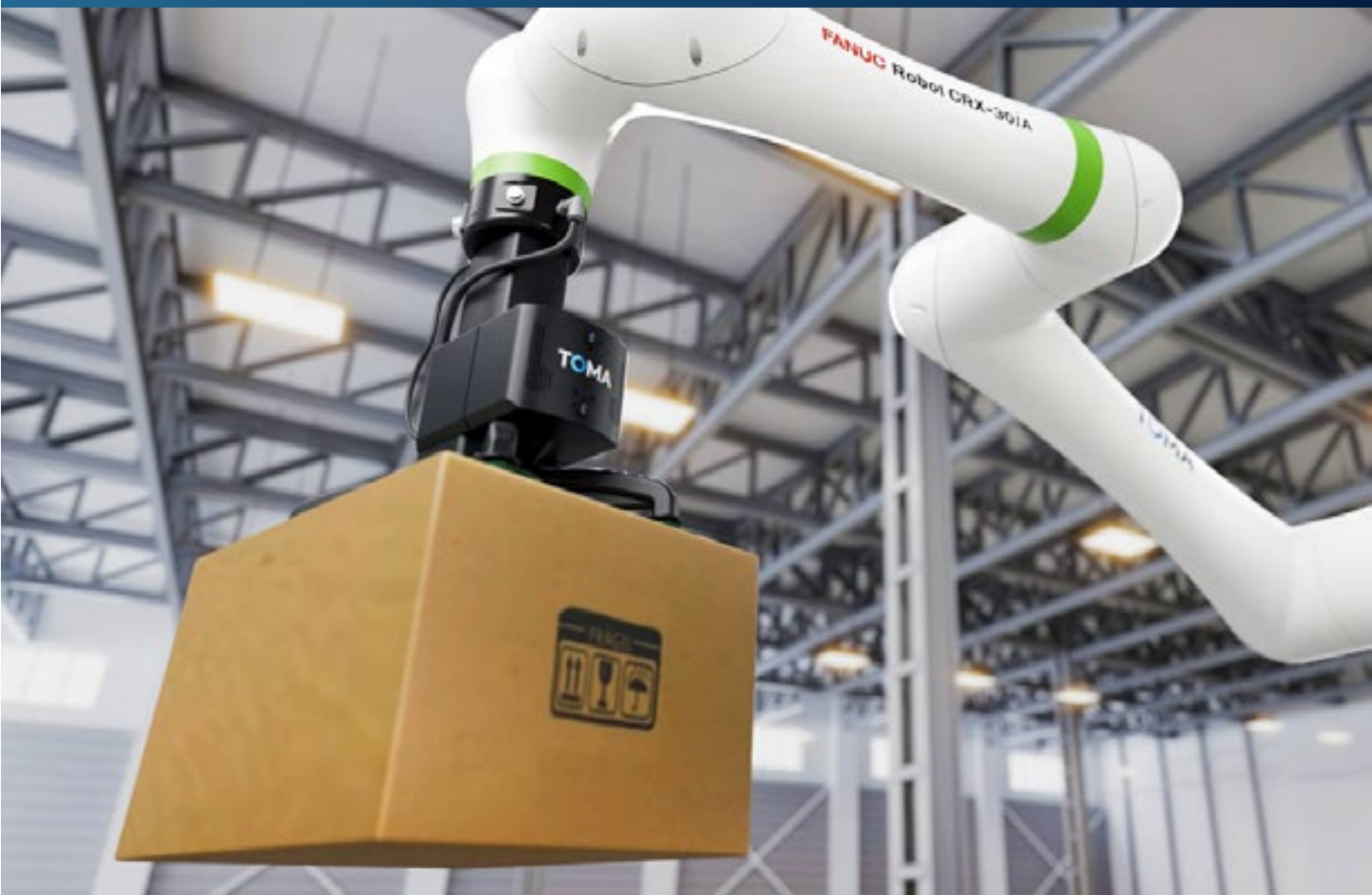
PREMIER TECH

TOMA™

# The ROI Calculator for Cobot Palletizing

Built for real world decisions



**Estimating your cobot palletizer's return on investment (ROI)** is one of the most important steps in deciding on the right palletizing solution for your business.

This guide will teach you about the most critical costs and savings you should consider and provide a template to estimate your palletizing cobot payback time. Before we get started, let's discuss why an accurate ROI matters and why not all calculation tools are trustworthy.

CONTENTS

# Why An Accurate ROI Calculation Matters

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## An Accurate and Realistic ROI Assessment is a Cornerstone of Your Automation Decision.

Whether you choose to move forward with a robotic palletizer (or decide to hold off), your ROI calculation will guide that call. Depending on how you run the numbers, it could also influence which solution you go with.

**A too-optimistic estimate** might convince you to greenlight a project that doesn't pay off soon enough. You could tie up capital in a system that doesn't meet your financial goals in the timeline you expected.

**On the other hand**, a rough or incomplete calculation might push you to walk away from a project that could've delivered real gains. You might dismiss a solid opportunity simply because the ROI wasn't fully understood.

That's why getting **a clear, realistic picture** of your expected payback is critical. It sets the stage for **better decisions** before anything hits your floor.

