# Superstore Sales & Shipping Performance Dashboard

**Brief:** This project involved building a **two-page interactive dashboard in Looker Studio** to analyze and visualize **sales and shipping performance** using **10,000+ rows** of transactional data from a Superstore Retail business (2020–2023). The goal was to deliver **executive-ready insights** that integrate **descriptive and diagnostic analysis** with **predictive benchmarks**, enabling data-driven decisions across departments.

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## Objectives:

- **Communicate critical KPIs** including:
    - **Sales performance**: Total Profit, Profit Margin segments, Average Order Value, and Return Rate
    - **Shipping performance**: Average Delivery Time per Shipping Mode, and On-Time vs. Delayed Distribution by Region

- **Reveal operational bottlenecks and profitability drivers** through multi-layered segmentation by:

    - **Product Category**
    - **Customer Segment**
    - **Geographic Region**
    - **Shipping Mode**

- **Support strategic planning** for marketing, fulfillment, inventory management, and logistics by highlighting high-performing segments and underperforming areas using:

    - Custom segmentations (by product, customer, shipping mode)
    - Regional shipping gap analysis
    - Seasonal demand trends
    - 10% improvement benchmarks for delivery efficiency

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## Key Skills Demonstrated in Looker Studio

📊 **Comprehensive Segmented Analysis Across Visual Types**
**Implemented dynamic segmentation logic** throughout the dashboard, enabling performance analysis across all visualizations:

- **Scorecards** (e.g., Profit, Sales, Return Rate per Segment)
- **Bar & Stacked Bar Charts** (e.g., Sales by Segment & Shipping Status by Mode)
- **Time Series Charts** (seasonal sales trends per category)
- **Geo Bubble Maps & Heatmaps** (regional sales intensity & delay distribution)

🔗 **Data Integration & Blending**

- Merged and processed **two large datasets** (15,000+ rows), enabling advanced comparative analysis across orders, returns, and fulfillment.
- Built cross-table metrics like **Returned Order Rate** using `COUNT_DISTINCT`, `CASE WHEN`, and key joins between order and return data tables.

🧮 **Custom Calculated Fields with SQL Queries**

Constructed calculated fields using a combination of arithmetic formulas and functions such as `CASE WHEN`, `DATEDIFF`, `IF`, and `COUNT_DISTINCT`, including:

- **Average Order Value**:
- **Average Shipping Time** (in days)
- **Returned Rate**
- **Profit Margin Ratio**
- **Profit Margin Groups** (Loss, Low, Moderate, High)
- **Shipping Status** (On-Time vs. Delayed)
- **Return Status** (Returned vs. All Good)
- **Target Metrics** to benchmark performance

🧩 **Custom Grouping and Binning:** Created **custom profit margin groupings and binnings with the same category** for comparative analysis as both a dimension and metric.

📆 **Time Series Drilldown & Trend Analysis:** Designed **drillable time hierarchy**: Year → Month → Week. This enabled identification of **seasonal sales peaks**, **holiday effects**, and **time-based shipping performance trends** per product category.

🧭 **Geo Visualization with Bubble Maps & Heatmaps**

- **Bubble Geo Map**: Displayed city-level sales intensity by **bubble size**, colored by **customer segment** (Consumer, Corporate, Home Office)
- **Heatmap**: Highlighted cities with **significant shipping delays**, using **color-coded conditional formatting** and calculated delay indicators.

🔍 **Advanced Filtering Capabilities**

Enabled dynamic exploration with control filters, including **Date range controls, Customer segment filters, Profit margin category selectors, and Shipping mode options.** These filters allowed granular analysis and personalization capability.

🎨 **Conditional Formatting in Tables**

Applied single colors and color scales to highlight orders that went above the targeted shipping time, high-discount products, and returned products.

🔁**Parameters**

Dynamic, personalized goal setting based on key business metrics used

# Sales Performance Dashboard

## 1. Which customer segment drives the most revenue?

**Insight:** The **Consumer segment** contributes the **largest share of revenue at 50.6%**, followed by **Corporate (30.7%)** and **Home Office (18.7%)**. The Consumer dominance reflects its large, general audience making frequent smaller purchases, which cumulatively generate substantial revenue.

