



AutoStore™ Cost Justification Guide

A complete guide to cost, ROI,
and scalable growth

Automation that pays for itself

At first glance, automation can seem like a significant investment. Many organizations continue operating with manual processes due to perceived cost barriers, despite increasing pressure from labor shortages, rising operating expenses, and growing fulfillment demands.

However, as operations scale, the cost of maintaining manual fulfillment models increases rapidly. Labor requirements grow, space constraints intensify, and throughput limitations begin to impact service levels and growth potential.



On average, automated warehouses reduce labor costs by 40–60% per order.



Cost per order in automated warehouses drops 22% compared to manual operations.



Training costs for warehouse staff decrease by 50% with automated systems, as tasks are simplified.



AutoStore™

AutoStore, empowered by Kardex, provides an efficient and scalable alternative to manual operations:



Achieve payback on your investment in 2–3 years through reduced operating costs



Reduce labor costs and eliminate inefficiencies from hiring, training, and turnover



Expand storage capacity 4× without additional real estate or relocation costs



AutoStore can deliver up to 10× higher picking throughput, depending on system configuration and order profile



Enable 24/7 operations to increase throughput and support revenue growth



Increase order accuracy to reduce costly errors, returns, and lost customers

By shifting from a labor-intensive model to an automated, goods-to-person system, organizations can reduce operational costs, improve performance, and create a foundation for long-term growth.

In this guide, we explore the hidden costs of a manual operation and the operational savings achieved by AutoStore, demonstrating how the system ultimately pays for itself over time.

Ready to calculate your cost savings? Enter your operational metrics into the StoreX Calculator and get your personalized report.



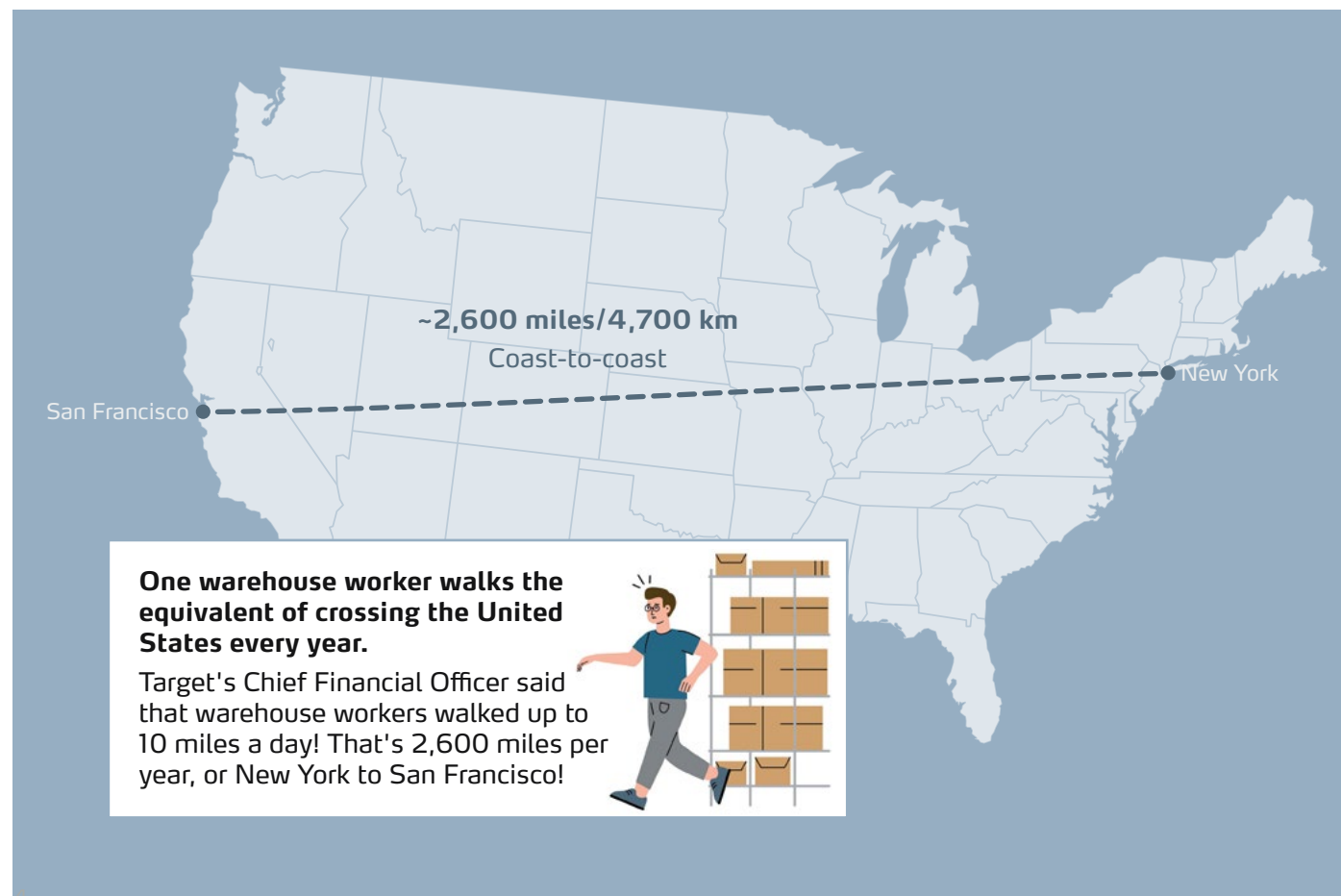
Labor efficiency & workforce impact

Labor remains one of the most significant and complex cost drivers in warehouse operations, often accounting for 50–70% of total operating expenses.

