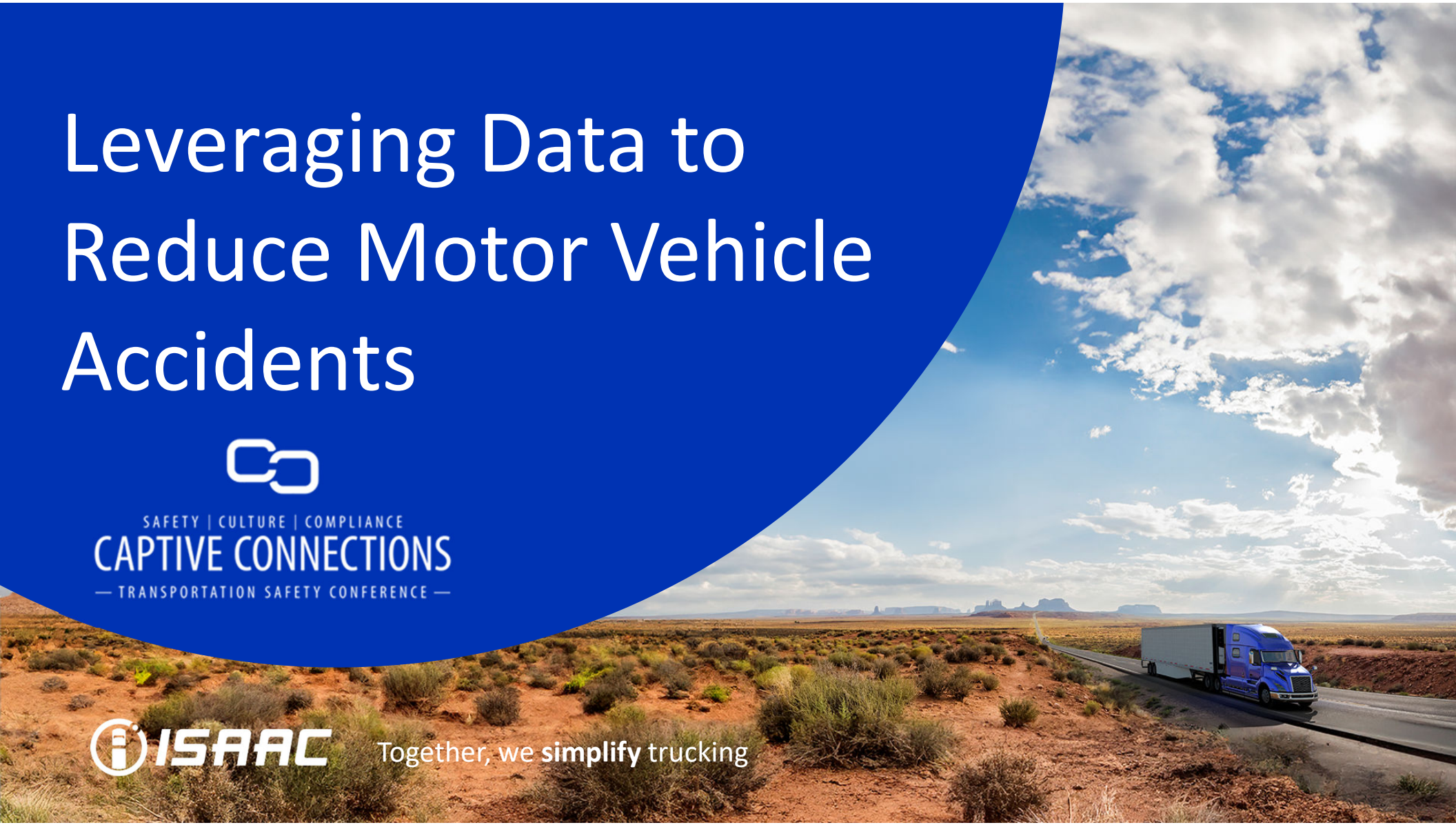
Leveraging Data to Reduce Motor Vehicle Accidents

SAFETY | CULTURE | COMPLIANCE

CAPTIVE CONNECTIONS

— TRANSPORTATION SAFETY CONFERENCE —



ISAAC

Together, we **simplify** trucking

ISAAC Team

Jacques DeLarochellière

CEO, Chairman, Cofounder

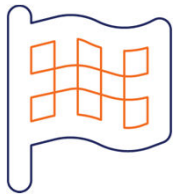
Sam Sussenguth

Chief Sales & Marketing Officer

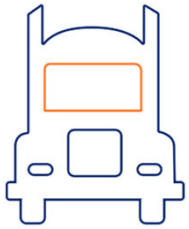
John Chima

Business Development Manager

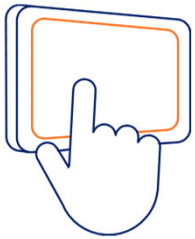
Our story from racing to trucking!



1999



2008



2014

76 % of Top Quebec Carriers

2016

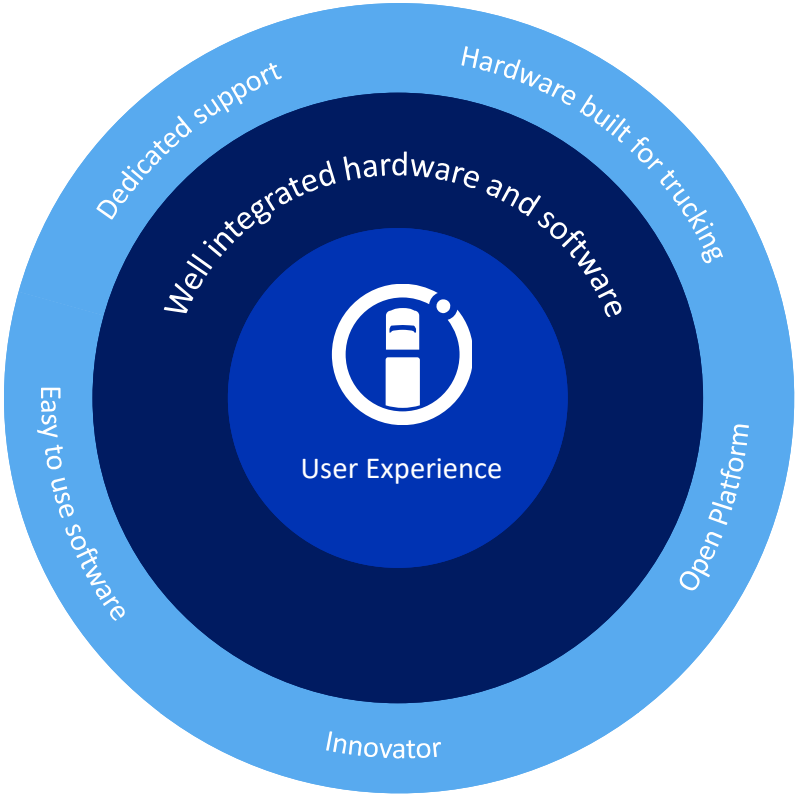
40 % of Top 100 Canadian fleets

2021

1 Telematics provider in Canada

ISAAC

It’s all about the User Experience



Hardware to keep the wheels turning

ISAAC InControl Tablet

- Less than 2% returns/year
- 5-year life expectancy
- Handles drops & harsh weather
- -6°F to 140°F operating temp.
- -22°F to 158°F storage temp.

ISAAC InMetrics Gateway

- Less than 0.5% returns/year
- 10-year life expectancy
- -40°F to 185°F operating temp.

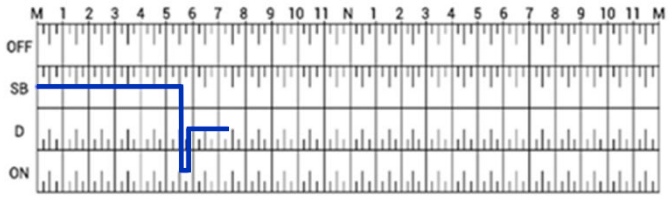
ISAAC Tablet Dock

- Less than 0.1% returns/year
- 5-year life expectancy
- Resistant to heavy vibration
- One-handed tablet handling
- Integrated charging
- Exclusive ISAAC-patented, temporary-mount option for short-term installations

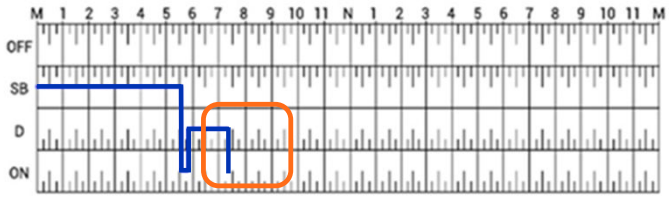
Activity based approach

The drivers' logbooks
update automatically
as they drive and go about their day

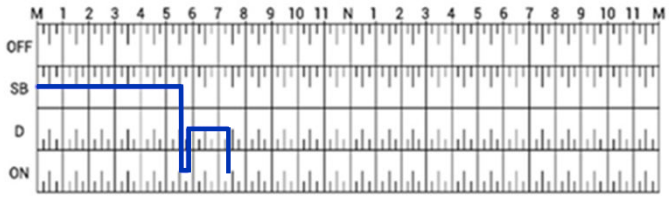
Activity based approach



Activity based approach

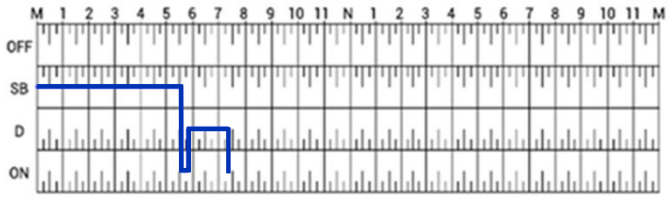


Activity based approach



ISAAC

Activity based approach



- Easy workflow for drivers
- Guaranteed match between trip sheet and logbook

Driver Coaching

Drivers influence your MPG score

Driver behavior accounts for as much as 30% of a truck's MPG score

Sources :

- Cummins Fuel Economy Guide - Secrets of Better Fuel Economy
- Detroit – Demand Great Fuel Economy - https://demanddetroit.com/why-detroit/fuel-economy
- Kenworth - Module 5 improving driver behavior

A fair incentive program

Driver shortage, driver compensation, and driver retention are top fleet challenges

2 to 3% fleet average of fuel savings

7 to 11% improvement on some truck

Table 2: 2024 Truck Driver and Motor Carrier Top Concerns

Rank	Truck Drivers	Motor Carriers
1	Truck Parking	Economy
2	Driver Compensation	Lawsuit Abuse Reform
3	Economy	Driver Shortage
4	Detention/Delay at Customer Facilities	Insurance Cost/Availability
5	Speed Limiters	Driver Retention
6	Broker Issues	CSA
7	ELD Mandate	Truck Parking
8	Fuel Prices	Battery Electric Vehicles
9	Autonomous Trucks	Driver Distraction
10	Driver Training Standards	Diesel Technician Shortage

How it works

Big data recording

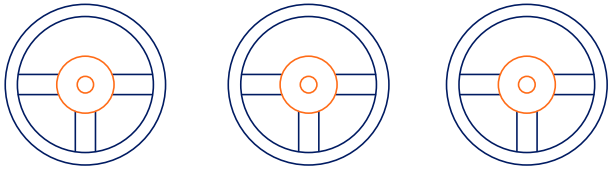
100+ parameters up to 200 times per second

