



VAN METER



smart

SOLUTIONS SUMMIT

**ADDRESS YOUR BIGGEST BUSINESS CHALLENGES
WITH AUTONOMOUS MOBILE ROBOTS**

WELCOME



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WELCOME



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BRINGING CONNECTED FACTORIES TO LIFE WITH THE SMARTEST AUTONOMOUS MATERIAL HANDLING SOLUTION

- Why AMRs?
- What should you consider to deploy an AMR?
- AMR vs AGV
- AMR Product lineup
- Architecture Overview
- Use cases



UNPRECEDENTED TIMES

- **INCREASED COSTS**
- **LIMITED SUPPLIES**
- **LABOR SHORTAGES**
- **SAFETY AND INJURIES**

Automation has moved from nice-to-have to must have – from tactical **to strategic**.





**EVEN THE MOST AUTOMATED
FACILITIES STILL MOVE
PARTS MANUALLY.**

MATERIAL HANDLING HASN'T CHANGED MUCH IN 30 YEARS

Manual: Driven by People



PERSON



MANUAL PALLET JACK



FORKLIFT

Pros:

Flexible, Dynamic, Scalable, Resilient

Cons:

Low throughput, High OpEx, Unpredictable, Errors, Safety concerns

Automated: Driven by Machine



CONVEYOR



CRANE



AGV

Pros:

High throughput, Low OpEx, Predictable

Cons:

Large footprint, Hard to reprogram, Inflexible, High CapEx

Yesterday

Manual MH equipment

Labor dependent MH

Low throughput

Injury and damage

Today



Reduce labor dependency



Safety first designed automation



Lights-out manufacturing



Cost reduction and high ROI

Tomorrow

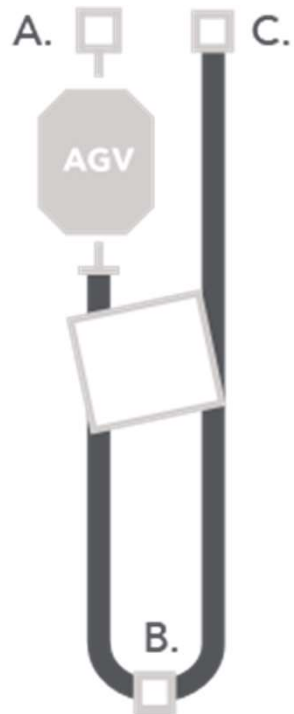
Digital transformation

Streamlined information and decision-making

Real time material visibility

Better deployment of scarce resources

AN AMR IS NOT AN AGV



AUTOMATED GUIDED VEHICLE (AGV)

- Pre-programmed
- Relies on physical infrastructure such as magnetic tape, wires, beacons
- Fixed paths in a controlled space
- Behaves like a conveyor - Point A to Point B



AUTONOMOUS MOBILE ROBOT (AMR)

- Onboard intelligence
- No physical infrastructure required to move and navigate around a facility
- Machine learning enables the robot to become more efficient and accurate as it encounters new situations
- Behaves like a material handler (labor) Operational flexibility





DIFFERENCES BETWEEN AGVs AND AMRs

FLEXIBILITY

AGV

AGVs are fixed. They follow predefined paths using lasers, beacons, barcodes or magnetic tape.

Impacts:

- Multiple AGV units are required for different applications.
- Ongoing infrastructure maintenance is required.
- Minor debris in the laser's field of view prevents the vehicle from moving until the obstacle is manually removed by human personnel.

AMR

AMRs do not require external infrastructure for navigation, making implementation hassle-free and highly scalable.

Impacts:

- One AMR unit can be used in multiple applications.
- Encourages 5S standards for clean aiseways throughout entire facility.
- AMRs detect, avoid and dynamically move around obstacles to continue to destination, reducing downtime and human interaction.
- Parameters can be customized to navigate throughout aiseways, personnel zones and narrow corridors.

SCALABILITY

AGV

AGVs can be added to a facility if the layout adheres to AGV infrastructure requirements.