# Not Just Numbers: What Most ROI Templates Leave Out

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Not all ROI calculators are created with real-world conditions in mind. Many skip over key variables that actually move the needle. Others ignore the human side of the equation, like the fact that manual labor isn't 100% efficient across every shift.

If your calculator assumes perfect productivity or skips intangible benefits like stronger customer relationships or improved staff retention, the result is a number that doesn't reflect reality.

## This Guide Was Built To Go Deeper.

It helps you weigh both the measurable and the meaningful, so your ROI estimate is a decision-making tool that actually holds up.

# Calculating Your Accurate ROI

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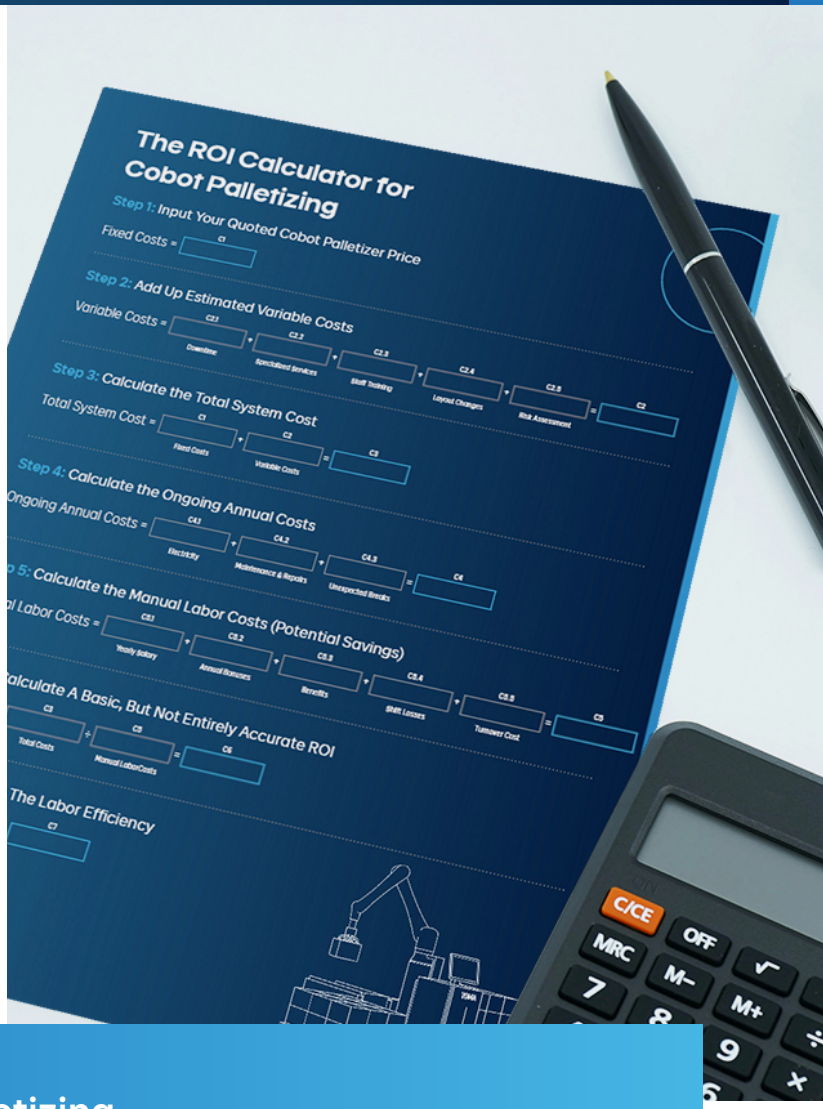
The calculator at the end of this guide covers all critical financial variables and provides very simple steps/formulas to follow. It's the most complete calculator you'll find for a precise estimate of your cobot palletizer ROI.

**The following step-by-step process will give you:**

1. An explanation of each variable along with its cost/savings effect on ROI

2. An example scenario to make it easy to follow along

3. And an action step to fill out the calculator sheet




## The ROI Calculator for Cobot Palletizing

This tool will help you quickly determine how long it takes to recoup your initial investment. Keep in mind that the guide and calculator emphasize your payback period (the time required to earn back your investment), rather than forecasting overall profitability.

**LETS GET STARTED!** »

## Fixed Costs

The fixed costs will depend on the specific cobot palletizer type, brand, and overall scope of the package. What sets apart the different types of palletizing cobots is the level of integration, software, included hardware, and, most importantly, the level of added value by the solution provider.

The more productive and complete the solution, the more costly it may become. However, the included integrations and provided value can qwuickly pay for themselves. So, it's important to consider the whole impact on your production and return on investment of the solution.

Depending on the palletizing cobot solution you choose, it will usually have a basic fixed cost as noted in the table.

|  |  |  |
|---|---|---|
| **SIMPLE** COBOT PALLETIZERS | **VALUE-ADDED** COBOT PALLETIZERS | **INTEGRATED** COBOT PALLETIZERS |
| Simple cobot palletizers with limited features and hardware. Usually no dedicated software. | Fully integrated palletizing solutions designed for ease of use, reducing operator effort, installation costs, and training time. Includes advanced software and adaptability. | Custom solutions provided by robotic systems integrators, including various hardware elements integrated for you. |
| **$75 000 - $120 000** | **$120 000 - $160 000** | **$150 000 - $250 000+** |

This is usually the quoted cost from your solution supplier. Make sure to ask what's included in that price, as it can affect other variables in your ROI calculation. We'll explain those later.

