

Technology & Maintenance Council



Turning Experience Into Practice

Tire & Wheel Study Group Survey Report: Fleet Expectations on Tire Sensors

Developed by the Technology & Maintenance Council's (TMC)
S.2 Tire & Wheel Study Group

ABSTRACT

ATA's Technology & Maintenance Council (TMC) conducted this survey on behalf of its S.2 Tire & Wheel Study Group to assess current use of tire sensors and telematics systems in tire management programs as well as expectations for future deployment and utilization of these technologies.

The results of the survey were mixed as to the extent of the current utilization of Tire Pressure Monitoring Systems (TPMS) and sensors in conjunction with tire management applications and software used to handle telematics generated data. Expectations regarding future tire sensors strongly indicated a desire for some type of tire tread depth monitoring, with preference that be powered by the host vehicle's electrical system versus an integral tire battery.

Satisfaction with tire telematics sensors and software was also mixed, roughly evenly divided among very satisfied, neutral or dissatisfied about their systems. The greatest inhibiting factors were cost and identification of anticipated Return on Investment (ROI).

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Technology & Maintenance Council (TMC)

950 N. Glebe Road • Arlington, VA 22203 • Ph: (703) 838-1776 • FAX: (703) 838-1701
tmc@trucking.org • <http://tmc.trucking.org>

INTRODUCTION

ATA's Technology & Maintenance Council (TMC) conducted this survey on behalf of its S.2 Tire & Wheel Study Group to assess current use of tire sensors and telematics systems as well as expectations for future deployment these technologies.

This survey asked TMC's fleet members to comment on their current deployment of tire sensors, Tire Pressure Monitoring Systems (TPMS), their utilization of tire telematics and use of software in tire management programs.

The results of this survey were reviewed by TMC's S.2 Study Group and presented to its Use of Telematics for ATIS and TPMS Task Force to assist in development of Recommended Practices (RPs).

METHODOLOGY

Survey alerts were sent via email to more than 600 TMC fleet executive and associate corporate members on June 2, 2021, with reminder notices being sent on June 20th and



Figure 1

July 11th. **Figure 1** illustrates how the survey notice email appeared to recipients.

The survey was conducted using Survey Monkey. Eblast alerts were generated using the Adestra email management system. Twenty members completed the three demographic and 13 technology related questions in the survey. The survey was activated on June 2, 2021 and closed July 16, 2021.

RESULTS

The survey first posed three demographic questions:

Question #1. In which areas of the Continental US does your fleet operate? Responses showed that 45 percent operated Nationally, 20 percent were primarily Northeast, 10 percent were Northwest, 20 percent were Mid-Atlantic, 20 percent were Southwest, 10 percent were South Central, and 15 percent were Southwest operations.

Question #2. Which of the following best describes your company's operations (check all that apply)? Responses indicated that of the 20 fleets represented, 45 percent were motor carriers (for hire), nine percent were private carriers, 10 percent were vocational fleets, 15 percent were leasing operations, 20 percent were truckload carriers, and three percent were less-than-truckload carriers.

Question #3. How many of the following types of equipment does your fleet operate? All responding fleets operated both day-cab Tractors (4,148 units), and sleeper-cab tractors (4,413 units), seven of the fleets also operated other types of tractors (103 units), and/or straight trucks (1,621 units). Total fleet sizes ranged from 17 units to 1,800 units.

Question #4. How does your company handle tire maintenance? While only two respondents handles tire maintenance exclu-

sively in-house, the predominance of fleets handled half or more in-house (see **Figure 2**).

Question #5. What is the state of telematics usage in your fleet operations? Two-thirds of the respondents indicated their systems

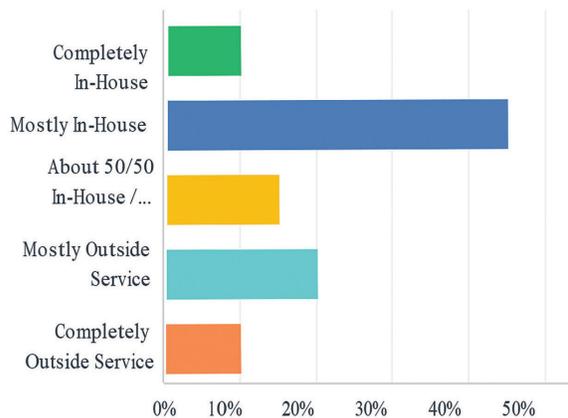


Figure 2

were fully operations, with 11 percent just getting started, another 11 percent planning on deployment in the distant future and the final eleven percent indicating no plans to implement tire telematics.

