

MasterMover®

AGVs you can trust

Your Guide to Automated Guided Vehicles (AGV)





Introduction to AGVs

Automated Guided Vehicles (AGVs) have the ability to be transformational when it comes to driving operational efficiency within industrial manufacturing.

Featuring best-in-class navigation and safety technologies, AGVs remove the need for human operation, carrying out movement of products, equipment and materials on time, every time.

In addition, people are protected from manual handling injuries, and can spend more of their time on greater value adding and important tasks.

With 25 years of proven experience and track record in electric tugger solutions, and combining this with best-in-class technologies, MasterMover is bringing new standards and capabilities to autonomous load moving...



25+ Years' vehicle design



Safety as standard

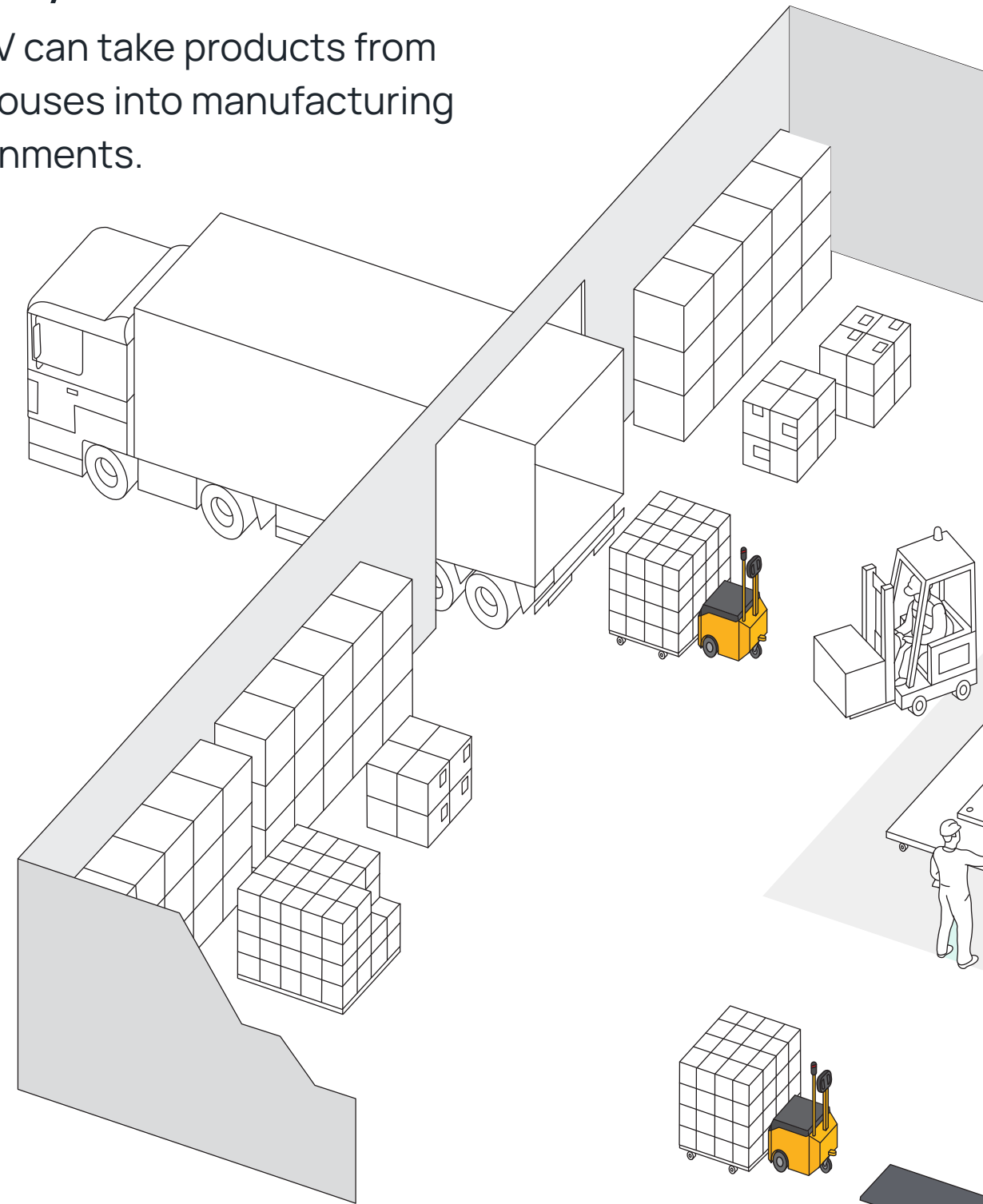


Heavy payload handling

AGVs in Action

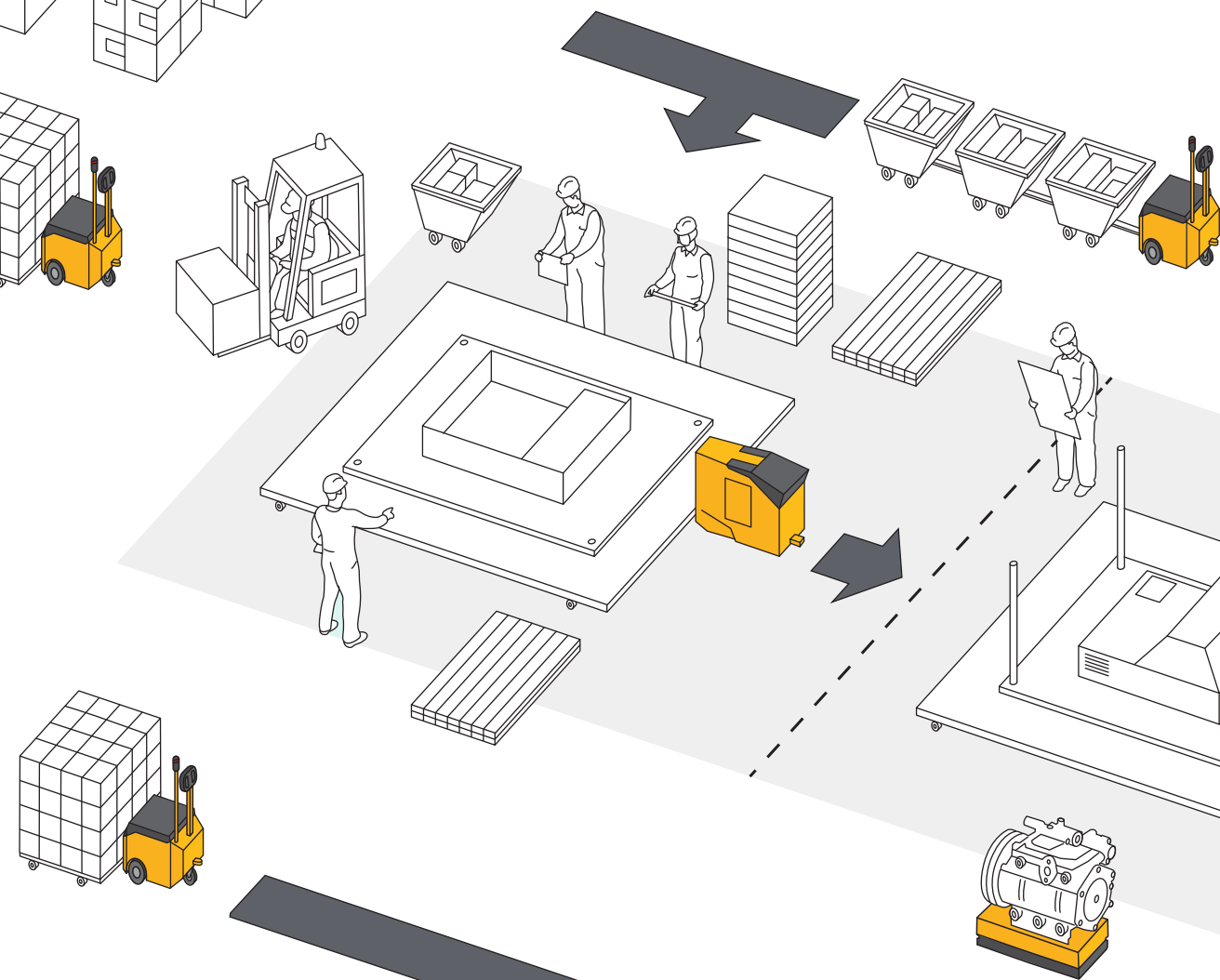
Delivery from warehouse

An AGV can take products from warehouses into manufacturing environments.



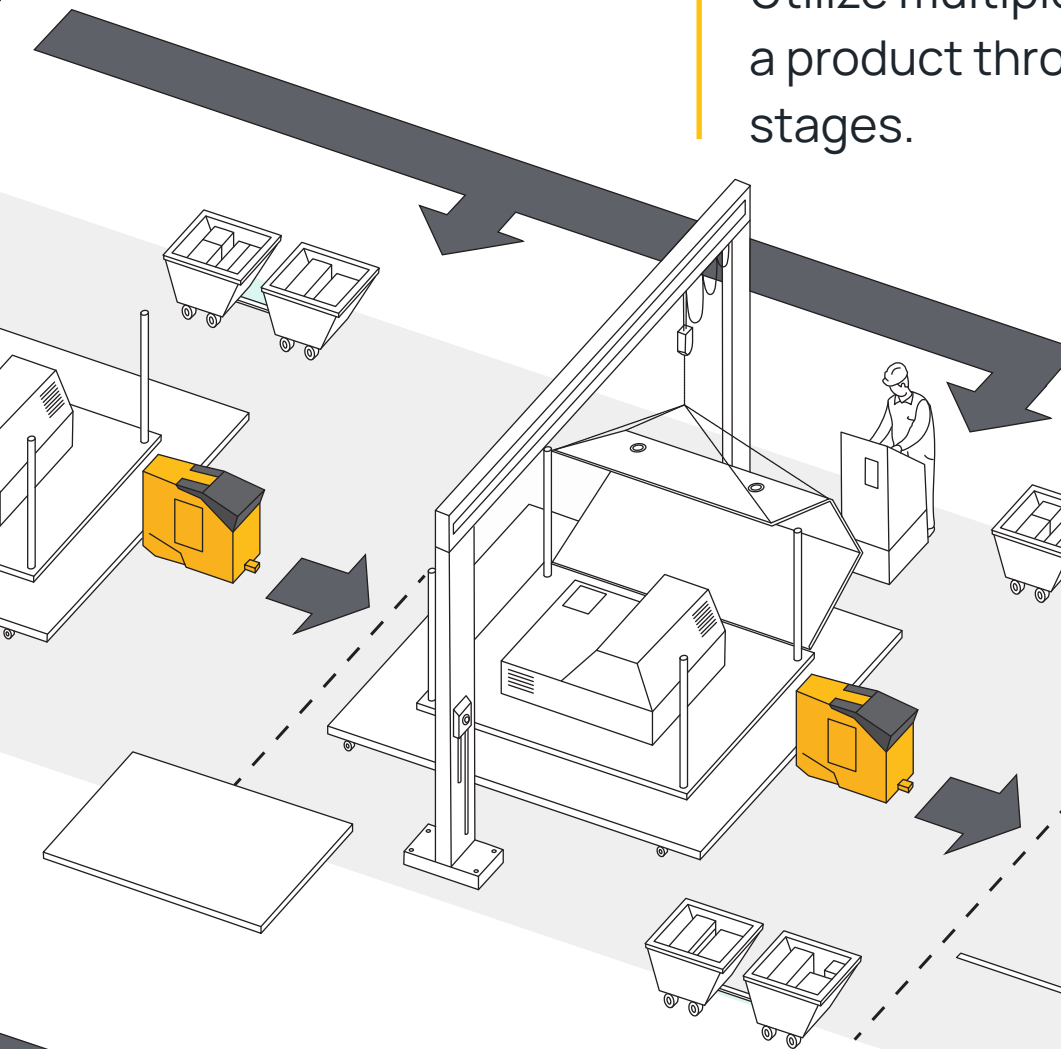
Picking area

AGVs allow operators to concentrate on value added tasks such as item picking.



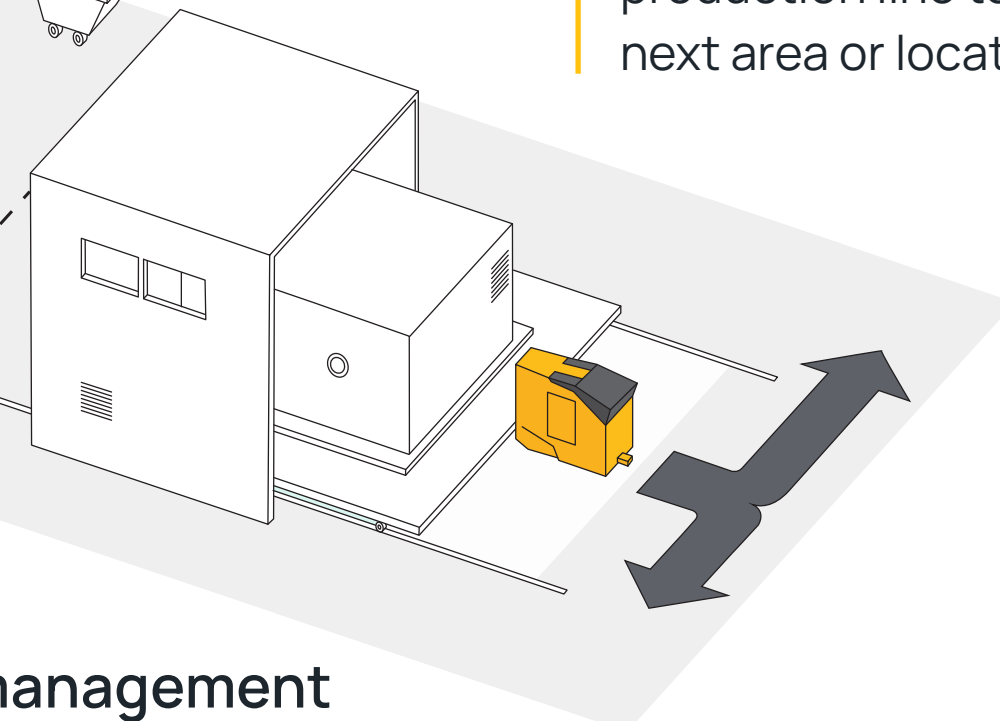
Pulse production

Utilize multiple AGVs to move a product through production stages.



