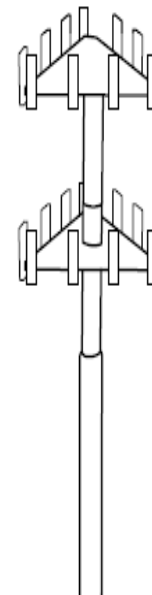
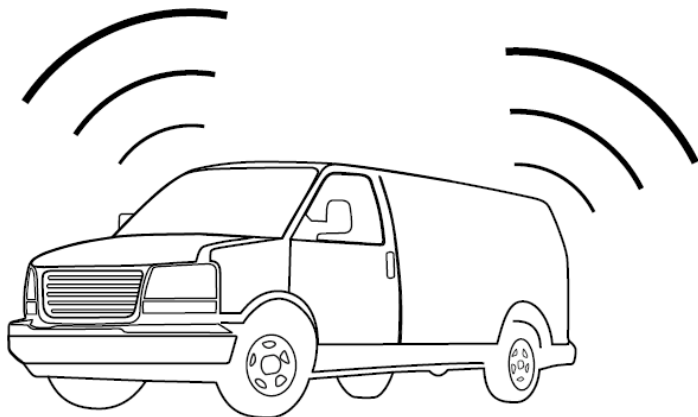
**City of Fort Worth Water Department**

**by: Travis Andrews  
Assistant Director/Field Operations**

# Discussion Points

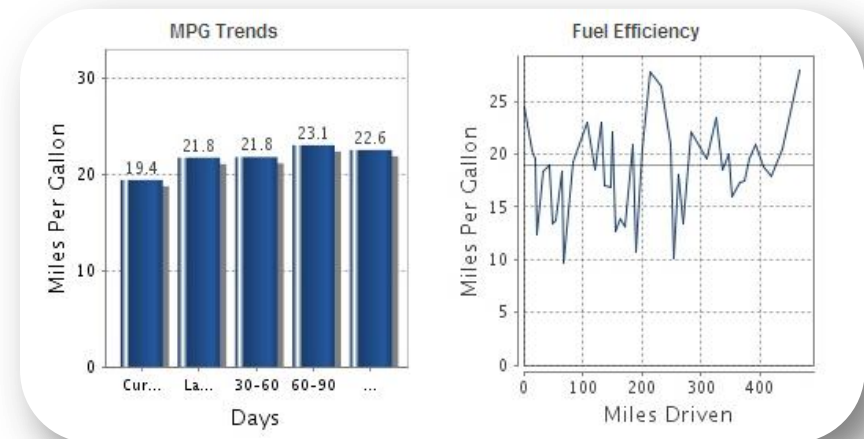


- **Reasons for Purchasing an AVL Fleet Management Solution**
- **Fort Worth Water Department, Field Operations Fleet**
- **Implementing and Installing a Fleet Management Solution**
- **Reports**
- **Results**



# Why Fleet Management

- **A Fleet Management Solution Can:**
  - » Track vehicle location and driver behavior
  - » Reconcile customer complaints
  - » Reduce idling and optimize fuel usage/MPG
  - » Improve crew productivity & efficiency
  - » Proactively maintain fleet through vehicle diagnostic trouble codes (DTC)
  - » Reduce liability claims
  - » Sensors can be added to key vehicle components such as pumps, blowers, rod truck motors, etc.
  
- **Main Considerations When Choosing a Vendor:**
  - » Vehicle location and diagnostic system
  - » Low startup costs
  - » Web-based, hosted solution
  - » Easy installation



# Why AVL Fleet Management

- **Initial Purchasing Price**

- » Purchased through HGAC
- » \$27 per unit per month
- » \$425 for the box
- » No minimum purchase

- **Current and Actual Costs**

- » Lowered monthly fee to \$25.95 per unit per month
- » Lowered hardware cost to \$350 per box
- » Previous 1 year, now 3 year warranty
- » No IT staff costs (web-based, hosted solution)
- » No upgrade costs
- » No licensing or software installation
- » Online training videos

