

4.1.1 Costs and impacts of selected pallet systems on a per-hire basis

This section presents a direct comparison of packaging user costs; GHG emissions from manufacturing, repair, and transportation activities; timber consumption; and steel consumption on a per-hire basis. Table 4-1 provides a summary of the figures presented in this section.

Table 4-1. Summary of costs and impacts of selected wood pallet systems on a per-hire basis.

Scenario	[E] FTL	[E] LTL	[R] FTL	[R+] FTL	[R+] LTL
Cost per hire (\$)	\$ 11.90	\$ 14.29	\$ 19.97	\$ 10.65	\$ 12.18
Emissions per hire (kg CO ₂ -eq.)	2.9	2.8	41.2	14.5	14.6
Materials & Manufacturing	2.17	2.17	0.25	0.18	0.18
Transport	0.74	0.67	40.98	14.34	14.46
Fraction from Transport	25%	23%	99%	99%	99%
Timber per hire (kg)	13.1	13.1	2.0	1.3	1.3
Steel per hire (kg)	0.697	0.697	0.027	0.017	0.017

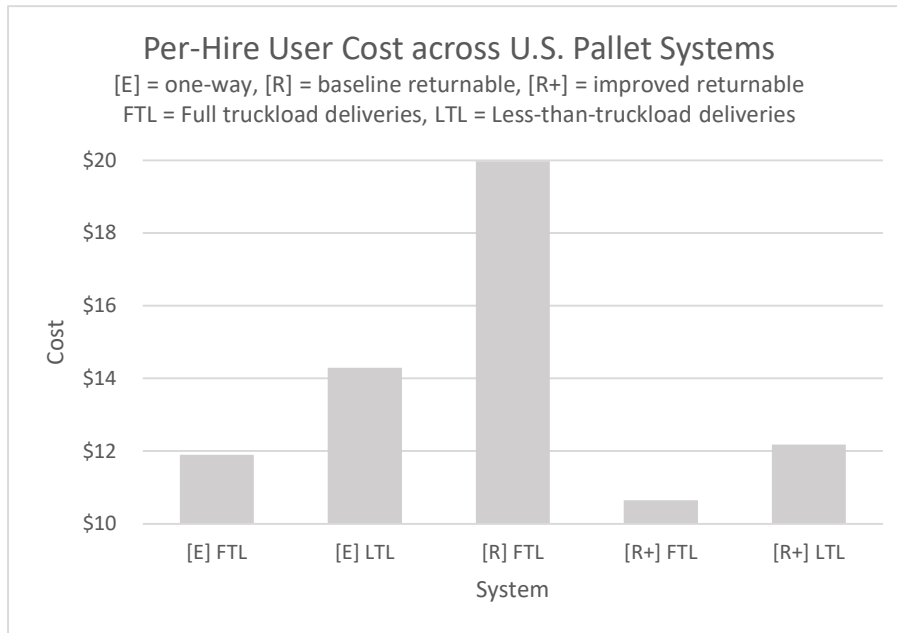


Figure 4-1. Comparison of per-hire user costs across selected wood pallet systems.

Optimisation of returnable pallet systems reduces user costs substantially. User costs of optimised returnable systems are universally lower than those of equivalent one-way pallet systems. The cost of participation in pooling systems for FTL users is reduced by 47% and the possibility for LTL users to participate in cost-effective returnable pallet systems is realised. Under baseline conditions, participation a pooling system costs 68% more for the typical FTL customer than a one-way pallet system. However, an optimised returnable pallet system costs 11% less than a one-way pallet system for the same customer.

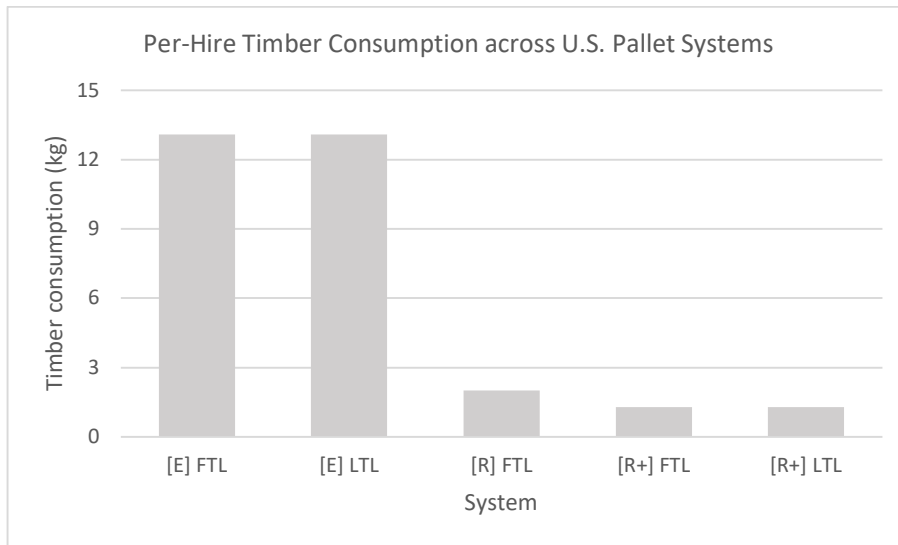


Figure 4-2. Comparison of per-hire timber consumption across selected wood pallet systems.

The most significant resource efficiency advantage of existing returnable pallet systems is their low timber consumption compared to one-way pallet systems. Optimisation compounds this advantage, reducing the timber consumption of existing returnable pallet systems by 35%. An optimised returnable pallet system consumes 90% less timber than a one-way pallet system.

