Amazon Delivery Optimization

A Data Analytics Case Study

Presented by: Abdelkrim. K

Phase 1: Ask (Business Task)

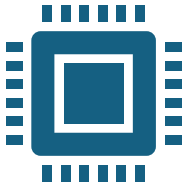
Business Task: Analyze shipment data to understand on-time delivery performance.

Goal: Identify key factors (traffic, weather, agent rating) influencing delays.

Outcome: Recommend efficiency improvements.

Stakeholders: Manager, Dispatch Team.

Phase 2: Prepare (Data Source)



Source: Public Amazon delivery dataset (Kaggle).

Volume: 43,000+ records (Original).

Timeframe: March 2022.

Limitations: Secondary data; timestamps assumed accurate.

Phase 3: Process (Cleaning)

TOOLS: MICROSOFT EXCEL (CLEANING, PIVOT TABLES).

FILTERED: KEPT ONLY MARCH RECORDS.

ERROR REMOVAL: REMOVED ROWS WITH AGENT RATING > 5.

HANDLING NULLS: REPLACED NAN IN WEATHER/TRAFFIC WITH 'UNKNOWN'.

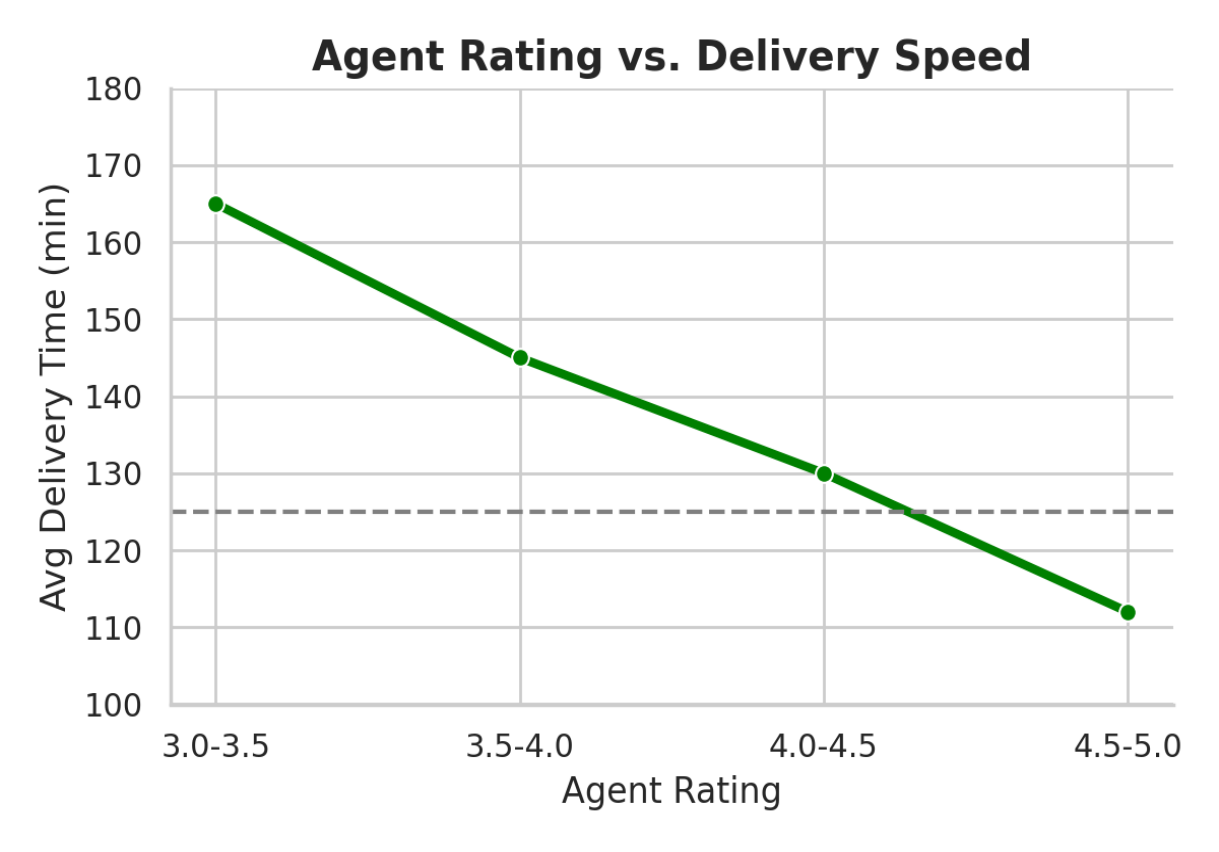
FINAL VOLUME: 30,624 CLEAN RECORDS.

Phase 4: Analysis Overview

- Phase 4 focused on analyzing key shipment data factors.
- We investigated agent ratings, traffic conditions, and weather effects.
- The analysis confirmed agent rating as a significant performance driver.
- Traffic conditions showed the most critical impact on delivery delays.