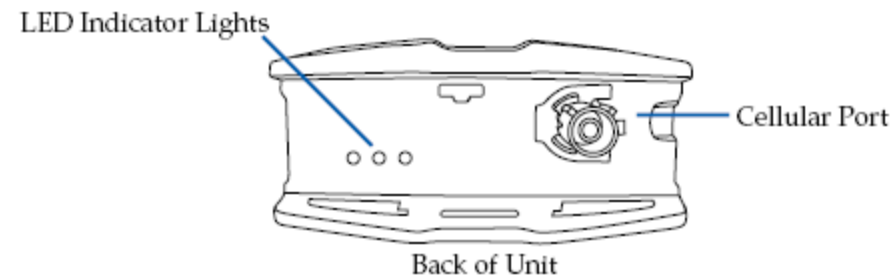
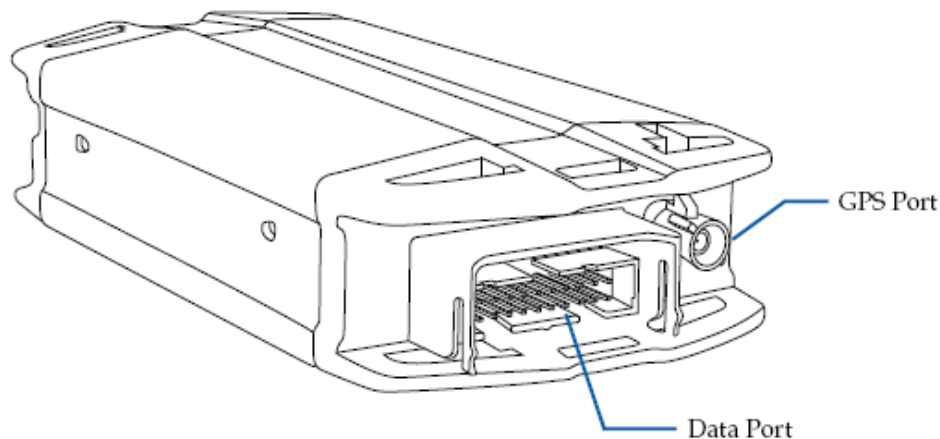
# FWWD Field Operations

- **Initial Installation Completed in January 2010 – 198 units**
- **Final number of vehicles installed with Fleet Management – 259 units**
  - » 100% (199) of the Field Operations' Fleet
  - » Other Division vehicles include:
    - 6 Construction Inspectors
    - 4 Laboratory Sampling Technicians
    - 4 Security Guards
    - 43 Water Meter Readers
    - 3 Conservation



# Installing and Registering Vehicles

- **Process for implementing GPS units into our vehicles:**
  - » Ordered GPS units for all vehicles at once
  - » Installed all devices on-site with existing personnel
  - » Allow 15 to 30 minutes per vehicle
  - » Did not try to complete any group first
  - » Minimum disruption to daily crew activities
  - » Used PDA to email required information (serial #, fuel type, etc) to office
  - » Unit registered by office staff
  - » Office staff verified successful installation and emailed installer



# Using the System

Fleet Login

[Login Help](#)

Fleet Solutions

Return on Investment

Industry Expertise

Client Testimonials

Media Center

About Us

Contact Us

Overview

GPS Fleet Tracking

Vehicle Diagnostics

Fleet Maps

Vehicle Alerts

Reporting

Fuel Economy

Safety and Security

Preventive Maintenance



**DRIVING BUSINESS**

[GPS Tracking](#)

[Fleet Management](#)