Data processing using our patented algorithm

Progressive acceleration

Anticipation

Real-time driver coaching



98% 99% 91%

ISAAC

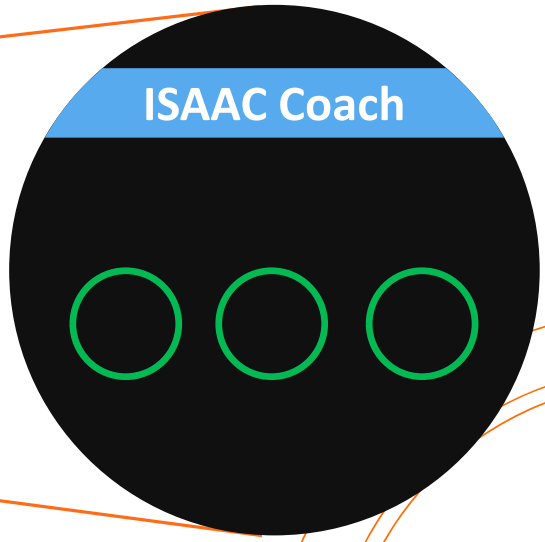
Coach on the road

Doesn’t penalize the driver for elements outside his control:
Aerodynamics, wind, load, slope, engine type

Downhill | Flat terrain | Light load | Headwinds | Uphill

The ISAAC Coach

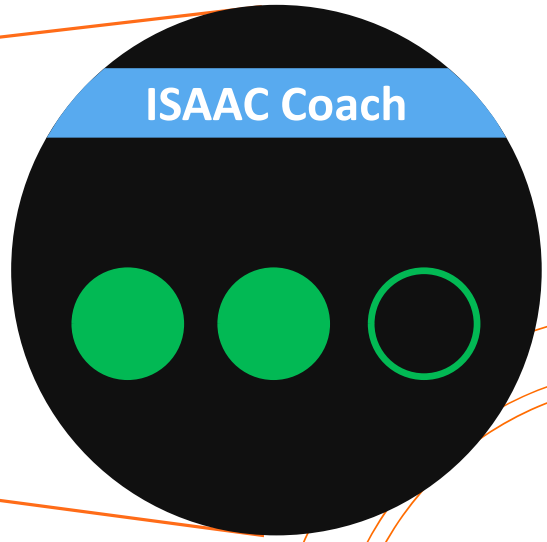
Accelerator pedal



ISAAC

Driver Coach

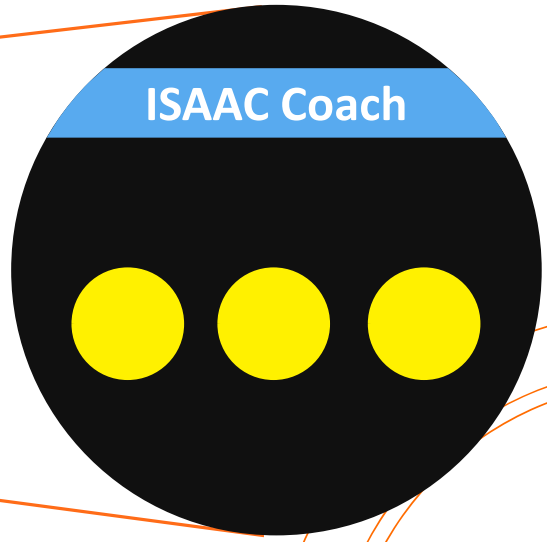
Accelerator pedal



ISAAC

Driver Coach

Accelerator pedal



ISAAC

Driver Coach

Other indicators

ISAAC

A fair incentive program

Drivers can see a summary of how their driving results compare to the targeted results.

Traffic Injury Research Foundation

TIRF is a charitable road safety research institute studying unsafe behaviors & related risks affecting all road users

- **Study on the benefit of eco-driving style**:
  - fuel cost savings
  - safety benefits for fleet operators
  - lower insurance costs
  - increased productivity
  - improve road safety for the population at large

Study population & sample

- Long-haul class 8 vehicle drivers employed by commercial companies
- Three commercial companies used ISAAC including:
  - 2,531 drivers
  - Total 18,024,525 driving segments
  - Total 208,863,535 miles of driving exposure
- One commercial company did not use ISAAC including:
  - 106 drivers
  - Total 3,267,021 miles of driving exposure

Data Collection

Data collected from 3 companies using ISAAC from January 19th, 2020 to April 12th, 2022

Number of collisions

Near-hit events including stability control events, hard-braking, hard left-turn, and hard right-turn events

Weighted mean of ISAAC score (driving performance score)

Total distance traveled

Total number of segments a driver exceeded the posted speed limit (110 or 120 km/hr equal to 68.35 or 74.56 mph)

ISAAC

Data Collection

- Data collected from one transportation company between June 2021 through October 2021
- Age and experience of drivers
- No use of ISAAC
- Driving style characteristics such as highest gear, engine revolutions per minute (RPM), cruise control and speeding
- Total distance travelled

Statistical Analysis

- Quantify the odds ratio of a near-hit event or collision by one unit increase of an explanatory variable
- Using logit models in Stata software
- Define higher-risk driving by various thresholds of hard near-hit events and collisions
- Benefiting from several measures of goodness-of-fit:
  - Maximum value of Pseudo R2
  - Area under the Receiver Operating Characteristic (ROC) curve
  - Correctly classified (%)

Study Findings: Overview

Odds of having collisions: Logit regression results

Near-hit collisions	WM ISAAC		Sum distance (per 10,000 km)		Sum Speeding110		Sum Speeding120		Pseudo R2	Area under ROC curve	Correctly classified (%)
	Odds	P>|z|	Odds	P>|z|	Odds	P>|z|	Odds	P>|z|			
Hard-braking	0.928	0.000	1.511	0.000	1.000	0.282	1.005	0.808	0.360	0.919	92.92
hard left-turn	0.918	0.000	1.057	0.000	1.000	0.858	1.000	0.933	0.098	0.710	67.06
hard right-turn	0.920	0.000	1.061	0.000	1.000	0.336	1.006	0.044	0.103	0.718	71.06

Study Findings: Overview

Odds of having collisions: Logit regression results

Crashes	WM ISAAC			Sum distance (per 10,000 km)			Pseudo R2	Area under ROC curve	Correctly classified (%)
	Odds	95% CI	P>|z|	Odds	95% CI	P>|z|			
Total	0 .964	[0 .946, 0.984]	0.00	1.066	[1.055, 1.077]	0.00	0.115	0.726	66.76

ISAAC

Slide 27

0 [@Jean-François Thériault] - Can you adjust this slide so the numbers are all aligned?
Sam Sussenguth, 2025-04-04T19:14:51.780

JT0 0 [@Sam Sussenguth]
:p It’s done!
Jean-François Thériault, 2025-04-04T22:34:24.795

0 1 Thanks!
Sam Sussenguth, 2025-04-08T17:31:34.425

Study Findings: Overview

1% Increase in the weighted mean of the ISAAC score is associated with:

- **7%** Hard brakings ▼
- **8%** Hard turns ▼
- **4%** Collisions ▼

A **1% increase** in the use of cruise control is associated with:

3% reduction in the odds of a hard-braking event

An increase in the driver's age is associated with:

9% reduction in the odds of a hard-braking event

ISAAC

Slide 28

---

0 [@Jean-François Thériault] - Can we change the 'one unit' to '1%' and make it 'pop' more? We want that part to stand out

Sam Sussenguth, 2025-04-08T13:50:11.576

JT0 0 [@Sam Sussenguth]
I did 3 versions for you to choose. Slide 28 is my favourite because it's all balanced but I'm not sure the copy still make sense.

Otherwize you have two other options.

Jean-François Thériault, 2025-04-08T17:40:38.682

0 1 LOVE it! Thank you

Sam Sussenguth, 2025-04-08T17:42:24.696

0 2 Agreed, 28 is the one!

Sam Sussenguth, 2025-04-08T17:52:17.860

Study Findings: Overview

Increasing **1%** in the weighted mean of the ISAAC score is associated with:

- **7%** Hard brakings ▼
- **8%** Hard turns ▼
- **4%** Collisions ▼

A **1% increase** in the use of cruise control is associated with:

3% reduction in the odds of a hard-braking event

An increase in the driver's age is associated with:

9% reduction in the odds of a hard-braking event

ISAAC

Slide 29

0 [@Jean-François Thériault] - Can we change the 'one unit' to '1%' and make it 'pop' more? We want that part to stand out

Sam Sussenguth, 2025-04-08T13:50:11.576

0

Study Findings: Overview

Increasing **1%** in the weighted mean of the ISAAC score is associated with:

- **7%** Hard brakings ▼
- **8%** Hard turns ▼
- **4%** Collisions ▼

A **1% increase** in the use of cruise control is associated with:

3% reduction in the odds of a hard-braking event

An increase in the driver's age is associated with:

9% reduction in the odds of a hard-braking event

ISAAC

Slide 30

0 [@Jean-François Thériault] - Can we change the 'one unit' to '1%' and make it 'pop' more? We want that part to stand out

Sam Sussenguth, 2025-04-08T13:50:11.576

Study Findings: Overview

- Driving in top gear with steady speed (63 mph) is associated with:
  - 34% reduction in the odds of a stability control event
- 1% increase in speeding is associated with:
    - 4% increase in the odds of a stability control event
- An increase in distance traveled of 6,214 miles is associated with:
  - 55% increase in the odds of a stability control event

Implications for Improvement

Increasing the awareness regarding benefits of the Eco-Driving style

Paying attention to smooth driving

Focusing on the target population (e.g., young drivers)

Training to improve the ISAAC score (SmartDriver for Highway Trucking online course from Natural Resources Canada)

ISAAC

Acknowledgement

Natural Resources Canada

This research study was commissioned by
Natural Resources Canada's Greening Freight Program

ISAAC

The TRUCKING ALLIANCE

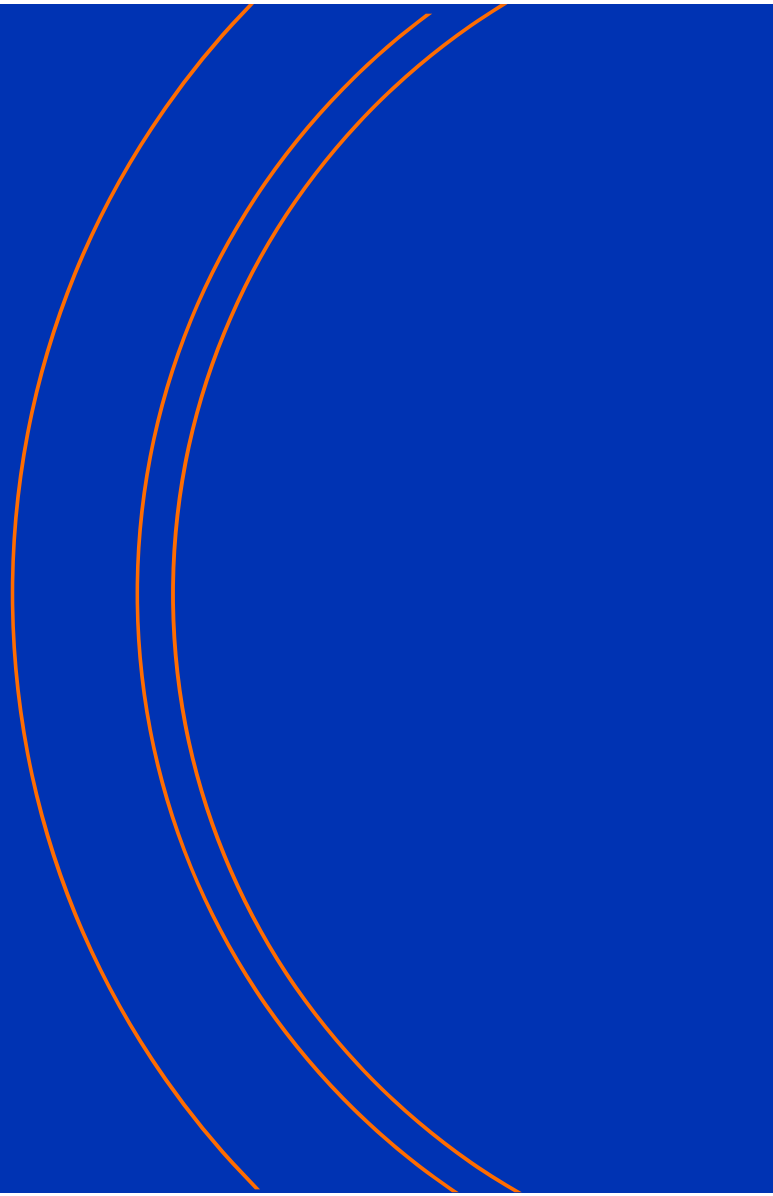
NATIONAL 2021-2024 CRASH STATISTICS

NATIONAL SUMMARY	2021	2022	2023	2024
NUMBER OF VEHICLES INVOLVED IN FATAL & NON-FATAL CRASHES	**198,090**	**199,415**	**184,546**	**179,215**
# IN FATAL CRASHES	5,978	6,150	5,263	4,562
# IN NON-FATAL CRASHES	192,112	193,265	179,283	174,653
NUMBER OF FATAL & NON-FATAL CRASHES	**184,689**	**185,162**	**172,107**	**167,303**
# IN FATAL CRASHES	5,384	5,525	4,704	4,077
# IN NON-FATAL CRASHES	179,305	179,637	167,403	163,226
NUMBER OF FATALITIES AS A RESULT OF A CRASH	**6,065**	**6,204**	**5,243**	**4,569**
NUMBER OF INJURIES AS A RESULT OF A CRASH	**92,034**	**90,137**	**87,775**	**85,697**

