



# Will Connected Trucks be a Lead Sector in Connected Vehicles?

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Stoneridge

# Historical Perspective on the Connected Truck

- ▶ Commercial trucks have been “connected” since the 1970’s with the use of Citizen’s Band Radio’s enabling first vehicle to vehicle communication.
- ▶ Global Positioning System (GPS) and telematics systems have been installed since the early 2000’s to optimize route and logistics planning.
- ▶ The trucking industry is highly regulated. Hours of Service (HOS) records moved from paper/analog to digital in Europe in 2006 and in the US, Electronic Logging Devices (ELD’s) are mandated by December 18, 2017.
- ▶ Fleet management systems collect information from on-board sensors and computers to optimize performance, reduce emissions, collect driver behavior data, communicate location and vehicle performance and to plan optimal preventative maintenance timing, improving Total Cost of Ownership (TCO).
- ▶ Weigh stations for fuel tax (IFTA), vehicle and hours of service inspections are being upgraded to Automated Vehicle Identification (AVI) which utilizes a transponder located in the truck to relay data to bypass weigh stations.

**Commercial trucks have historically been  
the lead sector in connected vehicles**

# The Connected Truck



- ▶ Sensors
- ▶ ECU's
- ▶ CANBUS
- ▶ ELD's
- ▶ Telematics

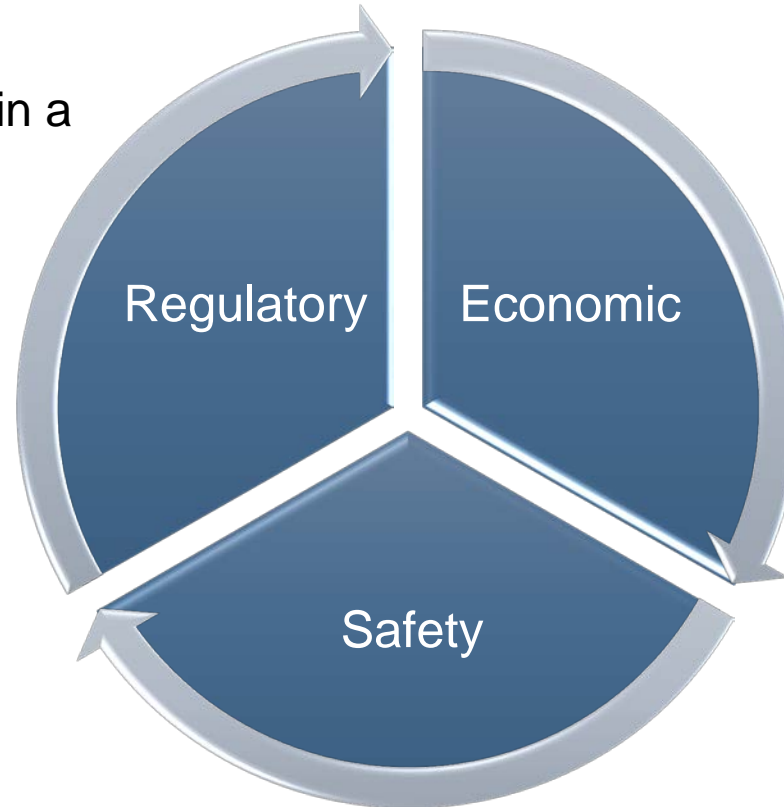
- ▶ Increased Efficiency
- ▶ Improved Safety
- ▶ Higher Job Satisfaction
- ▶ Lower Operating Costs
- ▶ HOS tracking
- ▶ Monitor Safety Habits
- ▶ Optimize Vehicle Performance
- ▶ Alerts for Service Centers
- ▶ Retain / Attract Drivers

- ▶ Truck Condition
- ▶ Cargo Tracking
- ▶ Traffic Conditions
- ▶ Weather Conditions
- ▶ Parking Availability
- ▶ On-demand freight matching services

**Sensors, electronics, software and big data analytics enable vehicle efficiency and provide a moving communication node for V2V and V2I infrastructure**

# Current Commercial Vehicle Fleet Decision Priorities

US fleets operate in a highly regulated marketplace: state & federal compliance and documentation requirements



