In-Cab Camera Safety Program

Leveraging Technology Systems in the Detection of Risk in a Collaborative Safety Model

Executive Summary

This presentation documents the implementation of the camera system and associated coaching program to the company driver workforce. This process has yielded immediate improvements to safety conditions.

- XNG rolled out the camera program in September 2021 to make our workforce safer.

- To do this, we have worked to get drivers bought into the program with incentive opportunities.

- In doing so, it gives us more insight on where we can reduce risk in our workforce.

- Through coaching we have seen a steady downward trend in all types of unsafe driving behaviors, which indicates a successful coaching program.
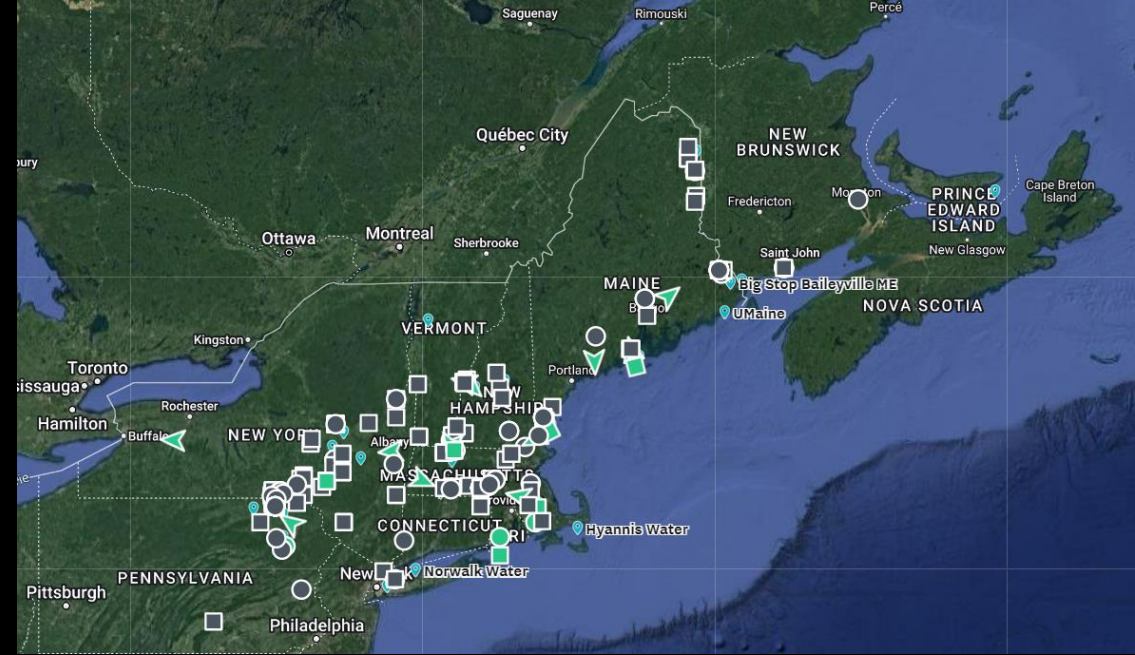
Technology in use

➢ Gateways in trucks

- GPS tracking of assets.
- Odometer tracking.
- Fuel level tracking.
- Speedometer tracking.
- Hours of Service tracking.
- Truck Maintenance tracking

This can be viewed in a company portal for oversite on our assets.

➢ Driver Use

- Electronic Logging Device.
- Pre/Post trip tracking.

Allows drivers to log into a truck for their Electronic logging device which allows them to monitor their hours of service and conduct pre/post trips on their vehicle, all through their phone.

Technology in use

Cameras in the cab

- All XNG trucks have a dual facing camera installed and mounted on the windshield. The camera is connected to the GPS unit in the truck.

- The camera is constantly powered and saves video when the camera is triggered by an unsafe act or a G-Force trigger.

- When triggered, the camera will capture a 10 second video clip (5 seconds before and 5 seconds after the event).

- The video is automatically uploaded to an inbox for review and can be shared with drivers for them to review.

- The cameras also takes a road facing picture every two minutes while the vehicle is in motion.

Technology in use

Example of Distracted Driving

Artificial Intelligence Events:

AI events are following too closely (tailgating) and distracted driving, for example, cell phone use or falling asleep.

The camera picks up on eye movement and will trigger the camera to record an event when it recognizes a driver not paying attention to the road.

Not all "distracted driving" events are valid

Example of following too closely

Technology in use

Harsh Events:

A harsh event is either a harsh braking or harsh turning event.

