

# Video Based Safety Programs Smarter Driving. Better Fleets.



Photo by Robert McConnell  
2006-07-06

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# About SmartDrive

GLOBAL INNOVATION LEADER IN DRIVER PERFORMANCE

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Founded 2004 | Employees 600+

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220,000,000+ DRIVING EVENTS SCORED  
World's largest and fastest-growing database of risky driving events

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## Leading Government Study Initiatives



## Prominent Industry Awards & Recognition

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Top 100 Companies in North America

WALL STREET JOURNAL

Top 25 Venture-Backed Companies to Watch

FROST & SULLIVAN

Customer Value Leadership Award for Trucking Industry Video Safety Solutions



Food Logistics Top 100 Software and Technology Providers

Deloitte

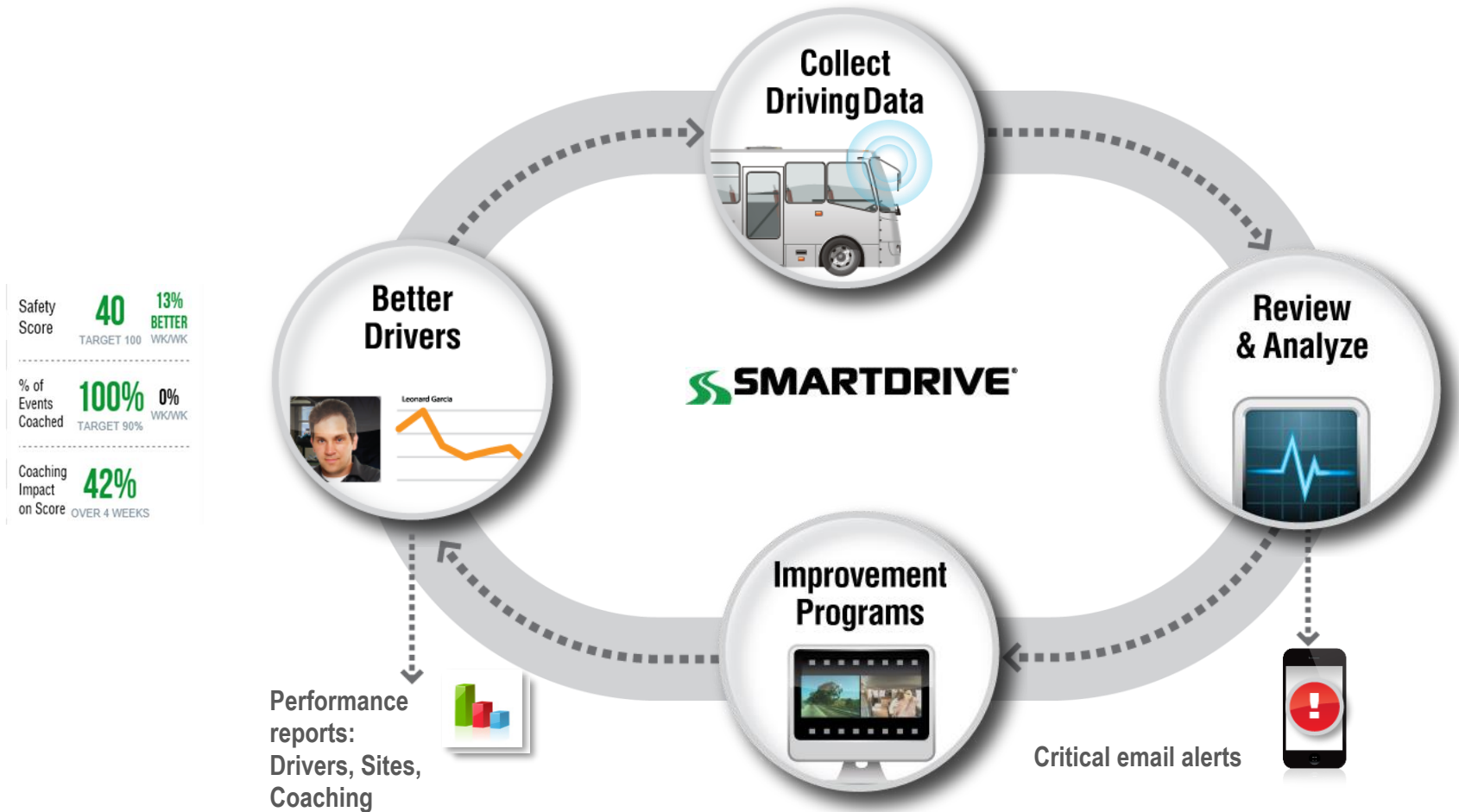
Deloitte's 2016 Technology Fast 500™

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143 issued and pending patents

