AutoGuide
Mobile Robots
A Teradyne Company

# Tier 1 Automotive Manufacturer Deploys Autonomous Solution to Transport Automotive Frames, Improve Safety

## THE CHALLENGE

A Tier 1 automotive manufacturer was interested in automating the transport of heavy car frames from paint to final assembly. It was clear that precise, autonomous transport would increase employee safety and decrease product damage. The challenge was to find an industrial mobile robot that could seamlessly integrate into their existing workflows. The autonomous solution had to be capable of negotiating tight turns, and safely maneuvering around pedestrian walkways and conveyance equipment. It also needed to be able to communicate with existing mobile robots in subassembly areas.

## THE AUTOGUIDE SOLUTION

The solution combined AutoGuide tuggers fitted with extra safety sensors to monitor the busy work zone, and custom-designed trailers to transport painted car bodies without damage. AutoGuide worked with the customer's manufacturing team from planning to installation, providing onsite support for conveyance system integration.

A process that was previously managed by manual drivers and pull cords was replaced with autonomous mobile robots that wirelessly communicate with the central PLC, moving with far greater floor awareness than their manual counterparts and performing multiple safety checks.

The process begins when a custom car body trailer is hitched to an AutoGuide tugger. The tugger interfaces with the PLC, which activates safety equipment in the car body elevator, enabling the tugger to drive to a precise location. This software interface eliminates the pull cord used by manual operators to activate safety equipment at the car body elevator cell.

After the car body elevator lowers a painted car body onto the trailer, the robot navigates narrow aisles and two tight turns to transport the car body to the subassembly cell. Previously, manual drivers in this environment focused on hitting marks on the floor to safely transport the car body and did not always notice other obstacles that impeded their path or could cause damage to the car body. AutoGuide tuggers feature multiple custom-placed sensors that watch for obstacles in adjacent walkways and conveyance zones—improving safety for employees while reducing product damage.



When evaluating high-value opportunities to deploy autonomous solutions, AutoGuide consultants can help calculate the cumulative impact of multiple factors, from savings gained by decreasing manual drive-time to improving safety for product and employees.

## Results

- AutoGuide tuggers interface with central PLC to coordinate safe collaboration with other manual and autonomous solutions in the conveyance system

- Multiple onboard safety sensors ensure the tuggers navigate shared, narrow work zones and improve employee safety

- Precise trailer loading coordinates and turn-protection sensors eliminate car body damage

- Autonomous solution for high-risk transport task improves efficiency of labor at assembly cells, decreasing trapped labor costs

