TMSystems Roll-Out, Cost savings, ROI Benefits. Heavy Vehicles Australia- Discussion + Analysis

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Discussion: Roll- out Costs + Savings + ROI- TMSystems

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1. INTRODUCTION.

This paper has been prepared by the Engineering Manager and CEO of LSM Technologies, who brings over 20 years of specialist expertise in the design, testing, and deployment of Tyre Monitoring Systems (TMSystems) for heavy vehicles.

The author has actively contributed to national safety initiatives with regulators and industry bodies including NHVR, ARTSA-i, HVIA, NBTA, and TfNSW, and was responsible for the first TMSystem in the world tested and certified for use in Dangerous Goods (DG) Transport in 2016.

Tyre Monitoring Systems (TMSystems) are increasingly recognised as a critical industry safety and productivity measure. By providing continuous monitoring of tyre pressures and temperatures, TMSystems prevent many of the most common and costly tyre-related incidents- including blowouts, rollovers, fires, and equipment damage.

The specific benefits and advantages of TMSystems include:

- **Extended Tyre Service Life & Fuel Savings:** Maintaining correct set-point pressures reduces rolling resistance, prolongs tyre life, and lowers fuel consumption.
- **Increased Safety:** Early detection avoids catastrophic tyre failures, blowouts, and wheel- end fires caused by under- inflation, bearing failures, or dragging brakes.
- **Avoid Risk of DG Truck / Tanker Explosions**: By preventing tyre and wheel- end fires, pyrolysis, TMSystems significantly reduce the risk of catastrophic explosions in Dangerous Goods transport, protecting lives, cargo, and infrastructure.
- **Avoid Environmental Impacts:** Preventing tyre / wheel- end fires and tanker incidents reduces the risk of dangerous goods spillages and secondary fires that damage ecosystems (grasslands) and other infrastructure (road / houses / bridges).
- **Reduced CO_2 Emissions:** Maintaining correct tyre pressures lowers rolling resistance, directly reducing fuel use and greenhouse gas emissions.
- **Less Road Damage & Wear:** Properly inflated tyres distribute loads more evenly, lowering road surface wear and reducing maintenance costs for road authorities.
- **Improved Braking, Traction & Control:** Correct tyre pressures enhance stability and handling in both dry and wet conditions.
- **Meeting Delivery Schedules & Productivity:** By reducing unplanned breakdowns, blowouts, and fires, TMSystems improve on- time delivery performance, minimise penalties for late arrivals, and boost fleet productivity.
- **Lower Labour & Productivity Costs:** Manual tyre checks are labour-intensive. TMSystems allow operators to identify / target only tyres that need attention (eg re- pressurisation), saving time and reducing downtime.
- **Reduced Equipment Damage:** Prevents collateral damage (other eg vehicles) from catastrophic failures such as rollovers, tyre fires, wheel- offs and tanker incidents.
- **Insurance & Liability Reductions:** Lower incident frequency and severity should translate into reduced insurance claims and premiums.
- **Emergency & Risk Mitigation:** TMSystems support compliance with OH&S standards, mitigate risks of fires and improve post-incident analysis.
- **Life and Injury:** With safer operations and reduced potential for crash incidents, the TMSystem can lower the risk of injuries and fatalities.

This discussion paper should be read in conjunction with: LSM TMSystems- Regulatory Environment- ECE R141 Mandate Alignment and Implementation in Australian On- Road Vehicles- Discussion + Analysis.

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2. BENEFITS AND ADVANTAGES OF TMSYSTEMS.

This report consolidates calculations and modelling for a national rollout of Tyre Monitoring Systems (TMSystems) across Australia's heavy vehicle and light commercial fleets and considers the respective classes as detailed in ECE R141 mandate:

- The Australian registered fleet base considered, includes **5.1 million heavy vehicles** and **trailers** for On-road usage.
- Rollout investment is **~$5B ($5,184,000,000).**
- Annual benefits are **~$$31- $37B**, delivering a payback of **under one year.**
- Accumulated **10- year net benefits of $310- 370B**.