End of line

Move products from the production line to the next area or location.



Building to building

Utilize an AGV - capable of outside operation - to transfer loads between buildings.

Parts delivered to line

Deliver the right parts to the production line whenever they are needed.

Storage to picking

Take parts and components from your storage locations to the picking area.

Waste management

Remove waste materials away from the production line for processing.

Benefits of AGV technology



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Maximum safety

AGVs detect hazards and dangers, taking the appropriate action.

No human error

AGVs eliminate human error, stopping the AGV in its tracks when risks are detected.

Repeatability and precision

AGVs guarantee repeated movement and precision – crucial in manufacturing to make the environment safe and reduce risk of damage to loads, premises and people.

24/7 operation

With spare batteries and multi-charging options, AGVs can operate 24/7 helping to keep environments safe.

Better efficiency

AGVs carry out tasks on time and at the optimal speed, faster than if done manually.

Better use of people

AGVs do the heavy manual work, and deliver greater ROI through staff spending more time doing greater-value tasks.

Flexible and scalable

AGVs can be switched to a manual operation mode to move any wheeled load within their weight capability. This enables them to accomplish a wider range of tasks.

Better than fixed automation systems

AGVs can complete a wider range of tasks and can easily be swapped out to minimize any disruption caused by faults.



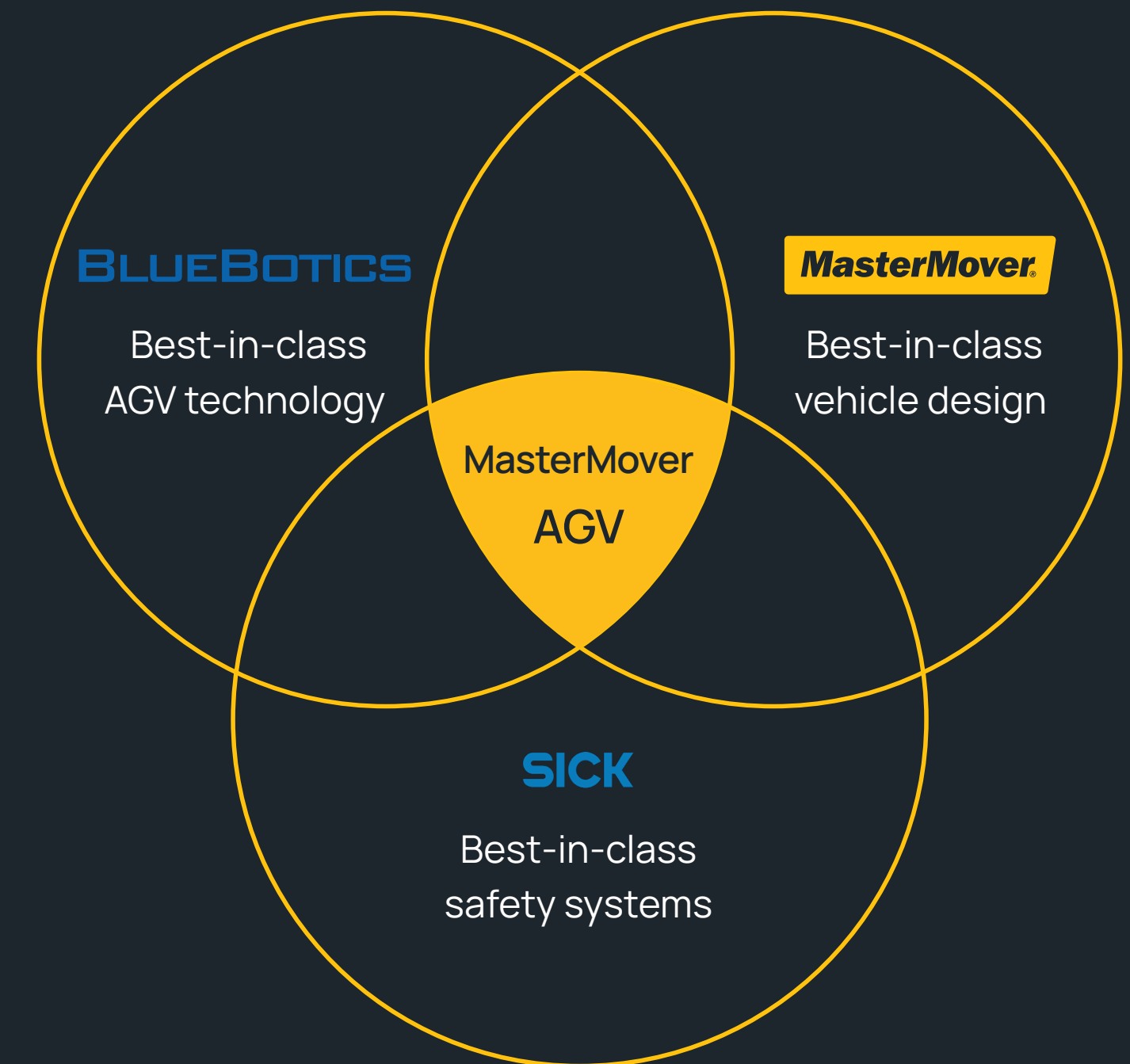
Why choose MasterMover AGVs?

AGVs you can trust

MasterMover is the market leader in electric tugger and tow solutions, with over 25 years of experience. Our machines are used around the world by some of the biggest and most innovative names in industrial manufacturing.

Autonomous solutions delivered by MasterMover have delivered impressive increases in operational efficiency, while maintaining the highest safety standards.

We work with best-in-class technology partners, combining this with our own in-house engineering excellence, to deliver world-class AGV solutions.



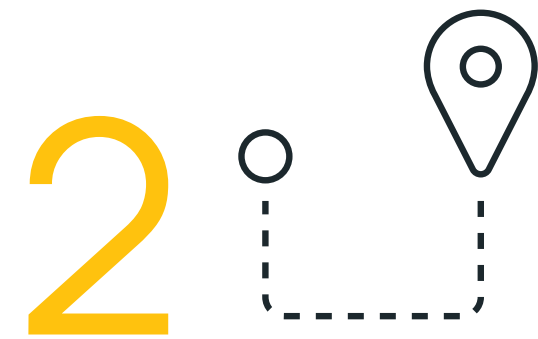
An AGV that fits your application

We understand that switching to an AGV solution is an investment, even if it is one that will inevitably deliver increased ROI, efficiency and safety. Our skilled and experienced team is here to guide you with our tried and tested approach.



