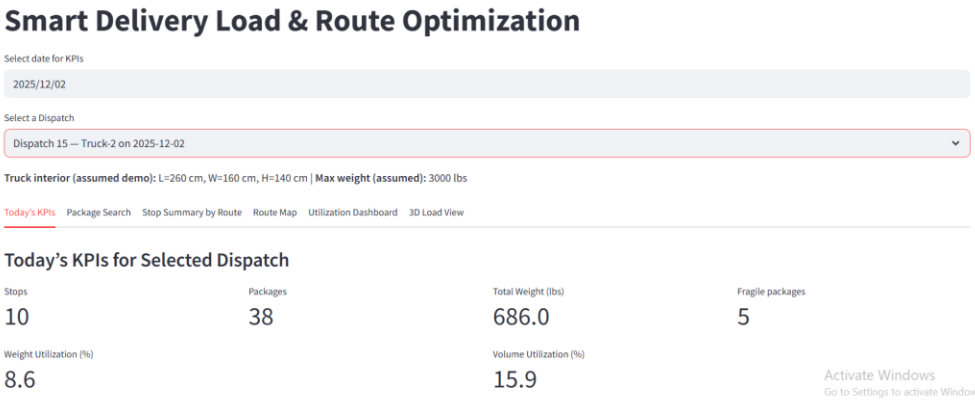
Smart Delivery Load & Route Optimization System

This section explains the key screenshots included in this repository. Each image demonstrates how the system works from a business user's perspective, without requiring access to the code or database.

Main Dashboard – Operational Overview and Dispatch Selection by Date



This screen is the main entry point of the application. It provides a high-level operational overview for managers and dispatch planners.

Key information visible:

- Total number of dispatches for the selected date
- Number of active trucks in use
- Total packages scheduled for delivery
- Number of fragile packages
- Average truck utilization (weight and volume)

Why it matters:
This dashboard allows managers to quickly understand the overall state of daily operations and identify potential inefficiencies without drilling into detailed data.

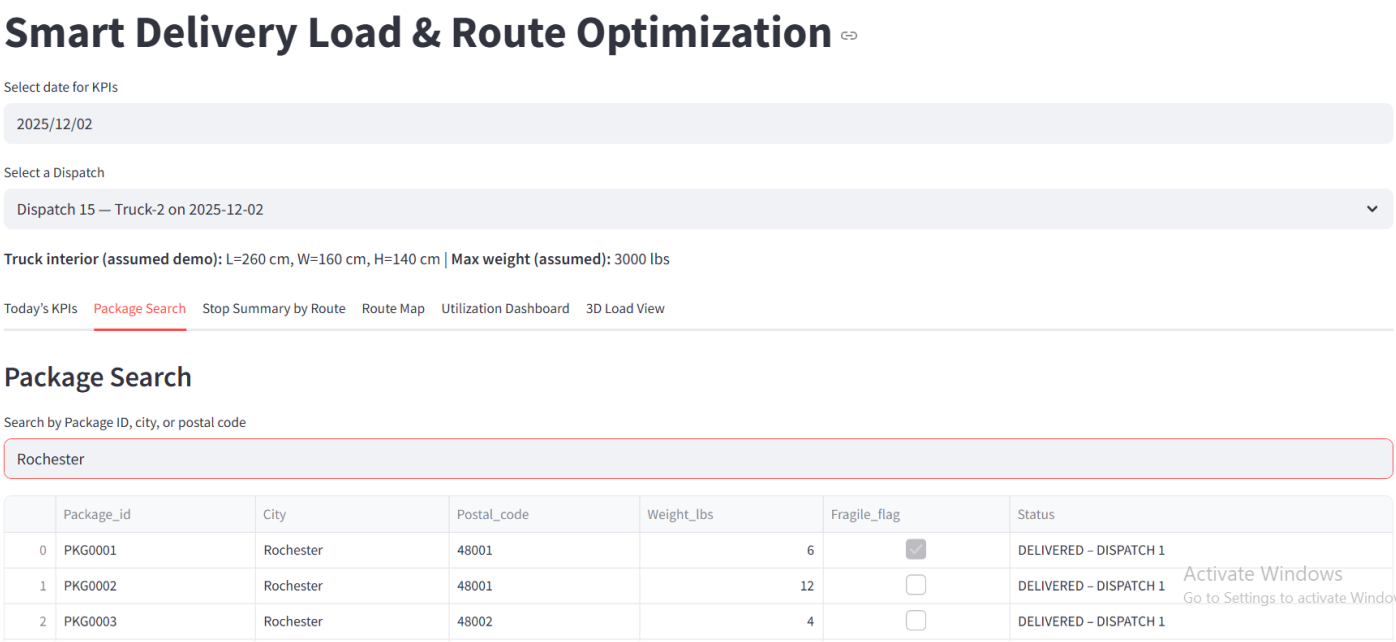
This lower view allows users to select a service date and then choose from the available dispatches scheduled for that day.