3. ROLL OUT COST / SAVINGS / ROI- NATIONAL FLEET PROFILE.

This section isolates the ROI analysis for the Australian registered fleet base considered includes **5.1 million heavy vehicles** and **trailers** for all classes of heavy vehicles for on- road usage.

3.1 Cost Savings- National Fleet Profile.

Category	Mechanism	Est. Annual Benefit	Source
Tyre Life Extension	Correct pressures extend life; fewer replacements- 9%- 30%	$1- 2.4B	Michelin / LSM
Fuel Efficiency	1- 3% fuel savings- maintaining set- point pressures	($12- 48B-) use ≈$20B	Continental Tyres / LSM
Tyre Check Labour	Weekly / daily manual checks (~3- 5 mins / tyre)	$8- 13B (use $2.4B- $3.9B)	LSM / Continental
Crash & Fire Avoidance	61.3% of non-impact fires are wheel- end / tyres	$3.5- 4.5B	NTI / NTARC 2024; NSW CRS 2012, BTRE
Cargo & Insurance	Fewer destroyed / damaged loads	$1- 2B	NSW CRS, NTI, OTSI, NHTSA, and DMIRS data
Congestion & Clean-up	Fewer closures & emergency responses	$1- 2B	Bridgestone, NHTSA
CO_2 Reduction	Fuel saved + longer tyre life	$1B (≈$0.6- 0.8B)	TNO; OICA / NIRA; Michelin
Road Damage (Predictive)	Early defect detection	$1B	Bridgestone (intelligent monitoring)
Total Annual Benefits	**-**	**$31B- 37B (rounded)**	**-**

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3.2 Roll Out Costs- National Fleet Profile.

The following analysis considers an average cost for a TMSystem using, Wheel Sensor base line cost at a nominal $**200**. Roll out cost (proportional / average cost of a complete TMSystem) is by vehicle class are shown below.

Vehicle Type	Vehicles	Wheels / Vehicle	Cost per Vehicle	Total Cost
Buses (M1- M3)	100,000	6	$1,200	$120,000,000
Heavy Rigid Trucks (N1- N2)	400,000	6	$1,200	$480,000,000
Light Rigid Trucks (N2)	230,000	6	$1,200	$276,000,000
Articulated Trucks (N3)	130,000	10	$2,000	$260,000,000
Speciality (SP- M1) Emergency / Fire / Tow	40,000	6	$1,200	$48,000,000
Trailers, Tankers, Dogs (O3- O4)	400,000	12	$2,400	$960,000,000
Light Commercial (N1- N2)	3,800,000	4	$800	$3,040,000,000
TOTAL	**5,100,000**	—	—	**$5,184,000,000**

3.3 ROI- National Fleet Profile.

The following is an ROI for a complete Australian National Fleet of **5.1 million** Trucks, Trailers, etc registered for On- road use:

Timeframe	Annualised Rollout Cost	Estimated Annual Benefits	ROI / Payback
5 Years	~$1.04B / year	$31- 37B / year	<1 year payback (TMSytem)
10 Years	~$0.52B / year	$31- 37 / year	**>$310B- 370B** cumulative net benefits

4. ROLL OUT COST / SAVINGS / ROI- TRANSPORT FLEET PROFILE.

4.1 Roll Out Costs- Transport Fleet Profile.

This section isolates the ROI analysis for On- road transport rigs **~530,000,** specifically Articulated Trucks (N3) and Trailers, Tankers and Dogs (O3- O4).These categories represent the core of Australia's linehaul freight fleet and carry elevated risks of tyre and wheel- end related issues.