1 The Right Machine For You

Firstly, we put time into understanding your application to help decide whether an existing product is the right fit, or whether a custom AGV design would offer better performance.



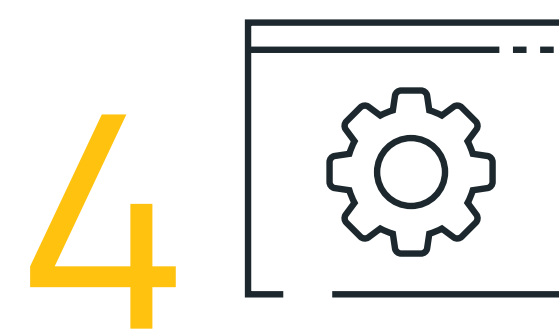
2 The Right Navigation For Your Site

We'll explore which navigation system will work best, whether that be floor-based navigation (e.g. line following) or full natural navigation.



3 The Right Dispatch Commands

Next, our team will look at how the AGV gets its instruction to move or 'pulse' to the next location, whether that be through a simple press of a button or a system driven command.



4 Integrate With Your Systems

Then, we'll look at where other system integrations are needed. These could include a Warehouse Management System or an Enterprise Resource Management platform, or infrastructure such as doors and traffic lights.



5 Optimize Your Safety Systems

Depending on the environment and application, identifying the right safety systems is key to ensure people, loads and the operating environment are protected.

1 The Right Machine For You

Take advantage of our existing range, or work with our Customer Engineering team on a new solution to solve a specific operational challenge.

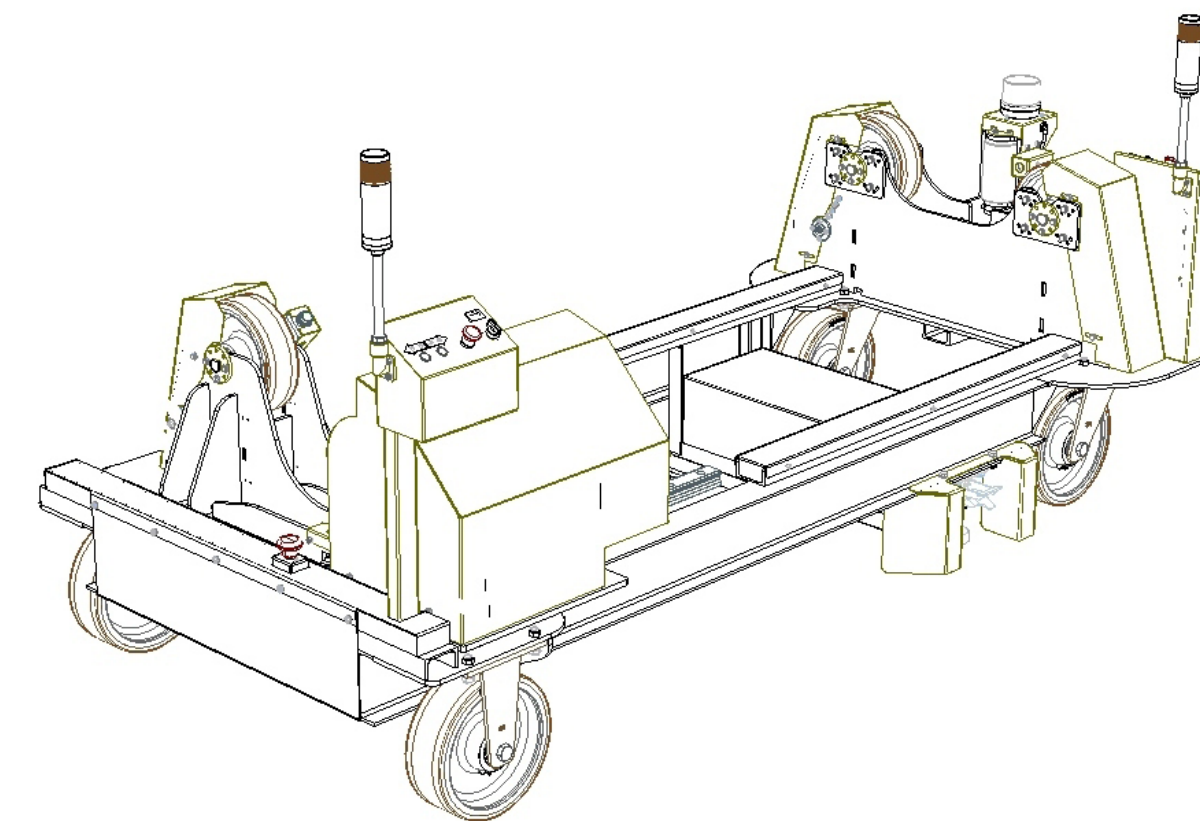
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Existing product

MasterMover offers the widest range of electric tugger and tow solutions available from a single material handling equipment provider.

The benefit for you? We'll have the solution you need to support your application and solve your operational challenges.



Custom solution

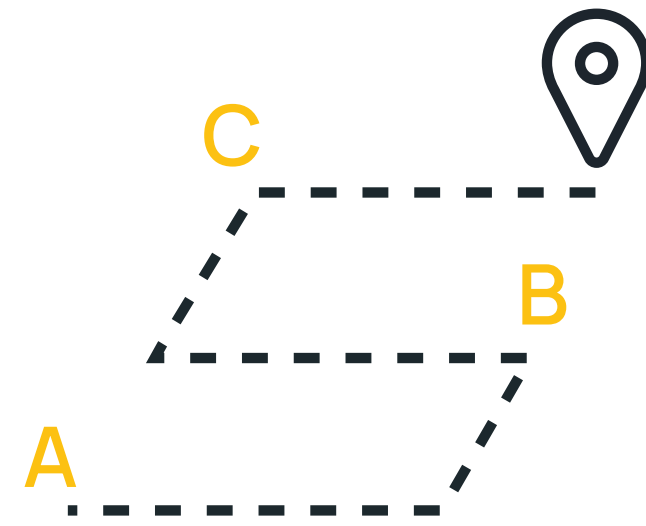
Need something a bit different to fit your exact needs? No problem. Our experienced project and engineering experts regularly design custom solutions for our customers, from complete solutions, to items such as custom coupling options.

In fact, many of our existing products were born out of customer engineering projects.

2

The Right Navigation For Your Site

Software and sensors ensure highly accurate navigation and safer environments.



Line follow

Set to follow a defined path that can be specified by the operator. Line follow capabilities make sure AGVs follow the exact same route time after time, even when working in tight spaces or moving loads through areas with minimal clearance.

Barcodes can also be placed on the ground, or other similar identifiable prompts, for the machines to scan for additional programmed information, such as slowing down through a specific area.



