NYC Taxi Demand Analysis

Exploratory Data Analysis Report

Dataset Period: July 01, 2014 - January 31, 2015

Total Observations: 10,320

Frequency: 30-minute intervals

Key Statistics

Average trips per 30-min: 15,138
Maximum trips (30-min): 39,197
Minimum trips (30-min): 8
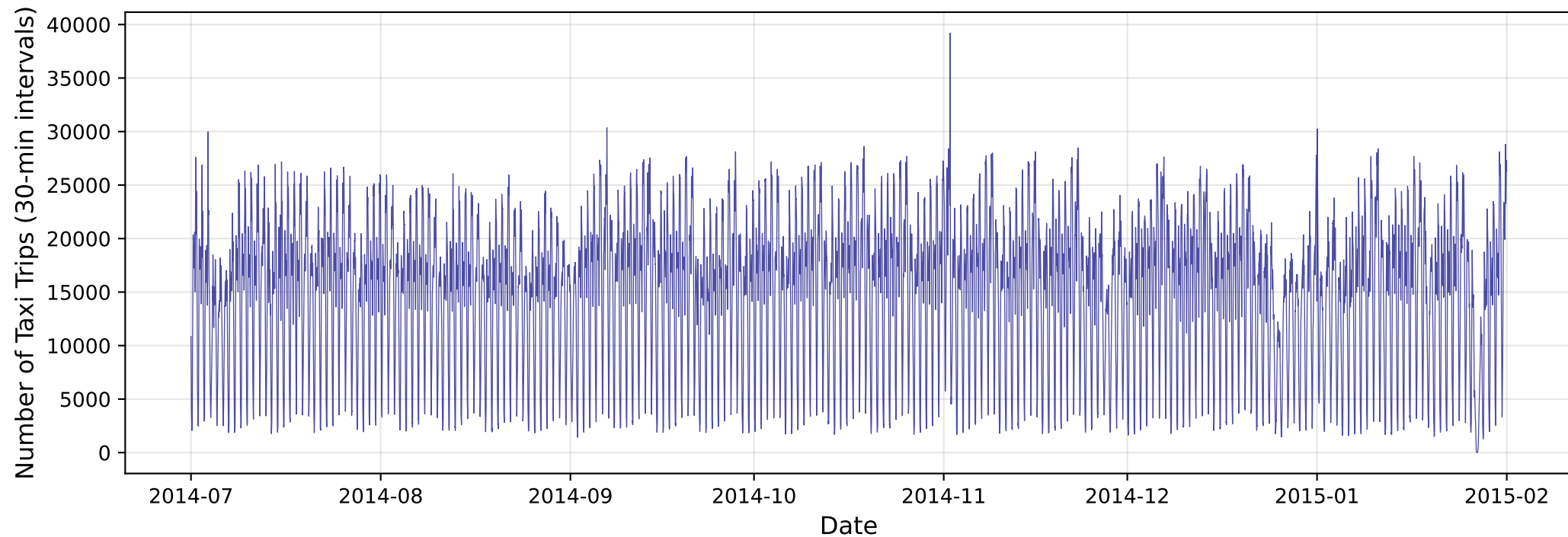Standard deviation: 6,939