These events are triggered by G-force through the accelerometer.

Not all harsh events that we see are counted against the driver, as sometimes there are circumstances where a harsh brake/turn is warranted.
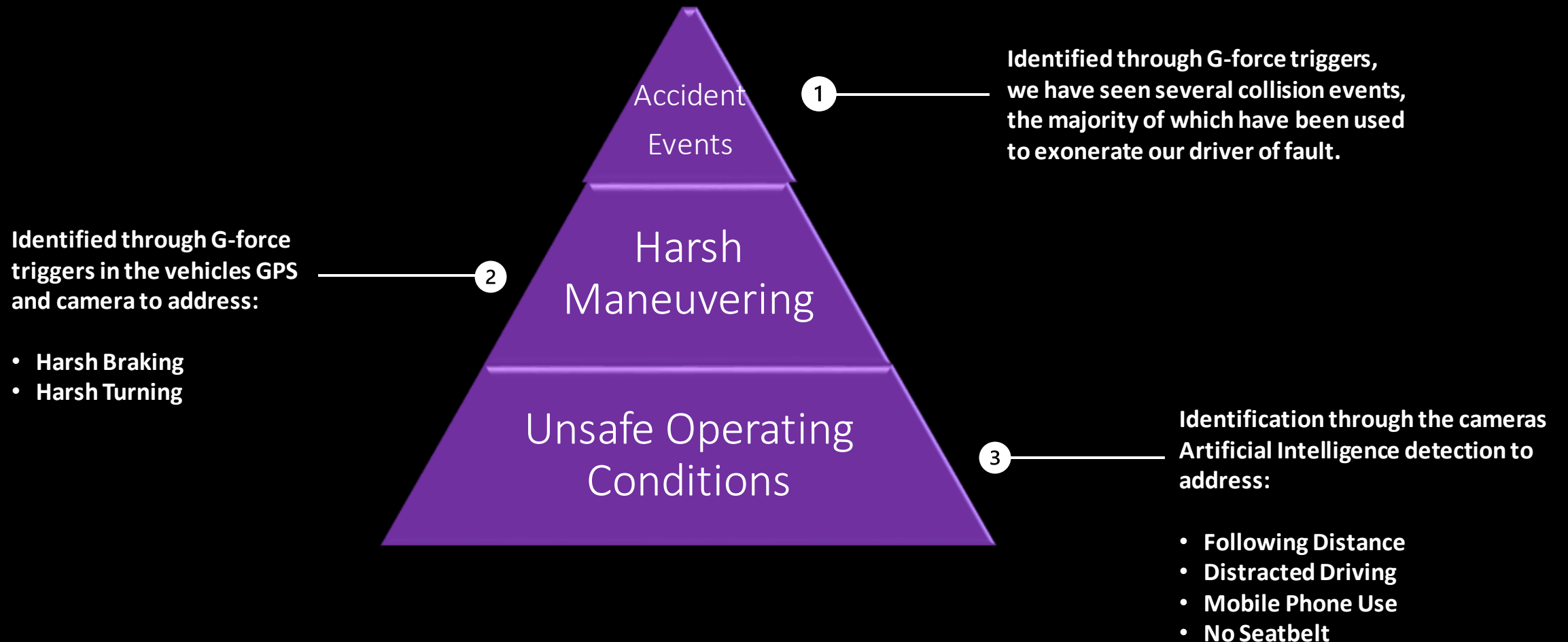
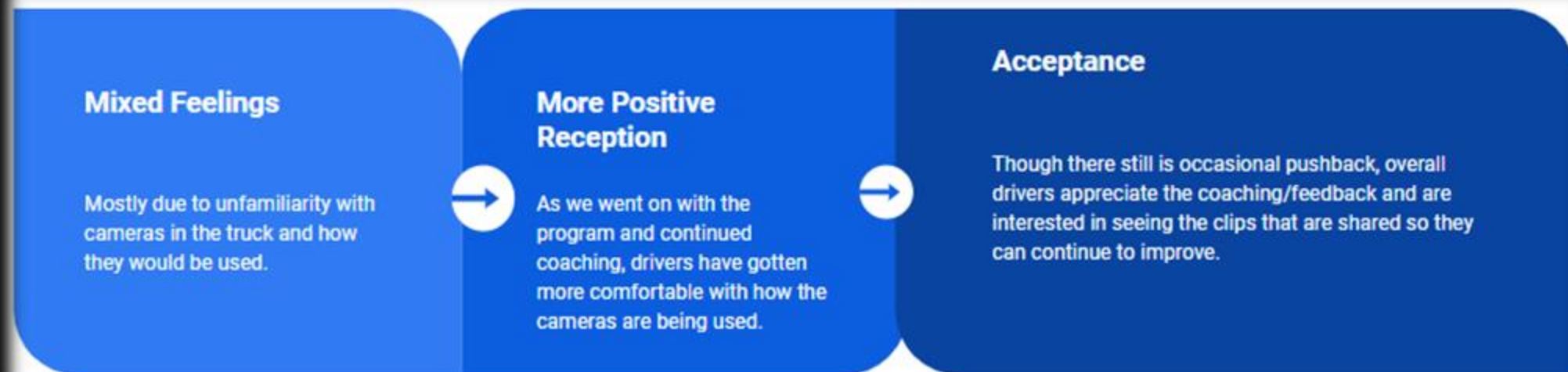Harsh Braking Example