Natural feature

Machines use sensors and scanning systems to navigate autonomously by detecting and mapping the environment around them to move around obstacles.

The sensors ensure a programmed response to any detected risk and the units will stop until the hazard has been moved away.



GNSS outdoor

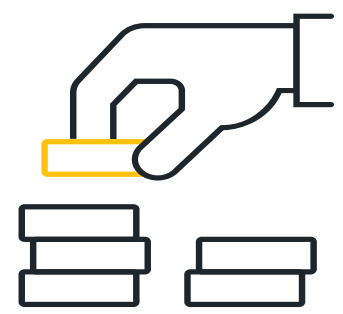
Utilizing GNSS with real-time kinematic (RTK) positioning, our AGVs deliver seamless movement indoors and outdoors.

Line follow

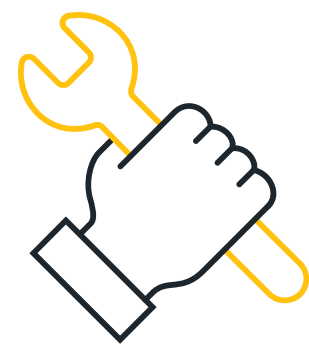
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Barcodes can also be placed on the ground, or other similar identifiable prompts, for the machines to scan for additional programmed information, such as slowing down through a specific area.

Benefits



Cost-effective



Easy to modify



Simple

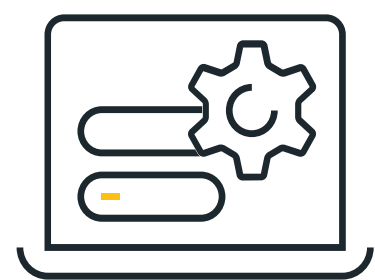


Natural feature

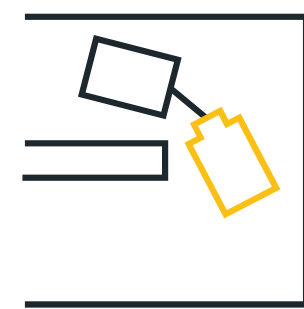
The most sophisticated form of AGV, natural navigation machines use sensors and scanning systems to navigate autonomously by detecting and mapping the environment around them to move around obstacles.

The sensors ensure a programmed response to any detected risk and the units will stop until the hazard has been moved away.

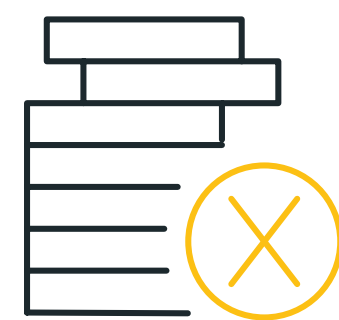
Benefits



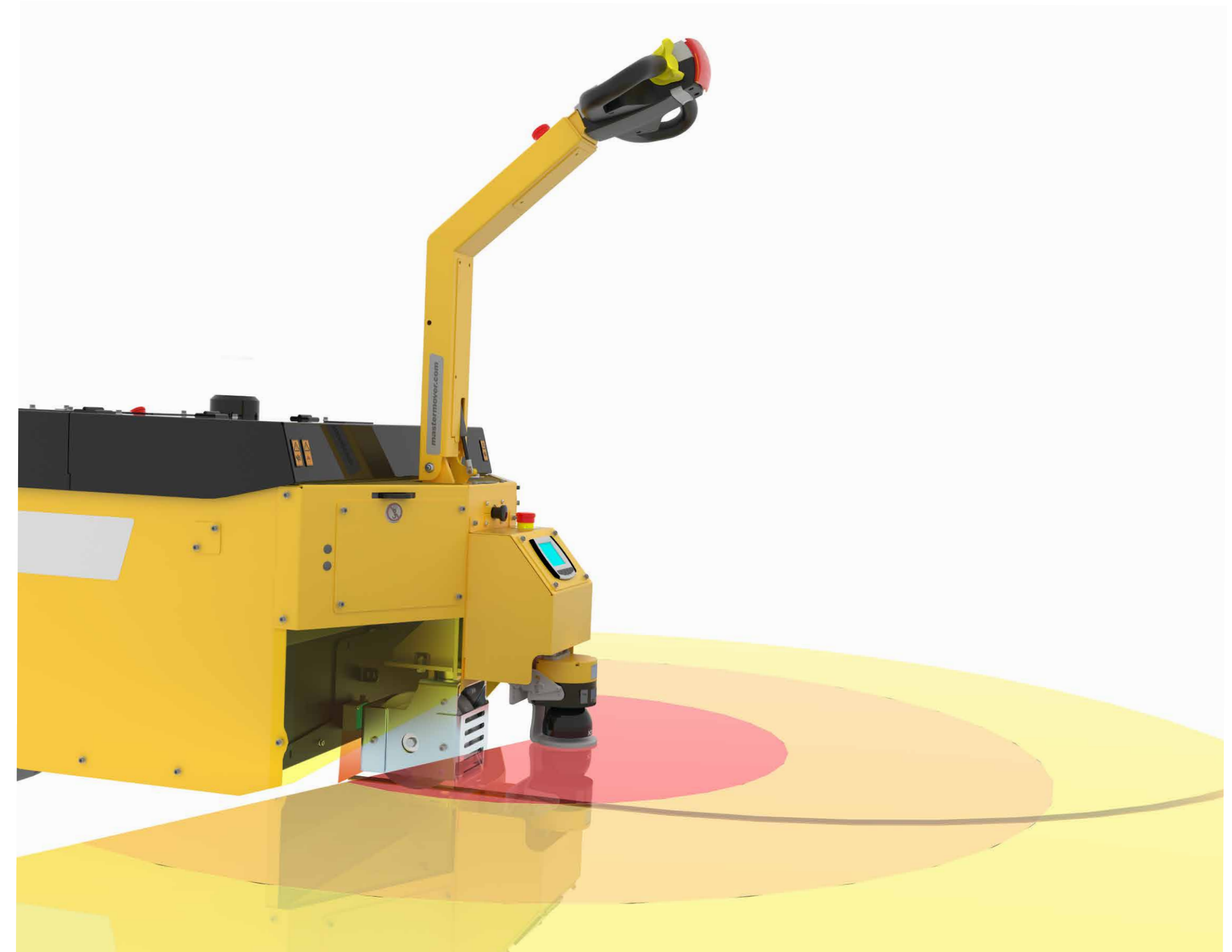
Easy integration



Precise movements



No additional infrastructure



GNSS outdoor

Our AGVs are also available with GNSS navigation for safe, robust, and accurate navigation outdoors. Receiving real-time kinematic (RTK) positioning from satellites into the AGV's receiver, our AGVs deliver pinpoint accuracy – even outside.

AGVs are configured with a GNSS receiver (one per vehicle) and a GNSS base station (one per site).

Benefits



Fully integrated indoor and outdoor solution



Accurate positioning outdoors



Quick to install



3

The Right Dispatch Commands

Determine how an AGV gets its instruction to move, or 'pulse', to the next location for maximum efficiency within your environment.