## Our Example Scenario:

THE QUOTED COBOT PALLETIZER PRICE

Our first step in calculating the ROI is figuring out the cost of our system. Let's assume that our cobot palletizer package has a total fixed cost of **$130 000**.

*Note: You should consider the actual price quoted by your supplier.*

Fixed Cost: **$130 000**

### NOW IT'S YOUR TURN:

Enter the fixed costs into **Step 1** (**C1**).

Enter your costs in the fillable boxes at each step throughout the guide. Your ROI will be automatically calculated in the ROI Calculator on **page 31**. To skip the guide, jump straight to **page 31**.

## Variable Costs

Variable costs depend on the palletizing solution and several other factors. These are often underestimated (or missed entirely), especially when layout changes are involved.

Use the ROI calculator to estimate them accurately and avoid unexpected additions to your total project cost.

These variable costs can vary widely. Let's break down how to estimate them.


## INSTALLATION & DOWNTIME

If installation takes one full shift, you could lose a full shift of output. For example, 1 000 boxes per shift at $5 per box could result in **$2 500**-**$5 000** in lost revenue. A 50% drop in staff efficiency also impacts output. Both scenarios matter when estimating downtime costs.

## SPECIALIZED SERVICES

You may need external help to modify conveyors or integrate machinery. Budget anywhere from **$5 000** to **$30 000** depending on scope. In some cases, conveyor upgrades can cost more than the robot itself.

## STAFF TRAINING

Even if training is free, labor costs still add up. Training three staff members for one shift at $20/hour comes out to $480. You may also lose about 10% of your shift revenue, roughly $520 because those employees aren't on the production line during training. That brings the total cost to around **$1 000** per shift.

## LAYOUT CHANGE AND AREA PREPARATION

Cobot palletizing systems usually minimize layout changes. But if you must modify the work area to install a palletizing system, you need to account for the direct cost & lost productive labor time.

## RISK ASSESSMENT

Cobot systems are generally safer than traditional robots, but a risk assessment is still required for compliance and is often your responsibility. If you are working with an integrator, he might include it in the project (confirm to be sure).

As you can see, the costs go beyond the palletizing system itself. Every factor needs to be accounted for to get a realistic total.

## Our Example Scenario:

ADDING UP ESTIMATED VARIABLE COSTS

In our example, we'll assume there are no layout changes and that the risk assessment will be done internally. Here are our annual estimates for the variable costs:

1. Downtime (assuming full shift lost): **$5 000**
2. Specialized services (e.g., conveyor modifications): **$15 000**
3. Staff training (2 shifts at $1 000 each): **$2 000**
4. Layout changes: **$0**
5. Risk assessment (included): **$0**

Variable costs: downtime **+** specialized services **+** staff training **+** layout changes **+** risk assessment

Variable costs: **$5 000 + $15 000 + $2 000 =** $22 000

### NOW IT'S YOUR TURN:

Add up your estimated variable costs in the **Step 2** section of the ROI Calculator.

1. Downtime (**C2.1**)
2. Specialized services (**C2.2**)
3. Staff training (**C2.3**)
4. Layout changes (**C2.4**)
5. Risk assessment (**C2.5**)

Total of **Step 2** (**C2**) 0

## Calculating the Total System Cost

Before estimating ROI, you'll need to combine all fixed and variable costs to get a complete view of your total system investment. This total will be used as the baseline when calculating your payback period.

Use the example below as a reference, then enter your numbers into the ROI calculator.

### Our Example Scenario:

CALCULATING THE TOTAL SYSTEM COST

1. Fixed costs: **$130 000**
2. Variable costs: **$22 000**

Total system cost: Fixed costs **+** variable costs

Total system cost: **$130 000 + $22 000 = $152 000**

### NOW IT'S YOUR TURN:

Add the fixed and variable costs to get the initial investment in the **Step 3** section of the ROI Calculator.

1. Fixed costs (**C1**)
2. Variable costs (**C2**) 0

Total of **Step 3** (**C3**) 0

## Ongoing Costs

Once your palletizing system is installed, the costs don't stop. You'll need to factor in annual operating expenses like maintenance, electricity, and support. Your automation provider should be able to provide realistic estimates based on your chosen system.

One cost that's often overlooked is the time and labor involved in using the system day-to-day. If programming or updating recipes is time-consuming, or if the software is hard to navigate, you'll see productivity losses, especially in environments with frequent product or pattern changes. A system that's intuitive to use reduces these costs significantly.

Here's a breakdown of typical annual costs:

- **Electricity** - **$1 500–$2 000**, depending on the hardware and load.
- **Maintenance and Repairs** - 3–10% of the system's value, or roughly **$3 000–$10 000** per year.
- **Unexpected Downtime** - Even one breakdown every two years that causes you to lose a shift (~**$5 000**) averages to **$2 500**/year. It's better to include this now than be caught off guard later.

These costs can vary, but being conservative in your estimates will give you a more accurate picture of your ROI and reduce surprises later.