# Video Based Safety Programs



# Flexible: Link to Definitive Operator Performance Data

Video & Audio

Vehicle Maneuvers

Location

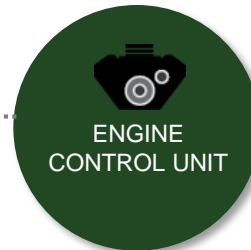
Active Safety (ADAS)

Miles & Hours Driven

Fuel Use

RPM, IDLE & PTO

Brake & Throttle



PANIC

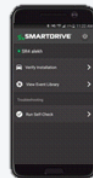
KEYPAD

COMBINED CAMERAS

CONFIGURATION APP

SENSOR BAR

CONTROLLER

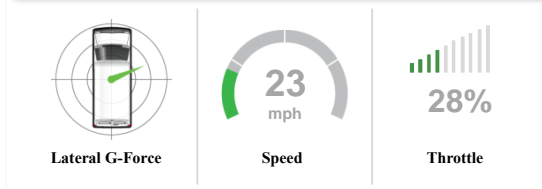


Optional Equipment

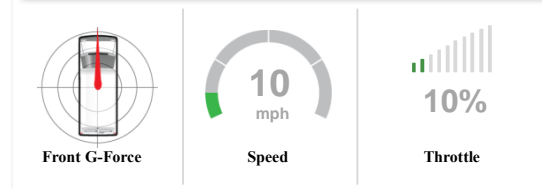
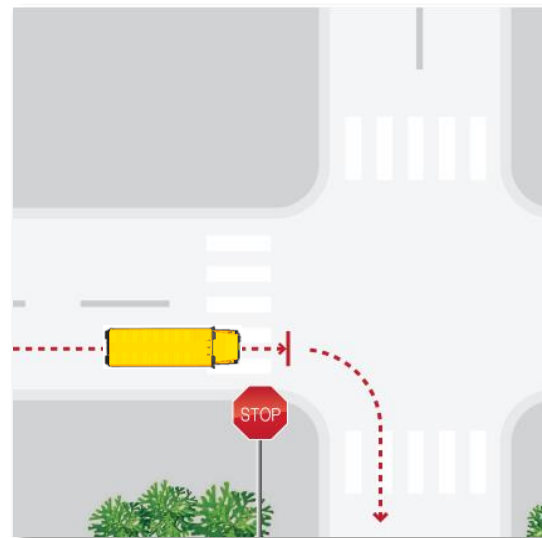
Required Equipment

# Sensor Fusion: Assessment of Driving Skills

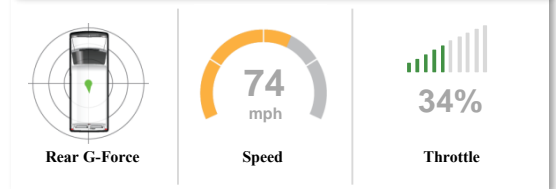
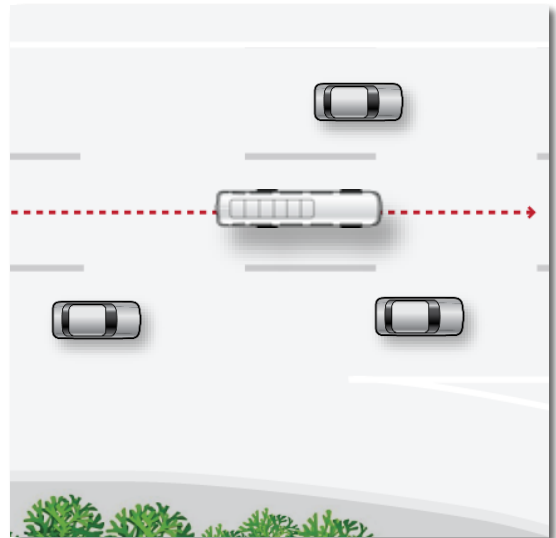
## Cornering