Key information visible:

- Dispatch ID
- Assigned truck
- Service date
- Dispatch status

Why it matters:
In real logistics operations, planning and execution are done day by day. This feature mirrors how dispatch planners review and manage daily delivery operations.

Package Search & Status Tracking



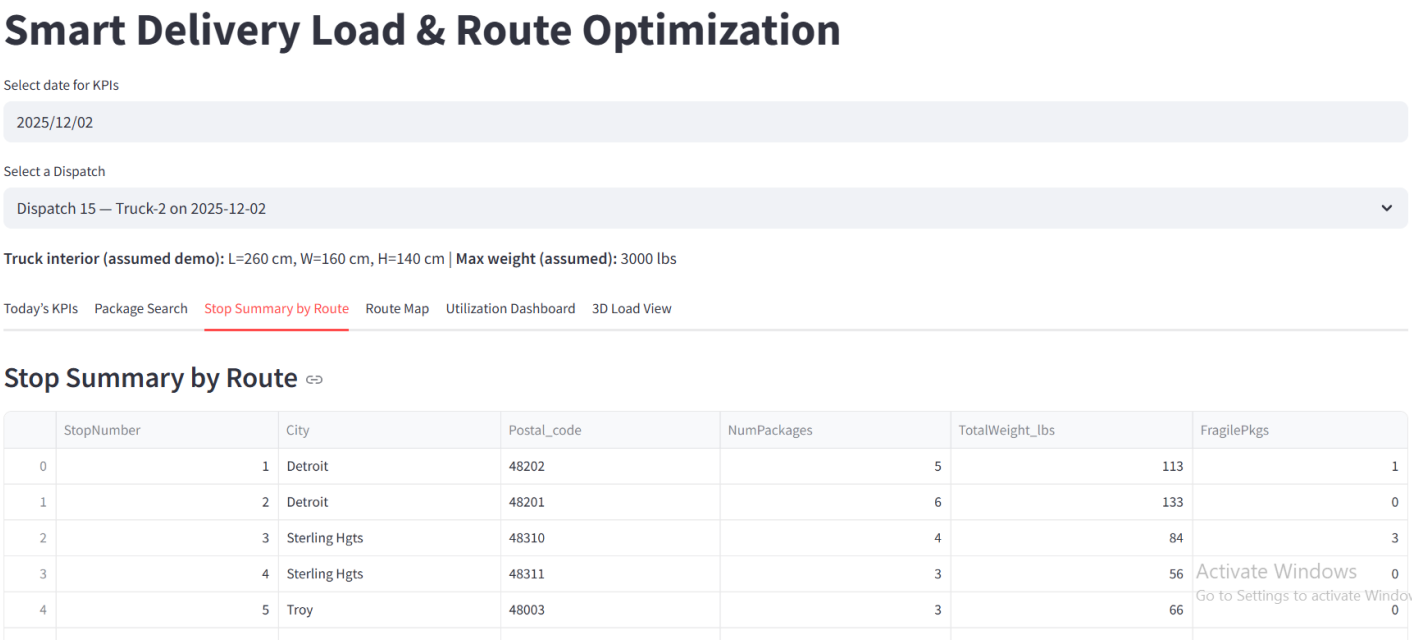
This screen allows users to search for individual packages using package ID, city, or postal code.

