



National Center for Supply Chain Automation

2021 Annual Symposium



How Valued Workers Can Use Autonomous Mobile Robots to
Improve Efficiency and Boost Productivity

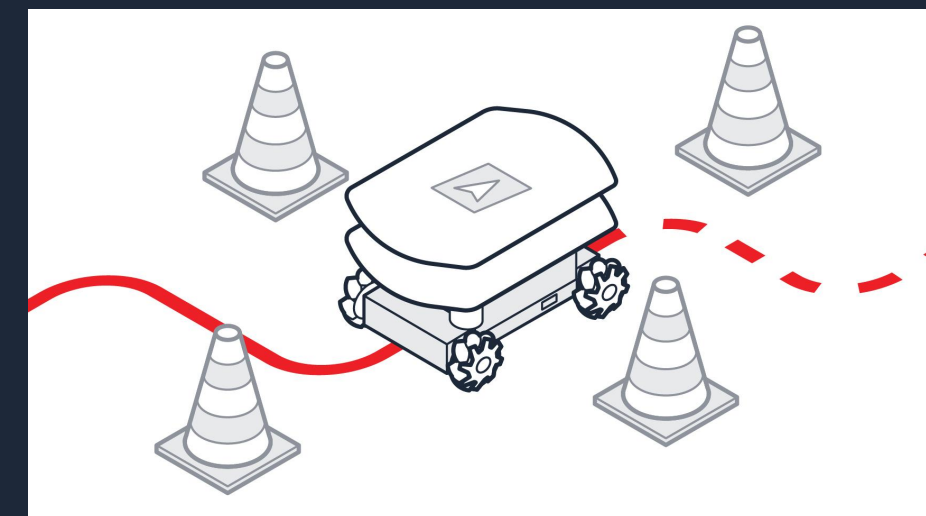
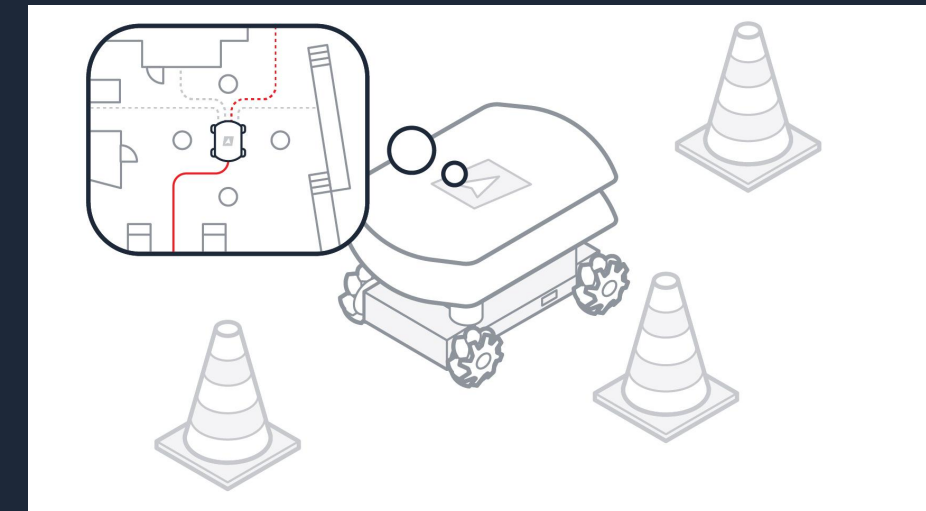
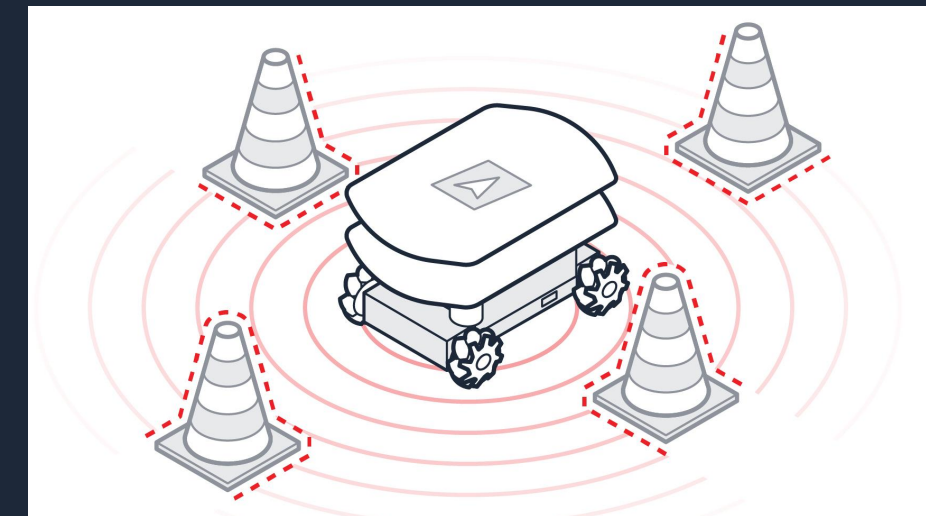
April 28, 2021



