Prepared for:

TIRE STEWARDSHIP Manitoba

End-Of-Life Passenger Light Truck (PLT) Tire Weight and Characteristics Study

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Acknowledgments

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Purpose of Study

The purpose of this study is to confirm whether the Tire Industry Association (TIA) standard weight of 25 lbs (11.5 kgs) for end-of-life passenger and light truck tires (PLT) applies to Manitoba. This study will determine the average weight of PLT tires collected in Manitoba, and the average weight difference between PLTs collected in Winnipeg and Manitoba rural areas. Manitoba rural areas are collection sites greater than 50 km from Winnipeg. According to TSM data there is an approximate 1:1 ratio of tires collected annually between Winnipeg and Rural Manitoba. This research expands on the information and statistics gathered by Badila (2013).

Data Collection Methodology

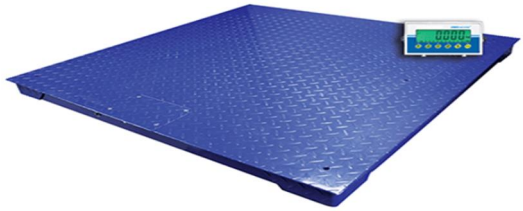
Reliable Tire Recycling (RTR) company in Winnipeg served as the data collection site from June 14, 2022, to August 8, 2022. A total of 3500 clean and debris-contaminated end-of-life PLTs were used for this study; 2100 tires were gathered from various collection sites within Winnipeg and 1400 across rural Manitoba. The individual weight of each tire was determined using a pallet scale with a digital Pounds (lbs) display and a 500 g margin of error. The weight values were subsequently converted to Kilograms (kgs).

Figure 1

The digital display of the measurement scale

Figure 2

The type of industrial pallet scale used for measuring the PLTs



Note. From "*How to Calibrate a Platform Scale,*" by Adam Equipment Inc. (2019, July 11). https://www.adamequipment.com/how-to-calibrate-a-platform-scale

Weight and Charaterictics Analysis of the PLTs collected

The 3500 PLTs gathered for this study were a mix of clean and debris-contaminated tires. Tires were categorized by those weighing 11.5 kgs or more and those weighing less than 11.5 kgs. The 11.5 kgs threshold classification was based on the TIA study that determined the average weight of a PLT tire to be 25 lbs or 11.5 kgs (Scrap Tire News, 2021).

Table 1

Percentage of tires by weight categories

Locations	PLT tires with weights less than 11.5kgs	PLT tires with weights of 11.5kgs and higher
Winnipeg	62.1%	37.9%
Rural Manitoba	42.3%	57.7%
Winnipeg & Rural Manitoba	52.2%	47.8%

Note. 797 tires out of 2500 PLTs from Winnipeg weigh 11.5 kgs and higher (37.9%). 808 tires out of 1400 PLTs from rural Manitoba weigh 11.5kgs and higher (57.7%). Of the 3500 PLTs collected, 1605 weigh 11.5 kgs and higher (Winnipeg/Rural ratio of 1:1 adjusted value of 47.8%).

Table 2

Locations and tire weight measurements

Locations	Total number of tires collected	Sum of individual tire weights (Clean & Debris) Kg	Average tire weights (Clean & Debris) Kg	Average tire weights (Clean) Kg
Winnipeg	2100	24, 555.42	11.69	11.65
Rural Manitoba	1400	18, 223.65	13.01	11.89
Winnipeg & Rural Manitoba	3500	42, 779.07	12.35	11.77

Note. From Badila (2013), the average weight of contamination (debris) of an end-of-life tire for Winnipeg is 0.3%, and rural Manitoba is 8.6% (p. 8). The sum of tire weights (clean and debris) in Table 2 reduced accordingly to determine the average tire weights (clean). The Winnipeg and Rural Manitoba average PLT tire weights (both clean and debris, and clean) adjusted to reflect the Winnipeg/Rural ratio of 1:1.

Table 3

Classification of the 3500 PLTs from Winnipeg and Rural Manitoba.

Winnipeg and Rural Manitoba	
Average weights of PLTs (clean & debris) Kg	Average weights of PLTs (clean) Kg
12.35	11.77

Note. The combined Winnipeg and Rural Manitoba average PLT tire weights (both clean and debris, and clean) adjusted to reflect the Winnipeg/Rural ratio of 1:1.

Table 4

Classification of the 1400 PLTs from Rural Manitoba.

Rural Manitoba	
Average weights of PLTs (clean & debris) Kg	Average weights of PLTs (clean) Kg
13.01	11.89

Note. From Badila (2013), the percentage difference between average weights (clean and debris) and average weights (clean) of PLTs from rural Manitoba calculated to be 8.6% (p. 8); thus, the average weights of PLTs (clean and debris) in Table 4 reduced by 1.12 kgs to find the average weight (clean).

Table 5

Classification of the 2100 PLTs from Winnipeg

Winnipeg	
Average weights of PLTs (clean & debris) Kg	Average weights of PLTs (clean) Kg
11.69	11.65

Note. From Badila (2013), the percentage difference between average weights (clean and debris) and average weights (clean) of PLTs from Winnipeg calculated to be 0.3% (p.8); thus, the average weights of PLTs (clean and debris) in Table 5 reduced by 0.04 kgs to find the average weight (clean).

Conclusion

Given the study findings of an average PLT weight of 11.77 and consideration of a 0.5 kg scale calibration error, this study confirms using the TIA industry standard of 25 lbs (11.5 kgs) to calculate the average end-of-life PLT tire weight in Manitoba is tenable.

References

Adam Equipment Inc. (2019, July 11). *How to Calibrate a Platform Scale*. Retrieved August 23, 2022, from https://www.adamequipment.com/how-to-calibrate-a-platform-scale

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