Key information visible:

- Package identifier
- Destination city and postal code
- Package weight and fragility
- Current package status (e.g., at warehouse, assigned, loaded, delivered)

Why it matters:
This feature provides full package lifecycle visibility. Managers and warehouse staff can immediately determine where a package is and what stage of the delivery process it is in, reducing confusion and investigation time.

Dispatch-Level Summary & KPIs



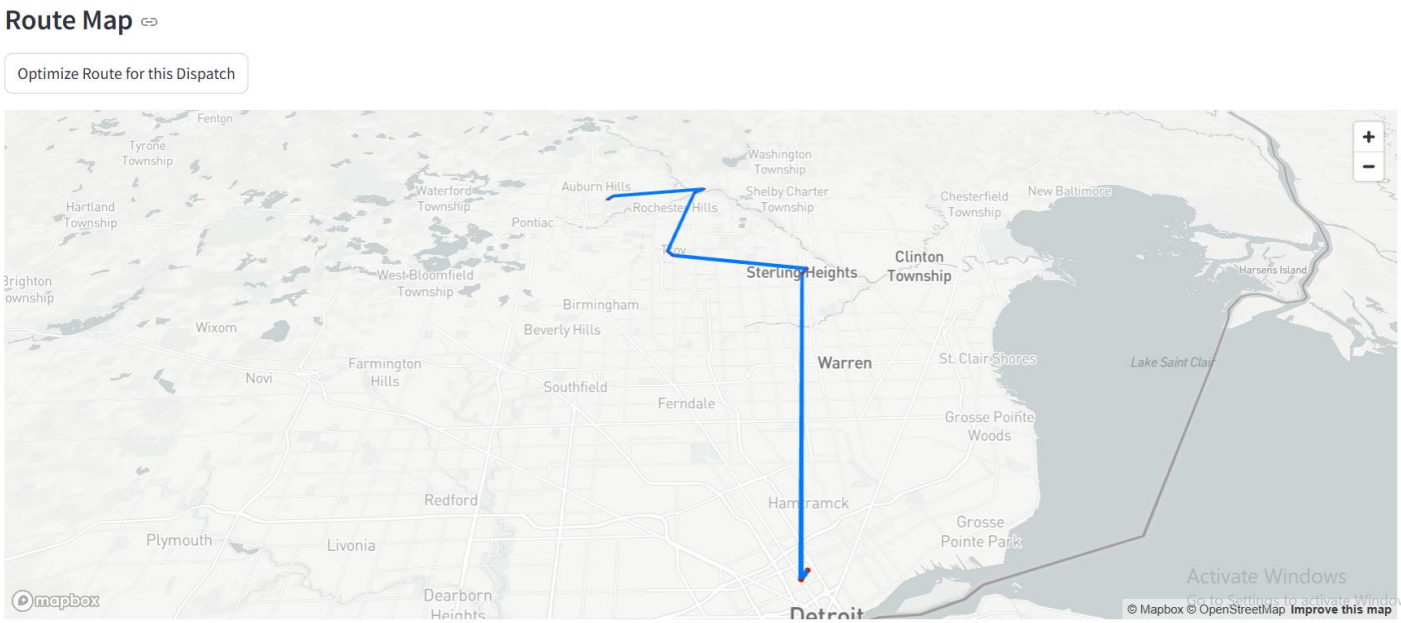
This view summarizes key metrics for a selected dispatch.

Key information visible:

- Number of stops
- Total packages
- Total weight
- Fragile package count
- Truck utilization metrics

Why it matters:
This summary allows managers to evaluate dispatch performance quickly and compare efficiency across different delivery runs.

