



# How many AGVs do you need? Case study and approach

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## From observation to simulation: how to optimise internal logistics

### Why AGVs make a difference now

Automated Guided Vehicles (AGVs) make internal logistics safer and more predictable. That leaves one essential question unanswered: how many vehicles do you need? The answer depends on your production environment and processes. Sirris looked into this in a factory with three production lines. This practical case shows how to use observation, analysis and simulation to arrive at an informed decision based on data rather than making assumptions.

### Step 1: define the context using a detailed specification document

The project began with a detailed analysis of the existing processes. The following parameters were systematically documented: distances, loading and unloading times, transport frequencies

and cycles.

This data provided the core for a comprehensive specification document. This document is essential to guide internal decision-making and also to provide suppliers with objective input. It prevents misinterpretation and ensures that substantive aspects are comparable across different bids. This document continues to be used as a reference point during implementation and validation.

## **Step 2: from guesswork to certainty with simulation**

Based on the specification document, simulation models were then built. These reproduced the production flows on the three lines, including all pallet movements, layout data and process parameters. Testing scenarios made it possible to reveal bottlenecks, peak loads and waiting times.

The result was clear: three AGVs were enough to handle all main and ancillary tasks. This conclusion is based on data and lead times rather than simply on assumptions. The simulation made the investment decision concrete, transparent and robust.

The simulation also provided additional insights:

- The effect of alternative pick and drop positions
- The impact of buffer sizes and dispatching rules
- The role of safety zones and intersections in the layout
- The sensitivity of the system to shifts or capacity changes

This not only provides quantitative underpinning for the business case but also future-proofs it.

## **Step 3: focus points for successful implementation**

An AGV project is not just about calculating numbers. The study revealed crucial implementation factors that make the difference between smooth integration and daily frustration.

### **1. Optimise pick and drop positions**

The locations that are chosen determine versatility, cycle time and throughput. Incorrect positioning leads to bottlenecks or unnecessary delays.

### **2. Ensure safety and avoid obstructions**

AGVs share the floor with people and machines. Routes must remain clear of obstructions such as open doors or stacking areas. Collision risks call for clear signage and safety zones.

### **3. Provide buffers with the correct dimensions**

Buffers are the system's shock absorbers. If buffers are too small this can lead to shutdowns, while making them too large results in waste. Cooperation with cobots or operators determines how robust the flow remains.

#### **4. Develop fallback scenarios**

'For every happy flow there are unhappy flows.' What happens in case of a blockage, error message or breakdown? You should define emergency procedures and train staff, so you can prevent lost production and increase reliability.

### **From business case to implementation**

Using the results from the simulation and the points for attention from the analysis, the company can map a concrete implementation pathway:

- Request quotes based on the specification document
- Work out a detailed business case, including ROI and TCO
- Involve management and appoint a project leader
- Provide a project plan with test phases and evaluation points
- Involve operators from the beginning to ensure support

The study also provided a list of suppliers and users who are willing to share their practical experiences. This knowledge sharing allowed faster validation of the decisions made.

### **Outcome of the case: three lines, three AGVs**

For the plant under investigation, three AGVs were sufficient to cover all tasks. The system is scalable and ready for growth, thanks to smart buffer dimensions and optimised positioning. The strength of this study lies not in the number itself, but in the method that was used. Each company has its own context and parameters, but the same approach can still be used.

### **The importance of simulation for informed AGV decisions**

The case shows that simulation is essential in order to make informed choices. Measurements and models replace guesswork and gut feeling. This allows you to invest with confidence, avoid over-dimensioning and move towards a more efficient, safe and sustainable logistics system.

#### **Do you want to optimise your internal logistics with AGVs too?**

Do you have plans to automate material handling, but don't know where to start? Do you have questions like:

- How many AGVs do I need for my production facility?
- What adjustments in my factory layout are needed?
- How should I prepare an objective business case?

The experts at Sirris will guide you through a phased approach that is tailored for your business, from in-depth analysis and simulation to implementation plan and follow-up.

Contact us to discuss your needs on a no-obligation basis and find out how we can help you take the next step in automating your logistics processes.

[Contact us](#)

## Want to learn more about flexible automation?

Do you want to look beyond AGVs and discover how other mobile and reconfigurable solutions can strengthen your production floor? These two articles offer deeper insight into data-driven AMR applications and the use of flexible cobot carts. This gives you a complete view of the possibilities in modern internal logistics and production automation.

Read our articles:

[Learn more about the mobile cobot cart](#) [Start optimizing with Autonomous Mobile Robots \(AMRs\)](#)

## About Beyers



Beyers has been taking coffee to the next level since 1880. From its beginnings in Antwerp, after more than 140 years it has become Belgium's largest coffee roaster and a leading player in the European private-label market. Now part of the Sucafina group, Beyers strives to offer its customers excellent quality as a true one-stop shop.

At its production facility in Puurs-Sint-Amands (Belgium), Beyers produces a wide range of coffee products: beans, roasted and ground coffee, pads and capsules.

A few years ago, Beyers built a new production and storage facility. Numerous logistics movements occur in this environment every day: supply of packaging materials and components for the production lines, and removal of finished products.

Beyers is looking at how the deployment of **AGV/AMR** can contribute to more efficient and flexible internal logistics within this production and warehouse context.

[More info](#)

## Authors



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