



# PROMAT®

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## Leveraging the Latest Innovations in Equipment Monitoring Telematics for Improved Material Handling Productivity

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Presented by:

**Phil Van Wormer - Senior Vice President, TotalTrax, Inc**

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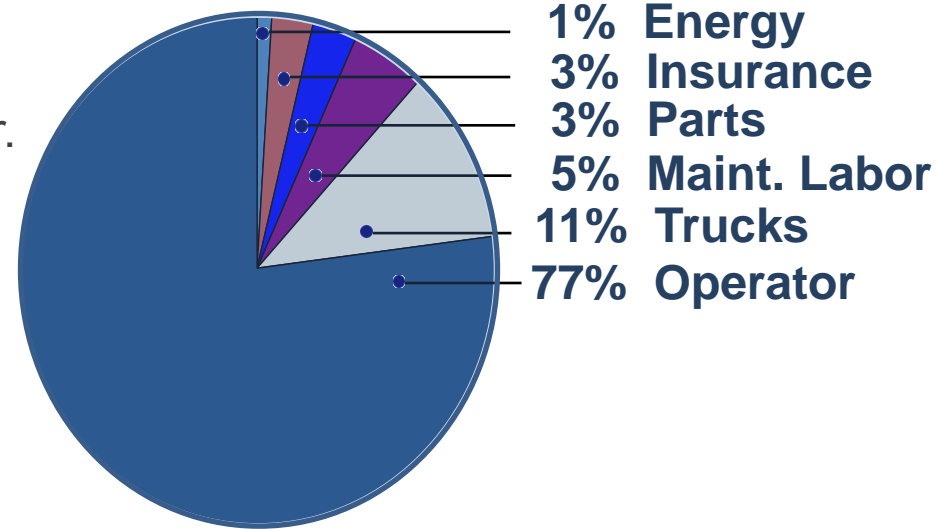


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## The Warehouse Industry's Challenge

1. Substantial forklift truck accidents result in costly injuries, lost work time and damages totaling 100's \$MM's/Yr.
2. Forklift trucks and drivers account for over 80% of operating expenses.
3. Manual tasks associated with data collection and inventory tracking reduce driver productivity while increasing human error and rework.
4. Lack of real time visibility to fleet movement, utilization and driver activity limits productivity improvement.



***Small gains in labor productivity beat large improvements in other cost areas***

FIND WHAT'S  
NEXT.

# Answer: Turning Lift Trucks Into Smart Trucks



## On-board sensors

- automatically collecting usage, operating and inventory data by driver, lift and load

## Accurate location tracking

- real-time visibility inside and outside

## Vehicle computer

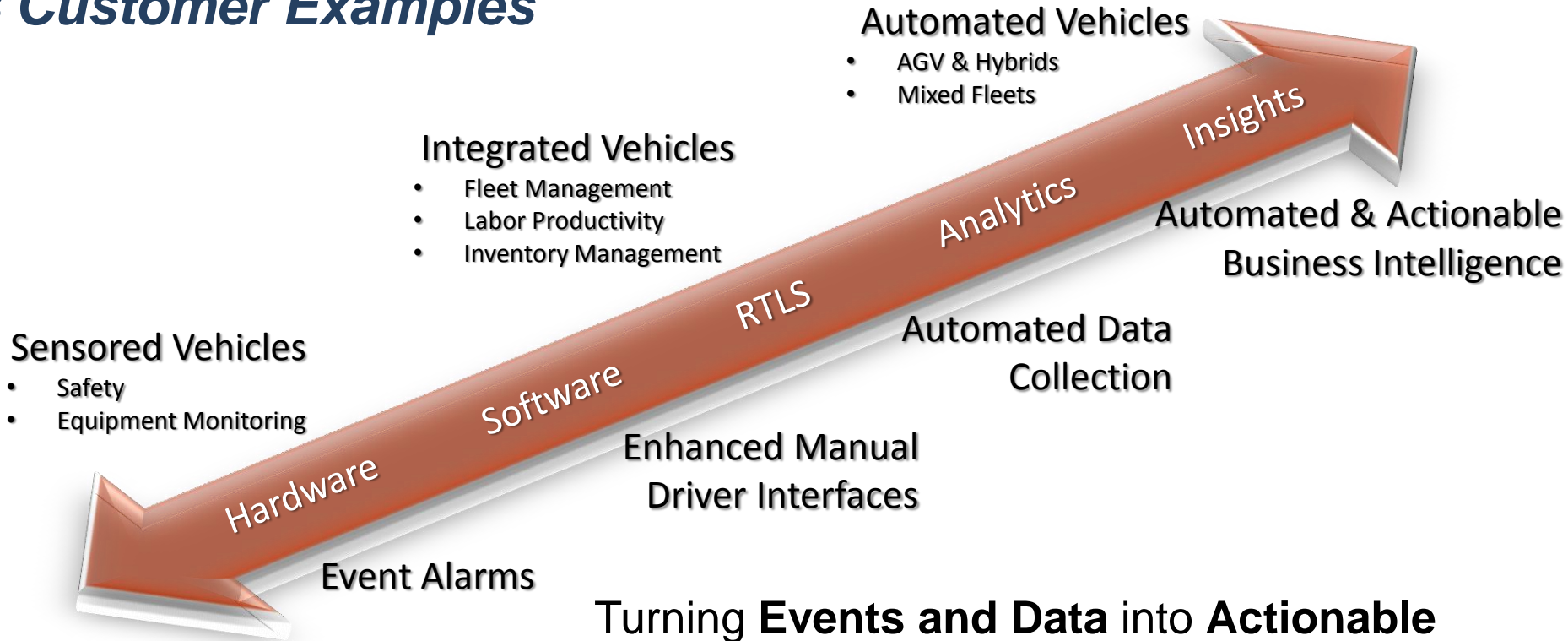
- on-board computing and smart truck software