Route Map Visualization



This map displays the delivery route for a selected dispatch using geographic coordinates.

Key information visible:

- Delivery stop locations plotted as points
- Lines connecting stops in delivery sequence order
- Visual representation of the planned route

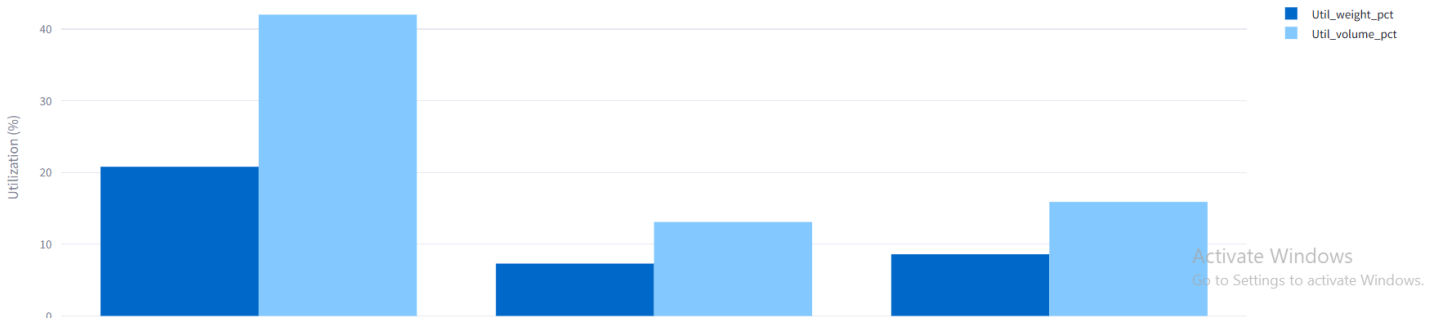
Why it matters:
The route map makes delivery sequencing transparent. Instead of relying on tables or stop numbers, users can visually understand how a truck will travel and why certain stops are visited in a specific order.

Truck Utilization Dashboard

Utilization Dashboard

Latest load plan utilization per dispatch for this date.

	Loadplan_id	Dispatch_id	DispatchLabel	Util_weight_pct	Util_volume_pct
0	27	10	Dispatch 10 (2025-12-02)	20.8	42
1	28	11	Dispatch 11 (2025-12-02)	7.3	13.1
2	26	15	Dispatch 15 (2025-12-02)	8.6	15.9



This dashboard visualizes how efficiently each truck is being used for a selected dispatch.

Key information visible:

- Weight utilization percentage
- Volume utilization percentage
- Comparison across dispatches

Why it matters:
Truck utilization directly impacts fuel costs and delivery efficiency. This view helps managers identify underutilized or overloaded trucks and improve future planning decisions.

