PLANNING - Route optimization

Qargo's optimization automates efficient groupage and LTL route planning using time windows, weight, volume, loading meters and pallet metrics. It reduces costs, maximizes capacity, adapts to changes and supports re-optimization when loads are updated.

Updated July 21, 2026

Introduction



The optimization feature in Qargo is designed to automatically generate the most **efficient routes for groupage and less-than-truckload (LTL) shipments.** This process relies on various metrics to determine the optimal sequence of deliveries.

Benefits of route optimization

Efficiency improvements:

- Automatically calculates the most efficient delivery sequences
- Reduces total travel time and fuel consumption
- Maximizes vehicle capacity utilization
- Minimizes operational costs through optimized routing

Automated decision making:

- Eliminates guesswork from manual route planning
- Considers multiple variables simultaneously
- Provides data-driven routing recommendations
- Adapts to changing conditions and requirements

Optimization tool options

Qargo offers configuration options for the optimization tool, which is configured as part of the onboarding process. Options include:

- HERE Maps
- More Optimal
- Optimize
- PTV Optiflow

🧰 Configured by a Qargo admin. Contact Qargo support if further assistance is required to verify or configure load optimization.

Key metrics for optimization

1. Time windows
Function: Determines delivery sequence priority based on customer time requirements
How it works:

- Orders with defined time windows are prioritized in the optimization sequence
- The algorithm ensures deliveries occur within the specified time frames
- Earlier time windows receive higher priority in route sequencing
- Helps maintain customer service commitments

Configuration requirement: Time windows must be defined in the order details for this metric to work

2. Weight distribution
Function: Optimizes load distribution based on shipment weight and vehicle capacity
Optimization factors:

- **Shipment weight:** Individual order weight requirements
- **Vehicle payload:** Maximum weight capacity of assigned vehicles
- **Load balance:** Ensures even weight distribution across the load
- **Capacity utilization:** Maximizes payload efficiency without exceeding limits

Result: Prevents overloading while maximizing vehicle capacity utilization

3. Volume optimization
Function: Maximizes space utilization within vehicle freight areas
Calculation components:

- **Shipment volume:** Cubic space required for each order
- **Vehicle volume capacity:** Maximum freight space available
- **Space efficiency:** Optimizes three-dimensional space utilization
- **Load configuration:** Considers how items fit together in the freight space

Benefit: Ensures maximum freight space utilization for cost-effective transportation

4. Loading meters
Function: Accommodates linear freight space requirements
Considerations:

- **Order loading meters:** Linear space required for each shipment

- **Vehicle loading capacity:** Available linear loading space
- **Freight configuration:** How items are arranged linearly in the vehicle
- **Space allocation:** Ensures proper accommodation for all freight

Application: Particularly important for long or irregularly shaped freight

5. Pallet spaces
Function: Optimizes pallet-based freight organization
Optimization elements:

- **Pallet requirements:** Number of pallet spaces needed per order
- **Vehicle pallet capacity:** Maximum pallet spaces available in the vehicle
- **Pallet configuration:** How pallets are arranged and secured
- **Space efficiency:** Maximizes pallet space utilization

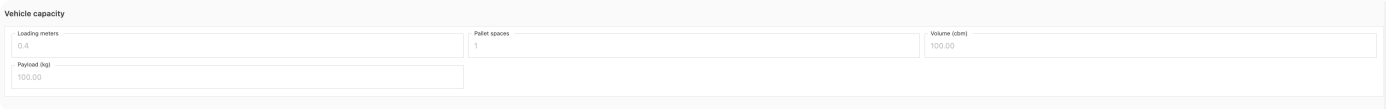
Result: Ensures efficient pallet-based freight management

Planning considerations:

- Group orders with similar time windows when possible
- Consider geographic proximity when selecting orders for groupage
- Balance vehicle capacity utilization with delivery time requirements
- Plan for contingencies and potential route changes

Data entry requirements

For successful optimization, all the above metrics must be filled in accurately in the order and in the ***vehicle capacity*** details (see: 👉Creating drivers/vehicles/containers).



‼️ Blank fields may prevent the system from generating optimal routes.

Complete information ensures that the calculations are performed effectively.

Important note:

- If any order is removed from a load, it is **essential to trigger the re-optimization** function.
  - This dynamically adjusts the remaining orders and creates a new optimal route without the removed order.
- The system includes error-handling mechanisms. If any required metric is missing or incomplete, the system issues a warning and blocks the optimization process until the necessary information is provided.