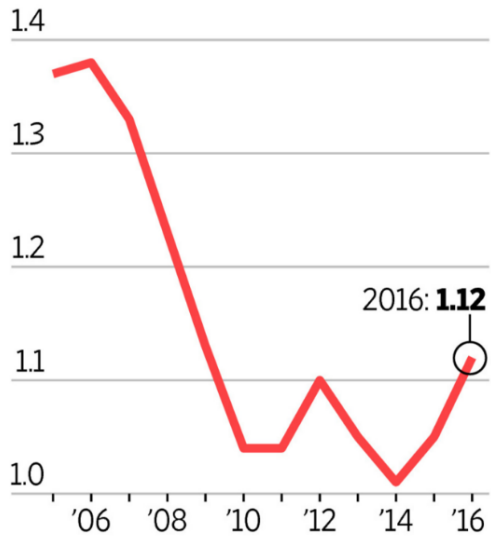
Fuel economy / diesel prices, uptime, maintenance, insurance, technology system cost, driver attraction / retention

System reliability, technology that enables more effective driver decisions, Driver Training

# Safety Trends and Costs

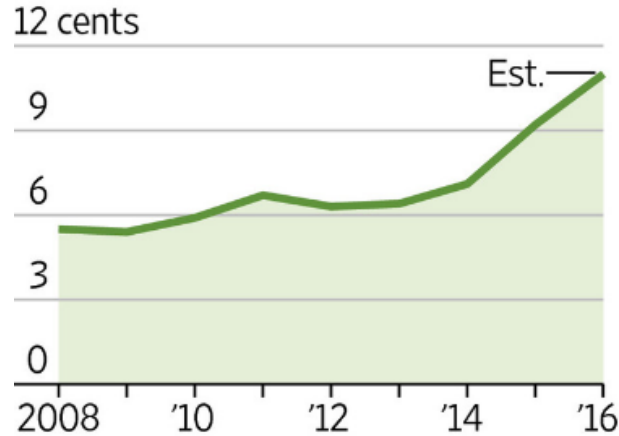
## Fatalities per 100 million vehicle miles traveled

First half of the year



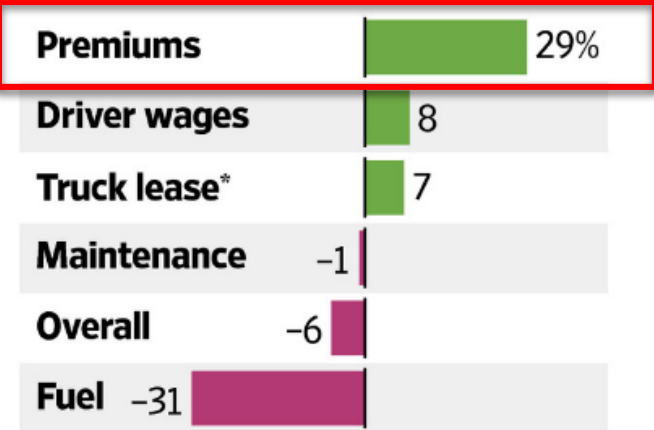
Source: National Highway Transportation Safety Administration

## Cost of premiums per mile driven



Sources: Department of Transportation (fatalities); American Transportation Research Institute (premiums 2008-2015, cost); brokers and trucking companies (premiums 2016 est.)

## Change in 2015 trucking cost from a year earlier



\*Or purchase payments

THE WALL STREET JOURNAL.

**Fatality trends and insurance rates track closely.  
Connected safety technologies will provide drivers with tools to reduce accidents and therefore the biggest inflationary cost drivers.**

