# Rubber Truck Bed Liners
# RTBL

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## Safety & Performance Benefits

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## Presentation Outline

- Health & Safety Benefits of Rubber Truck Bed Liners
- Dispelling Myths
- Why Valley Rubber
- Q&A

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# Why Use RTBL?

**What you need to know…**

- Reduced Impact resulting in bed damage and expensive repairs and negative driver impacts
- Reduced Noise both ambient and in-cab
- Extended time in service makes you more money
- Improved Driver Safety
- Reduced cost of ownership
- ***Because it just simply makes sense!***

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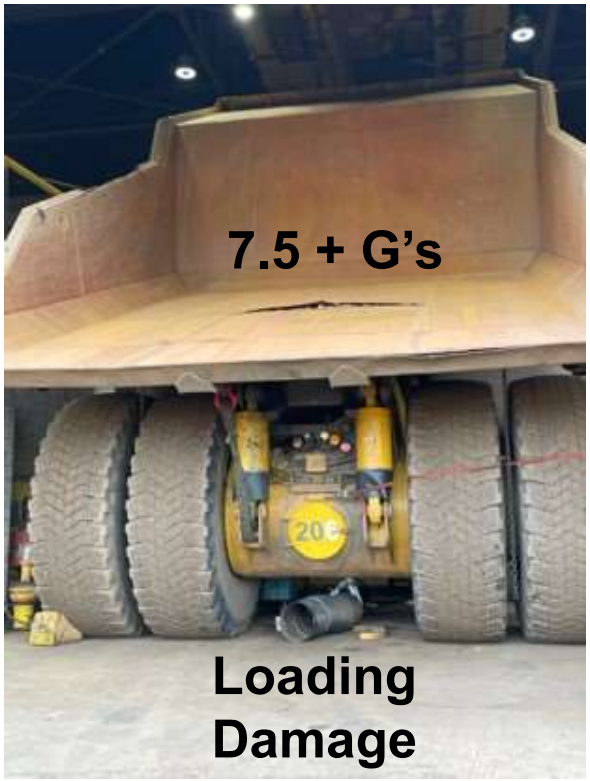
Traditional Steel Liner