Walking and travel time

A significant portion of labor cost in manual operations is tied to non-productive activity, particularly walking and searching. While it may not be visible on a P&L, time spent traveling between locations directly reduces picking efficiency and increases overall labor requirements.

Excessive walking also introduces secondary effects. As pickers become fatigued, error rates and mispicks tend to increase, especially as the day progresses, leading to additional costs incurred from processing returned items, reshipping, and customer intervention.



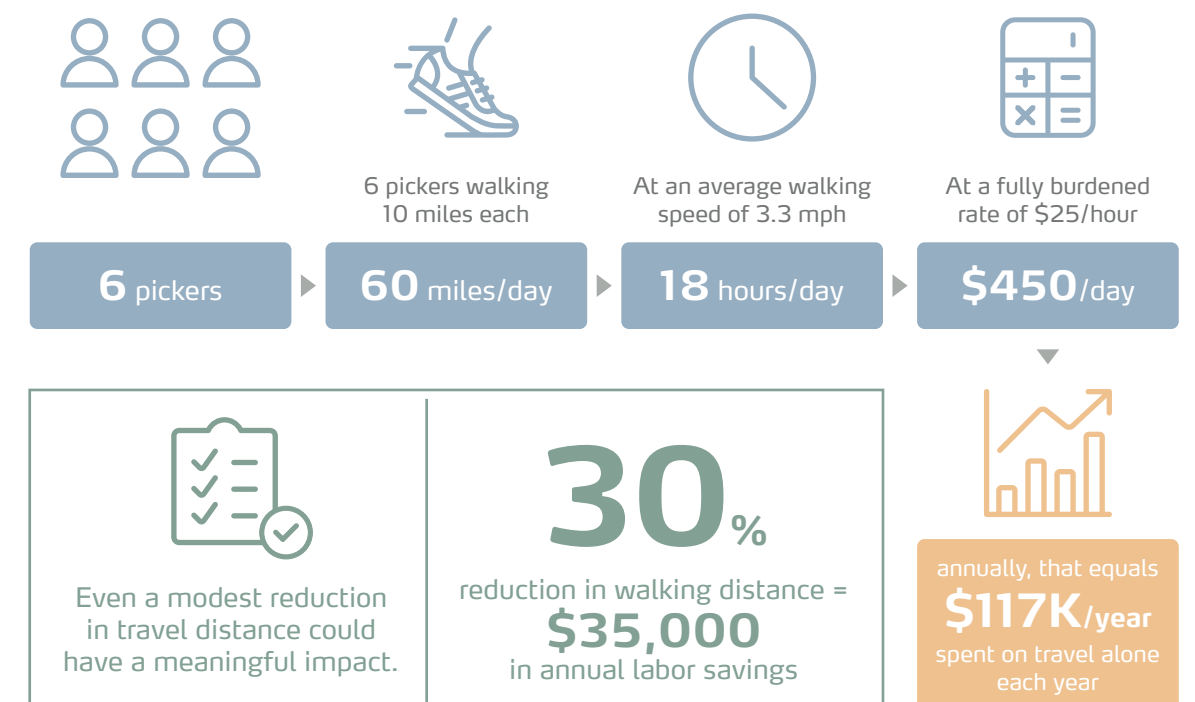
To understand the financial impact, consider a mid-sized e-commerce operation:

- 6 pickers walking 10 miles per shift = **60 miles of total daily travel**
- At an average walking speed of 3.3 mph, that equals **~18 collective labor hours per day spent walking**
- At a fully burdened rate of \$25/hour, **walking alone costs ~\$450 per day**
- Annually, that equals **\$117,000 spent on travel alone**

Even a modest reduction in travel distance could have a meaningful impact:

- A 30% reduction in walking distance would result in \$35,000 in annual labor savings before accounting for other gains realized through improved productivity, reduced fatigue, and fewer errors

But goods-to-person technologies change the equation entirely.



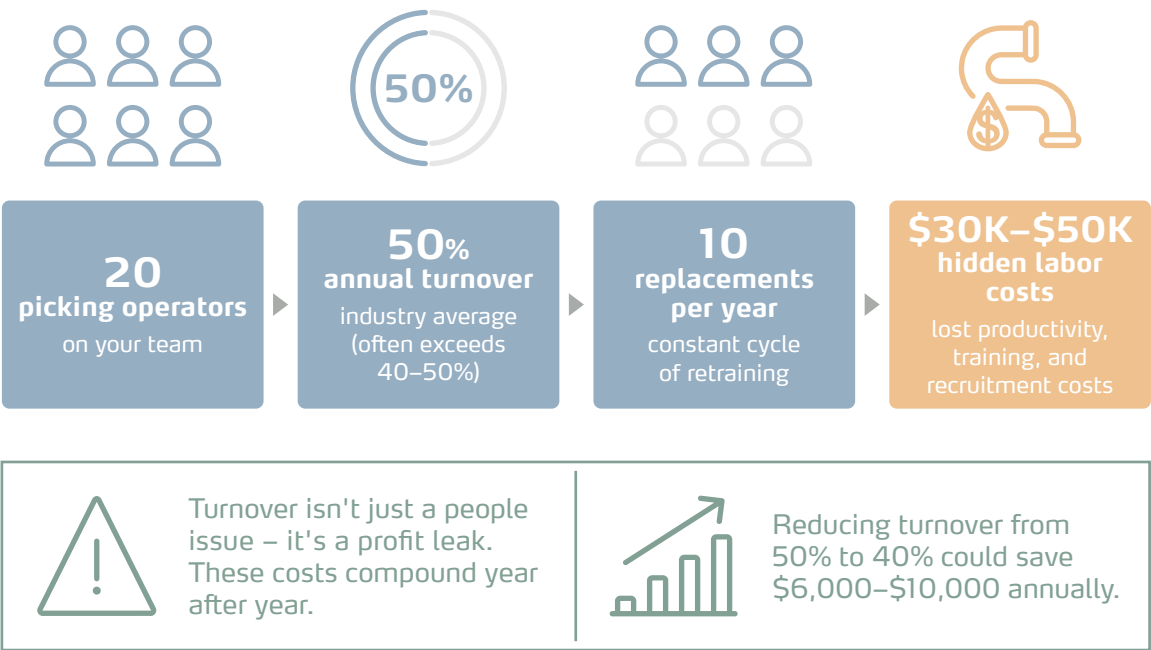
Key Impact: AutoStore significantly reduces operator walking by delivering inventory directly to a stationary workstation. This converts non-productive travel time into productive picking time, significantly increasing throughput per operator and reducing labor costs.