What is an AMR?

HOW IS IT DIFFERENT FROM AN AGV?

- An autonomous mobile robot (AMR) uses **perception**, **decision making**, & **actuation** to perform tasks.
- AMRs use on-board sensors and processors to perceive their environment and make navigation decisions, so they can autonomously move materials without the need for physical guides or markers.
- An AMR learns its environment, remember its location, and dynamically plans its own path from one waypoint to another.
- AMRs can automatically reroute on the fly, and find their own way to the destination if their initial path is blocked.
- In contrast, Automated Guided Vehicles (AGVs) typically require installation of physical guides (wiring, tape, reflectors, etc) for navigation so they are expensive to set up and inflexible when changes are required. Their paths are fixed and if blocked, AGVs stop until the object is removed.





How AMRs are helping workers

- Reduce tedious, time consuming tasks so workers can focus on high value jobs
- Automate loading and unloading of materials
- Reduce long walks
- Transport heavy, bulky materials and minimize forklift traffic
- Keep workers socially distanced & safe

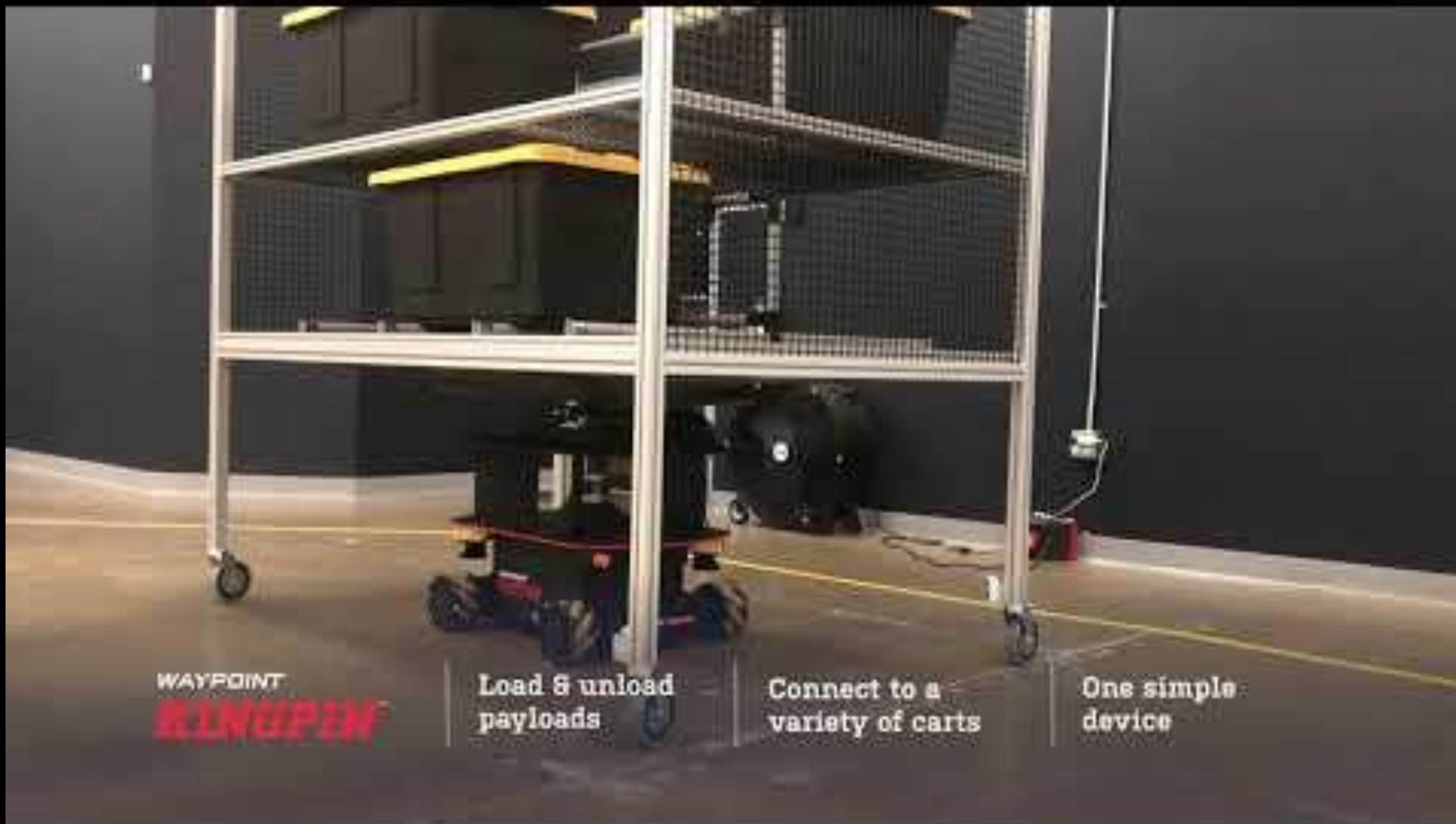
Some application examples...



Autonomous Mobile Robot Applications

AUTOMATED MATERIAL TRANSFER & DELIVERY

- AMRs can be used for tasks as simple as moving materials from A to B
- AMRs can communicate directly with machines or conveyors via PLCs, ERP, and WMS systems among others to automate the workflow