Data Source: *FMCSA Motor Carrier Management Information System (MCMIS) data snapshot as of 12/31/2024. MCMIS data are considered preliminary for 22 months to allow for changes. The combined large truck and bus counts may not equal the sum of the individual truck and bus counts if some crash events involved both types of vehicles.*

Report Filters: *Crash Type - All Crashes, Carrier Domicile - All, Report Focus - National, Time Period - Calendar, Year - 2021 to 2024, Vehicle Type - Large Trucks & Buses, Data Source - MCMIS*

Mitigating Risk

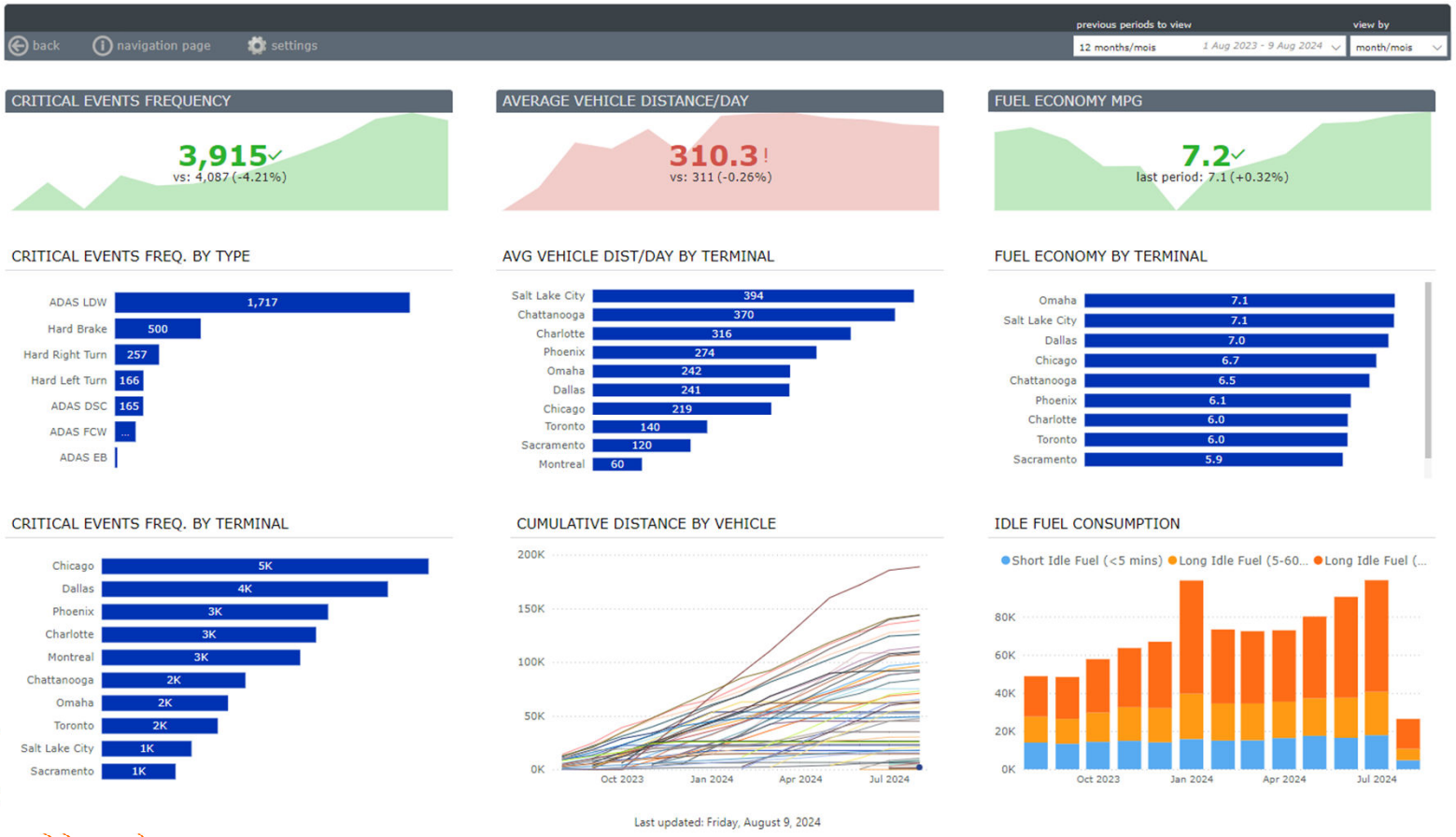


Analytics

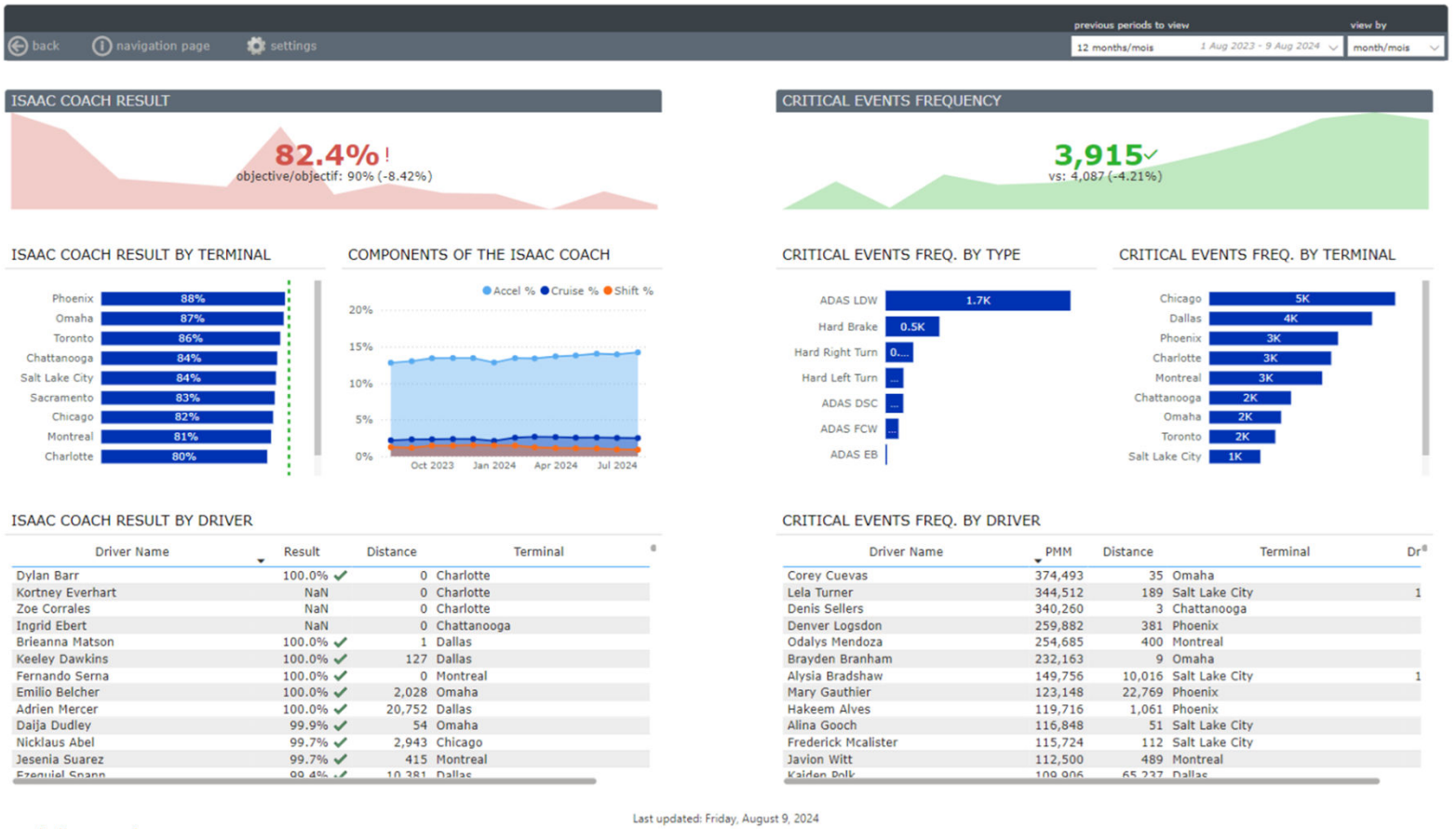
No to complicated software, yes to simplicity

- Millions of data points to drive business intelligence for fleets
- Dashboards are customizable, easy to understand
- Fleet trends come to light thanks to quality data over time
- Clearly shows whether your initiatives are working
- Data-driven fleet decisions, no more guesswork