# Moving Beyond Connected

- ▶ Commercial Vehicles have long been highly connected

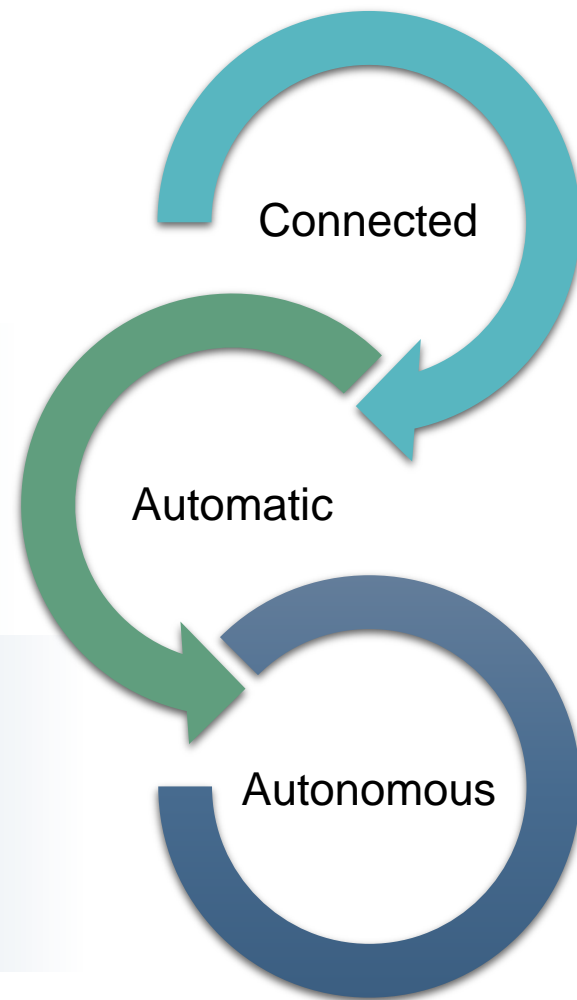
- GPS
- Telematics
- Fleet Management
- Wi-Fi
- Tachograph/ELD

- ▶ ABS, Adaptive Cruise Control, TPMS/Auto Inflate, Forward collision warning, Dock Assist

- ▶ ADAS: Vision Systems, Lane Departure/Retention, Platooning....

- ▶ Level 3  
some driver intervention

- ▶ Level 4-5  
limited, no driver intervention



# Stoneridge “Connected” Product Portfolio Examples

## Camera Monitor Systems



## Instrumentation and Displays



## Telematics and Tachographs



## ECUs and Power Modules



Stoneridge's  
Products Comprise  
the Basic Elements  
of Every Vehicle's  
Electrical System  
and Control  
Architecture

