Swift Logistics Delay Analysis Report (2022-2024)

1. Executive Summary

Swift Logistics, a leading Third-Party Logistics (3PL) provider, faces significant challenges with shipment delays, impacting customer satisfaction and retention. Analysis of 2022–2024 data reveals that **42% of all shipments** and **50.1% of Express shipments** are delayed, undermining the company's promise of reliability. Key drivers include:

- **Systemic planning flaws**: Planned Estimated Times of Arrival (ETAs) might be ignoring Hours of Service (HoS) regulations and lack disruption buffers.
- **Route inefficiencies**: Some routes extend up to 496 km longer than optimal, inflating costs.
- **Supplier-side delays**: Missing trip start timestamps post-loading suggest delays originate at supplier sites.
- **Limited real-time visibility**: Inadequate tracking hampers proactive disruption management.

While driver-related issues account for **50.17% of Express shipment delays**, deeper analysis shows that fatigue and inexperience are not primary causes. Instead, structural gaps in planning, visibility, and process execution are the root issues. This report, supported by visual data, outlines actionable recommendations to reduce delays, optimize operations, and restore customer trust through quick wins, mid-term initiatives, and long-term strategies.

2. Company Overview

Founded in 2019, Swift Logistics specializes in cross-border transportation across Mexico, Canada, and the United States, alongside domestic U.S. operations. As a 3PL provider, the company manages complex supply chains, prioritizing speed and

reliability. However, rising customer complaints and churn due to delays threaten its reputation and growth.

2.1 Business Problem

Shipment delays have led to:

- Increased customer dissatisfaction and churn.
- Eroded trust in premium Express and Priority services.
- Higher operational costs from inefficient routing and disruptions.

2.2 Project Objectives

- Analyze delay patterns by region, shipment type, and timeframe.
- Identify root causes of delays using data-driven insights.
- Recommend strategies to enhance operational efficiency and customer satisfaction.

3. Data Sources & Methodology

3.1 Data Sources

- **Internal Transportation Management System (TMS) logs (2022–2024)**: Detailed records of shipment statuses, ETAs, and enroute issues.

3.2 Methodology

1. **Data Cleaning & Validation**: Ensured data accuracy by addressing missing timestamps and inconsistent delay definitions. Data error in distances and scammer trips exclusion.
2. **Exploratory Data Analysis (EDA)**: Identified delay drivers across shipment types, regions, and timeframes.
3. **Statistical Analysis**: Quantified key delay drivers and their impact on ETAs.
4. **Root Cause Analysis**: Examined systemic issues beyond driver performance.

3.3 Data Gaps Identified

- **Missing supplier bay departure timestamps**: Hinders analysis of loading delays.
- **Inconsistent enroute issue reporting**: Limits precision in attributing delays.
- **Lack of real-time tracking data**: Obscures visibility into ongoing disruptions.

4. Key Findings

4.1 Delay Overview

- **Overall Delay Rate**: 42% of all shipments are delayed.
- **Express Shipment Delays**: 50.1% of Express shipments arrive late, undermining the premium service offering.
- **Shipment Type Delay Distribution**:
    - Express & Priority: 57.2% of delays (despite being marketed as “fast”).
    - Regular: 22.97% of delays.
    - Special Handling: 19.82% of delays.

Figure 1: Shipment Type Delay Distribution (2022–2024)

Shipment Type	
Express	28.771930
Priority	28.684211
Regular	22.719298
Special Handling	19.824561