The following analysis considers an average cost for a TMSystem using Wheel Sensor base line cost at a nominal $**200**. Roll out cost (proportional / average cost of a complete TMSystem) is by vehicle class are shown below

Vehicle Type	Units	Wheels / Vehicle	Cost per Vehicle	Total Cost
Articulated Trucks (N3):	130,000	10	$2,000	$260,000,000
Trailers, Tankers, Dogs (O3- O4)	400,000	12	$2,400	$960,000,000
TOTAL	**530,000**		**$4,400**	**$1.22B**

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4.2 Cost Savings- Transport Fleet Profile.

Expected Annual Benefits (conservative allocation extrapolated from national fleet profile).

Category	Estimated Annual Benefit
Tyre Life Extension:	~$0.7B / year
Fuel Efficiency	~$2.0- 2.5B / year
Tyre Check Labour	~$0.5B / year
Crash & Fire Avoidance	~$1.0- 1.2B / year
Cargo & Insurance:	~$0.3B / year
Congestion & Clean-up:	~$0.3- 0.4B / year
CO_2 Reduction:	~$0.1- 0.15B / year
Road Damage Prevention	~$0.2B / year
Total Annual Benefits (~10% of National Fleet)	**$5.1–5.8B / year**

4.3 ROI- Transport Fleet Profile.

Timeframe	Annualised Rollout Cost	Est. Annual Benefits	ROI / Payback
5 Years	~$0.244B / year	$3.1- 37B / year	<1 year payback (TMSystem)
10 Years	~$0.025 / year	$31- 37B / year	**>$310- 370B cumulative net benefits**

5. ROLL OUT COST / SAVINGS / ROI- CASE STUDY FLEET.

Using the above data, a realistic articulated operation included for a fleet of **100 trucks and 150 trailers** (with 12 wheels each) is estimated as follows:

5.1 Roll- out Costs- Case Study Fleet.

The following analysis consider an average cost for a TMSystem using Wheel Sensor base line cost at a nominal $**200**. Roll out cost (proportional / average cost of a complete TMSystem) is by vehicle class are shown below

Vehicle Type	Units	Wheels / Vehicle	Cost per Vehicle	Total Cost
Trucks	100	10	$2,000	$200,000
Trailers	150	12	$2,400	$360,000
TOTAL	**230**		**4,400**	**$560,000**

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5.2 Cost Savings- Case Study Fleet.

Expected Annual Benefits (conservative allocation extrapolated from national fleet profile).

Category	Assumption	Annual Saving for Fleet
Tyre Life Extension	10- 20% longer life across trucks + trailers	$150,000
Fuel Efficiency	2% at 100,000 l/ year @ $2/ litre per truck	$500,000
Tyre Check Labour	Manual checks avoided (3 min / tyre)	$250,000
Crash & Fire Avoidance	Early alerts prevent blowouts / overheats	$120,000
Cargo & Insurance	Avoided destroyed / damaged loads	$50,000
CO_2 Reduction	Fuel saved → ~2 t CO_2 / truck	$25,000
Total Savings		**$1,095 000**

5.3 ROI- Case Study Fleet.

Timeframe	Annualised Rollout Cost	Est. Annual Benefits	ROI / Payback
5 Years	~$106,000 / year	$1,095,000	<1 year payback (TMSystem)
10 Years	~$53,000 / year	$1,095,000 / year	**~11.00 cumulative net benefits**

Note: This case study does not also consider other potential cost savings such as:

- Productivity and supply chain delay (scheduling) savings (avoided missed deliveries, demurrage fees, and knock-on congestion effects).
- Road side delays and servicing.
- Clean- up, emergency service, medical, vehicle recovery costs.
- Etc- savings could far out- weigh the estimate amounts.

Cost savings are to the Bottom Line.

6. DERIVATION OF COST ESTIMATES.

Data used to calculate the estimated costs savings of TMSystems is as tabled below:

6.1 Source Data used in Calculations.

Category	Average Units	Category	Units
Total Vehicle Wheels (National)	25,920,000	Labour Rate	$120 / hour
Costs / Tyre	$400	Tyre Checks Weekly	3-5 mins / tyre
Tyre Service Life	250,000 kms	Tyre check savings	Upto 30%
Tyre retread / exchange Interval	9 months	Tyre Life Savings	9.0%- 30%
Fuel cost	$2 / litre	Fuel usage	0.3- 0.5 litres / km
Trucks No's	4,570,000	Tye Life Extension	10- 20%

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6.2 Tyre Life Extension.