**Implication:** From a strategic standpoint, **marketing efforts should prioritize the Consumer segment** through loyalty programs, targeted promotions, and seasonal campaigns to maintain and grow this core customer group. However, **Corporate customers also represent a significant revenue share** and should not be overlooked. Since they place **higher average value orders** than other categories**,** they are strong candidates for **premium product bundles and B2B discounts**

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## 2. Which profit segment contributes most to total sales?

**Insight:** The **Moderate** profit margin segment (0.25–0.5) contributes the highest share of total revenue at approximately **55% ($929.8K)**, followed by the **Low** segment at around **40% ($860.6K)**. Interestingly, the **Loss** category, representing products sold at negative margins, accounts for a **substantial ~30% of total revenue ($468.7K)**. Meanwhile, the **High** margin segment contributes the least, at just **~3% ($38.7K)**. We can conclude that the **Moderate segment strikes the most effective balance** between **competitive pricing** and **healthy profit margins**. This means that products in this range are likely priced attractively enough to drive volume, while still maintaining solid profitability. Also, the **Loss** category's unexpectedly large revenue share raises concerns about long-term profitability.

**Implication**: **Prioritize selling and promoting products** within the **Moderate profit margin range**, as they offer the most effective balance between high demand and healthy profitability. This is true as well for the **Low** segment, despite thinner margins, still drives meaningful revenue and may be optimized through pricing or cost adjustments.

Meanwhile, the **High margin** segment's minimal contribution suggests a need for improved positioning, premium branding, or bundling strategies to justify higher pricing.

Unfortunately, the **large share of revenue from the Loss category** is a clear red flag. Although these products contribute volume, they erode profit. A deep dive is essential to identify opportunities for **cost reduction** or **discontinuation** of unprofitable items to protect the business's financial sustainability.

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## 3. Which product categories generate the highest sales volume, and how do they compare in terms of quantity sold and profit margins?

**Insight:** From three categories, here are the evaluation of their profit margin, sales revenue, and order quantity:

- **Office Supplies** recorded the highest **order volume** at **3.7K orders**, contributing **$719K in sales revenue** with an average **profit margin of 10%**.
- **Furniture** followed with **1.8K orders**, generating **$784K in sales**, but had the **lowest profit margin at just 2%**.
- **Technology** had the **fewest orders** (1.5K) but **led in revenue** with **$836K** and a **profit margin of 17%**, the highest among the three.

This information highlights that **technology products have the highest revenue and weighted profit margin**, while **Office Supplies rely on volume**, and **Furniture products have relatively low profitability** despite decent sales figures.

**Implication:** Each product category should be guided by a tailored business strategy for sales and promotion. **Technology items** should be **prioritized as premium offerings** due to their strong profitability and sales impact, making them ideal for feature placement and targeted promotional campaigns. **Office Supplies**, driven by high purchase volume, should be supported through **consistent availability and efficient logistics**. However, because they are primarily **need-based products**, **discounting must be carefully controlled** to protect profit margins. **Furniture products**, while generating a moderate level of sales, yield **the lowest returns**, indicating the need for closer evaluation. Strategies such as **cost structure improvements** may help boost sales,but if margins remain low, **discontinuing underperforming items in the furniture category** is necessary to maintain overall profitability.

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## 4. Which cities in the United States stand out as top contributors to sales volume, and how do they align with customer segments?

**Insights:** Metropolitan cities, particularly **New York City, Los Angeles, San Francisco, Seattle, and Chicago**, demonstrate the highest order volumes and a strong **overlap between all segments, especially Consumer and Corporate buyers.**These urban hubs are key revenue drivers and display significant activity across all customer types.

Beyond major metros, **Corporate segment strength** is also visible in **semi-urban business hubs** such as **Seattle, Springfield, Santa Barbara**, and **Reno**, indicating concentrated procurement from **small to mid-sized enterprises** and **tech communities**.

Meanwhile, **suburban cities** like **Boulder (CO), Eugene (OR), Gainesville (FL)**, and parts of **Northern Texas and Arizona** show noticeable spikes in the **Home Office segment**. These areas are often characterized by **college towns** and emerging **remote work populations**.

**Implication:**

- **Large Metro Campaigns**: Launch broad, high-impact marketing initiatives in major cities such as **New York City, Los Angeles, San Francisco, Seattle, and Chicago**, where all customer segments are active. Nevertheless, **segment-specific marketing strategies should still be implemented:** target Consumers and Home Office audience through digital platforms like social media with lifestyle-driven campaigns, while engaging Corporate clients via tailored B2B offerings and account-based marketing.