## Mobile network connection

- wireless network integration

# FIND WHAT'S NEXT.

## Leveraging Data for Productivity Improvements 3 Customer Examples



Turning **Events and Data** into **Actionable Business Intelligence and Automation** is the next big opportunity for warehouse operations

## Example #1 – iWarehouse Labor & Warehouse Productivity Improvement

### Budget Results Report

Facility:

Period:

Department Process Metric	Category	Labor Std.	Units / Hr.	\$/Unit	Budgeted Volume	Actual Volume	Volume Variance	Budgeted Hours	Actual Hours	Hours Variance	Budgeted Cost	Actual Cost	Cost Variance	Budget Results	Volume Adjusted Budget
<b>Picking</b>															
Cases		95 %	39.3	\$ 0.472	81,162	72,300	-11 %	2,317	1,841	-21 %	\$ 41,015	\$ 34,093	-17 %	-\$ 6,822	-\$ 2,444
(No Category)		20 %	11.7	\$ 1.580	81,162	212	-100 %	2,317	18	-99 %	\$ 41,015	\$ 335	-99 %	-\$ 40,680	\$ 228
Counter Balance		92 %	55.5	\$ 0.334		19,217		0	346		\$ 0	\$ 6,410		\$ 6,410	\$ 0
Double Pallet Jack		102 %	171.6	\$ 0.108		2,032		0	12		\$ 0	\$ 219		\$ 219	\$ 0
High Reach Truck		100 %	36.8	\$ 0.503		46,985		0	1,276		\$ 0	\$ 23,639		\$ 23,639	\$ 0
Single Pallet Jack		72 %	20.4	\$ 0.906		3,854		0	188		\$ 0	\$ 3,490		\$ 3,490	\$ 0

Costing and Budget Information Not Only for Labor, but also MHE

# FIND WHAT'S NEXT.

## Costs by Customer

Client	Unloading	Putaway	Picking	Packing	Outbound	Total Cost
Nordstroms	\$0.093	\$0.250	\$0.040	\$0.267	\$0.150	\$0.800
Polo	\$0.112	\$0.330	\$0.050	\$0.290	\$0.140	\$0.922
Tommy Bahama	\$0.145	\$0.360	\$0.062	\$0.332	\$0.162	\$1.061
Kohl's	\$0.070	\$0.227	\$0.041	\$0.305	\$0.151	\$0.794
Average	\$0.105	\$0.292	\$0.048	\$0.299	\$0.151	\$0.894

Complete Cost  
 Visibility Based on  
 Equipment and  
 Labor

## Costs by Process

Facility:

Date Range:

Department	Process	Client	Unit Name	Units / Hr	Units Processed	Total Hour	Unit Cost (unburdened)	Unit Cost (90 Day)	Total Cost	Productivity Score
Forklift	Full Case Pick - NonWalmart		Locations	73.01	55,959	766.4	\$ 0.250	\$ 0.252	\$ 13,966	124.4 %
	Full Case Pick - WalMart		Locations	40.88	932	22.8	\$ 0.389	\$ 0.421	\$ 362	106.7 %
	Full Case Replenishment		Full Pallets	13.63	2,741	201.1	\$ 1.306	\$ 1.316	\$ 3,580	104.3 %
	Putaway		Pallets	23.96	2,459	102.6	\$ 0.802	\$ 0.787	\$ 1,972	129.8 %

# FIND WHAT'S NEXT.



## How does the integration of vehicle telematics and labor management impact the operation?

- Productivity Goals
- Costing
- Budgeting
- Incentives
- Planning New Facilities
- Contract Negotiations

## Example #2 – Bobcat Company

### BACKGROUND

4 Sites, First Implementation (Go Live May '14)

### PURPOSE

Improved Productivity and Inventory Accuracy

- **Improvements seen in first 6 months**
  - 35% increase in Avg. number of pallets moved per hour
  - 25% decrease in number of drivers per shift
  - 5% increase in inventory accuracy
  - Over 50% reduction in new driver training. New drivers are trained within 1 day vs. 3-4 days on the older system
  - 30% Reduction in inventory counts
- **DC Velocity article published October 2014.**



**DC VELOCITY** DIRECTOR TECHNOLOGY **technologyreview**



**Bobcat excavates productivity, inventory improvements**

The construction equipment company makes heavy-duty gains in lift truck driver productivity and inventory accuracy with the help of some new technologies.

BOBCAT'S COMPACT BUT POWERFUL LOADERS, excavators, and other types of landscaping, construction, and industrial equipment are pretty much ubiquitous during construction season. Nearly all of those products flow out of Bobcat Co.'s main production facility in Gwinnett, N.D. The 800,000-square-foot manufacturing campus includes three warehouse buildings that range in size from 25,000 to 50,000 square feet. Production materials, which include large steel coils and subassemblies from other Bobcat facilities in North Dakota and Minnesota, pass through those warehouses on their way to manufacturing.

Dougie Herbst, Bobcat's strategic materials manager, says the warehouses handle about 40 truckloads of inbound materials each day—about a thousand skids in total. And keeping track of all that inventory in a fast-moving operation had become a vexing problem for the company. Its inventory management practices could no longer keep up with the rapid flow of materials.

"We had a significant amount of error in trying to locate product," Herbst says. "We had used a gatekeeper or check-out philosophy, but humans make mistakes." Essentially, the company relied on forklift drivers to report where they had picked up or dropped specific pallets. But pallets were often not where they were expected to be, and quantities were sometimes incorrect. "We were looking for a solution that would take out the human error," he says. With some 4,000 dotting locations in the warehouses, the manufacturer needed a robust system for keeping accurate real-time data on every pallet.