Data Quality:
- Missing values: 0
- Duplicate timestamps: 0
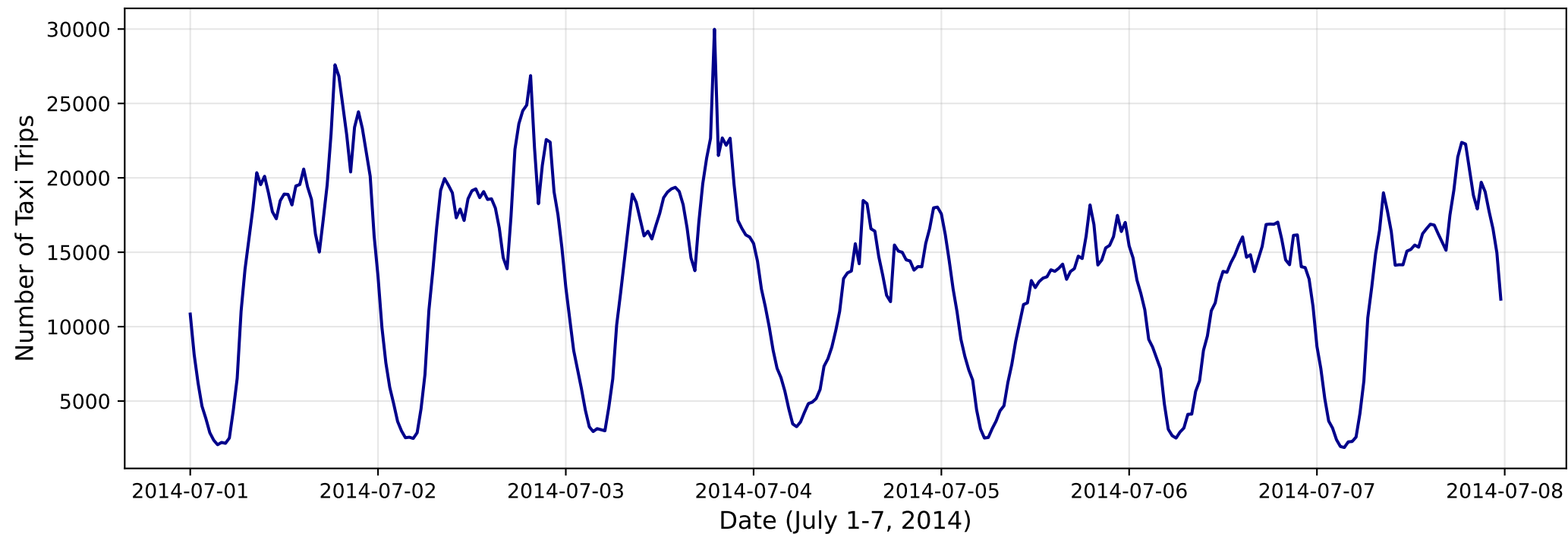- Negative values: 0

NYC Taxi Trips Over Time (Complete Dataset)

Number of Taxi Trips (30-min intervals)

Date

First Week Detail - Daily Patterns Visible
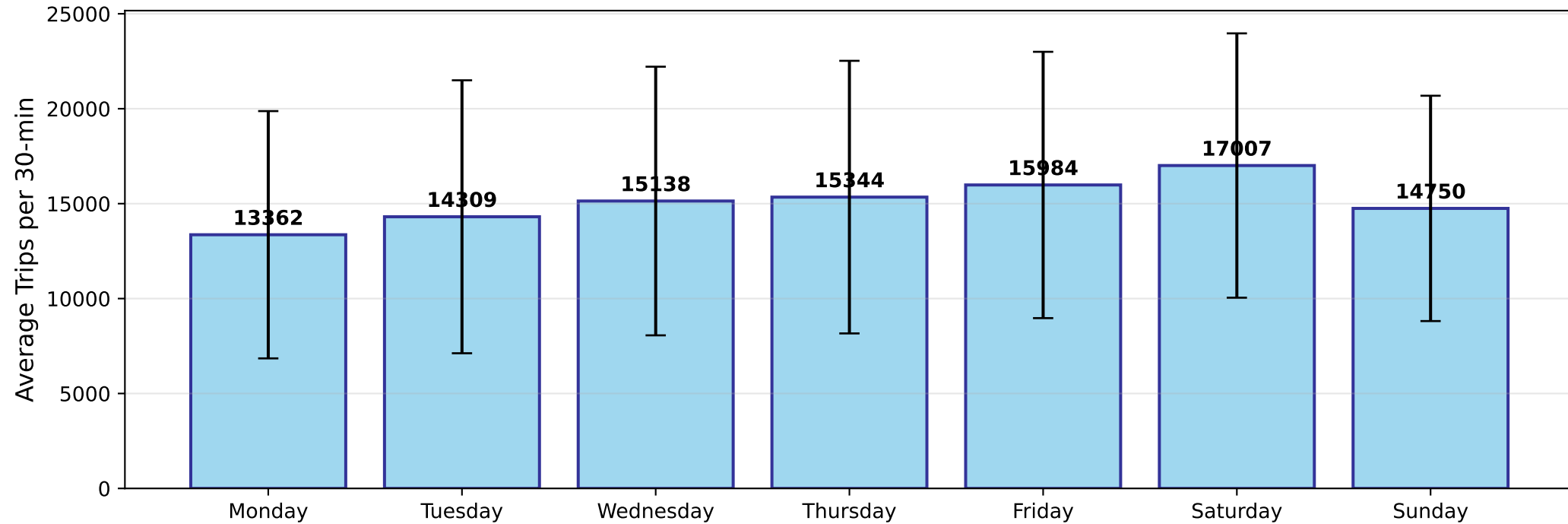
Number of Taxi Trips