- AMRs can include or integrate with a variety of top modules and work with existing equipment
- Waypoint offers Kingpin™ to lift loads and connect to many types of carts as well as conveyor decks for automated transfer of materials
- Waypoint AMRs can be integrated with cobot arms for mobile manipulation









Autonomous Mobile Robot Applications

MOVING HEAVY LOADS

- AMRs can carry heavy loads to reduce the number of dangerous forklifts
- AMRs can move large parts, subassemblies, and work in progress
- MAV3K can carry loads up to 3000 lbs & its omnidirectional mobility means it can precisely dock to conveyors or palletizing cells to receive boxes



WAYPOINT
MAVERIK

- Fully autonomous mobile robot
- 3000 lb payload capacity
- Omnidirectional mobility



Case Study- quick success & flexibility to scale

MEDICAL SUPPLY COMPANY SUBSTANTIALLY INCREASED OUTPUT WITH EXISTING WORKFORCE

- NorthShore Care Supply deployed Waypoint AMRs integrated with Numina WES-WCS System to respond to growing demand, multiply output, and retain their valued, existing workforce.
- Workers tripled their order picking throughput when they moved from manual push-carts to picking with the Waypoint Vector AMRs, Kingpin, EnZone wireless chargers, Numina system, and high-capacity custom carts.
- NorthShore doubled overall output with 99.9% accuracy rate
- As demand continues to grow, Northshore can easily expand the fleet and add use cases