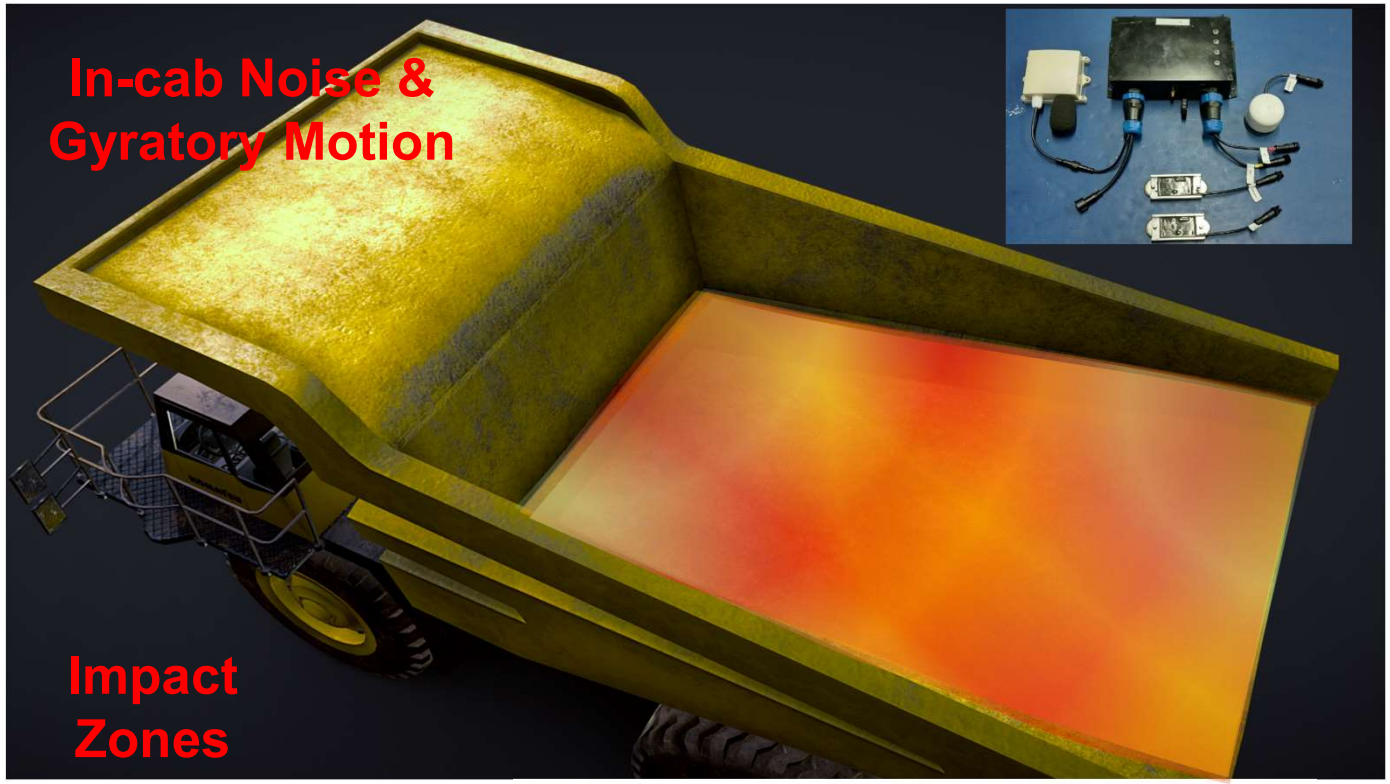
Rubber Liner

# Energy Absorption

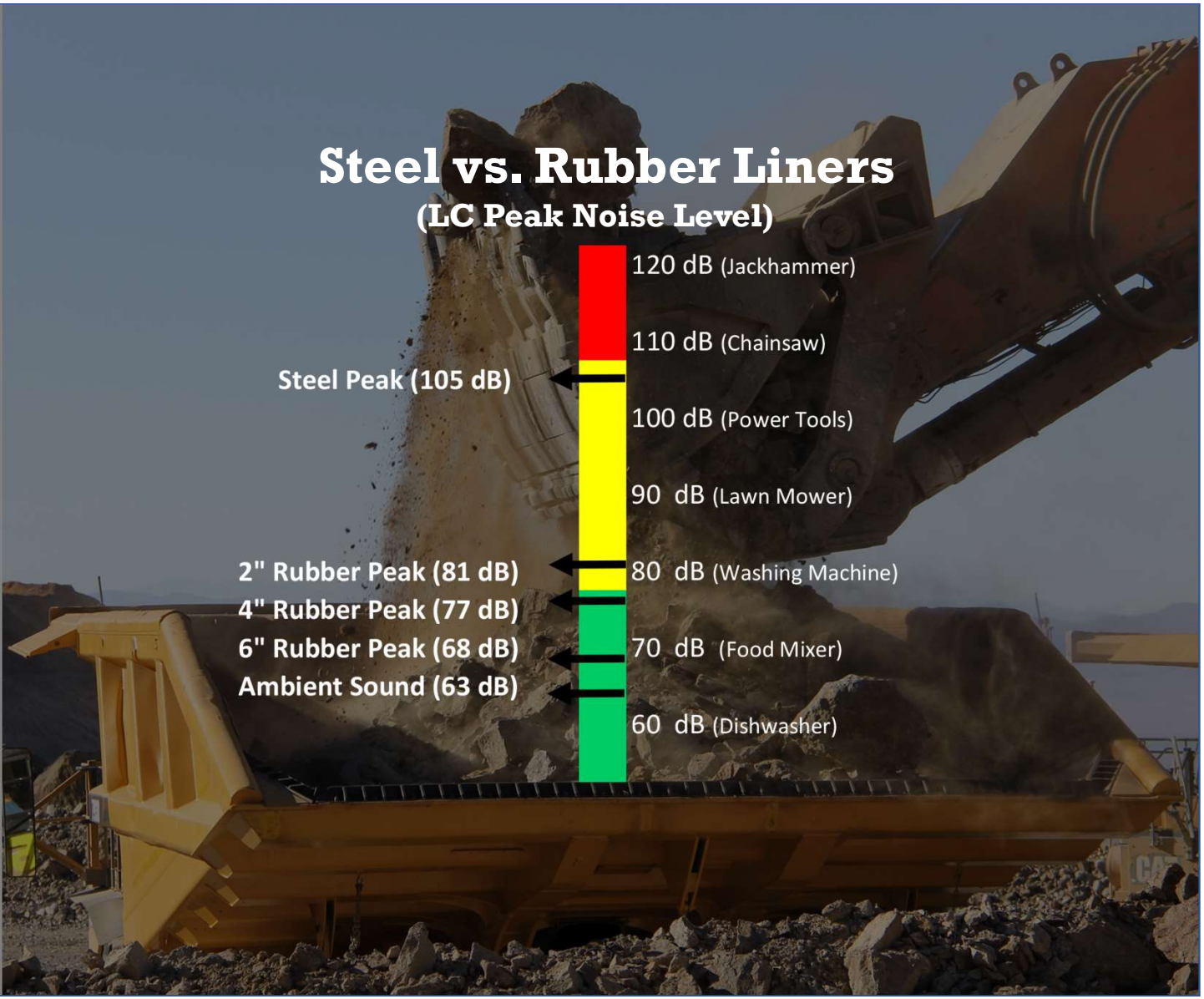
- Rubber Liners can absorb **400% more impact force** than traditional steel systems
- Much less stress on the chassis, axles, planetary gears ***and drivers.***