Date (July 1-7, 2014)

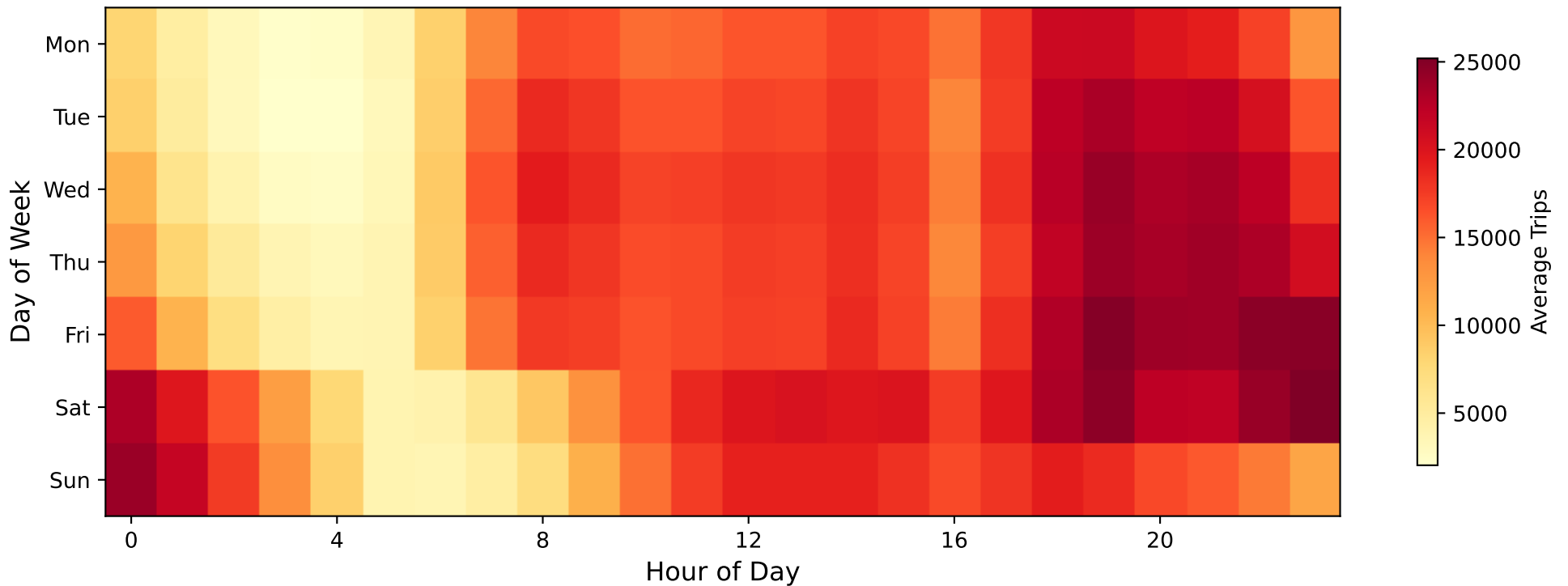**Average Taxi Trips by Hour of Day**
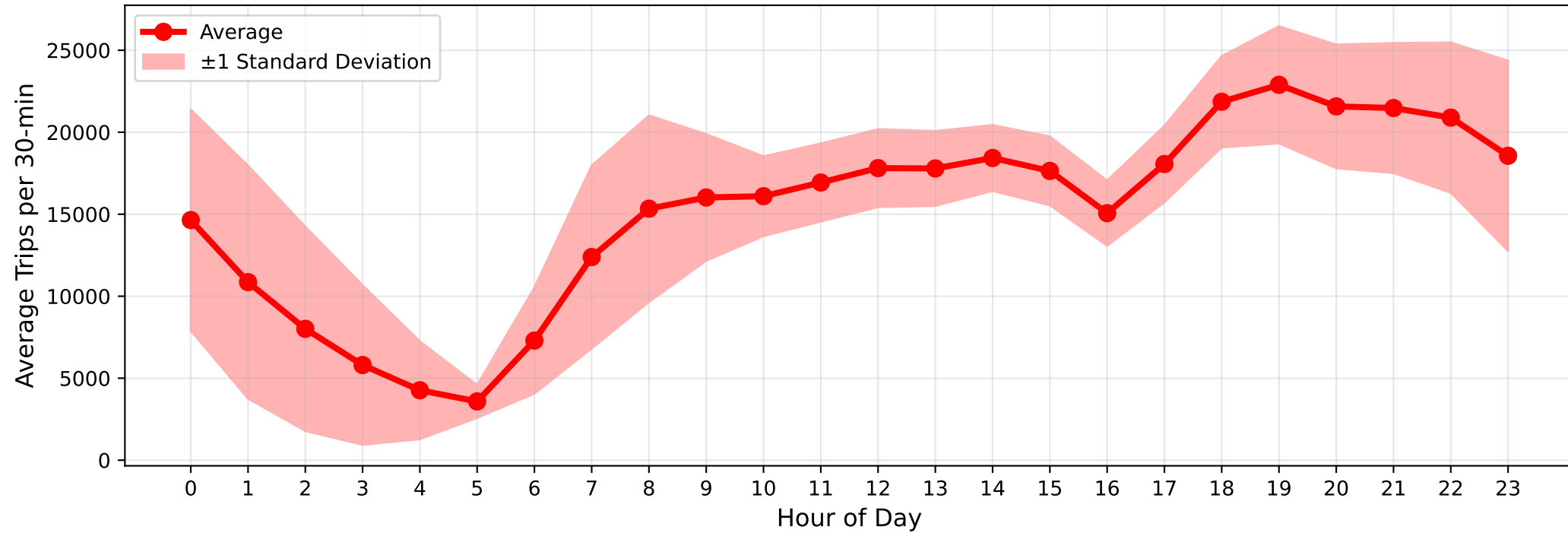