Recruiting, onboarding & training

While wages are the most visible component of labor, they represent only a portion of the total cost. Organizations must also manage a range of overlooked indirect costs that significantly impact overall efficiency and profitability, including:

- Recruiting
- Onboarding
- Training
- Safety equipment
- Overtime (to cover staffing gaps)
- Productivity loss

High turnover compounds these costs over time. Warehouse turnover rates often exceed 40–50% annually, requiring operations to continuously hire, train, and ramp up new employees while maintaining daily throughput demands.

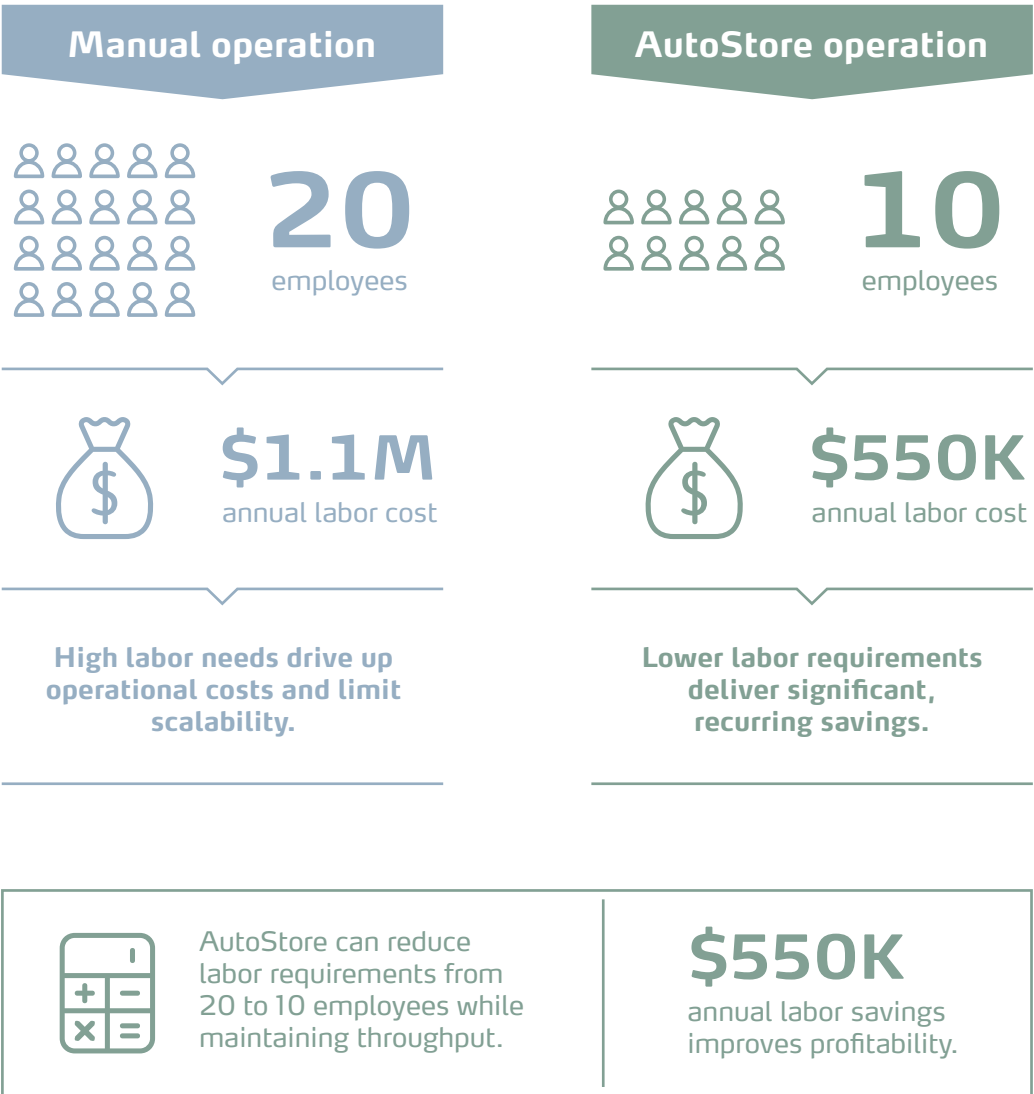


At a 50% turnover rate, a warehouse with 20 picking operators may replace 10 of them every year, which means \$30,000–\$50,000 in hidden labor costs each year. Leveraging automation, especially goods-to-person technologies, is a way to mitigate these costs.