3D Truck Load Visualization and Fragile Package Identification

Deploy

Smart Delivery Load & Route Optimization

Select date for KPIs

2025/12/02

Select a Dispatch

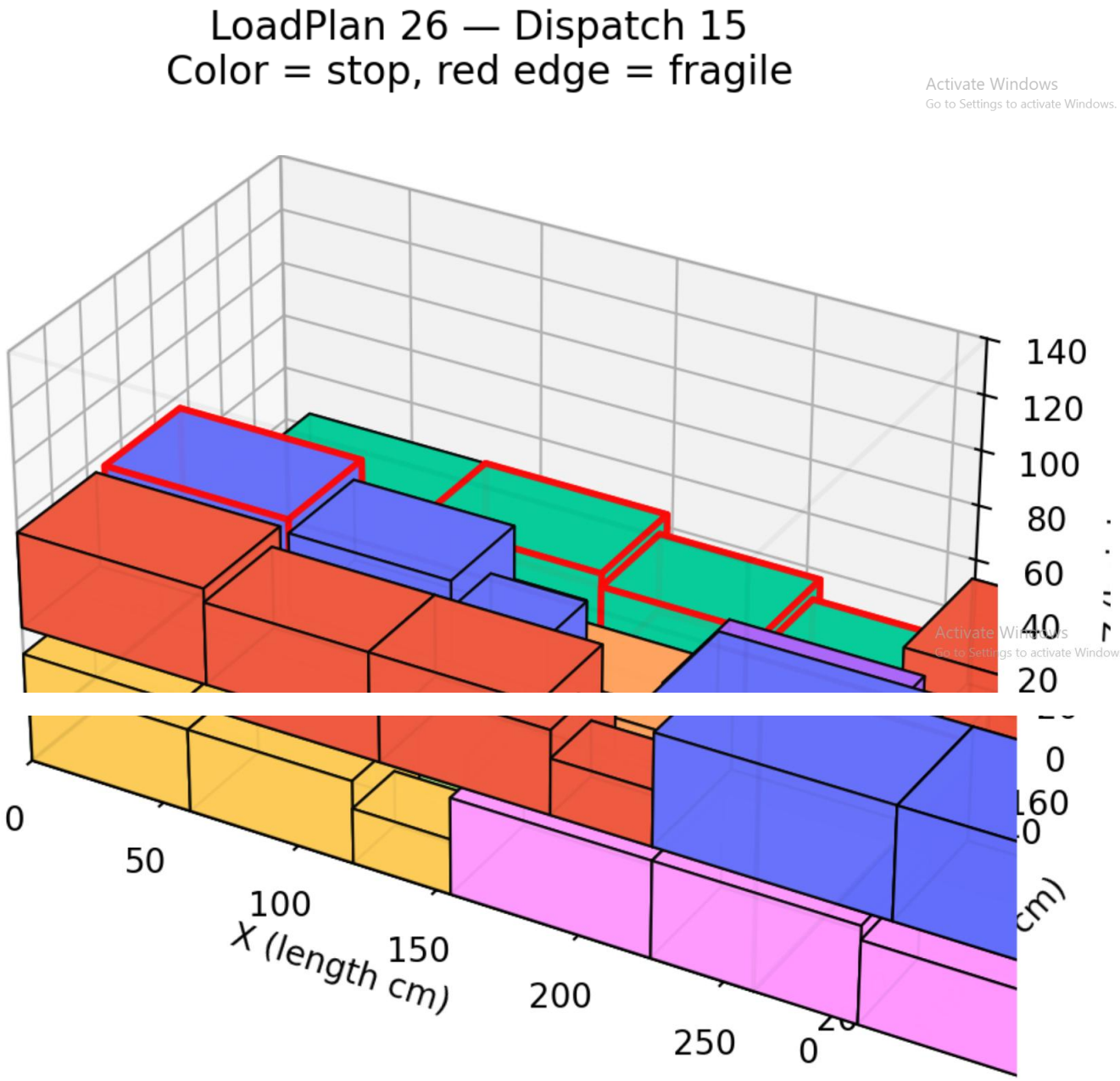
Dispatch 15 — Truck-2 on 2025-12-02

Truck interior (assumed demo): L=260 cm, W=160 cm, H=140 cm | **Max weight (assumed):** 3000 lbs

Today's KPIs | Package Search | Stop Summary by Route | Route Map | Utilization Dashboard | 3D Load View

3D Load View – Latest LoadPlan for Selected Dispatch

Generate Load Plan for this Dispatch



This screen displays a three-dimensional view of the truck interior with packages loaded inside and highlighted fragile packages within the truck load.

Key information visible:

- Truck interior dimensions
- Package placement inside the truck
- Color-coded packages representing delivery stops
- Fragile packages visually highlighted
- Fragile flag
- Visual emphasis on fragile items
- Relative position of fragile packages within the truck

Why it matters:
This visualization helps planners and drivers understand how packages are physically arranged. It ensures that loading decisions are feasible, safe, and aligned with delivery execution needs.

Fragile items require special handling. By making them visually distinct, the system reduces the risk of damage and supports quality control in delivery operations.