

Smart robotics solutions The Linde-MATIC range

Linde Material Handling

Linde

 Linde robotics





Linde robotics, an integrated smart solution

This new robotic solution, the most advanced available today, provides for the first time incredible competitiveness gains and a unique flexibility for your operations.

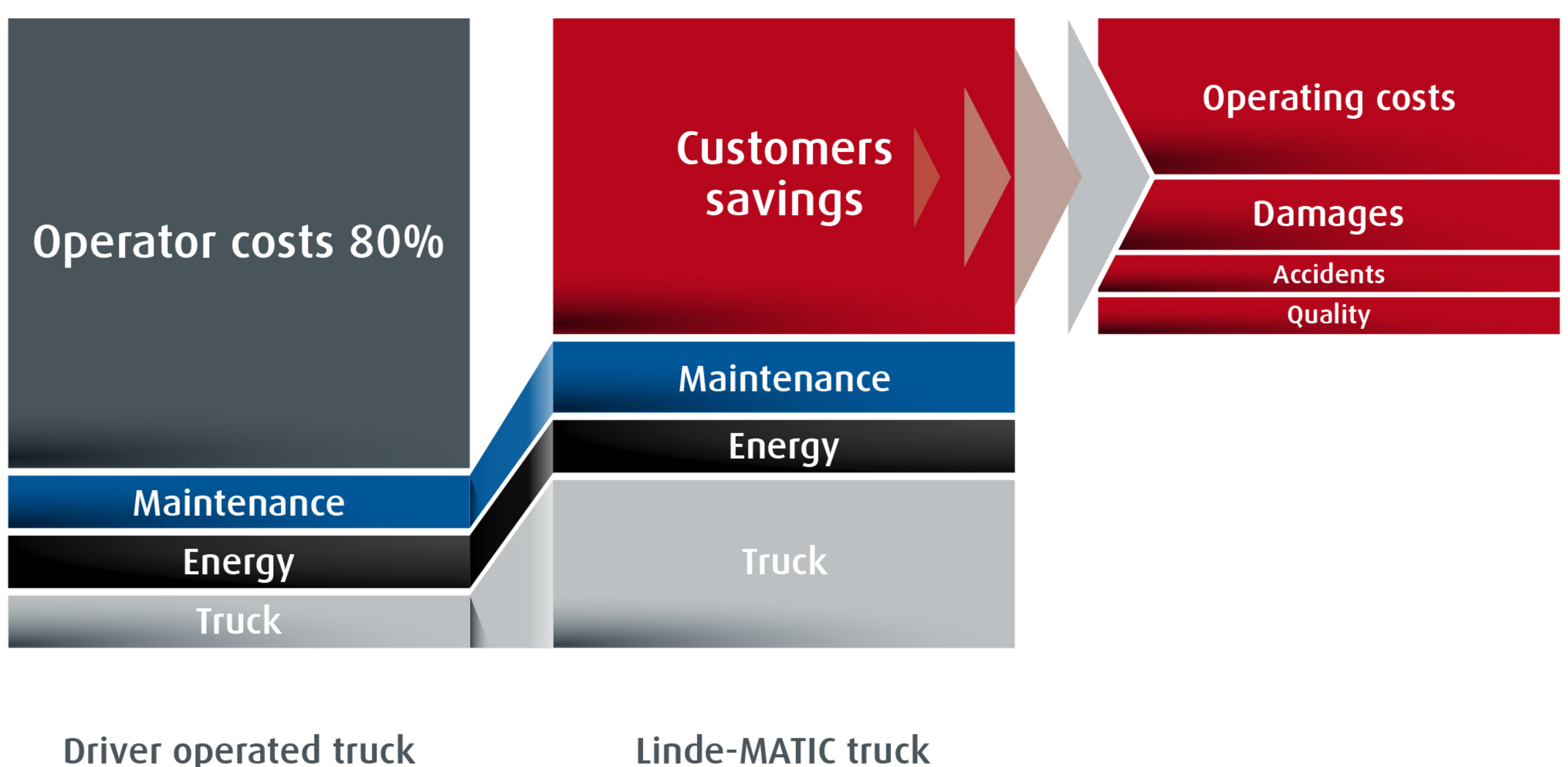
To ensure a fully integrated solution, our safety system protects continuously your environment: humans, goods and machines which are now able to all work together.