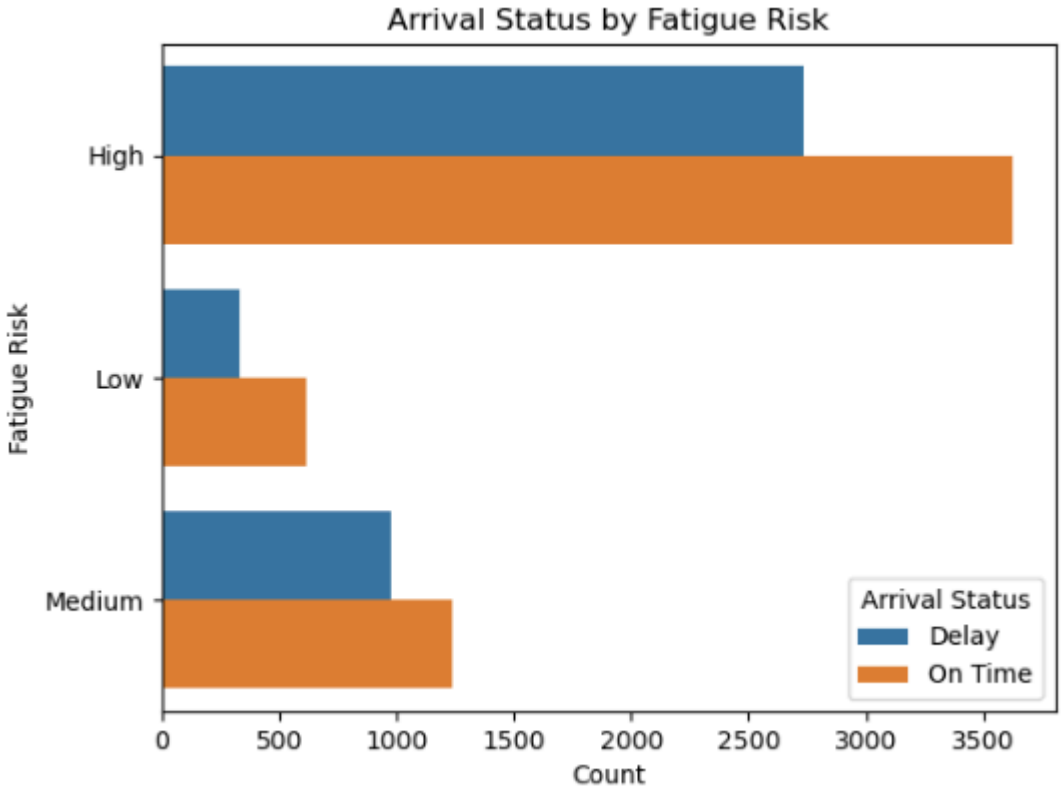
Description: Illustration of the proportion of delays by shipment type (Express & Priority: 57.2%, Regular: 22.97%, Special Handling: 19.82%). This highlights the disproportionate impact of delays on premium services, signaling a need for targeted improvements in Express shipment processes.

4.2 Key Delay Drivers

- **Planning Deficiencies**:

    - Planned ETAs (assumption) exclude HoS regulations and disruption buffers.
    - Example: Express shipment delays stem from underestimated transit times.
- **Route Inefficiencies**:
    - Average route deviation: -75.75 km (some routes up to 496 km longer).
    - Impacts both delayed and on-time shipments, inflating fuel and operational costs.
- **Supplier-Side Delays**:
    - Missing trip start timestamps post-loading indicate delays at supplier sites.
    - Lack of data on departure and arrival times obscures loading process inefficiencies.
- **Driver-Related Issues**:
    - Account for 50.17% of Express delays but are not primarily due to fatigue or inexperience.
    - Example: Veteran driver Todd Rosales (61 trips) has a 38% delay rate, comparable to less experienced drivers.

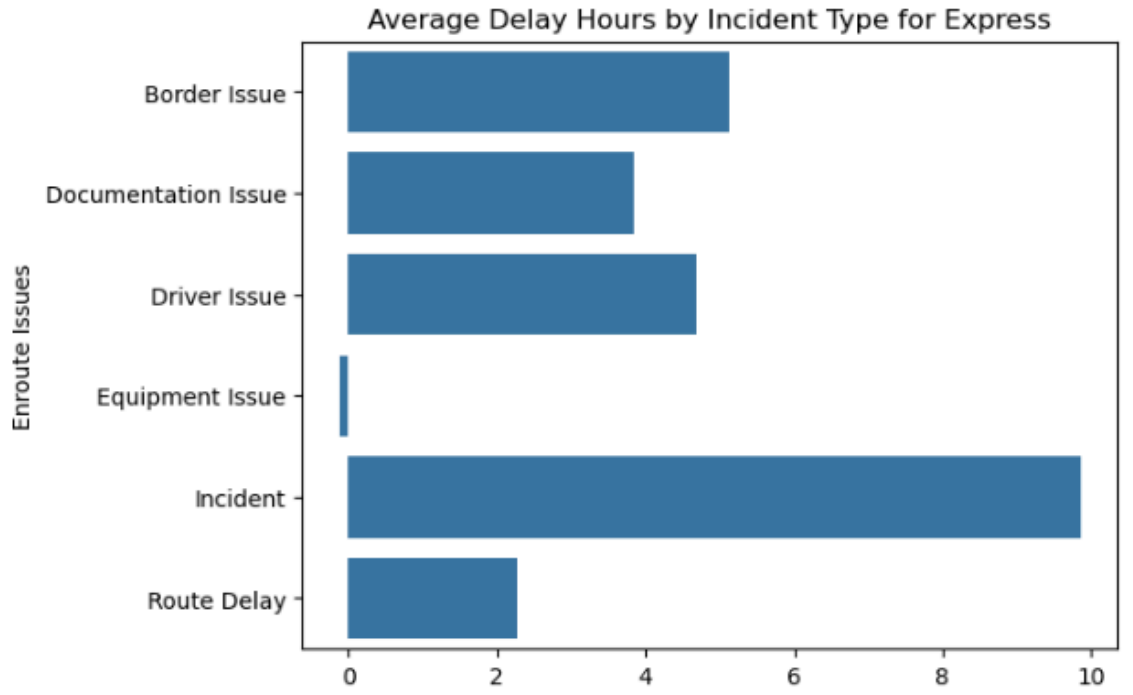
Figure 2: Arrival Status by Fatigue Risk (2022–2024)