Bobcat ruled out the use of radio-frequency identification (RFID) tagging. Previous experience with

[www.earthdata.com](http://www.earthdata.com) OCTOBER 2014 DC VELOCITY 47



# FIND WHAT'S NEXT.

## Customer Data Display

Customer  
**WMS / ERP / LMS**



SmartLIFT  
**COCKPIT**



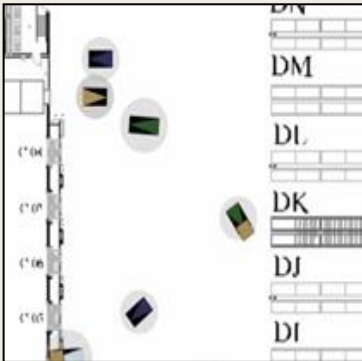
SmartLIFT  
**DRIVER GUI**



## Solution Benefits

1

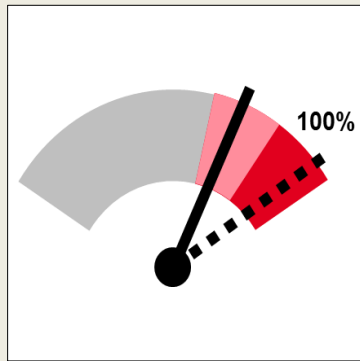
### INCH-ACCURATE VEHICLE TRACKING



- Real-time visibility to vehicle location & bread crumb trail
- Inventory locations optimized based on traffic

2

### REAL-TIME INVENTORY ACCURACY



- Real-time location of inventory is known
- Time spent "hunting" for pallets is eliminated

3

### NO MORE SCANNING



- Hands-free / Voice-free scanning
- Average savings of 8 to 14 seconds per move

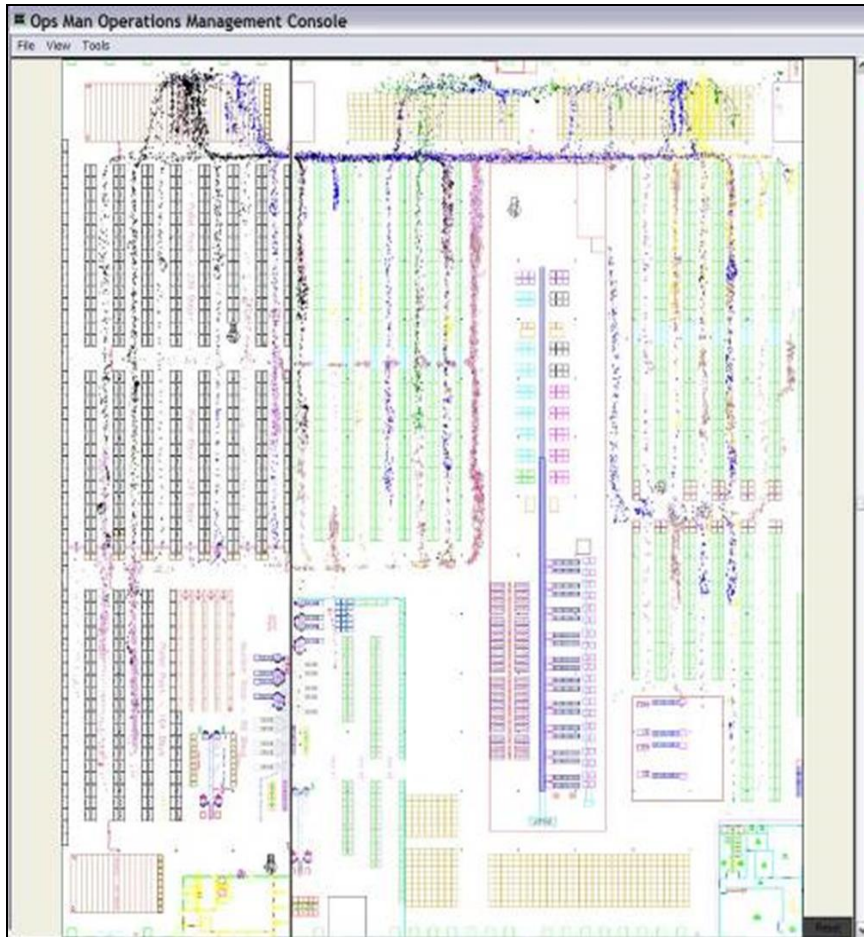
4

### BIG DATA INTELLIGENCE



- Web-hosted BI Tools that display real-time forklift data
- Automated email / text alerts

## 1 Inch-Accurate Vehicle Tracking - Breadcrumb View

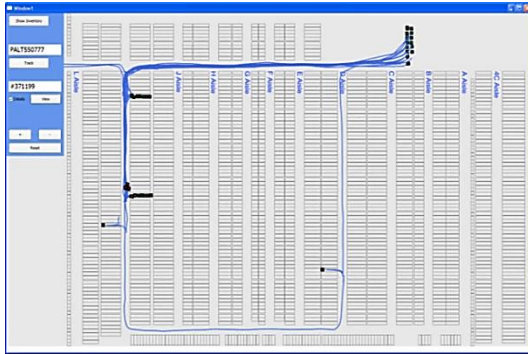


### Forklift Tracking:

- Real-time viewer – full operations visibility from anywhere
- Breadcrumb view:
  - *Historical truck movements plotted on facility map*
  - *Helps understand routing patterns, work flow, and congestion issues.*
- Replay
  - *Every forklift move is recorded*
  - *Historical moves can be replayed*