Why robotics?

While logistics tasks will always be directed by people, this new generation of robotic trucks can perform repetitive, low added value material handling tasks reliably and independently. Called “cobotics” - the collaboration between people and robots allows both to work and interact together safely.

Robotics also helps increase productivity and lower costs by reducing damage to goods and putting people at less risk of physical strain by giving uncomfortable tasks to the robotic truck. Robotics also improves the efficiency of material handling flows thanks to consistent timing between transfers optimising the management of work in progress and buffer stocks.

Total cost of ownership (TCO) savings







Our solution offers multiple benefits and cost savings

Linde expertise and support

- # Standard trucks: volume production, high-quality, proven reliability
- # Comprehensive sales network, after-sales services and maintenance
- # Proven expertise and market presence

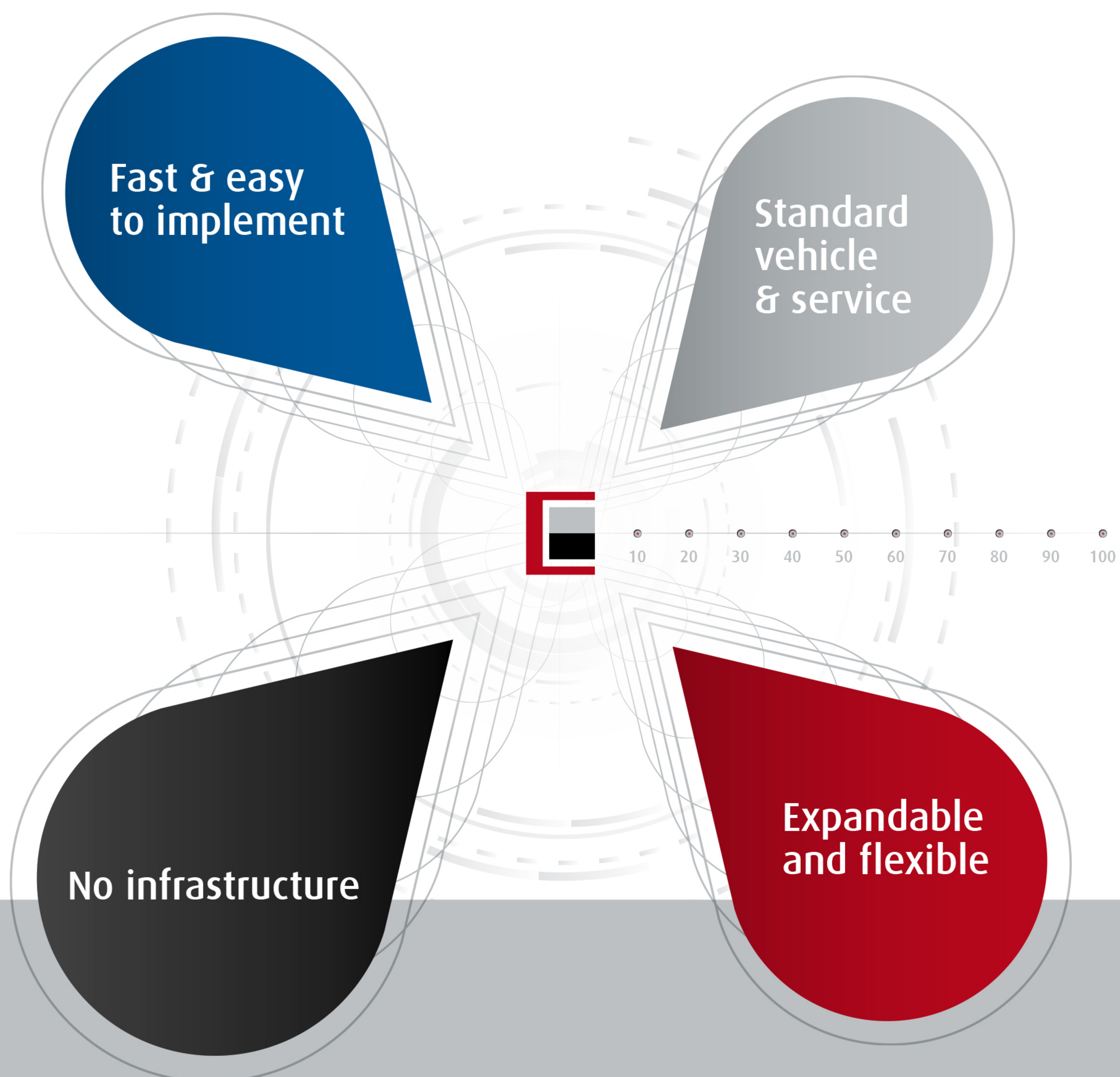
Technology performance

- # No infrastructure required providing the utmost flexibility
- # Easy, fast integration into existing operations
- # Fully scalable solution

Robots that can think and work autonomously alongside people

Linde-MATIC robotic trucks are equipped with smart features allowing them to operate in the same environment alongside people and other vehicles without any additional infrastructure.

The robots navigate using existing structural features such as walls, racking or columns: a solution that is economical, easy and quick to install and can easily accommodate future changes to routes or activities.





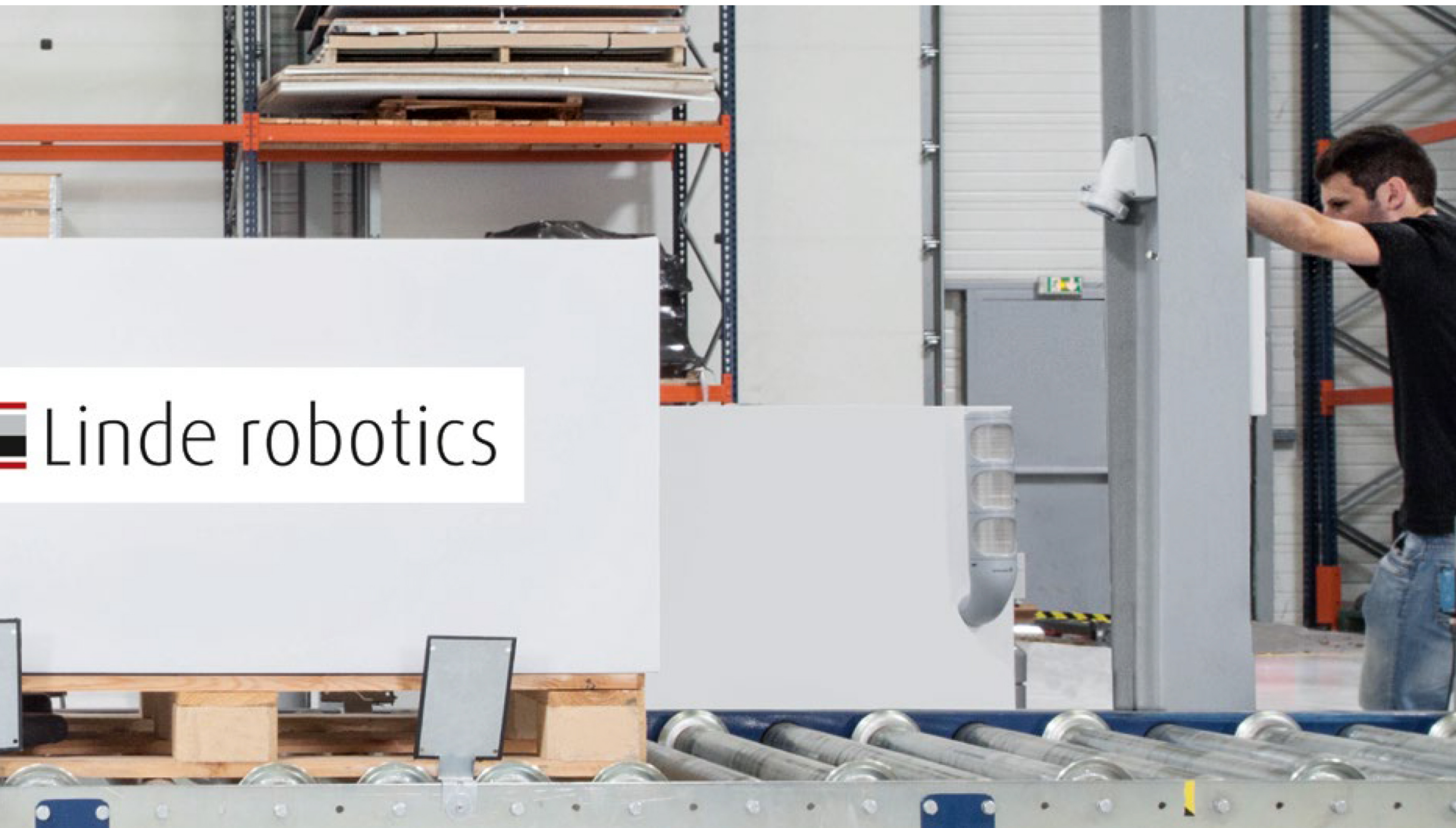
Competitiveness:

The most cost-effective
robotic solution
on the market

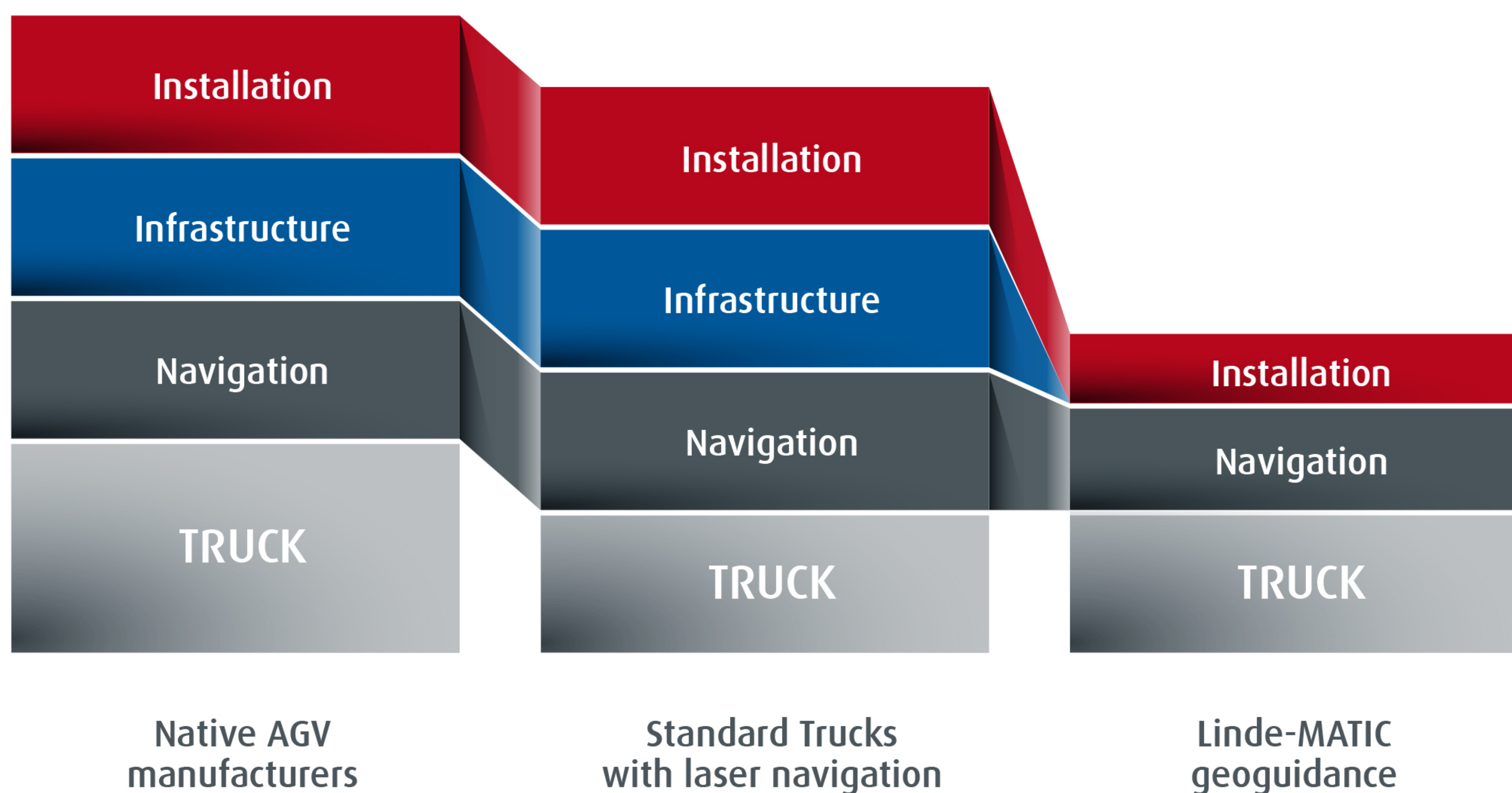
By combining a unique navigation system with Linde's expertise in material handling equipment, the Linde robotics truck range offers reliable solutions to help our customers optimize their in-house material flows and achieve major cost savings.