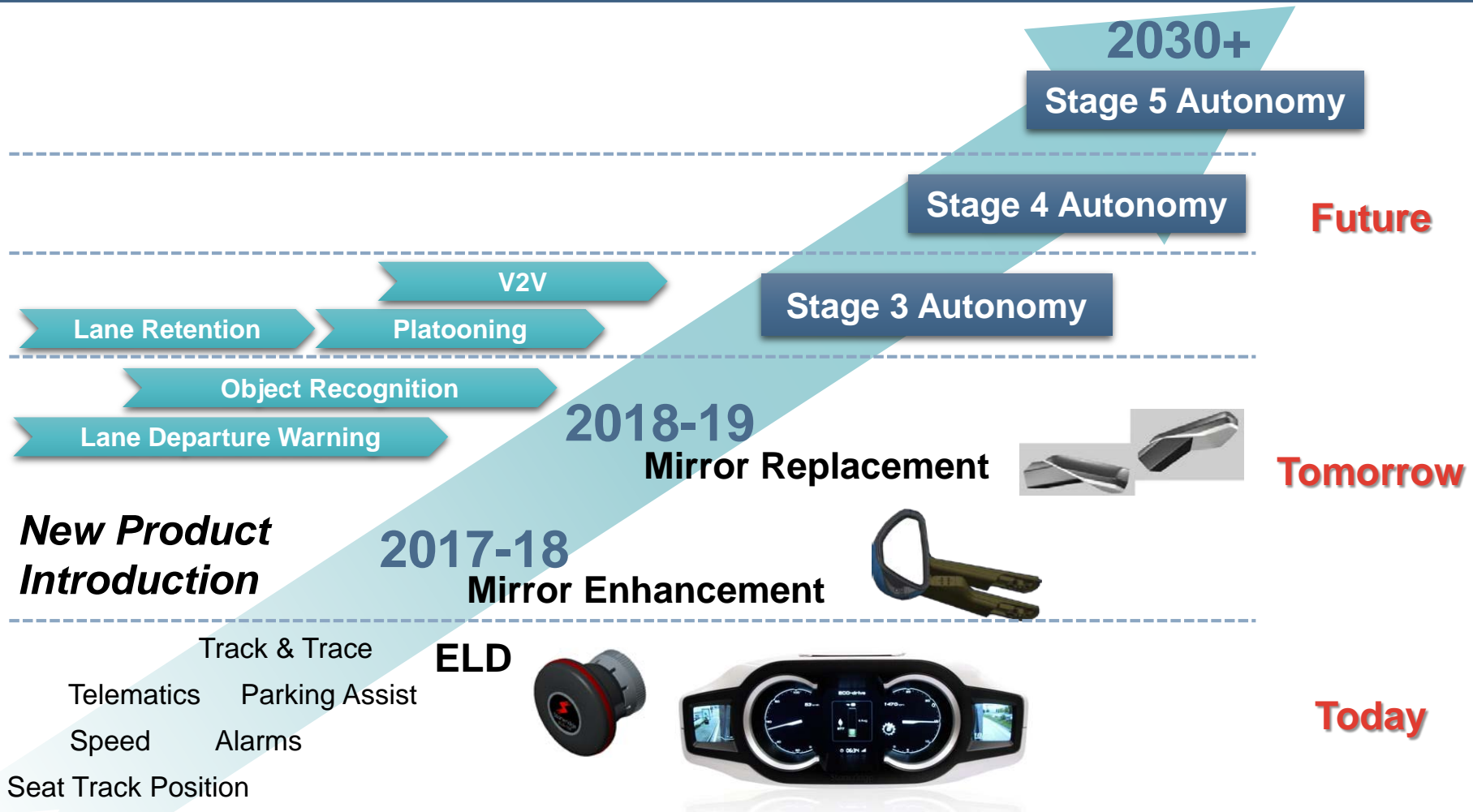
## Sensors Emissions/Position/Temp/Level



## Actuators



# Moving Beyond Connected – Stoneridge Roadmap



**Stoneridge is building on our current portfolio and capabilities with innovative vision technology (Camera, Radar, Object Recognition, Lane Departure)**



