



VTTI

EFFECTIVE STRATEGIES TO IMPROVE SAFETY

CASE STUDIES OF COMMERCIAL MOTOR CARRIER
SAFETY ADVANCEMENT



VIRGINIA TECH
TRANSPORTATION INSTITUTE
VIRGINIA TECH.

MATT CAMDEN

SENIOR RESEARCH ASSOCIATE & TEAM LEADER

DIVISION OF FREIGHT, TRANSIT, & HEAVY
VEHICLE SAFETY

BACKGROUND

- Thousands of carriers each year are identified as high-risk
 - FMCSA
 - Insurance
- Most others engage in a continual process to identify opportunities to improve safety
- Objective: conduct case studies of carriers that have significantly improved safety performance
 - What strategies were successful?
 - What interventions were not effective?
 - Barriers to implementation?
 - Strategies to overcome barriers?

Methods



Case studies at 9 carriers

Worked with insurers and state trucking associations

Significant reduction in crashes, claims, or BASIC scores

Confirmed safety improvement

Recruited for participation



Focus on

What initiated the improvement

Timeline for improvement

Which safety interventions were key

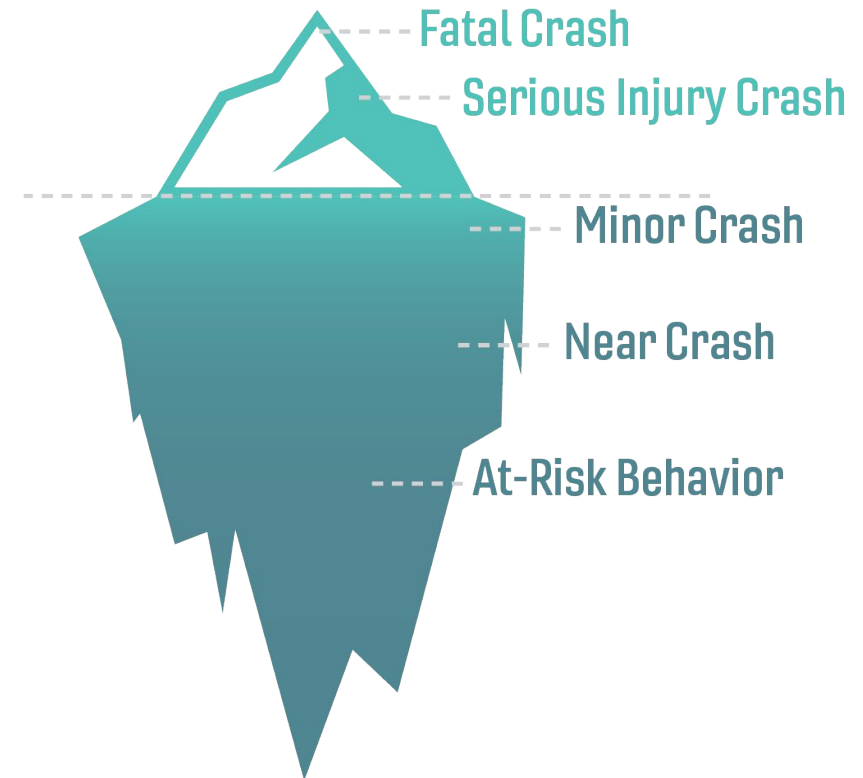
CARRIER SAFETY IMPROVEMENT

Carrier	Size	Safety Improvement
A	>1000	1) 19.5% reduction in reportable crash rate, 2) 20 percentile improvement in CSA, 3) 56% reduction in rear-ends
B	501-1000	1) 31.7% reduction in reportable crash rate, 2) 70 percentile improvement in CSA
C	501 -1000	1) 75.6% reduction in preventables, 2) 17 percentile improvement in CSA
D	101-500	1) 45 percentile improvement, 2) eliminated all rollovers and rear-ends
E	101-500	1) 35.8% reduction in reportable crashes
F	51-100	1) 66.3% reduction in reportable crash rate, 2) 44 percentile improvement in CSA
G	51-100	1) 26.3% reduction in reportables since 2012, 2) 66.3% reduction since 2017, 3) 38 percentile improvement in CSA
H	101-500	1) 24.4% reduction in reportable crash rate, 2) 39.7 percentile improvement in CSA
I	<50	1) 53.6% reduction in crashes, 2) Zero reportables, 3) 46 percentile improvement in CSA