Workforce challenges

- Workers push back when change is forced upon them & often fear the unknown
- Workers hate complicated tools they can't use that aren't for them
- Workers resent “experts” who don't know about the company, task, or trade
- Workers naturally worry about job security
- Workers in low skilled jobs intuitively recognize that they are most at risk for job loss... and the data backs that up¹

1- BCG estimates that among today's skilled workers and those workers currently being trained, roughly half may not qualify for the jobs that will be in the greatest demand over the next decade- BCG 2018 “Advancing Robotics to Boost US Manufacturing Competitiveness”



Workers must be included

- Automation tools like mobile robots should be designed for the great workers who are already on the job today
- Features and functions should support the goal of workers getting robots working immediately, and also enable scalability
- People can then focus the unique and valuable parts of their jobs and unleash the unlimited potential of their expertise, experience, and creativity
- Companies of all sizes can use workforce-first tools to not just survive, but thrive

ACCESSIBILITY IS KEY TO WORKFORCE INCLUSION



How to include workers from the start

UNDERSTAND WORKERS' PERSPECTIVE

- Important to explain WHY automation is necessary and what's in it for the workers
- Include employees in documenting material handling functions to understand the tasks from the workers' perspective
- Ask about their material handling work so you recognize which tasks are physically or psychologically challenging
- Get their input on which automation tools would improve their day-to-day work experience



Workers should guide automation decisions

INCLUDE THE FRONTLINE IN YOUR AUTOMATION RESEARCH & EXPLORATION

- Include workers in vendor demos. Encourage them to ask questions about how the robots will work in their world.
- Have workers help design tests based on their experiences and best practices and have them conduct testing together with engineers
- Worker / robot interaction should be part of the testing criteria and should be measured and documented