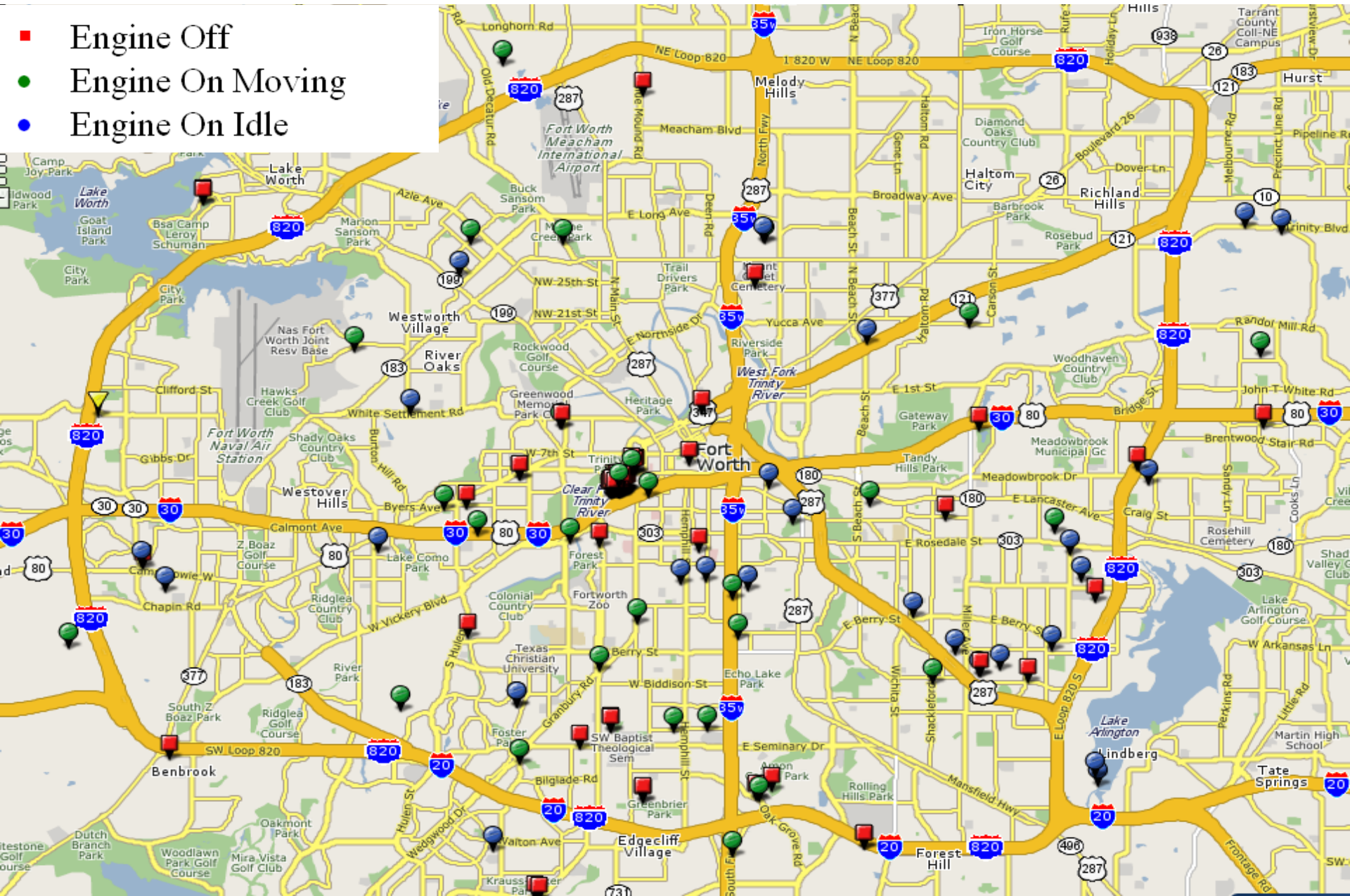
[Vehicle Diagnostics](#)

Networkfleet, Inc. is a leading provider of wireless fleet management services that improve fleet operations by decreasing fuel use, optimizing vehicle utilization, decreasing maintenance costs with vehicle diagnostics and improving driver management.

[Demo Today!](#)

# Using the System

- Engine Off
- Engine On Moving
- Engine On Idle



# Using the System

Route:   (Estimated based on individual GPS fixes.)

The map displays a network of roads, including major highways like I-35, I-820, I-30, and I-20. Numerous green location pins are scattered across the map, indicating the positions of vehicles. The interface includes a zoom control on the left and a 'MAP CONTROLS' button in the bottom right. The map shows various geographical features like Eagle Mountain Lake and Lake Worth, and several cities and towns such as Saginaw, Hurst, and Arlington.

©2011 Networkfleet - Map data ©2010 Tele Atlas

**MAP CONTROLS**

# Using a Web Based AVL Fleet Management System

- **Make part of daily business for supervisors**
- **Vehicle location data/reports**
  - » Spot check driver location and behavior
  - » Identifies suspicious activities using the Stop Detail report and breadcrumb trail
  - » Compare dispatch log and work order system to find inefficiencies or problems
- **Fuel MPG and Idle time are key areas of interest**
- **Automatic Report Scheduling**
  - » Sent directly to supervisors
  - » Top down support by management
- **Use geofences and alerts to track drivers in restricted areas**
  - » Example: Fort Worth 2011 Super Bowl security zones were geofenced
- **Sensor module (future expansion)**
  - » To increase efficiency of dump truck operations
  - » Potential to reduce underutilized vehicles

# Frequently Used Reports

- **Idle Time Report**

- » Can see “red flags” in driver behavior
- » Highlights which vehicles may need additional investigation

