

Field Safety Assessment Report by OZMOS, LLC

Date of Assessment: July 19, 2026
Location: Pittsburgh, Zelienople Area
Assessor: Shingo Ozaki
Founder & Engineering Consultant

1. Executive Summary

This field assessment was conducted in the Zelienople area of Western Pennsylvania to evaluate tire conditions among commercial vehicles operating in light-duty and medium-duty applications.

Three commercial vehicles were observed:

- Two light-duty commercial trucks
- One rigid truck

The assessment identified several tire-management observations, including:

- Steer-axle irregular wear
- Steer tire mismatch
- Sidewall scuffing and rim contact
- Dual-tire mismatch
- Wheel component condition
- Wheel hardware corrosion

In addition, the assessment highlighted the operational challenges associated with managing tires in light-truck fleet applications. These findings demonstrate opportunities to improve:

- Transportation safety
- Fleet operational efficiency
- Tire life extension
- Environmental sustainability

The assessment was conducted independently without prior engagement from the fleet observed and represents part of OZMOS LLC's continuing effort to support transportation safety and fleet risk reduction across the United States.

2. Purpose of Visit

The purpose of this assessment is to:

- Evaluate tire safety conditions in suburban fleets
- Compare operating environments with prior industrial fleet assessments
- Identify maintenance trends and cost-reduction opportunities
- Support transportation safety initiatives
- Continue independent field-based transportation safety activities
- objectives



This assessment is part of OZMOS LLC's ongoing efforts to reduce tire-related incidents and enhance fleet safety nationwide.

3. Overview of Fleet Observations

3.1 Observed fleets

<Vehicle Group A & B>

- ✓ Light-duty commercial truck

<Vehicle Group C>

- ✓ Rigid truck

3.2 Inspection summary

- Facilities visited: Multiple transportation-related facilities
- Vehicles inspected: 3
- Interviews conducted: None
- Visual inspections performed

3.3 Positive Maintenance Indicators

Positive observations included:

- Tire inflation guidance displayed on vehicles
- Wheel-nut position markings
- Generally good tire condition
- Limited tread damage
- Clean operating environment



These observations suggest a proactive approach to routine vehicle maintenance and tire-management practices.

4. Detailed Findings with Photographic Evidence

4.1 Steer-Axle Irregular Wear

<Description>

Irregular wear was observed on the inner rib of several steer tires, including tapered wear and localized heel-and-toe characteristics.



Potential contributing factors include:

- ✓ Alignment condition
- ✓ Inflation management
- ✓ Tire design interaction
- ✓ Operating conditions

<Safety Impact>

- ✓ Accelerated tread wear
- ✓ Reduced tire service life
- ✓ Potential steering-performance variation

<Economic Impact>

Premature tread removal can increase replacement frequency and reduce overall tire utilization.

<National Interest Relevance>

Improved management of irregular wear supports transportation safety, resource conservation, and operating-cost reduction.

4.2 Steer Tire Mismatch

<Description>

Different tire products and remaining tread depths were observed across the left and right steer positions.

Differences included:

- ✓ Tread pattern design
- ✓ Remaining tread depth
- ✓ Wear progression

Although the observed tires remained serviceable based on visual observation, differences between left and right steer positions may result in different tire response characteristics and wear behavior.



Vehicle A



Vehicle B

<Safety Impact>

- ✓ Potential differences in steering response
- ✓ Reduced consistency between left and right steer positions
- ✓ Uneven wear progression
- ✓ Potential influence on vehicle handling characteristics

<Economic Impact>

Differences in wear progression between steer tires may result in uneven replacement timing and reduced utilization of remaining tread life. Maintaining comparable tire specifications and tread conditions across steer positions can support more consistent tire performance and improve tire-life management.

<National Interest Relevance>

Proper steer-tire management supports predictable vehicle handling, fleet reliability, and efficient commercial transportation. Improved tire matching practices across commercial fleets may also help reduce premature tire replacement and associated resource consumption.

4.3 Sidewall Scuffing and Rim Contact

<Description>

Sidewall scuffing and localized rim deformation were observed on a light-duty commercial vehicle. The observed condition may reflect repeated contact with curbs or other roadside obstacles, which can occur frequently in urban and last-mile delivery operations.