## Inventory Tracking

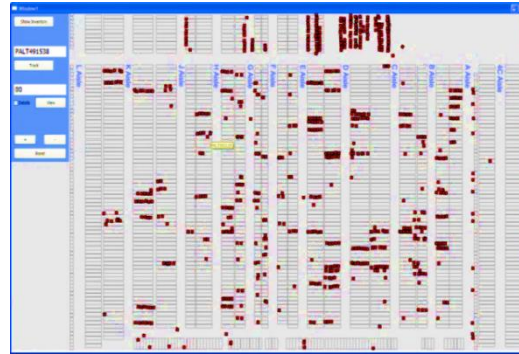
Pallet moves are tracked



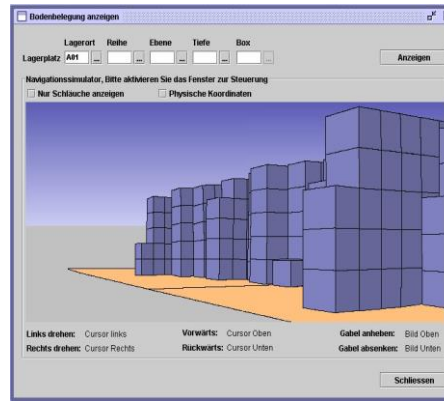
Actual



Pallet location (x,y,z) recorded



Virtual



### Track by location:

- With the forklift being tracked, inventory is tracked too!
- The real-time location of every pallet after the initial ID read is tracked
- Inventory data is real time accurate and complete
- No wasted time “hunting” for pallets and open slots

## No More Manual Scans - Optical Label Reader

### Manual Scanning



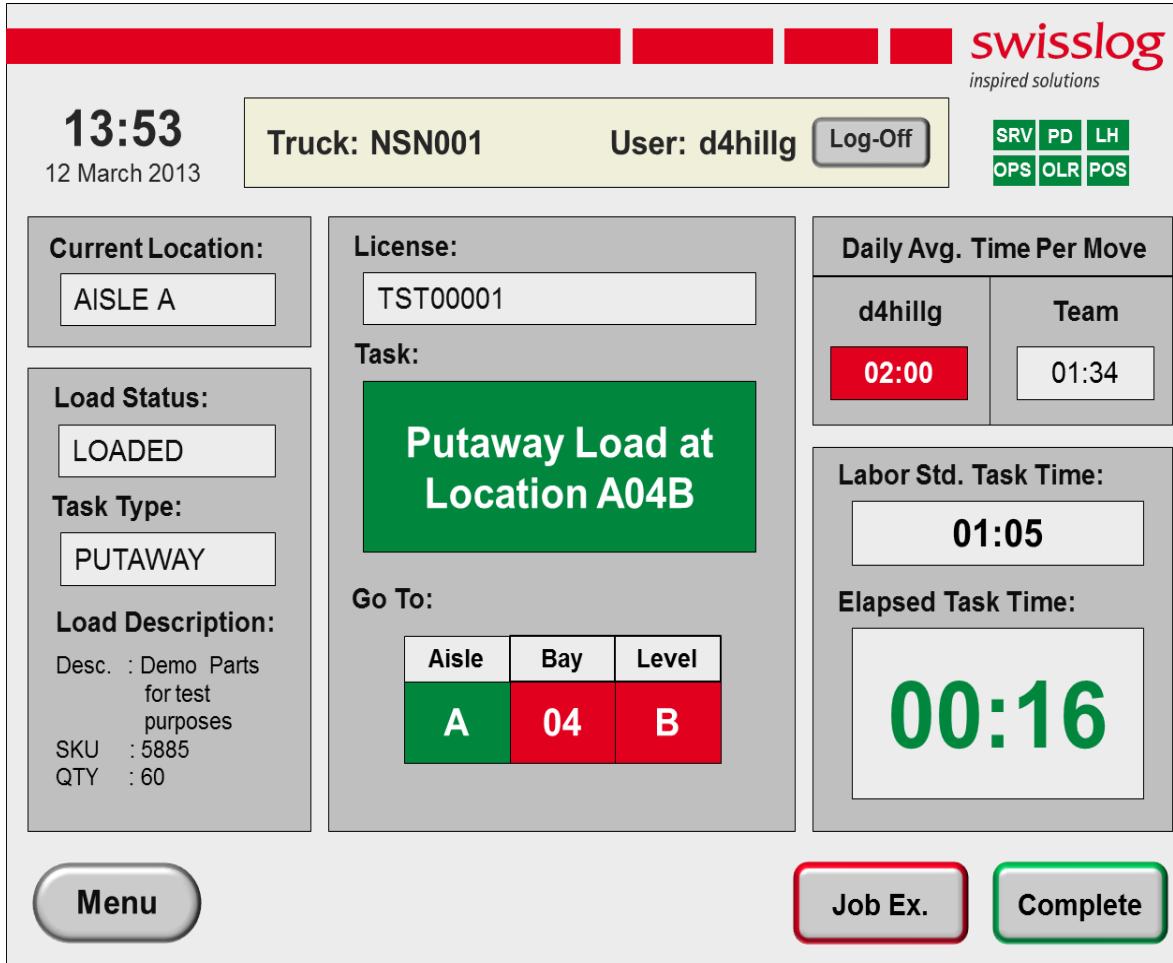
### Auto-Scanning



### AUTO-SCANNING

- The driver does not scan a single label!
- The Optical Label Reader (OLR) uses vision technology to scan 2D barcodes automatically
- On average, 8 seconds saved per move leading to a significant increase in productivity
- Inventory tracked by the x,y,z coordinates of the pallet forks