New opportunities for existing workers

ACCESSIBLE AUTOMATION EXPANDS GROWTH POTENTIAL FOR WORKERS

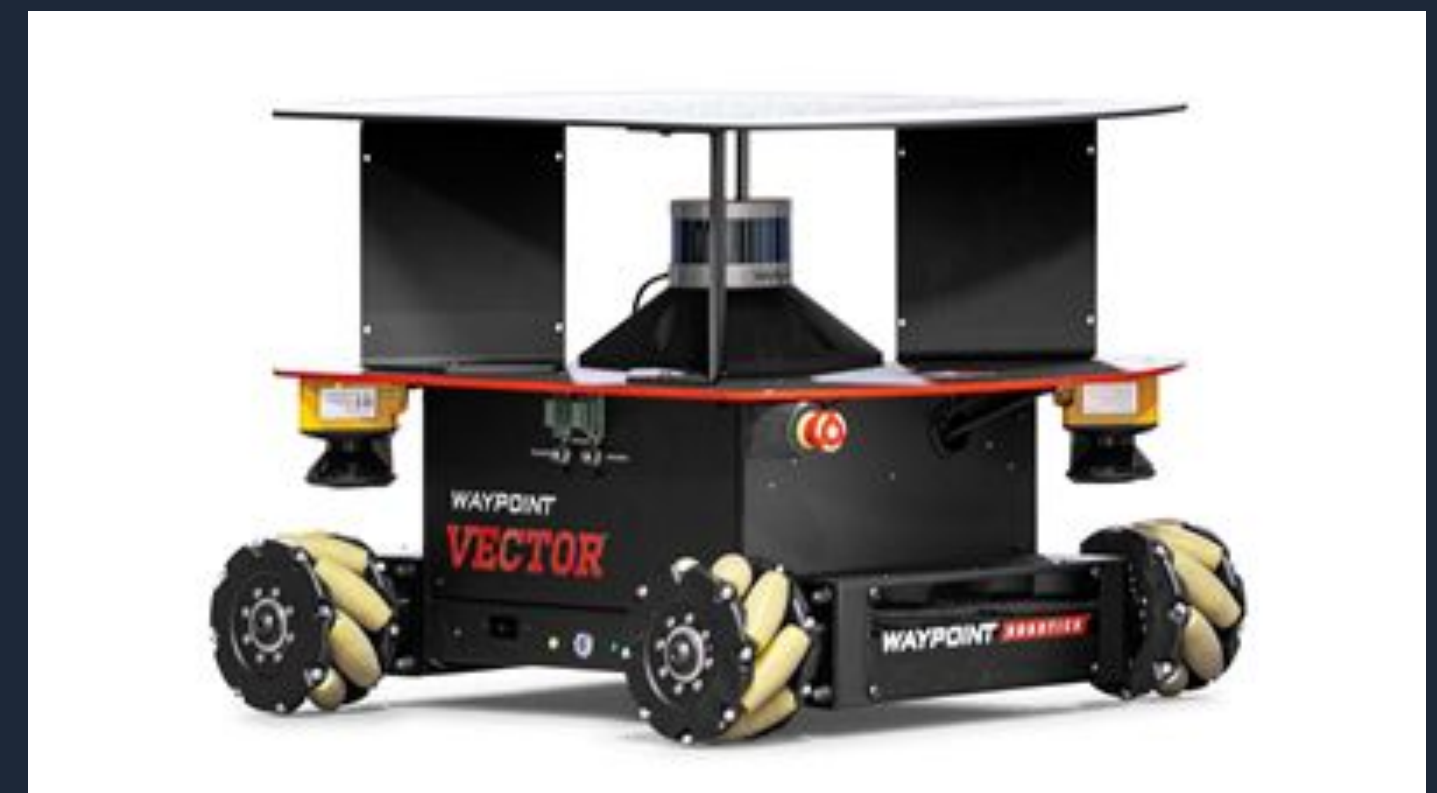
- No Code Programming - robot set up and optimization using visual programming tools
- Reconfiguration - Easily make changes as needs evolve
- Preventive Maintenance - keep robots running smoothly: visual inspection of hardware, cleaning lidar lenses, running software updates
- Connectivity - keep robots and other warehouse equipment connected, monitor network performance, and eliminate sources of interference



Choosing accessible mobile robots

UNLOCKING AUTOMATION FOR ALL

- Seek features and functions that enable fast set up and intuitive operation without the need for outside robotics experts
- Look for user-friendly functionality that engage workers from the start





What to look for in a mobile robot

SIMPLE, INTUITIVE SETUP AND OPERATION

- AMRs must be easy to set up so workers can get robots working immediately and reconfigure as needed.
- Dispatcher™ software from Waypoint features intuitive and powerful facility mapping that makes mission set-up simple and straightforward. Make changes in minutes to adapt to evolving needs.
- Waypoint AMRs can be fully deployed in under 15 minutes
- Waypoint Whistle™ is automatically set up and custom configurable to call and send robots on missions. Initiate missions at the push of a button



UNBOXING - 5 MINUTES





What to look for in a mobile robot

INTUITIVE BEHAVIOR & MANEUVERABILITY

- AMRs need robust obstacle avoidance, 3D perception, & instant path planning
- Waypoint AMRs are designed for real-world environments employing high speed, real-time sensor fusion within Waypoint's proprietary robot controller.
- Robots should be able to quickly dock in any orientation to interface with workers, work cells, machines, or conveyors
- Waypoint AMRs offer omnidirectional mobility and can move in any direction and in any orientation with precision and speed so they will dock into a work cell any way you want.





WAYPOINT
VECTOR SR-02

Slide into
workcells



What to look for in a mobile robot

WORRY-FREE CHARGING

- Workers shouldn't worry about batteries or charging
- EnZone™ is a wireless energy transmission system for autonomous charging, opportunity charging, and on-demand payload power even when the robot is operating
- EnZone keeps Waypoint AMRs up and running through multiple shifts.