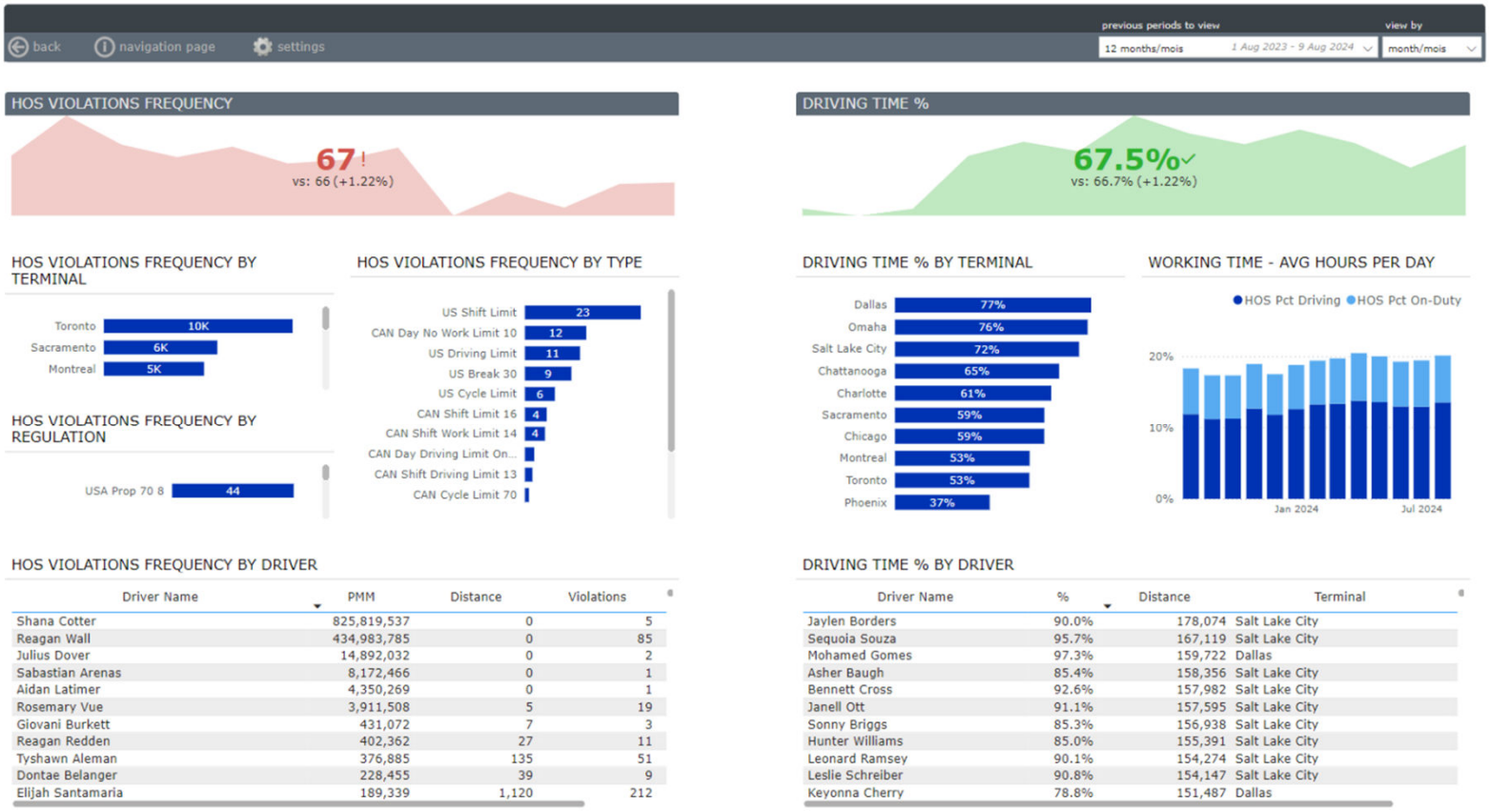
Executive Dashboard



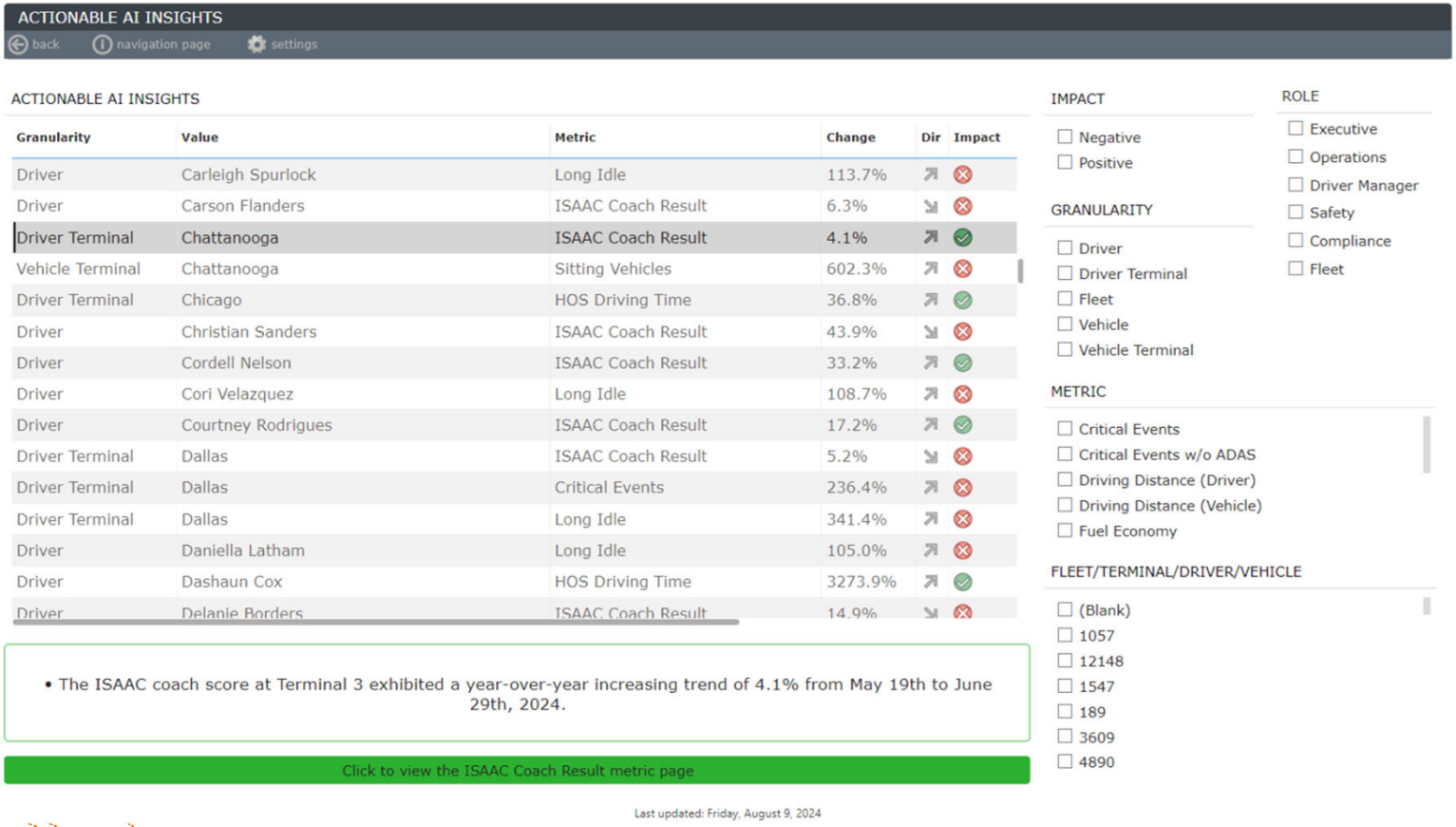
Safety Dashboard



Compliance Dashboard



AI Dashboard



Safety and compliance

ISAAC

Reducing Critical Events

Real-time alerts can tell the driver when it detects:

- Hard brakes
- Hard turns
- Stability control
- Collision warning
- Active braking
- Lane departure

Reducing Critical Events

Expected 79**%** reduction in Critical Events with real-time alerts

- Less tire and brake wear
- Less cargo shift and damage
- Fewer accidents

ISAAC

Knowing what happened

Truck drivers are not at fault in

80% of collisions

involving large trucks.*

* Ohio DOT Accident Report

Witness every detail

You get undeniable videos with integrated camera systems

- Web portal shows **all relevant details** regarding incidents
- **Protects** your company's and drivers' reputation
- **Insights from all sides:** Forward-facing camera, side-view cameras, driver-facing camera and 4-channel DVR

ISAAC

Configurations

Reliable forward-facing camera

Clear, detailed video in all light conditions

Separate DVR installed behind the dashboard

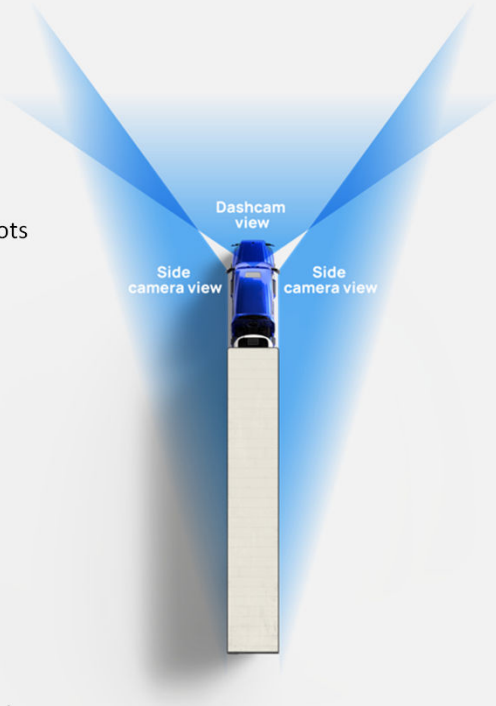
Keep footage intact during severe accidents

ISAAC

Options

Side-view cameras

145° angle views virtually eliminate blind spots



Improved driver-facing camera

works in low-light conditions & through sunglasses

Knowing what happened

Dig even deeper when necessary.

Our expert engineers can perform in-depth data analysis of specific cases when required

Knowing what happened

You get telemetry data reports on demand

Tread cautiously with Camera AI

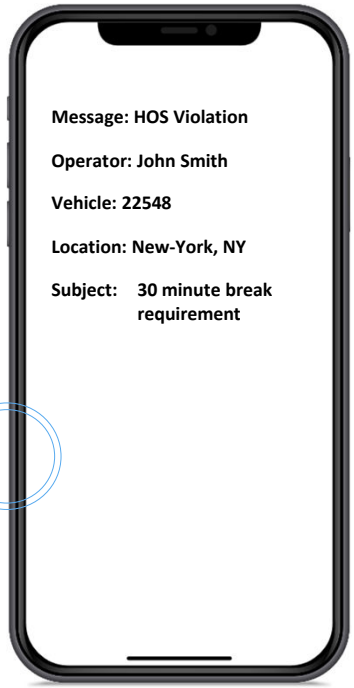
Legal issues | News | Technology | Top Stories | Truck Driver Issues | Trucking

Drivers settle class action with [redacted] over in-cab surveillance, data gathering

[redacted] admits no wrongdoing in Illinois case over BIPA; settlement fund will be $4.25 million

