**Insights & Recommendations – Last Mile Delivery Optimization Strategy**

**Key Insights**

**1** **Semi-Urban Areas Are Causing Major Delivery Delays**

* Average delivery time here is **200+ minutes**, much higher than Urban (110 mins) or Metro areas (130 mins).
* Highlights the need for route or hub optimization in these regions.

**2** **Traffic Jams with Bad Weather Lead to Longest Delays**

* Under **cloudy or stormy** weather with **jammed traffic**, delivery times go up to **180 mins**.
* Even in better traffic, poor weather still slows deliveries noticeably.

**3** **Idle Time Peaks Mid-Morning and Afternoon**

* Idle time before pickup hits **10.5+ mins** around **10 AM** and **2 PM**.
* Points to inefficiencies in pickup scheduling or driver availability.

**Recommendations**

**Insight 1: Severe Delays in Semi-Urban Zones**

**Problem:** Average delivery time exceeds 200 minutes in semi-urban areas, compared to 110 minutes in urban and 130 minutes in metro regions.  
**Impact:** Causes serious inefficiencies in fulfillment speed, leading to lower customer satisfaction and higher operational costs.  
**Recommendation:**

* Conduct a detailed route efficiency and hub placement analysis.
* Deploy micro-fulfillment hubs or localized dark stores in delay-heavy areas.
* Use clustering algorithms (e.g., K-Means) to redesign delivery zones more effectively.

**Insight 2: Traffic and Bad Weather Drive Longest Delays**

**Problem:** Delivery times rise to 180 minutes during heavy traffic and adverse weather. Even with moderate traffic, poor weather noticeably slows deliveries.  
**Impact:** Limits delivery reliability and affects customer trust in service-level agreements (SLAs).  
**Recommendation:**

* Integrate real-time weather and traffic data into the routing system.
* Design dynamic fallback routes within delivery SOPs.
* Build risk-adjusted buffer times into SLAs and ETA models.

**Insight 3: Idle Time Peaks During Mid-Morning and Afternoon**

**Problem:** Idle time before pickup exceeds 10.5 minutes around 10:00 AM and 2:00 PM.  
**Impact:** Reduces fleet productivity and increases cost per delivery due to suboptimal dispatching.  
**Recommendation:**

* Implement real-time driver assignment based on demand surges.
* Analyze order flow trends to optimize dispatch windows.
* Introduce staggered pickup slots to reduce clustering of dispatch tasks.