Harsh Turning Example

Event Pyramid

Accident Events ①

Identified through G-force triggers, we have seen several collision events, the majority of which have been used to exonerate our driver of fault.

Identified through G-force triggers in the vehicles GPS and camera to address: ②

- **Harsh Braking**
- **Harsh Turning**

Harsh Maneuvering

Unsafe Operating Conditions

③ **Identification through the cameras Artificial Intelligence detection to address:**

- **Following Distance**
- **Distracted Driving**
- **Mobile Phone Use**
- **No Seatbelt**

Accident Event

NSCNNE Safety and Health Conference

Driver Reception

Camera coaching is a tool for:

- Identifying potential risks.

- Behavior recognition, continuous improvement and future accountability.

- **_NOT_** for surveillance purposes.

Mixed Feelings

Mostly due to unfamiliarity with cameras in the truck and how they would be used.

More Positive Reception

As we went on with the program and continued coaching, drivers have gotten more comfortable with how the cameras are being used.

Acceptance

Though there still is occasional pushback, overall drivers appreciate the coaching/feedback and are interested in seeing the clips that are shared so they can continue to improve.

Procedure

Step 1	Step 2	Step 3

Step 1

- Safety Department reviews videos in inbox.

- The clips are then shared with the driver to review.

- The events are logged into our database.
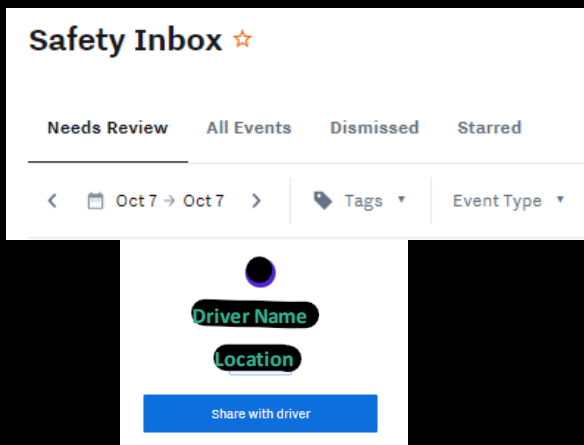
Step 2

- The Database helps us track who needs to be coached and why.

- For more "minor" events the driver will receive a message and are asked to review the video.

- For more serious events, the driver will be contacted directly through a phone call to review the event with the Safety Department.
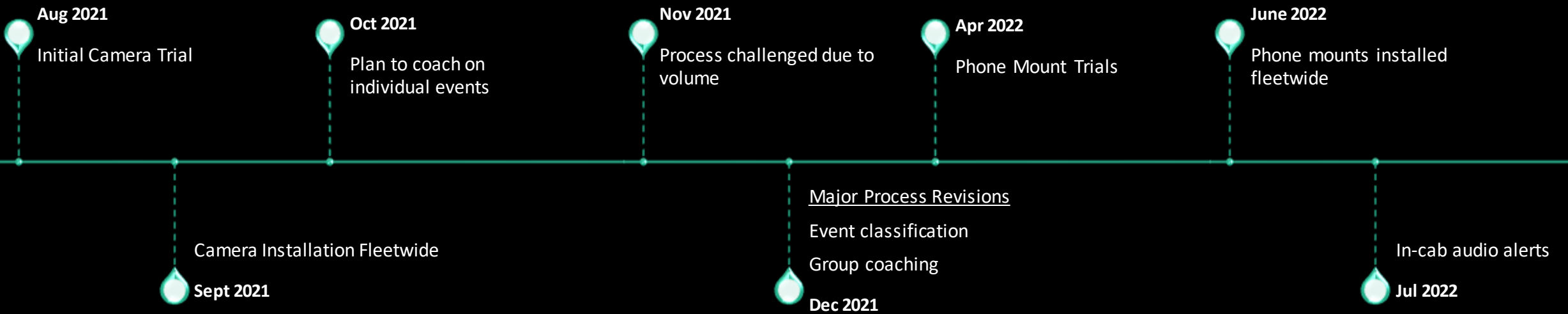
Step 3