Applying optimization to existing loads

Step-by-step process

To optimize routes for existing loads:

Step 1: Navigate to the load details

1. Open the page of the load to optimize
2. Scroll down to the **Route details** section
3. Review the current route configuration

Step 2: Start the optimization

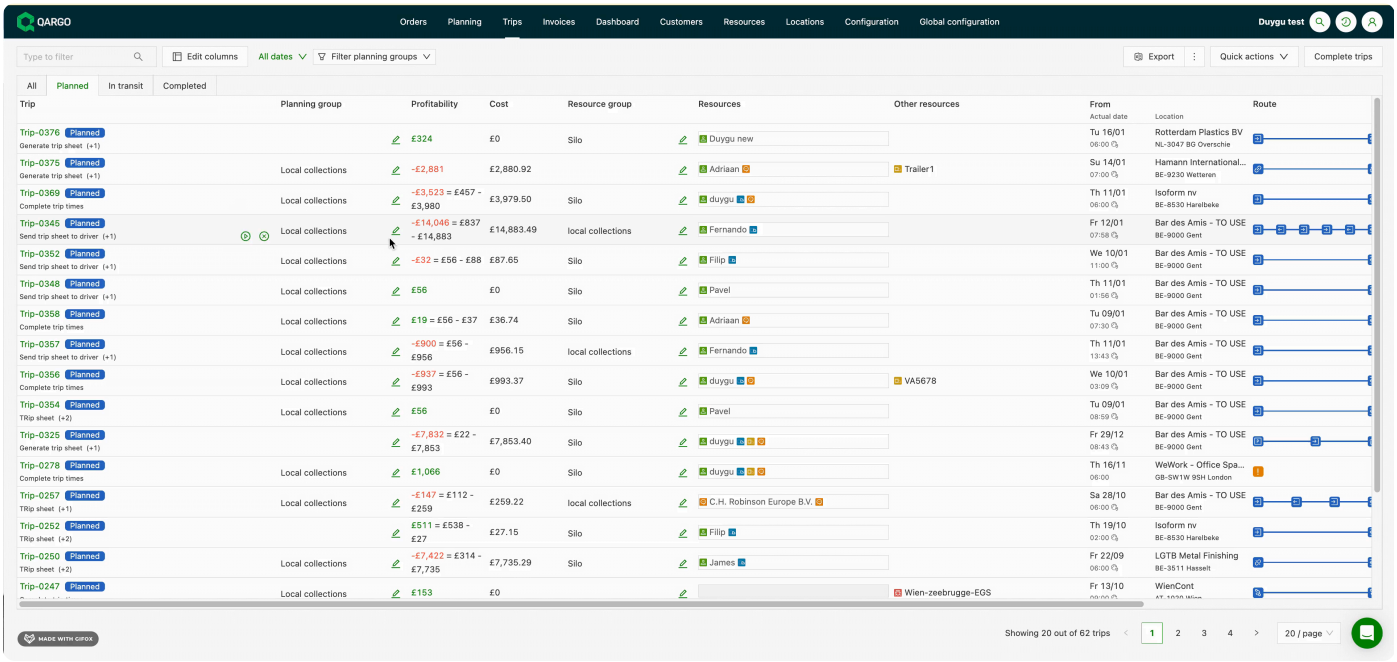
1. Click the **Optimize route** button in the route details section
2. The system automatically analyzes the current orders and constraints
3. The algorithm calculates the most efficient route sequence

Step 3: Review the optimized route

1. The route is automatically adjusted for optimal efficiency
2. The new sequence is displayed in the route details
3. Manual adjustments can still be made if needed using the route editing features

Step 4: Apply the changes

1. Review the optimized route for accuracy
2. Make any necessary manual adjustments
3. Save the optimized route configuration



📚 Loads can still be adjusted manually. Learn how here.