- Industry studies and reports (NHTSA, OTSI, NTI, NSW CRS) consistently show that tyre under-inflation is the primary cause of premature tyre failure, blowouts and fires.
- The **$1–2B savings estimate** comes from applying **9–30% tyre life extension** (supported by NHTSA, NTI, NSW CRS, OTSI findings) to Australia's **$8–10B annual tyre spend**. This is achievable when TMSystems maintain optimum inflation, prevent blowouts, and extend casing life for retreading.
- Maintaining set-point pressures through TMSystems:
  - **Extends tyre service life by 9–30%** depending on duty cycle and fleet type.
  - Reduces early **scrappage** and number of **retreads** required.
- Annual tyre expenditure (new + retreads + early scrappage) is estimated at **$8–10 billion**.
- A conservative **9–15%** life extension = ≈$1 billion savings.
- An upper-range **25–30%** extension = ≈$2 billion+ savings.

6.3 Fuel Effiencey.

6.3.1 Fuel Use Baseline.

- Australian heavy road transport fleet ≈ **4.57 million registered trucks / trailers** (ABS 2023).
- Diesel consumption for freight ≈ **15–16 billion litres / year** (BITRE).
- Average diesel cost ≈ **$2.00/L** (2024 average).
- **Annual spend = $30–32** billion **/ year**.

6.3.2 Savings from Correct Tyre Inflation (via TMSystems).

- Industry research (DOE, Michelin, Bridgestone, OTSI, NHTSA) confirms **2–10% diesel efficiency loss** from under-inflated tyres.
- **2% savings-** 0.3–0.32 billion litres saved= **$0.6 billion / year**
- **4% savings-** 0.6–0.64 billion litres saved= **$1.2–1.3 billion / year**
- **10% savings-** 1.5–1.6 billion litres saved= **$3.0–3.2 billion / year**

6.3.3 Range for Australia

- **AU$0.6 – 3.2 billion/year** in avoided diesel costs through TMSystems maintaining correct tyre pressures.

6.4 Crash / Fire Avoidance.

6.4.1 NTI/NTARC 2024 – Fire & Crash Incidents.

- NTI's insured fleet sample (≈200,000 powered units) recorded **1,634 major incidents in 2023**.
- Within those, ~64 tyre-originated wheel-end fires + steer-tyre blowout crashes were identified as preventable with TMSystems (≈0.32 incidents per 1,000 powered units).
- With average large-loss claims of **A$250k–A$1m**, the *insured fleet savings ceiling* works out to **A$13–55 million/ year** if all such incidents were eliminated.

6.4.2 Scaling to the Whole Australian Heavy-Vehicle Fleet.

- Australia has **~4.3-4.5 million registered commercial vehicles** (buses, rigid & articulated trucks, trailers, cranes, tankers).
- NTI's insured base is only a fraction. Scaling the NTI incident rate to the ***whole fleet*** multiplies the potential savings by ≈200.
- This produces a **national exposure range of ~A$2.6-11 billion**, depending on which claim-severity bands one assumes.

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6.4.3 Cross-Check- NSW Centre for Road Safety 2012.

- NSW CRS 2012 reported that >22% of heavy-vehicle crashes are tyre related.
- Applying this percentage to Australia's national heavy- vehicle crash costs (BITRE and ATSB) estimates put annual heavy-vehicle crash costs at ~A$16-20 billion, subsequently tyre-related incidents alone account for **A$3.5–4.5 billion annually**.
- That's consistent with the high-end scaled NTI calculation.