## Driver User Interface Screenshot



**swisslog**  
inspired solutions

**13:53**  
12 March 2013

Truck: NSN001    User: d4hillg    Log-Off

SRV PD LH  
OPS OLR POS

**Current Location:**  
AISLE A

**License:**  
TST00001

**Task:**  
**Putaway Load at Location A04B**

**Go To:**

Aisle	Bay	Level
A	04	B

**Daily Avg. Time Per Move**

d4hillg	Team
02:00	01:34

**Labor Std. Task Time:**  
01:05

**Elapsed Task Time:**  
00:16

**Load Status:**  
LOADED

**Task Type:**  
PUTAWAY

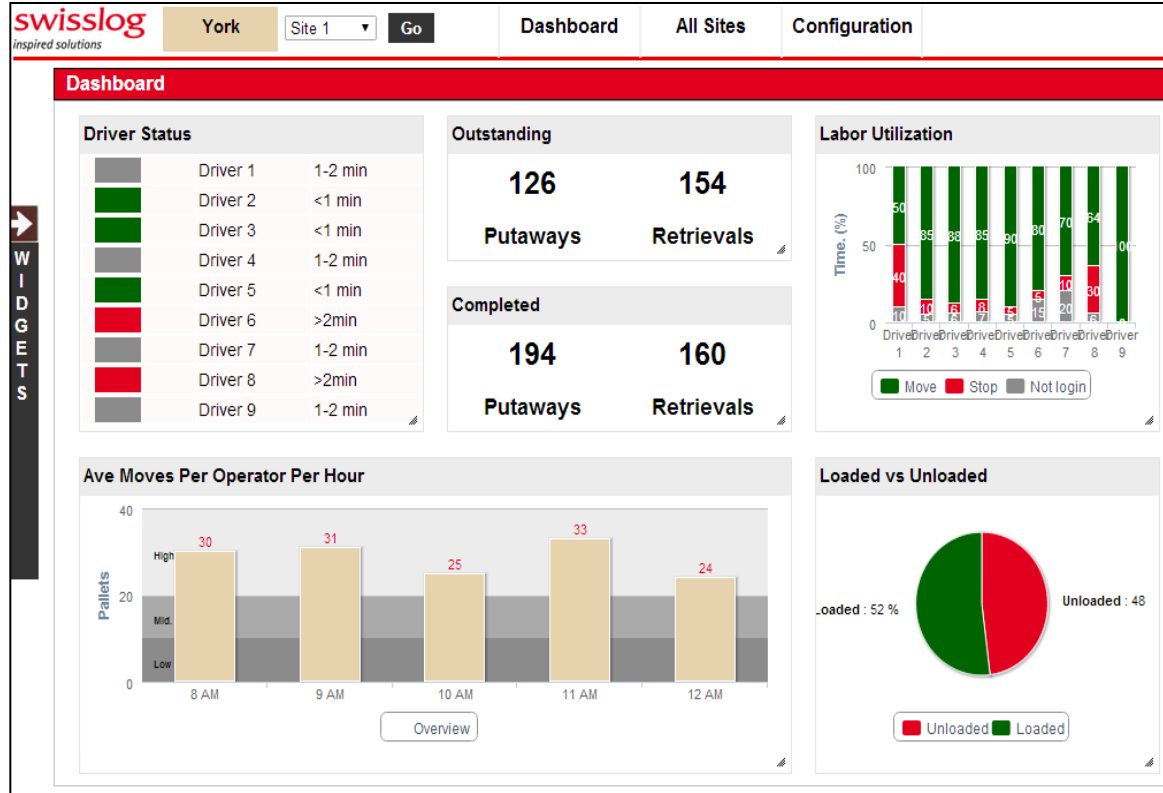
**Load Description:**  
Desc. : Demo Parts for test purposes  
SKU : 5885  
QTY : 60

Menu    Job Ex.    Complete

### RF Driver Interface:

- Standard user interface for driver boosts productivity and reduces “screen touches”
- Streamlined GUI design
  - Clear definition of task
  - Real-time location indicator
  - Task timer
  - Exception handling

## SmartLift: Big Data Meets Forklift



### Dashboard:

- A web-hosted business intelligence tool
- Interactive and user configurable charts
- Threshold based email alerts
- **WIDGET BASED!**
- **It is not possible to create a GUI that meets every employee's needs on a 15" monitor!**

In order for Big Data to be actionable, you need to provide: **Right information, to the right people, at the right time.**

## Example #3 - Nippon Express Europe

### Objective: - Optimization of staging and loading

#### Manual Scans



- Time consuming
- Error prone
- Not ergonomic

#### Automatic Registration



- No manual action required by operator
- Secure registration of loading

#### Manual Auditability



- Some routes require photo's
- Time consuming to make
- Time consuming administration
- Not 100% clear

#### Automatic Auditability



- Photo/video registration of all pallets
- Clear image of all pallets
- Links to WMS for easy administration



## Vision Based Locating (vs RFID)



### Vision Based Locating Positives

- High locating accuracy
- No annual reoccurring tag costs
- Upscale possibilities

### Vision Based Locating Requirements

- Equipping the forklift
- First registration on XYZ coordinate
- Changes to current work method

### Driving Statistics



- Distances covered
- Chosen routes
- Ratio driving with / without load

### Up-scale Possibilities



- Extend to entire operation
- First registration at inbound
- Complete automatic registration of all pallet movements
- Increased stock accuracy

### Task Distribution By Actual Location



- Dynamic task allocation based on location  
→ Reduce driving distances



## Nippon Express Europe - Business Case

### Approximate daily savings

- Staging scan: 6.6 hours
  - Loading scan: 6.6 hours
  - Dismount while loading: 2.2 hours
  - Take pallet photo: 5.0 hours
- 20.4 hours

