Diminos Delivery Performance Analysis Report

1. Executive Summary – Performance Metric

Diminos mandates that the 95th Percentile Delivery Time must be under 31 minutes.

- **95th Percentile Delivery Time: 27.26 minutes**
- **Compliance Status: PASSING**

Kanav’s store is currently meeting Diminos' performance standards.

However, deeper analysis reveals hidden risks and revenue leakage that require immediate attention.

2. Key Findings and Performance Breakdown

Overall Delivery Metrics

Metric	Value
Total Orders Analyzed	15,000
Average Delivery Time	20.5 minutes
Median Delivery Time	15.8 minutes
Orders Delivered After 31 mins (Free Pizzas)	3.71% (557 orders)
Extreme Delays (> 60 mins)	1.1% (170 orders)

High-Risk Periods (Critical Alerts)

While the overall performance is compliant, the 95th percentile threshold is exceeded during specific hours.

A slight dip during these windows could put the franchise at risk.

Hour	95th Percentile Delivery Time	Risk Level
11:00 AM	33.41 mins	Worst Performance
4:00 PM (16:00)	32.44 mins	High Risk
1:00 AM	32.10 mins	High Risk

Day-wise Performance Insights

- **Mondays: 95th Percentile ≈ 28.7 mins**
- **Tuesdays: 95th Percentile ≈ 29.4 mins**

These are the slowest-performing days of the week compared to others.

3. Actionable Insights and Recommendations

1. Optimize Staffing for Problem Hours

- **Delays at 11 AM and 4 PM align with lunch/dinner rush and shift changeovers.**
- **Recommendation:**
  Ensure delivery riders are on-duty at least 15 minutes earlier.
- **1 AM delays suggest late-night staff shortages.**

2. Reduce “Free Pizza” Revenue Leakage

- **3.71% of all orders are free pizzas, resulting in significant revenue loss.**
- **Recommendation:**
  Implement a Priority Dispatch system once an order crosses 20 minutes.

3. Investigate Extreme Outliers

- **170 orders exceeded 60 minutes**
- **Some deliveries show extreme values (7000+ minutes), indicating forgotten orders or incorrect status updates.**
- **Recommendation:**
  Implement a real-time Order Aging alert at 25 minutes to notify managers.

4. Data Integrity Improvements

- **Unrealistic maximum delivery times skew performance metrics.**
- **Recommendation:**
  Train staff to accurately mark order delivery times in the system.

4. Univariate Analysis (Individual Variable Study)

Focus:

Analyzing the volume of business and the general distribution of individual variables.

Order Volume Distribution

Hourly Volume

- **The count plot reveals the business load across 24 hours.**
- **This identifies peak hours where order volume is highest, which is critical for preparing kitchen capacity and delivery staffing.**

Daily Volume

- **Order counts per day show a relatively even distribution across the week.**
- **This suggests steady demand, rather than demand being concentrated on specific days.**

Delivery Time Spread

- **The histogram of delivery times shows that the majority of orders are completed within 15–20 minutes.**
- **This confirms that the core delivery operation is efficient.**
- **A small tail of late orders exists, which contributes disproportionately to SLA risk and revenue loss.**

5. Bivariate Analysis (Relationship Study)

Focus:

Understanding how delivery performance changes based on time and day.

Performance Trends by Hour

- **The line plot compares Mean Delivery Time and 95th Percentile Delivery Time across hours.**
- **The mean delivery time remains stable and within safe limits.**
- **The 95th percentile fluctuates significantly, crossing the 31-minute SLA at specific hours.**

Critical Insight

- **SLA breaches are time-dependent, not random.**
- **Spikes at 1 AM, 11 AM, and 4 PM confirm that operational strain during these hours drives failures.**

Delivery Consistency by Day

- **Violin plots show the density of delivery times for each day of the week.**
- **Most days have a thick concentration below 20 minutes, confirming consistent performance.**
- **Mondays and Tuesdays show longer upper tails, indicating more orders approaching the SLA limit.**
- **This suggests staffing gaps or consistent traffic challenges on these days.**

Overall, the bivariate analysis confirms that when and on which day an order is placed significantly impacts delivery performance.