Description: Histogram showing the count of shipments by fatigue risk level (High, Medium, Low) and arrival status (Delayed in blue, On Time in orange). The chart reveals that high fatigue risk shipments have the highest counts for both delayed (3000) and on-time (3500) statuses, while low fatigue risk shipments have the lowest counts for both (500 delayed, ~700 on time). Medium fatigue risk shipments fall in between (1000 delayed, ~1200 on time). This suggests that fatigue risk does not strongly correlate with delays, as the proportion of delayed to on-time shipments is similar across risk levels.

Insight: This supports the finding that driver fatigue (e.g., Jennifer Pena's data) is not a primary delay driver, emphasizing the need to focus on systemic issues like planning and visibility.

Figure 3: Average Delay Hours by Incident Type for Express (2022–2024)



Description: Bar chart showing the average delay hours for Express shipments by incident type. Incidents cause the longest delays (10 hours), followed by border issues (6 hours), driver issues (5 hours), documentation issues (4.5 hours), route delays (2 hours), and equipment issues (0.5 hours).

Insight: While driver issues contribute to 50.17% of Express delays, their average delay duration (~5 hours) is moderate compared to incidents and border issues, reinforcing that systemic factors (e.g., cross-border processes) significantly impact delays.

Figure 4: Driver Performance for Express Shipments (2022–2024)

Driver Name	total_trips	delayed_trips	average_delay_hours	total_delay_hours	avg_trip_duration	delay_percentage
Jennifer Pena	8	6	2.102261	16.818089	48.348643	75.000000
Claudia Wallace	29	20	1.844794	53.499018	88.290476	68.965517
Donald Schultz	22	15	0.740420	16.289246	63.057171	68.181818
Joseph Dean	44	30	1.802074	79.291245	61.612838	68.181818
Randy Sandoval	39	26	1.452199	56.635778	61.921038	66.666667
Alexis Baker	9	6	1.581700	14.235301	62.273571	66.666667
Michael Berger	26	17	2.148055	55.849442	80.370684	65.384615
Sarah Robinson	40	26	0.926936	37.077421	62.491281	65.000000
Todd Rosales MD	61	38	0.893412	54.498119	58.483708	62.295082
Jerry Wheeler	29	18	1.524183	44.201299	61.263435	62.068966
Andrew Payne	38	23	1.475471	56.067904	68.916872	60.526316
Michael Young	35	21	1.721803	60.263092	65.537428	60.000000
Samantha Davis	15	9	2.100500	31.507494	54.718196	60.000000
Alfred Galvan	15	9	0.247721	3.715820	48.688828	60.000000
James Goodman	22	13	0.980924	21.580337	64.073560	59.090909

Description: Table listing driver performance metrics for Express shipments, including total trips, delayed trips, average delay hours, total delay hours, average trip duration, and delay percentage. Top performers like Jennifer Pena (75% delay rate, 8 trips) and Claudia Wallace (66.96% delay rate, 29 trips) show high delay percentages despite varying trip volumes. Todd Rosales (61 trips, 62.29% delay rate) and others like Andrew Payne (60.52% delay rate) also exhibit significant delays.

Insight: The top 10 drivers for Express delays rarely appear in the overall delay rate top 25 (see Figure 5), suggesting that Express delays are not solely due to driver performance but are influenced by shipment-specific challenges like planning and route inefficiencies.

