

# Video Based Safety Programs Smarter Driving. Better Fleets.

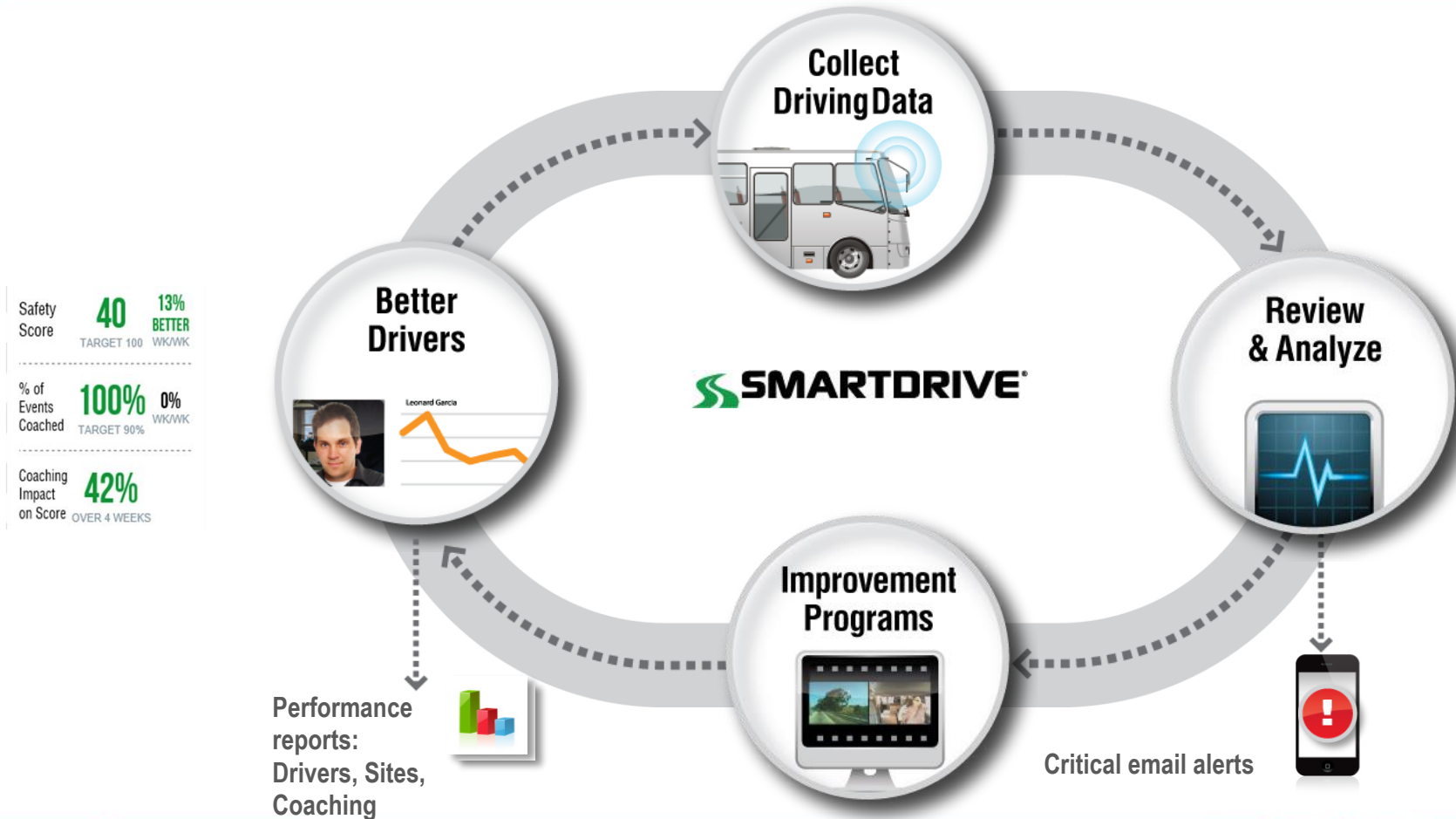


Photo by Robert McConnell  
2006-07-06

**COMPANYCONFIDENTIAL** This document contains forward looking statements based on current expectations, forecasts, and assumptions of SmartDrive that involve risks and uncertainties. Forward looking statements are subject to risks and uncertainties associated with SmartDrive's business that could cause actual results to vary materially from those stated or implied by such forward looking statements. This document and the statements contained herein should not be interpreted as a commitment on the part of SmartDrive, and SmartDrive cannot guarantee the accuracy of any information presented after the date of publication.