- As the necessary coaching is completed, the status of the event is updated to reflect that they have been coached and what the outcome was.

- The database allows us to track trends.

Program Development

Aug 2021

Initial Camera Trial

Oct 2021

Plan to coach on
individual events

Nov 2021

Process challenged due to
volume

Apr 2022

Phone Mount Trials

June 2022

Phone mounts installed
fleetwide

Camera Installation Fleetwide

Sept 2021

Major Process Revisions

Event classification

Group coaching

Dec 2021

In-cab audio alerts

Jul 2022

NSCNNE Safety and Health Conference

Improvements

Since the installation of phone mounts, we have seen drastic improvements in the number of mobile-phone use events.
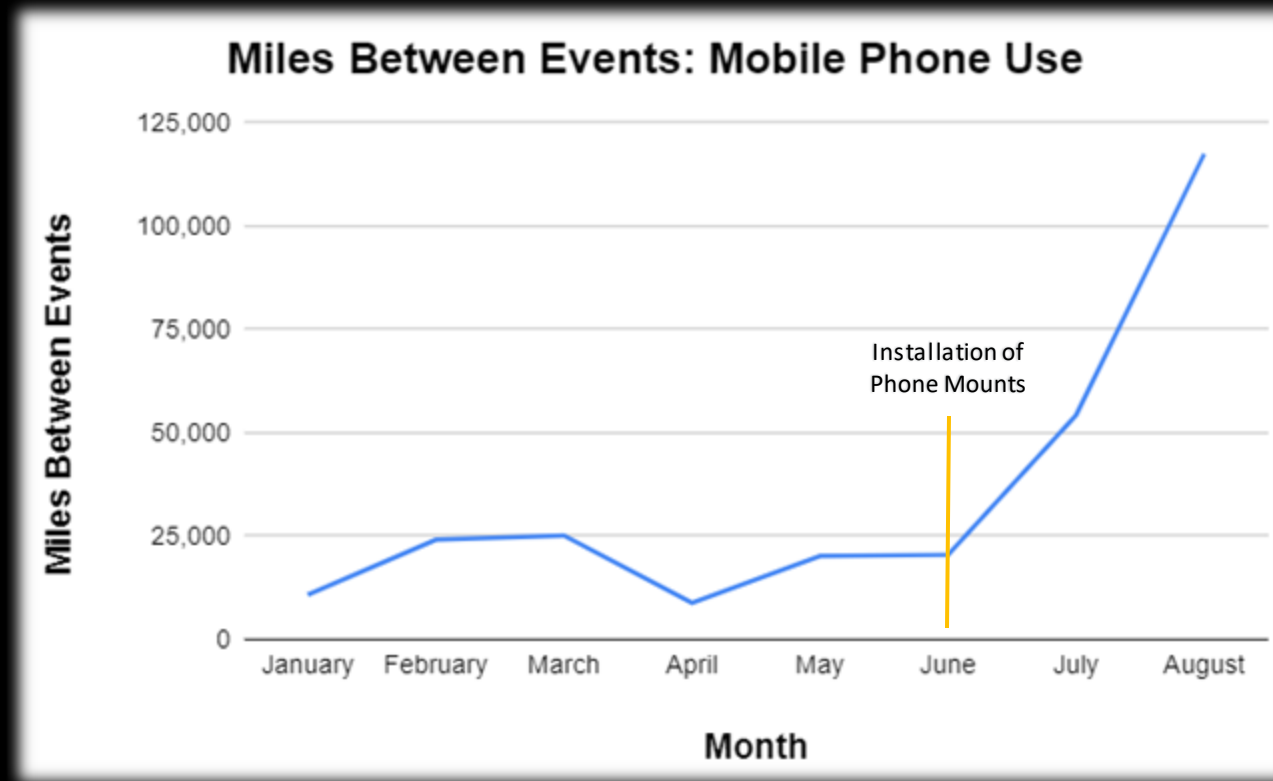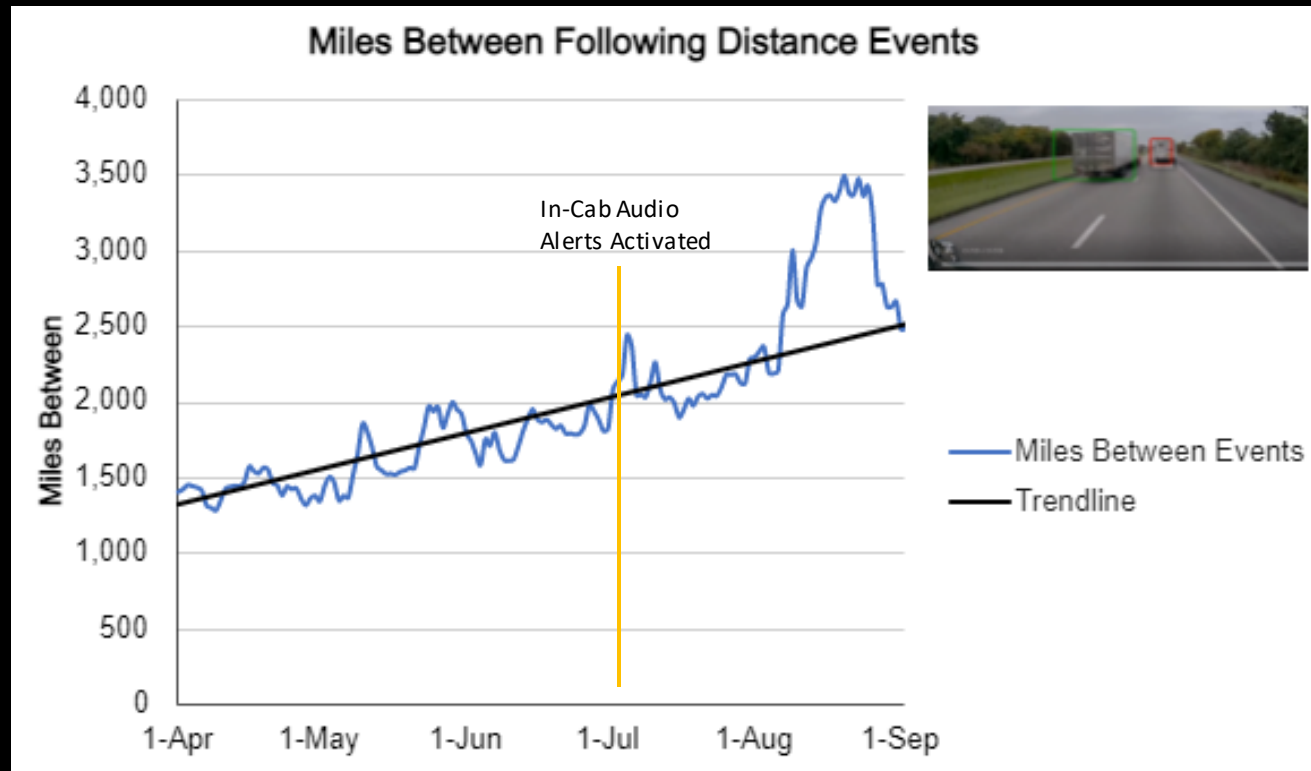
AI Event Frequency

Since the implementation of In-cab audio alerts we have seen steady improvement in miles between distracted driving events.