Creating optimized loads from scratch

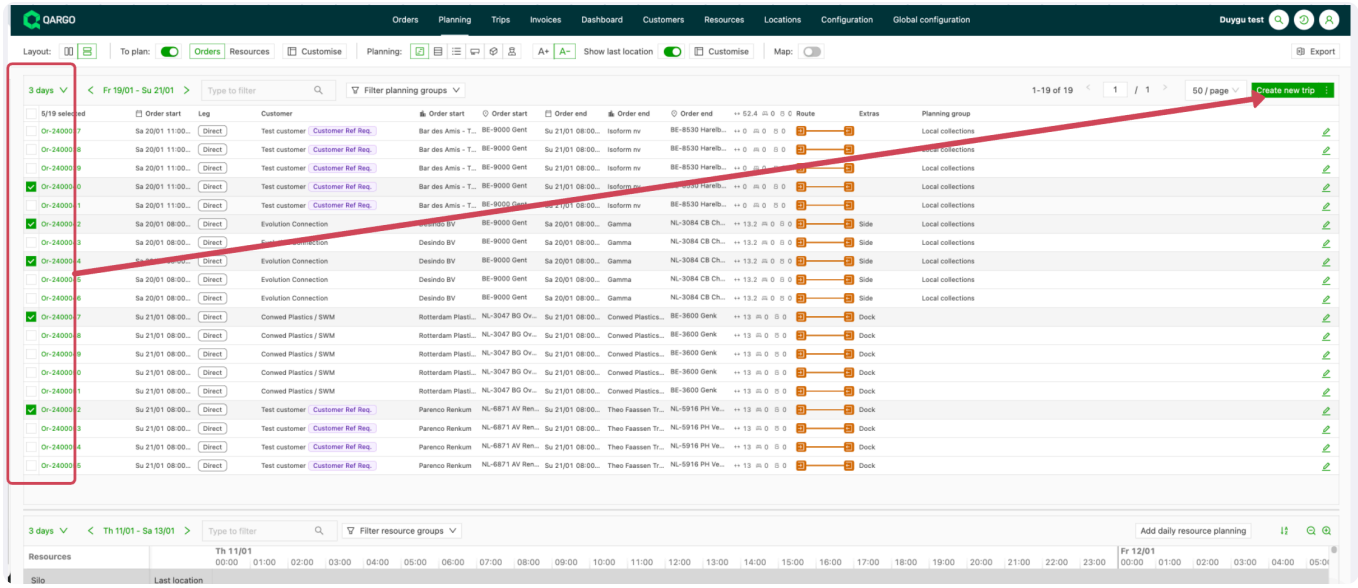
Use case scenario

When multiple trucks and orders need to be planned in the most effective way, use the optimization suggestions feature during load creation.

Step-by-step optimization process

Step 1: Select orders for groupage

1. Navigate to the list of **To plan** orders
2. Select the orders to include in the groupage shipment
3. Make sure all selected orders have complete metric information