Impacts:

- Resources are required for facility planning, infrastructure innovations, maintenance and line training.
- Facility layout must be designed to accommodate equipment.

AMR

Additional AMRs can be operational in less than one day as they operate from a centrally controlled map, shared among the fleet.

Impacts:

- Infrastructure renovations, facility planning or additional training are not required.
- AMR customers do not need to outsource work to third party vendors for changes or additional implementation.

MOBILE DEPLOYMENT

AGV

Moving an AGV is equivalent to installing an AGV system for the first time – significant resources are required.

Impacts:

- Infrastructure is fixed. Changes are rigid and costly.
- Multiple systems are required in total, despite low/high seasonal periods.

AMR

AMRs can be redeployed from one plant to another, or to a different zone within the same plant. With a centrally controlled fleet manager, set up time is minimal and can be completed by the customer.

Impacts:

- Units can be shared among multiple facilities to alleviate seasonal demands.
- Throughput is increased in facilities or zones, that would otherwise be underutilized assets from other facilities or zones that experience a downturn.
- AMRs can become a shared resource; therefore, less units are required for purchase.

LEVEL OF INTELLIGENCE

AGV

AGVs are not intelligent machines and do not facilities industry's vision of the "smart factory." Due to infrastructure, intelligence is not required.

Impacts:

- Due to lack of data collection, plant operators do not have insight into real-time KPIs or vehicle performance.
- Standard stack lights and sounds are unchanging, despite changes in environment.
- AGVs are unable to back up to take alternate routes.
- AGVs cannot easily integrate with other solutions.

AMR

Onboard intelligence enables AMRs to adapt to changing environments and easily integrate with other solutions (including ERPs). Machine learning collects data and updates the fleet's shared map with learned parameters.

Impacts:

- AMRs learn which routes are the fastest and take optimal paths, even within unpredictable environments.
- Plant personnel can safely and collaboratively interact with AMRs.
- AMRs offer integrated lights and sounds that resemble outdoor automobiles to intuitively indicate behaviors to plant personnel.

USABILITY

AGV

AGVs are designed to do simple tasks, yet setup and operation is cumbersome, complex and costly.

Impacts:

- AGVs require training expertise by certified personnel or engineers.
- Changes to the system require facility infrastructure updates and additional staff training.

AMR

Implementation includes mapping facility once with a robot then setting up zones and points of interest on the map in the fleet manager.

Impacts:

- System is set up by the customer and is done so with a point and click interface.
- Updates to robot or access zones can be made by plant personnel.
- Changes in production lines or distribution layouts are easily implemented.