## Braking / Acceleration



## Speed



Before



After





# Hard Left Turn Failure to Attempt Stop at Light

SMARTDRIVE



BRAKE OFF  
ABS OFF  
ATC OFF

THROTTLE 0%  
ENG LOAD 0%  
PTO OFF  
ENGINE N/A

1500 3000 4500 6000  
1672 rpm

25 50 75 100  
48 mph ECU  
Low

FORWARD / BACKWARD -0.14  
SIDE TO SIDE 0.00

9:52:11.00 PM

# Sensor Fusion: Leverage the intelligence already in your vehicle



ACTIVE SAFETY SYSTEM DATA



Pedestrian Detection



FOLLOWING DISTANCE



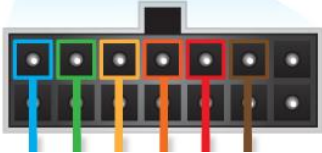
COLLISION AVOIDANCE



LANE DEPARTURE



ROLLOVER STABILITY



horn, ramp, dome light, seatbelt sensor, turn signal



PLAY-BY-PLAY OBSERVATIONS

BEFORE AND AFTER VIDEO

SAFETY SYSTEM INDICATORS

ENGINE AND VEHICLE DATA

LOCATION AND G-FORCE



SmartDrive Video Player brings Active Safety information together with video for unified view.

\*J1939 Protocol 2009 or newer

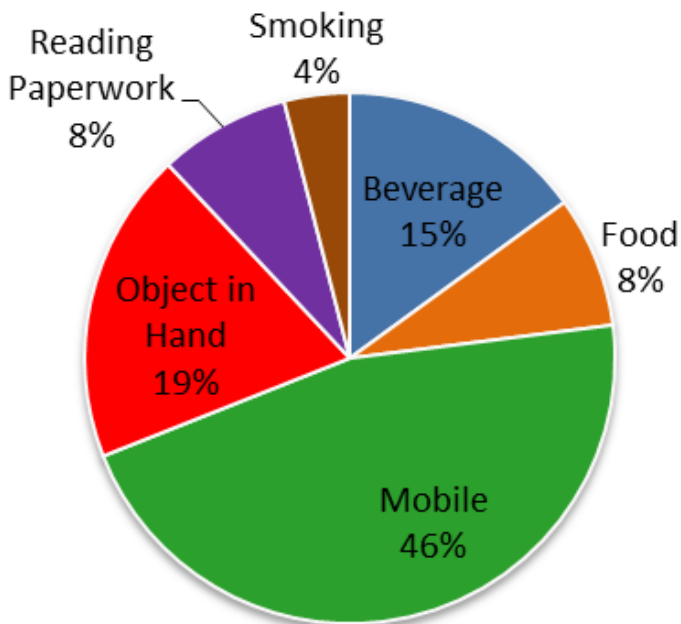
# Sensor Fusion: Pedestrian Detection





# Transit: Distracted Driving Leads Risky Driving Behavior

## Distraction Rates for Public Transit



Most Common Distractions for Drivers in Public Transit

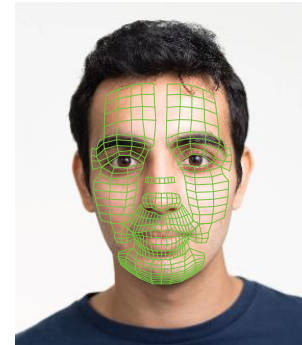
Mobile phone usage is most common distraction for public transit at **46%**

**IMPACT:**  
*23% of all collisions in 2011 involved mobile phone usage, resulting in 1.3 million collisions, according to NSC*

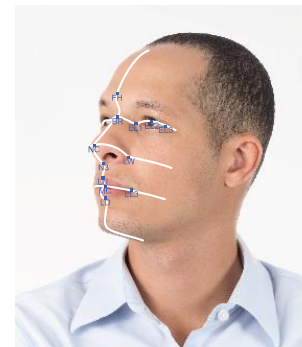
# Sensor Fusion: Stop distraction and drowsiness at the source

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- Assess face and eye position using computer vision technologies
- Record situations that wouldn't be captured otherwise
- Review to confirm risk, prioritized for fleet action



**Facial  
Analysis  
3D Mapping**



**IR Facial  
Analysis**



# Trigger: Eye's off Road

## Observations: Driver Distracted Mobile Phone

SMARTDRIVE

The video player shows a driver in a white shirt and orange safety vest looking down at a mobile phone in the driver's seat of a vehicle. The dashboard displays the following information:

