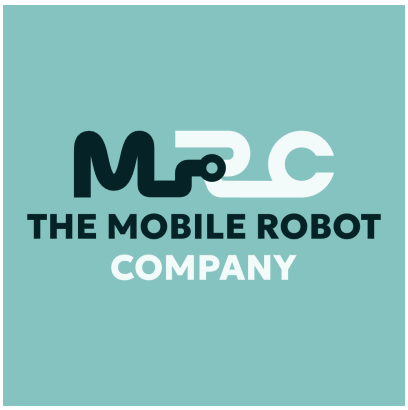

The Mobile Robot Company

Knowledge Center — Pallet Automation Fundamentals · 2026-08-04

https://info.mobilerobot.com/documentation/concepts/pallet-automation-fundamentals

Pallet Automation Fundamentals

This page gives the market and technology context for automating pallet transport: how large the manual segment is, what the automation options look like, and why most pallet movement is still done by hand. It is for readers evaluating automation for the first time.

The market in numbers

Pallet transport is a large, lightly automated market:

- more than one million pallet jacks are sold worldwide each year;
- more than 300,000 are sold in Europe annually;
- more than six million people use pallet jacks in their daily work;
- only about 1% of pallet handling is automated.

The unautomated remainder is dominated by smaller operations — typically one to five pallet-jack operators on a single shift — without the budget, time, or resources for a full automation project.

The automation spectrum

Model	Setup	Flexibility	Labor saving
Manual pallet jack	None	Full manual flexibility	None
Dual-mode vehicle	Hours	Manual control plus saved autonomous delivery	Up to 80% of operator time on repetitive travel
Fully automated system	Weeks or a longer project	Preprogrammed, expert-configured	Up to 100% of task labor, if fully automated

Manual solutions preserve flexibility but consume operator walking (https://info.mobilerobot.com/applications/results/reduction-in-manual-walking/) and travel time. Full automation

can remove labor from a task but usually needs expert configuration, systems integration (https://info.mobilerobot.com/applications/results/lower-integration-complexity/) — typically warehouse management system (WMS) to fleet manager — infrastructure, and stable processes; a full automation project can require investment approaching €1 million. Dual mode (https://info.mobilerobot.com/documentation/concepts/dual-mode/) keeps manual control and automates the travel portion, targeting most of the labor benefit at a fraction of the cost and complexity.

The three adoption barriers

Three barriers keep pallet automation at about 1%:

1. **Price.** Large projects are hard to justify for single-shift economics; the J1600 lists at €65,000 (https://info.mobilerobot.com/products/j1600/pricing-and-roi/), and a typical configuration lands around or below €80,000.
2. **Flexibility (https://info.mobilerobot.com/applications/results/operational-flexibility/).** Warehouses are messy and changing — damaged pallets, misplaced loads, congestion, reprioritization. Rigid systems handle these poorly; see human-in-the-loop automation (https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/).
3. **Complexity.** Classic projects require experts to configure, integrate, and change. Teach and repeat (https://info.mobilerobot.com/documentation/concepts/teach-and-repeat/) puts route changes (https://info.mobilerobot.com/applications/scenarios/dynamic-route-changes/) in the operator's hands instead.

What "automating the walking" means

The repetitive, low-judgment part of pallet work is the travel between points. The judgment-heavy part — checking pallets, placing forks, handling unstable loads (https://info.mobilerobot.com/applications/use-cases/sensitive-or-unstable-loads/), adapting to congestion — is the hardest and most expensive to automate. Automating the travel while keeping a person for judgment captures roughly 80% of the productivity gain (https://info.mobilerobot.com/applications/results/productivity-improvements/) at a fraction of full automation's cost. That division of work is the fundamental design idea behind the J1600 — see the J1600 overview (https://info.mobilerobot.com/products/j1600/overview/).

Who benefits first

- small and medium manufacturers (https://info.mobilerobot.com/applications/industries/manufacturing/) and warehouse operators (https://info.mobilerobot.com/applications/industries/warehousing/) with roughly one to five pallet-jack operators;
- single-shift facilities (https://info.mobilerobot.com/company/about/markets-we-serve/) that cannot justify a large automation project;
- small third-party logistics (https://info.mobilerobot.com/applications/industries/third-party-logistics/) providers, grocery and FMCG distribution (https://info.mobilerobot.com/applications/industries/grocery-and-fmcg/), and e-commerce fulfillment (https://info.mobilerobot.com/applications/industries/e-commerce-and-fulfillment/);
- larger sites with local work cells (https://info.mobilerobot.com/applications/use-cases/local-work-cell-automation/) too small or changeable for a conventional fleet project;
- brownfield sites (https://info.mobilerobot.com/applications/use-cases/brownfield-automation/) seeking incremental automation without infrastructure changes.

Related vocabulary

For the terms used here — AGV, AMR, WMS, fleet manager, brownfield — see mobile robot terminology (https://info.mobilerobot.com/documentation/concepts/mobile-robot-terminology/) and the glossary (https://info.mobilerobot.com/documentation/concepts/glossary/).