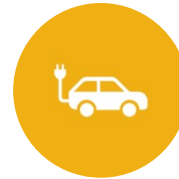


WHEN SHOULD I CONSIDER AMRs

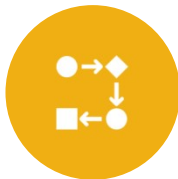
USE CASES



**AUTONOMOUS
HORIZONTAL
TRANSPORTATION**



**LONG TRAVEL
DISTANCES –
OVER 100'**



**REPETITIVE
WORK-FLOWS**



MULTIPLE SHIFTS



**TIGHT LABOR
MARKETS**

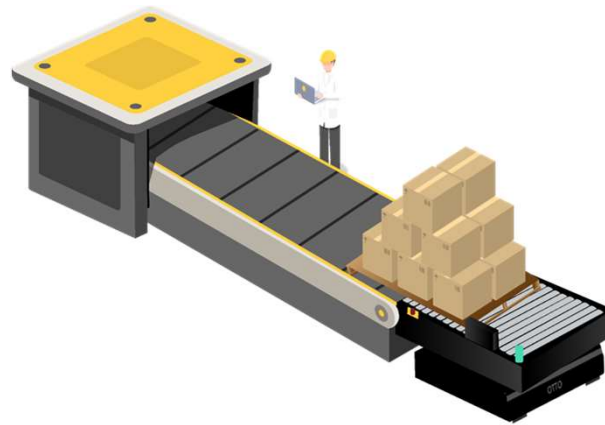


**EXPENSIVE LABOR
MARKETS**

USE CASES AUTOMATED ACROSS INDUSTRIES



**BRINGING MATERIALS
TO AND FROM PEOPLE**

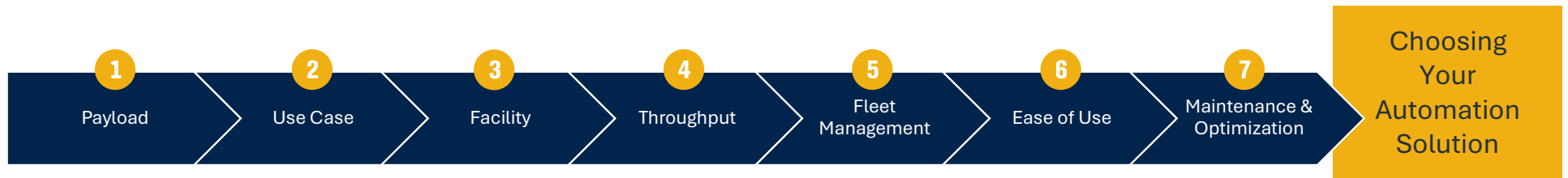


**BRINGING MATERIALS TO AND
FROM AUTOMATION EQUIPMENT**



**MOVING MATERIALS TO AND
FROM RACKS AND NEAR THE
FLOOR**

THINGS TO CONSIDER



JJ0 This is what I'm trying to recreate
Joyce, Jessica, 2025-04-15T17:37:17.068



THE OTTO SOLUTION



Autonomous Mobile Robots

Industry-leading portfolio of autonomous material handling robots, built for the most demanding 24/7 production environments

**Unmatched
Hardware
Portfolio**

**Most Complete
Software Suite**

OTTO
MOTORS
by ROCKWELL AUTOMATION

**Services and
Support**

OTTO Care & Services

Global network of systems designers, project engineers, and support technicians to deliver turnkey autonomous capabilities over the complete automation lifecycle



Autonomous Operating System
Proven & proprietary autonomous vehicle navigation software



Fleet Management Software
Centralized monitoring and control integrated with enterprise systems for hands-off orchestration of material flow



Fleet Analysis Software
On-demand, actionable insights and reporting on fleet performance and productivity

AN UNMATCHED AMR PORTFOLIO

Automate any material handling job up to 4,200 lbs



OTTO 100

Small and agile;
perfect for
human-scale
loads up to 150
kg (330 lbs)



OTTO 600

Built to navigate
the tightest
environments
with loads up to
600 kg (1,322 lb)



OTTO 1200

Designed to
maximize
productivity in
tight spaces with
loads up to 1,200
kg (2,640 lb)



OTTO 1500

Durable for
demanding
applications and
designed to move
loads up to 1,900
kg (4,200 lbs)



OTTO LIFTER

Intelligent and
predictable pallet
transport of
loads up to 1,200
kg (2,640 lbs)

UNLOCK COUNTLESS USE CASES WITH CUSTOM ATTACHMENTS



DUAL STACKED CONVEYOR



LIGHT CHASSIS CONVEYOR



FINISHED GOODS AT END OF LINE



ROBOTIC PALLETIZER TO OUTBOUND



RM TO LINE SIDE



SIDE LOADING CONVEYOR PICK UP FROM
STRETCH WRAP

OTTO'S AUTONOMOUS EXECUTION SYSTEM

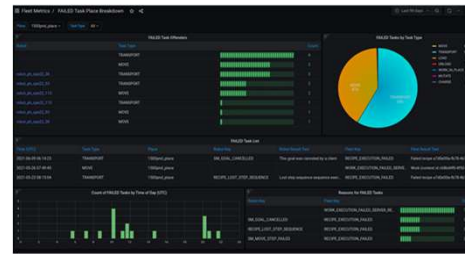
Integrate with Existing Systems

Streamline handoffs in complex workflows with flexible APIs.