6. Diminos Delivery Recommendations

Kanav's store is currently compliant with Diminos standards, but the Violin and KDE plots indicate that operations are fragile during specific time windows. Performance is stable on average, yet highly sensitive to staffing and transition inefficiencies.

Strategic Staffing for Spike Hours (11 AM, 4 PM, 1 AM)

The 95th percentile delivery time exceeds the 31-minute SLA specifically during these transition periods.

Overlap Shifts

- **Ensure the Afternoon Shift starts at least 30 minutes before the Morning Shift ends.**
- **This overlap prevents order backlogs during the 4 PM shift handoff, when rider availability temporarily drops.**

Incentivize Late Night Performance

- **Data shows elevated delays around 1 AM, despite comparatively lower order volumes.**
- **Introduce a late-night speed incentive for the 1 AM crew to improve focus and accountability during low-supervision hours.**

Fix the Monday–Tuesday Operational Slump

Performance on Mondays and Tuesdays is more volatile and less predictable than other days.

- **Investigate whether the most experienced riders (the informal "A-Team") are disproportionately taking these days off.**
- **Lack of senior oversight during these days can disrupt dispatch efficiency.**

Recommendation

- **Rotate experienced riders so that each day has at least one Lead Rider responsible for:**
  - **Monitoring dispatch flow**
  - **Resolving rider bottlenecks**
  - **Preventing cascading delays**

Revenue Leakage Control (The 3.71% Free Pizzas)

A total of 3.71% of orders exceed the 31-minute threshold, directly impacting revenue.

20-Minute Alert System

- **Implement a Kitchen-to-Rider alert once an order reaches 20 minutes.**
- **Any order crossing this mark should be labeled Priority Zero, meaning:**

- The next available rider takes only that order
- No bundled or double-delivery routes are allowed

This intervention targets delays before they become SLA violations.

Data Integrity Training and Controls

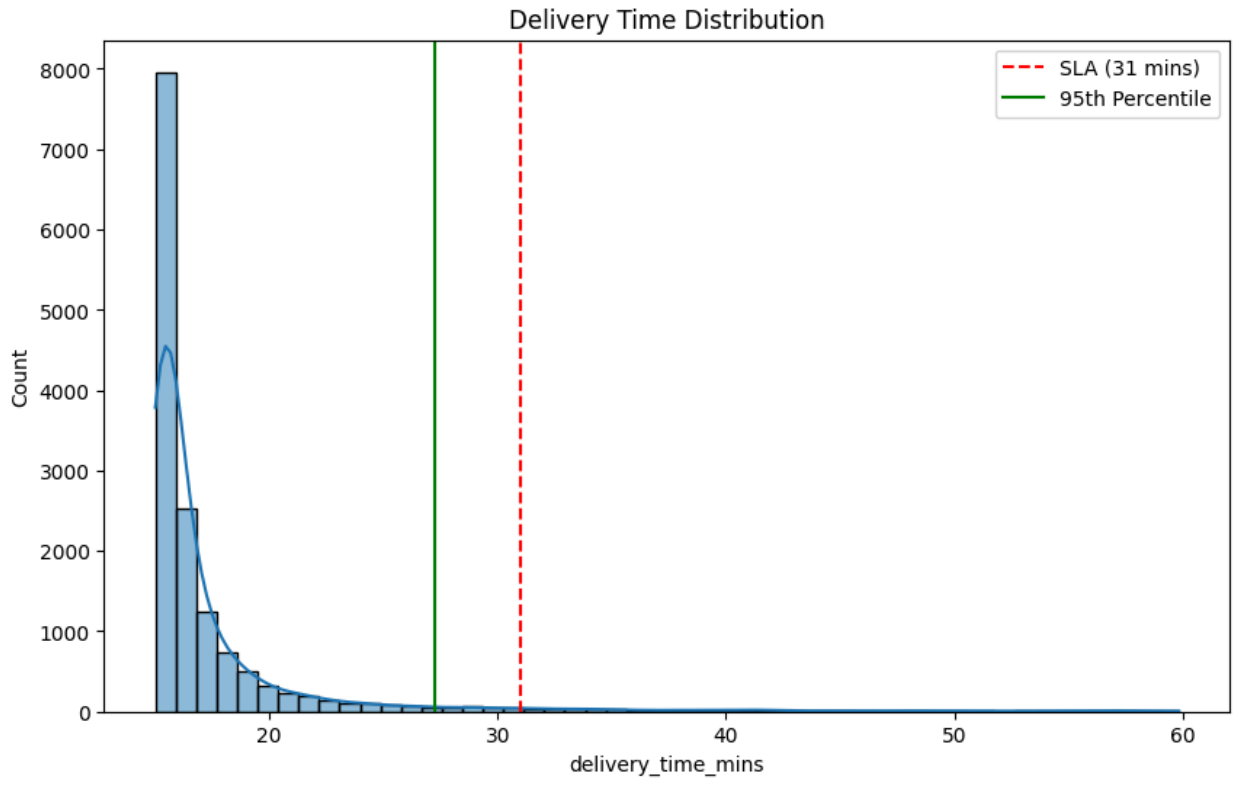
Maximum delivery times exceeding 7000 minutes indicate orders are not being properly closed in the system.