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On board

A simple but effective solution. With on-board dispatch, an operator gives the AGV a command to move via a user interface on the machine.

This command prompts the AGV to move to the next location, with the operator able to control when this movement takes place.



Fleet managed

Using a more technology orientated approach, the AGV is fully integrated into your existing systems, for example Fleet Management, Production Management System or Warehouse Management solutions.

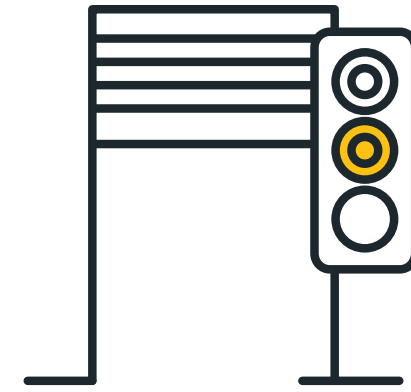
These systems send commands to the AGV to move to a designated location, at the right time and in conjunction with your other processes and production program.

4

Integrate With Your Systems

Our AGV solutions can be programmed to interact with your systems and infrastructure, to ensure efficient, seamless and safe operation.

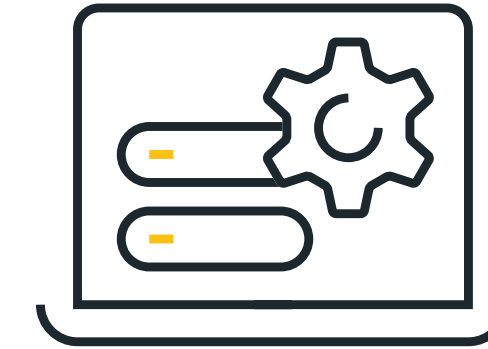
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Environment interaction

In addition to best-in-class navigation and safety systems, MasterMover AGVs will work with your existing infrastructure, for example stopping based on traffic lights or open doors, or taking signals to slow down in certain areas.

Other processes can be programmed as well, such as auto charging or interacting with our material handling or production systems.



Systems interaction

As well as interacting with your infrastructure and environment, our AGVs work with your management systems as well.

This can involve Warehouse Management Systems, Enterprise Resource Planning and other fleet management systems, with two-way communication of key data and information.

5

Optimize Your Safety Systems

Our AGV solutions ensure safety as standard, detecting hazards and taking the appropriate action.

MasterMover

Intelligent safety rated features.

High level scanner

This scanner looks for obstacles and hazards, capable of identifying overhanging objects.

Outdoor weather detection

If visibility is reduced, the AGV will slow down, on the basis obstacles or hazards may be detected later or closer to the machine.

Speed adaptive safety system

Taking environmental prompts, the AGV will take appropriate actions, restarting when the path is clear.

Low-level safety scanner

This scanner detects hazards and risks as well as factors such as surface condition and visibility.



Awareness and warning features.

Flashing safety lights

Flashing lights when in movement, indicate position for nearby people.

Audio beacons and warnings

Sound horn and audible beeps announce travel direction and presence.

Emergency stop/ Anti-crush button

When in dual mode and being used by an operator an anti-crush button brings the AGV to a complete stop.

Blue light/light curtain

Lights in front and at the side of the AGV, shining on the floor, indicate the position and movement for people nearby.

Our AGV range



MasterHandler AGV

Weight capacity: Up to 13,200 lbs.

Type: Tugger AGV



FlatBed AGV

Weight capacity: 22,000 lbs. plus

Type: Unit Load AGV



MasterTow AGV

Weight capacity: Up to 44,000 lbs.

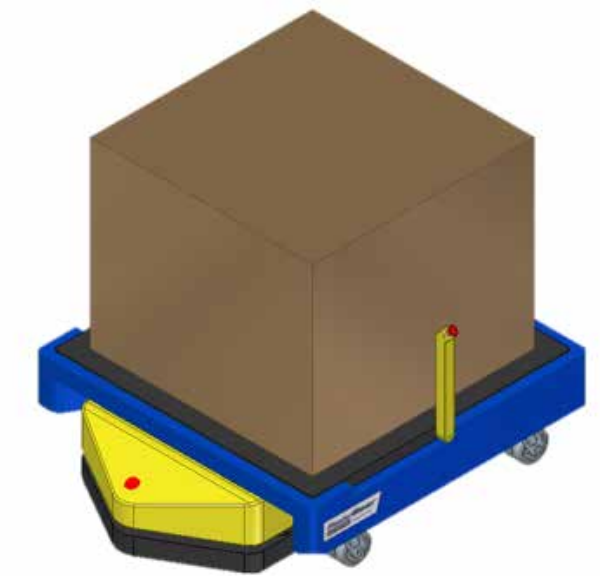
Type: Towing AGV



PowerSteered AGV

Weight capacity: 154,000 lbs.

Type: Heavy Duty Tugger AGV



Custom Solutions

Weight capacity: Custom

Type: Custom

MasterHandler AGV

Featuring a unique design centred around delivering maximum control, the MasterHandler AGV range can easily steer and position heavy loads that ordinarily would be difficult to move in a controlled way.

The MasterHandler AGV range is ideal for working across repeatable processes such as the movement of work-in-progress or in creating pulsed production lines.



Range capacity
Up to
13,200 lbs.

Line follow
Natural feature

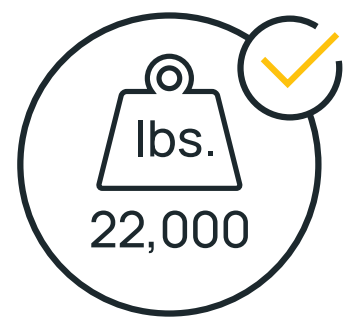


FlatBed AGV

The Flatbed AGV range of heavy-duty unit load vehicles is built for industrial and distribution environments.

Combining a 25+ year track record of heavy load movement with best-in-class AGV technology, our Flatbed AGV range is the ideal solution for moving heavy payloads with unrivalled manoeuvrability, flexibility and control.

Whether you're looking for an alternative to traditional conveyor systems, to streamline the movement of parts assemblies and palletized goods, or a more flexible assembly line – the Flatbed AGV is the perfect fit.



Range capacity
Up to 22,000 lbs.
and beyond

Line follow
Natural feature



MasterTow AGV

The MasterTow AGV range is ideally suited to towing trains of carts in industrial manufacturing and logistics environments, driving greater efficiency in material handling processes.

With a design focused on durability, the MasterTow AGV range is trusted by leading organisations to work in the toughest environments. Based on our established pedestrian range of tow tugs, the MasterTow AGV range is built with the power to move the heaviest loads – and with best-in-class AGV technology, it does it day-in, day-out.



Range capacity
Up to
44,000 lbs.