- Vehicle Status: BRAKE  N/A, ABS  OFF, ATC  N/A
- Throttle: 0%
- Engine Load: 64%
- PTO:  N/A
- Engine:  N/A
- Speedometer: 696 rpm
- ECU Speed: Low Speed (25-75 ECU)
- Direction: FORWARD / BACKWARD -0.06, SIDE TO SIDE 0.42

4:47:54.00 PM

MAP CHART SELECT ANY 2 OPTIONS

FOLLOWING TIME THROTTLE

# Expert driving analyst reviews driver performance

## Fundamental Driving Errors

### Unprofessional Driving

- Unsafe Backing
- Unsafe Braking
- ✓ ▪ Unsafe Lane Change / Merging / Passing
- Unsafe Railroad Crossing
- Unsafe Turning
- Lane Departure/Straddling Lanes
- Competitive/Aggressive Driving
- Driving the Wrong Way - On Roadway
- Driving the Wrong Way - Off Roadway
- Curb Check/Jumped Curb

### Vehicle Control

- Driving with Two Hands off Wheel
- Unattended Moving Vehicle

### Stopping

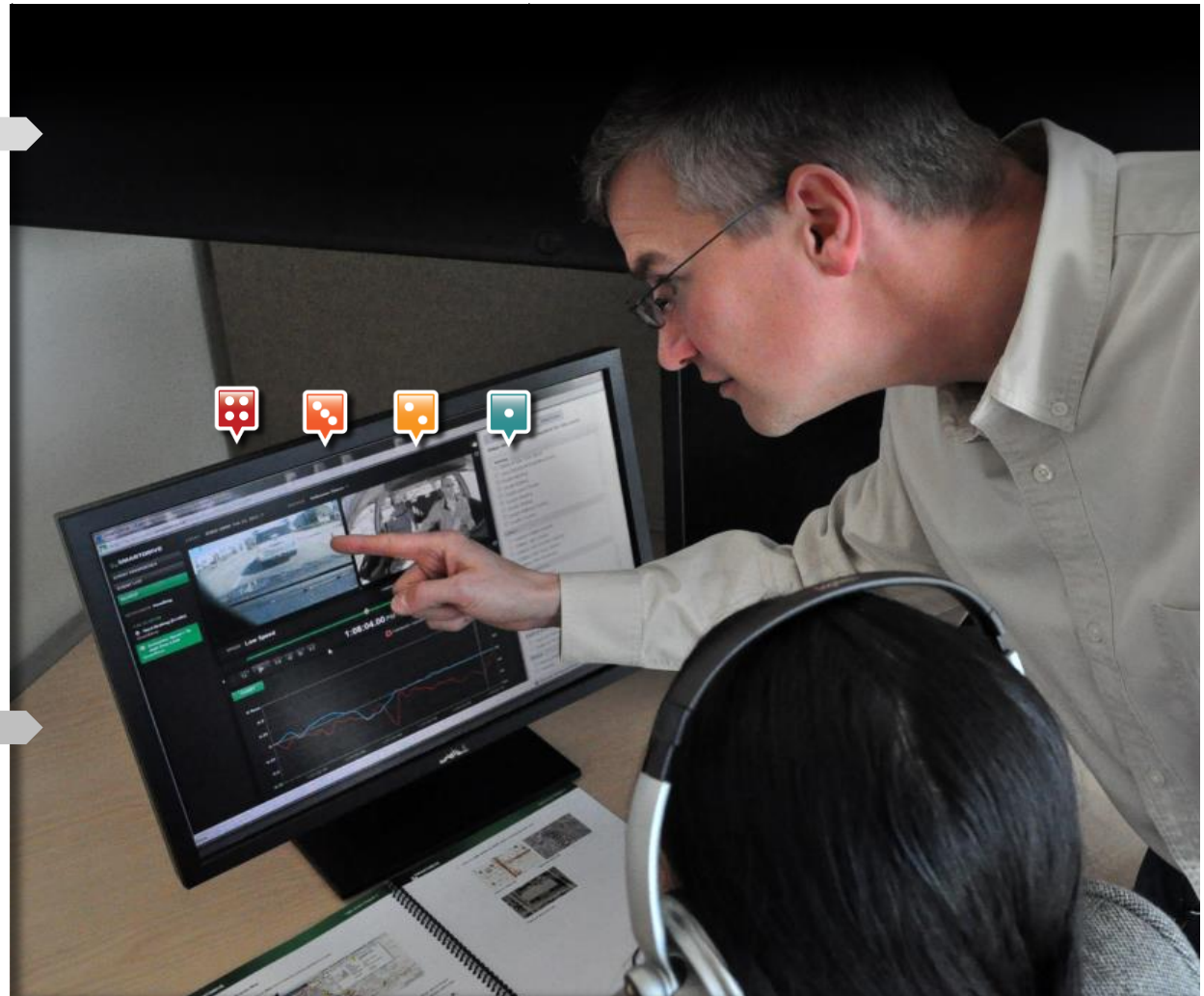
- Incomplete Stop at Light
- Incomplete Stop at Stop Sign
- Failure to Attempt to Stop at Light
- Failure to Attempt to Stop at Stop Sign
- False Start
- Failure to Yield to Pedestrian(s)
- Failure to Yield to Vehicle(s)