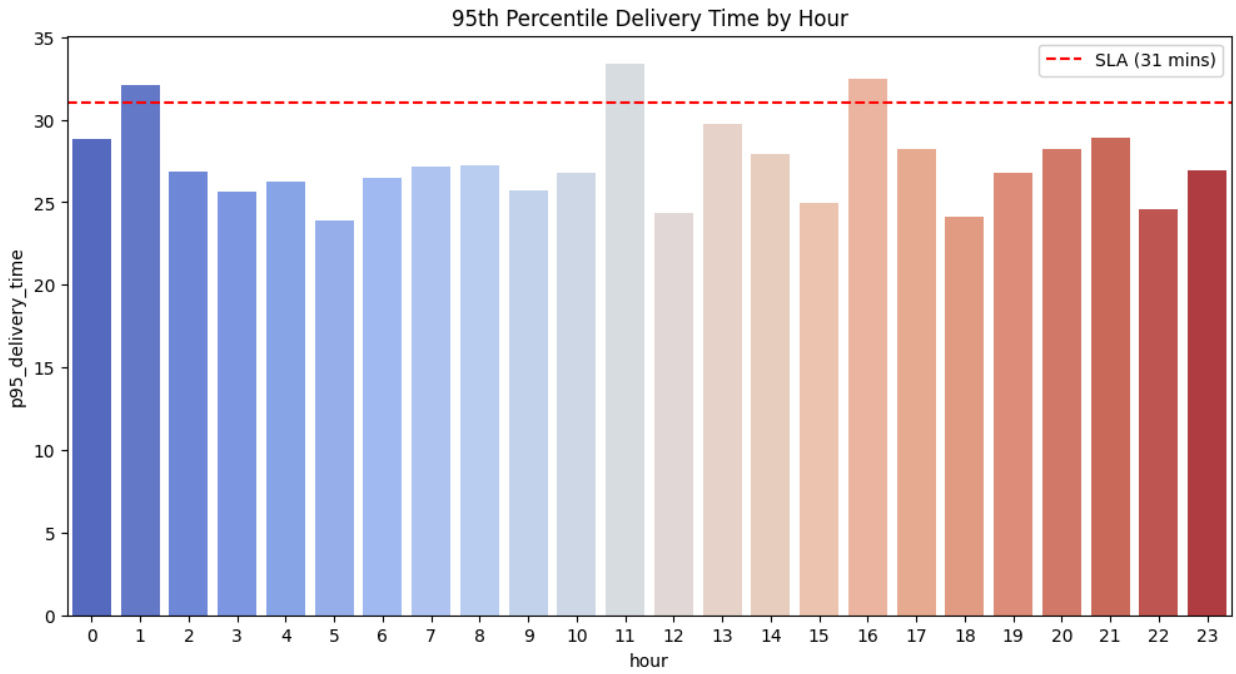
Recommendation

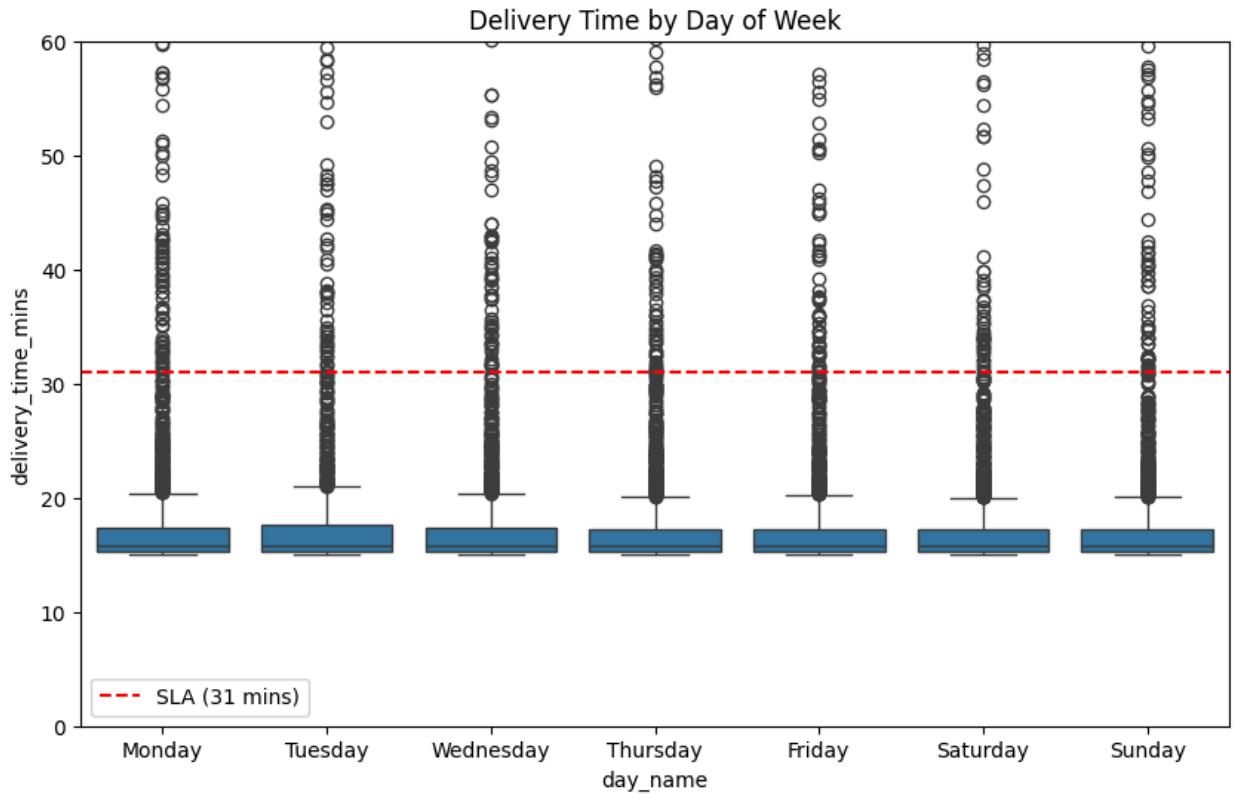
- **Introduce an automated Order Aging Report at the end of every shift.**
- **Any order open for more than 60 minutes must be:**
  - **Reviewed by the shift manager**
  - **Signed off with a documented reason (delay, cancellation, system error)**