6.5 Cargo & Insurance Loss Estimates (Tyre-Related Causes, Australia).

Incident Type	Tyre-related Share	Typical Cargo / Equipment Loss per Incident (AUD)	Annual Estimate
Tyre-related rollover (NSW CRS 2012)	22% of truck crashes	$0.5–2.0m	$500m-$900m
Truck fire (NTI 2015)	33% of truck fires	$1.0–3.0m	$300m- $600m
Bus/coach & freight wheel-end fires (OTSI 2016, NHTSA 2015)	43% bus fires; major freight losses	$0.5–5.0m	$200m-$400m
Mining tyre explosion / fire (DMIRS, 2016)	Frequent catastrophic losses	$2.0–10.0m	$100m+

6.6 Congestion and Clean- up- Economic Cost of Truck Crashes.

- **BITRE (Bureau of Infrastructure, Transport and Regional Economics)** reports that heavy vehicle crashes cost Australia **$2.9 billion annually** in direct crash costs (medical, vehicle damage, property, clean-up, etc.).
- **Congestion costs**: BITRE and Austroads estimate that **traffic disruption from a major truck crash can cost $10,000–$80,000 per hour** on key freight corridors (due to lane closures, detours, lost productivity).

6.7 Co2 Reduction.

- The **$1 billion annual CO_2 reduction savings** figure comes from modelling of fuel savings when heavy-vehicle fleets maintain tyres at correct inflation using TMSystems.
- Underinflated tyres increase rolling resistance, which raises fuel consumption and emissions.
- Studies and industry data suggest that keeping tyres at set-point pressure improves fuel efficiency by **1-4%**, and when scaled to Australia's national truck / trailer fleet. This translates to roughly **$1 billion / year in avoided fuel costs and CO_2 emissions**.

6.8 Road Damage (Predictive).

The **$1 billion / year Road Damage (Predictive)** figure is not a published number. It is an *inferred, conservative estimate* generated by:

- Using published Australian infrastructure damage costs,
- Applying widely accepted predictive maintenance saving ratios (20–40%),
- Attributing those savings to intelligent tyre / road analytics such as the Bridgestone intelligent system.

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7. INJURY, FATALITY AND ANCILLARY COSTS.

Beyond direct vehicle and cargo losses, tyre-related crashes and fires impose significant social and infrastructure costs.

- Based on NSW CRS (2012) findings that **~22% of truck crashes** are tyre- related, applied to BITRE data showing **~10,000 heavy truck crashes per year** nationally, it is estimated there are **~2,000- 3,000 tyre**-related crashes annually across Australia.
- Using BITRE (2022) unit social costs (**fatal ~$9.8M; serious injury ~$5.1M**), preventing 20 fatal and 200 serious injury crashes annually equates to **~$1.2B / year** avoided social costs.
- Road asset damage and disruption from major vehicle fires (e.g., motorway repairs / closures) is conservatively **$0.3- 0.5B / year**.
- Reduced bushfire ignitions from vehicle fires add another **$0.20- 0.3B** / year.
- Emergency response (police, fire, ambulance, recovery teams) for tyre-related crashes / fires is conservatively **$0.05B / year**.
- Productivity and delivery reliability gains from avoiding delays, demurrage, and missed schedules are estimated qualitatively at **~$0.5B / year**.
- Together these ancillary savings add **~$1.75- 2.6B** / year to the above benefit model.

8. OTHER UPSIDE / COST REDUCTION.

Beyond the quantified annual benefits of **$310- 370B**, TMSystems deliver additional upside opportunities that are not yet included in the cost model but represent material savings and efficiency gains for fleets:

- **Productivity & Delivery Reliability**: Tyre-related incidents cause unplanned downtime, missed delivery windows and ripple effects across supply chains. Avoiding these delays improves reliability, reduces penalty/demurrage costs, and strengthens customer trust. These impacts are not included in the data but represent further upside.
- **Predictive Maintenance:** TMSystems data integrated with telematics enables predictive maintenance, forecasting tyre and wheel-end failures before they occur. This reduces repair costs, minimises downtime and optimises workshop scheduling.
- **Driver Efficiency Support:** Studies show combining TMSystem data with driver feedback can improve fuel efficiency by up to 16% in long-haul operations. TMSystems therefore act as both a safety and driver efficiency tool, enhancing fuel savings and tyre life.
- **Breakdown Prevention & Uptime:** Continuous tyre monitoring reduces unscheduled breakdowns, avoiding roadside assistance, recovery costs and lost operational time. Improved uptime boosts fleet reliability and supply chain resilience.