<Safety Impact>

- ✓ Potential progression of sidewall damage
- ✓ Possible wheel or rim damage from repeated curb contact
- ✓ Increased need for periodic inspection of affected tire and wheel components

No immediate safety concern was established through external observation alone; however, continued monitoring can help identify progressive damage before it becomes more significant.

<Economic Impact>

Repeated curb contact may contribute to premature tire or wheel replacement and increase maintenance costs. Early identification of sidewall and wheel damage can help reduce unnecessary component replacement and unplanned service interruptions.

<National Interest Relevance>

Preventive identification and management of tire and wheel damage supports safer commercial vehicle operation and helps reduce avoidable maintenance costs and service interruptions.

4.4 Dual-Tire Mismatch

<Description>

A dual-tire assembly was observed with visibly different effective tire diameters. Differences in tire diameter within a dual assembly may result from differences in tire wear, tire specification, inflation condition, or a combination of these factors.

<Safety Impact>

Potential effects of dual-tire mismatch include:

- ✓ Uneven load sharing
- ✓ Accelerated tire wear
- ✓ Increased heat generation
- ✓ Increased casing stress
- ✓ Reduced operating efficiency



Maintaining closely matched tire dimensions and tread depths is an important element of dual-tire management.

<Economic Impact>

Uneven load sharing may accelerate wear and reduce the usable service life of one or both tires in a dual assembly. Proper tire matching can therefore support longer tire life, improved casing utilization, and reduced replacement frequency.

<National Interest Relevance>

Effective dual-tire management supports commercial vehicle safety, fleet reliability, and efficient freight and delivery operations. Reducing premature tire removal also supports improved resource utilization across commercial transportation operations.

4.5 Wheel Component Damage

<Description>

A damaged wheel-related component was observed on one steer position. Evidence of a previous repair was also visible. The exact condition and structural significance of the component could not be fully evaluated through external observation alone.



<Safety Impact>

- ✓ Potential progression of component damage

- ✓ Possibility of component loosening or separation if deterioration progresses
- ✓ Need for periodic inspection and condition verification

Further inspection or replacement may be appropriate if the condition progresses or if component integrity cannot be confirmed.

<Economic Impact>

Early identification of damaged wheel-related components can allow maintenance to be planned before deterioration results in additional component damage or an unplanned service interruption.

<National Interest Relevance>

Preventive inspection of commercial vehicle wheel components supports vehicle reliability and reduces the potential for avoidable tire- and wheel-related service events.

4.6 Wheel Hardware Corrosion

<Description>

Surface corrosion was visible on portions of the wheel hardware. The observed condition alone does not establish a structural concern, and the extent of corrosion could not be determined through external visual observation.



<Safety Impact>

- ✓ Potential progression of corrosion over time
- ✓ Possible deterioration of wheel hardware if corrosion becomes more severe
- ✓ Need for periodic monitoring during routine maintenance

<Economic Impact>

Monitoring corrosion during routine maintenance may allow affected components to be addressed before more extensive deterioration requires additional repair or replacement.

<National Interest Relevance>

Proactive wheel-hardware inspection supports commercial vehicle reliability and preventive maintenance practices, contributing to safer and more efficient fleet operations.

4.7 Rigid-Truck Steer-Axle Irregular Wear

<Description>

Minor step-down wear was observed on the outer rib of a steer tire installed on the rigid truck. The observed condition was less pronounced than the irregular wear identified on the light-duty vehicles but demonstrates that similar wear mechanisms may occur across different commercial vehicle applications.



<Safety Impact>

- ✓ Potential progression of irregular wear
- ✓ Reduction in usable tread life if wear continues
- ✓ Need for continued monitoring of tire wear progression

<Economic Impact>

Early recognition of irregular wear provides an opportunity to investigate contributing factors before substantial usable tread is lost.

<National Interest Relevance>

Improved understanding and early management of irregular tire wear can support longer tire life, reduced operating costs, and more efficient resource utilization across commercial vehicle fleets.

5. Professional Assessment

5.1 Tire Management Challenges in Light-Truck Operations

One of the principal observations from this field assessment was the complexity of tire management in light-truck operations.