Report: Idle Time													
Selected Vehicle(s):		All Vehicles in the FIELD OPERATION SEWER Group											
Report Run Date/Time:	09/21/2010 02:11 AM	Average Idle Pct:	60.82 %										
Report Time Period:	09/16/2010 12:00 AM - 09/18/2010 12:00 AM	Average Idle Hrs:	3.44										
Group Size:	54	Total Idle Hrs:	92.79										
Total Vehicles in Report:	27	Total Operating Hrs:	56.19										
Percentage of Group Shown:	50 %	Avg Overall Speed:	27										
Idle Percentage Threshold:	N/A	Total Miles:	1474.0										
Idle Hours Threshold:	>= 1.0	Average Miles Driven per Day:	1474.0										
Page 1 / 3. <span style="float: right;">Show 10 per page.</span>													
Vehicle Label	VIN	Year Make Model	Starting Mileage	Ending Mileage	Distance Traveled	Percent of Time Idle	Hours Idle	Drive Hours	Total Operating Hours	Maximum Speed Range	Average MPH	Vehicle Begin Date	Vehicle End Date
725_221-0097_SMALL_TV_PM	1GCHG392561255864	2008 CHEVROLET EXPRESS	31,240	31,319	79.0	67.63	6.9	3.3	10.2	60.0-70.0	24	09/16/2010 07:16 AM	09/17/2010 07:07 AM
727_225-0012_LARGE_TV_PM	1GDKP32YXV3503643	1997 GMC TP31442	4,390	4,432	42.0	79.55	6.03	1.55	7.57	60.0-70.0	27	09/16/2010 06:57 AM	09/17/2010 06:59 AM
604_262-0211_LG VACTOR_PM	1HTWPAZT59J055143	2009 INTERNATIONAL 7500	12,372	12,408	36.0	80.41	6.01	1.46	7.48	50.0-60.0	25	09/16/2010 07:23 AM	09/17/2010 07:05 AM
721_221-0057_SMALL_TV_PM	1GCHG39F4W1021718	1998 CHEVROLET C3500	101,290	101,381	91.0	67.62	5.56	2.66	8.23	60.0-70.0	34	09/16/2010 07:18 AM	09/17/2010 08:19 AM
722_223-0013_LARGE_TV_PM	1FDXE45F63HB66089	2003 FORD E450	48,852	48,916	64.0	72.66	5.23	1.97	7.2	60.0-70.0	33	09/16/2010 07:15 AM	09/17/2010 07:08 AM
611_208-0104_SVC TRUCK_PM	1FDWF37R48EE40795	2008 FORD F350	19,401	19,467	66.0	67.68	5.14	2.45	7.59	60.0-70.0	27	09/16/2010 07:04 AM	09/17/2010 07:12 AM
707_242-0295_LG FLUSH_STOPS	2FZACGDC27AY51288	2007 STERLING SEWER FLUSHER	31,762	31,786	24.0	81.85	4.65	1.03	5.68	60.0-70.0	23	09/16/2010 08:15 AM	09/17/2010 10:12 AM
702_242-0261_LG_FLUSH_STOPS	1HTSCAAN91H360308	2001 INTERNATIONAL SEWER FLUSHER	175,040	175,137	97.0	61.6	4.5	2.81	7.31	60.0-70.0	35	09/16/2010 07:42 AM	09/17/2010 07:25 AM
703_242-0302_SM GAP VAC_STOPS	2FZAATDC05AU15776	2005 STERLING LT7500	93,901	93,953	52.0	60.72	4.1	2.65	6.75	50.0-60.0	20	09/16/2010 07:16 AM	09/17/2010 07:25 AM
601_262-0173_LG VACTOR_PM	1FVHC5CV46HW45988	2006 FREIGHTLINER M2	118,608	118,675	67.0	52.02	3.92	3.61	7.53	50.0-60.0	19	09/16/2010 07:03 AM	09/17/2010 07:04 AM

# Frequently Used Reports

- **Stop Detail and Idle Time Report**

- » Used to review vehicles' stops and pinpoint excessive idling
- » Stops/idling should only occur in the yard, on jobsites, breaks, and lunch

**Report: Stop and Idle Time**

Selected Vehicle: 702 \_ 242-0261\_LG\_FLUSH\_STOPS (1HTSCAAN91H360308)  
 Report Run Date/Time: 09/21/2010 02:14 AM  
 Report Time Period: 09/17/2010 12:00 AM -09/18/2010 12:00 AM  
 Total Trips: 6  
 Min Idle Stop Duration: 10