Illustrative labor savings

Let's look at how labor savings with AutoStore extend beyond reducing walking time. In a representative example, a manual warehouse operation may require 20 employees across picking, put away, inventory control, and quality assurance functions. At an average fully burdened labor cost of \$55,000 per employee, this represents approximately \$1.1 million in annual labor expense.

By increasing picking performance from roughly 50 lines per hour to 225+ lines per hour, AutoStore can reduce total labor requirements from 20 employees to 10 employees while maintaining the same throughput. Labor savings are realized not only through faster picking, but also through streamlined putaway, automated inventory tracking, and simplified cycle counting and quality control processes. In this example, that equates to approximately \$550,000 in annual labor savings.



Throughput & growth performance

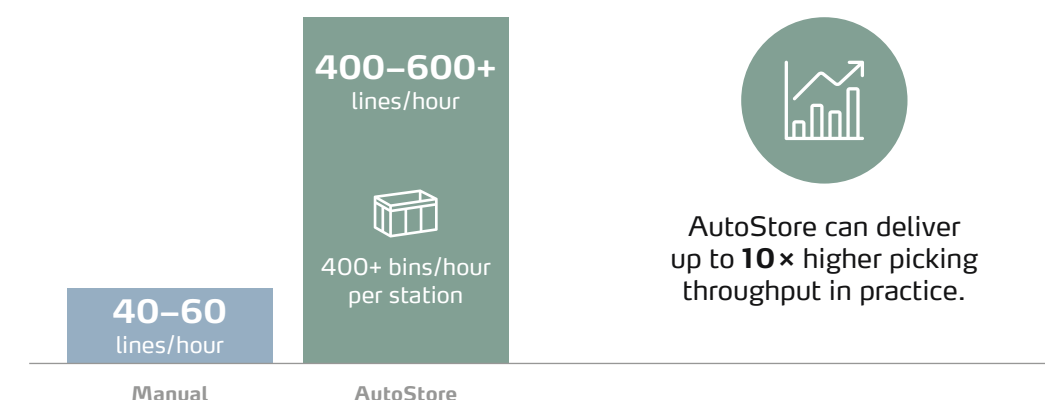
Manual throughput limitations

As order volumes increase and delivery timelines shrink, many fulfillment operations struggle to keep pace, often constrained not just by labor availability, but by the speed and efficiency of their processes. When fulfillment cannot keep pace with demand, organizations face delayed shipments, missed SLAs, and lost revenue opportunities.

In a manual environment, operators are limited by travel time and item search. With AutoStore, inventory is delivered directly to the operator, eliminating travel time and enabling multiple picks from a single bin presentation.

Typical performance:

- Manual: 40–60 lines per/hour per operator
- AutoStore: ≈400–600+ order lines/hour per station



Some bin presentations at an AutoStore port may result in one pick, while others may result in multiple picks. This is why a CarouselPort presenting 400+ bins per hour can translate into an estimated **400–600+ lines per hour** in practice.

To learn more about how Port configuration impacts performance and throughput, read our breakdown: [Types of AutoStore Ports & Best Use Cases](#).

This represents a 10× increase in throughput, enabling operations to:

- Process higher order volumes without increasing headcount
- Reduce order cycle times and improve customer satisfaction
- Support faster service levels like same-day or 2-hour delivery
- Maintain consistent service levels during demand spikes

In manual environments, increasing throughput typically requires adding more labor or extending working hours, driving up cost and complexity. With AutoStore, higher lines per hour allow operations to scale output far more efficiently and reduce overall labor costs.



Reduce labor
Up to 50% fewer employees required for picking.



Increase throughput
Up to 10× higher picking throughput in practice.



Lower total cost
Lower labor needs and higher throughput reduce total cost.



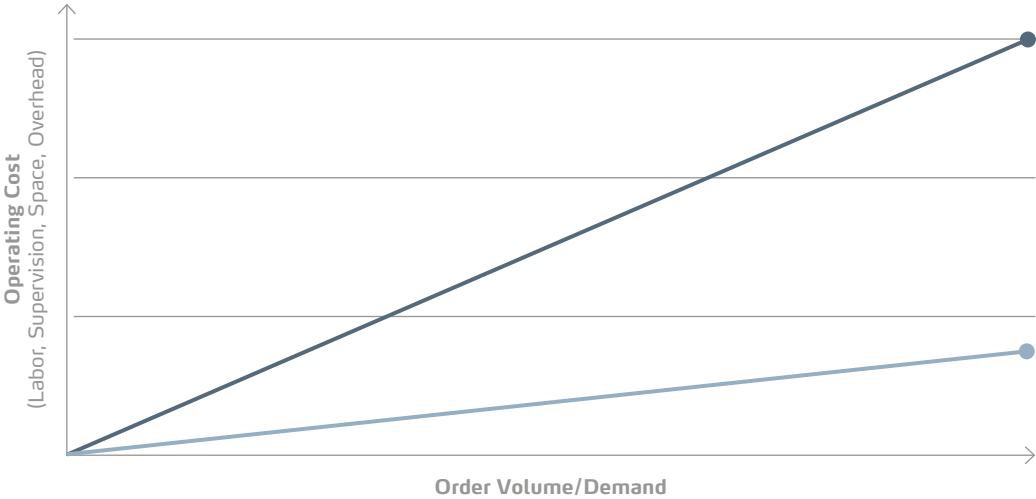
AutoStore delivers **more picks** with fewer people – improving productivity and **lowering costs**.



The financial impact of scaling manually

As fulfillment operations grow, manual environments typically require proportional increases in labor, supervision, and floor space to support higher throughput. This creates a direct relationship between growth and operating cost.