9. SUMMARY & CONCLUSION: ROLL-OUT, COST EFFECTIVENESS – BENEFITS.

The analysis clearly demonstrates that Tyre Monitoring Systems (TMSystems) are not only **cost-effective** but also essential safety controls for the Australian heavy vehicle sector.

9.1 Cost Effectiveness & ROI.

- A **National Fleet** rollout (~5.1 million trucks, trailers, and buses) would require an upfront investment of ~**$5.18B**, yet annual benefits exceed **$31–37B**, delivering **payback in under a year** and cumulative **$310–370B in net benefits over 10 years**.
- For a **Transport Fleet** rollout (530,000 articulated trucks and trailers), investment of **~$1.22B** yields **$5.1–5.8B annual savings**, again with sub-year ROI.
- Even at a **Fleet level Case Study** rollout (100 trucks, 150 trailers), ~$560k investment generates **~$1.1M** savings annually, equating to an **11:1 return over 10 years**.

9.2 Fit-for-Purpose, Longevity & Compliance.

- Heavy-duty TMSystems must be **robust, reliable and tested to recognised standards** (e.g., SAE J2848, IP69K ingress protection).

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- **Fit-for-purpose design is essential,** industrial-grade sensors, simple field replacement, telematics integration, and warranties **>3–5 years**.
- Systems proven and **certified for Dangerous Goods transport** (as achieved by LSM in 2016) demonstrate compliance with high-risk industry requirements.

9.3 Life & Injury Savings

- Tyre-related crashes account for **22% of truck accidents** (NSW CRS 2012). Scaling to national crash statistics equates to **2,000–3,000 preventable incidents annually**.
- Prevention could save ~$1.2B/year in **social costs of fatalities and injuries** (BITRE unit values: $9.8M fatal, $5.1M serious injury).
- **Reduced fire/explosion risks in tankers** and DG transport directly **safeguard drivers, passengers, emergency responders, and the public**.

9.4 Congestion, Emergency & Infrastructure Savings

- Reduced crashes/fire events lessen **road closures and congestion**, valued at ~$1–2B/year.
- **Bushfire ignition prevention** from fewer wheel-end fires avoids $0.2–0.3B / year in losses.
- **Better-inflated tyres** spread axle loads more evenly, lowering **road wear and damage costs** (~$1B / year).
- Emergency response and recovery cost savings (~$50M / year) further contribute to societal benefit.

9.5 Environmental & Operational Benefits.

- Correct tyre inflation improves **fuel efficiency by 1- 4%**, saving $0.6- 3.2B annually and cutting ~1B in CO_2 emissions.
- Predictive maintenance via telematics integration improves **uptime and fleet reliability**, reducing roadside breakdowns and unplanned downtime.
- Insurance claims and premiums are expected to decline due to **lower frequency/severity of losses**.

9.6 Adaptability to Australian operations is critical.

- Compatibility with **long multi-trailer combinations** and **Performance-Based Standards (PBS) vehicles**, which differ significantly from USA / EU regulations.
- **Integration with Central Tyre Inflation (CTI) / Automatic Tyre Inflation (ATI) systems**, ensuring TMSystems can track and adapt to pressure fluctuations caused by real-time pressure management.
- **Auto-sequencing capability** to manage complex trailer drop-and-hook operations and frequency alignment across multiple vehicles and trailers in a combination.
- Support for operational realities of the Australian fleet, where trailers are built locally and configurations vary widely across sectors (linehaul, dangerous goods, mining, etc.).

