**DIVE Analysis – NYC Yellow Cab Trips (Jan–Nov 2022)**

**Summary**

NYC Yellow Cabs have been losing market share to ride-sharing companies. This analysis aims to identify the factors affecting revenue and to develop strategies for regaining market share.

The DIVE method is applied using trip data from January to November 2022, with outliers excluded. These outliers include trips with a distance of 0 or over 200 miles, and trips with a total amount exceeding $1,000.

**Discovery**

The analysis reveals that financial performance, based on net revenue, is shaped by seasonal demand patterns, trip volume, trip type, and payment behavior.

**Key Findings**

**1. Revenue Trends**

* **Seasonality:** Revenue showed clear seasonal patterns, peaking in October at $79.7M and hitting a low in January at $46M. The spring and fall were high-demand periods, while summer saw a dip, likely due to less business travelers.
* **Event and Holiday Impact**: Events like the NYC Marathon and holidays like Memorial Day consistently generate revenue spikes in specific zones, while others, like the Fourth of July and Thanksgiving, predictably lead to a sharp decline in trips.
* **Trip Volume vs. Fares:** Average fare per trip remains relatively steady across the year, meaning volume—not pricing—increases—drives revenue peaks.
* **Time Patterns:** The highest revenue-generating periods were weekdays, particularly during the evening commute (5 PM to 6 PM) and weekend nightlife peaks. Sunday generated lower revenue, with a different peak period (12 PM to 5 PM).

**2. Cost Patterns and Profitability Drivers**

* **Vendor Performance:** Verifone (Vendor ID 2) was the dominant vendor, generating more than double the revenue of CMT (Vendor ID 1). This is due to a larger market share and a slightly higher average revenue per trip, suggesting that Verifone handles a more profitable mix of trips.
* **Rate Code Profitability:** While the **Standard rate** contributed the highest total revenue (79.69%), it had the lowest average net revenue per trip ($16.24). In contrast, airport trips (JFK and Newark) and negotiated fares generated significantly higher average net revenue per trip, making them the **most profitable segments** on a per-trip basis.
* **Pass-Thru Costs:** Pass-thru costs, such as tolls and airport fees, were highest for airport trips. While these costs reduce net revenue, the high average fares for these trips still ensure their profitability.
* **Tips:** Tips accounted for a substantial amount of revenue ($97M), representing a significant component of driver income. A large majority of tips (76.46%) came from credit card payments, suggesting a potential gap in data for cash tips.
* **Extra Charges:** "Extra" charges, such as rush hour surcharges, were a notable but smaller source of revenue, contributing a small average amount per trip ($1.00).

**3. Customer Segmentation**

* **Local vs. Airport Segments:** Two primary customer segments were identified:
  + **High-Volume, Local Riders:** The most dominant segment involved short trips (0-2 miles) within Manhattan, particularly on the Upper East Side. These trips, while lower in per-trip profitability, accounted for the bulk of the company's total revenue.
  + **High-Profit, Airport Riders:** A less frequent but highly valuable segment involved trips to and from airports like JFK and Newark. These trips, driven by higher fares and fees, were the most profitable per ride.
* **Payment Behavior:** Credit card payments were the clear payment preference, accounting for 79.07% of reported revenue and having a higher average value per trip compared to cash payments.

**Investigate**

Based on the combined findings, financial performance is primarily impacted by three key factors: trip profitability, operational efficiency, and structural business models of the vendors.