# Bed Monitoring



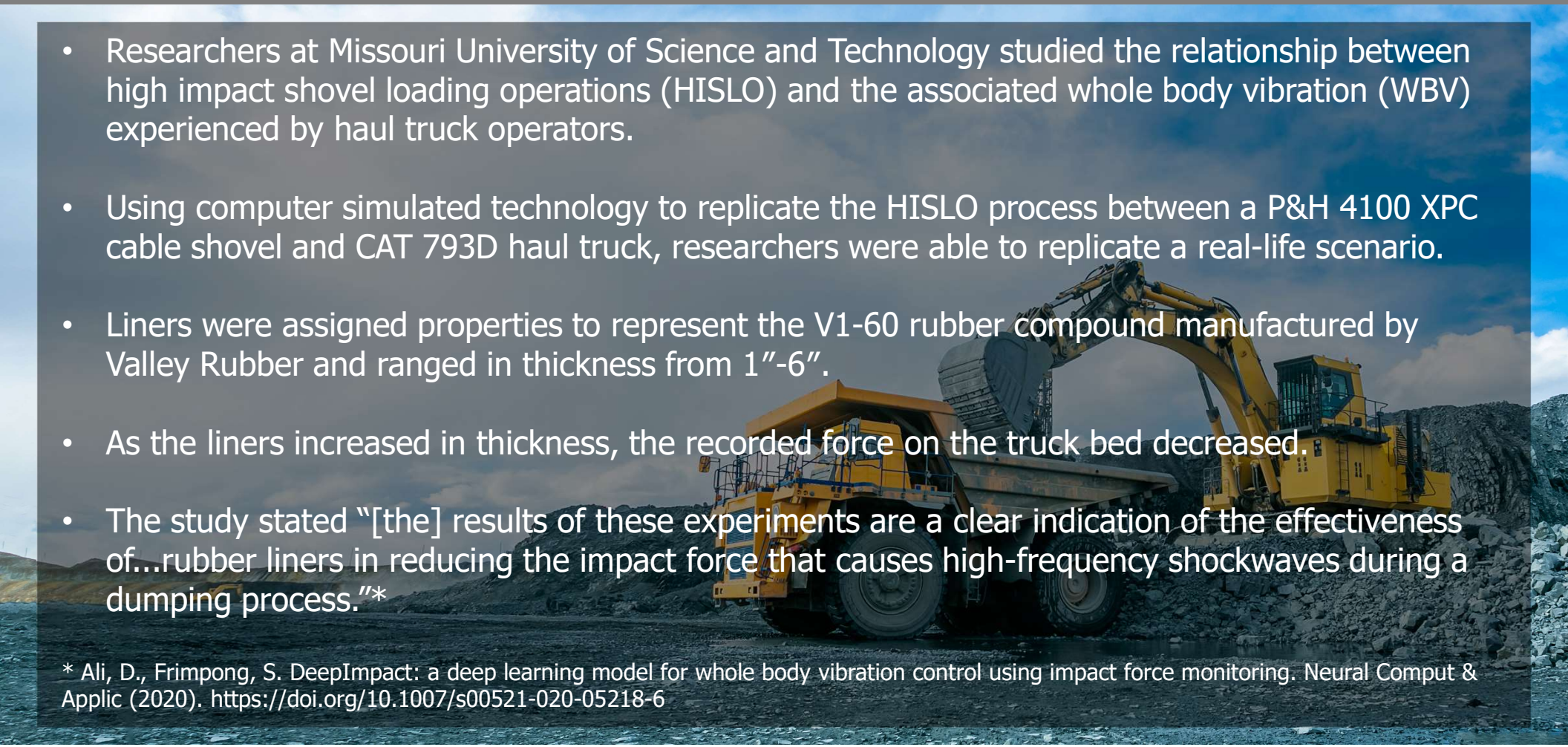

CATERPILLAR
CAT
Without RTBL
Cab Impact
During Loading
Up to 4 G's




# Sound Attenuation

- Based on the OSHA international standard 1910.95 (Occupational noise exposure), the maximum level of noise exposure and frequency is an 8-hour time-weighted average of 85 decibels.
- As per research performed by Valley Rubber, the impact of a rock on steel can reach a peak of 135 dB, which is above allowed or stated OSHA standards.
- When testing the 6” Valley Rubber Truck Bed Liner vs. steel, the 6” rubber noise peak was only **88 dB***

# Operator Well-Being & Safety



- Researchers at Missouri University of Science and Technology studied the relationship between high impact shovel loading operations (HISLO) and the associated whole body vibration (WBV) experienced by haul truck operators.
- Using computer simulated technology to replicate the HISLO process between a P&H 4100 XPC cable shovel and CAT 793D haul truck, researchers were able to replicate a real-life scenario.
- Liners were assigned properties to represent the V1-60 rubber compound manufactured by Valley Rubber and ranged in thickness from 1”-6”.
- As the liners increased in thickness, the recorded force on the truck bed decreased.
- The study stated “[the] results of these experiments are a clear indication of the effectiveness of…rubber liners in reducing the impact force that causes high-frequency shockwaves during a dumping process.”*

* Ali, D., Frimpong, S. DeepImpact: a deep learning model for whole body vibration control using impact force monitoring. Neural Comput & Applic (2020). https://doi.org/10.1007/s00521-020-05218-6

# Health & Safety
## Whole Body Vibration

- Whole body vibration (WBV), including jolting and jarring, occurs during the process of loading the Haul Truck
- With Rubber Liners, the driver will experience reduced shock and vibration, thus increasing their well-being

WBV (Whole Body Vibrations)
= Vertical Root Mean Square (RMS)

**Typical driver experience during loading of truck boxes.**

Table 1.1. Expected Comfort Zones to Vibration (ISO 2631 – 1)

| Acceleration Value (RMS) | Comfort Zone |
|---|---|
| Less than 0.315 $m/sec^2$ | Not Uncomfortable |
| 0.315 – 0.63 $m/sec^2$ | A little Uncomfortable |
| 0.5 – 1 $m/sec^2$ | Fairly Uncomfortable |
| 0.8 – 1.6 $m/sec^2$ | Uncomfortable |
| 1.25 – 2.5 $m/sec^2$ | Very Uncomfortable |
| Greater than 2 $m/sec^2$ | Extremely Uncomfortable |

ISO 2631 – 1 (1997), "Mechanical Vibration and Shock – Evaluation of Human Exposure to Whole Body Vibration – Part 1: General Requirements," *International Organization for Standardization*, Switzerland.