# MirrorEye – Mirror Replacement Safety System

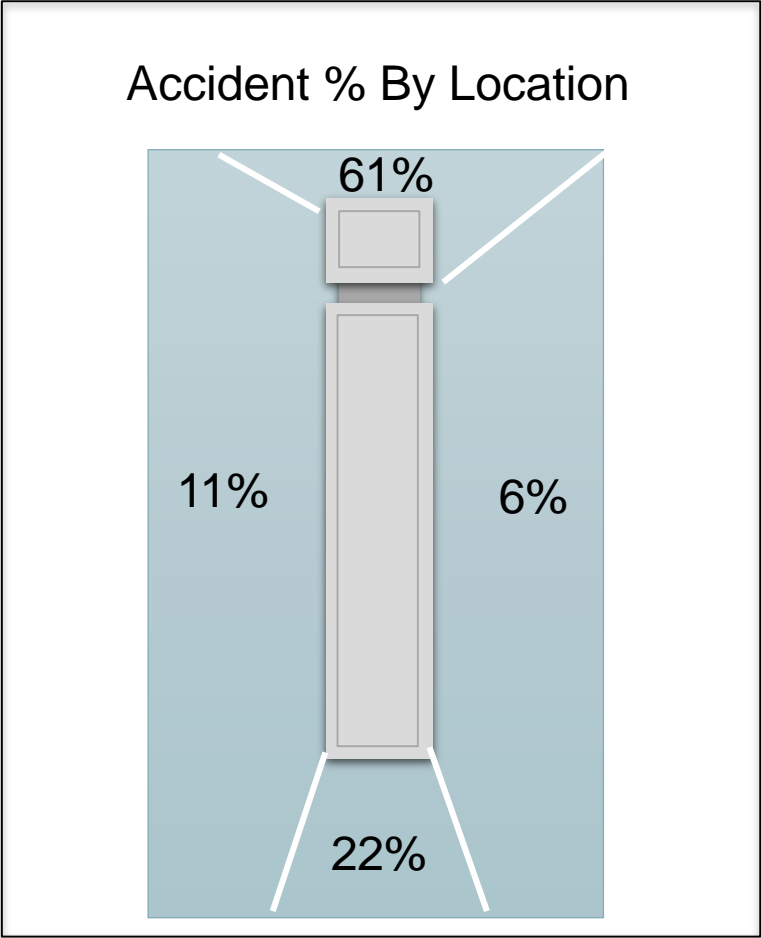
## The MirrorEye Advantage

- ▶ Enhanced safety
  - Most advance camera technology
  - Blind spot elimination with mirror removal
  - Enhanced fields of view
  - Enhanced performance in all weather / light conditions
  - State-of-the-art auto-defrost
- ▶ Advanced video processing with Ultra-low latency
- ▶ High resolution / high brightness displays
- ▶ Fuel Savings estimated at 2-3% fuel savings
- ▶ Plug-and-play options include
  - Night vision
  - Object recognition and advanced driver assistance

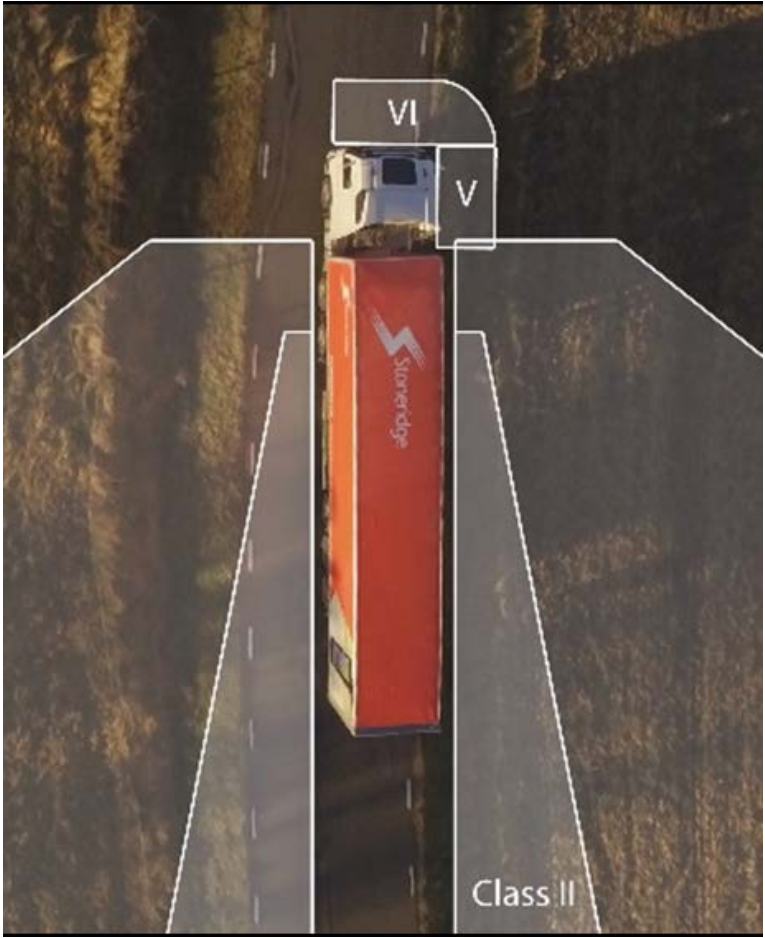
**MirrorEye**<sup>TM</sup>  
the future in truck mirror replacement



# MirrorEye – Enhancing Driver Capability



US Dept. of Transportation



# MirrorEye - Next Steps Toward Adoption



## Technical Reliability

- Reliability for a safety critical component that would replace a proven design.



## ROI

- Payback has to be demonstrable.



## Driver Acceptance

- New technology brings a new learning curve for drivers.



## Regulation

- To realize the full benefits, legislation in the USA would need to more closely match EU legislation.