Figure 5: Overall Driver Performance (2022–2024)

Driver Name	total_trips	delayed_trips	average_delay_hours	total_delay_hours	avg_trip_duration	delay_percentage
Alexis Baker	62	36	1.377867	85.427761	66.478504	58.064516
Donald Schultz	97	55	1.302932	126.384450	66.694521	56.701031
Jerry Wheeler	92	48	1.683449	154.877306	65.932431	52.173913
Sarah Robinson	149	76	1.173654	174.874425	64.114734	51.006711
Cynthia Walter	119	59	0.884604	105.267841	63.053658	49.579832
Jacqueline Wolfe	199	98	1.151551	229.158720	63.237684	49.246231
James Goodman	88	43	0.796160	70.062036	62.044697	48.863636
John Jones	33	16	0.187761	6.196099	53.457075	48.484848
Alfred Galvan	64	31	0.921055	58.947502	67.903237	48.437500
Randy Sandoval	140	67	1.510922	211.529141	64.488150	47.857143
Todd Thompson	150	70	1.010244	151.536569	66.159137	46.666667
Samantha Davis	55	25	1.367536	75.214458	63.471521	45.454545
Sarah Chambers	135	61	1.059980	143.097263	66.829839	45.185185
Bruce Hayes	31	14	1.249085	38.721643	70.823947	45.161290
Daniel Howell	246	111	1.025211	252.201971	64.389976	45.121951
Christina Wilson	38	17	1.349393	51.276919	67.027105	44.736842
Claudia Wallace	161	72	0.719249	115.799111	66.411394	44.720497
Ronald Foster	132	59	0.824563	108.842354	65.030151	44.696970
Mary Whitney	179	80	0.628182	112.444597	69.788976	44.692737
Jessica Robinson	74	33	0.351042	25.977128	70.917768	44.594595
Carly Riggs	90	40	1.177442	105.969780	73.111064	44.444444
Madison Marshall	97	43	1.022128	99.146376	62.114759	44.329897
Mrs. Kristen Reyes	88	39	1.212079	106.662948	63.761897	44.318182
Megan Le	131	58	0.959582	125.705267	69.157937	44.274809
Michael Berger	93	41	0.765293	71.172280	67.808742	44.086022

Description: Table listing overall driver performance metrics, including total trips, delayed trips, average delay hours, total delay hours, average trip duration, and delay percentage. Drivers like Alexis Baker (58.06% delay rate, 62 trips) and Donald Schultz (57.01% delay rate, 97 trips) top the list, but many Express delay leaders (e.g., Jennifer Pena) do not appear here, highlighting a disconnect between Express and overall delay patterns.

Insight: This discrepancy indicates that Express shipment delays are driven by factors beyond driver performance, such as unrealistic ETAs and systemic inefficiencies.

4.3 Insights

- **Systemic Issues Outweigh Driver Performance**: Figures 2, 4, and 5 show that fatigue and driver experience (e.g., Todd Rosales' 38% delay rate) are not primary delay drivers. Structural gaps in planning, supplier inefficiencies, and poor visibility are the root causes.

- **Express Service Underperformance**: The high delay rate for Express shipments (50.1%) and the significant impact of incidents and border issues (Figure 3) signal a mismatch between customer expectations and operational reality.

- **Route Optimization Opportunity**: Reducing route deviations (noted in the data as up to 496 km) could save costs, even for on-time shipments.

- **Data Gaps Hinder Precision**: Missing supplier bay timestamps and inconsistent issue reporting (e.g., Jennifer Pena's missing enroute issue data) limit actionable insights.

5. Recommendations

5.1 Quick Wins (0–3 Months)

1. **Implement Route Optimization Software**:
    - Use tools like Route4Me or OptimoRoute to minimize route deviations.
    - Expected Impact: Reduce average route length by 10–15%, saving fuel costs.

2. **Capture Supplier Bay Timestamps**:
    - Deploy GPS-enabled tracking or IoT devices to record departure and arrival times at supplier sites.
    - Integrate with TMS to calculate loading durations.
    - Expected Impact: Identify and address supplier-side bottlenecks.

3. **Enable Real-Time Delay Notifications**:

- Develop customer-facing alerts for delays via SMS/email.
- Expected Impact: Improve transparency and customer satisfaction.

4. **Target High-Impact Hotspots**:
    - Focus on the top 10% of routes and suppliers with highest delay rates, as identified in Figures 3 and 4.
    - Expected Impact: Reduce Express delays by 5–10% within 3 months.