Return On Investment (ROI): Rapid payback and massive TCO savings

- # Reduced installation costs
- # Massive savings on operating costs



Improved costs structure





Flexibility:

Innovative navigation
and easy integration

Navigation

Navigation without infrastructure

The innovative “Geoguidance” navigation system integrates easily into existing warehouses.

Easy to install

The system maps existing physical structures and quickly accommodates changes in the environment. Creating and modifying driving paths is fast and simple to implement.

Real-time localization of robots

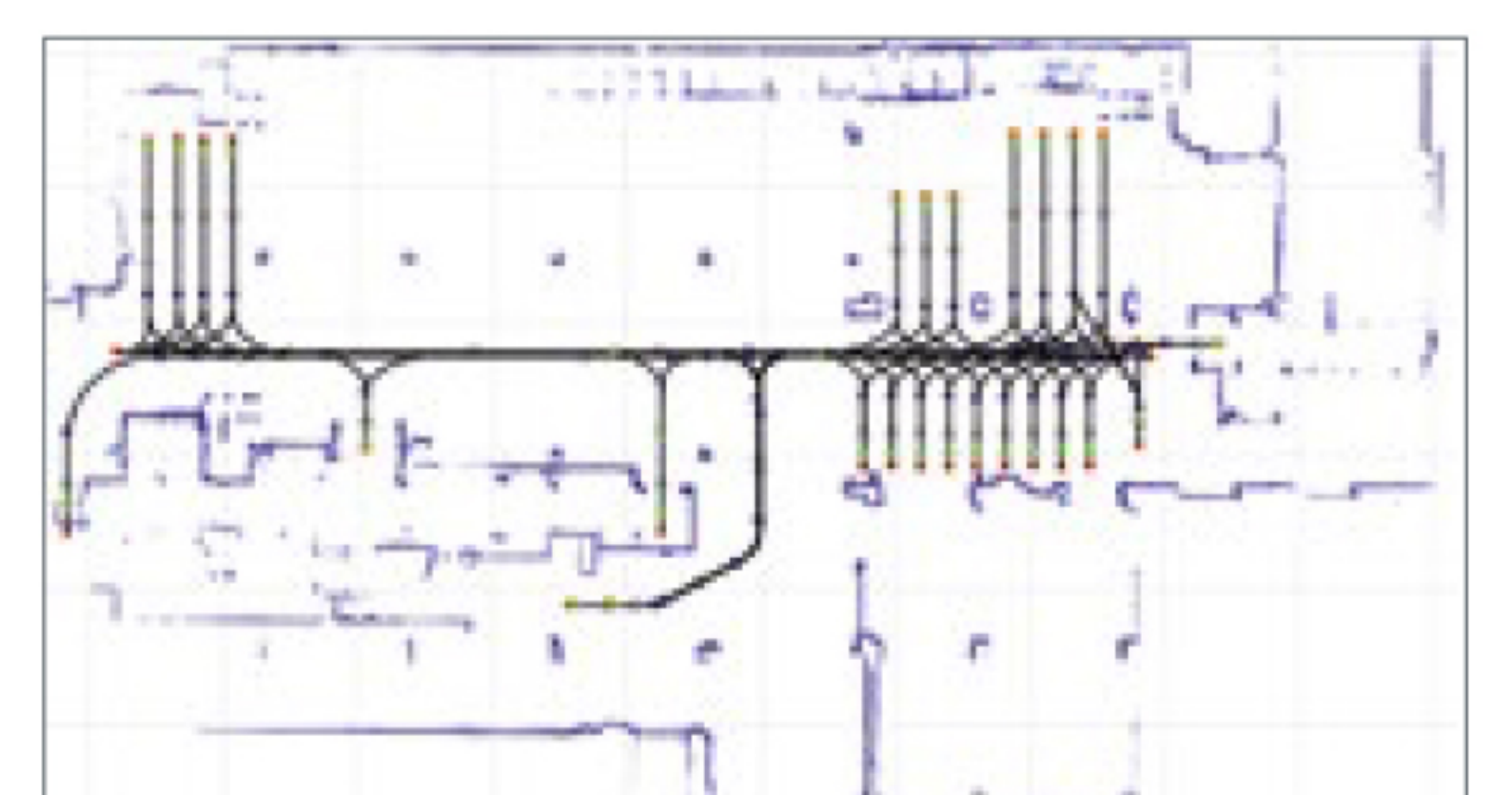
Robotic trucks use a map of the environment to locate themselves in real time by comparing what the navigation laser detects with the reference map.