## Our Example Scenario:

CALCULATING THE ONGOING ANNUAL COSTS

Now, let's add these annual ongoing costs:

1. Electricity: **$1 500**
2. Maintenance and repairs: **$4 000**
3. Unexpected breaks: **$2 500**

Ongoing annual costs: electricity **+** maintenance and repairs **+** unexpected breaks **+** software productivity loss

Ongoing annual costs: **$1 500 + $4 000 + $2 500 =** $8 000

### NOW IT'S YOUR TURN:

Add the ongoing costs as noted in the **Step 4** section of the ROI Calculator.

1. Electricity (**C4.1**)
2. Maintenance and repairs (**C4.2**)
3. Unexpected breaks (**C4.3**)

Total of **Step 4** (**C4**) 0

## Why System Design Matters in Your ROI Calculation

The design of your palletizing system has a direct impact on cost and, in turn, your ROI. Some systems are easier and faster to install, require less training, and come with built-in tools that simplify day-to-day use. These differences directly affect labor, integration, and maintenance costs, and ultimately impact how quickly you see a return.

Standardized systems using cobot technology, like TOMA™, are designed to streamline setup, reduce downtime, and simplify operation at the end of the line. These features help keep your project on budget and improve long-term performance.

**To better understand the true cost of ownership, ask your solution provider the following questions:**

- Does the system arrive ready to deploy, or does it require on-site assembly? Is installation included?
- How easy is the software to use? Will my team need extensive training? What documentation or onboarding is provided?
- Does the solution come with a conveyor, or can it connect to the ones we already use? How is integration handled?
- Can the system manage other hardware in the cell beyond palletizing?
- How long does it take to create or adjust a palletizing task? Can you walk me through a real example?
- Is there a simulation tool to help calculate cycle time? Does it support offline programming?

# Calculating End-Of-Line Labor Savings

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When evaluating labor savings, it's important to look beyond just the hourly wage. The true cost of a manual palletizing position includes much more.

Repetitive, physical roles like end-of-line palletizing often lead to fatigue, high turnover, and reduced performance over time. It's common for workers to leave as soon as another opportunity comes up or when the job becomes too physically demanding.

Here's a breakdown of estimated yearly costs we often see for one manual palletizer, including more than just wages:

- Base salary - **$35 000 to $50 000**
- Bonuses - **$2 000 to $10 000**
- Benefits - **Usually 25% to 40% of base pay. For a $40 000 salary, that's an extra $10 000 to $16 000**

You're also covering the hidden costs of turnover and unreliable attendance:

- A missed shift can slow or stop palletizing, delaying production.
- If someone quits without notice, you absorb the costs of:
  - Exit processing - $200 to $1 000
  - Recruiting and hiring - $1 000 to $2 000
  - Training and lost productivity - $4 000 to $8 000

And that's just for one person working one shift per day. A cobot palletizer can run multiple shifts without the same interruptions, fatigue, or turnover.

## Our Example Scenario:

CALCULATING MANUAL LABOR COSTS (POTENTIAL SAVINGS)

Let's calculate all of these costs for a set number of employees per shift and a defined number of shifts in our example:

The median yearly salary in 2023 was **$36 770**, according to the U.S. Bureau of Labor Statistics. But, this number can go as high as **$50 000**, depending on your location and other factors.

1. Yearly salary: **$40 000**
2. Annual bonuses: **$5 000**
3. Benefits: **$10 000**
4. Shift losses: **$2 500**
5. Turnover cost: **$7 000**
6. Number of employees per shift: **1**
7. Number of shifts: **2**

Manual labor cost: (Yearly salary **+** Annual bonuses **+** Shift losses **+** Turnover cost) × (Number of shifts × Number of employees per shift)

Manual labor costs: **(40 000 + 5 000 + 10 000 + 2 500 + 7 000) × (1×2) =** $129 000

### NOW IT'S YOUR TURN:

Add the manual labor costs in the **Step 5** section of the ROI Calculator.

1. Yearly salary (**C5.1**)
2. Annual bonuses (**C5.2**)
3. Benefits (**C5.3**)
4. Shift losses (**C5.4**)
5. Turnover cost (**C5.5**)
6. Number of employees per shift (**C5.6**)
7. Number of shifts (**C5.7**)

Total of **Step 5** (**C5**) 0

# Calculating A Basic ROI Based on Labor Savings

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Most ROI calculators for cobot palletizers reduce the math to a simple ratio:

**ROI = Total system cost ÷ Manual labor cost being replaced**

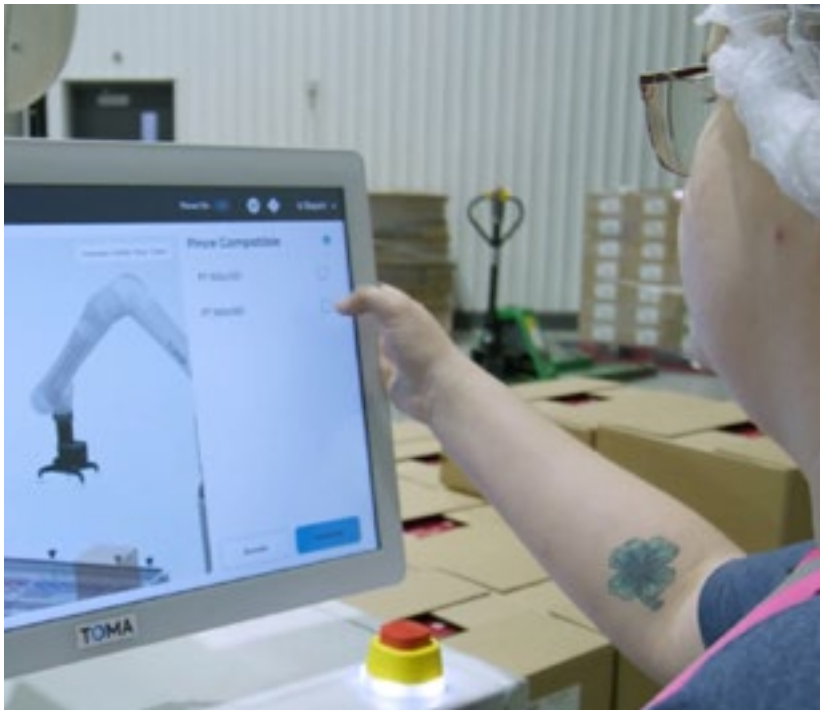
But in reality, that only tells part of the story.

This approach overlooks key factors that impact both costs and savings. Even with a more detailed total cost estimate, you still need to account for:

- Realistic worker efficiency
- Actual cobot palletizer efficiency
- Ongoing annual costs of running the system
- Expected reductions in waste or damaged goods

Gains in productivity from consistent output

Without factoring these in, the ROI calculation doesn't reflect how the system will actually perform over time. That's why the deeper analysis in this guide matters. It brings those real-world elements back into the equation.



## Our Example Scenario:

CALCULATING A BASIC, BUT NOT ENTIRELY ACCURATE ROI

Under the assumption of the cobot palletizer and staff working at 100% efficiency and no ongoing cobot costs, the calculation in our example so far could look like this:

1. Total system cost: **$152 000**
2. Manual labor cost: **$129 000**

Basic ROI: Total system cost ÷ Manual labor cost

Basic ROI: **$152 000 ÷ $129 000 = 1.18** years

### NOW IT'S YOUR TURN:

Go to **Step 6** in the ROI Calculator to calculate a basic ROI.

| | |
|---|---|
| 1. Total system costs (**C3**) | 0 |
| 2. Manual labour cost (**C5**) | 0 |
| Total of **Step 6** (**C6**) | NaN |

# Refining the ROI Calculation with Real-World Variables

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The basic ROI calculation is a starting point. But to get a result that actually reflects your operation, you need to factor in how the system performs over time.

This next section walks through the key variables that influence ROI in the real world like efficiency, productivity, damage, and injury-related costs.

These adjustments make the calculation more accurate and more useful for decision-making.

## Adjusting The Labor Cost For Efficiency

Manual labor isn't 100% efficient, and that's expected. But when calculating ROI, that inefficiency needs to be accounted for. You're not just paying for productive time. You're also paying for the time when work slows down, stops, or shifts unexpectedly.

If a worker operates at 85% efficiency, their effective cost per unit of work increases. That's because you're still paying for 100% of their time, but only getting 85% of the output.

No one expects human workers to hit 100% productivity. But if you're comparing against a robotic system, this difference becomes a critical factor in an accurate ROI calculation.

To adjust for this, divide the total manual palletizing cost by the expected efficiency rate.

### Our Example Scenario:

ADJUSTING THE LABOR COST FOR EFFICIENCY

In our example, we determine that our labor is only 85% efficient.

1. Labor efficiency: **0.85**

### NOW IT'S YOUR TURN:

Use **Step 7** in the ROI Calculator to input your labor efficiency.