Compliant hours of service

To safety manager

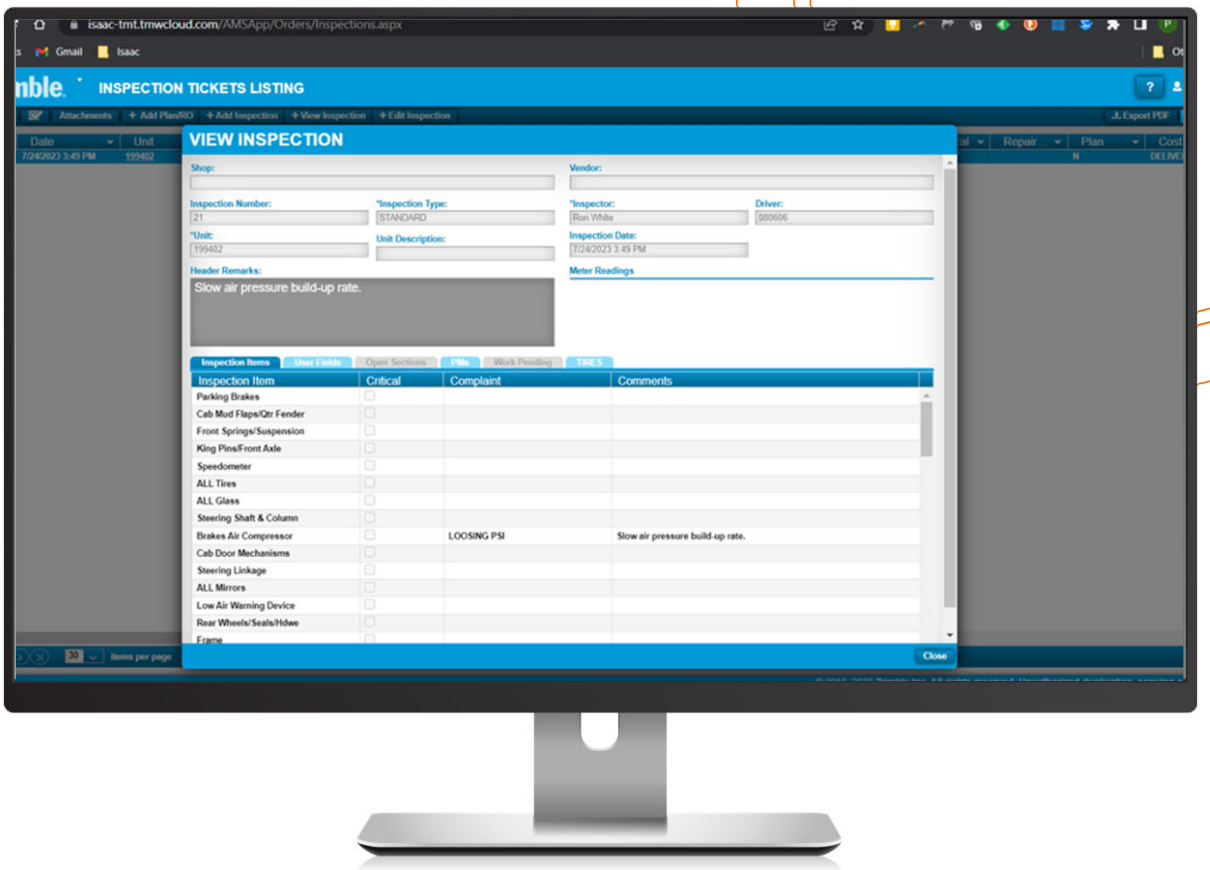


Smart vehicle inspections

- Minor Defects
- Major Defects
- Non-regulated items

To fleet manager

Inspections integrated to Maintenance Software



ISAAC

Smart notifications for inspections

Drivers

- Traveling with an expired DVIR
- Traveling with a violation in effect due to a major or minor defect
- Previously reported defects on a trailer about to be hooked

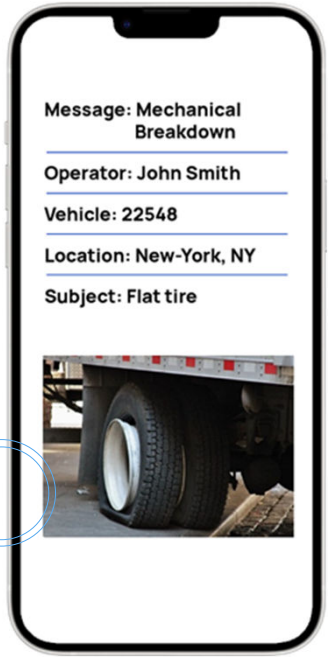
Managers

- A truck traveling with an expired DVIR
- A truck traveling with a violation in effect due to a major or minor defect

Mechanical breakdown

Drivers can quickly report breakdowns to dispatchers and mechanics

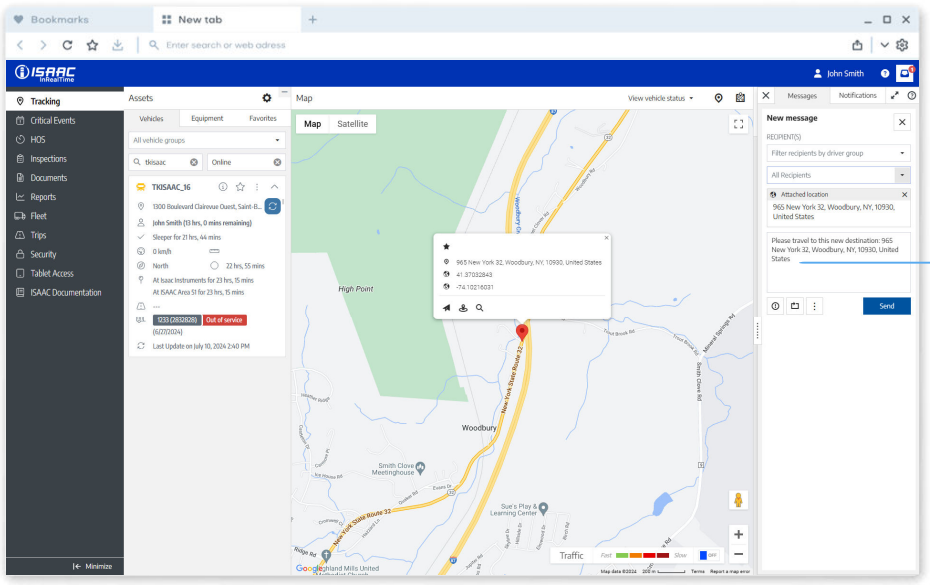
To mechanic



ISAAC

Dedicated messaging

Allowing dispatchers and drivers
to communicate in real time



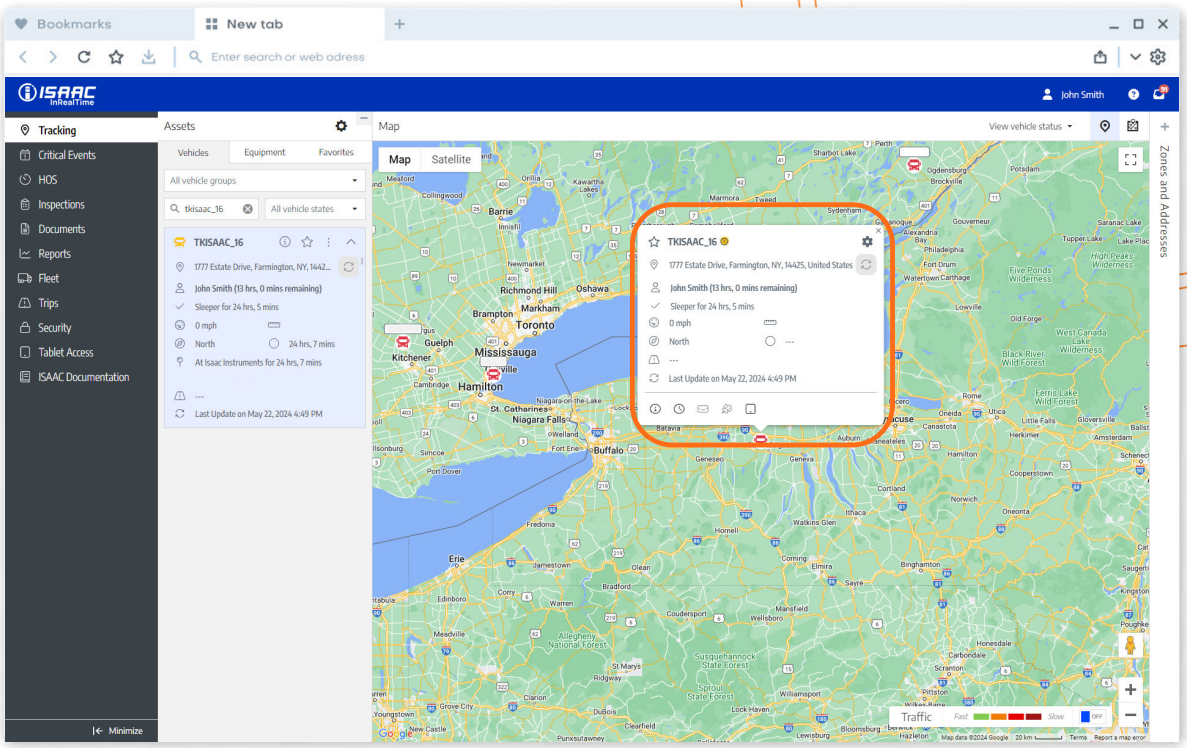
TG0

Assist your driver instantly with remote control

Remote access to driver’s tablets

Real-time support when drivers need it

Fast and easy onboarding

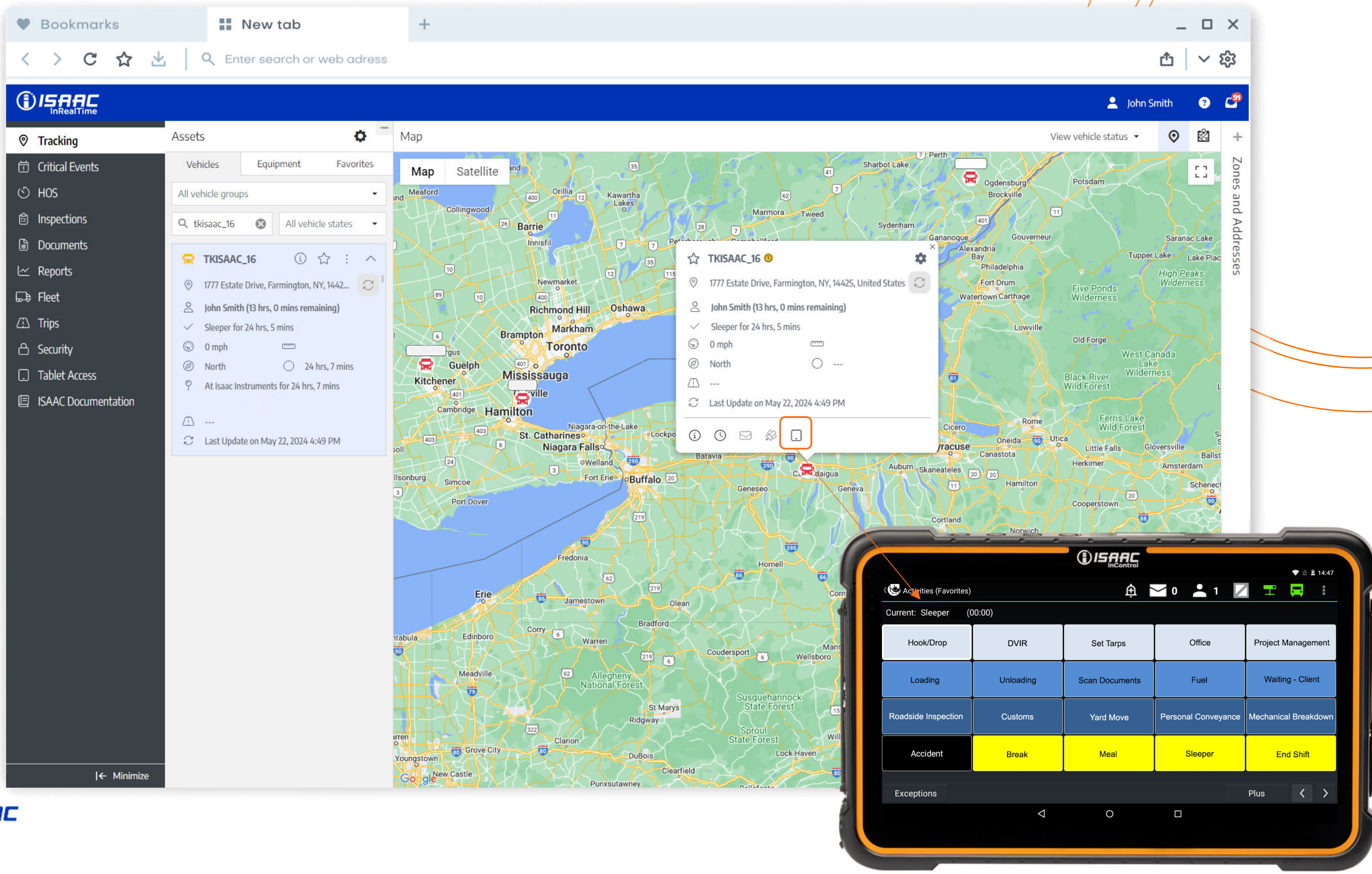


Slide 56

TG0 [@Sam Sussenguth] - Normally, we get comments that the IIRT screenshots are too small. We might need to transition to a larger image of the vehicle info bubble
Trent Gilles, 2024-07-29T16:19:47.904