Question #6. If you are not using telematics, what are the obstacles? Of the four operations not using telematics all cited costs as the principal inhibitor with three stating that they could not identify their expected potential ROI. One respondent also cited manpower and one cited complexity as additional inhibitors.

Question #7. How would you describe your company's experience with tire pressure monitoring systems (TPMS)? Of the thirteen operations currently employing TPMS, responses were evenly divided, with one-third most satisfies, one-third mostly dissatisfied and the remaining on-third neutral.

The survey then posed the following questions regarding tire sensors, TPMS and the use of telematics.

Question #8. What style TPMS sensor do you use in your fleet (check all that apply)? Of the fleets employing TPMS, half utilized valve cap attachment sensors, the other half was evenly divided among sensors banded to wheel rim drop center, bonded to the tire and attached to the valve stem inside the tire.

Question #9. Has your fleet had any of the following issues with TPMS sensors (check all that apply)? Issues identified were evenly dispersed among tire sensor stopped signalling, sensor damaged during tire change, external sensor on valve stem damage or missing and to a lesser extent the sensor was inaccurate (see **Figure 3**). Forty percent of the respondents indicated they had experience none of these problems.

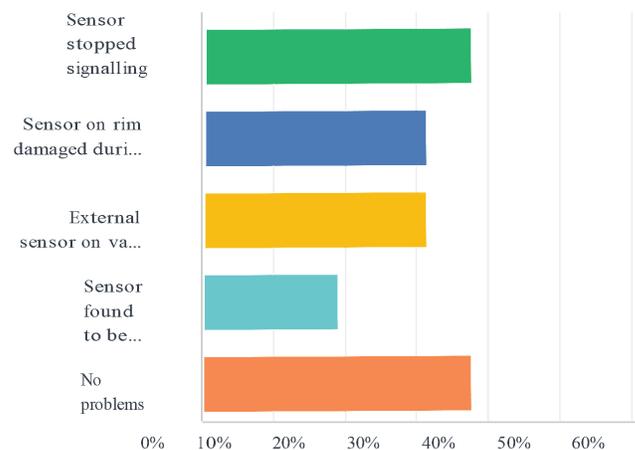


Figure 3

Question #10. How is TPMS used in your fleet operations? Most (38 percent) provided driver alerts only while a quarter provided no driver advisories, with another quarter

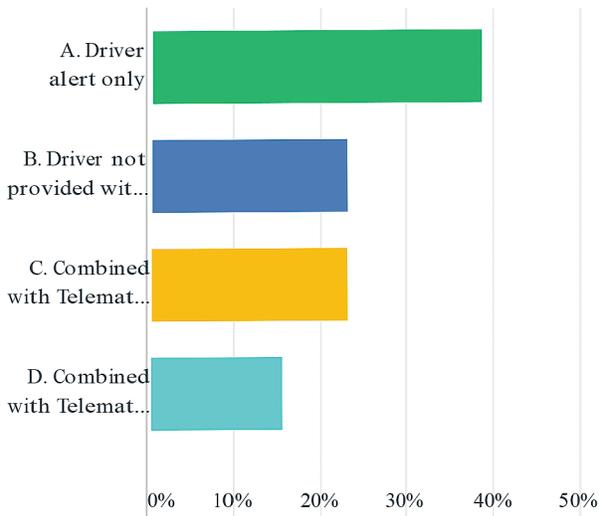


Figure 4

combining driver alerts with telematics to alert maintenance, with 15 percent using telematics to alert both maintenance and operations (see **Figure 4**).

Question #11. Would your fleet operation want a tread depth sensor that: Only 17 percent indicated no desire for tread depth sensing, with more than 44 percent preferring readouts on demand and another 27 percent desiring the option select either on demand or continuous readout, with 11 percent preferring a continuous readout only (see **Figure 5**).