1. Labor efficiency: (**C7**)

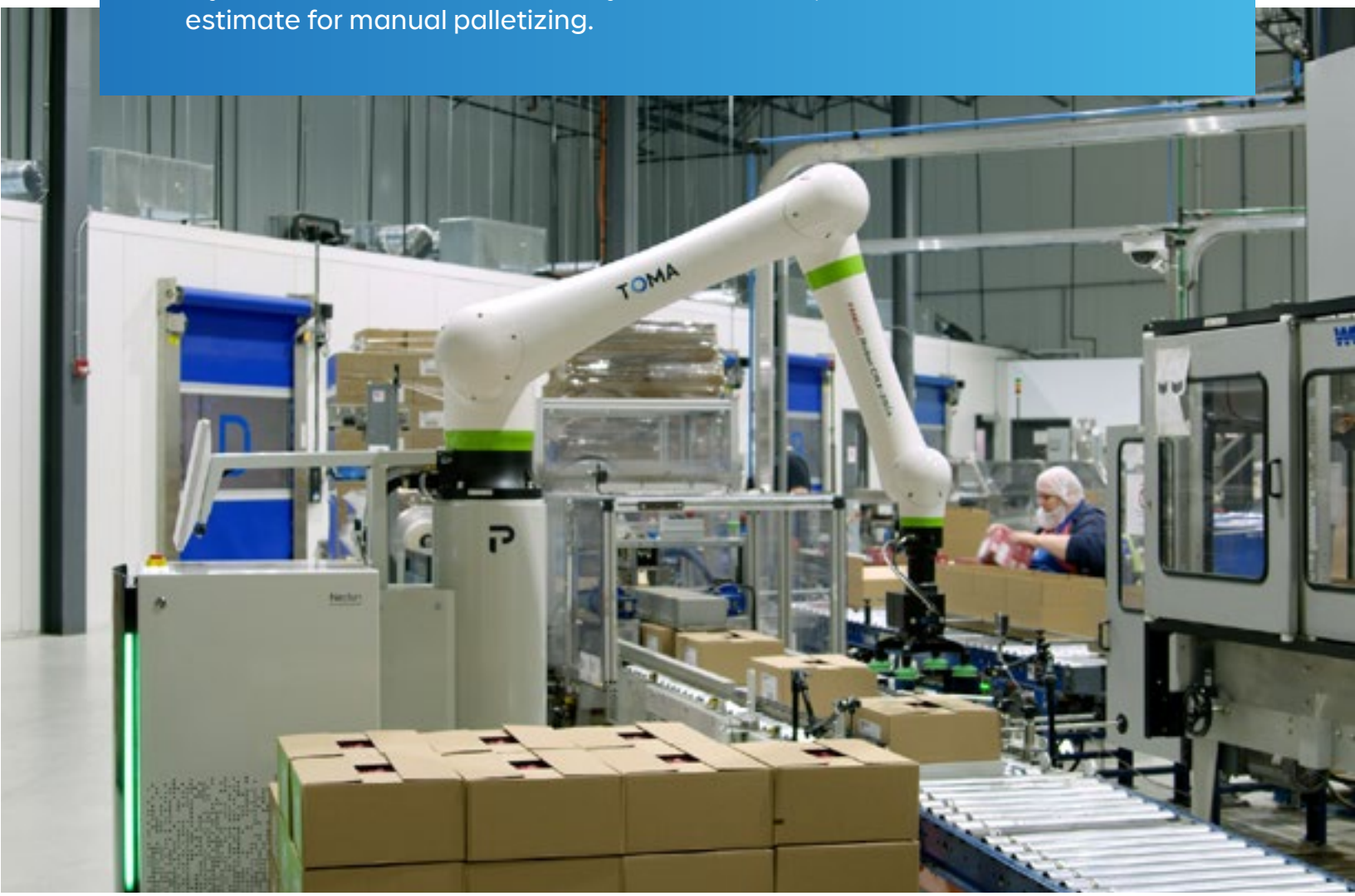
## How To Estimate The Efficiency And Why It Matters

Once efficiency is factored in, the true cost of manual labor becomes more visible. Here's a simple example:

Let's say your target is to palletize 250 000 boxes per year. With a human efficiency rate of 85 percent, only 212 500 boxes actually get palletized, even though the full 250 000 could be handled in theory.

Because you're paying full labor costs but only getting 85 percent of the output, your cost per box increases. The gap of 37 500 boxes represents lost productivity that still carries a cost. You won't see it as an extra line item, but it directly affects ROI when comparing to a robotic system that can maintain a more consistent throughput.

If you are not sure what efficiency number to use, 80-85% is a reasonable estimate for manual palletizing.



## Adjusting For The Palletizing System Efficiency

Your palletizing solution won't run at 100% either. So, it's important to get a realistic estimate of its actual efficiency against the adjusted labor costs.

While it's possible to get near 100% efficiency with robotics, it's safer to consider a lower number, like 85-90%.

### Our Example Scenario:

ADJUSTING FOR THE PALLETIZING SYSTEM EFFICIENCY

Let's define the palletizer efficiency as 90% efficient.

1. Palletizer efficiency: **0.90**

### NOW IT'S YOUR TURN:

Define your expected palletizer efficiency using **Step 8** in the ROI Calculator.

1. Palletizer efficiency **(C8)**

## Factoring In Increased Palletizing Throughput

Automated palletizing systems can run continuously with consistent output. This often results in higher palletizing throughput compared to manual labor.

Up to this point, we've assumed the cobot palletizer and the manual worker would handle the same number of boxes. In practice, the automated system typically handles more. The increase in throughput translates directly into more value per shift.

Depending on your production, a cobot palletizer may even add an entire new shift.

A conservative estimate would be a 5% to 30% increase in productivity, but if the palletizer introduces a whole new shift to your operations, this number could vary between 10% and 60%. To refine your ROI calculation, we will add a productivity gain factor to account for an increased throughput.

## Our Example Scenario:

CALCULATING THE INCREASED THROUGHPUT

Let's consider a 40% productivity gain, as an estimate under the assumption that a palletizer added an additional shift that mostly runs autonomously.

1. Productivity gain: **0.40**

### NOW IT'S YOUR TURN:

Add in your productivity gain factor in **Step 9** of the ROI Calculator.

1. Productivity gain **(C9)**

## Including the Palletizing-Related Product Damage Reduction

For a more complete ROI picture, consider the cost of product damage caused by inconsistent or unstable palletizing.

A robotic palletizing system can reduce these losses by improving stacking precision and load consistency. The actual savings will vary depending on your product, packaging type, and current process.

If you have historical data on units damaged due to palletizing issues, use that to estimate annual costs. If not, take a conservative approach using your lowest known annual loss numbers from these events.