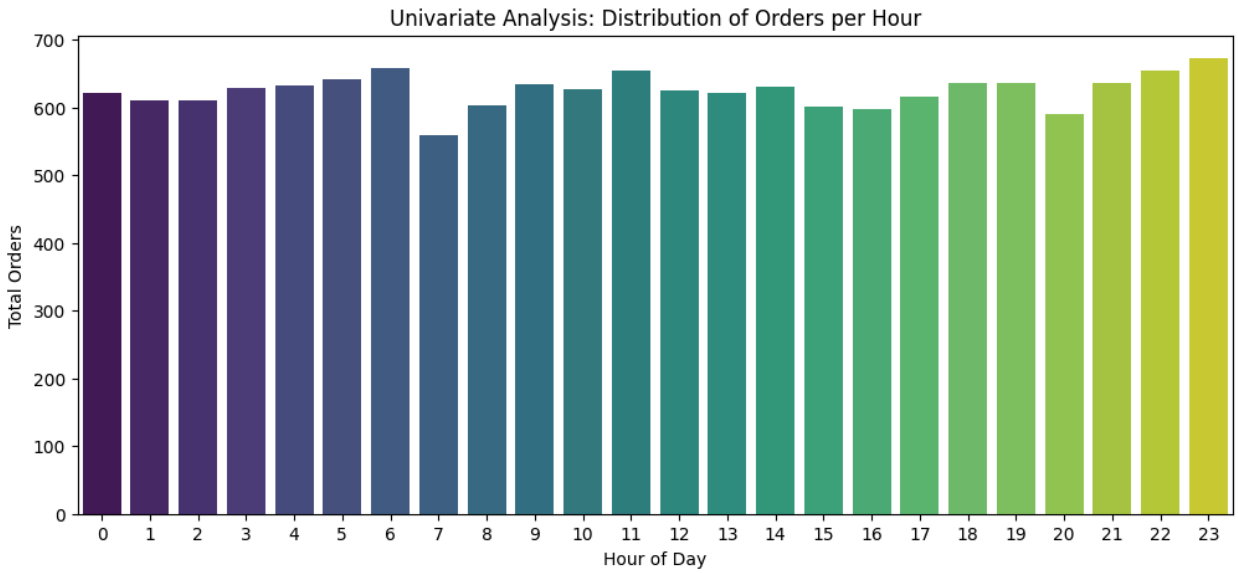
This ensures accurate metrics and prevents distortion of performance analytics.

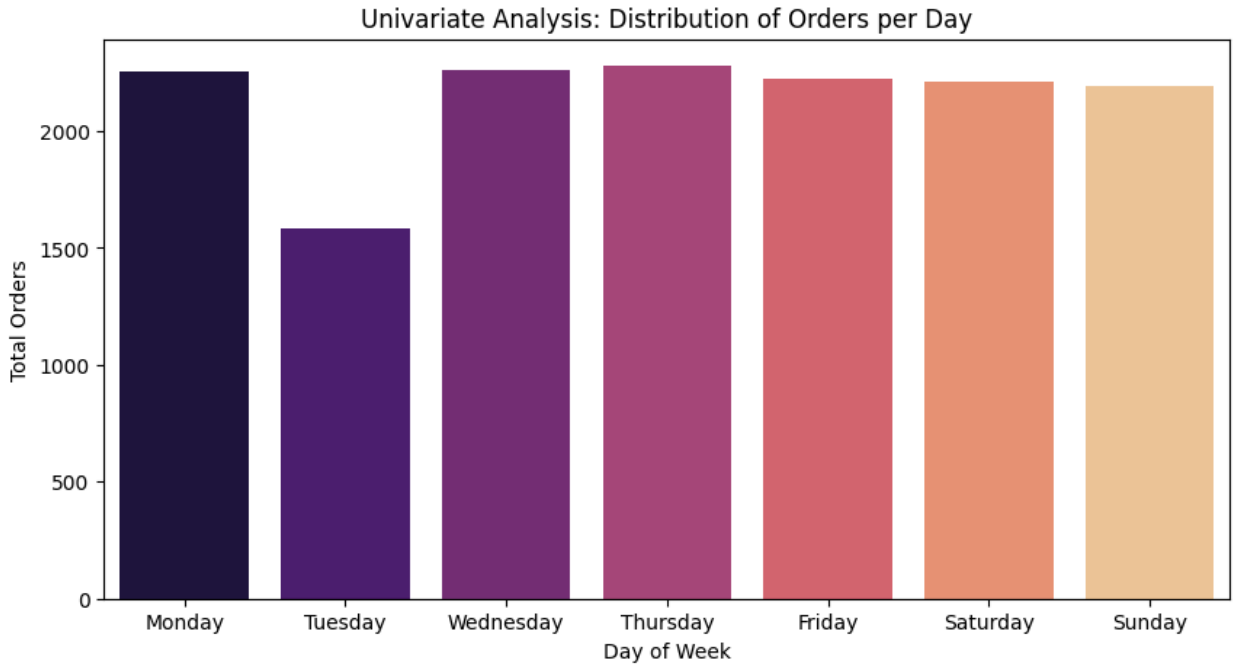
Overall, these recommendations shift Kanav's operation from SLA-compliant to SLA-resilient, reducing risk, controlling losses, and improving operational stability during peak stress windows.