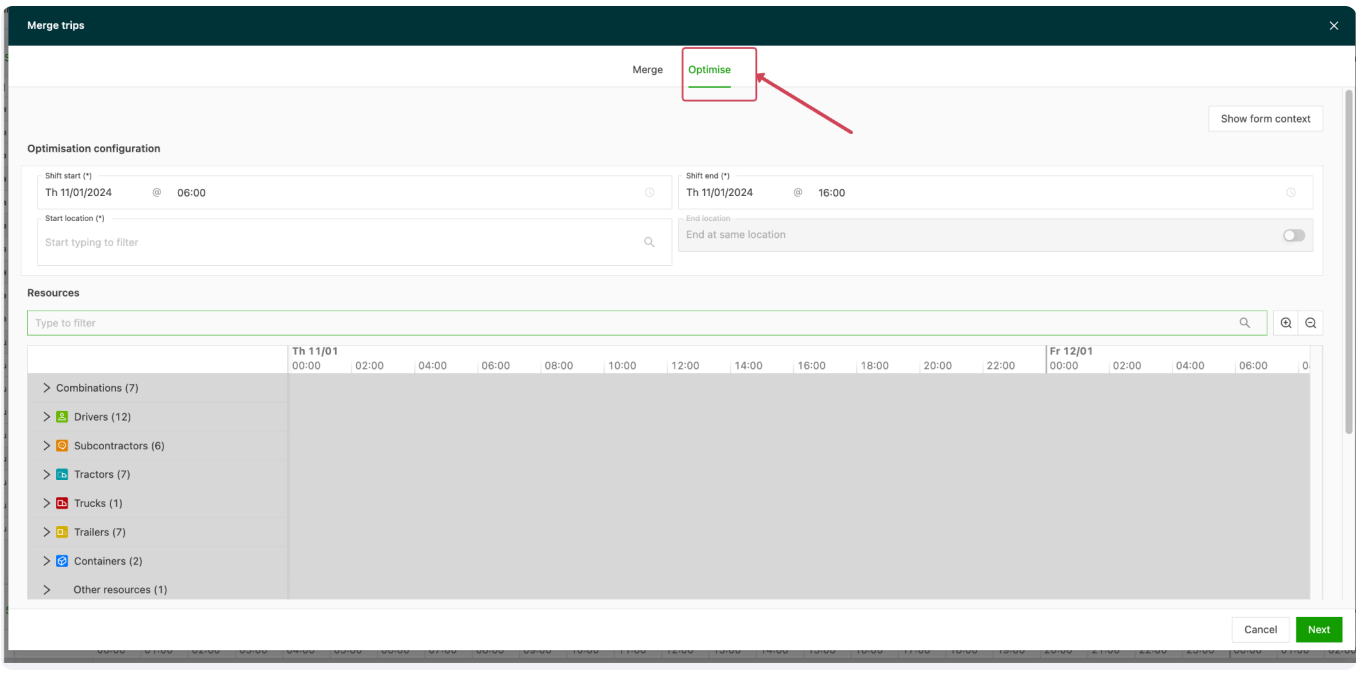


Step 2: Start load creation

1. Click **Create new load** after selecting the orders
2. The load creation interface opens with the selected orders
3. Proceed to the optimization configuration

Step 3: Open the optimization settings

1. Switch to the **Optimization** page within the load creation interface
2. This page gives access to all optimization configuration options
3. Review the available optimization parameters



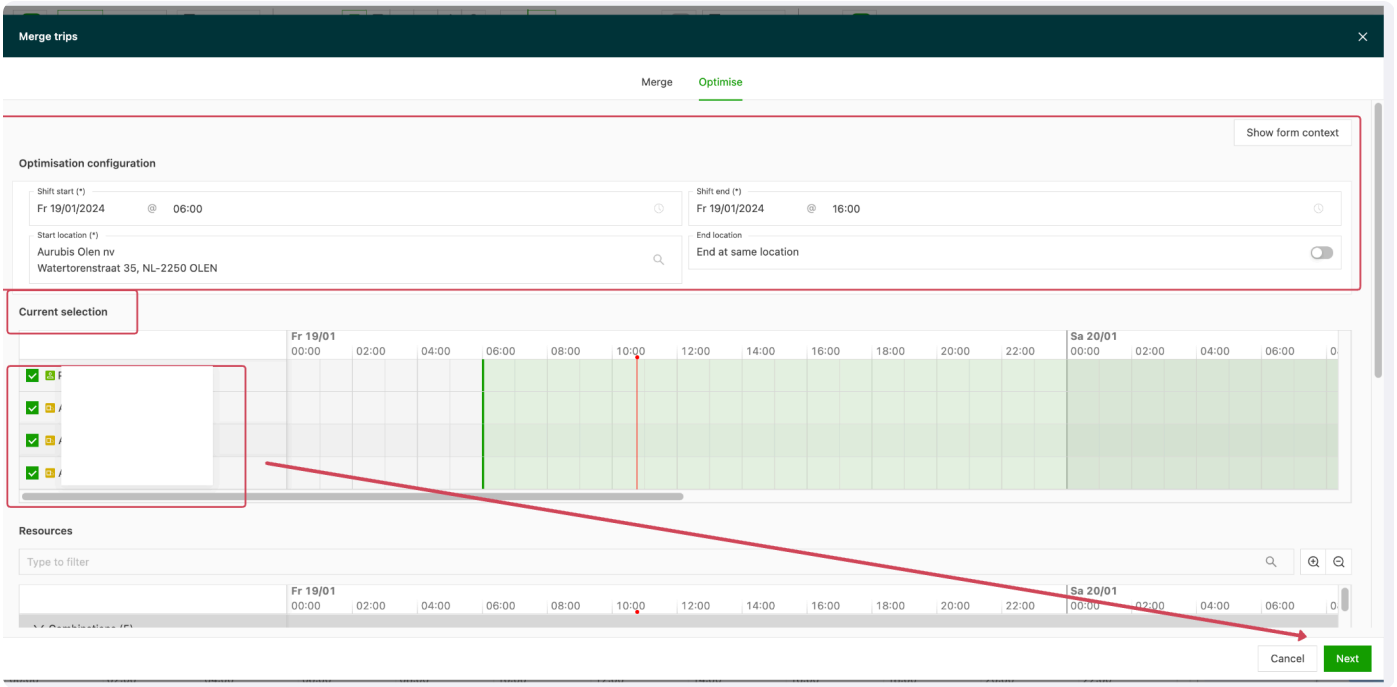
Step 4: Configure the start parameters

1. **Start location:** Set the departure point for the load
2. **Start date:** Define the load start date
3. **Start time:** Specify the departure time
4. Make sure all start parameters align with operational requirements