# Video Based Safety Programs

Designed to optimize safety and compliance



# 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**

VIDEO EVENT  
RECORDER

ENGINE  
CONTROL UNIT



PANIC

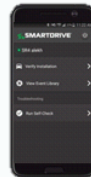
KEYPAD

COMBINED CAMERAS

CONFIGURATION APP

SENSOR BAR

CONTROLLER

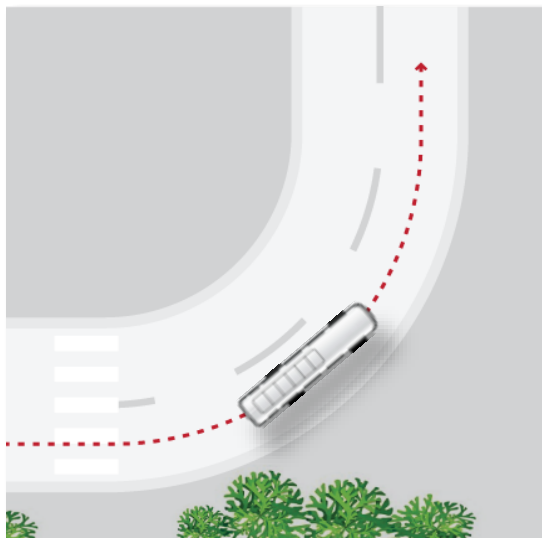


Optional Equipment

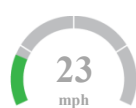
Required Equipment

# Sensor Fusion: Assessment of Driving Skills

## Cornering



Lateral G-Force



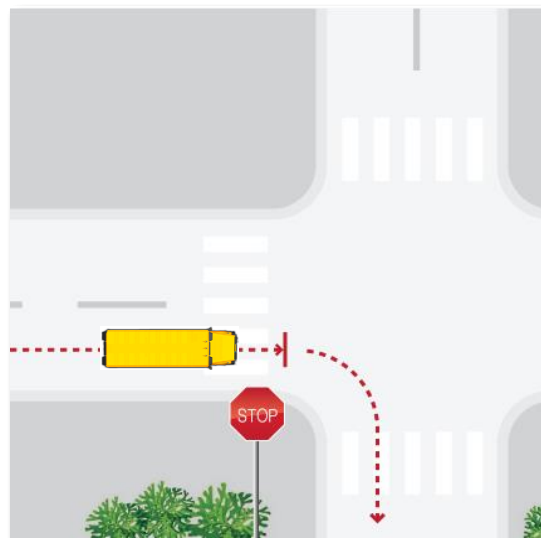
Speed



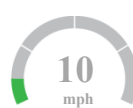
28%

Throttle

## Braking / Acceleration



Front G-Force



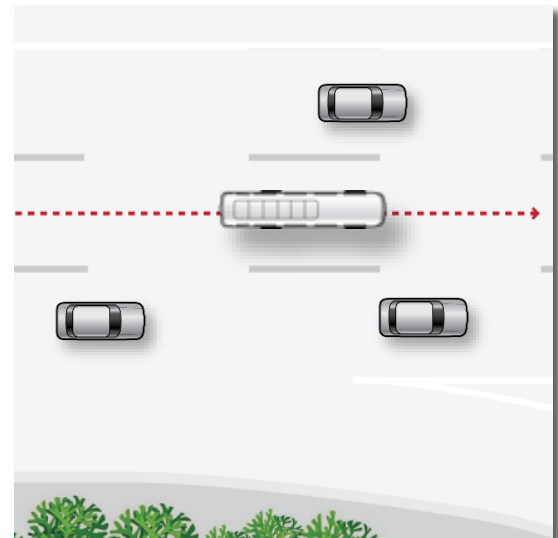
Speed



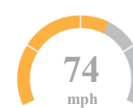
10%

Throttle

## Speed



Rear G-Force



Speed



34%

Throttle



Before



After





# Hard Left Turn: Failure to Attempt Stop at Light



# Sensor Fusion: Leverage the intelligence already in your vehicle



ACTIVE SAFETY  
SYSTEM DATA



Pedestrian  
Detection



FOLLOWING  
DISTANCE



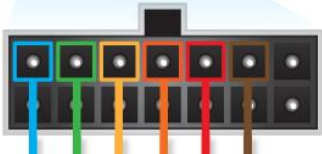
COLLISION  
AVOIDANCE



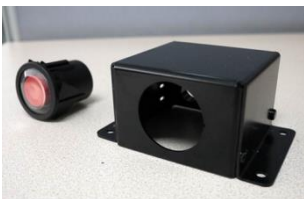
LANE  
DEPARTURE



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.