### Estimated Payback

- (payback period < 2 years)

### Additional (estimated) benefits

- Photo/video of all outbound pallets = ??
- Claim (& claim handling) reduction = ??
- Administration of photos = 0.25 FTE
- Reduced check at staging area = 0.5 FTE

# FIND WHAT'S NEXT.



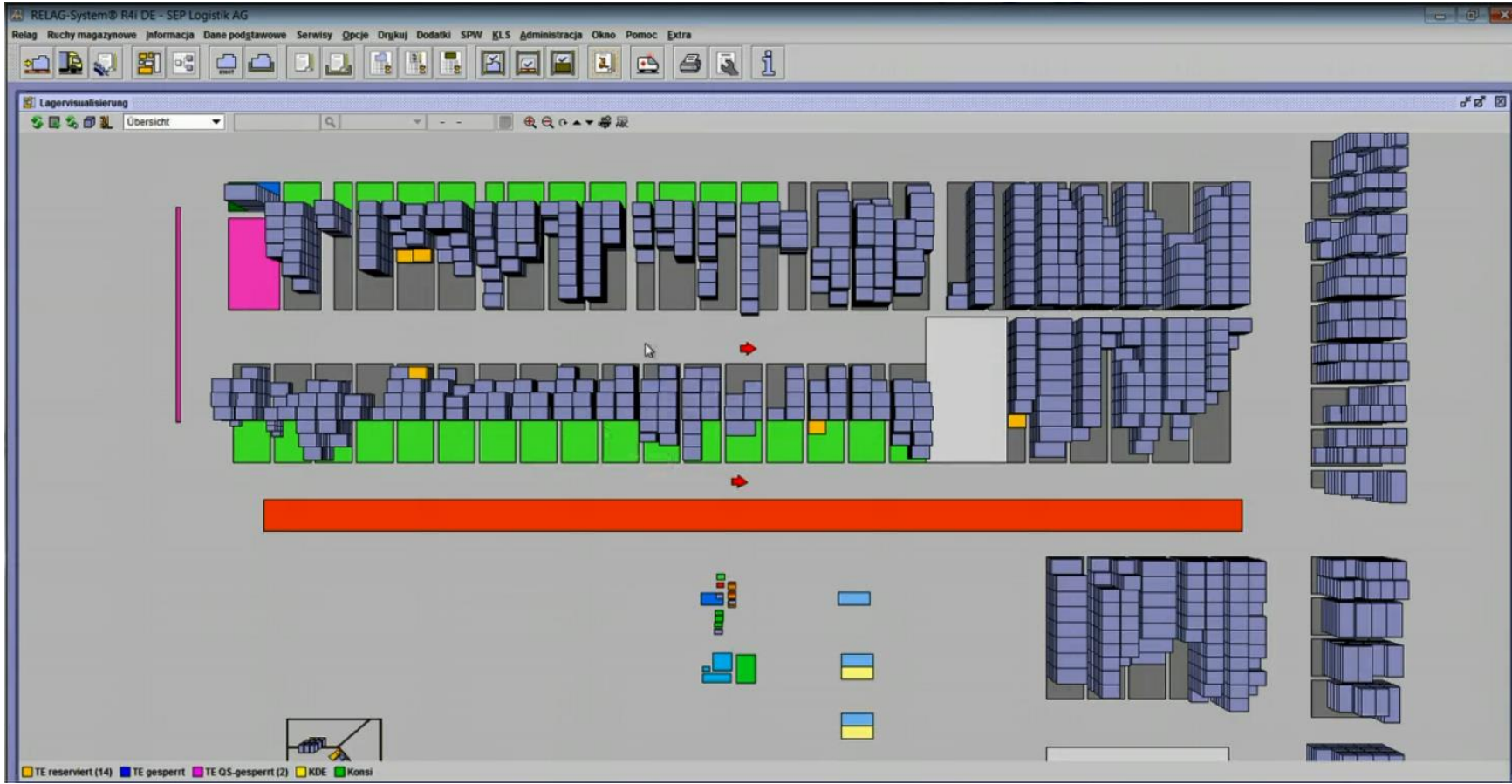
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## Warehouse view