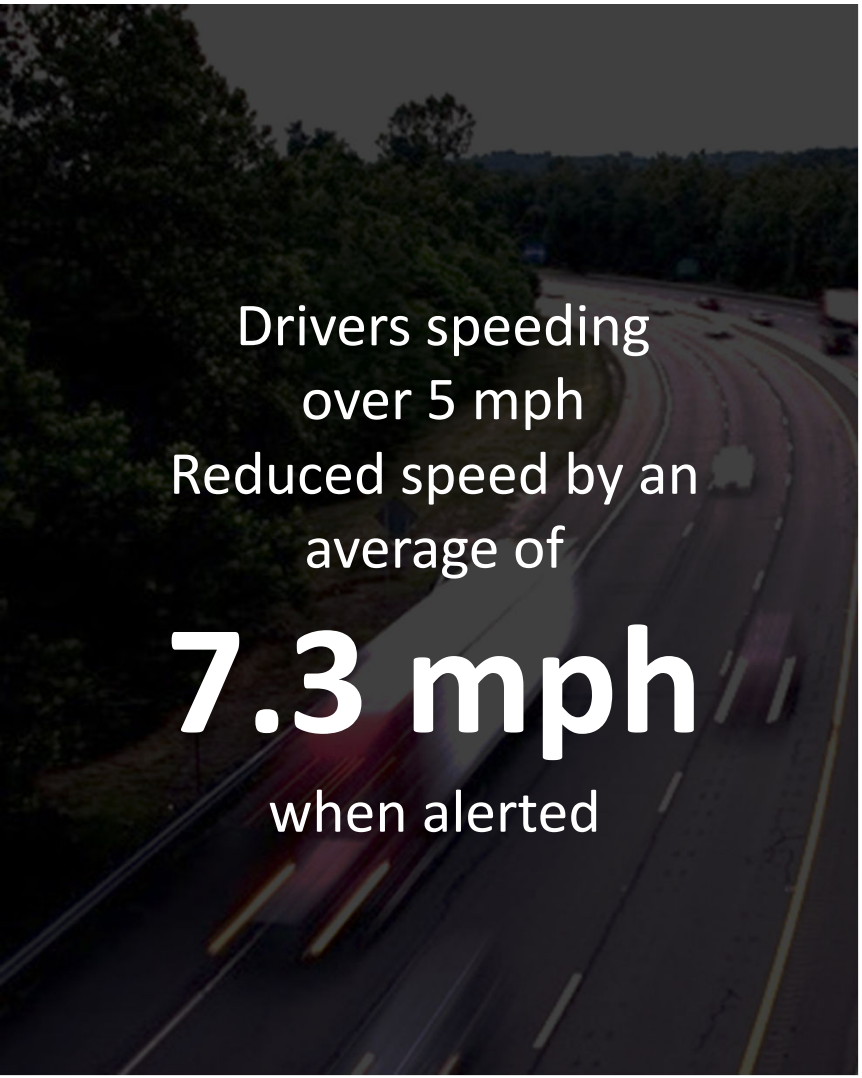
PS0 0 [@Trent Gilles] I've added a new slide that follows, zooming in on IIRT. Let me know if it meets the need.
Pamela Sauro, 2024-07-30T01:42:27.479

TG0 1 [@Pamela Sauro] - It definitely helps. Thanks
Trent Gilles, 2024-07-30T14:09:05.767


Bookmarks
New tab
Enter search or web adress
ISAAC InRealTime
John Smith
Tracking
Critical Events
HOS
Inspections
Documents
Reports
Fleet
Trips
Security
Tablet Access
ISAAC Documentation
Minimize
Assets
Vehicles
Equipment
Favorites
All vehicle groups
tkisaac_16
All vehicle states
TKISAAC_16
1777 Estate Drive, Farmington, NY, 1442...
John Smith (13 hrs, 0 mins remaining)
Sleeper for 24 hrs, 5 mins
0 mph
North
24 hrs, 7 mins
At Isaac Instruments for 24 hrs, 7 mins
Last Update on May 22, 2024 4:49 PM
Map
View vehicle status
Map
Satellite
Zones and Addresses
TKISAAC_16
1777 Estate Drive, Farmington, NY, 14425, United States
John Smith (13 hrs, 0 mins remaining)
Sleeper for 24 hrs, 5 mins
0 mph
North
Last Update on May 22, 2024 4:49 PM
ISAAC InControl
Activities (Favorites)
Current: Sleeper (00:00)
Hook/Drop
DVIR
Set Tarps
Office
Project Management
Loading
Unloading
Scan Documents
Fuel
Waiting - Client
Roadside Inspection
Customs
Yard Move
Personal Conveyance
Mechanical Breakdown
Accident
Break
Meal
Sleeper
End Shift
Exceptions
Plus

DriveWyze

ISAAC



ISAAC

Alerts Are Effective

Rollover Alerts

- 52% of large truck occupant deaths occurred in crashes with rollovers, much higher than occupant deaths in cars (21%)
- Drivewyze has geo-fenced 434 high rollover areas
- Drivers speeding over 5 mph reduce speed by an average of 7.3 mph when alerted

Sudden Slowdown Alerts

- Speed was reduced, on average, by 11 miles per hour (compared to 2 miles per hour in a control group)
- Drivers that receive a Sudden Slowdown alert show a 10 - 16% reduction in hard braking incidents.

*Source: Georgia Department of Transportation

What Drivers See: Essential Alerts & Advisories

Drivewyze Sponsored Alerts & Advisories

Drivewyze works with safety partners and carriers to identify high-risk zones, known hazards and high-speed citation areas. These alerts are included as part of the Drivewyze Free Essential Alerts and Advisories.

Drivewyze sponsored alerts and advisories are available: Across North America

Rollover

Runaway Ramp

Brake Check

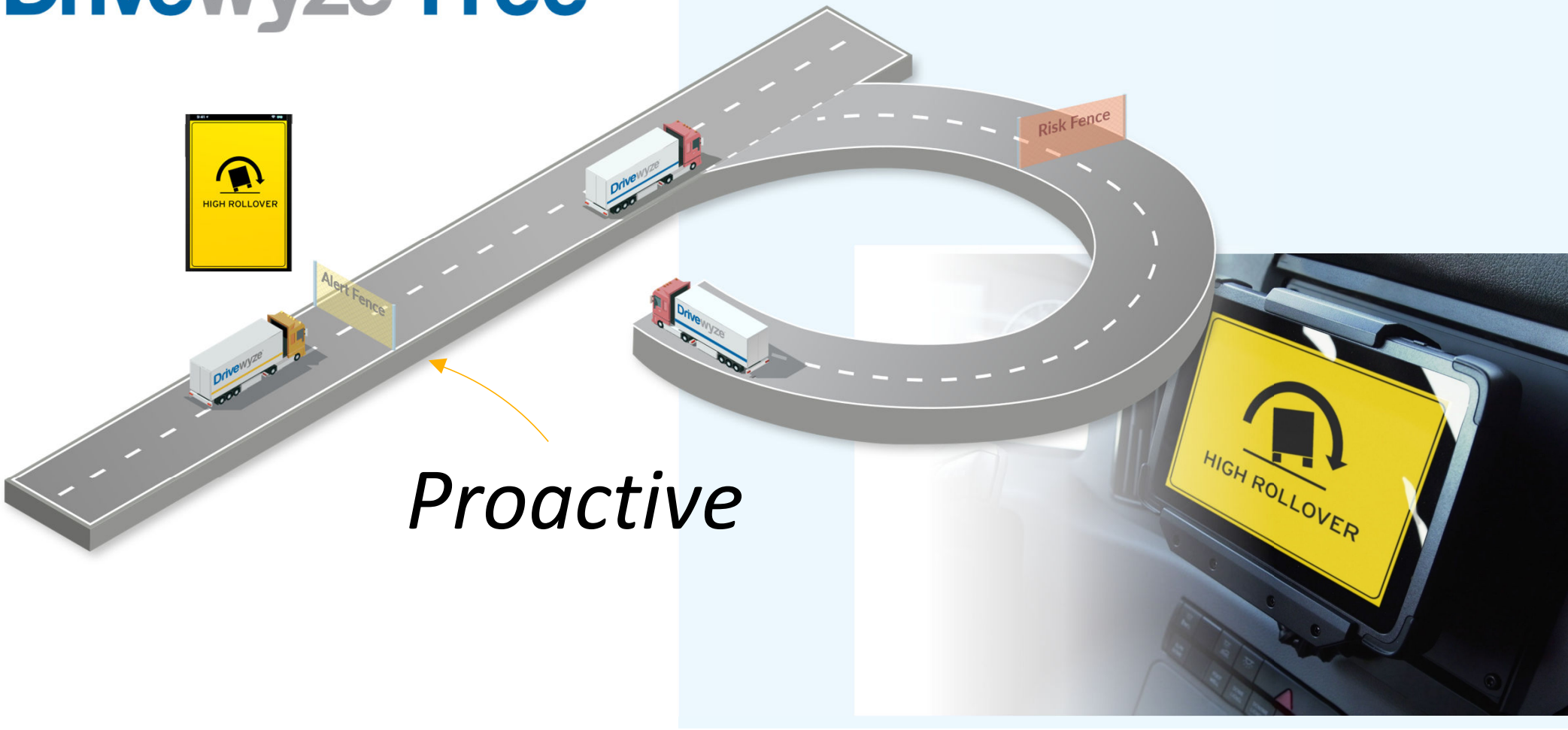
Steep Grade

Low Bridge

Rest Area

ISAAC

Drivewyze® Free



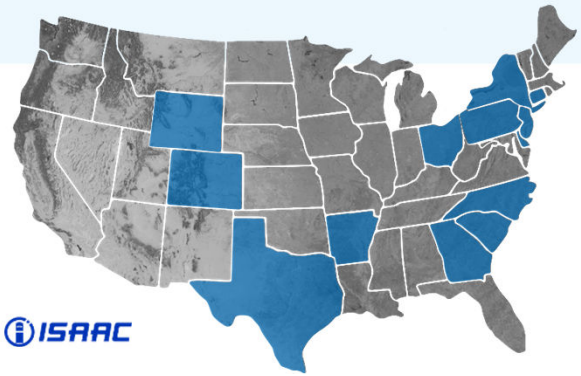
Proactive

ISAAC

What Drivers See: Essential Alerts & Advisories

Agency Sponsored Alerts & Advisories

The agency sponsored real-time alerts are exclusive to Drivewyze. They are sponsored by state departments of transportation (DOTs) and other regional/state agencies through their Smart Roadways services, to extend their transportation safety programs into your fleet.