Distribution of Trips by Hour (Boxplot)
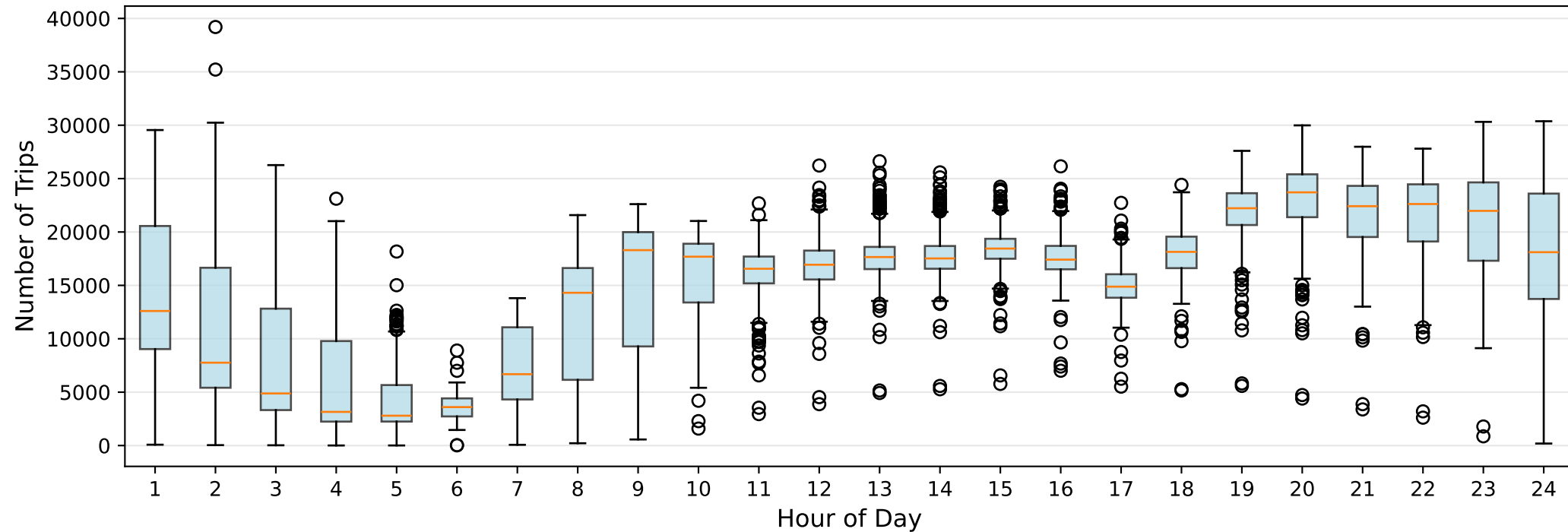
Average Taxi Trips by Day of Week