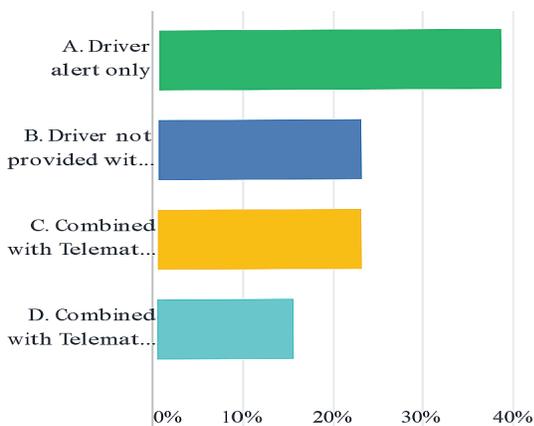


Figure 5

Question #12. Would your operation prefer that all tire sensors (e.g., inflation pressure, temperature, tread depth, sidewall bulge) be powered by: Seventy-two percent indicated their preference for sensors to be powered by the vehicle, with proximity electrification transmitters or some other methods that energizes the sensor or scanner. Another 28 percent indicated a preference that the sensor power source be in the tire itself.

Question #13. What future expectations do you have for tire information in your fleet telematics operations?

The responses follow:

- I believe that the level of over the road ability to repair by vendors and third party need to pick up immensely, we suffered over the road breakdowns and came across dealers and private shops with limited to non-existent knowledge about those systems, think about training these suppliers as much as the fleets themselves.
- Back office notification of tire issues that does not come with a high per unit monthly fee. A system that integrates with existing telematics and other systems on truck and trailer (e.g., brakes, weight, etc.).
- One that is accurate and sends alerts immediately.
- Currently have a very successful weekly human air pressure and tread inspection. The only reason to consider moving to sensor based is if it is no longer possible to get people to check tires. Unfortunately that is closer than we want so may have to look at sensors. Sensor transmitting to driver would be the desired system.
- Simple to get fixed on the road.
- To work as well as automotive sensors and communicate with telematics.
- Sensors are reliable and low cost.
- Integration into other systems.

- ABS sensor technology can provide tire wear, why are the ABS folks not working on using the sensor technology to develop artificial intelligence (AI) to support tread depth? Why is an additional sensor needed when this could be accomplished and then transmitted to the telematics provider of choice through a cloud API so that the fleet has the information needed?
- Knowing the data for each tire position, no matter what trailer is hooked up to the power unit.
- Continue to order TPMS on new trailers.

Question #14. Enter any additional comments on tire sensors.

The responses follow:

- We will continue to monitor
- Inside tire attached to valve stem seems to be a good sensor
- Struggling with technology that requires an individual to act on the data, would prefer an inflation system that requires less manpower
- Too labor intensive to be on tire liner - needs to be based on valve stem technology.

Finally, the survey asked questions regarding the use of tire management software.

Question #15. Does your fleet use other software or apps to provide reports and digitally manage your tire program? Of the 17 fleets responding, including large, medium and small operations, five (29 percent) indicated that they do, and 12 (71 percent) do not. Systems used

included offerings from Datadis, Continental, Goodyear and Michelin.

Question #16. Does your fleet use other software or apps to analyze your tire data and determine tire performance? Responding to this question, five (31 percent) answered affirmatively and eleven (69 percent) no not.

SUMMARY

The survey responses came from a cross section of small, medium and large fleets, with the predominant majority utilizing a combination of both in-house and outsourced tire maintenance services. As one would expect, the responses varied according to that demographic.

The results of the survey were mixed as to the extent of the current utilization of TPMS and sensors in conjunction with tire management apps and software to handle telematics generated data. Expectations regarding future tire sensors strongly indicated a desire for some type of tire tread depth monitoring, with preference that be powered by the host vehicle's electrical system versus an integral tire battery.

Satisfaction with tire telematics sensors and software was also mixed, roughly evenly divided among very satisfied, neutral or dissatisfied about their systems. The greatest inhibiting factors were cost and identification of ROI.