- **Regional Prioritization**: In **Santa Barbara** and **Reno**, design localized strategies that appeal to **SMEs**, offering value bundles. For **college towns and semi-urban tech zones** such as **Boulder** and **Eugene**, focus on **home office solutions** that cater to flexible work and study environments. Additionally, in regions with **logistical challenges,** prioritize **supply chain optimization** so it aligns with relatively fast-moving inventory.

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## 5. How has the sales trend evolved over time within the three years across different product categories, and what seasonal patterns can be observed?

**Answer**: Overall, the time series visualization from 2020 to 2023 highlights a **steady upward trend in total sales year-over-year**, with **short-term monthly dips** that reflect normal, category-specific seasonality. Nevertheless, there is a clear, category-specific sales patterns:

- **Technology products** show consistent and sharp spikes in **Q4 (October–December)** each year, reflecting strong seasonal demand during the holiday period and end-of-year procurement cycles. The regularity of these peaks suggests a highly predictable seasonal uplift.

- **Office Supplies** maintain a relatively stable sales pattern across months but exhibit **modest increases in Q3 (July–September)**. These align with **back-to-school demand** and **mid-year restocking** by offices and institutions.

- **Furniture** displays a more irregular trend, with **moderate, less predictable sales fluctuations**. Peaks normally occur in **Q2 and Q3**, pointing to spring and summer projects.

**Implication**: Leverage category-specific seasonal trends to optimize staffing, marketing budgets, and inventory planning throughout the year. For example, **ramp up inventory** and **logistics capacity** for **Technology products ahead of Q4**, supported by targeted promotional campaigns and flash sales during the holiday season. Meanwhile, **schedule Office Supplies promotions in late Q2 through early Q3** to capture demand from educational institutions and mid-year office replenishments. Strategic alignment with these peak windows will help maximize sales opportunities and operational efficiency.

# Shipping Performance Dashboard

## 1. How is the shipping performance across ship modes?

**Insight:** Shipping performance varies widely across the available shipping modes:

- **Same Day** shipping is the fastest, with an average of just **0.04 days**, indicating near-instant dispatch and fulfillment.
- **First Class** follows with an average of **2.18 days**, still well within acceptable delivery standards.
- **Second Class** averages **3.72 days**, bordering on the standard delivery threshold.
- **Standard Class** is the **slowest**, averaging **5.00 days**, which **exceeds the 4-day target** for this method (the number is taken from the **overall average shipping time** across all modes).

Additionally, **Standard Class is the most commonly used shipping method**, including across all profit margin segments. This widespread use combined with its performance poses a significant risk to customer satisfaction if expectations are not properly managed.

**Implication:** To improve logistics efficiency and maintain positive customer experience, a few strategies could be performed in accordance with the company's budget, customer behaviors, and customer service history.

- **Set clear and realistic delivery expectations** by shipping method, especially for Standard Class, to reduce negative perceptions related to delays.
- **Audit and optimize the logistic networks for Standard Class shipments** to identify areas for improvement or reallocation.
- Where feasible, **shift order volume from Standard to Second Class**, balancing improved delivery speed with manageable cost increases.

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## 2. Where are shipping delays concentrated in the United States?

**Answer**:
The heatmap visualization reveals that **shipping delays are most heavily concentrated in key cities across the Midwest and Southern United States**. Prominent red zones, indicating a high volume of delayed orders, appear in **Texas (Houston, Dallas)**, **Georgia (Atlanta)**, and **Florida (Miami)**, as well as in **Sparks (NV), Port Arthur (TX), and Pompano Beach (FL)**. These patterns likely reflect **logistical bottlenecks**, which may stem from limited local warehousing, underperforming courier services, or geographic distance from major fulfillment centers.

Notably, **Same Day and First Class** shipping methods are rarely seen in these high-delay zones, reinforcing that **Standard and Second Class shipments are the main contributors** to prolonged delivery times.