1 - cartography



2 - structural map



3 - path creation

Integration

The DRIVEN BY BALYO technology offers a complete logistics solution interfaced with customers' own logistics management software ensuring real-time supervision.

Based on Linde's standard products, the robotic versions are equipped with dual mode commands (manual & automatic) so they can easily integrate into a customer's existing operation.

Dual mode: automatic or manual control

If needed, an operator can take manual control of the robotic truck to perform ordinary manual tasks.

Supervision & interface

The Supervisor software provides overall management of the robotic truck fleet in real time. It controls traffic, assigns tasks to individual robotic trucks and interfaces with systems such as ERP (Enterprise Resource Planning) and WMS (Warehouse Management System), or equipment such as automatic doors, conveyors, production machines etc.



Safety:

Linde's best selling features, enhanced

The safety features of Linde-MATIC trucks are based on a combination of best in class safety solutions used on Linde standard trucks with the addition of further innovative safety and detection features.



Geoguidance laser
(range in excess of 30 meters)

3D camera:
obstacle detection, safety support

Visual and acoustic warning indicators

User Interface equipped with intuitive
touch screen

Emergency stop buttons

Tiller: simply activating the buttons
or the tiller itself stops the truck immediately
and returns it to manual mode

Restarting automatic mode is easily done
using the touch screen

Indicators on the user interface bring
the truck back on track

Rear laser scanner: environment recognition,
obstacle detection, safety support
(recognition module)

Front Safety laser scanner:
obstacle detection, load recognition for stock
line management

Standard Linde truck



Front safety

- # High safety level (Performance Level D)
- # Dynamic and responsive



3D Smart safety

- # The end of the safety versus productivity trade-off: unnecessary stops are avoided
- # Autonomous decision-making
- # Productivity gain



Rear scanners

- # High safety level (Performance Level D)
- # Mobile load perception
- # Pallet detection sensor

Hardware safety features

- # Emergency stop buttons
- # Tiller switch



A streamlined & versatile truck range

With a comprehensive standard truck range, we cover 80% of all material handling applications in most manufacturing and logistics businesses.

TOW TRACTOR



P-MATIC

Load train applications
Loads transport
Kitting
Waste management
Feeding production lines

STACKER



L-MATIC

Pick & drop at low levels
Bar code scanning
Conveyor to packing machine
Order picking
Stock line management

The combination of Linde’s standard trucks and Balyo’s unique technology enables us to offer our customers the real flexibility and versatility they need.

COUNTERBALANCED STACKER



L-MATIC AC

Pick & drop of closed pallets
Handling stillages and industrial containers
Stacking onto conveyors

PALLET TRUCK



T-MATIC

Long distance load transfers
Block stacking loads in marshalling areas
Transferring long loads



Linde Material Handling and BALYO are merging their technologies and strengths to develop innovative robotic material handling solutions. High quality products are matched by the standards of service that we provide.

With a comprehensive network of local sales partners, we are available around the clock and around the world. Your local Linde partner offers a complete single-source package: from qualified pre-sales consulting to after-sales service, including financial packages matched to your business: leasing, rental or hire purchase. Flexibility is guaranteed to meet your operational and decision-making needs.