Sudden Slowdown

Unexpected Slowdown

Public Service alerts and agency virtual sign

Service Vehicles

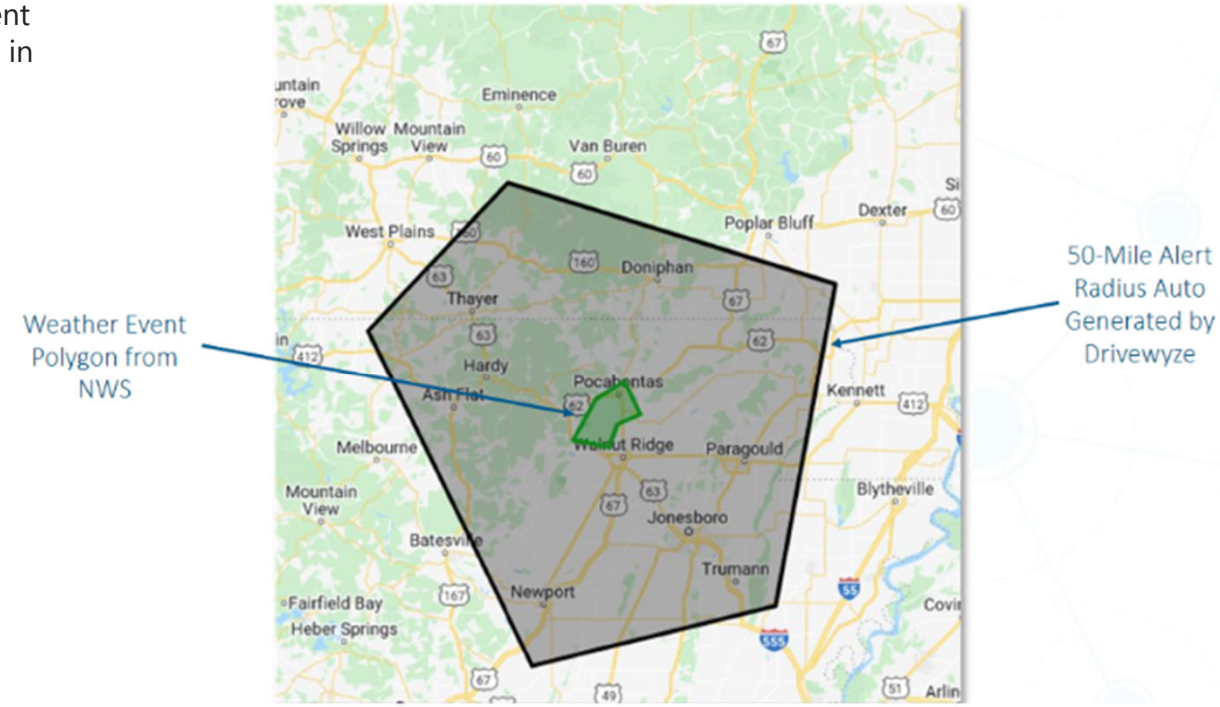
Active Work Zones

Public Service advisories and agency virtual sign

Agency-Sponsored alerts are available from: Ohio, Texas, PA Turnpike, Arkansas, Georgia, Delaware, Connecticut, New York, Colorado State Police, North Carolina, Virginia, Wyoming Highway Patrol, and New Jersey

Safety+: Severe Weather Alerts

- Drivers will be notified of a severe weather incident when they are within a 50-mile radius of the area in real time.
- Partnership with the National Weather Service (NWS)



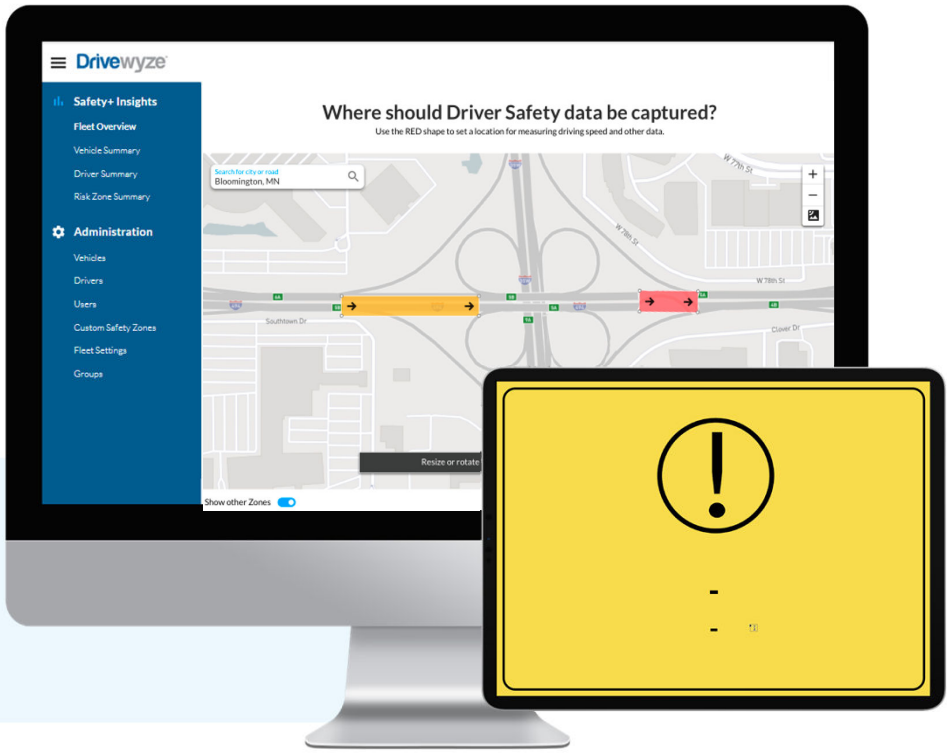
Example of the 50-mile alert radius

ISAAC

Create Custom Safety Zones Tailored to your Fleet

Every carrier is unique, and each route presents challenges and hazards that you may want to let your drivers know about.

With Drivewyze Safety+ you can create your own custom location-based safety alerts and advisories through our simple drag and drop geo-fence interface.



Examples from Drivewyze Customers

ISAAC

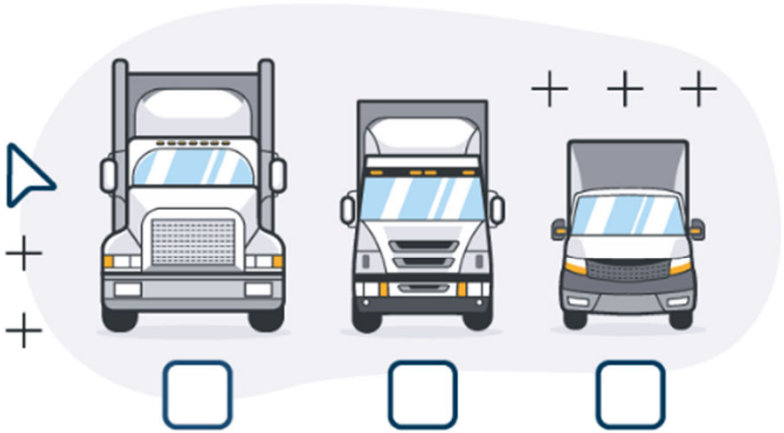
Safety and Compliance Data Location Based Analysis

- Parking related towing issues
- Lane Restrictions - Atlanta

Bollards AKA Yard Posts

ISAAC

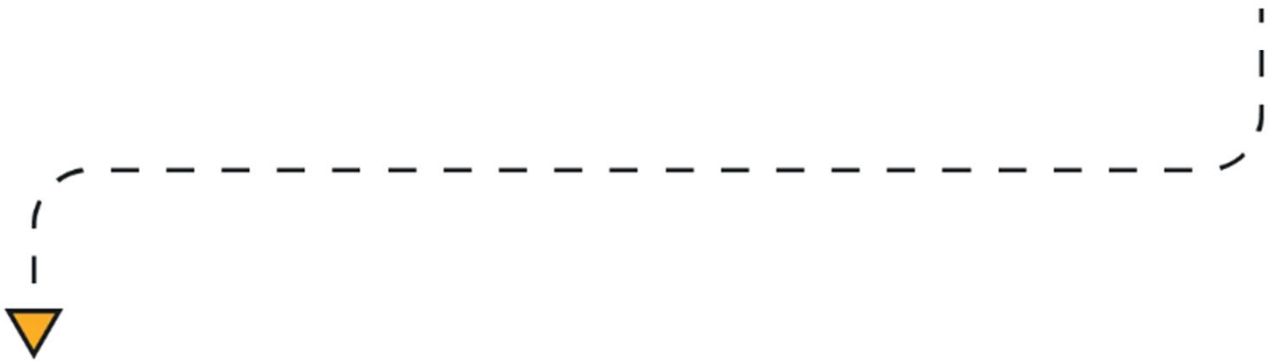
ISAAC



1

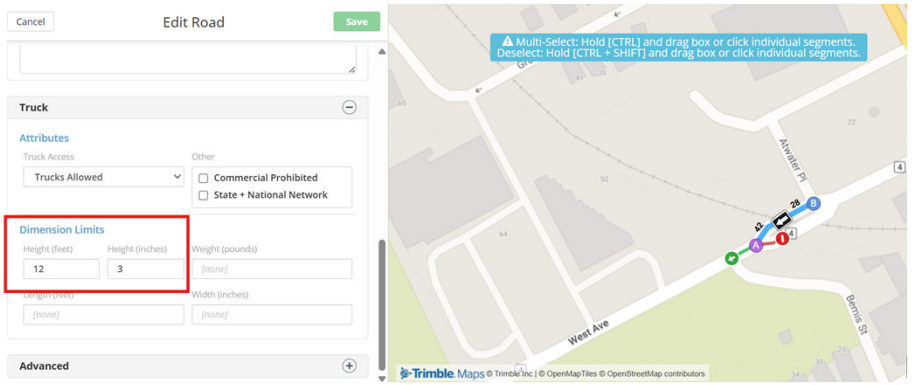
Vehicle-Specific Turn-by-Turn Navigation

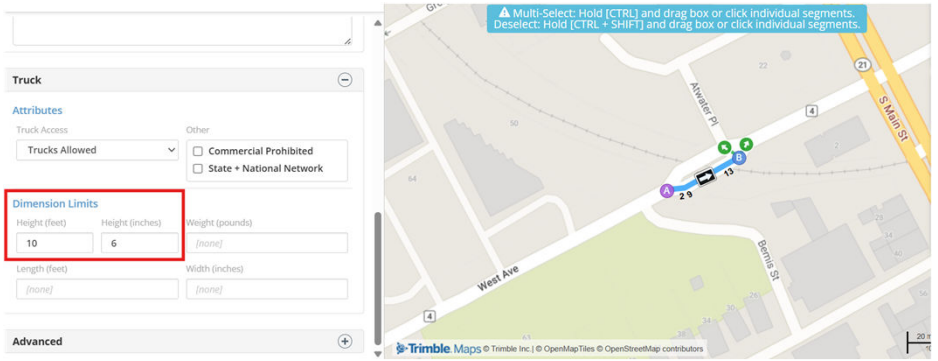
Drivers, dispatchers and fleet managers can configure CoPilot with vehicle routing profiles, taking into account specifications like vehicle type and size as well as any load weight and type restrictions (like hazardous materials). **This ensures drivers are guided on legal, planned routes suited to their vehicle and that they avoid low bridges, tunnels and restricted roads.**