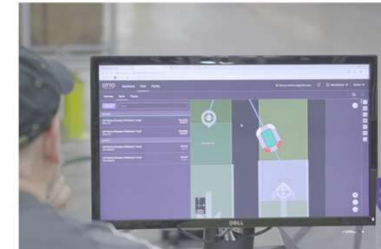
Informed Decision-Making

Powerful analytics to maximize performance and ROI. Trigger-based smart notifications.



Facility Scale

Manage hundreds of robots through a single interface. Intelligent job scheduling and dispatch.



Simplicity Out of the Box

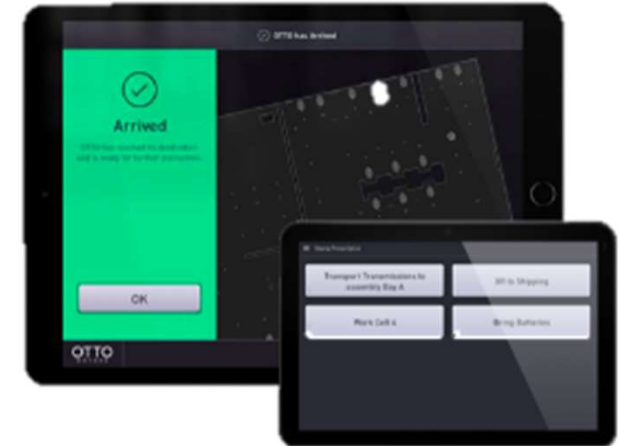
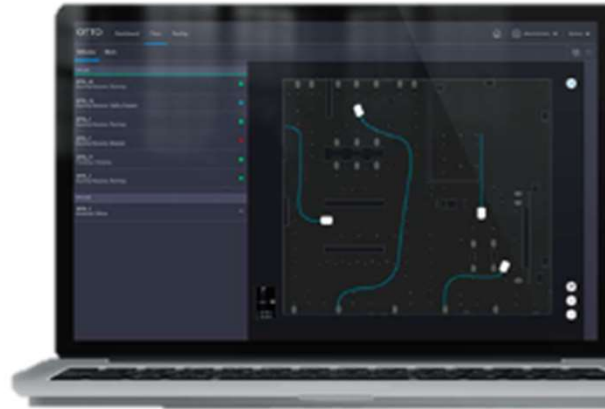
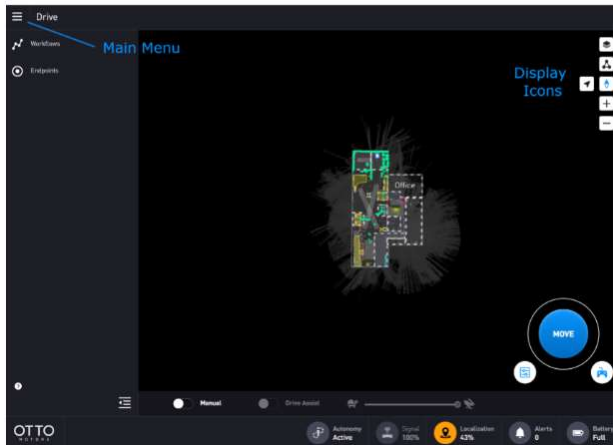
Start moving materials in 5 mins. Dynamically map environments in real time.

OTTO APP

The Drive window is displayed by default when OTTO App is launched.



MAPPING AND FLEET MANAGEMENT SOFTWARE



SOFTWARE PLATFORM

OTTO App is the core robot operating system for autonomous mobile robots. It is what transforms industrial material handling equipment into robots that can automate moving material, while enabling control and workflow creation for a single robot.



OTTO APP

Core robot operating system

OTTO FLEET MANAGER

Automate at enterprise scale

OTTO Fleet Manager helps you automate materials handling at enterprise-scale. Learn more about fleet management and how you can flexibly and easily integrate it with your existing mission-critical factory tools and systems.

