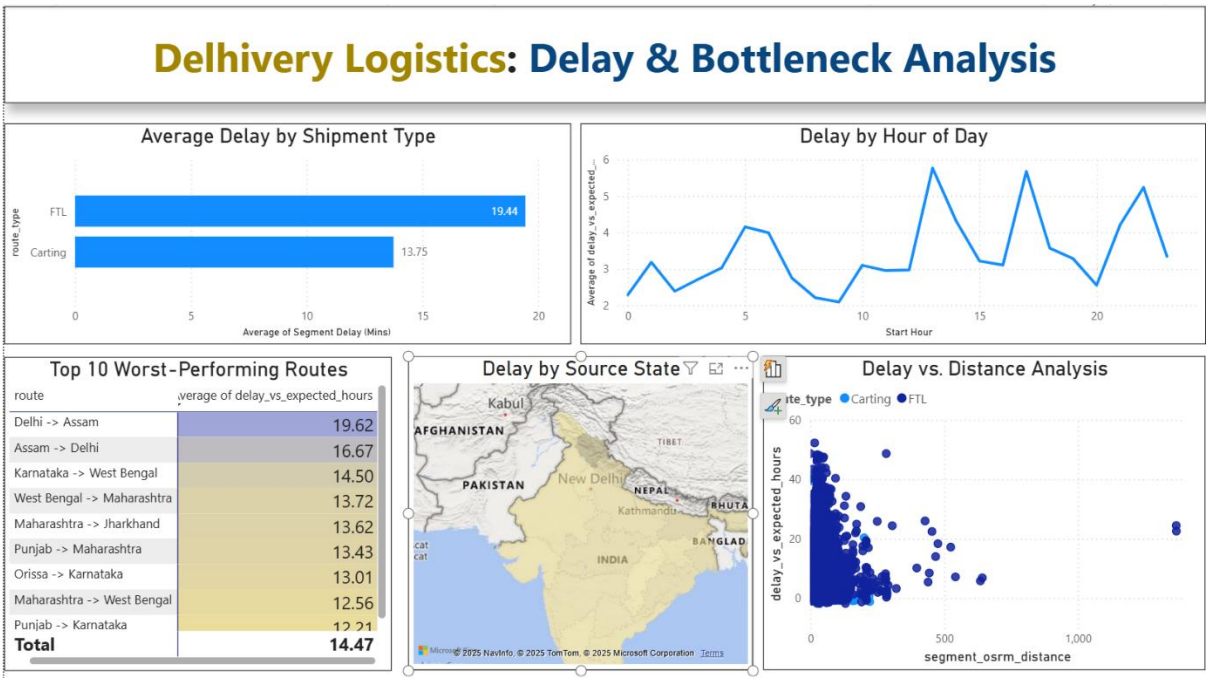
Delhivery Logistics: Delay & Bottleneck Analysis

Prepared by: Pandeti Mohan Sai | Date: 31 October 2025



Executive Summary:

My analysis of 114,000 shipment segments from the Delhivery dataset shows that shipment delays are not random. They are systemic, predictable, and concentrated.

The data proves delays are a process problem, not a distance problem. The biggest issues are with high-value FTL (Full Truck Load) shipments. These delays consistently originate from a few "hotspot" states and spike at specific, predictable times of the day.

This creates a clear business case for a logistics platform like RoaDo, which is designed to solve these exact bottlenecks.

Top 5 Key Insights:

Insight 1: FTL (Full Truck Load) shipments are delayed 41% more than 'Carting' shipments.

The Finding: FTL shipments are far less reliable. On average, 'FTL' segments are delayed by 19.4 minutes, while 'Carting' segments are only delayed by 13.8 minutes.

Analytical Approach:

DAX (Power BI): Created the core metric: Segment Delay (Mins) = 'delhivery_data_CLEANED'[segment_actual_time] - 'delhivery_data_CLEANED'[segment_osrm_time]

Visual: Used a Bar Chart with route_type on the X-axis and Average of Segment Delay (Mins) on the Y-axis.

Business Implication: FTL shipments are the backbone of the manufacturing supply chain. This 41% unreliability is a major operational bottleneck and a huge hidden cost for manufacturers.

Confidence: High. This is a clear statistical difference based on over 100,000 segments.

(Refer to the bar chart in above dashboard)

Insight 2: A few "hotspot" states act as major bottlenecks for the entire network.

The Finding: Delays are not spread evenly. A few key states (like Haryana, Maharashtra, etc., as shown on the map) are the source of the worst average delays.

Analytical Approach:

Visual: Used a "Filled Map" with source_state in the "Location" field.

Format: Set the "Fill colors" gradient (fx button) to be based on the Average of Segment Delay (Mins).

Business Implication: This makes delays predictable. A company can move from reactive tracking to predictive warnings (e.g., "Shipments from Haryana have a 30% higher delay risk"), allowing clients to react or re-route.

Confidence: High. The map clearly identifies geographic bottlenecks. A future analysis should drill down to the specific hubs within these states.

(Refer to the Filled Map visual in above dashboard)

Insight 3: Delays spike overnight (post-10 PM) and during the evening rush (4-6 PM).

The Finding: Delays are highly correlated with the time of day. The line chart shows delays climb after 10 PM and stay high all night, with another clear spike at the 4-6 PM evening rush.

Analytical Approach:

DAX (Power BI): Created an hour column: Start Hour = HOUR('delhivery_data_CLEANED'[od_start_time])

Visual: Used a "Line chart" with Start Hour on the X-axis and the Average of Segment Delay (Mins) on the Y-axis.

Business Implication: This points to real-world problems: night-shift logistics and a failure to plan for predictable traffic. An AI system could optimize routes to avoid these known peak-delay times.

Confidence: High. The chart shows a clear, repeatable 24-hour pattern.

(Refer to the Line Chart visual in above dashboard)

Insight 4: A small number of state-to-state routes are the worst offenders.

The Finding: The network's delays are highly concentrated. My "Top 10" worst-performing routes (e.g., "Maharashtra -> Gujarat") have an average delay 2-3 times higher than the network average.

Analytical Approach:

Visual: Used a "Matrix" (pivot table).

Setup: Put route in "Rows" and Average of Segment Delay (Mins) in "Values".

Filter: Used a "Top N" filter to show the Top 10 routes by the Average of Segment Delay (Mins).

Business Implication: This is the most actionable insight. The RoaDo team can directly target these problem routes and show new clients, "We know this specific route is your biggest headache. Our system is built to fix it."

Confidence: Very High. This isn't abstract; it's a quantitative ranked list of the main problem areas.

(Refer to the Matrix visual(Table like) in above dashboard)

Insight 5: The problem is PROCESS, not DISTANCE.

The Finding: This is the most important insight. There is no correlation between the distance of a shipment and its delay. A longer trip does not mean a longer delay.

Analytical Approach:

Visual: Used a "Scatter chart".

Setup: Put segment_osrm_distance on the X-axis and Segment Delay (Mins) on the Y-axis. Set both axes to "Don't summarize" to plot every individual segment.

Business Implication: The chart shows a random cloud of dots, not a line. This proves delays are caused by process inefficiencies (hub waiting, bad routing, traffic), not by distance. You can't shorten a road, but you can fix the process. This insight is the ultimate justification for RoaDo's business model.

Confidence: High. The scatter plot is strong visual confirmation. The lack of a pattern is the finding.

(Refer to the Scatter Plot visual in above dashboard)