ISAAC

Utilizing Technology to Reduce Bridge Strikes



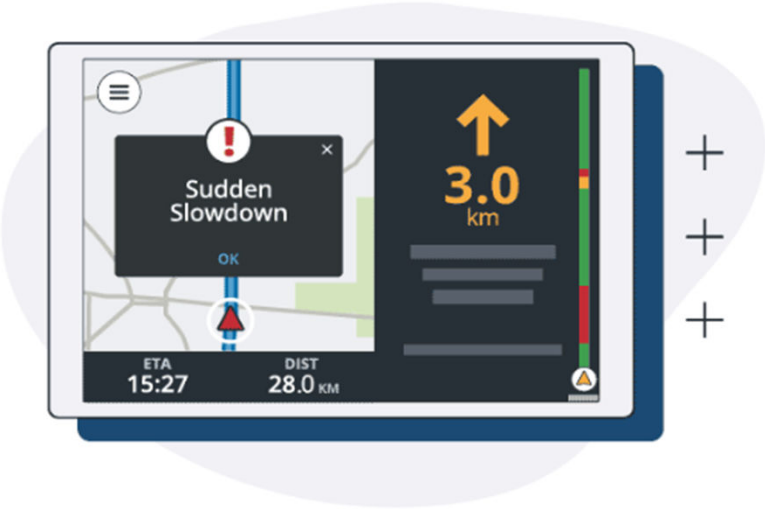


ISAAC

4

Traffic & Slowdown Alerts

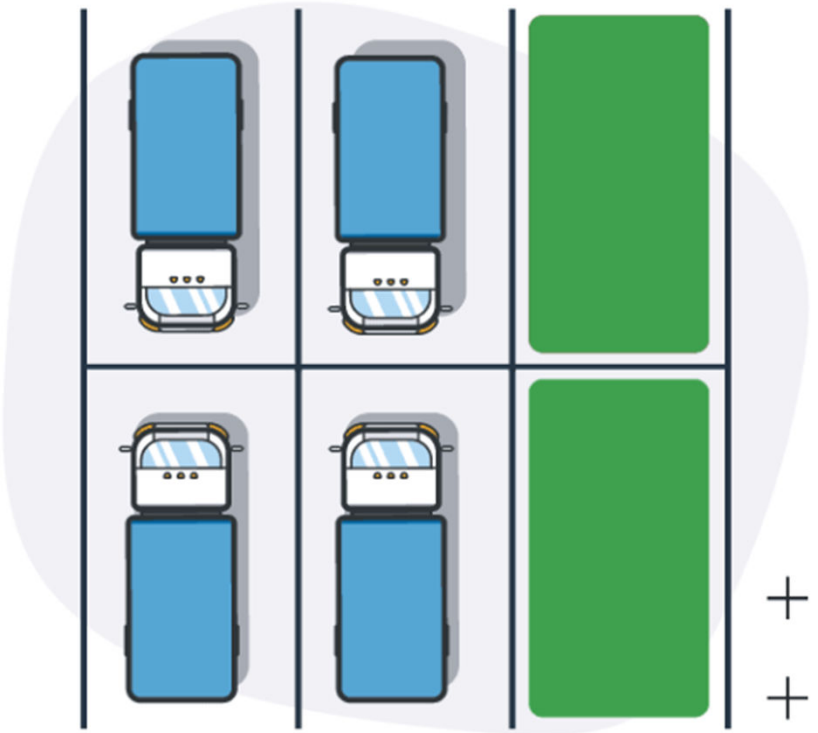
CoPilot's ActiveTraffic service* combines real-time and historical traffic data to provide drivers a more accurate picture of how traffic will behave along their routes. **Look ahead to gain a complete perspective on potential risks, and receive proactive, in-app notifications when unforeseen slowdowns loom on high speed interstate highways or motorways.**



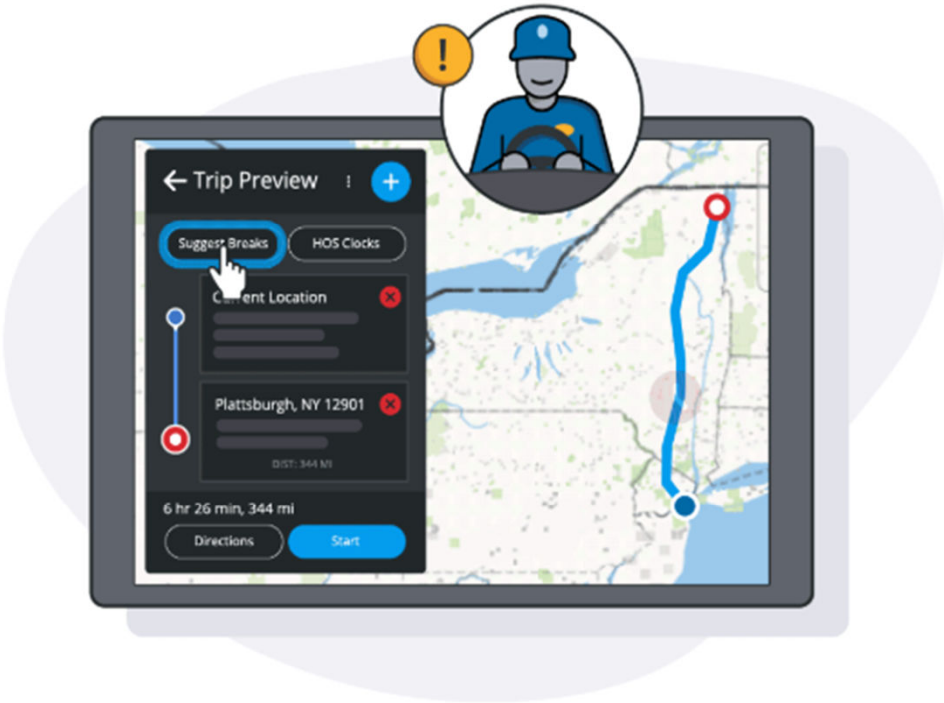
ISAAC

Live and Predictive Parking Insights

Live parking insights help drivers across North America access real-time information about the availability of parking for large vehicles, including facility hours. **This feature helps drivers plan before arriving at a location or truck stop, so they can limit the need to search for a space and avoid dangerous situations requiring risky maneuvers.** Upon arriving at a location, drivers can also provide feedback on parking.



ISAAC



Hours of Service Break Planning

Built-in Hours of Service (HOS) functionality helps drivers better plan their days and manage their hours. With this feature, CoPilot suggests breaks along a route that meet HOS requirements and guides drivers to stop locations, so **drivers can maximize their drive time without the anxiety of planning breaks or the struggle to determine the most efficient and compliant trip.**

ISAAC

What is Intelligent Speed Assistance?

ISA

The generic name for

Advanced Systems

in which the vehicle “knows” the speed limit and can use that information to give feedback to the driver or limit maximum speed.

Risk Reduction by Speed Management technology types[1]

Passive Technology

Advisory Type

- Haptic, visual or audio warnings
- Coaching-based systems
- Cameras

Active Technology

Voluntary type (Overridable)

- Adaptive Cruise Control (ACC)

Mandatory type (Non-Overridable)

- Automated Emergency Braking (AEB)
- **Dynamic ISA**

ISA Type	Reduction in Injury Crashes	Reduction in Serious Crashes	Reduction in Fatal Crashes
Advisory ISA	-3%	-4%	-5%
Assisting (Overridable) ISA	-12%	-17%	-23%
Non-Overridable ISA	-29%	-40%	-49%

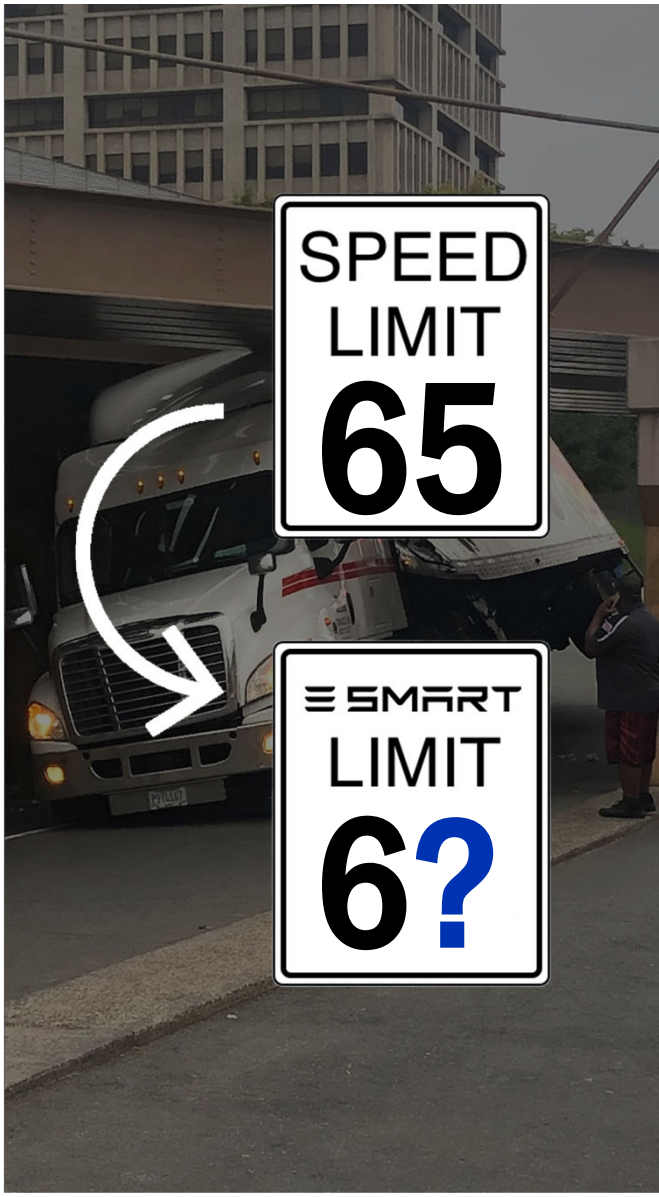
1. Oliver Carsten, **The Science Behind Intelligent Speed Adaptation**, University of Leeds, *https://etsc.eu/wp-content/uploads/4_CARSTEN_The-science-behind-ISA_190416.pdf*

Dynamic Speed Management System™

How does it work?

- Remotely set and control vehicle speed
  in any speed zone, anywhere in North America
- The system communicates with an ECU that is
  installed in the truck to control the throttle
- Speed limits are updated daily using our
  proprietary database and map matching algorithms
- ESMART manages the whole
  solution as a service and monitors it 24/7

ISAAC



Dynamic Speed Management System™

Additional Features

Low Bridge Collision Prevention

Safely stop a vehicle heading toward a low bridge or tunnel

Geofencing

Enables speed limiting in custom geofenced zones
(off highway/yards, terminals, fuel station, toll booths…)

Remote Immobilization

Can disable a vehicle before it is gone
(theft, maintenance, driver non-compliance)

ELD Integration

Integrate with popular fleet management systems to enable voiceover notifications

Customer Results

NAVAJO

98%	Reduction in speeding events
67-13	Improvement in CSA Score
50%	Reduction in accident ratio
100%	Reduction in low clearance bridge hits

80%	Reduction in preventable accidents
100%	Reduction in low clearance bridge hits

ISAAC

WESTERN EXPRESS

53%	Reduction in speed related incidents and accidents
50%	Reduction in the severity of the remaining incidents and accidents
92%	Reduction in low clearance bridge hits

SCHUSTER

75%	Reduction in speed related citations and accidents
Significant	Benefit in geofencing key customer yards and terminals
Great	Improvement in driver retention
100%	Reduction in low clearance bridge hits

Involvement in the trucking industry

ISAAC

Pride in client success

Dedicated	TA Dedicated, Tranco logistics, Veltri Trucking Made Easy, Manitoulin Transport, Hervé Lemieux
Dry Van	Heartland Express, TFI International, Challenger We go the Distance, Titan Transfer, Inc., West Side Transport, CAT, M&M Cartage Family owned since 1972, Southwest Freightlines, Swing Transport Inc., Howard Sheppard LLC, Liberty Transportation Inc, Titanium Transportation Group Inc., Kriska, WB
Flat Bed; Over-size/Over-weight	TLX A Division of AWL Transport, ARD Trucking Co., Inc. Since 1945, KIM-TAM Logistics, Sycamore Specialized Carriers, Joseph
Intermodal	Carolina Freightways, Inc., ATS Advance Transportation Systems, Inc. est. 1980, Trans West, CN, TRANSX Group of Companies
Private	Great Plains Trucking, kemira, Reagent Chemical, Walmart Canada, Cascades
Reefer	Leonard's Express, Hummer Don Hummer Trucking, TransAm, Peters Brothers Since 1950, Erb, Morneau
Tanker/Bulk	QC Quality Carriers, Trimac, Sprint Transport, Buchheit Logistics Miles Beyond Expectations, Three C Logistics LLC, Rio Valley Biofuels, Reliable Liquid Transport, Inc., ISAAC

Thank you

John Chima

Jchima@isaacinstruments.com

(315) 391 - 8365