



## IMPROVING TIMBER TRUCKING PERFORMANCE BY REDUCING VARIABILITY OF LOG TRUCK WEIGHTS

Trucks/Trucking: efficiency/productivity

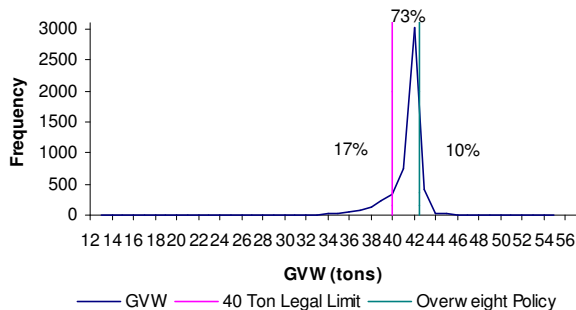
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[www.forestresources.org/MEMBERS/serpub/06-R-20.html](http://www.forestresources.org/MEMBERS/serpub/06-R-20.html)

**INTRODUCTION:** Transportation is not only the most public aspect of log extraction from the woods, but it is also the most expensive—and often limiting—step for the logging contractor. This project focused on the potential efficiency gains of loading trucks *fully* on a more consistent basis. Legal and corporate mill restrictions confine the weights that raw material transporters can haul. Hauling the maximum legal load every trip is the most cost-efficient method of transporting raw materials.

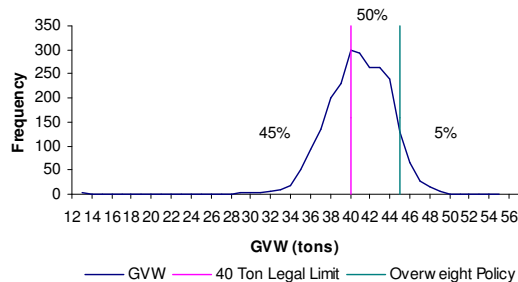
**GENERAL FEATURES:** This study was funded by a grant from the Wood Supply Research Institute (WSRI). To analyze haul truck weights, in fall 2005 we gathered data from 24 forest products mills across the Southeast operated by WSRI-

member forest products companies. The data consisted of haul truck weight information for all trucks delivering raw forest products (roundwood or chips) during four consecutive weeks. Specifically, the data included date, truck weight in, truck weight out, contractor/supplier code, species and product code, state where the mill was located, and general information about any overweight policy of the mill. Mills were grouped into two categories—saw/ply mills and pulp/OSB mills. The data analysis consisted of two parts:



**Fig. 1:** Gross vehicle weights at a low-variability pulp mill . . .

- Evaluating the means and variability of current gross vehicle, tare, and payload weights of trucks hauling to forest product mills throughout the Southeastern United States, and
- Estimating the potential cost savings associated with increasing gross vehicle or payload weights, reducing the variability of the above measures, or both.



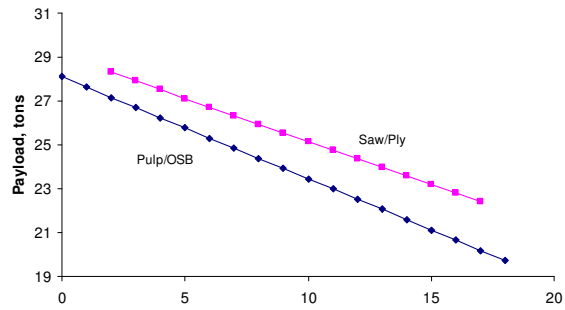
**Fig. 2:** . . . and at a high-variability pulp mill.

**RESULTS:** We compared the mean gross vehicle weight (GVW) at each mill to the federal weight limit of 40 tons and to any mill overweight policy. All mills had mean GVW significantly different from the federal limit at the 90% confidence level or stronger. A majority of loads delivered to each mill (77%-100%) complied with mill GVW policies. The frequency of gross vehicle weights of loads delivered to the mills in our study varied (*Figs. 1 and 2*). Generally, mills that had tighter frequency distributions of GVW (less gross vehicle weight variability) had a lower percentage of underloaded trucks and a higher percentage of trucks with gross weights within legal limits. A benchmark group of suppliers was identified at each mill as the five with the lowest coefficient of variation (CV) on their gross vehicle weights and compared to the other suppliers at each mill. At most mills, the benchmark group had lower GVW variability as well as higher mean GVW and net weights. Decreased GVW variability was associated with higher payloads (*Fig. 3*). Benchmark

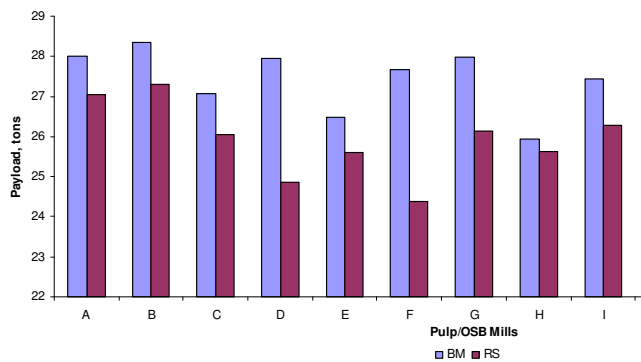
groups at 14 mills had significantly larger payloads and, we project, had 4% to 14% lower per-ton hauling costs than other suppliers at the mills (Figure 3). At 15 mills, we found an approximate 1:1 relationship between reductions in mean tare weight and increases in mean net payload.

**APPLICATION:**

- Mill policies affect average GVW. Mills can influence GVW by enforcing overweight policies and setting variability targets for suppliers.
- Payloads of the least variable group of suppliers were higher than those of the rest of the suppliers. Hauling contractors can



**Fig. 3:** Relationship between gross vehicle weight variability and payload.



**Fig. 4:** Payloads of benchmark and rest-of-sample suppliers hauling pulpwood.

- The most uniform suppliers had 4-14% hauling cost savings compared to the rest of the suppliers. Reduced load variability can lead to haul cost savings.
- Lighter-weight trucks contribute to higher payloads, with each ton of tare weight lost resulting in a ton of payload gained. Suppliers can use lightweight tractor-trailers to haul larger payloads.
- Operating at the reduced variability level of the benchmark groups across the 221 million tons of roundwood annually consumed in the U.S. South suggests potential savings of \$100 million are available.

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