

PROJECT 4-

UBER SUPPLY DEMAND GAP

~ SUBMITTED BY
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OBJECTIVE 1

TO COMPARE CANCELLATION RATES BETWEEN AIRPORT AND CITY PICKUPS → THIS OBJECTIVE AIMS TO IDENTIFY WHETHER ONE PICKUP LOCATION (AIRPORT VS. CITY) EXPERIENCES SIGNIFICANTLY HIGHER RIDE CANCELLATIONS, USING THE PICKUP POINT AND STATUS FIELDS IN THE DATASET.

In **Objective 1**, we examined trip outcomes by pickup location, focusing on differences between the City and the Airport. The data reveals that the **City experiences the majority of trip requests**, which is expected due to population density. However, this also correlates with a high volume of **cancellations and no-car availability**. A key finding is that **84% of all cancelled trips occur in the City**, with only **16% from the Airport**, indicating service unreliability in urban zones. Airport pickups show relatively better fulfillment, likely due to structured zones and predictability. Still, the Airport is not immune—no-car availability is a challenge there too, especially during peak arrival times. This suggests the need for dynamic fleet allocation and prioritization based on location-specific behavior.

OBJECTIVE 2

TO INVESTIGATE WHETHER SPIKES IN CANCELLATIONS OR LACK OF CAR AVAILABILITY CORRELATE WITH PUBLIC HOLIDAYS OR DRIVER STRIKES → THIS OBJECTIVE FOCUSES ON ANALYZING DAILY TRENDS IN RIDE STATUS (E.G., “CANCELLED”, “NO CARS AVAILABLE”) AND IDENTIFYING ANOMALIES THAT MAY ALIGN WITH KNOWN PUBLIC HOLIDAYS OR LABOR STRIKES, USING THE REQUEST TIMESTAMP AND STATUS.

In **Objective 2**, we explored how **trip outcomes vary based on the day type**: Normal, Holiday, and Disruption (e.g., strikes). Normal days recorded the **highest request volume**, which resulted in both the **highest number of completed trips** and **the most cancellations**. While this seems paradoxical, it reflects system stress under daily operational loads, where supply cannot always keep up with demand. On Holidays, completions dropped slightly, possibly due to fewer available drivers or reduced passenger demand. However, the most concerning trend appears on Disruption days. These days saw a sharp **increase in 'No Cars Available' status**, and **trip completion rates were significantly lower**, highlighting Uber’s vulnerability to uncontrollable external events. The data clearly indicates that disruption scenarios significantly degrade service performance, calling for contingency planning and better communication with users during such events.

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OBJECTIVE 3

TO ANALYZE THE VARIATION IN UBER SERVICE AVAILABILITY THROUGHOUT DIFFERENT HOURS OF THE DAY → THIS OBJECTIVE INVOLVES STUDYING HOW SERVICE STATUSES VARY BY TIME OF DAY (E.G., HOURLY DISTRIBUTION OF “TRIP COMPLETED”, “CANCELLED”, OR “NO CARS AVAILABLE”), USING EXTRACTED HOUR VALUES FROM THE REQUEST TIMESTAMP.

In **Objective 3**, we studied **hourly trends** in both trip completions and unavailability. Trip completions peaked during the **morning rush (7–10 AM)** and **evening peak (5–9 PM)**. This confirms that commuter behavior strongly drives Uber usage. However, the area chart showing “No Cars Available” also peaked **during these exact hours**, revealing a severe **supply-demand mismatch**. Even though these time slots have the highest potential for revenue generation, Uber’s inability to fulfill many requests during these hours may result in lost customers and missed income. Furthermore, low fulfillment in these hours—when customer expectation is highest—can negatively impact the platform’s reputation. Outside of peak hours, especially during late night and early morning (12 AM–5 AM), demand and unavailability both drop, presenting potential windows for driver rest cycles or fleet redistribution.