5.2 Mid-Term Initiatives (3–12 Months)

1. **Strengthen Supplier Service Level Agreements (SLAs)**:
    - Introduce penalties for late loading or documentation errors.
    - Expected Impact: Decrease supplier-related delays by 15–20%.

2. **Expand Predictive Maintenance**:
    - Use IoT sensors to monitor equipment health and schedule maintenance proactively.
    - Expected Impact: Reduce equipment-related delays (currently ~0.5 hours per incident, Figure 3) by 50%.

3. **Optimize Driver Scheduling**:
    - Align shifts with HoS regulations and incorporate disruption buffers.
    - Expected Impact: Improve ETA accuracy for Express shipments.

4. **Enhance Real-Time Visibility**:
    - Deploy telematics for live tracking of shipments and driver status.
    - Expected Impact: Enable proactive rerouting and incident management.

5.3 Long-Term Strategic Actions (12+ Months)

1. **Invest in AI-Driven Dispatch Optimization**:
    - Use machine learning to predict delays and optimize dispatch decisions.
    - Expected Impact: Reduce overall delay rate by 20–25%.

2. **Streamline Cross-Border Processes**:

- Partner with customs brokers to pre-clear documentation, addressing border issues (Figure 3, ~6 hours average delay).
- Expected Impact: Cut border-related delays by 30%.

3. **Redesign Customer-Centric SLAs**:
   - Offer tiered service levels with realistic ETAs for key accounts.
   - Expected Impact: Boost retention for high-value customers.

6. Implementation Roadmap

Phase	Timeline	Actions	Owners	KPIs
Quick Wins	0–3 Months	Route optimization, supplier timestamp tracking, delay notifications	Operations, IT	Delay rate reduction (5%), cost savings ($50K)
Mid-Term	3–12 Months	Supplier SLAs, predictive maintenance, driver scheduling	Operations, Procurement	Delay rate reduction (15%), equipment uptime (95%)
Long-Term	12+ Months	AI dispatch, cross-border partnerships, SLA redesign	Executive Team, IT	Delay rate reduction (25%), customer retention (+10%)

7. Risks & Mitigation

- **Data Quality Issues**:
  - Risk: Inaccurate or incomplete TMS data.

    - Mitigation: Implement continuous data validation and audits.

- **Change Management Resistance**:
    - Risk: Pushback from drivers or suppliers.
    - Mitigation: Engage teams early with training and clear communication.

- **External Dependencies**:
    - Risk: Delays from customs, weather, or regulations.
    - Mitigation: Build contingency buffers and partner with reliable brokers.

8. Clarifying Questions for Stakeholders

1. How and when is the Planned ETA calculated?
    a. If the Planned ETA does not include the road disruptions the company is overselling a dream that they are failing miserably to achieve.
    b. If the planned ETA is calculated during booking the the loading times and time of arrival at supplier should be recorded to see if the suppliers are also contributing to the

9. Assumptions

- Historical TMS data accurately reflects operational realities.
- Operational cost models align with Finance team validations.
- Stakeholders prioritize Express shipment reliability.
- Planned ETA is assumed to include rest breaks (However, due to early findings we considered that it might not be including)
- Delay definition may vary by shipment priority (e.g., regular, priority, express and special handling)

10. Initial Hypothesis

- Quality-sensitive items (like perishables) may use smaller, faster vehicles.
- Missing or incorrect paperwork causes border delays.
- Long-distance trips naturally carry more delay risk (rest, breakdowns).
- Delays due to hazardous goods requiring cautious driving.
- Repeated trips without rest for drivers is a potential red flag.

- Booking a vehicle already in transit may signal fraud or system error

11. Definitions

1. **Timeframe**: 2 years of data + past 4 years for comparison.
2. Delay Threshold:
    a. **Express shipments** > 30 min delay
    b. **Priority shipments** > 45 min delay
    c. **Regular Shipments** > 1 hr 30 min delay
    d. **Special Handling** > 2 hours delay

12. Next Steps

3. **Stakeholder Review**: Present findings and recommendations to the COO and leadership team by May 20, 2025.

4. **Pilot Quick Wins**: Launch route optimization and supplier timestamp tracking in high-delay regions within 30 days.

5. **Data Enhancement**: Invest in IoT and telematics to close data gaps within 6 months.

6. **Progress Tracking**: Monitor KPIs monthly and adjust strategies as needed.

Contact: For further discussion, contact the Analytics Team at analytics@swiftlogistics.com.