The chart below illustrates how operating costs can scale over time in manual versus automated environments. While both require investment to support growth, AutoStore enables organizations to increase throughput and capacity more efficiently, reducing the rate at which operating costs increase as order volumes grow.



Manual operation
Operating cost increases proportionally with demand.



Order volume growth
Demand grows faster than operating costs.



AutoStore
Operating cost grows with volume at a more efficient rate, greater efficiency.

Key Impact: AutoStore enables operations to scale throughput and capacity more efficiently, reducing the rate at which operating costs increase as demand grows.

Generate your personalized business case report

Evaluate your investment decision in AutoStore with our interactive cost & performance calculator. Enter your operational data inputs into the calculator to generate:

- Estimated cost & ROI
- Overall system footprint
- Performance & throughput metrics
- Interactive 3D rendering
- FTE reduction
- Annual cost savings

 Build your business case



Order accuracy & error impact

Order accuracy is often treated as an operational metric, but its financial impact is significant and often underestimated. A single mispick creates a chain of downstream costs that extend far beyond the warehouse.

In manual environments, errors may occur due to disorganized inventory, similar-looking SKUs, and variability between operators. As order volume increases, even small error rates can quickly scale into significant operational and financial impact.

Direct cost of a mispick

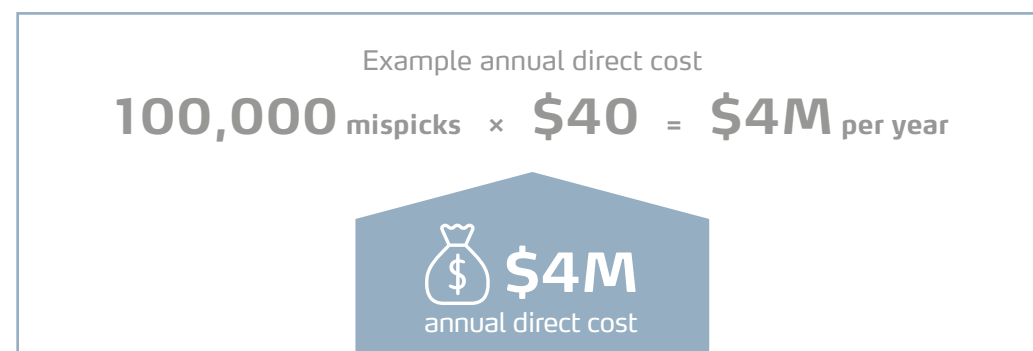
An incorrect pick can lead to:

- Additional labor to identify and correct the error
- Reverse logistics (returns processing, restocking)
- Reshipping costs (packaging, shipping, and handling)
- Customer service time

To understand how this scales, consider a mid-sized operation:

- Annual order lines: 10 million
- Mispick rate: 1% (typical for manual operations)
- Total mispicks per year: 100,000
- Average cost per mispick: \$40

Annual direct cost of a mispick: $100,000 \times \$40 = \$4,000,000$ per year



The impact on customer experience & brand

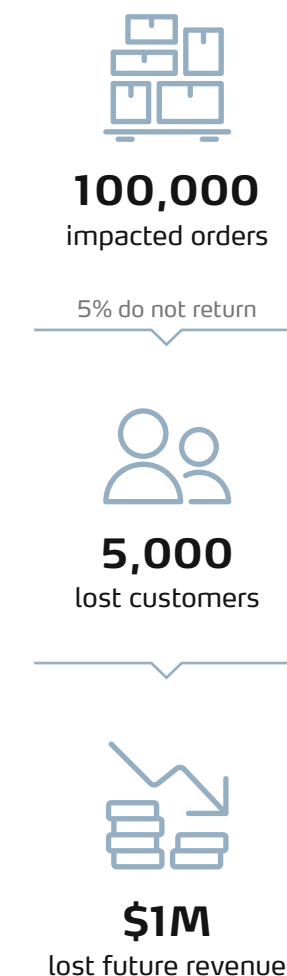
The direct cost of a mispick is only part of the equation. Errors also impact:

- Customer satisfaction and retention
- Brand reputation and trust
- Lifetime customer value
- Reviews and word-of-mouth referrals

In high-volume environments, even a small percentage of errors can affect thousands of customers.

Example cont'd:

- Assuming one mispick per affected order, 100,000 mispicks could affect 100,000 orders.
- If just 5% of affected customers do not return, that's 5,000 lost customers annually
- At \$200 customer lifetime value, that's \$1M in lost future revenue



Key impact: AutoStore improves accuracy by eliminating manual searching and delivering the right inventory directly to the operator. With the Intuitive Picking Assistant, picking errors decrease by up to 58%, while operator performance improves by 19%, driving more consistent, error-resistant picking at scale.



Improved Accuracy
with the Intuitive Picking Assistant.



Higher Performance
through improved operator efficiency.



More Consistent, Error-Resistant Picking
delivered at scale.



AutoStore improves **accuracy** by eliminating manual searching and delivering the right inventory directly to the **operator**.
Better accuracy. Better performance. More consistency at scale.