Line follow
Natural feature
GNSS Outdoor

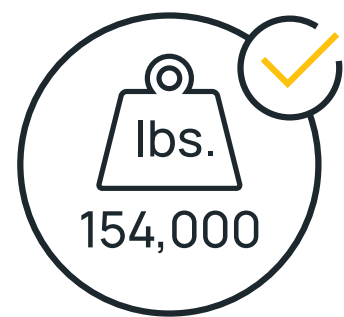


PowerSteered AGV

The robust design of the PowerSteered AGV range guarantees unrivalled weight-moving performance.

A secure coupling system ensures maximises connection to the load, and a compact machine footprint delivers maximum manoeuvrability.

With heavy weight moving performance, the PowerSteered AGV range is ideal for creating pulsed production lines in heavy industrial manufacturing or moving high-value loads with millimetre accuracy.



Range capacity
Up to 154,000 lbs.
and beyond

Line follow
Natural feature



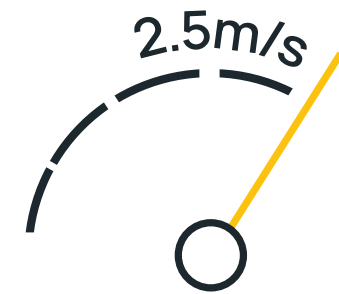
Why we're different

MasterMover AGV solutions offer a new level of capability and reliability, based on our proven track record of delivering load moving solutions and utilization of best-in-class technologies...



Weight Capacity

Our AGV solutions are available with the power to move up to 154,000 lbs., enabling automated movement of even the heaviest of loads.



Speed

MasterMover AGVs travel up to 2.5m per second, even with heavier loads.



Terrain

Unlike other AGVs, MasterMover AGVs are designed to travel inside, outside, in the rain, and even on slopes.



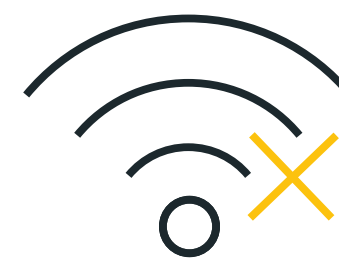
Durability

All MasterMover products are manufactured to the highest standards, meaning they are reliable, durable and dependable.



Dual Mode

MasterMover AGVs can easily be utilized for other tasks and jobs, helping drive additional ROI and flexibility.



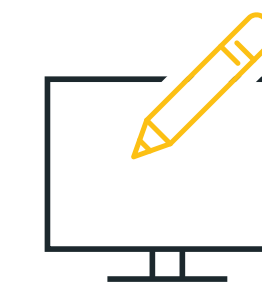
Intelligence

Our AGV does not rely upon WiFi like many other AGVs to operate. Removing the need for large infrastructure and IT changes within operational settings.



Battery Capacity

With a runtime of 10 hours, and 24 hours using multiple batteries. Operational efficiency is maximized.



Customer Engineering

Our in-house team can design and build entire solutions, or specific elements. Likewise, machines can be delivered in stainless steel, and to ATEX and IP55 standards.

Market comparison

MasterMover AGVs are designed to deliver beyond the 'standard', compared to many alternative automated options.

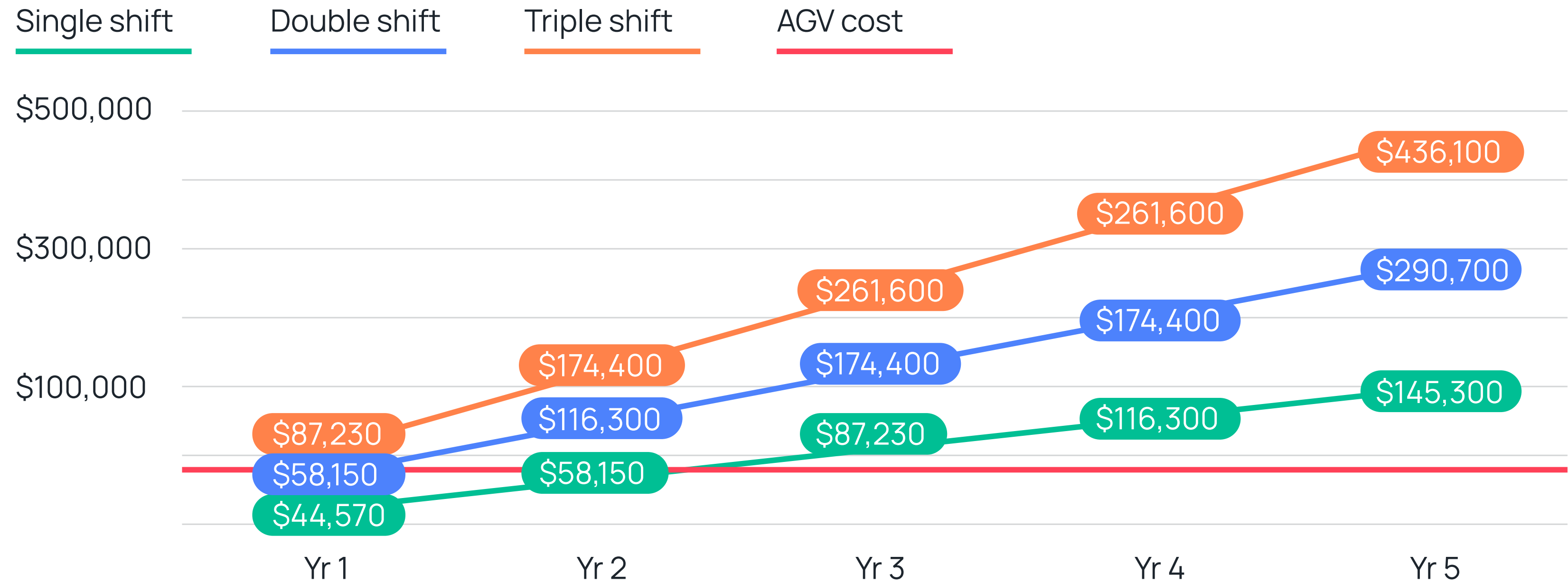
	MasterMover AGV	Other AGVs
Weight Capacity	Up to 154,000 lbs.	Majority designed for 2,200 lbs or less
Speed	2.5m/s even with heavy loads	Sometimes faster but only when moving light loads
Terrain	Inside, outside, on slopes and uneven terrain	Typically inside only and requiring high quality floor
Durability	Manufactured and built to run 24/7	Limited due to battery life
Dual Mode	Yes	AGV only in most cases
Intelligence (WiFi)	WiFi not required	Typically require high performing, WiFi access and control
Battery Capacity	10 hours (24 hours with interchangeable batteries)	Typically much less runtime
Customer Engineering	Complete custom design available	Off-the-shelf solutions

ROI of moving to AGV



MasterMover

Typical cost of single operator and vehicle



AGVs deliver an exceptional return on investment.

An AGV can reach an ROI of between 50% and 150% when used for a single-shift over 3 years.

This can be dramatically increased to over 600% when the unit is used as part of a three-shift operation over a 5-year period.