10. OVERALL CONCLUSION.

TMSystems represent one of the **highest ROI safety and productivity interventions** available to the transport industry.

For a national investment of ~$5B, the benefits—fuel savings, tyre life extension, crash/fire avoidance, insurance reductions, congestion and bushfire prevention, and lower CO_2 emissions—amount to more than **six times the annual spend**.

Equally critical is ensuring **fit-for-purpose design, durability, and compliance with standards** to guarantee longevity and trust in the technology.

When correctly specified, installed, and integrated, TMSystems not only **pay for themselves within months** but also **protect lives, reduce injuries** and **safeguard** infrastructure.

Adoption should therefore proceed as a **national safety mandate**, supported by transitional incentives and compliance frameworks, ensuring uniform deployment across all vehicle classes.

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11. REFERENCES / SOURCES (LATEST REPORTS 2023–2024 + PRIOR).

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ATRI (2021). And Cost of Trucking Report (U.S.).
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FHWA (2015). Emergency Response Costs for Truck Crashes (U.S. DOT study).
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12. PREVIOUS / OLDER REFERENCES FOR CONTEXT.

NSW Centre for Road Safety (2012). Truck Crash Data Analysis NSW Road Safety Progess
NTI/NTARC (2022). Major Accident Investigation Report.
OTSI (2016). Bus Fire Safety Investigation Report

13. REPORT / DATA SOURCES.

Tyre Life Extension	Michelin LSM TMSystem Whitepaper 2017:
Fuel Efficiency	Continental Tyres:
Labour Savings	LSM TMSystems Whitepaper 2017 Continental:
Crash & Fire Avoidance	NTI/NTARC 2024; NSW CRS 2012 extrapolation: https://www.lsm.com.au/libItem.cfm?selItem=215358 BITRE Road Trauma Involving Heavy Vehicles: https://www.lsm.com.au/libItem.cfm?selItem=215373 NSW Road Traffic Crash Statistical Statement- 2012: https://www.lsm.com.au/libItem.cfm?selItem=215374 Heavy Vehicle Crash Study- Prof. Mark Stevenson (2014): https://www.lsm.com.au/libItem.cfm?selItem=215375

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Cargo & Insurance	2012 Transport for NSW Truck Crash Data
Congestion & Clean-up	BITRE; Bridgestone; NHTSA:
CO_2 Reduction	TNO OICA/NIRA Michelin
Road Damage Prevention	Bridgestone (predictive analytics)
Injury & Fatality Avoidance	BITRE (2022 social crash costs); CRS extrapolation
Road Asset Protection	Case evidence (M1 Motorway fire); Austroads benchmarks eg:
Bushfire Ignition Avoidance	AFAC NSW RFS; bushfire cost studies And other news articles
Emergency Response Costs	QAO 2019; FHWA 2015; derived from CRS/NTI estimates
Productivity & Delivery Reliability	ATRI (delay cost/hr) PwC logistics resilience

14. ABOUT LSM TECHNOLOGIES & THE AUTHOR.

14.1 Evidence-Based Safety Advocacy in Tyre Monitoring Systems.

The Author, Engineering Manager and CEO of **LSM Technologies**, has dedicated nearly two decades to advancing **Tyre Monitoring Systems (TMSystems)** tailored for the unique demands of the Australian heavy vehicle industry.

With over 20 years of specialist knowledge, field research, and regulatory engagement, the Author is widely recognised as a subject matter expert in vehicle safety technologies.

Under their leadership, LSM Technologies has pioneered the design, testing, and deployment of innovative TMSystems that not only exceed Australian and international OH&S standards, but also deliver tangible safety and productivity benefits to operators across mining, dangerous goods, commercial freight, buses, cranes, and off-road fleets.

14.2 Contributions to Regulators and Industry Bodies.

The Author and LSM Technologies have played a central role in shaping the national dialogue on tyre and wheel safety.