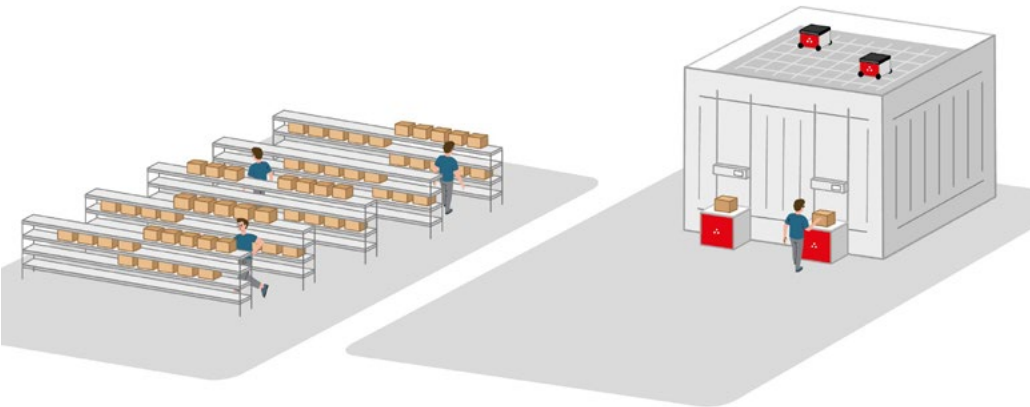
Maximizing space to enable growth

AutoStore can increase storage capacity by up to 4 × compared to traditional storage methods, enabling organizations to scale within their existing facility footprint.

Whether adding new product lines, onboarding new customers, or expanding e-commerce operations, AutoStore enables organizations to scale without the immediate need for facility expansion or relocation. By consolidating inventory into a compact, automated grid, operations can free up valuable floor space for pallet storage, packing stations, kitting, or other value-added activities.

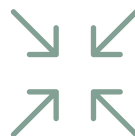
Kardex further enhances space utilization through its dynamic bin compartmentalization capability. Kardex further enhances space utilization through FulfillX and its Paccurate integration, which can improve bin utilization by up to 19% without expanding the footprint.

AutoStore is also designed to adapt to existing facilities. Systems can be configured around columns, integrated across mezzanines, or built across multiple levels to maximize available cubic space while minimizing disruption to current operations.



Traditional storage
Wide aisles and fixed shelving consume more floor space limiting capacity and flexibility.

AutoStore
Compact storage maximizes usable space for value-added activities.



Up to 4 × storage capacity
in the same footprint.



Scale within your existing facility.
Grow without the cost and disruption of expansion.

The Operational Impact of Density

- Support more SKUs, orders, or clients within the same facility
- Avoid facility expansion or relocation, reducing capital investment and disruption
- Consolidate most inventory into a single, highly efficient system
- Reduce operator travel distance and floor congestion
- Free up space for packing, kitting, staging, or other value-added tasks

See how Codale consolidated three warehouse facilities into one scalable, high-density distribution operation with AutoStore.



Avoid the cost of moving

As operations grow, many warehouses outgrow their space, forcing costly expansion or relocation.

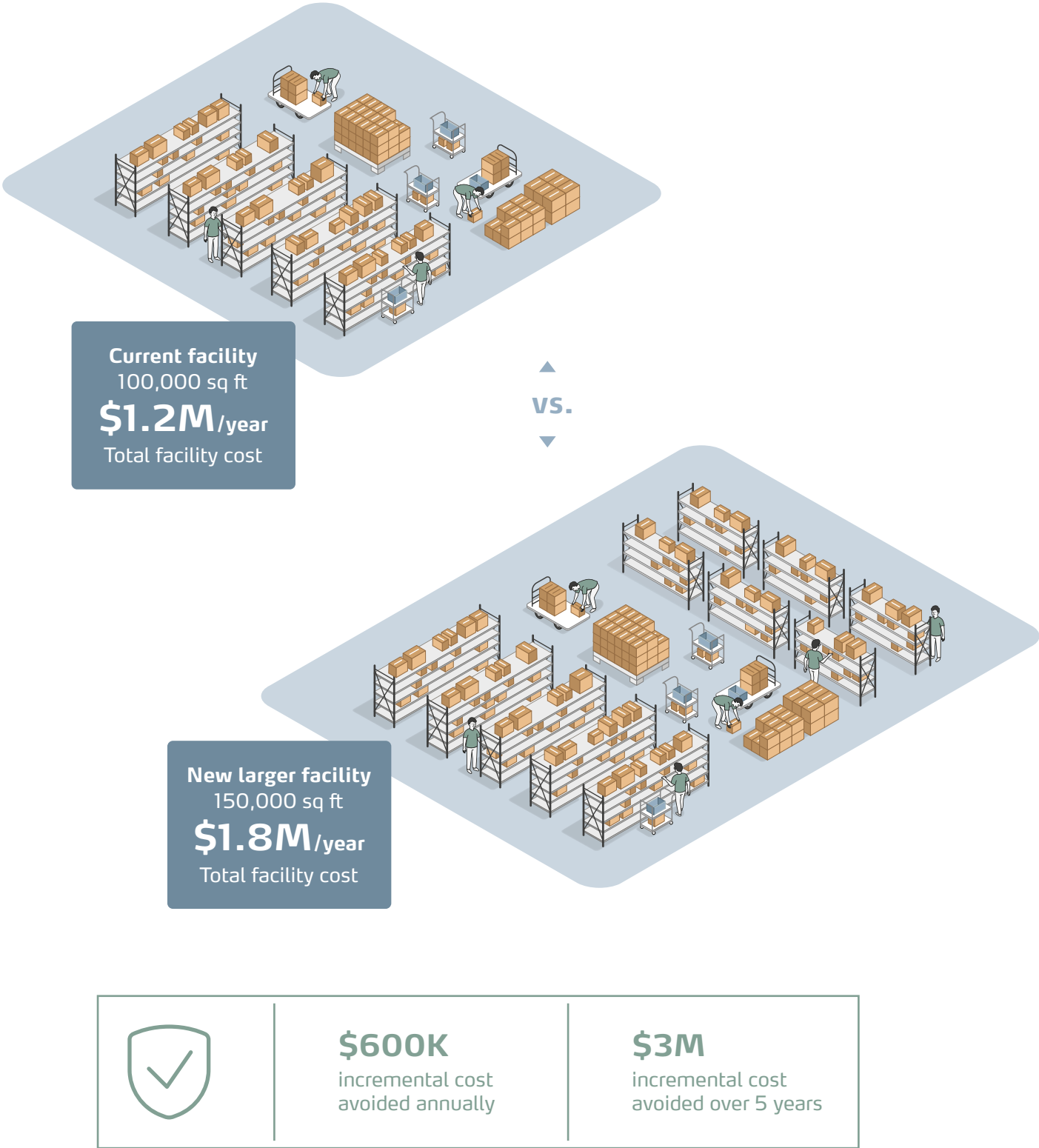
Expanding or relocating a warehouse introduces significant cost through higher rent, operational disruption, and increased labor and infrastructure requirements.