Demand Heatmap: Hour vs Day of Week

Monthly Trends
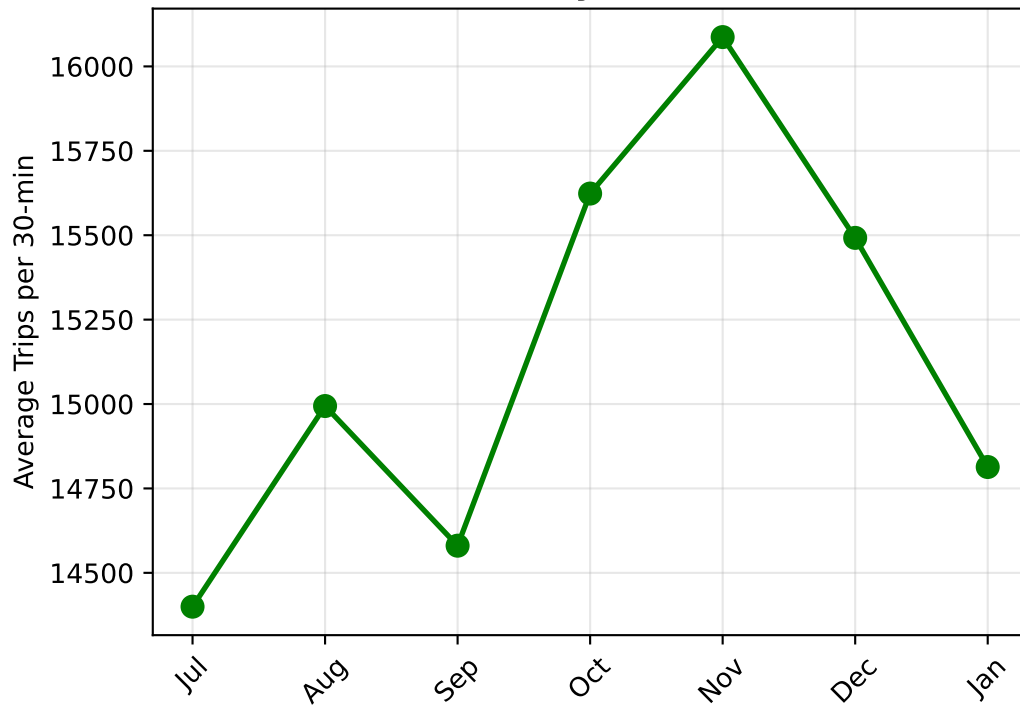
Trip Distribution

- Mean: 15138
- Median: 16778
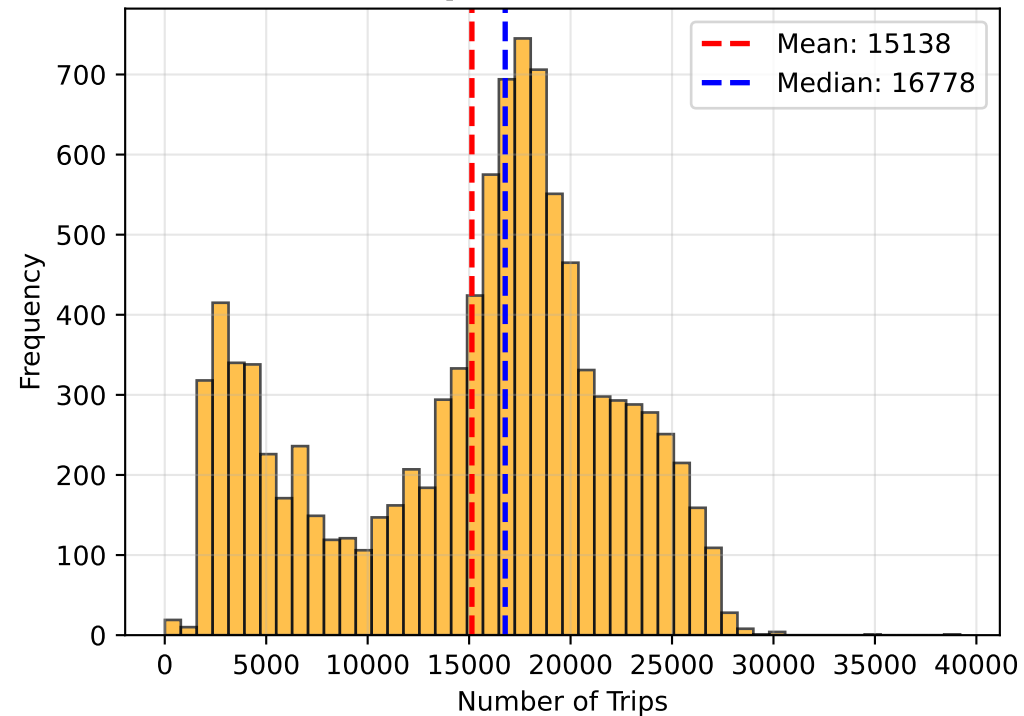
Top 10 Peak Periods
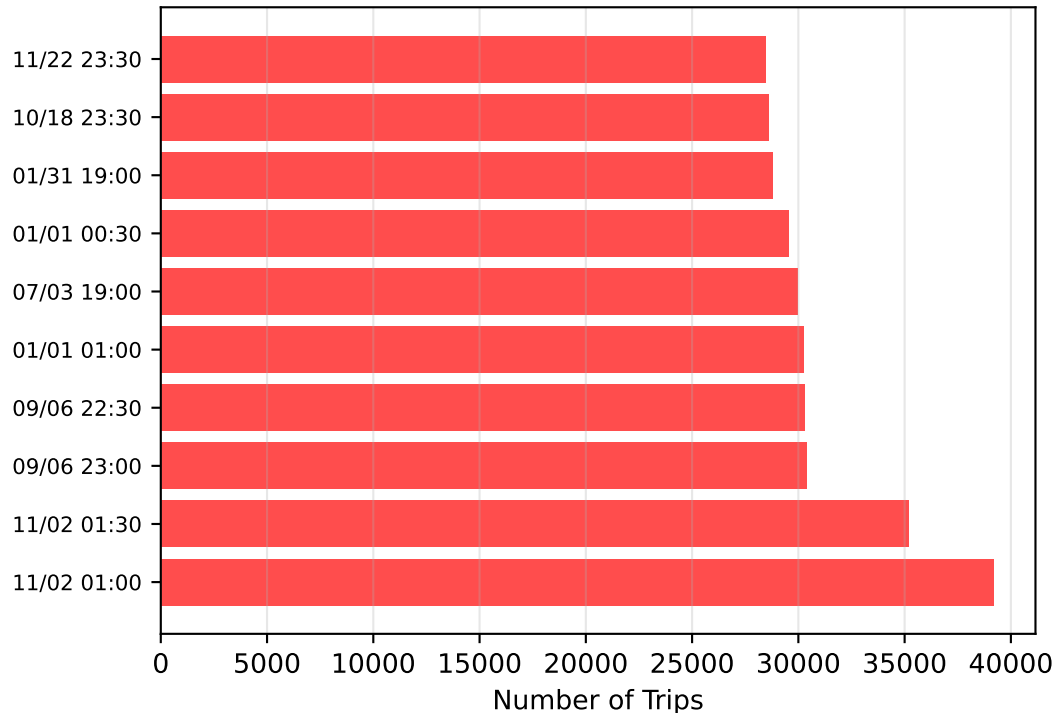
Summary Statistics

Statistic	Value
Total Trips	156,219,716
Average per 30min	15,138
Peak Period	November 02, 2014 01:00
Peak Trips	39,197
Coefficient of Variation	0.46
Weekday Average	14837
Weekend Average	15897

Key Insights from Exploratory Data Analysis

TEMPORAL PATTERNS DISCOVERED:

 Daily Patterns:
• Peak Hour: 7:00 PM (22,892 avg trips)
• Rush Hours: 6-8 PM consistently highest demand
• Quiet Period: 3-6 AM (lowest demand)
• Rush Hour Ratio: 6.4x higher than minimum

 Weekly Patterns:
• Busiest Day: Saturday (17,007 avg trips)
• Quietest Day: Monday (13,362 avg trips)
• Weekend Effect: 7.1% higher than weekdays
• Business Days: Steady increase Thu-Fri

 Seasonal Trends:
• Peak Month: October (16,087 avg trips)
• Holiday Spikes: New Year's Eve/Day highest peaks
• Seasonal Variation: 11.7% difference

⚡ Demand Characteristics:
• High Variability: CV = 0.46
• Strong Predictability: Clear daily and weekly cycles
• Peak Demand: 39,197 trips on November 02, 2014
• Business Impact: Predictable patterns enable optimization

 MODELING IMPLICATIONS:
• Strong seasonality suggests seasonal models (SARIMA, Holt-Winters)
• Time-of-day features critical for ML models
• Lag features will be highly predictive
• Weekend/weekday effects should be captured
• Holiday effects need special handling