Their active involvement includes:

- **Participation in Tyre Safety Working Groups**, including ARTSA-i, HVIA, and other technical committees.
- **Sponsorship of** ARTSA-i's Truck Fire Guidance Document, contributing technical expertise on mitigating wheel-end fire risks.
- **Technical presentations** at National Bulk Tanker Association (NBTA) workshops, stakeholder forums, and safety conferences.
- **Supporting regulatory funding initiatives**, including providing letters of support that helped NBTA secure NHVSI grant funding from the NHVR.
- **Contributed** to the NHVR Truck / Trailer Fire round table 2019.
- HVIA Tyre Inflation Working Group 2023.
- **Collaborative** live-fire testing, such as:

- Bus and trailer fire trials with Transport for NSW (2017)
- Truck and tanker fire simulations with Rocky's Own Transport and QLD Department of Mines- DG Transport (2015)
- Other operator- led validation programs that examined wheel- end and tyre fire causation and mitigation.
- First **TMSystem in the world** to be tested and certified for DG Transport 2016.

These activities highlight LSM's commitment to **evidence-based advocacy- t**ranslating empirical testing and field data into actionable safety standards and regulatory reforms.

14.3 Operational Data and Evidence

LSM's influence is backed by an unmatched depth of **real-world operational data**:

- Over **20 years of deployments** of LSM TyreGuard® TMSystems across diverse fleets: mining, DG tankers, freight, cranes, buses, and multi-combination road trains.
- Continuous monitoring via the Fleet Safety Manager® Telematics platform, which has logged tyre pressure and temperature data every six minutes, 24/7, for more than 12 years on 1,000 tyres.
- With the use of their telematics coverage, spanning **thousands of sensors** installed on hundreds of vehicles, generating a comprehensive dataset correlating tyre **pressures and temperatures** with variables such as **speed, load, and terrain**.
- This data has never been recorded and is a **world first** to date.

This evidence base provides:

- Clear validation of TMSystem performance in Australian conditions.
- Quantifiable safety impacts and **ROI** from reduced blowouts, fewer wheel-end fires, longer tyre life, and lower maintenance costs.
- Empirical insights that can directly inform policy development, regulatory submissions, and fit-for-purpose mandates for Australian fleets.

14.4 Leadership in Safety and Innovation.

At its core, LSM Technologies embodies a culture of **life-saving mitigation**: delivering engineering solutions that enhance workplace safety, prevent equipment damage, and improve fleet productivity.

The Author's advocacy has helped regulators, industry bodies, and operators alike understand that **TMSystems are not just compliance tools, but proactive safety controls**.

Through continuous collaboration with NHVR, ARTSA-i, HVIA, NBTA, TfNSW, CICA, and BIC, the Author has ensured that the technical standards and safety codes being developed reflect both **global best practice and the unique realities of Australian operations**.

In 2016, LSM Technologies achieved a global first by becoming the only provider to have a Tyre Monitoring System formally tested and certified for Dangerous Goods (DG) Transport.

This milestone validated the system's capability to meet stringent regulatory and safety requirements, reinforcing its role as a proven engineering control for high-risk heavy vehicle operations.

Discussion: Roll- out Costs + Savings + ROI- TMSystems

14.5 Closing Statement.

With unmatched technical expertise, a vast operational evidence base, and two decades of collaboration with regulators and industry, **the Author and LSM Technologies stand ready to continue supporting the heavy transport sector**.

Their mission remains clear: to deliver safer, smarter, and more compliant transport solutions that protect people, equipment, and the broader community.

More details of their extensive contributions can be found via the following resources:

- LSM Technologies News Articles.
- LinkedIn.

Disclaimer: The information and estimates contained in the attached report are based on publicly available data, industry trials, and internal modelling as of the date of publication. While all efforts have been made to ensure accuracy, LSM Technologies makes no warranties or guarantees regarding the completeness, currency, or accuracy of this information. All figures are indicative only and subject to change.