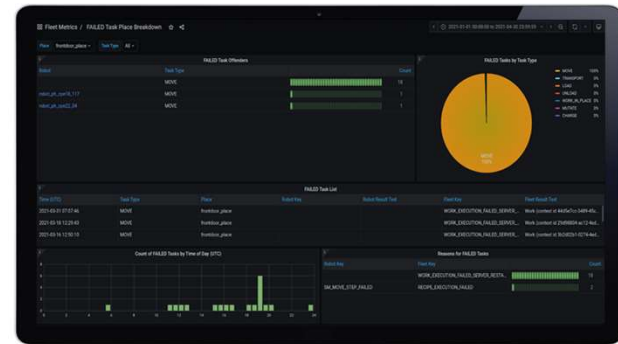


POWERFUL DATA & ANALYTICS

AT A GLANCE DETAILED STATISTICS FOR EACH JOB



FLEET MANAGER: DRILL DOWN TO HOTSPOTS

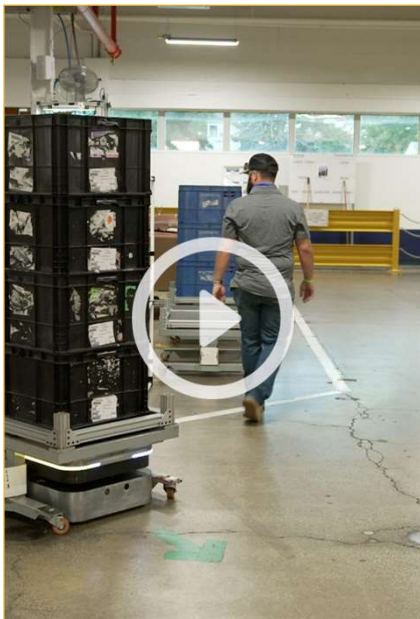


OVERALL PERFORMANCE





INDUSTRIES SERVED



AUTOMOTIVE

OEMs, Tiered Automotive Suppliers, Aerospace, Security and Defense



CPG & FOOD AND BEV

White goods, Food and Grocery, Cosmetics and Beauty, Furniture, Personal Care, Textiles



INDUSTRIAL & OTHER

Machinery, Electronics, Chemical, Life Sciences, Medical Devices, Paper, Building Materials



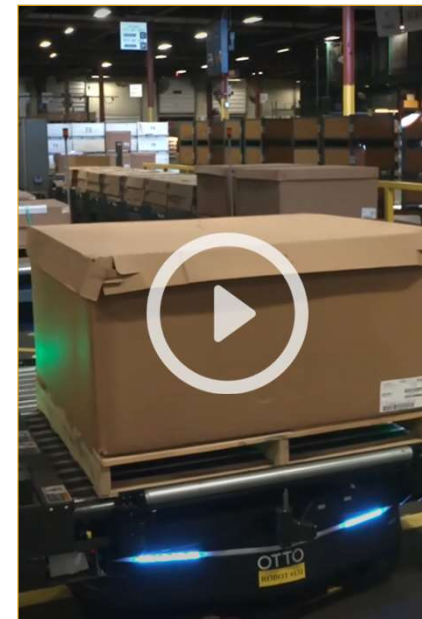
GE HealthCare



Celestica



Heirloom



WAREHOUSE & LOGISTICS

3PL and Courier, Express and Parcel Services (CEP)



CONSUMER GOODS INDUSTRY

Mauser Packaging Solutions improves throughput by 600% with AMRs



Application: Finished goods to stretch-wrapper in 2 facilities

How Material Moved Before AMRs: Forklifts and AGVs

Reasons for Implementing AMRs: Manual, labor intensive processes drove up operational costs, put physical strain on workers, and the traditional AGV system failed to meet the required uptime and throughput to run 24/7 production

Benefits Experienced After AMRs: 3 laborers re-allocated to higher value-added roles and improved safety at Langley. In Oakville, AMRs increased uptime and enhanced throughput by 600%.



► **600%**
**throughput
improvement**



WHY AUTOMATION?

- Manual, labor intensive processes driving up operational costs
- Physical strain on employees
- Corporate mandate to improve safety

WHY AMRs?

- Flexible and adaptive to facility changes
- Traditional AGV system failed to meet the required uptime and throughput

WHY OTTO?