**Key**  
 Stops < 15 minutes ■ Green  
 Stops >= 15 minutes and < 60 minutes ■ Yellow  
 Stops >= 60 minutes ■ Red

View a map of ALL stop locations

Stop Type	Total Stop Count	Total Stop Time
Hard Stops	6	00:03:50
Idle Stops	10	00:05:42
<b>Total Stops</b>	<b>16</b>	<b>00:09:31</b>

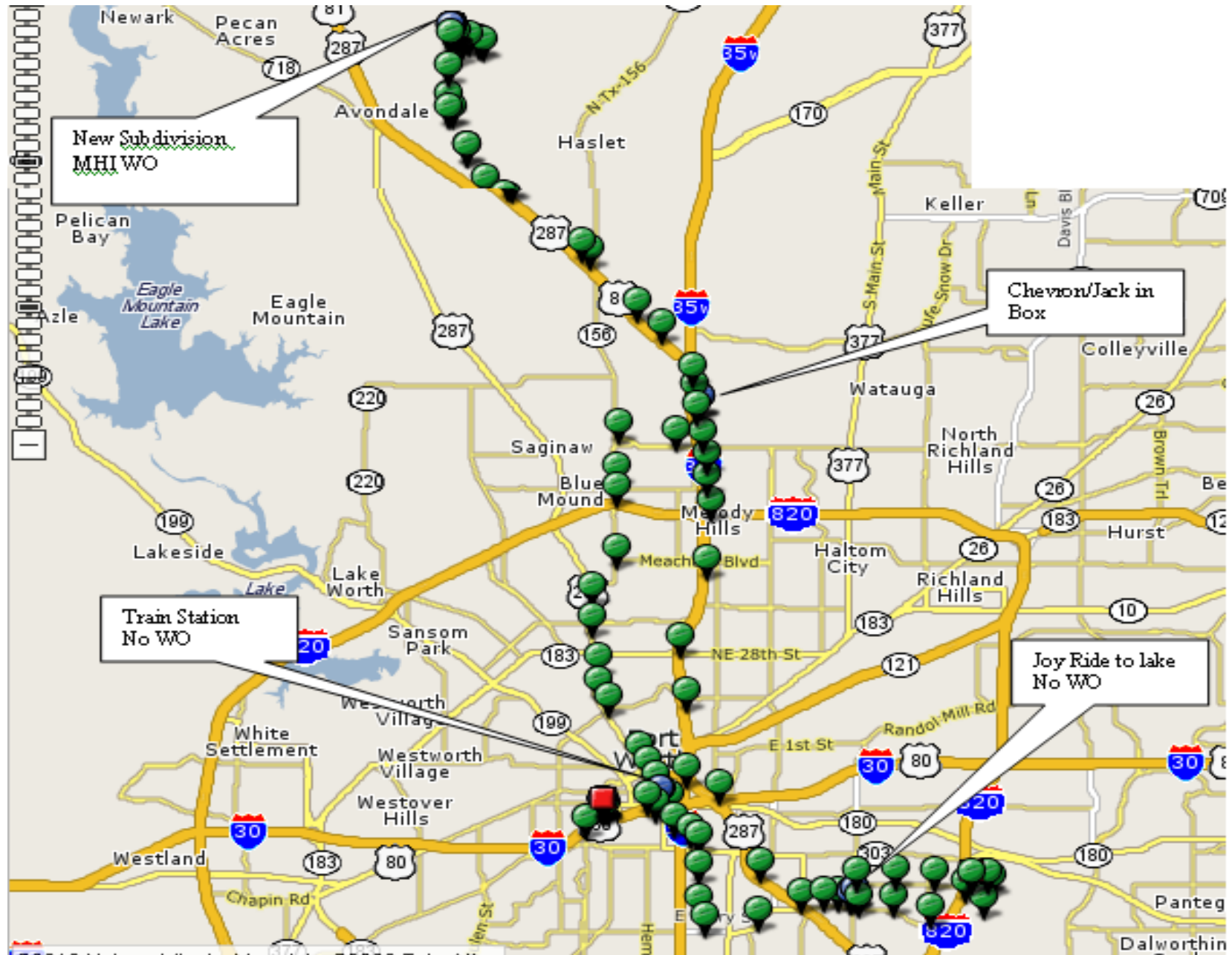
Total Time Interval: 1  
 Total Miles: 84.8  
 Speed: 70

Total Travel Time: 00:11:24  
 Time of First Start: 09/17/2010 07:25 AM  
 Time of Last Stop: 09/17/2010 10:38 PM

Page 1 / 1. Show  per page.