Step 5: Select vehicle resources
Choose from the available vehicle resources based on the requirements:
Available resource types:

- **Resource combinations with trailers:** Tractor-trailer combinations
- **Trailers:** Standalone trailer units
- **Containers:** Shipping container options
- **Vans:** Delivery van configurations
- **Straight trucks:** Straight truck options

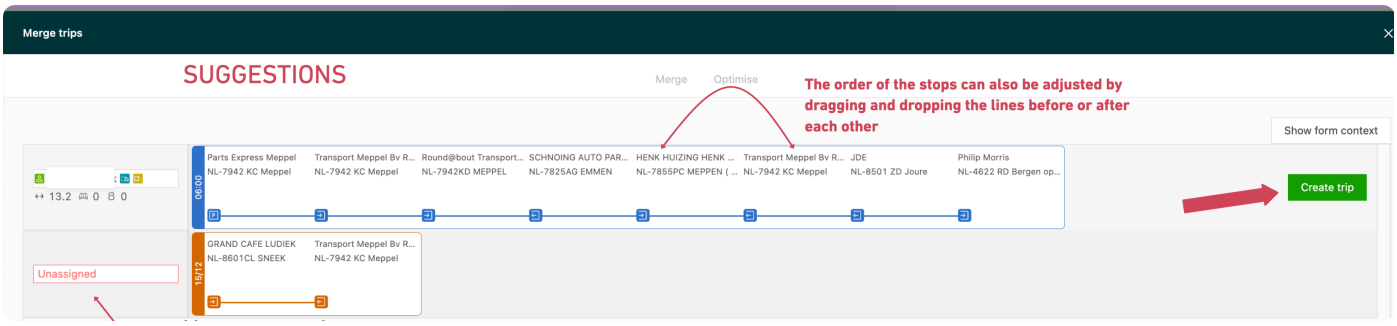
After selecting the appropriate resources, click **Next** to generate optimization suggestions



⚠️ The order of the stops can also be adjusted by dragging and dropping the lines before or after each other.

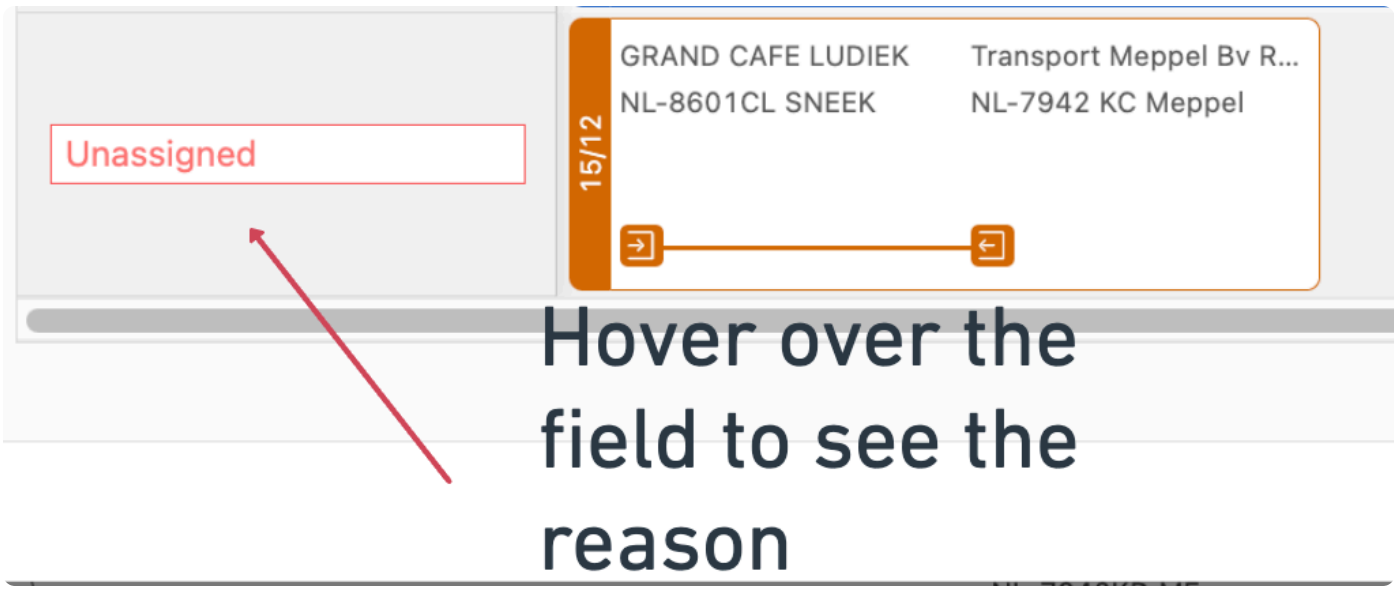
Step 6: Review the optimization suggestions

