**Citi Bikes Analysis – June 2023**

**Overview:**

The Citi Bikes dataset for June 2023 consists of over 3.45 million rides, providing detailed insights into ride patterns, popular stations, user types, and bike usage across New York City. The data reflects diverse commuter behavior, peak traffic periods, and a mix of casual and subscriber-based riders.

**Key Metrics:**

* **Total Rides**: 3,451,549
* **Types of Users**: Members (Subscribers) vs. Casual (Non-Subscribers)
* **Bike Types**: Classic Bikes and Electric Bikes
* **Ride Duration**: Average trip durations vary by bike type and user type.

**Key Insights:**

**1. Peak Ride Hours:**

* **Most Popular Starting Times**: Rides peak between **3 PM and 7 PM**, with the highest ride count occurring during evening rush hours. These peak times suggest significant usage for post-work commutes.
* **Top Hours**:
  + Start Time: 3 PM to 7 PM
  + End Time: 4 PM to 8 PM
* **Implication**: The high volume of rides during these hours indicates the need for bike availability during the late afternoon to evening rush hours.

**2. Ride Duration:**

* **Classic Bikes**: Average trip duration is between **30 to 40 minutes**.
* **Electric Bikes**: Shorter trip duration, averaging between **20 to 25 minutes**.
* **Observation**: Shorter rides often begin and end in the same neighborhood, indicating a preference for localized commuting using electric bikes, while classic bikes are used for slightly longer trips.

**3. High-Traffic Areas:**

The top 3 stations with the highest ride traffic, both as starting and ending points, include:

1. 11 Ave & W 41 St
2. Broadway & W 58 St
3. University Pl & E 14 St

**Popular End Stations**:

* W 21 St & 6 Ave
* West St & Chambers St

**Observation**: These areas correspond to high-density commercial and residential zones, reflecting concentrated commuter activity during peak hours.

**4. User Type Analysis:**

* **Subscribers (Members)**: Tend to use bikes more consistently, especially during weekday commuting hours.
* **Casual Users**: Ride patterns are more spread out, likely reflecting tourist or leisure riders.

**5. Bike Type Usage:**

* **Electric Bikes**: More popular among casual users due to their convenience and shorter ride times.
* **Classic Bikes**: More widely used by members who often take longer trips, especially during peak commuting hours.

**Recommendations for Bike Placements and System Optimization:**

1. **Reposition Bikes for High Demand**:
   * Focus on the top 3 high-traffic stations: **11 Ave & W 41 St, Broadway & W 58 St, and University Pl & E 14 St**.
   * Regularly monitor these areas, particularly during peak commuting hours (3 PM - 7 PM), to ensure there are sufficient bikes and docking spaces.
2. **Monitor and Adjust for Demand Fluctuations**:
   * **Dynamic Rebalancing**: Use real-time data to rebalance bike placements throughout the day, moving bikes from low-demand areas to high-traffic zones.
   * Ensure that high-completion areas (where many rides end) are restocked to support ride start points for the next commuter wave.
3. **Optimize for Weather and Seasonality**:
   * **Weather Sensitivity**: During clear, warm days—especially weekends—bike demand increases significantly. Increase bike deployment during these periods.
   * **Seasonal Trends**: Summer months typically see higher leisure traffic. More bikes should be deployed near tourist and recreational areas on weekends and holidays.
4. **Address Imbalances in Supply and Demand**:
   * **Supply Gaps**: Midtown Manhattan, Lower East Side, and key Brooklyn locations often face scooter shortages during peak times. Reposition scooters and bikes to these areas to meet demand.
5. **Enhance Service for Short-Trip Riders**:
   * **Local Commutes**: For neighborhoods with a high concentration of short-duration rides, maintain a high density of electric bikes for faster, short-distance commutes.

**Conclusion:**

The analysis of June 2023 Citi Bike data highlights the importance of dynamic bike repositioning and real-time monitoring to balance supply with demand. By focusing on the busiest areas and optimizing for peak hours, Citi Bike can ensure smooth operations, reduce shortages, and enhance the commuter experience.