Improving Out-of-Network Trailer Monitoring using Data Visualization with Microsoft Power BI

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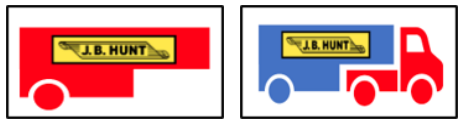
J.B. Hunt DCS

J.B. Hunt Transport Services is a Fortune 500 logistics provider headquartered in Lowell, Arkansas. One of its core divisions, Dedicated Contract Services (DCS), operates customer-specific fleets of trucks and trailers. DCS faces a costly and recurring issue known as trailer misuse—when dedicated trailers are mistakenly moved outside their assigned customer account networks. This misuse leads to billing inaccuracies, increased labor, and equipment losses that can reach $15,000 per unrecovered trailer. DCS account managers are most impacted as they are responsible for out-of-network trailer monitoring. The Home Depot, one of DCS's largest accounts, experiences the highest rate of trailer misuse within its 6,000-trailer fleet.

Identifying Trailer Misuse

J.B. Hunt is concerned about trailers staying out of network due to costs, billing issues, reduced visibility, and potential equipment loss. Trailers that remain out of network for extended periods can lead to operational delays and high recovery expenses. Account managers can dedicate up to 15 hours a week tracking down 2-3% of an account's fleet.



Using data provided by J.B. Hunt DCS, we created a Power BI dashboard using DAX to help monitor and respond to trailer misuse. The dashboard allows account managers to identify trailers currently out of network, view their last in-network location, and determine the associated offender based on tracking data. These features support faster investigations, improve trailer tracking visibility, and help reduce the overall impact of misuse across dedicated customer fleets.

Project Objective

Our objective is to help DCS account managers by improving their out-of-network (OON) trailer monitoring process through designing a new OON trailer monitoring system and evaluating its potential impact. This monitoring system is to be an all-in-one, user-friendly Microsoft Power BI dashboard providing the following primary capabilities:

Function	Purpose
List current OON trailers	Real-time misuse cases, can filter by longest time OON
Show last in-network location	Determine misuse offender, account manager may contact
Display trailer ping history	See a trailer's movement over time in a table and on a map
Record misuse occurrences	Keep a historical record of high-volume offender locations

Using Stakeholder Feedback

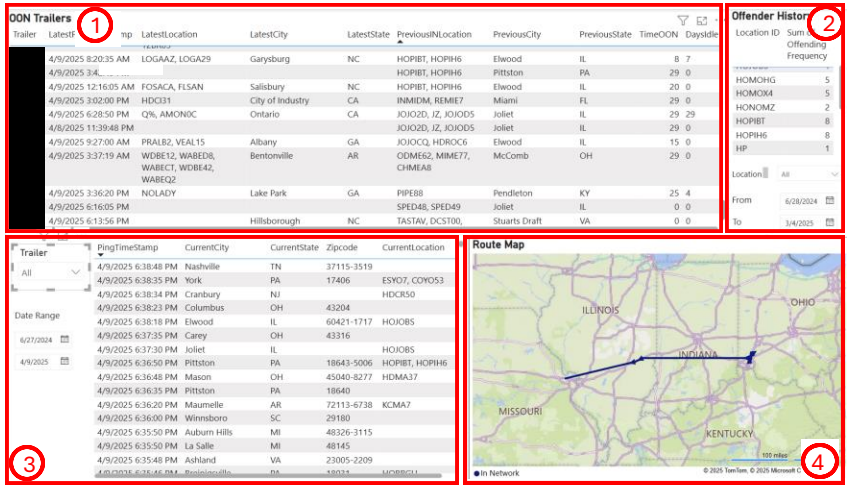
We sent our dashboard to our stakeholder to test with live DCS datasets and help us validate that it worked across different data sources. Based on their feedback, we added fields like PreviousCity and PreviousState to provide better context around the PreviousINLocation. They also emphasized the importance of interaction between dashboard segments - specifically, when an account manager selects a trailer from the OON Trailers list, the Trailer History and Route Map should automatically update to match that trailer. These updates made the dashboard more intuitive, accurate, and better aligned with account manager workflows.

Send Dashboard → Include other datasets to ensure validity

Feedback → Align map and table views
Add clarifying fields
- previousCity
- previousState

Apply Improvements → Update DAX logic, Dashboard layout, and cross section integration

OON Trailer Monitoring Dashboard



1 **OON Trailers** – Displays all trailers currently out of network. The 'PreviousINLocation' field identifies the last in-network location—defined by J.B. Hunt as the offender. The time-based metrics such as 'TimeOON,' tracks how long a trailer has been out of network, and 'DaysIdle,' which shows how long it has remained idle.

2 **Offender History** – Lists all location IDs overseen by the account manager along with the number of times each location was the last in-network point for a trailer. If a trailer leaves the network, then its last recorded DCS location is considered the offender.

3 **Trailer History** – Displays a table that populates when the account manager searches for a trailer or selects one from the 'OON Trailers' list. The table includes basic fields such as the timestamp, current city, state, ZIP code, and current location ID.

4 **Route Map** -Displays the trailer's route over a specific time span. The account manager can search for a trailer and specify a date range to view its physical locations based on GPS pings. The map uses color coding to distinguish between in-network (dark blue) and out-of-network (dark red) segments of the route.