* Based on guide figures

3 Year ROI		5 Year ROI	
Saving	ROI	Saving	ROI
\$30,151	50%	\$90,614	150%
\$120,846	200%	\$241,773	399%
\$211,541	349%	\$392,932	649%

Working with MasterMover

Our proven process - from original concept to final site acceptance - ensures our AGV solutions always deliver...

Identify AGV Applications >

Our experienced sales teams work with you to identify the applications where AGV technology can improve your operations.

Concept & Engineering Study >

Our technical teams conduct a detailed study to develop a concept and fully understand engineering implications.

Design & Manufacture >

The design phase finalizes all aspects of the machine, both in terms of the AGV itself and its interaction with your environment and systems. With a finalized design, we manufacture the AGV.

Installation & Testing >

With a built AGV, we deliver to your site and begin the process of installation, testing all aspects of the application with a rigorous site acceptance testing phase and providing full training to your team.

Ongoing Support >

Our service teams are with you every step of the way, making continuous improvements, updates and modifications, working with you to get the most out of your AGV solution.

Service and support

We'll be there for you every step of the way

The implementation of an AGV solution is the beginning, not the end, of the process for MasterMover.

Our service and support team are always on hand to answer questions, or help with any challenges that occur.

Not only are we there to keep your AGV running through regular service, but we're here to grow with you, providing the latest software and adapting technology to grow with your operations.

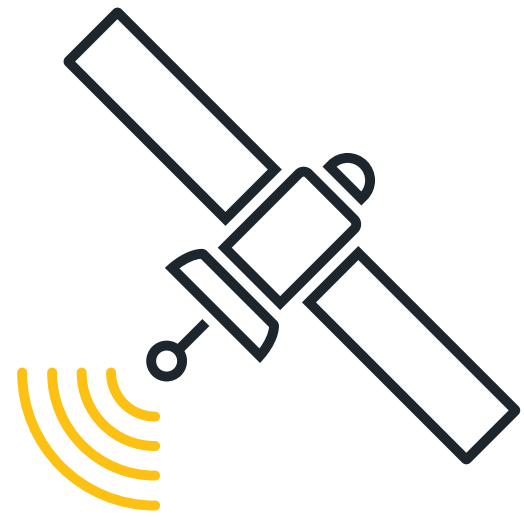
We are committed to delivering excellence for our customers, with our aim being to exceed your expectations.

If you need us, we will be there...

MasterMover



Case Study



Aerospace

In the USA, a world-leading satellite company utilizes MasterMover AGV solutions to move multi-million dollar satellites through the production process.

Due to the high-value of the satellites, and the tight spaces they must travel through, this company has utilized Line Follow navigation technology. This delivers repeated precision and controlled movement.

As a result, the possibility of human error has been eliminated, and the high value, sensitive equipment being moved is protected from accidental damage.

The process has also become far more efficient, as the movement of satellites through tight spaces is successfully achieved each time, whereas previously attempts could be aborted and delays caused where risk of damage was identified.

Less people are now involved in load movement activity, allowing valuable employees to spend time on tasks of greater importance.

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Automotive

One of the world's most recognized car makers, innovators in their field, use MasterMover AGVs as a key part of their production process.

AGVs are used to collect parts from one part of the production facility, taking them straight to the production line and dropping them off, before collecting empty platforms and taking these back to the parts area for reloading.

In addition, the company takes advantage of the benefits of AGV by moving parts between buildings, with machines designed to operate even in the worst weather conditions.

Use of the AGVs has resulted in huge operational efficiency benefits, and impressive ROI vs more manual or alternative load moving approaches.

In this operation, one MasterMover AGV travels over 1,000 miles per month, and works for 10 straight hours between battery swap-outs.

Case Study



Logistics

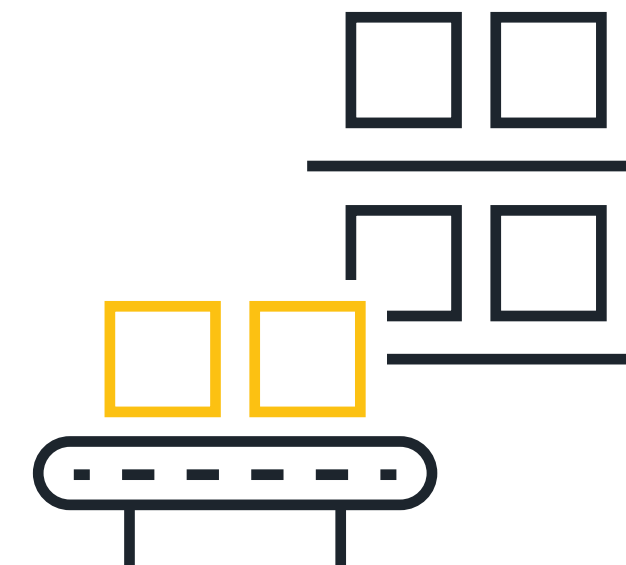
A UK based third-party logistics provider (3PL) has reduced its forklift fleet, significantly reducing traffic in populated areas, and driven efficiency benefits...all through the use of a MasterMover AGV solution.

Working with a well known home maintenance and DIY retailer, this 3PL uses cages to transport parts from the depot to stores. When these cages are returned to the depot, they are located on the opposite side of the site from where they are needed.

Previously, the company was using forklift trucks to move these nested cages, however the forklifts were able to only move a small number at a time. This meant a high level of forklift traffic through the site, increasing the risk of incidents.

Due to a MasterMover AGV solution, this transfer of the nested cages is automated, with the AGV moving five times the number of cages in one go. Forklifts are now only used outside in safe areas, and less operators are needed to transfer the cages across the site.

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SME Manufacturing

AGVs are not only for big operations! This manufacturer of aluminum extrusions has driven significant efficiency improvements through the use of an automated solution.

Previously, the company relied on manual handling to move materials to the production line. This caused a range of problems, such as strain on the individuals, speed of the process, and the need to take people away from more important, value-adding, tasks.

In addition, due to the production process, certain tasks needed to be completed within a short time-frame, so as to not cause operational delays. The manual handling approach was adding pressure to this process.

The company deployed an MasterMover AGV solution to tackle these challenges, and as a result, has eliminated manual handling, protecting their employees. They have also improved efficiency and reduced pressure on completing elements of the production process in the desired timeframes.

MasterMover AGV solutions in action...

If you'd like to see and explore how our AGV solutions could benefit your operation, talk to us about:

- A visit to an existing customer
- A demonstration at MasterMover
- A week-long on-site demonstration

Get in touch with our team today...

mastermover.com

980-263-2210



MasterMover



About us

Compact solutions to safely and efficiently move products, equipment and materials.

MasterMover material handling solutions help people easily move heavy or large loads, while improving safety and operational efficiency in organizations around the world.

MasterMover

Our brand promise

Engineered innovation.
Performance guaranteed.

Our brand mission

To help organizations worldwide empower and protect their people with the right solutions to safely and efficiently move products, equipment and materials.

MasterMover®

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