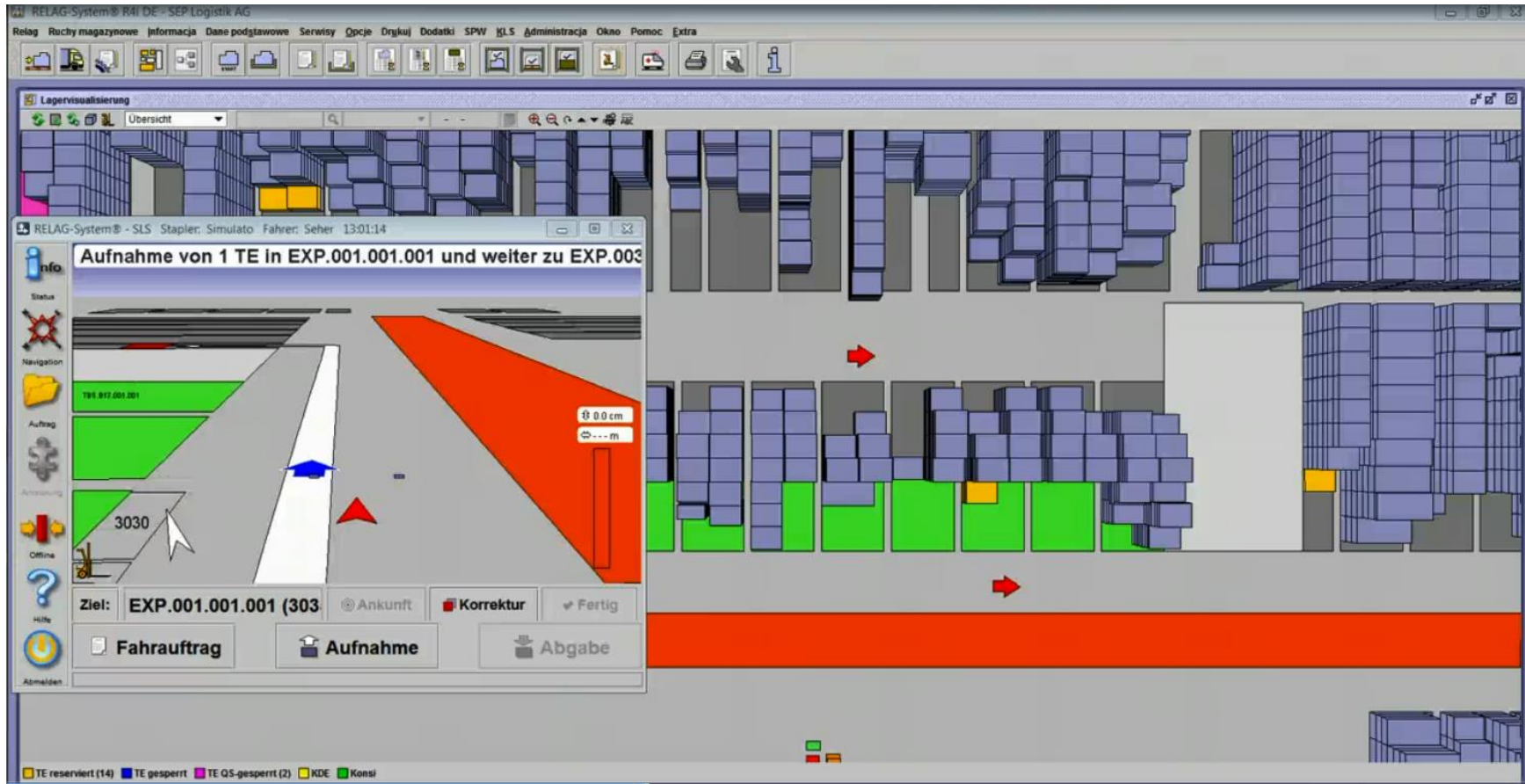
*Colors indicate areas with different (system) functions. Pallet sizes are kept in 3D.*



# FIND WHAT'S NEXT.

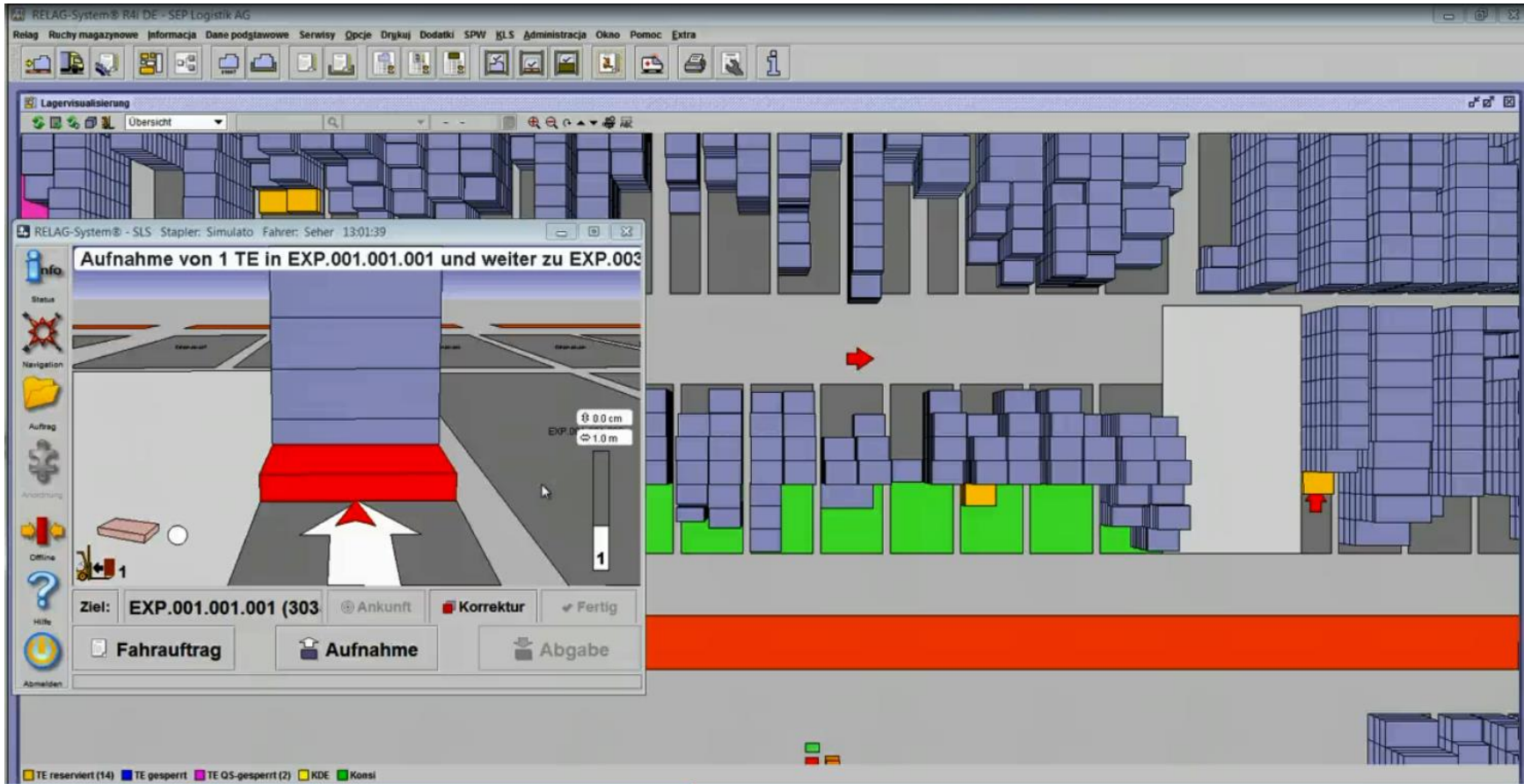
## Warehouse view with insert of 3D driver navigation