# Dispelling the Myths

**What you need to know…**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- Myth #1 : " I am going to lose hauling capacity"
- Myth #2 : "Rubber is too heavy"
- Myth #3 : "Carry back will increase in rubber lined bed"
- Myth #4 : "RTBL are for hard rock quarries"
- Myth #5 : "RTBL are for rigid frame trucks only"

***Build On Knowledge***

# Equipment Availability- Example

| 777-E | 3/4" - 1" Steel | Valley Rubber 4" |
|---|---|---|
| Expected life (overall) | 12,000 – 20,000 Hrs. | 25,000 – 50,000 Hrs. |
| Impact Absorption | Structural damage to the Truck Box & Chassis | **400% more impact absorption compared to steel** |
| Installation | 160 – 240 Hrs. (7-10 days) | 6 – 24 Hrs. |
| Maintenance (200 Hrs. - out of service maintenance every 10,000 Hrs. of operation) | Re-occurring maintenance every 10,000 – 15,000 Hrs. Removal/repair the steel liner and repair of the truck box | **Zero maintenance One Day Install** |
| Guarantee | No guarantee | **3 Years** |
| Loss of Box Availability | 160 - 240 Hrs. **(7-10 days)** | **100% Box availability** |

# Reduced Cost of Ownership

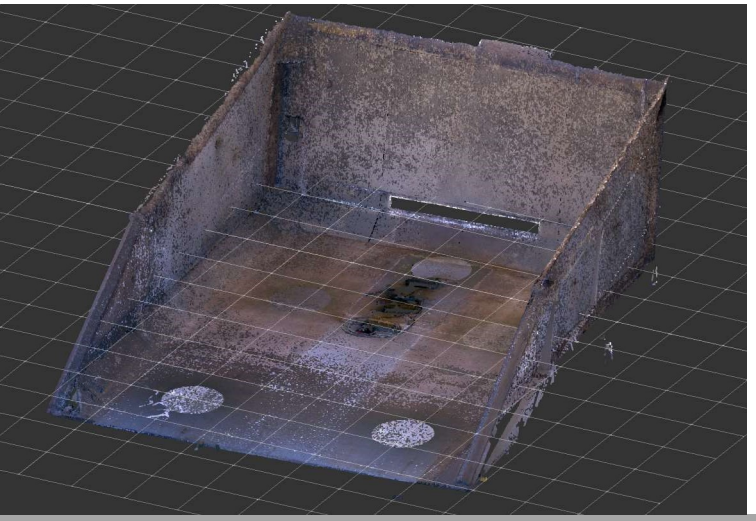
A cost & time analysis for a CAT 777D Haul Truck:

**Steel**

- Cost to purchase, install, and maintain steel liners for 3 years averages $35-40K
- Removal, repair, and installation of new steel liners takes 5-10 days for a 2 or 3 person team
- Costs can vary depending on location

**Rubber**

- After Valley Rubber's Truck Bed Liners were installed, the average savings total $5-10K in the same period – per truck
- Rubber Liners installed by 2 to 3 person team should take eight hours or less
- Install cost is not the only differentiator
- Cost benefits become larger as the truck size increases
- The longer the liner is in place, the larger the benefit



# Why GRT RUBBER™

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- Decades of industry experience
- Optional 3D laser scanning
- Peopled focused
- Customization

- Innovation
- Trusted source
- Quality of rubber to metal bonding
- Customer experience

# RTBL Innovations

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Reduced Weight

Reduced Carry Back

Monitoring Technology

# Haul Truck
## Bed Liners

Questions?

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