- From under 3,000 miles between events in April to now over 15,000 miles.
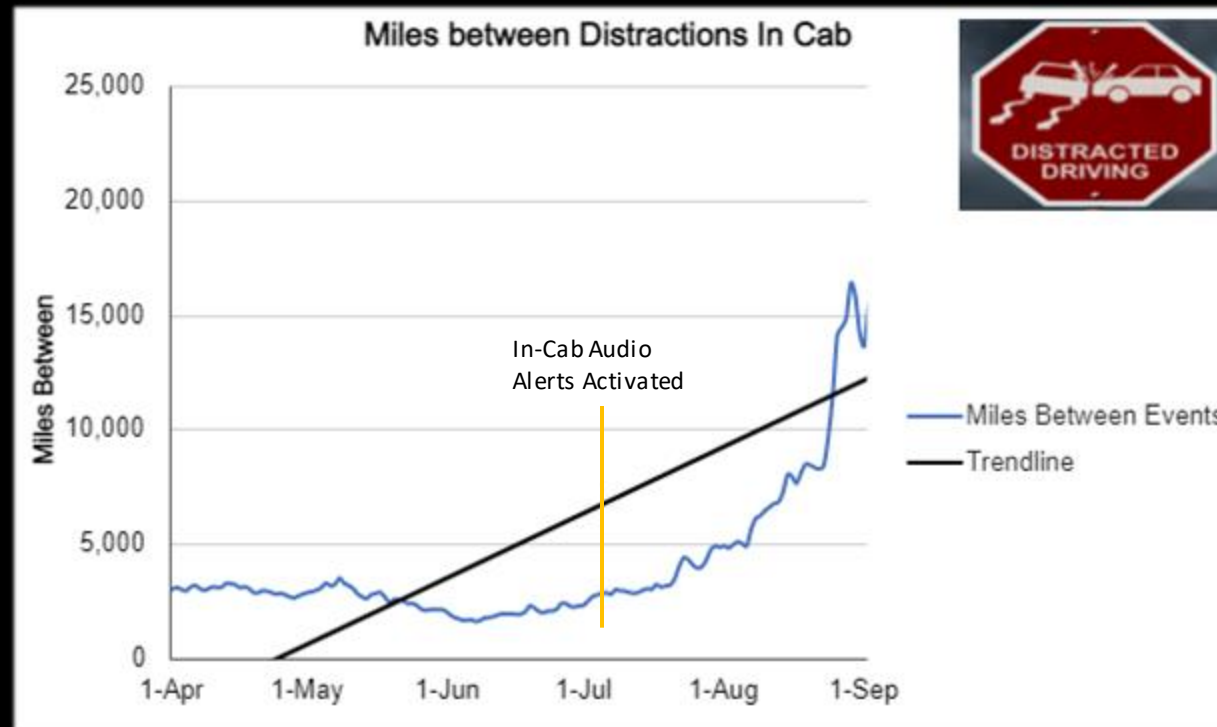
AI Event Frequency (following Distance)

Though we have seen an overall positive trend in mileage between following distance events we are working to implement driver safety scorecards to continue the trend in the right direction.
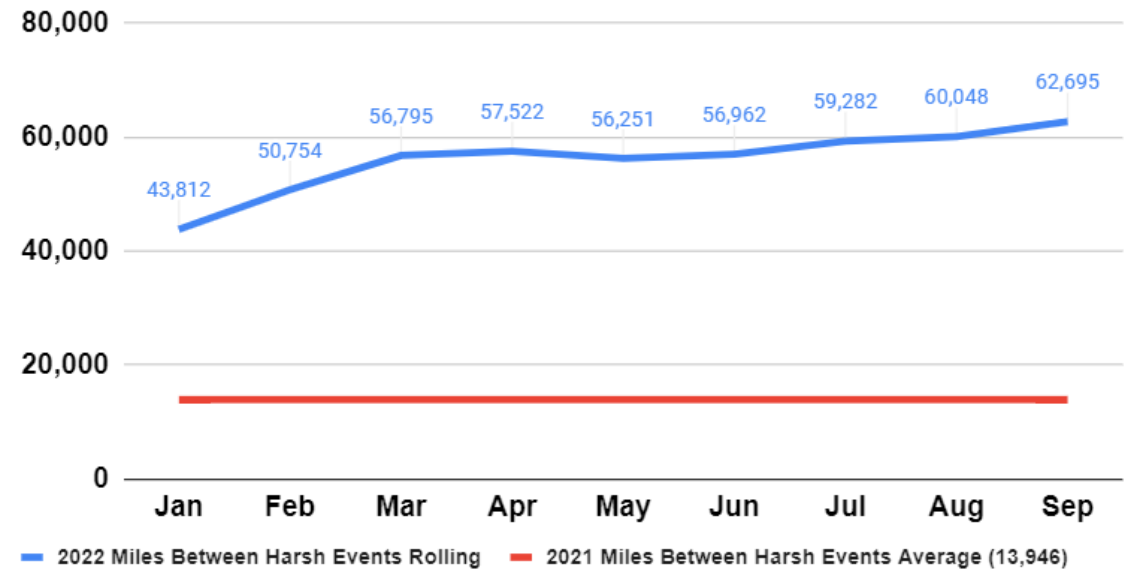
Harsh Event Frequency