**Key Factors Impacting Financial Performance**

1. **Trip Volume as Primary Revenue Driver**
   * The strongest determinant of total revenue is the number of completed trips, with month-to-month fluctuations in volume directly mirroring revenue trends.
   * High-volume months are consistently linked to high business travels, favorable weather, and major city events.
   * Conversely, low-volume months (winter) see a steep drop in both trips and revenue, regardless of fare per trip.
2. **Trip Type and Distance Economics**
   * The data shows a nuanced relationship between trip distance and profitability. While short-haul trips (0-2 miles) deliver the highest net revenue per hour ($68.47), long-haul trips consistently yield a higher net fare per trip.
     + Certain urban pickup zones — especially in Midtown Manhattan, Lower Manhattan, and high-density commercial areas — produce high trip turnover with lower pass-through costs, driving higher **net revenue per hour**.
     + Airport trips, in particular, are extremely profitable, with Newark trips providing the highest net revenue per trip and JFK trips generating the most total net revenue due to sheer volume. This confirms that even after accounting for significant pass-through fees like tolls and surcharges, these long-distance trips are highly valuable.
3. **Payment Method and Tipping Behavior**
   * Credit card payments are consistently associated with higher reported tips compared to cash payments, could be an under-reporting issue.
   * Zones and times with higher card adoption contribute disproportionately to net revenue per trip, making payment type a subtle but important profitability driver.
4. **Vendor Performance Variance**
   * Differences in revenue per trip between Vendor 1 (Creative Mobile) and Vendor 2 (VeriFone) suggest that vendor-specific operational factors (e.g., zone coverage, driver network) may influence trip mix and profitability.
     + **Zone Coverage:** Verifone's superior average revenue is a direct result of its dominance in high-yield zones, particularly at JFK and Newark airports.
     + **Trip Type Mix:** Verifone also has a more profitable mix of trips, with a higher share of long-haul trips and negotiated fares. In contrast, CMT's focus on short-haul, standard-rate trips in the city lowers its overall average fare. The analysis concludes that once normalized for trip type and location, driver performance is nearly identical between the vendors.
5. **Operational Efficiency**
   * High-margin zones show reduced “deadhead” time between trips, enabling drivers to complete more trips per shift.
   * Concentrated demand areas during peak hours (weekday rush, weekend evenings) significantly improve earnings per driver hour.
6. **Demand Patterns:**
   * The majority of trips are at the "Standard rate," with demand peaking during evening commute hours (5-6 p.m.) on weekdays and during evening/nightlife hours on weekends. This highlights the need for a fleet distribution strategy that aligns with these predictable daily and weekly demand cycles.

**Validate**

The Validate phase has successfully confirmed several key assumptions about the financial drivers of NYC yellow cab revenue.

**Key Confirmations**

1. **Trip Volume Is the Dominant Driver of Gross Revenue** 
   * Revenue fluctuations are almost entirely explained by total completed trips.
   * Fare per trip (net of pass-through costs) is stable, so volume growth—not pricing—is the main lever.
2. **Pass-Through Fees Are Neutral**
   * Tolls, MTA tax, airport surcharges pass directly to customers.
   * Excluding them gives a clearer view of actual profitability.
3. **Demand Peaks in Events & Weekdays**
   * Modest revenue lift during certain holidays/events.
   * Weekdays evening high volume is possibly driven by business travel after working hours.
4. **High-Density Zones Are More Profitable Than Airport Zones**
   * The analysis validates the assumption that high-density urban zones have a higher potential for sustainable net profitability compared to airport-heavy zones. Urban areas like the Upper East Side have higher trip turnover.
5. **Vendor Operational Differences Directly Influence Profitability**
   * Vendor 1 follows a high-volume, low-fare strategy but consistently underperforms the average on revenue per trip, suggesting potential pricing or operational inefficiencies.
   * Vendor 2 is more efficient with trip duration but also underperforms on revenue per trip, which points to a need for better revenue management or targeting higher-value routes.
   * Vendors 5 and 6 pursue a high-fare, low-volume niche strategy. Vendor 6, in particular, demonstrates successful revenue management by consistently performing above the average for the zones it serves. This shows that a focused strategy on specific, profitable niches can be very effective.
6. **Seasonal and Event-Based Patterns Are Predictable**
   * The findings validate that both seasonal trends and event-driven spikes are largely consistent and predictable.
   * Commuter and Nightlife Peaks: Weekday evening commuter peaks and weekend nightlife peaks are consistent across all seasons, providing reliable opportunities for fleet management and dynamic pricing.
   * Seasonal Trends: The data shows a predictable dip in trip volume during the summer months (July and August) and an increase in the fall, peaking in October.
   * Certain NYC events generate revenue spikes in specific zones, while others, like the Fourth of July and Thanksgiving, predictably lead to a sharp decline in trips.

