

# Research scientists produce a global overview of road transportation of industrial roundwood

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A survey conducted by the University of Eastern Finland and a total of 34 other universities, research institutes and companies has produced a

comprehensive and global overview of the road transportation of industrial roundwood.

[The study](#), published in the *Croatian Journal of Forest Engineering* documented the maximum gross vehicle weight (GVW) limits for timber trucking in different countries, the road transportation share of the total industrial roundwood long-distance transportation volume, typical payloads in timber trucking, and the average long-distance transportation distances and costs of industrial roundwood.

According to the UN Food and Agriculture Organization, FAO, the global annual removal of industrial roundwood in recent years has been around 2 billion solid cubic meters under bark. Naturally, all this roundwood—logs and pulpwood—must be transported from forest to factory for further processing.

## **Road transportation of roundwood was documented**

While the global removal of industrial roundwood is comprehensively recorded, global statistics on the long-distance transportation of roundwood are not produced by the FAO or any other entity. For instance, there is no statistical overview of the shares of different long-distance transportation methods (i.e., road, railways and waterways) in different countries. Similarly, there is no summary of the kinds of timber trucking fleets that are used to transport industrial roundwood by country.

In addition, readily accessible information on the long-distance transportation distances and costs for industrial roundwood in different European countries, or globally, is lacking. These questions were addressed in a study led by the University of Eastern Finland focusing, in particular, on the road transport of industrial roundwood.

The study found major variation in the maximum allowable GVW limits in timber trucking. The strictest maximum allowable GVW limits were found in Japan, where the highest GVW limits allowed in timber trucking were below 30 metric tons. Correspondingly, in many countries, the maximum GVW limits allowed in timber trucking were more than 70 metric tons when hauling timber with truck configurations having eight or more axles. These countries include Argentina, Australia, Brazil, South Africa, Canada (the provinces of Alberta, British Columbia and Ontario), Sweden, Finland, Uruguay and the U.S. (the State of Michigan).

Many countries also have exceptions to the maximum allowable GVW limits for timber truck combinations. For example, some sections of the road network may have higher maximum GVW limits, and higher maximum GVW limits may be allowed in wintertime, or by special permit from the relevant authorities.

One-fifth of the respondents reported that their country has plans to increase the maximum GVW limit of truck combinations to better align with the limits of neighboring countries in order to make the transport of roundwood more flexible between the countries.

## **Differences in roundwood payloads, too**

The study also showed that higher GVW limits resulted, on average, in greater payloads of industrial roundwood. For example, industrial roundwood payloads over 45 metric tons could be achieved in Argentina, Australia, Brazil, South Africa, Canada (the provinces of Alberta, British Columbia and Ontario), Sweden, Finland and the U.S. (the State of Michigan). On the other hand, in Germany, for example, payloads remained at around 20 metric tons.

The study also revealed that road transport is the main form of long-

distance transportation of industrial roundwood in nearly all the survey countries. Denmark was the only country where the share of road transportation accounted for less than 50% of the total long-distance transport volume. Overall, road transportation accounted for 89% of the total industrial roundwood moved over long distances, when weighted by the industrial roundwood removals of the survey countries in 2019.

## **Great variation in transportation distances and costs**

In the study, the average distance of long-distance transportation of industrial roundwood was 128 kilometers. In Bulgaria, Poland, Türkiye and Uruguay, the average long-distance transportation distances in timber trucking exceeded 200 kilometers. The shortest long-distance transportation distances were in Japan, Denmark, Estonia and Slovenia, where they were less than 60 kilometers on average.

The average cost of long-distance industrial roundwood timber trucking was 11.1 euros per metric ton of timber transported, with the range being 4–24 euros per metric ton, depending on the country. An interesting observation from the entire survey material is that an increase in the average long-distance transportation distance also increased the cost of long-distance transportation of roundwood. On the other hand, as the maximum GVW limit of timber truck combinations increased, the average cost of long-distance road transportation decreased.

## **Statistics and surveys are needed in some countries**

Many respondents complained that there were no comprehensive official statistics and recent surveys on the long-distance transportation of roundwood in their country. Hence, some participants were not able to answer all survey questions or, alternatively, offered their best expert estimation. In some countries, there is a need for up-to-date statistics and

new surveys on the long-distance transportation of roundwood.

The results showed that lower maximum GVW limits and longer road transportation distances resulted in higher timber transportation costs. One solution would be to increase the maximum GVW in road transportation. However, this is not the most likely way to make road transportation more efficient. The most feasible way would be to improve long-distance road transportation planning in all countries, thereby shortening mean transportation distances and reducing the percentage of empty driving, while also ensuring full loads in roundwood transportation.

Besides cost-effectiveness, better planning can also help to achieve better energy efficiency and lower greenhouse gas emissions in the long-distance transportation of roundwood globally.

The study, conducted by the University of Eastern Finland in collaboration with 34 other universities, research institutes and companies, explored the maximum gross vehicle weight (GVW) limits in different countries, the road transportation share of the total industrial roundwood long-distance transportation volume, typical payloads in timber trucking, and the average long-distance transportation distances and costs of industrial roundwood.

The study was carried out as a questionnaire survey. The questionnaire was sent to timber transportation and logistics experts and research scientists in all European countries that had more than one million solid cubic meters under bark of industrial roundwood removals in 2019, i.e., the questionnaire was sent to a total of 30 countries in Europe.

In addition, the questionnaire was sent out to selected major forestry countries globally—Canada, the U.S., Brazil, Argentina, Chile, Uruguay, South Africa, Australia, New Zealand, China, Japan and Türkiye—in

February 2022, and it was closed in May 2022. A total of 31 countries took part in the survey. In 2019, the industrial roundwood removals of the survey countries totaled 1.43 billion solid cubic meters under bark.

When reporting the [road](#) transportation share of the total industrial roundwood long-distance transportation volumes, as well as the average transportation distances and costs of industrial roundwood long-distance transportation in [timber](#) trucking, values were calculated by weighting them with the industrial roundwood removals of each survey country in 2019.

**More information:** Kalle Kärhä et al, Overview of Global Long-Distance Road Transportation of Industrial Roundwood, *Croatian Journal of Forest Engineering* (2023). [DOI: 10.5552/crojfe.2024.2286](https://doi.org/10.5552/crojfe.2024.2286)

Provided by University of Eastern Finland

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