*Warehouse view shows FLT's as red arrows. Driver navigation shows shortest route to next pick up*



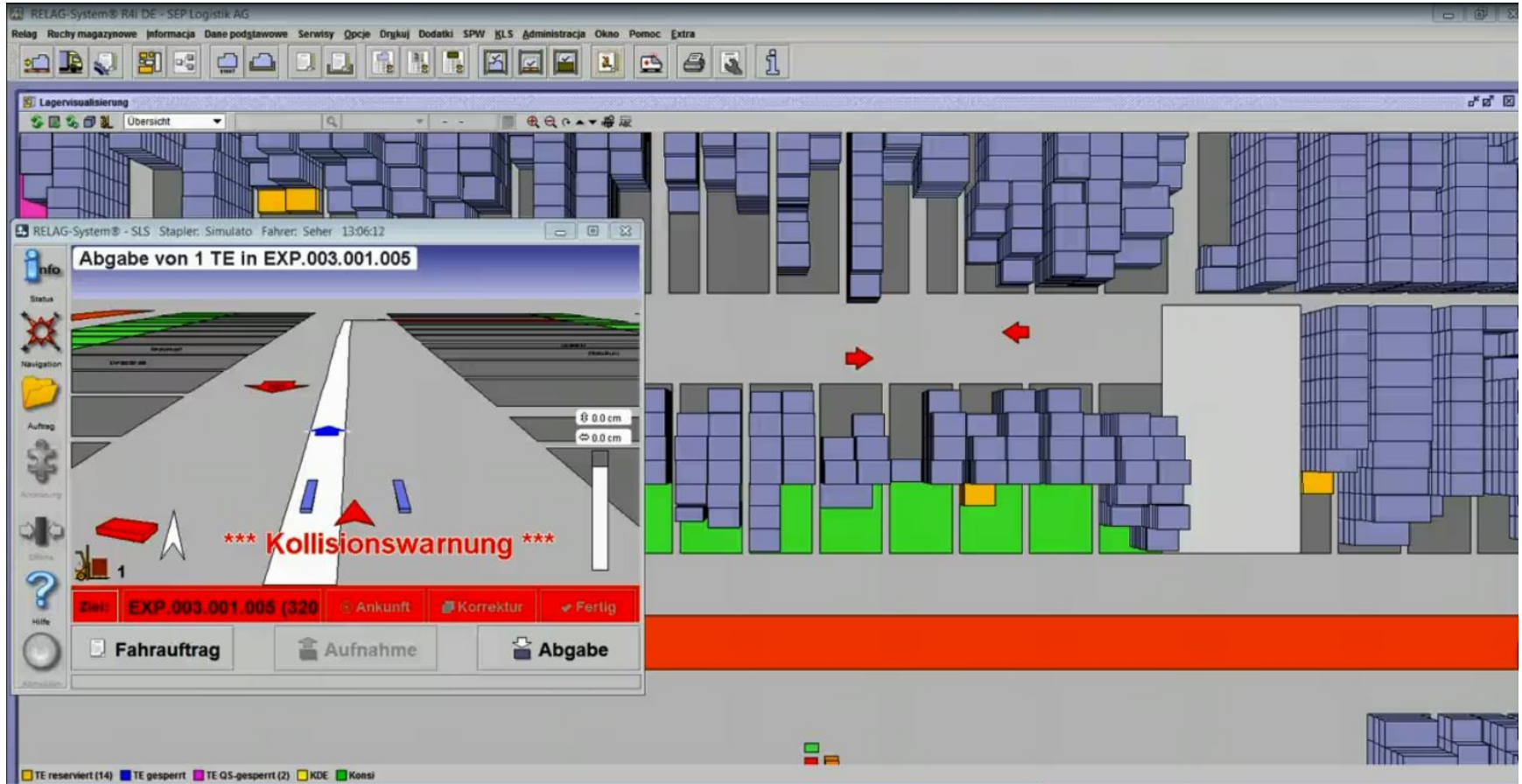
## Warehouse view with insert of 3D driver navigation

*Driver picks up pallet. Left bottom corners shows that pallet is on fork*



## Warehouse view with insert of 3D driver navigation

*Collision warnings if FLT's are close or if FLT backs against products*



# FIND WHAT'S NEXT.

## What's Next For Productivity Improvements?



- Remote Diagnostics & Software Updates

- Enhanced User Experience
- Single Platform
- Upgradability

Insights

Analytics

RTLS

Software

Hardware



- Enhanced Data Management

- Browser Enabled Device Compatibility



# A New KPI: The Perfect Move

*Done correctly, the first time, at minimum cost*

- Right load picked
- Closest driver with right equipment (AGV or manned)
- Correct destination location and load orientation
- With no damage
- Optimal routing
- At optimum safe speed
- Minimum total time
- Fully tracked and updated in management software
- Truck load manifest verification





**FIND WHAT'S  
NEXT.**



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