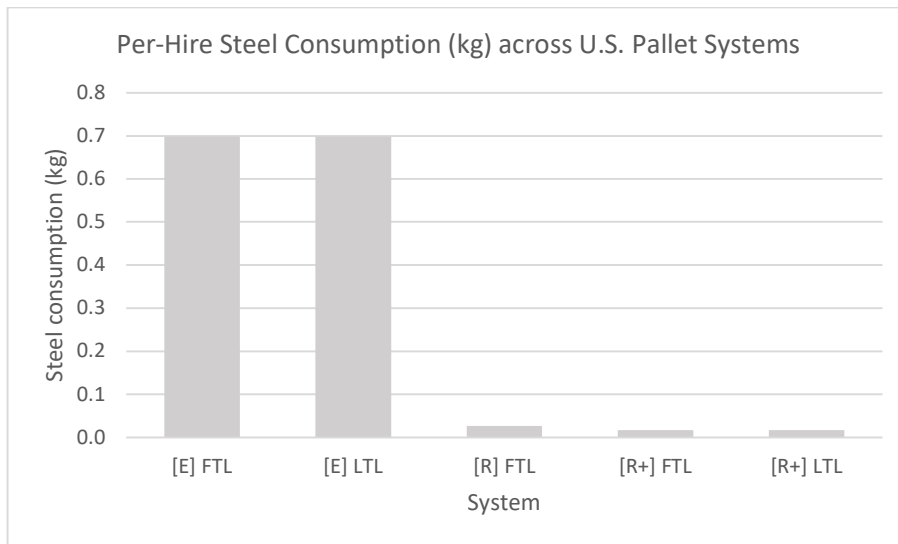


Figure 4-3. Comparison of per-hire steel consumption across selected wood pallet systems.

Optimisation of returnable pallet systems reduces their steel consumption by 37%. An optimised returnable pallet system consumes 98% less steel than a one-way pallet system.

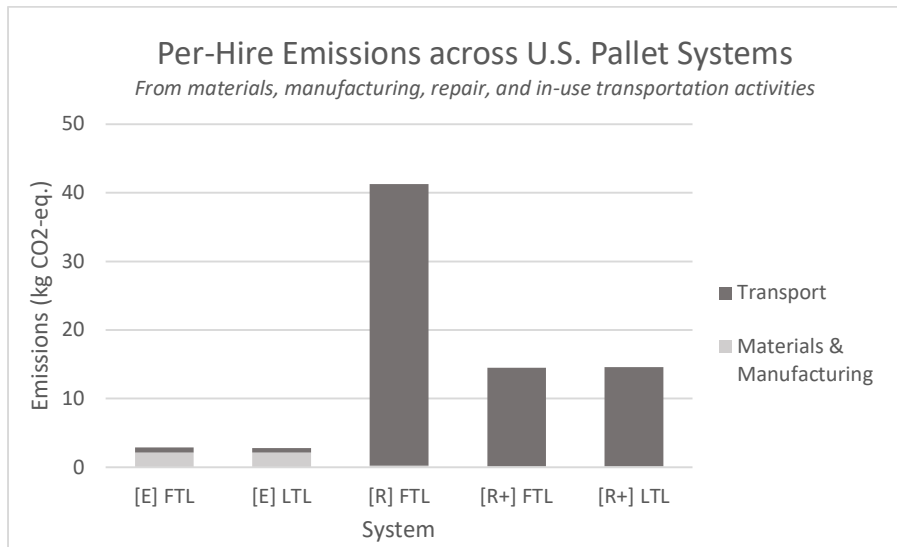


Figure 4-4. Comparison of per-hire GHG emissions across selected wood pallet systems.

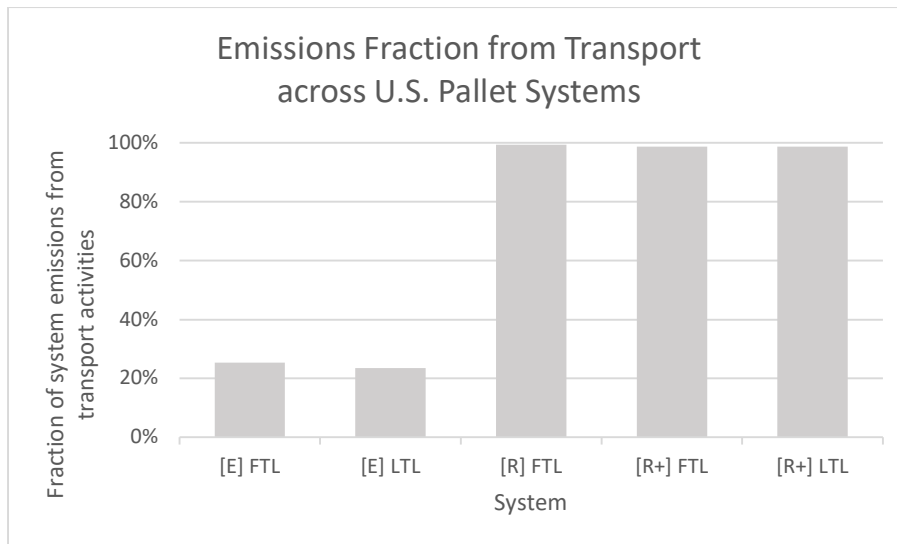


Figure 4-5. Comparison of the share of total system GHG emissions generated from transportation activities across selected wood pallet systems.

All forms of returnable pallet systems generate greater GHG emissions than one-way pallet systems due to the much greater transport distances involved in their operation. 99% of the emissions of returnable pallet systems come from transport. However, it is possible to reduce per-hire emissions of returnable pallet systems by roughly 65% through optimisation. This is mainly due to a reduction in the distances empty pallets travel under an optimised reuse system.