Alternatively, you can take a lower range of 15-30% reduction in product damages due to palletizing faults.

Reducing product damage is not always easy to quantify, but the impact on margin, customer satisfaction, and rework costs makes it worth including in your ROI calculation.

## Our Example Scenario:

**ESTIMATING SAVINGS FROM PRODUCT DAMAGE REDUCTION**

For our example, we decided to reduce the annual palletizing-related product damage by 15%.

1. Estimated damage savings: **0.15**

### NOW IT'S YOUR TURN:

Go to **Step 10** in the ROI Calculator to enter the savings from product damage reduction.

1. Estimated damage savings (**C10**)

## Including Injury-Related Cost Savings In Your ROI Calculation

Manual palletizing is physically demanding work. Over time, it often leads to strain injuries, musculoskeletal issues, and lifting-related incidents. These injuries carry real financial costs.

While the exact numbers can vary, workers' compensation claims and increased insurance premiums are common outcomes. If you have historical data on injury-related expenses, you can use that to estimate the potential cost savings from switching to a robotic system.

If not, here are baseline figures you can use:

- The average injury related to warehouse and palletizing tasks costs between **$40 000 and $50 000 per incident**.
- According to OSHA estimates, even a simple sprain can result in **$30 487** in direct costs.
- Indirect costs can be similar, but for simplicity, you can focus on the direct impact.

To apply this in your ROI calculation, consider how many employees are currently palletizing, how often injuries have occurred in the past, and whether you want to include indirect costs for a more complete view.

Use the OSHA Injury Cost Estimator to calculate the potential savings.

## Our Example Scenario:

**INCLUDING INJURY-RELATED COST SAVINGS**

In this example, we'll estimate one sprain injury every five years, using a direct cost of **$30 487** per incident.

1. Estimated injury cost: **$30 487**
2. Estimated injury occurrence: **1 every 5 years**

Estimated injury savings: Estimated injury cost / Estimated injury occurrence

Estimated injury savings: **$30 487 ÷ 5 = $6 100**

## NOW IT'S YOUR TURN:

Estimate the estimated injury savings using **Step 11** in the ROI Calculator.

1. Estimated injury cost (**C11.1**)
2. Estimated injury occurrence (**C11.2**)

Total of **Step 11** (**C11**)

# Combining All Inputs for a Realistic ROI Estimate

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Now that you've worked through the key cost and savings inputs, you can calculate a more realistic payback period for your palletizing system. This reflects the measurable factors that directly impact ROI from labor efficiency to injury-related costs and throughput gains.

## Our Example Scenario:

CALCULATING A REALISTIC ROI FOR THE COBOT PALLETIZER

In our example, here are the variables we gathered so far:

1. Total system cost: **$152 000**
2. Palletizer efficiency: **0.90**
3. Manual labor cost: **$129 000**
4. Labor efficiency: **0.85**
5. Ongoing annual costs: **$8 000**
6. Productivity gain: **0.40**
7. Estimated damage savings: **0.15**
8. Estimated injury savings: **$6 100**

ROI or Payback Period: [(Manual Labor Cost ÷ Labor Efficiency) × (1 + Productivity Gain + Damage Savings) + Injury Savings – Ongoing Annual Costs] ÷ (Total System Cost ÷ Palletizer Efficiency)

ROI or Payback Period: **[($129 000 ÷ 0.85) × (1 + 0.40 + 0.15) + $6 100 – $8 000] ÷ ($152 000 ÷ 0.9) = 1.38 years**

## NOW IT'S YOUR TURN:

Go to **Step 12** in the ROI Calculator to calculate the final ROI.

| | |
|---|---|
| 1. Total system cost (**C3**) | 0 |
| 2. Palletizer efficiency (**C8**) | |
| 3. Manual labor cost (**C5**) | 0 |
| 4. Labor efficiency (**C7**) | |
| 5. Ongoing annual costs (**C4**) | 0 |
| 6. Productivity gain (**C9**) | |
| 7. Estimated damage savings (**C10**) | |
| 8. Estimated injury savings (**C11**) | |
| Total of **Step 12** (**C12**) | NaN |

# Intangible Benefits Impacting Your ROI

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Intangible factors won't appear in your cost breakdown, but they can still have a major impact on your ROI. These benefits are harder to quantify and vary widely depending on your operation, but they often create meaningful gains that go beyond direct labor savings.

For some businesses, these intangibles can shorten the payback period significantly, even down to a few months or a single project.

**Here are a few examples to consider:**

If you're in a region with persistent labor shortages or high turnover, reducing that pressure can make a major difference in day-to-day operations.

If you're limited by current throughput, but can't expand with manual labor alone, automation may be the only way to grow production and win new business.

Common intangible benefits include:

- Fewer disruptions caused by labor gaps or turnover
- Increased throughput potential
- More stable, long-term staff retention
- Reduced time and cost spent on training
- Improved employee morale
- Stronger customer confidence from more reliable delivery
- Easier production planning with predictable output
- Greater perceived value and marketability from adopting automation

While these are not measured in dollars upfront, they often influence key decisions and long-term success. Include them in your evaluation, even if they aren't reflected in the calculator.