### Speeding

- Moderate Speeding ( $\leq 10$  mph Over Limit)
- ✓ ▪ Excessive Speeding ( $> 10$  mph Over Limit)
- Exceeded Maximum Fleet Speed

### Situational Awareness

- Unsafe Following ( $\leq 1$  second)
- Unsafe Following (1.25 - 2 seconds)
- Unsafe Following (2.25 - 3 seconds)
- Unsafe Following (3.25 - 4 seconds)
- Not Checking Mirrors
- Not Scanning Road Ahead
- Not Scanning Intersection





# Better insights for effective coaching and training



**Trends**  
1 Historical view of driver performance.

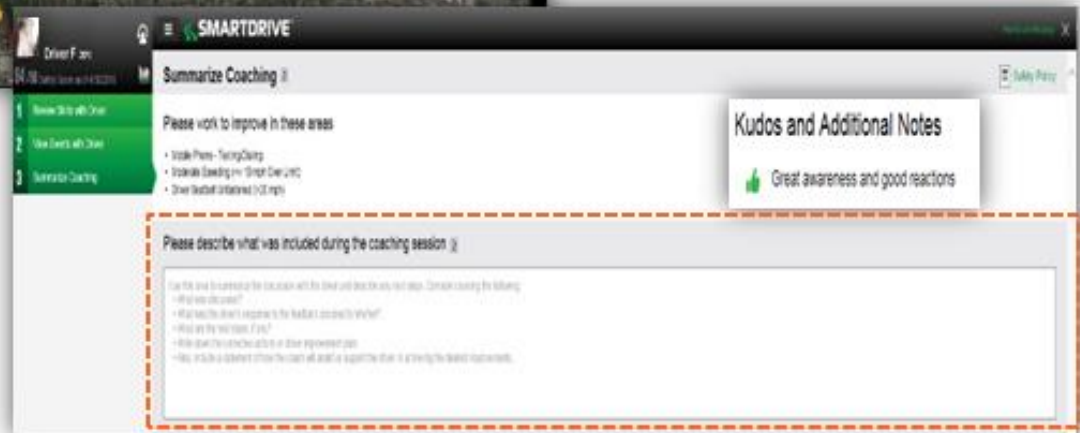
# Driver Performance Coaching



2

**Coach**  
Review videos with driver.

3 **Summarize**  
Add notes for session outcome and next steps.