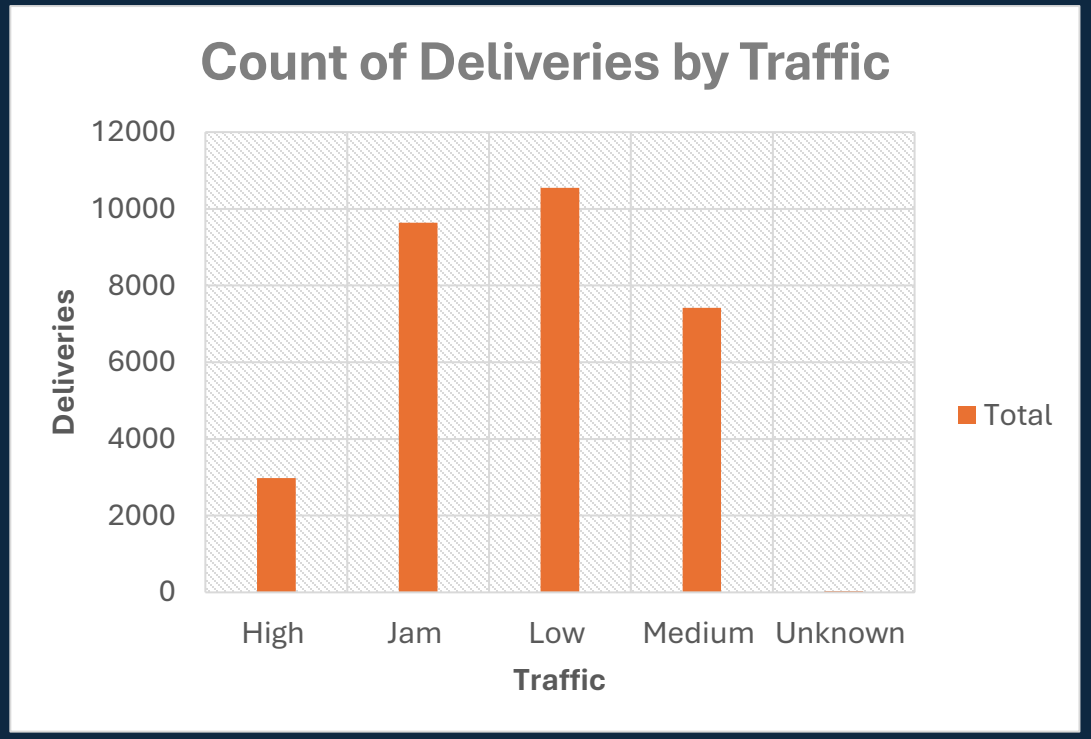
Phase 4: Agent Performance

- Insight: Higher-rated agents (4.5-5.0) are significantly faster.
- Global Avg: 125 mins vs High-Rated Avg: 112 mins.