**Implication: These delay-prone cities** present a **higher risk for customer churn rate** due to dissatisfaction over delivery speed. To mitigate this, the store needs to consider **expanding logistical coverage** by adding secondary warehouses or partnering with regional fulfillment providers in the most affected areas. If infrastructure investment is limited, consider **adjusting delivery time prediction** based on city of operation to manage customer expectations,

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### 3. Is there a correlation between shipping method and delay rate?

**Insight:** Yes, the stacked bar chart comparing shipping methods by on-time vs. delayed status shows a **clear correlation** between **the chosen shipping mode** and **the likelihood of delay** as the following:

- **Standard Class** has the highest delay rate, at nearly **37%**
- **Second Class** follows with a delay rate of approximately **24%**
- **First Class** shows a significantly lower delay rate of **under 10%**
- **Same Day** performs the best, with delays in **less than 2%** of cases

These figures confirm that **budget-friendly shipping options**, while frequently chosen, come with **higher risk of late delivery**.

**Implication:** While **lower-tier shipping options** like Standard and Second Class play a vital role in maintaining affordability and sales volume, their **higher delay rates** can significantly impact customer satisfaction, especially when expectations are not well managed.

To mitigate dissatisfaction, it's essential to **set transparent expectations** by clearly communicating typical delivery windows based on both **shipping mode and geographic region**. For high-value or repeat customers, providing **discounted upgrade options** to faster shipping methods during checkout

Where possible, **leverage heatmap data** to **identify and address high-delay zones more proactively.** This could mean offering incentives, such as discounts, loyalty points, or priority customer services for affected regions. This strategy not only helps maintain brand credibility, but also actively strengthen customer retention.

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### 4. How does shipping mode preference vary by profit margin segment, and what does that imply for cost control?

Insight: The bar chart mapping shipping mode usage across profit margin segments reveals that **Standard Class** is disproportionately used for **Loss** and **Low** profit margin orders. These categories also correlate with the **highest delay rates**. In contrast, **Moderate** and

**High** margin orders frequently utilize **First Class** or even **Same Day** delivery — options with significantly **lower delay percentages** and **better speed performance**.

This pattern suggests a behavioral split: **low-margin products (likely from the furniture category)** tend to rely on slower, cheaper shipping, while **higher-margin products (likely tech goods)** benefit from faster, more reliable delivery due to higher willingness to pay.

**Implication:**

- **Preserve premium delivery options** (e.g., Same Day, First Class) for **high-margin product orders** (especially those from Technology category) to sustain the perception of value, justify premium pricing, and protect overall brand positioning.

- **Reallocate logistics investments** toward **regions with Moderate profit margin performance** but **frequent shipping delays**, particularly **Los Angeles**, **Dallas**, **Houston**, **Chicago**, **Indianapolis**, and **St. Louis**. Also, these cities show dense order volumes from the **Office Supplies category**, which accounts for the biggest share of sales revenue and mostly offers mid-range profitability. Improving logistics here directly supports both customer satisfaction and financial performance.

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## 5. Which shipping modes need the most improvement to meet target delivery benchmarks for the next period?

A comparison between the **current average shipping times** and the **10% reduced targets** reveals that:

| Ship Mode | Current Avg (Days) | Target (Days) | Gap |
|---|---|---|---|
| **Standard Class** | 5.028 | 4.525 | **+0.503** |
| **Second Class** | 3.777 | 3.399 | **+0.378** |
| **First Class** | 2.197 | 1.978 | **+0.219** |
| **Same Day** | 0.047 | 0.043 | **+0.004** |

The **largest performance gaps** relative to the 10% improvement target are observed in:

- **Standard Class**: +0.503 days above target — equivalent to **half a day**, which is a meaningful delay in an e-commerce context.
- **Second Class**: +0.378 days above target.

These two shipping modes also **represent the bulk of order volume**:

- **Standard Class** is responsible for over **5,000 orders**, and

- **Second Class** covers approximately **3,200 orders**,
  out of the **10,000 total recorded sales** in the dataset — meaning that **over 80%** of all shipments rely on these two slower modes.

**Implication: Prioritize improvements in Standard and Second Class shipping**, which together account for over 80% of orders and show the largest gaps from target. The most feasible action is focus on reducing delays through better carrier selection and delivery routing. If possible, **invest in better logistic partnership or infrastructure** in high-delay, high-revenue regions like **Los Angeles, Dallas, and Chicago**, using the 10% reduction target as a benchmark for ongoing performance tracking.