Miles Between Harsh Events by Month vs. Total Miles Between Harsh Events 2021-22
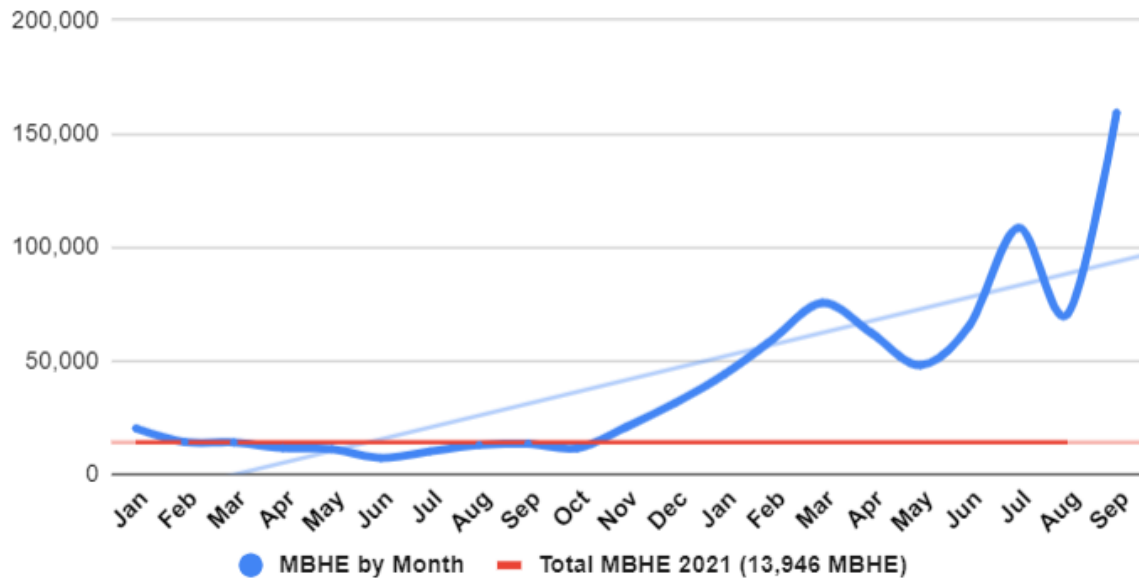
2022 Miles Between Harsh Events Rolling Average vs. 2021 Miles Between Harsh Events Average
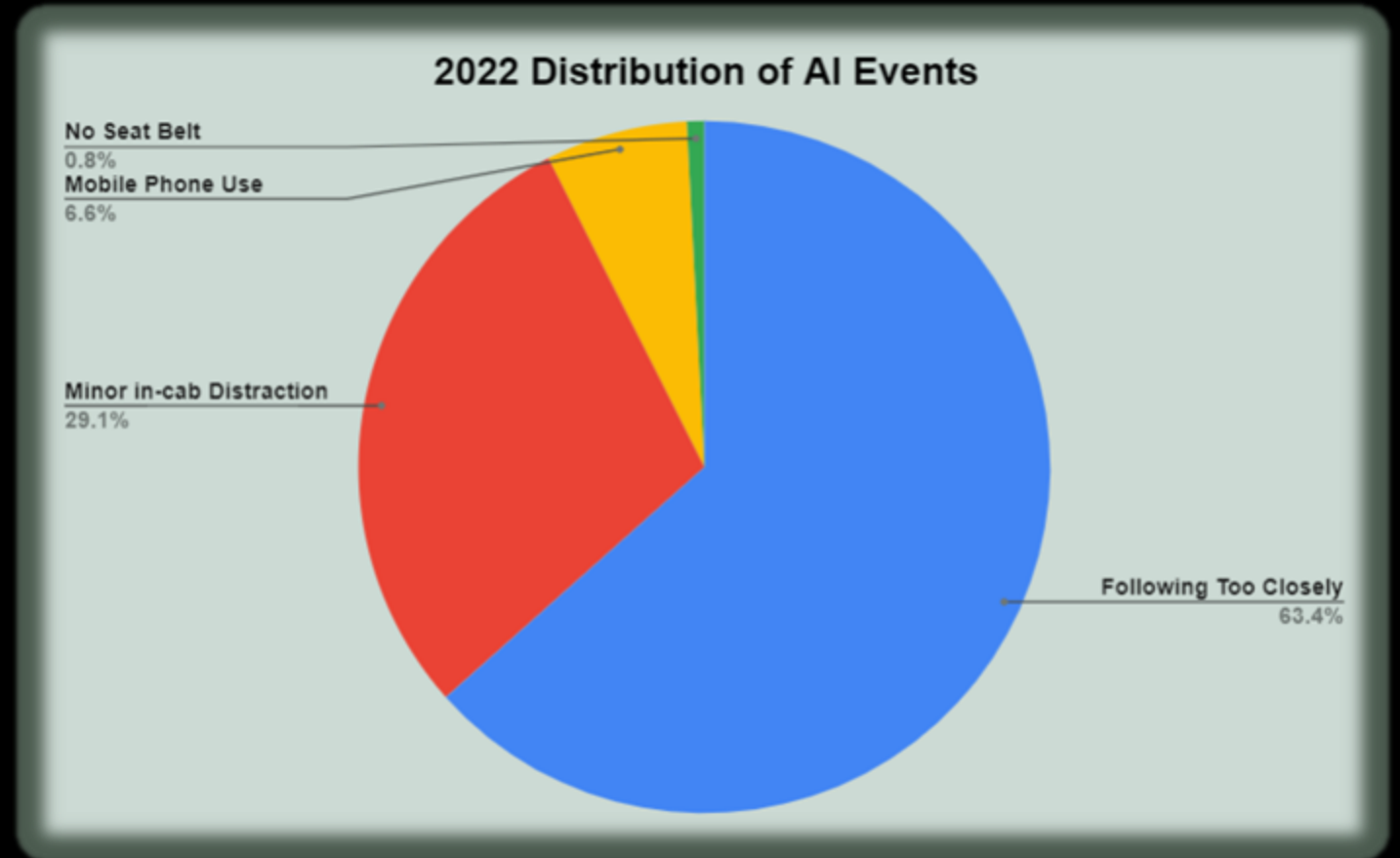
YTD Distribution of AI Events