**Extend: Financial Projections and Investment Recommendations**

**1. Financial Projections**

Based on revenue trends (Discovery), key drivers (Investigate), and validated correlations (Validate), the following revenue impact is projected if Yellow Cab adapts competitive strategies against ride-sharing companies:

* **Baseline (no change):** Annual revenue projected to remain flat or decline at 2–3% YoY due to continued ride-sharing competition.
* **With targeted interventions:** Revenue can grow **5–8% annually** over the next 3 years, stabilizing market share.
* **Upside potential:** By fully capturing untapped demand from airports, evening commuters, and app-based hailing, revenues could rise **10–12% annually**.

**2. Investment Recommendations**

To compete effectively, Yellow Cab should focus on the following areas:

**a) Digital Competitiveness**

* **Mobile App Upgrade:** Modernize the hailing and payment app to match ride-sharing user experience (real-time tracking, upfront pricing, digital tipping, instant booking).
* **Dynamic Pricing:** Implement flexible fare adjustments during peak events and holidays.
* **Loyalty Program:** Discounts for frequent riders, corporate packages for business travelers.

**b) Operational Efficiency**

* **Fleet Optimization:** Incentivize drivers to cover high-demand areas (airports, Midtown, nightlife zones).
* **Data Analytics:** Real-time monitoring of demand zones to reduce idle time and increase trip density.

**c) Customer Experience**

* **Cashless Default:** Promote credit card/digital payments for transparency and reliable tip reporting.
* **Service Quality:** Driver training and customer service standards to differentiate from ride-sharing complaints.

**3. Implementation Timeline**

| **Phase** | **Initiative** | **Timeline** | **Resources Required** |
| --- | --- | --- | --- |
| **Phase 1: Foundation** | Data analytics system, app redesign, corporate partnerships | 0–6 months | $2–3M (tech dev, partnerships, training) |
| **Phase 2: Growth** | Loyalty program, marketing campaigns, dynamic pricing rollout | 6–12 months | $1–2M (marketing, incentives, IT ops) |
| **Phase 3: Expansion** | Scale to all boroughs, integrate with events/airport demand | 12–24 months | $3–4M (fleet incentives, system scaling) |

**4. Resource Requirements**

* **Technology Investment:** $5–7M over 2 years (app, pricing engine, analytics platform).
* **Human Capital:** Driver training, customer service staff, marketing team.
* **Partnerships:** Corporate travel accounts, event organizers, hospitality industry.

**5. Expected ROI**

* **Payback Period:** 18–24 months.
* **Net ROI:** 25–30% over 3 years, assuming successful app adoption and corporate ridership contracts.
* **Breakdown:**
  + 5–8% revenue lift from digital enhancements.
  + 3–5% from operational efficiency gains.
  + 2–3% from corporate/event partnerships.

**6. Success Metrics**

* **Financial:** Revenue growth rate (target +8% annually), average net fare per trip, reduction in idle driver hours.
* **Operational:** Increase in airport/business district trip share, average trip utilization per driver.
* **Customer:** App adoption rate (target 70% of rides booked via app in 2 years), customer satisfaction scores, loyalty program participation.

**Conclusion:**  
By upgrading digital capabilities, optimizing operations, and improving customer experience, NYC Yellow Cabs can stabilize revenues and recover market share lost to ride-sharing companies. With disciplined investment and execution, positive ROI within two years is realistic.