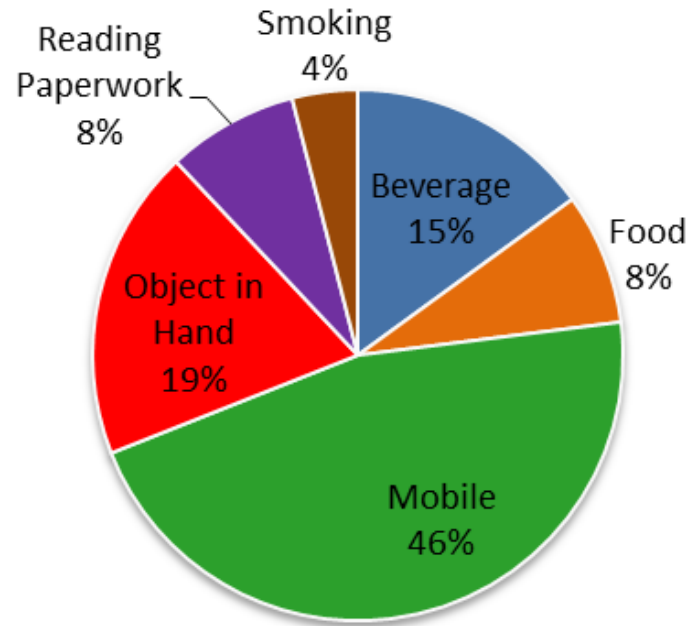
**\*J1939 Protocol 2009 or newer**

# Sensor Fusion: Mobileye Pedestrian Detection



# Transit: Distracted Driving Leads Risky Driving Behavior

## Distraction Rates for Public Transit



Most Common Distractions for Drivers in Public Transit

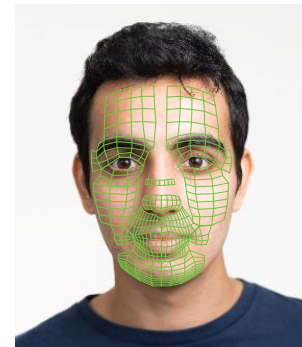
**Mobile phone usage is most common distraction for public transit at 46%**

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

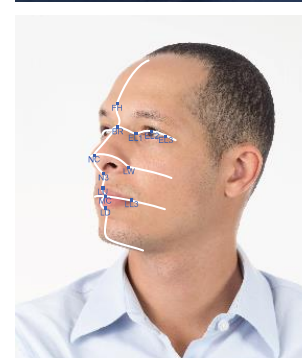


# Sensor Fusion: Stop distraction and drowsiness at the source

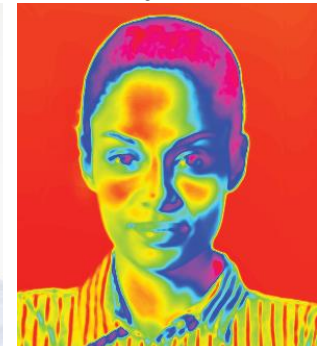
- Assess face and eye position using computer vision technologies
- Record situations that wouldn't be captured otherwise
- Review to confirm risk, prioritized for fleet action



**Facial  
Analysis  
3D Mapping**



**IR Facial  
Analysis**



# Trigger: Eye's off Road

## Observations: Driver Distracted Mobile Phone



# 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



## 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.

A screenshot of the SMARTDRIVE 'Summarize Coaching' form. The form is titled 'Summarize Coaching' and has a sidebar with a list of drivers and a 'Driver F' profile. The main area contains a section titled 'Please work to improve in these areas' with a list of items: 'Excessive Throttle', 'Excessive Braking', and 'Excessive Steering'. Below this is a section titled 'Please describe what was included during the coaching session (s)' with a text area for notes. To the right of the text area is a box titled 'Kudos and Additional Notes' with a green checkmark and the text 'Great awareness and good reactions'.

# Proactive video safety program results . . .



Distractions  
**-59%**



Fatigue  
**-74%**



Speeding  
**-69%**



Close  
Following  
**-75%**



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



# Smarter Driving. Safer Agencies.



# Thank you

Photo by Robert McConnell  
2006-07-06

**COMPANYCONFIDENTIAL** This document contains forward looking statements based on current expectations, forecasts, and assumptions of SmartDrive that involve risks and uncertainties. Forward looking statements are subject to risks and uncertainties associated with SmartDrive's business that could cause actual results to vary materially from those stated or implied by such forward looking statements. This document and the statements contained herein should not be interpreted as a commitment on the part of SmartDrive, and SmartDrive cannot guarantee the accuracy of any information presented after the date of publication.