# Proactive video safety program results . . .

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**Distractions**  
**-59%**



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**Fatigue**  
**-74%**



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**Speeding**  
**-69%**



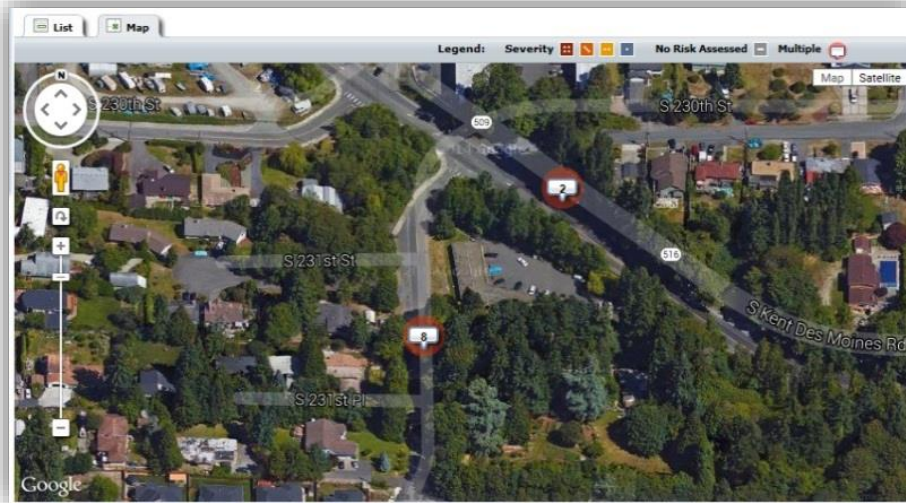
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**Close Following**  
**-75%**



**. . . Collision Frequency lowered by over 50%**

# 360 Capturing it all: Passenger Safety Unloading







# SmartIQ: Powerful analytics options

# SmartIQ: “The Power of Data”



**Better Insights Better Savings**

# SmartIQ Operations : Fuel

## DRIVER FUEL SAVINGS OPPORTUNITIES

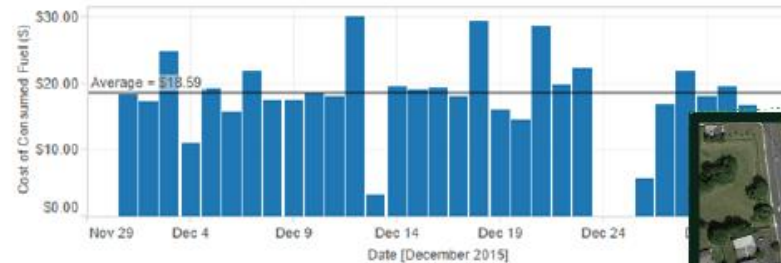
Uncover root cause for unexpected idling, measure cost & identify new savings

IDLING SCORECARD FOR DRIVER: JOE SMITH 12/1/2015 through 12/31/2015

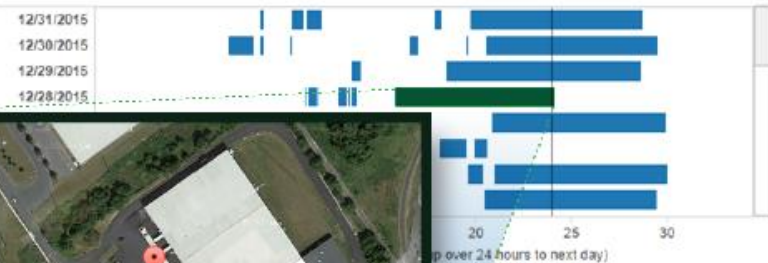
### DRIVER IDLING PERIOD SUMMARY

Cost of Consumed Fuel	Cost of Idling (\$/driver/month)	Idling Fuel Consumed	Idling Duration (hours)	Days
\$539.17	\$529.02	243.9	315.7	31

### IDLING TREND



### IDLING TIMELINE



### TOP IDLING CASES

Start Time	End Time	Vehicle SN	Vehicle Type	Cost of Fuel	Idling Duration (hours)	Idling Rate (gal/hr)
12/27/2015 3:48:12 PM	12/28/2015 12:08:40 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	8.3	0.9
12/21/2015 8:26:03 PM	12/22/2015 5:28:21 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/20/2015 6:14:13 PM	12/21/2015 3:16:11 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/26/2015 8:53:05 PM	12/27/2015 5:55:05 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/1/2015 11:00:02 PM	12/2/2015 8:02:04 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/2/2015 10:01:40 PM	12/3/2015 7:03:44 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/13/2015 9:53:05 PM	12/14/2015 6:55:08 AM	V #901E5	FREIGHTLINER / CASCA	\$15.77	9.0	0.8
12/12/2015 1:41:37 PM	12/12/2015 10:43:30 PM	V #901E5	FREIGHTLINER / CASCA	\$15.48	9.0	0.8
12/22/2015 8:57:33 PM	12/23/2015 5:50:37 AM	V #901E5	FREIGHTLINER / CASCA	\$15.48	9.0	0.8

**SMARTDRIVE** SmartIQ<sup>™</sup> Transportation Intelligence





# Smarter Driving. Safer Agencies.



# Thank you

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2006-07-06

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