Incremental facility costs avoided annually: \$600,000

Over five years, this represents **\$3 million in incremental facility costs avoided**, which does not even account for expenses such as relocation, system deconstruction and reinstallation, operational disruption, or the added headcount typically required to support a larger facility.

AutoStore avoids this by enabling incremental expansion within your existing space. Additional grid columns and bins can be added with minimal disruption. This flexibility is reflected in real-world adoption, with more than **40% of AutoStore systems globally having been expanded.**

Key Impact: Growth shouldn't require more space. AutoStore enables organizations to support long-term growth within their existing facility footprint, reducing the cost and disruption associated with expansion or relocation.



Example: Illustrative cost of Expansion

Inventory control & loss prevention

Inventory loss from mispicks, misplaced items, damage, or theft can create significant financial impact over time.

Manual environments are especially vulnerable because inventory is often openly accessible, item movement may not be fully tracked, and cycle counting processes can be inconsistent.

Annual shrinkage rates caused by errors, damage, and theft often range from 0.5% to 2% of total inventory value. For every \$1M in inventory, that can mean \$5K–\$20K in annual loss before accounting for downstream impacts such as order delays, added safety stock, investigation time, and recounting.

AutoStore creates a controlled environment where inventory is stored in a secure grid and accessed only through designated workstations. With Kardex FulfillX enabling streamlined cycle counting and technologies like PortScale providing real-time weight validation during picking and putaway, inventory accuracy is maintained while reducing loss and supporting continuous verification.

AutoStore helps reduce inventory loss, increase accuracy, and lower the manual effort required for inventory control.



\$1M
inventory value



0.5%-2%
annual shrinkage



\$5K-\$20K
annual loss

Does not include downstream costs such as order delays, added safety stock, investigation, and recounting labor.

Common causes of shrinkage



Errors



Damage



Theft

Example annual shrinkage impact

Traditional rack storage

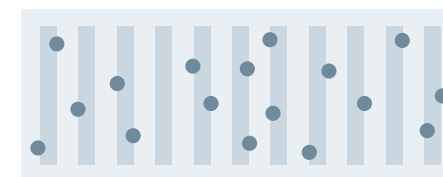
Less secure



Anyone can access inventory directly
Higher risk of shrinkage and theft



Multiple access points throughout the warehouse



Inventory can be easily accessed or removed



More security. Tight control. Peace of mind.

AutoStore restricts access, protects inventory, and helps reduce shrinkage and theft.



AutoStore System

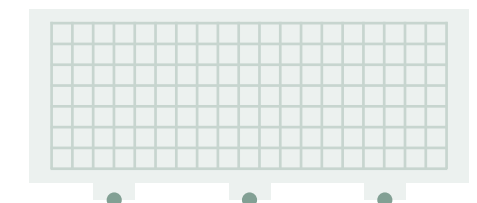
More secure



Inventory is stored in a secure, enclosed system
Access is controlled and restricted