Trip ▲	Trip Begin Time	Trip Duration		Stop Begin Time	Stop Duration		Trip Distance	Total Distance	Location Address	Closest Landmark	Speed
		dd:hh:mm	minutes		dd:hh:mm	minutes					
1	9/17/10 7:25:08 AM	00:00:05	5	9/17/10 7:29:43 AM	00:00:01	1	0.2	0.2	<a href="#">1566 11th Ave, Fort Worth, TX 76102 US</a>		10
2	9/17/10 7:30:16 AM	00:00:00	0	9/17/10 7:30:44 AM	00:00:02	2	0.0	0.2	<a href="#">1972 W Daggett Ave, Fort Worth, TX 76102 US</a>		7
3	9/17/10 7:33:00 AM	00:00:02	2	9/17/10 7:34:54 AM	00:00:05	5	0.2	0.4	<a href="#">2230 W Broadway St, Fort Worth, TX 76102 US</a>		11
4	9/17/10 7:39:42 AM	00:07:26	446	9/17/10 3:05:36 PM	00:00:47	47	51.8	52.2	<a href="#">1584 11th Ave, Fort Worth, TX 76102 US</a>		66
4a				9/17/10 8:17:08 AM	00:00:57 (Idle Stop)	57			<a href="#">2608 Selma St, Fort Worth, TX 76111 US</a>		
4b				9/17/10 9:55:29 AM	00:01:01 (Idle Stop)	61			<a href="#">8801 Oak Grove Rd, Fort Worth, TX 76140 US</a>		
4c				9/17/10 11:33:47 AM	00:00:39 (Idle Stop)	39			<a href="#">2409 W Berry St, Fort Worth, TX 76110 US</a>		
4d				9/17/10 12:16:49 PM	00:00:10 (Idle Stop)	10			<a href="#">3153 S University Dr, Fort Worth, TX 76109 US</a>		
4e				9/17/10 12:57:43 PM	00:00:31 (Idle Stop)	31			<a href="#">1052 E Vickery Blvd, Fort Worth, TX 76104 US</a>		
4f				9/17/10 2:11:28 PM	00:00:35 (Idle Stop)	35			<a href="#">3200 Frazier Ave, Fort Worth, TX 76110 US</a>		
5	9/17/10 3:52:32 PM	00:03:50	230	9/17/10 7:42:48 PM	00:02:55	175	32.5	84.8	<a href="#">1584 11th Ave, Fort Worth, TX 76102 US</a>		70
5a				9/17/10 4:23:53 PM	00:00:59 (Idle Stop)	59			<a href="#">7525 Meadowbrook Dr, Fort Worth, TX 76112 US</a>		
5b				9/17/10 5:49:15 PM	00:00:18 (Idle Stop)	18			<a href="#">2061 Bishop St, Fort Worth, TX 76105 US</a>		
5c				9/17/10 6:09:45 PM	00:00:18 (Idle Stop)	18			<a href="#">3201 E Berry St, Fort Worth, TX 76105 US</a>		
5d				9/17/10 7:01:02 PM	00:00:12 (Idle Stop)	12			<a href="#">3126 Rodeo St, Fort Worth, TX 76119 US</a>		