# Factoring In the Cost of Inaction

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Before wrapping up your ROI estimate, it's worth considering the cost of doing nothing.

Delaying investment in robotic palletizing can mean falling behind competitors who are already reducing costs, improving throughput, and attracting labor by automating repetitive tasks. As more manufacturers adopt automation, the gap widens, not just in efficiency, but in their ability to recruit and retain workers.

Manual palletizing is still possible today, but labor shortages are ongoing and expected to worsen. Fewer people are willing to take on physically demanding roles, and those who do are harder to retain. Relying on inconsistent labor makes it more difficult to hit delivery targets and protect your margins.

The question isn't just whether automation pays off. It's whether standing still will cost you more over time.

# What's Next: Complete Your ROI Calculator and Start the Conversation

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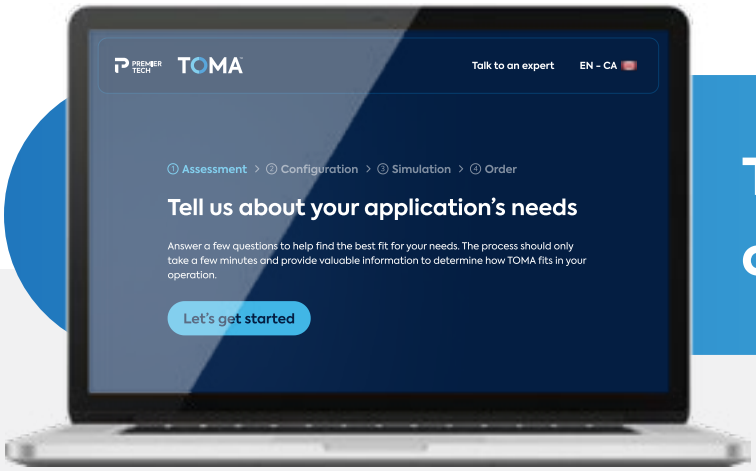
You've now worked through the key factors that influence the ROI of a cobot palletizing system, including labor efficiency, injury reduction, throughput gains, and more.

If you followed along, you likely have filled out the ROI Calculator and calculated a more realistic payback period based on your operation.

**If you're considering a standardized cobot palletizer, the next step is simple.**




**Try the TOMA™ online configurator**

It allows you to scope your application, select layout options, and receive a preliminary quote. You'll also get an estimate of speed and throughput.

Have questions or want help reviewing your numbers? Reach out to the palletizing experts at TOMA™. Our team can help you evaluate your results, talk through your production needs, and explore whether a TOMA™ system is the right fit for your line.

# The ROI Calculator for Cobot Palletizing

Reset form

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## Step 1: Input Your Quoted Cobot Palletizer Price

Fixed Costs = C1 [ ]

## Step 2: Add Up Estimated Variable Costs

Variable Costs = C2.1 [ ] (Downtime) + C2.2 [ ] (Specialized Services) + C2.3 [ ] (Staff Training) + C2.4 [ ] (Layout Changes) + C2.5 [ ] (Risk Assessment) = C2 [0]

## Step 3: Calculate the Total System Cost

Total System Cost = C1 [ ] (Fixed Costs) + C2 [0] (Variable Costs) = C3 [0]

## Step 4: Calculate the Ongoing Annual Costs

Ongoing Annual Costs = C4.1 [ ] (Electricity) + C4.2 [ ] (Maintenance & Repairs) + C4.3 [ ] (Unexpected Breaks) = C4 [0]

## Step 5: Calculate the Manual Labor Costs (Potential Savings)

Manual Labor Costs = C5.1 [ ] (Yearly Salary) + C5.2 [ ] (Annual Bonuses) + C5.3 [ ] (Benefits) + C5.4 [ ] (Shift Losses)

+ C5.5 [ ] (Turnover Cost) × ( C5.6 [ ] (Number of employees per shift) × C5.7 [ ] (Number of shifts) ) = C5 [0]

## Step 6: Calculate A Basic, But Not Entirely Accurate ROI

Basic ROI = C3 [0] (Total Costs) ÷ C5 [0] (Manual LaborCosts) = C6 [NaN]

## Step 7: Define The Labor Efficiency

Labor Efficiency = C7 [ ]

## Step 8: Define The Palletizing System Efficiency

Palletizer Efficiency = C8 [ ]

## Step 9: Calculate The Increased Throughput

Productivity Gain = C9 [ ]

## Step 10: Estimate Savings From Damage Reduction

Estimated Damage Savings = C10 [ ]

## Step 11: Calculate Injury-Related Cost Savings

Estimated Injury Savings = C11.1 [ ] ÷ C11.2 [ ] = C11 [ ]

Estimated Injury Cost | Estimated Injury Occurance

## Step 12: Calculating the Realistic ROI

ROI / Payback Period = [( C5 [0] ÷ C7 [ ] ) × (1 + C9 [ ] + C10 [ ] ) + C11 [ ]

Manual Labor Cost | Labor Efficiency | Productivity Gain | Damage Savings | Injury Savings

- C4 [0] ] ÷ ( C3 [0] ÷ C8 [ ] ) = C12 [NaN]

Ongoing Annual Costs | Total System Cost | Palletizer Efficiency | **Realistic ROI**


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