Inventory is only retrieved at ports
Fewer access points mean higher security



Access is controlled through software



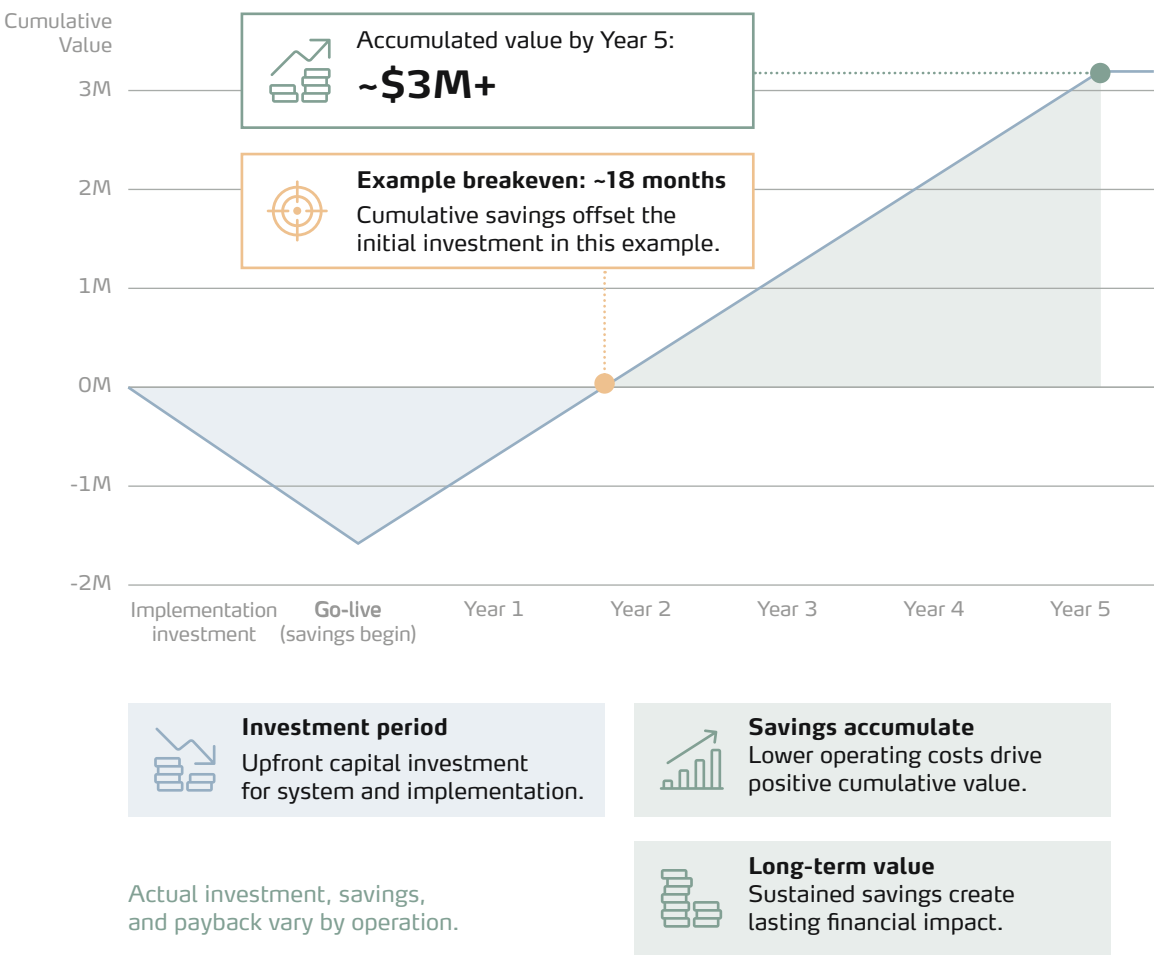


Financial modeling & total cost of ownership

Automation is often evaluated based on upfront cost, but the more important question is how quickly that investment is recovered and how much value it generates over time.

Learn more about calculating AutoStore ROI, payback period, and IRR.
Read **How Much Does AutoStore Cost? What the Brochures Don't Tell You**

Read the
cost guide



Illustrative AutoStore investment profile

The chart illustrates a typical AutoStore investment profile. While the system requires an initial capital investment, organizations begin realizing savings immediately after go-live through reduced labor, improved efficiency, and fewer errors.

This results in a rapid improvement between year 0 and year 1, reflecting the transition from manual to automated operations.

In this example, the system reaches breakeven in approximately 18 months, after which savings continue to accumulate in a predictable and scalable way. By year five, the cumulative financial impact becomes substantial, demonstrating how automation evolves from an upfront expense into a long-term value driver.

Leasing models

Kardex offers flexible financing and leasing models designed to align system investment with operational savings, making automation more accessible without significant upfront capital requirements.

Rather than concentrating cost in year one, these models distribute investment over time, allowing organizations to fund automation through operating expense while benefiting from immediate operational improvements and cost savings.

Want to calculate your breakeven point?

Try out the StoreX Calculator to get instant insights based on your own operation. Then, connect with us to dive deeper into your results.
Start the online assessment

Total cost of ownership: why optimization matters

The total cost of an AutoStore system is not defined by the initial investment alone – it is determined by how efficiently the system performs over time.

While all AutoStore systems improve performance compared to manual operations, not all systems deliver the same long-term financial results. Two systems with similar hardware can produce very different outcomes depending on how well they are designed, optimized, and supported.

Kardex reduces total cost of ownership across several key areas:

- **System reliability:** Kardex delivers an average uptime of **99.94%** across its North American systems, compared with the average AutoStore uptime of approximately 99.7%
- **System efficiency:** Kardex FulfillX optimizes robot movement and system flow, reducing required robots by up to **20%**, lowering both upfront and ongoing costs
- **Storage optimization:** Through our Paccurate integration, bin utilization increases by up to **19%**, enabling smaller system designs and delaying future expansion
- **Shipping efficiency:** Right-sized cartonization reduces transportation costs and improves trailer utilization
- **Accuracy & control:** Technologies like Intuitive Picking Assistant and PortScale reduce mispicks, shrinkage, and costly errors
- **Faster deployment:** Innovations like BinInductAI reduce implementation time and labor requirements, accelerating time to value
- **Cleaner grids & robots:** Kardex SnapVac removes up to 80% of dust and debris from the grid, while the Sensor Cleaning Station supports automated robot cleaning to help maintain uptime

Book an operations assessment

Every operation has unique growth objectives, operational constraints, and fulfillment challenges. Our team can help evaluate where automation can create the greatest impact within your facility.

During the initial assessment, we will discuss:

- Your primary operational goals and growth plans
- Current warehouse challenges and bottlenecks
- SKU count, inventory profile, and throughput requirements
- Facility characteristics, including available footprint and ceiling height
- Your current software and how we integrate
- Lead times and implementation timelines

Together, we can identify opportunities to improve throughput, optimize space utilization, reduce operating costs, and support long-term scalability with AutoStore, empowered by Kardex.

Let's get started.



Schedule a 30-minute operational assessment