# 1 Manhole Inspection and Joy Ride

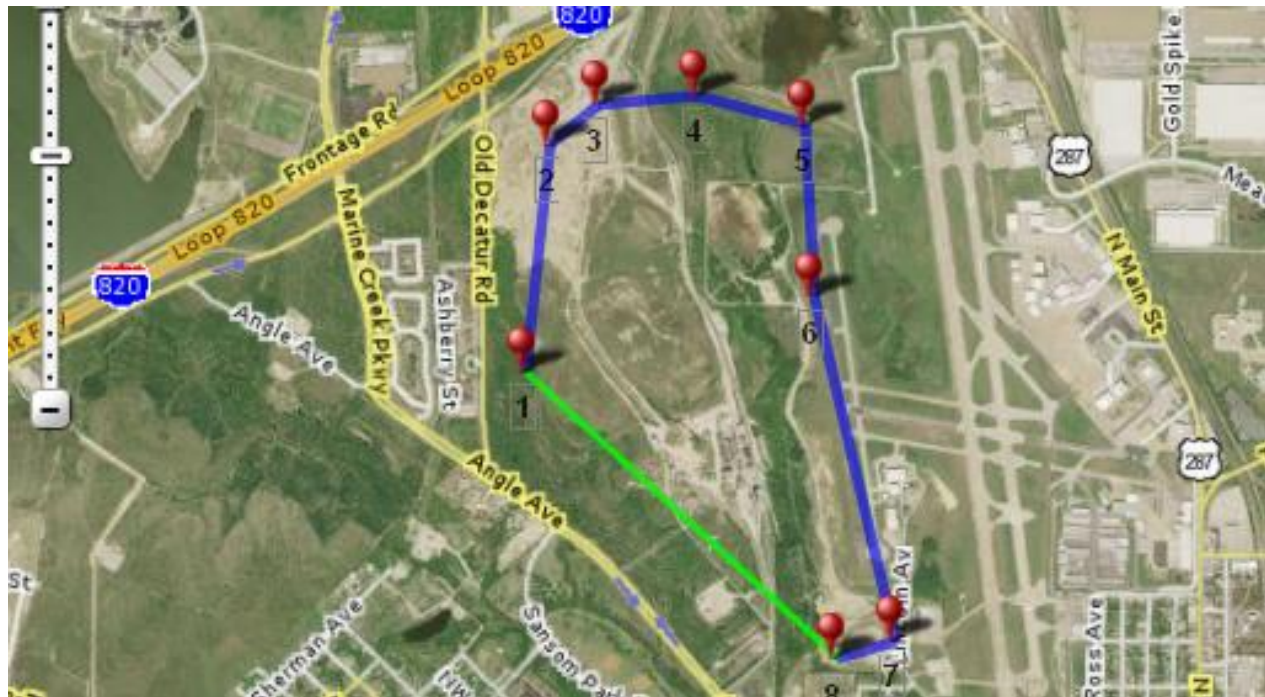


# Speed Violation Report Within a Geofence

Choose a Report Type:

**Input Report Parameters:**

Speed Report Type: <input type="text" value="Detail"/>	Start Date:* <input type="text" value="01/10/2012"/>
Group: <input type="text" value="-- ALL GROUPS --"/>	Start Time:* <input type="text" value="12 AM"/> <input type="text" value="00"/>
Vehicle Attribute: <input type="text" value="All Attributes"/>	Number of Days:* <input type="text" value="7"/>
Vehicle: <input type="text" value="All Vehicles"/>	Violation Type: <input type="text" value="Threshold"/>
Geofence: <input type="text" value="earthfillspeeding"/>	Exceeded Max Speed of:* <input type="text" value="13"/> <input type="text" value="MPH"/>



# Excel File of Speed Violation Report

Report: Speed Violation - Detail			
Report Run Date/Time	01/17/2012 07:46 AM CST		
Start Time	01/10/2012 12:00 AM		
End Time	01/17/2012 12:00 AM		
Selected Vehicle(s)	All Vehicles		
Violation Type	Threshold		
Violation Threshold	13 MPH		
Total Violations:	1026		
Geofence Name	earthfillspeeding		
Vehicle Label	License Plate	Violation Time	Vehicle Speed
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:06 AM	24
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:08 AM	32
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:10 AM	19
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:12 AM	21
510 _ 262-0139_SWR_MAIN_12YD	778138	01/10/2012 10:13 AM	14
510 _ 262-0139_SWR_MAIN_12YD	778138	01/10/2012 10:18 AM	17
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:18 AM	19
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:20 AM	31
306 _ 262-0190_12YD_WMAINS	1012780	01/10/2012 10:22 AM	24
SPARE _ 262-0230_SWR_MAIN_12YD	1132523	01/10/2012 10:27 AM	16
510 262-0139 SWR MAIN 12YD	778138	01/10/2012 10:30 AM	16

# Return On Investment (ROI) Analysis

- **Financial opportunities for ROI consideration**
  - » Operating cost associated with vehicle maintenance
    - Reduction of mileage associated with “cruising” between work orders.
    - Ability to move from calendar time based Preventive Maintenance (PM) to actual mileage or hours.
    - Diagnostic Trouble Codes (DTC) alerts for when a vehicle has a pending or active trouble code
    - Set up reports and review real time information about other diagnostics
      - Including battery voltage, monitor status, MIL (check engine light) status, load value, and others
      - Pump usage
      - Power Take Off (PTO) engagement hours
      - Generators
    - Fewer replacement parts; Fluids and filters, floor mats, door handles, tires, etc.