***Partner with other interested constituencies (OEMs, Fleets, Regulators...)  
to address challenges***



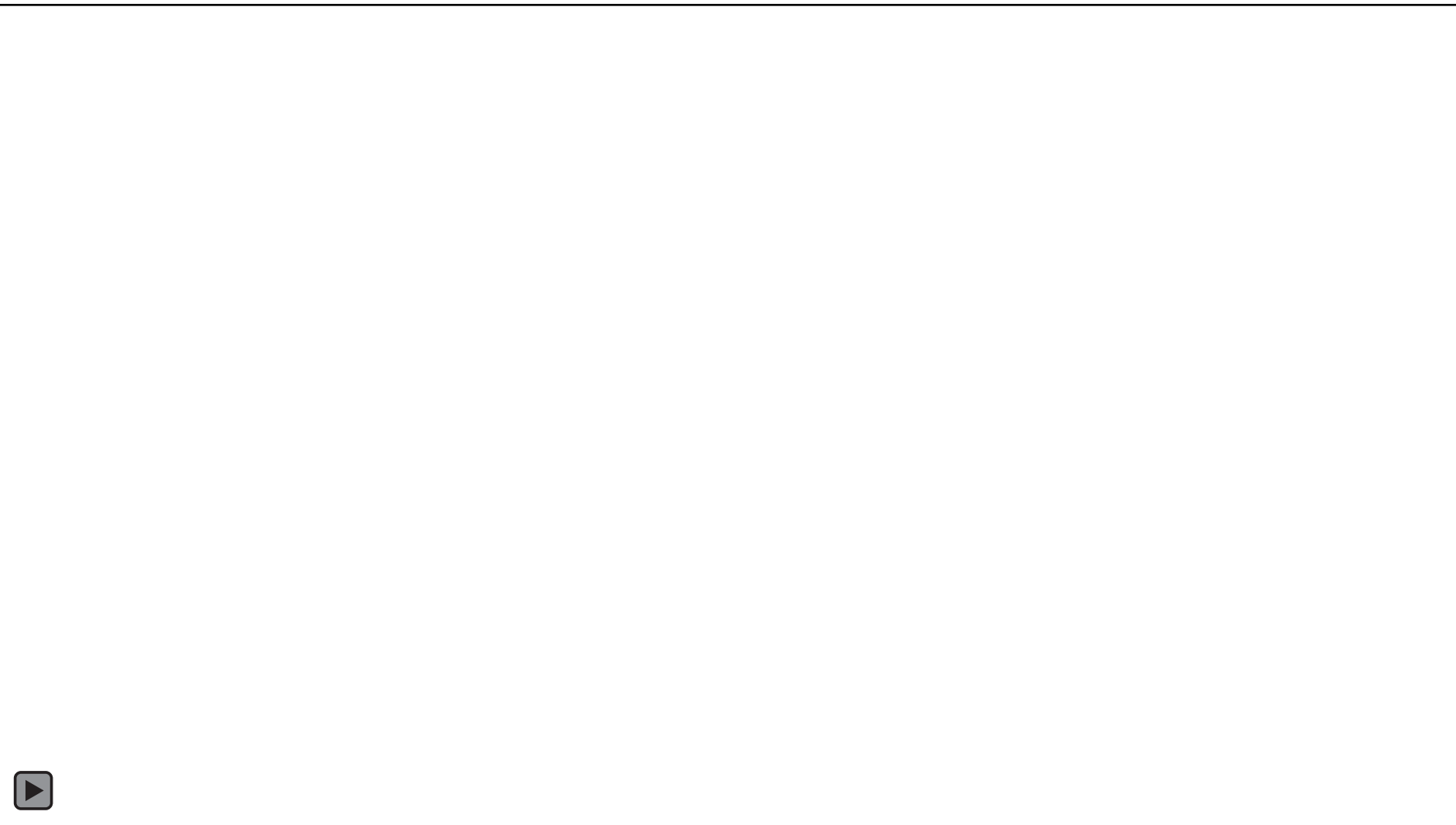
# Stoneridge TECHNOLOGIES IN MOTION

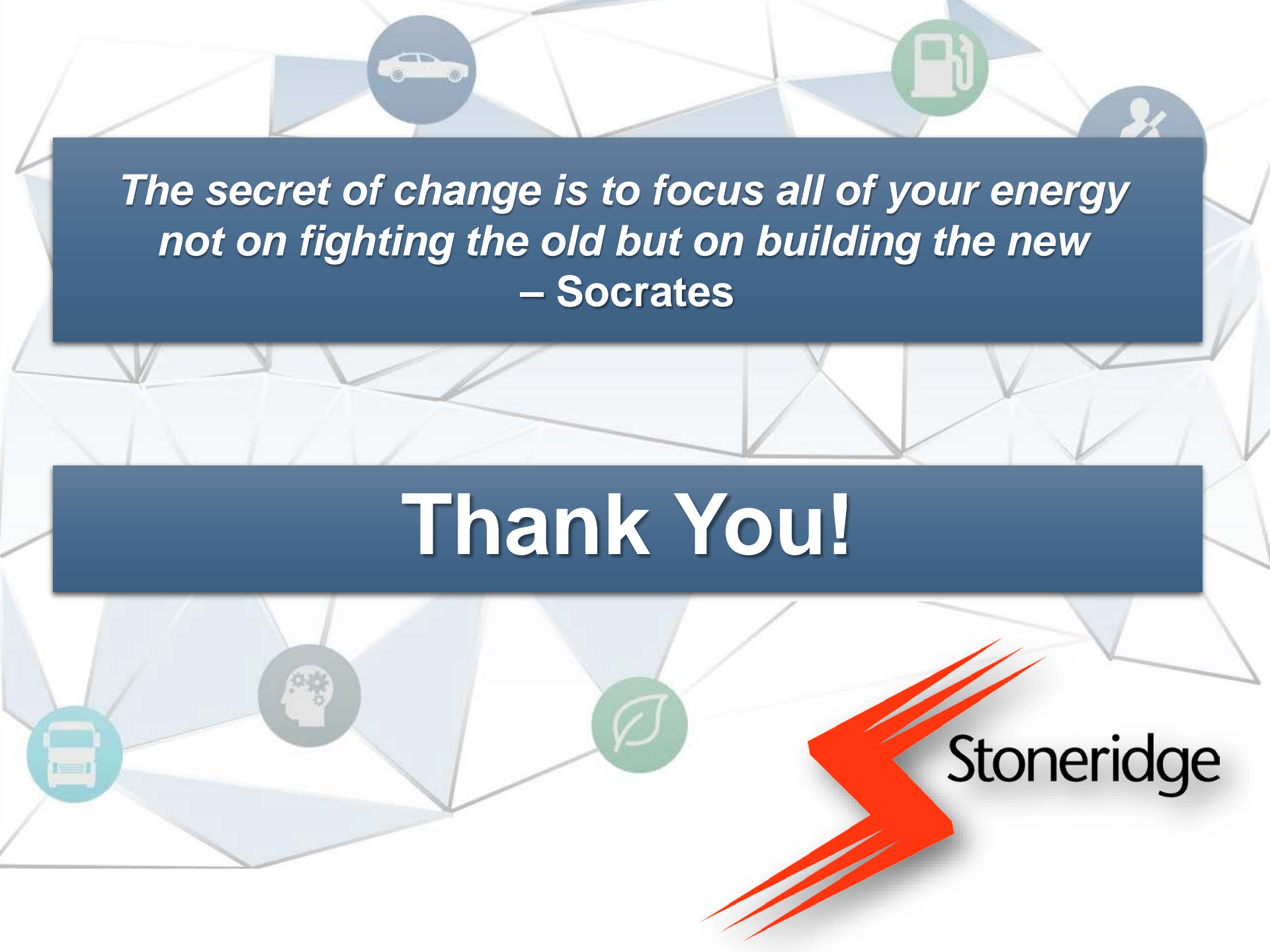


Stoneridge is providing a variety of technologies to enable the connected truck revolution.

**MirrorEye**<sup>TM</sup>  
the future in truck mirror replacement

# Stoneridge MirrorEye – The Future in Truck Mirror Replacement





*The secret of change is to focus all of your energy  
not on fighting the old but on building the new  
– Socrates*

**Thank You!**



Stoneridge