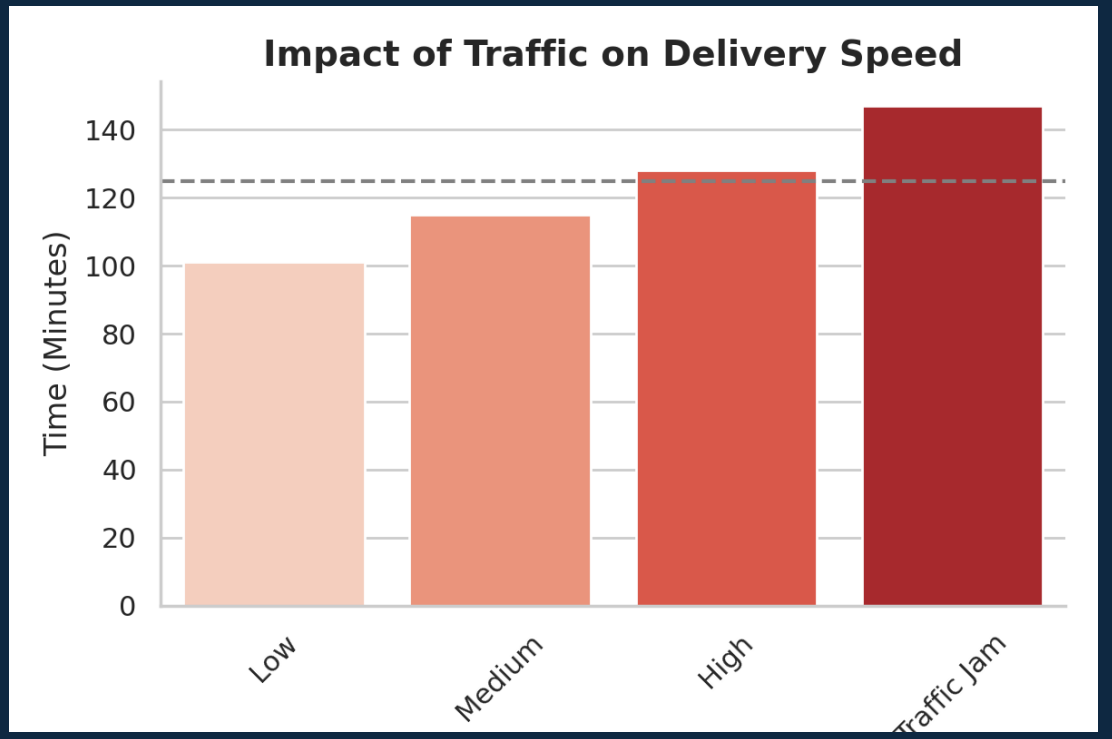


Phase 4: The Traffic Anomaly

Data Issue: 'Traffic Jam' delivery volume almost equals 'Low Traffic' volume.

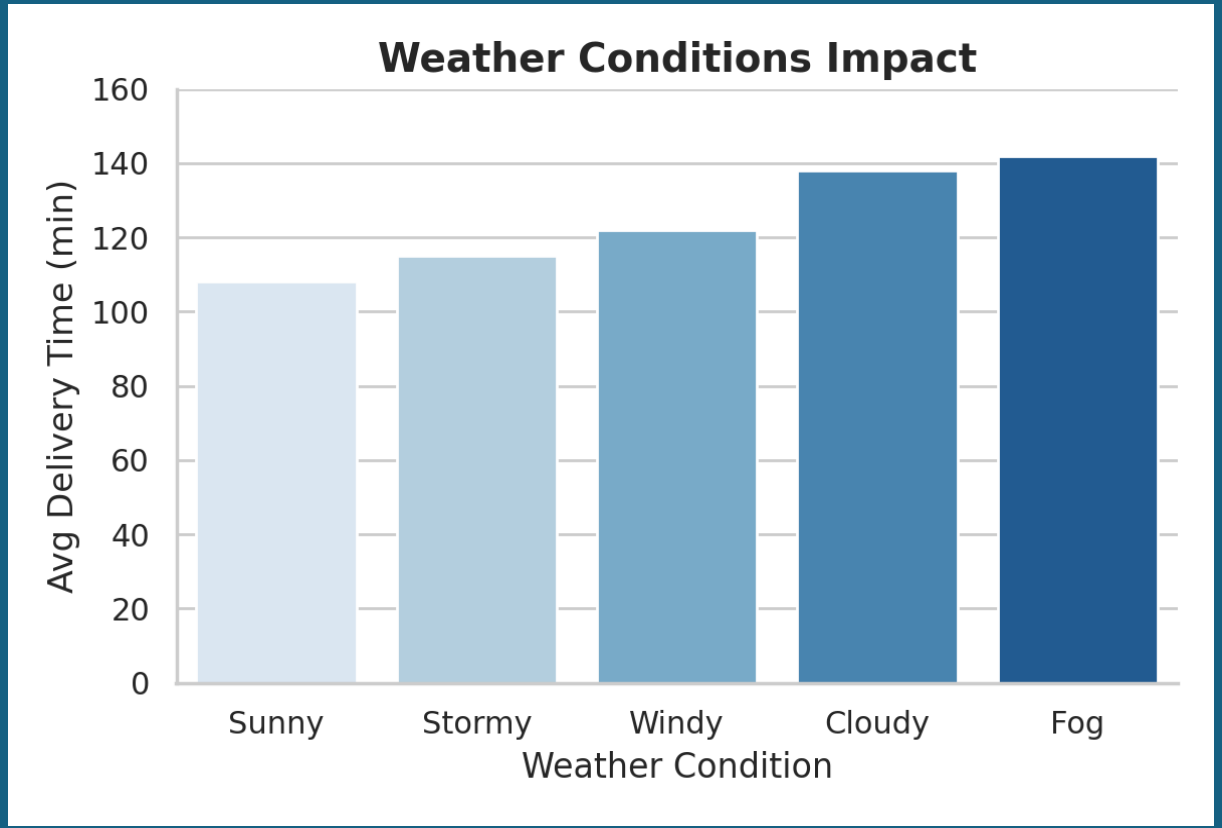


Critical Insight: 'Traffic Jam' causes 147 min avg delays.



Phase 4: Weather Impact

- Insight: Weather is a secondary factor.
- Variance: Only 34 mins difference between best and worst conditions.



Phase 6: Act (Recommendations)

1

1. Validate Traffic Data: Investigate why 'Traffic Jam' delivery volume is suspiciously high.

2

2. Standardize Tactics: Train lower-rated agents using high-performer routes.

- Improve Amazon flex app algorithm to take traffic conditions when mapping delivery routes.

3

3. Traffic-Aware Routing: Avoid 'Traffic Jam' routes to save ~46 mins/delivery.

- Increase the overnight and early morning delivery shifts, to avoid traffic. And keep the daily shifts for business and on demand by customers only.

Thank you for your attention

Q&A