- Highest payload capacity at 4,200 lbs
- Run-time achieves 24/7 production
- Top driving speed
- Fast, opportunistic charging

To learn more about Mauser's deployment, [read the blog](#).

6X
**INCREASE IN
THROUGHPUT**

3
**LABORERS
RE-ALLOCATED**

2
**ADDITIONAL FORLIFTS
REMOVED**

HEALTHCARE INDUSTRY

GE achieves lean efficiency with AMRs



GE HealthCare

Application: Finished goods delivery from repair cells to shipping

How Material Moved Before AMRs: Operators manually pushing carts

Reasons for Implementing AMRs: Inefficient material flow and wasted floor space due to the need for bulky carts and fixed infrastructure

Benefits Experienced After AMRs: Repair cells are 40% smaller since implementing AMRs because there was no need for extra physical infrastructure or large material movement equipment. This enabled GE to raise their throughput per square foot, and there has been a 66% increase in productive floor space.



► **66%**
floorspace
saved



GE HealthCare

WHY AUTOMATION?

- Inefficient material flow
- Wasted floor space due to the need for bulky carts and fixed infrastructure

WHY AMRs?

- Predictability of material movement
- No need for extra physical infrastructure or large material movement equipment
- Reduce repair cell sizes

WHY OTTO?

- Highest projected throughput
- Adaptable to process changes and different loads

To learn more about GE HealthCare's deployment, [read their story](#).

66%

**INCREASE IN
PRODUCTION FLOOR
SPACE**

40%

**REDUCTION IN REPAIR
CELL SIZE**

AUTOMOTIVE INDUSTRY

Faurecia reduces work cell sizes by 15% while achieving an 11-month ROI

faurecia

Application: Shipping to warehouse delivery

How Material Moved Before AMRs: Tuggers and AGVs

Reasons for Implementing AMRs: Reliable, small footprint solution for timely movement of materials with minimal downtime and hands-on support

Benefits Experienced After AMRs: 15% reduction in work cell sizes, an 11-month ROI, and higher response times leading to an improved efficiency of operations.



▶ **15%**
**work cell size
reduction**



WHY AUTOMATION?

- Predictability of material movement
- De-risk costs from tight labor pools
- Higher quality parts production
- Increase productivity

WHY AMRs?

- Small footprint for timely movement
- Safely work alongside humans
- Minimal downtime

WHY OTTO?

- Industrial grade build quality
- Always available service and support
- Hands off Fleet Management software
- Learns and adapts to dynamic environments

To learn more about FORVIA's deployment, [watch the webinar](#).

11
MONTH ROI

15%
**REDUCTION IN WORK
CELL SIZE**

OTTO DELIVERS RESULTS

6X

throughput
increase
compared to AGV
systems at
Mauser Packaging
Solutions

MAUSER
Packaging Solutions

24/7

lights-out
manufacturing
achieved at
HIROTEC AMERICA

h HIROTEC

\$1.3M

saved at GE
Aerospace within
one year of
implementation

 GE Aerospace

100%

safety rated at
Sunview Patio
Doors, zero
accidents in 16
months since
implementation



66%

floorspace saved
at GE HealthCare

 GE HealthCare

11

month customer
payback at FORVIA
(Faurecia)

FORVIA
faurecia

THE OTTO DIFFERENCE

Fully autonomous and flexible material movement.



NO PHYSICAL INFRASTRUCTURE

Minimal upkeep
Easy to change your
plans and experiment



INTUITIVE EXPERIENCE

Simple design tools and
scalable solutions
Integration with existing
systems



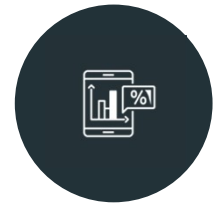
HEAVIEST PAYLOAD

Flexibility with
product and
appliance design
Minimize fleet size
and complexity



DEDICATED TECH SUPPORT

On-demand
documentation and
training
Knowledge Base access



DATA, ANALYTICS & INSIGHTS

Fleet analytics
to maximize
performance
Trigger-based smart
notifications



QUESTIONS?
THANK YOU!