What to look for in a mobile robot

FLEXIBILITY & NETWORK INDEPENDENCE

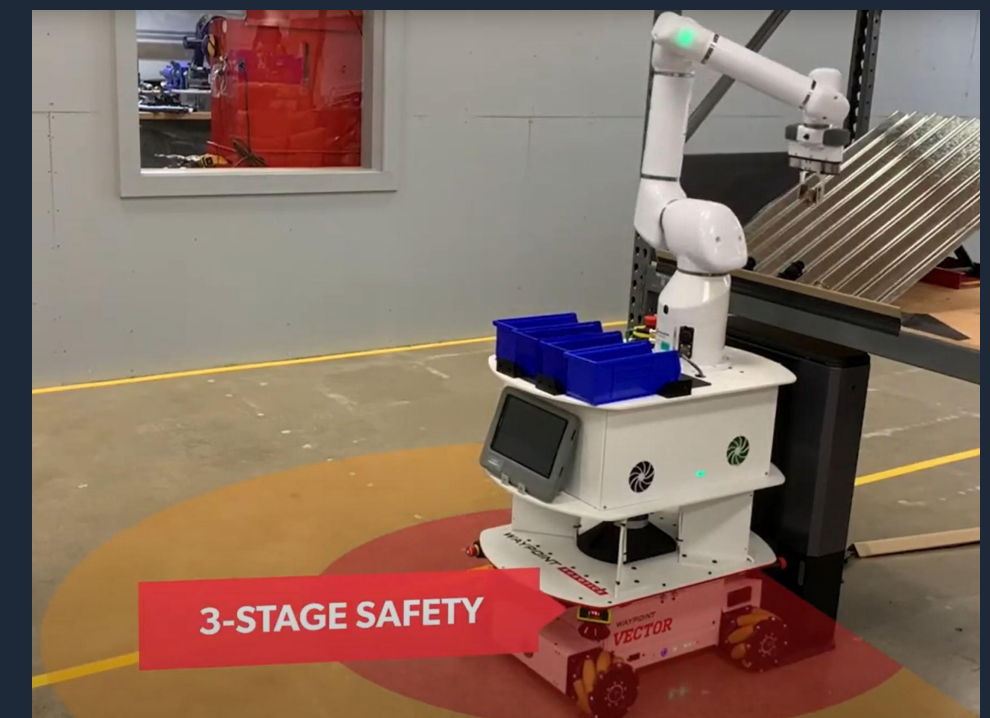
- Workers shouldn't need to wait weeks for the IT department to integrate the robot and approve internet access.
- Waypoint AMRs can operate completely independent of a network connection. All intelligence is built onto the robot
- Waypoint AMRs can communicate directly with machines, conveyors, PLCs, ERP, WMS system among others to automate workflows
- Network independence lets you start immediately, and interoperability lets you scale infinitely



What to look for in a mobile robot

SAFETY THAT GOES ABOVE AND BEYOND

- An AMR should have redundant safety systems in place that meet or exceed the international mobile robot safety standards.
- Waypoint AMRs include a configurable 3-Stage Safety System that is in addition to, and independent of the safe behaviors that are built into the navigation system.
- Safety rated components like lidars are integrated with the Waypoint Embedded Safety Kernel
 - DTS - Decelerate to slow zone
 - DTZ - Decelerate to zero zone
 - E-Stop stage





Benefits beyond measurable ROI

WORKFORCE

- *Workers using great tools are more engaged in work they are proud of.*
- *They go home daily with more energy for their families and better quality of life.*
- *They have more opportunities for advancement & longer, more productive careers.*

COMPANIES

- *Leaders who give workers great tools more easily attract and retain talent.*
- *They demonstrate a willingness to invest in their teammates.*
- *They get the benefits of automation and the loyalty of an empowered workforce.*



Thank you! For more information:



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