# ROI Analysis

- **Financial opportunities for ROI consideration**
  - » AVL Fleet Management
    - Better vehicle utilization
    - Justification of vehicle reallocation needs
  - » Speed and miles traveled have a direct correlation to number of accidents and accident severity.
    - Case Study: Eastern Municipal Water District, Riverside County, California. In the 12 months since telematics was implemented, had the following safety related ROI:
      - Vehicle related accidents drop from 34 to 8. None of those 8 were speed related
      - Liability claims drop from over \$1MM to under \$100K
      - Received reduction in insurance claims of more that \$40K
    - For 600 units Eastern Municipal Water District saw a positive ROI in 3 months

# ROI Analysis

- **Financial opportunities for ROI consideration**
  - » Fuel Savings
    - Reduction in idle time
    - MPG percentage increases can largely be attributed to driver behavior changes – lower speeds, less idling, better driving habits
    - 1-1.5 MPG increase year to year comparison = 12% MPG increase overall
  - » Increase in wrench on bolt productivity
    - Crews know their location and work orders can be monitored remotely
    - Shorter lunches and breaks
    - Efficient routing (no roundabout, time consuming routes)
    - Odometer at their fingertips
    - Fewer unauthorized trips during the day

# Field Operations Case Study for ROI Analysis

- **Sewer Stop Section selected for analysis**
  - » 18 vehicles equipped with AVL fleet management modules
  - » Section is comprised of 40 employees
  - » Meeting to explain fleet management and define expectations
  - » In 77 day period before meeting the section performed \$207,819 worth of work
  - » In 77 day period after meeting the section performed \$286,333 worth of work
  - » 27 % (\$78,514) increase in productivity (wrench on bolt time)
  - » **Complete return on investment in 19.5 days for 18 vehicles!**

# Field Operations Case Study for ROI Analysis

12/21/09 ~ Installation complete. Crews informed

March 2010 ~ Group meeting. Real time data presented. Idle time, crew location, time on site, correlation between AVL and mobile work order system, geofencing, driver behavior, etc

June 2010 ~ Group meeting. Disciplinary action initiated and enforced.

DEC 09	JAN 10	FEB 10	MAR 10	APR 10	MAY 10	JUN10	JUL 10	AUG 10	SEPT 10
--------	--------	--------	--------	--------	--------	-------	--------	--------	---------

Wrench on Bolt Case Study:  
Base line dataset = 11 weeks prior to June 2010 group meeting  
ROI dataset = 11 weeks after the June 2010 group meeting

# Return On Investment Opportunities

- **Fuel Savings**

- » Less Idling
- » Lower speed/less aggressive driving
- » Elimination of cruising around before, between, and end of shift
- » Non work related errands

- **Vehicle Maintenance**

- » Less wear and tear on vehicle by reducing issues related to the fuel savings referenced above
- » Moving from calendar time based PM to actual mileage or hours

- **Vehicle Utilization**

- » Cost effective vehicle utilization (dispatching closest available vehicle)
- » Elimination of under utilized vehicles and or vehicle components

# Return On Investment Opportunities

- **Safety/Liability**
  - » Eastern Municipal Water District Case Study
- **Wrench on Bolt**
  - » One hour per week of increase production (12 minutes per day!!!!)

# Return On Investment ~ Ultra Conservative Estimates

## Calculations = Per day savings for 150 vehicles

Fuel Savings	1/3 gallon per day per truck (10 gallons per vehicle per month)	\$113
Vehicle Maintenance	\$1.00 per month per vehicle	\$5
Vehicle Utilization	Elimination of one 4x4 pick up (\$27,000) over 5 years	\$15
Safety & Liability	1% of Eastern Municipal Water District Case per vehicle	\$6
Wrench on Bolt	One hour per week of increased production (12 minutes per day per vehicle = \$2.86 using one employee)	\$429

# Return On Investment ~ Ultra Conservative Estimates

	Per Day	Annual Savings
Fuel Savings	\$113	\$41,100
Vehicle Maintenance	\$5	\$1,800
Vehicle Utilization	\$15	\$5,400
Safety/Liability	\$6	\$2,200
Wrench on Bolt	\$429	\$156,400
<b>TOTAL</b>		<b>\$206,900</b>
<b>Year one cost for 150 vehicles</b> (hardware, installation, service)		<b>\$116,300</b>

**Return  
On  
Investment  
7 MONTHS**

**Questions?**