1. The system generates route suggestions based on:
    - Configured dates and time windows from the orders
    - Selected vehicle resources and their capacities
    - All optimization metrics (weight, volume, loading meters, pallet spaces)
2. Multiple route options may be presented for comparison
3. Each suggestion shows efficiency metrics and resource utilization



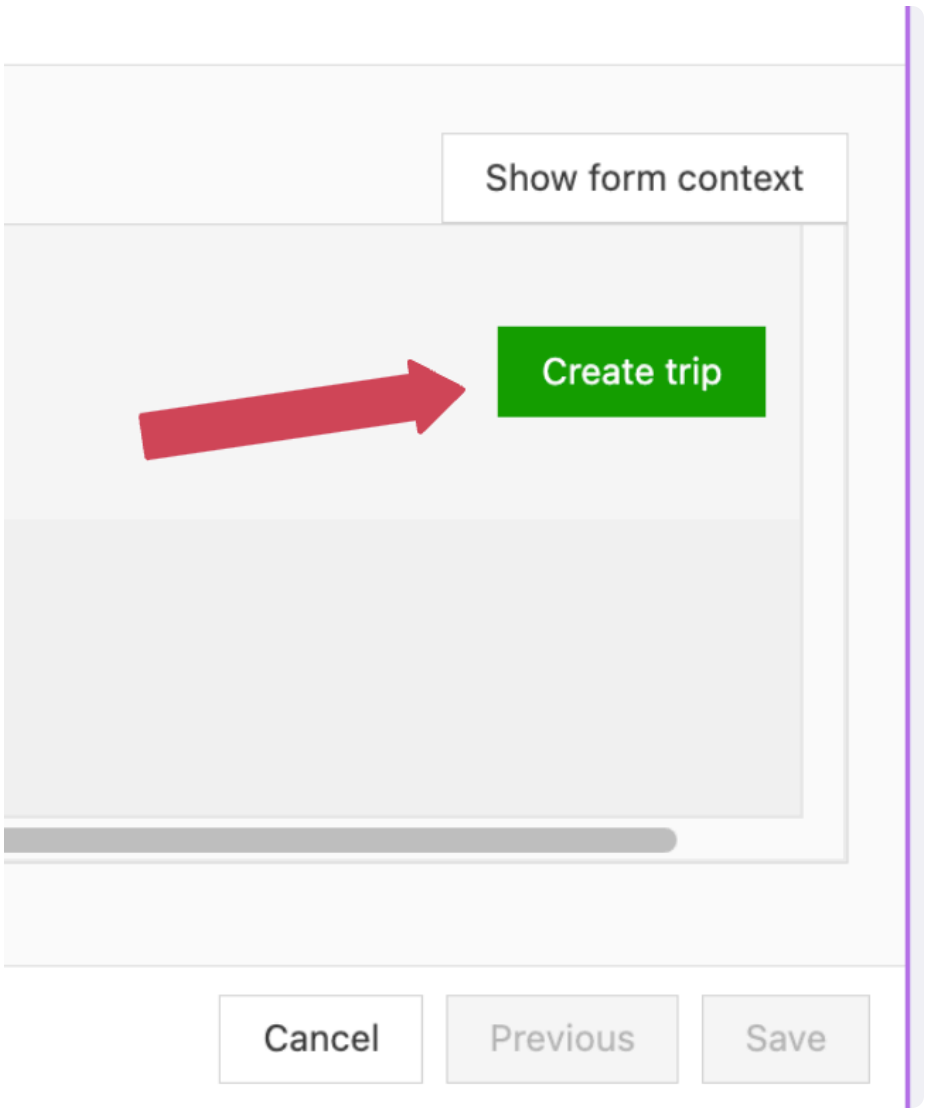
⚠️ A suggestion with no resources may mean that the resource limit is exceeded, or that some information is missing or does not match the requirements.