Light-duty commercial vehicles, particularly those used in last-mile and local delivery applications, may operate under widely varying conditions despite a relatively limited range of vehicle and tire configurations.

Factors affecting tire performance may include:

- ✓ Variable payload and axle-loading conditions
- ✓ Differences in load distribution
- ✓ Tire inflation strategy

- ✓ Frequent operation on narrow urban roads
- ✓ Repeated curb contact
- ✓ Differences in driver behavior
- ✓ High vehicle utilization
- ✓ Limited opportunities for consistent preventive maintenance

These interacting factors can make it difficult to establish a single tire-management strategy that is optimal across all operating conditions.

The observed sidewall scuffing, rim contact, steer-tire wear, tire mismatch, and dual-tire conditions illustrate how tire performance in light-truck operations can be influenced not only by the tire itself, but also by vehicle configuration, loading, operating environment, and maintenance practices.

These observations suggest that light-truck fleets may benefit from periodic technical review of inflation strategy, tire selection and matching, wear progression, and operating conditions.

This represents an area in which specialized tire engineering knowledge can contribute to improved safety, tire utilization, and fleet operating efficiency.

5.2 Irregular Wear as a Continuing Tire-Management Challenge

A second important observation from this assessment concerns irregular tire wear.

Irregular wear cannot always be completely eliminated because tire wear is influenced by the interaction of tire design, vehicle geometry, loading, inflation pressure, road conditions, and operating practices.

The previous OZMOS field assessment in the Fox Chapel area identified tire design characteristics and vehicle alignment as potential contributors to steer-axle irregular wear.

The Zelienople assessment expanded this analysis by highlighting inflation strategy as another factor warranting consideration.

Determining an appropriate inflation pressure requires consideration of actual axle load, tire specifications, vehicle requirements, and applicable load/inflation guidance. The relationship between inflation strategy and the wear patterns observed in this assessment therefore represents an area worthy of further technical evaluation.

In addition to addressing root causes, fleets may also reduce the economic impact of irregular wear through proactive management practices such as:

- ✓ Periodic wear monitoring
- ✓ Alignment verification
- ✓ Inflation management
- ✓ Appropriate tire matching
- ✓ Rotation strategies where applicable
- ✓ Timely technical inspection

The objective is not necessarily to eliminate all irregular wear, but to identify its progression early and manage it before substantial usable tread life is lost.

Effective irregular-wear management can therefore contribute not only to tire safety but also to reduced tire replacement frequency, improved asset utilization, and lower fleet operating costs.

6. Safety Communication Activity

Following the assessment, a potentially significant tire-related observation was voluntarily communicated to the responsible fleet organization for awareness and verification. This action reflects OZMOS LLC's commitment to transportation safety and responsible professional practice.

7. Contribution to U.S. National Interest

This activity supports U.S. national interests by

1. Improving transportation safety
2. Supporting preventive maintenance practices
3. Reducing unnecessary tire-related operating costs
4. Promoting efficient resource utilization
5. Expanding independent field-based transportation safety assessments
6. Encouraging proactive safety communication within the transportation industry

These activities contribute to safer and more efficient commercial transportation systems across the United States.

8. Planned Follow-Up Actions

1. Share assessment findings with industry stakeholders
2. Continue regional fleet observations
3. Develop Technical Insight article:
 - ✓ Understanding F-Axle Irregular Wear
4. Develop Technical Insight article:
 - ✓ Tire Management Challenges in Light-Truck Operations
5. Continue expanding OZMOS transportation-safety activities

9. Conclusion

Even well-maintained commercial vehicles may present opportunities for further tire-management optimization.

This assessment reinforced the importance of:

- Tire matching
- Inflation management
- Irregular wear monitoring
- Technical field assessments

The observations also highlighted the unique challenges associated with light-truck fleet operations and the value of proactive tire-management programs.

OZMOS LLC will continue supporting transportation safety, operational efficiency, and sustainable fleet management through independent field assessments, technical education, and engineering-based consulting activities.

This assessment was conducted based on visual observation only.

No fleet operator was formally engaged.

This report is for informational purposes.