- Manufacturer deployed additional AutoGuide tuggers to the initial installation to support increasingly efficient operations
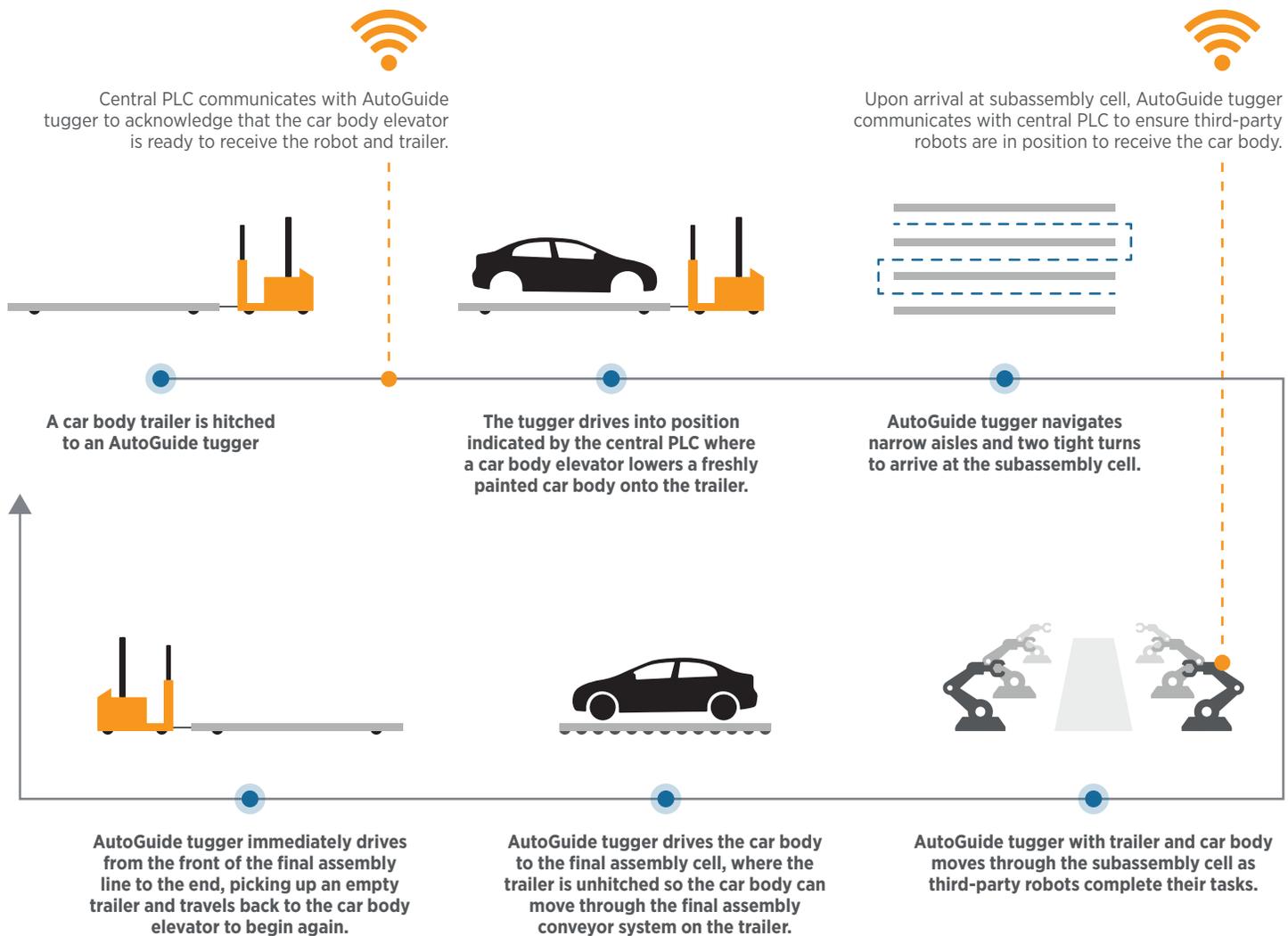
Upon arrival at the subassembly cell, the AutoGuide tugger communicates with the PLC and traffic control systems to ensure third-party robots in the subassembly cell are in place and ready to receive the car body. The AutoGuide tugger then pulls the car body through the subassembly cell as multiple manufacturing processes are executed.

When complete, the AutoGuide tugger drives the car body to the final assembly cell, where the trailer is unhitched and the car body moves through a conveyor system for the final assembly process. The tugger immediately drives from the front of the final assembly line to the end, picking up an empty trailer to travel back to the car body elevator to collect another car body.

# THE DEPLOYMENT

**250,000 Square Foot Area**

- Cycle time: approximately 5 minutes per car
- Cycles per day: 192 (during two 8 hour shifts)

Central PLC communicates with AutoGuide tugger to acknowledge that the car body elevator is ready to receive the robot and trailer.

Upon arrival at subassembly cell, AutoGuide tugger communicates with central PLC to ensure third-party robots are in position to receive the car body.

**A car body trailer is hitched to an AutoGuide tugger**

**The tugger drives into position indicated by the central PLC where a car body elevator lowers a freshly painted car body onto the trailer.**

**AutoGuide tugger navigates narrow aisles and two tight turns to arrive at the subassembly cell.**

**AutoGuide tugger immediately drives from the front of the final assembly line to the end, picking up an empty trailer and travels back to the car body elevator to begin again.**

**AutoGuide tugger drives the car body to the final assembly cell, where the trailer is unhitched so the car body can move through the final assembly conveyor system on the trailer.**

**AutoGuide tugger with trailer and car body moves through the subassembly cell as third-party robots complete their tasks.**

For more information, please contact **Sales@AGMobileRobots.com**

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