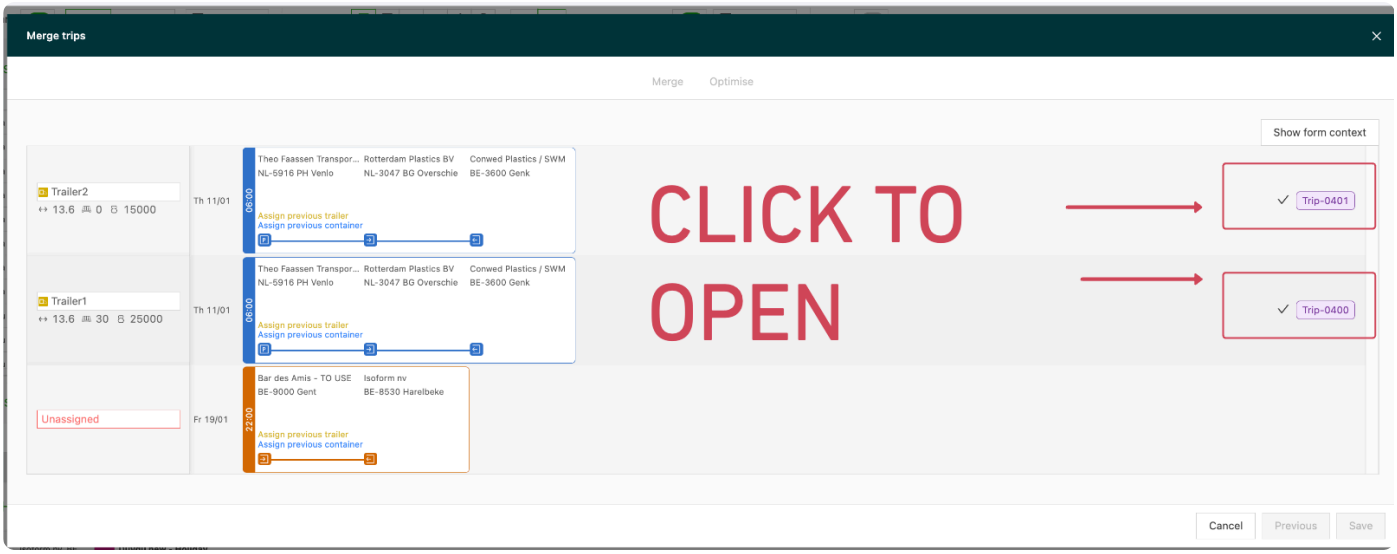
- To see the reason, hover over the ‘no resources’ field to display the message:

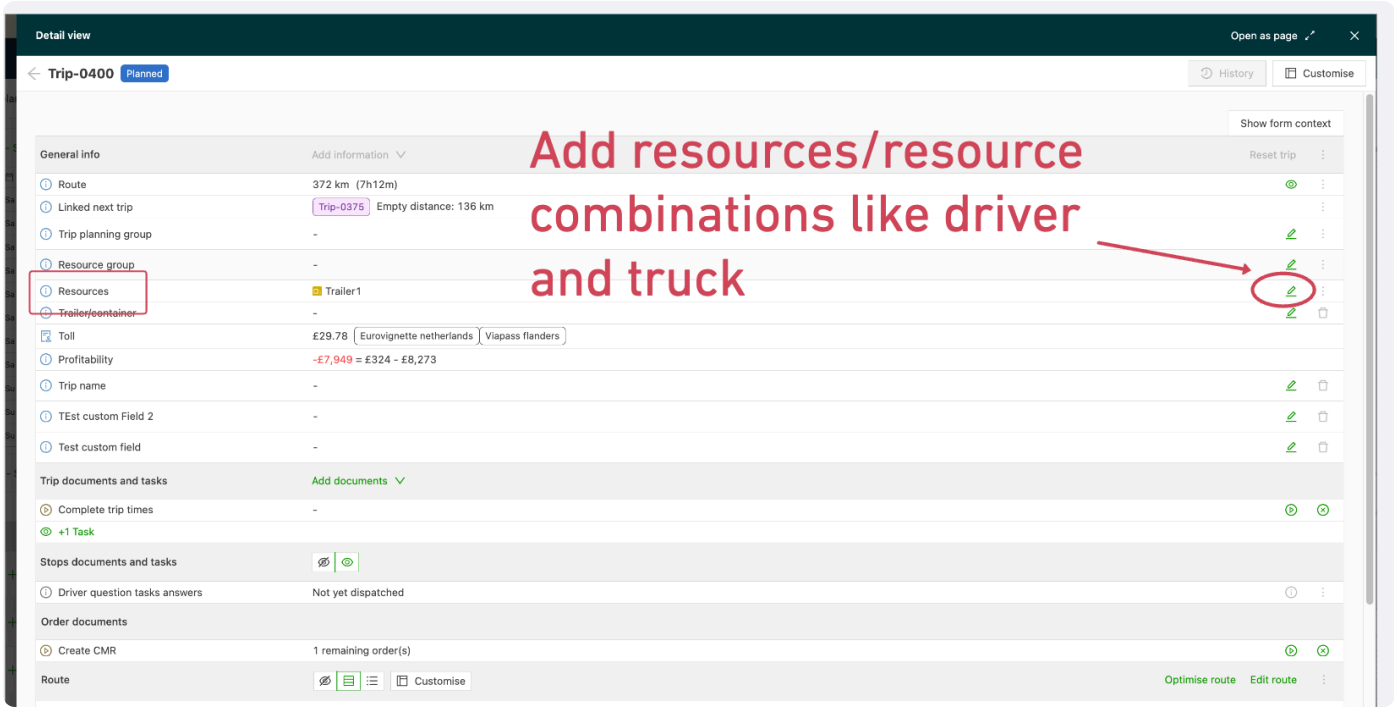


Step 7: Finalize load creation

1. **Review suggestions:** Examine all optimization suggestions and select the best option
2. **Make adjustments:** Apply any necessary manual changes to the route
3. **Create load:** Click **Create load** to finalize the optimized route
4. **Load assignment:** The system generates a planned load number
5. **Resource assignment:** Assign specific drivers and tractors to the load (if applicable)


Show form context
Create trip
Cancel
Previous
Save


Merge trips
Merge
Optimise
Show form context
Trailer2
13.6 0 15000
Th 11/01
06:00
Theo Faassen Transpor... Rotterdam Plastics BV Conwed Plastics / SWM
NL-5916 PH Venlo NL-3047 BG Overschie BE-3600 Genk
Assign previous trailer
Assign previous container
Trip-0401
Trailer1
13.6 30 25000
Th 11/01
06:00
Theo Faassen Transpor... Rotterdam Plastics BV Conwed Plastics / SWM
NL-5916 PH Venlo NL-3047 BG Overschie BE-3600 Genk
Assign previous trailer
Assign previous container
Trip-0400
CLICK TO OPEN
Unassigned
Fr 19/01
22:00
Bar des Amis - TO USE Isoform nv
BE-9000 Gent BE-8530 Harelbeke
Assign previous trailer
Assign previous container
Cancel
Previous
Save



Re-optimization requirements

When to re-optimize:

- After removing any order from an existing load
- When adding new orders to a load
- After changing vehicle assignments
- When time windows or delivery requirements change

Re-optimization process:

1. Trigger the re-optimization function after any load changes
2. The algorithm dynamically adjusts the remaining orders
3. Creates a new optimal route without the removed or changed orders
4. Maintains efficiency despite load changes

Hidden operational stops on the route timeline

A tenant setting can hide selected operational stops from the customer portal route timeline. When enabled, stop types such as terminal stops, parking, hook and drop activities, empty container moves and day-boundary stops are removed from the portal timeline entirely, leaving only the stops relevant to the end customer.

This keeps the portal route timeline aligned with the visualized order route, with no gaps or grayed-out placeholders in place of the hidden stops.

A super admin selects the stop types to hide in the route planning and optimization settings. For the configuration steps, see PLANNING – Route optimization.

Error handling and warnings

System validation process

Automatic data validation:

- The system checks for missing or incomplete metric information
- Validates data consistency across orders and vehicles
- Identifies potential capacity conflicts before optimization
- Provides specific error messages for missing data

Warning system:

- Issues warnings when required metrics are missing
- Blocks the optimization process until the necessary information is provided
- Highlights the specific data fields that need to be completed
- Ensures data integrity before route calculation