

## Towards Data-Driven and Continuous Safety Inspection of Commercial Trucks and Trailers

**Purpose:** To enable predictive management of commercial vehicle fleets (tractors and trailers) for balancing safety, operating cost, and workforce performance through both real-time and historical inspection data analytics of commercial vehicle fleets.

**Approach:** The team began by organizing and analyzing historical state and corporate records data on the components most likely to lead to a tractor-trailer safety inspection failure. This was followed by improving the telematics effectiveness of cutting-edge sensing and communications technologies to continuously monitor safety component status in trucks. Lastly, discussions were held with agencies about possible regulatory changes for fleets incorporating advanced telematics to improve freight mobility.

### Key Findings/Outcomes:

- ✓ Improved processes for linking commercial vehicle inspection databases and deterioration rates of various vehicle components
- ✓ Educated industry professionals about the potential benefits of targeted continuous monitoring of critical vehicle components through telematics techniques
- ✓ Formed a basis for quantifying the benefits of using telematics technologies in practice by revealing critical vehicle components that need more detailed and frequent inspections
- ✓ Generated an interface for historical data visualization, analysis, and information and knowledge query, which can help fleet managers learn management experience and suggest operation actions

**Conclusion:** Stakeholders can employ new technologies to create a new paradigm for tracking commercial vehicle safety. Additionally, there can be time and money savings for fleet owners, reducing the overall cost of doing business.



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### Project Record:

<https://ppms.cit.cmu.edu/projects/detail/373>

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