KEY TAKEAWAY #1

INFLUENTIAL SAFETY CULTURE

- All 9 carriers indicated the importance of improved safety culture
- All aspects of operations affect safety
- Targeted areas
 - Focused on leading indicators
 - Driver hiring
 - Driver training
 - Leadership
 - Dispatch
 - Maintenance



IMPROVED SAFETY CULTURE

GENERATING BUY-IN

- Starts at the top
 - Walk the talk
 - Sharing data
 - Safety communication
- Driven by the bottom
 - Everyone can be a safety leader
 - Safety needs to be owned by everyone
 - Recognition
 - Safety competitions



KEY TAKEAWAY #2

SAFETY TECHNOLOGIES

- 8 of the 9 carriers used technologies to improve
 - AEB, LDW, BSW, telematics, video OBMS
- AEB: 56% reduction in rear-ends; 26.3% reduction in DOT-reportable crashes
- Video monitoring: 53%-66% reduction incidents
- AEB/LDW/video: 31%-36% reduction in DOT-reportable crashes; 75% reduction in preventable incidents

TAKEAWAY #3

BE PROACTIVE

	Vehicle	People	Environment	Management Culture
Pre-crash	<ul style="list-style-type: none"> • AEB • LDW • Blind spot detection • Stability control systems • Speedgauge • Speed limiters • Video-based OSM systems • Monitor wear and tear • Replace parts when issues arise • 24 hour a day maintenance shop • Service tractors before 10,000 miles • Service trailers every 30 days • Inspect truck and trailer each time it returns to facility • Load specific pre-trip checklists 	<ul style="list-style-type: none"> • Participant in FMCSA's pre-employment screening program (PSP) • Require previous driving experience • On-the-job training for all drivers • Finishing program for new drivers • New hire mentoring • Face-to-face interview • Hiring criteria for involvement in previous crashes • Hiring criteria for previous citations and inspections • Past employer referrals • Driver referrals • Driving simulator assessment • Driving simulator training • Online training • Hair drug testing • Physical fitness/agility test • Safety pledge • Monthly or quarterly in-person safety meetings • Coaching sessions based on OSM data 	<ul style="list-style-type: none"> • Visible safety pledge signage in terminals • Plan routes for 45 mph average • Mandatory stops in bad weather • Schedule routes based on individual sleep patterns • Monitoring driving time in real-time 	<ul style="list-style-type: none"> • Non-monetary safety awards • Monetary safety bonuses • Frequency safety communication • Positive, non-confrontational coaching sessions • Open door policy • Full-time trainers to maintain consistent safety message • Management buy-in to safety programs • Zero tolerance for HOS violations • Ownership/top management safety communication • Driver scorecards • Family events • Encourage family involvement in safety • Family culture • Progressive discipline policy • Internal and external safety benchmarking • Share key carrier-wide crash and incident data with drivers • Share carrier-wide safety cost data with drivers • Accountability for safety in all departments • Wellness checks on drivers • Educating all department on their impact on safety • Health and wellness program • Drivers collaborate to develop safety strategies
At scene				<ul style="list-style-type: none"> • Support driver at scene
Post-crash	<ul style="list-style-type: none"> • Vehicle repair or replacement 	<ul style="list-style-type: none"> • Post-incident one-on-training • Progressive discipline policy based on crash causes • Health and wellness checks 		<ul style="list-style-type: none"> • Use of video-based OSM to find identify objective data on crash causes • Use of video-based OSM data for driver exonerations • Internal tracking of crashes for data analysis • Internal and external benchmarking • Driver incident reporting system

KEY TAKEAWAY #4

COMPREHENSIVE APPROACH IS NEEDED



- There was no single, correct answer
- Each carrier carefully evaluated their risks
- Developed programs/policies to address their specific needs
- BUT, safety started at the top in each carrier

WHAT DOES IT ALL MEAN?

- Consistency across the carriers
 - Supports two decades of research
 - Safety Culture is KEY
 - Examine and invest in safety technologies
- Be proactive
- Upfront costs, but savings in the long run
- Keep your drivers and general public safe
- Not one silver bullet to improve safety

Thank you!

Questions?

Data Needs and Next Steps????

Matt Camden

Team Leader, Research to Practice & Outreach

mcamden@vtti.vt.edu