2018

22,697 deaths from Motor Vehicle Accidents

- Over 50% were not wearing seatbelts.

- Approximately 3,000 deaths/year due to a distracted driver

- 26% deaths involve at least one of the drivers speeding.

2022 Distribution of AI Events

No Seat Belt
0.8%

Mobile Phone Use
6.6%

Minor in-cab Distraction
29.1%

Following Too Closely
63.4%

We continue to supplement our driver trainer pool to continue in focusing on reducing the number of events we see.

Camera Health Management

Camera health and functionality is key to success and requires continuous monitoring.

Health Status	Vehicle Name ▲	Uptime Last 50 Hours ⓘ	Last Known Location	Camera Last Connected	Gateway Last Connected
● Healthy	T058		XNG Montrose 38 minutes ago	Oct 17, 2022 9:59 AM EDT	Oct 17, 2022 10:36 AM EDT
● Healthy	T059		XNG Montrose 4 minutes ago	Oct 17, 2022 7:21 AM EDT	Oct 17, 2022 10:36 AM EDT
● Healthy	T060		I 81, Lenox, PA a few seconds ago	Oct 17, 2022 3:56 AM EDT	Oct 17, 2022 10:36 AM EDT
● Healthy	T061		XNG Montrose 4 minutes ago	Oct 17, 2022 10:30 AM EDT	Oct 17, 2022 10:36 AM EDT
● Healthy	T062		XNG Montrose 2 hours ago	Oct 17, 2022 8:43 AM EDT	Oct 17, 2022 10:36 AM EDT
● Healthy	T063		XNG Montrose 32 minutes ago	Oct 17, 2022 10:05 AM EDT	Oct 17, 2022 10:36 AM EDT

- Work closely with station management, fleet maintenance, and drivers to reboot/adjust cameras.

Incentive Program

As part of the cameras in the cab, we have an incentive program which allows drivers to make additional money for their safe driving.

An additional $1.00 an hour for not obstructing the view of the cab facing camera.

An additional $3.00 an hour for not obstructing cab facing camera and averaging 25,000 miles between harsh events.

An additional $5.00 an hour for not obstructing cab facing camera and averaging 50,000 miles between harsh events.

Incentive Program

- To date our top performing driver is at 232,000 miles between harsh events.

- Almost 50% of our driver pool is currently averaging over 50,000 miles between harsh events.

Conclusion

- Tested the cameras and coaching program on a small part of our driver population.

- Meetings with driver groups to give them familiarity with the technology and how it would be used.

- The combination of coaching and the incentive plan has yielded immediate results.

- Continuing to build on the positive trends we are seeing by finding and testing other tools at our disposal to continue to grow our program.

Future Plans

- Getting more involvement at sites to support and continue conversations with drivers.

- Continuing to look for the next "S-curve" in safety with enhancing initiatives.

Questions