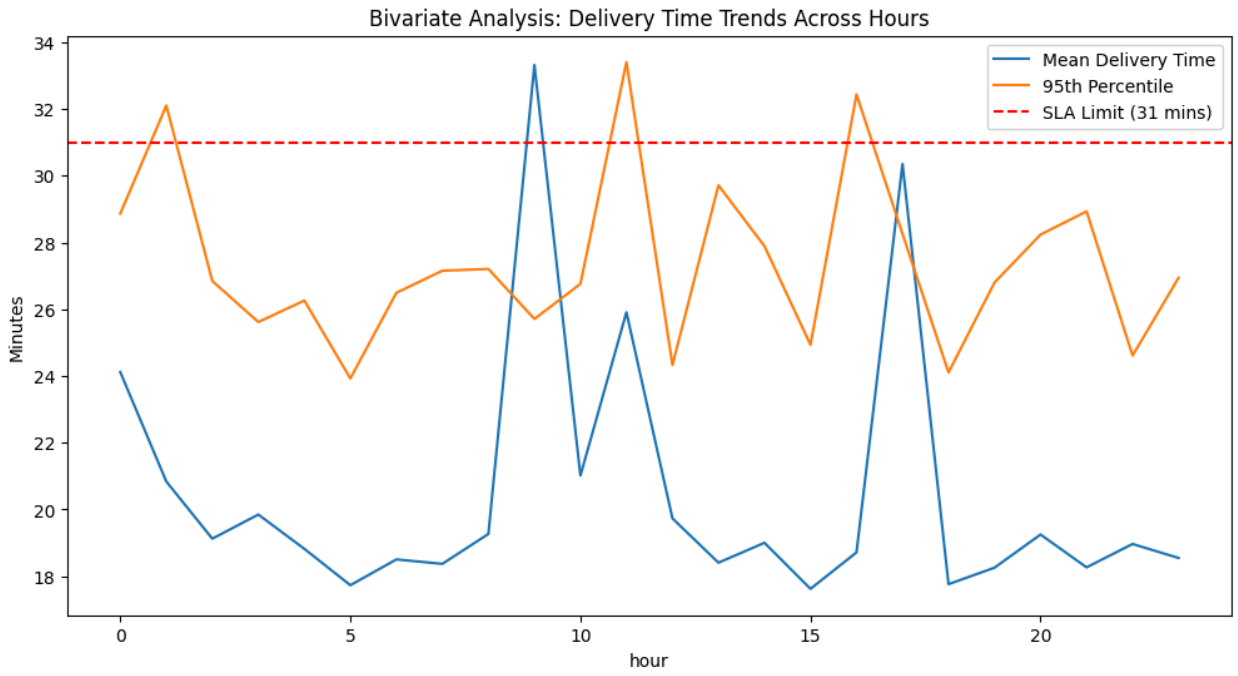


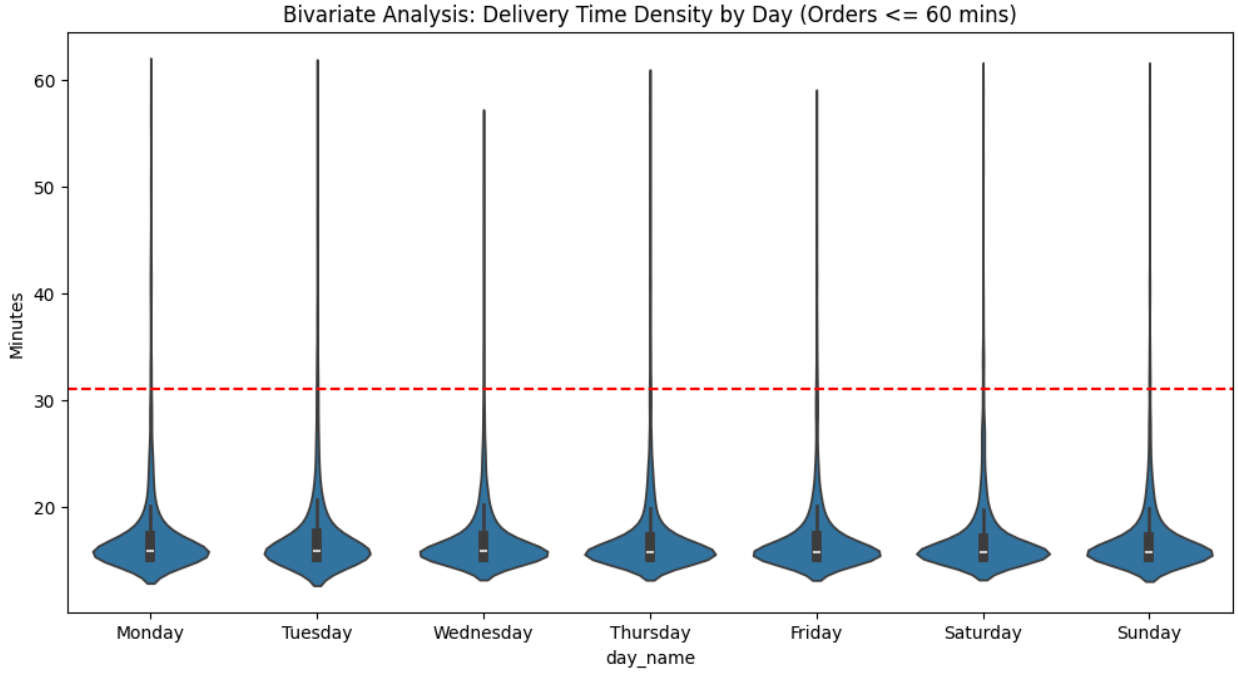

95th Percentile Delivery Time by Hour
SLA (31 mins)
p95_delivery_time
hour
0
5
10
15
20
25
30
35
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Delivery Time by Day of Week
delivery_time_mins
SLA (31 mins)
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
day_name
0
10
20
30
40
50
60


Univariate Analysis: Distribution of Orders per Hour
Total Orders
Hour of Day
0
100
200
300
400
500
600
700
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Univariate Analysis: Distribution of Orders per Day
Total Orders
Day of Week
0
500
1000
1500
2000
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday


Bivariate Analysis: Delivery Time Trends Across Hours
Mean Delivery Time
95th Percentile
SLA Limit (31 mins)
Minutes
hour
34
32
30
28
26
24
22
20
18
0
5
10
15
20


Bivariate Analysis: Delivery Time Density by Day (Orders <= 60 mins)
Minutes
day_name
60
50
40
30
20
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday