



## **Europe-Americas Linehaul Insights & Recommendations**

Volume Allocation Efficiency

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# Overview

# Context

This project aims to **investigate the capacity of Europe-Americas Linehaul** at FedEx to surface recommendations on efficient shipment volume allocation.

The shipments should be allocated to drive two primary objectives: 1) increase **operational efficiency**, and 2) drive **predictability** in periodic volumes shipped.

# North Star Metrics



To evaluate lane shortcomings, I focused on the following key metrics:

Increase Operational Efficiency	Increase Predictability
<b>Yield</b> The USD revenue per 1kg of charged weight.	<b>Interquartile Range</b> The difference between the 3rd and 1st quartiles of weekly weight charged measures the data's dispersion.
<b>Charged-to-Actual Weight Ratio</b> The ratio shows how much weight was charged per 1 kg of actual weight.	<b>% Dependence on Priority Services</b> The percentage of weight charged shipped via FedEx priority services.

# North Star Metrics



To evaluate lane shortcomings, I focused on the following key metrics:



Increase Operational Efficiency	Increase Predictability
<p><b>Yield</b></p> <p>From 01/2024 to 04/2024, the average Europe-Americas yield was <b>3.24 USD/kg</b> across <b>1,253,223 kg</b> of total weight charged.</p> <p><b>Charged-to-Actual Weight Ratio</b></p> <p>From 01/2024 to 04/2024, the average charged-to-actual weight ratio for the Europe-Americas lane was <b>1.18</b>, ranging from 1.02 to 1.66 per customer.</p>	<p><b>Interquartile Range</b></p> <p>From 01/2024 to 04/2024, the average interquartile range for charged weight in Europe-Americas shipments was <b>19 098 kg</b> across 18 weeks analyzed.</p> <p><b>% Dependence on Priority Services</b></p> <p>From 01/2024 to 04/2024, the overall % dependence on priority services for Europe-Americas shipments was <b>98.36%</b>, with a maximum of 99.41% per customer.</p>



# Insights Deep-Dive

# Europe-Americas Yield was highest among Customer C's shipments



- Across customers, Customer C brought the most revenue per 1kg of weight charged on Europe-Americas shipments (**4.86 USD/kg**) while shipping the smallest volume on the route among all customers (332,134 kg)
- Customer C brought the highest yield on International Priority Freight (**5.38 USD/kg**) and International Priority Parcel shipping (**3.43 USD/kg**) for the Europe-Americas lane.
- 1) For Customer A: economy parcel shipping is **3x pricier** than priority service, and freight services are the same price. 2) for Customer B: economy freight shipping is **2.5x pricier** than priority service, and parcel priority is cheaper than the economy. 3) for Customer C: freight services are almost **identically priced**.

EA Transatlantic	True			
		<b>Total Revenue</b>	<b>Total Charged Weight</b>	<b>Yield</b>
Customer A		\$ 976 438	341 923	\$ 2,86
Customer B		\$ 1 469 615	579 167	\$ 2,54
Customer C		\$ 1 613 908	332 134	\$ 4,86
<b>Grand Total</b>		<b>\$ 4 059 961</b>	<b>1 253 223</b>	<b>\$ 3,24</b>

EA Transatlantic		True	
	Total Revenue	Total Charged Weight	Yield
⊗ Customer A	\$ 976 438	341 923	\$ 2,86
International Economy	\$ 5 029	1 287	\$ 3,91
International Economy Freight	\$ 2 930	732	\$ 4,00
International Priority	\$ 192 075	144 975	\$ 1,32
International Priority Freight	\$ 776 403	194 930	\$ 3,98
⊗ Customer B	\$ 1 469 615	579 167	\$ 2,54
International Economy	\$ 8 620	3 019	\$ 2,86
International Economy Freight	\$ 48 213	8 092	\$ 5,96
International Priority	\$ 70 489	26 039	\$ 2,71
International Priority Freight	\$ 1 342 292	542 018	\$ 2,48
⊗ Customer C	\$ 1 613 908	332 134	\$ 4,86
International Economy	\$ 16 311	5 874	\$ 2,78
International Economy Freight	\$ 8 377	1 581	\$ 5,30
International Priority	\$ 279 119	81 266	\$ 3,43
International Priority Freight	\$ 1 310 100	243 414	\$ 5,38
Grand Total	\$ 4 059 961	1 253 223	\$ 3,24



# Charged-to-Actual Weight Ratio was highest across Customer A's Europe-Americas shipments



- Across customers, Customer A had by far the highest overall charged-to-actual weight ratio(**1.66**) on Europe-Americas shipments.
- Customer A's trend is consistent - having the highest charged-to-actual weight ratio across 17 of 18 analyzed weeks.

Priority vs Economy	(All)	
EA Transatlantic	True	

		Charged to Actual Weight Ratio	Charged Weight	Actual Weight
Customer A		1,66	341 923	205 651
Customer B		1,02	579 167	566 950
Customer C		1,16	332 134	285 823
Grand Total		1,18	1 253 223	1 058 423

Priority vs Economy	(All)	
EA Transatlantic	True	

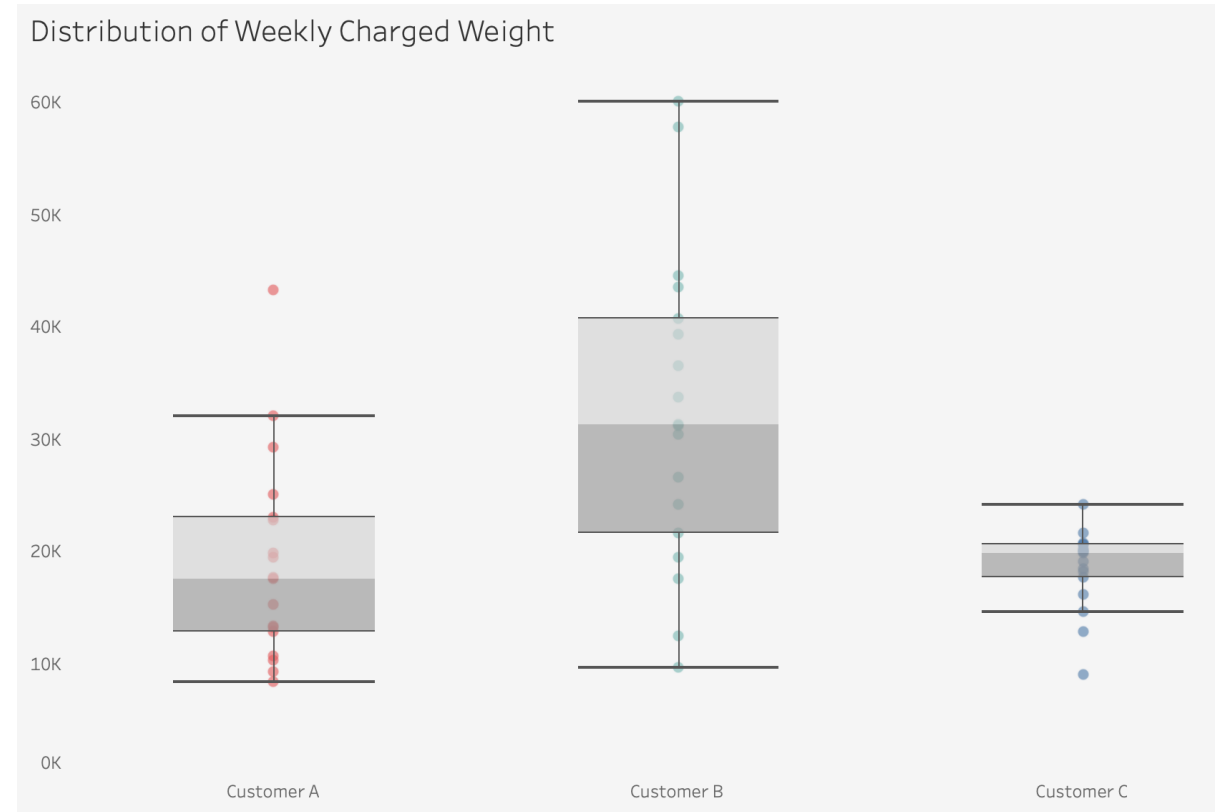
Charged to Actual Weight Ratio	Column Labels		
Week	Customer A	Customer B	Customer C
1	4,99	1,01	1,05
2	3,53	1,00	1,13
3	2,54	1,01	1,12
4	2,07	1,01	1,09
5	2,14	1,01	1,16
6	1,20	1,02	1,16
7	1,55	1,08	1,20
8	1,51	1,05	1,11
9	2,08	1,06	1,26
10	1,27	1,03	1,20
11	1,79	1,00	1,10
12	1,57	1,03	1,09
13	1,38	1,01	1,07
14	1,99	1,01	1,19
15	1,76	1,01	1,11
16	2,90	1,04	1,24
17	1,23	1,03	1,37
18	2,80	1,03	1,40
Grand Total	1,66	1,02	1,16

More pivot tables for the charged-to-actual weight ratio are in the Appendix section.




# Interquartile Range was highest across customer Customer B's transatlantic shipments



- Across customers, Customer B had the highest Interquartile Range for weight charged on Europe-Americas shipments (**19 142 kg**).
- Within the distribution of average shipment size, Customer B also displays the highest dispersion of values (**IQR 354 kg**).





- |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| EA Transatlantic                                                                    | True                                                                                |  |
| <hr/>                                                                               |                                                                                     |                                                                                     |
|  | Total Charged Weight                                                                | Dependence on Service Type                                                          |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer A                                                                        |                                                                                     |                                                                                     |
| Economy                                                                             | 2 019                                                                               | 0,59%                                                                               |
| Priority                                                                            | 339 904                                                                             | 99,41%                                                                              |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer B                                                                        |                                                                                     |                                                                                     |
| Economy                                                                             | 11 111                                                                              | 1,92%                                                                               |
| Priority                                                                            | 568 057                                                                             | 98,08%                                                                              |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer C                                                                        |                                                                                     |                                                                                     |
| Economy                                                                             | 7 455                                                                               | 2,24%                                                                               |
| Priority                                                                            | 324 679                                                                             | 97,76%                                                                              |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| Transatlantic                                                                       |  | Total Charged Weight % Dependence on Lane Type                                      |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer A                                                                        |                                                                                     |                                                                                     |
| Americas-Europe                                                                     | 63 148                                                                              | 10,35%                                                                              |
| Europe-Americas                                                                     | 341 923                                                                             | 56,02%                                                                              |
| Other                                                                               | 205 313                                                                             | 33,64%                                                                              |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer B                                                                        |                                                                                     |                                                                                     |
| Americas-Europe                                                                     | 105 210                                                                             | 14,47%                                                                              |
| Europe-Americas                                                                     | 579 167                                                                             | 79,66%                                                                              |
| Other                                                                               | 42 711                                                                              | 5,87%                                                                               |
| <hr/>                                                                               |                                                                                     |                                                                                     |
| ⊕ Customer C                                                                        |                                                                                     |                                                                                     |
| Americas-Europe                                                                     | 515 685                                                                             | 59,71%                                                                              |
| Europe-Americas                                                                     | 332 134                                                                             | 38,46%                                                                              |
| Other                                                                               | 15 855                                                                              | 1,84%                                                                               |

# Recommendations

# Key Recommendations

## Increase Operational Efficiency

- **Prioritize priority shipments for Customer C in the Europe-Americas lane during peak times.** These have the highest yield on priority shipments among customers for parcel and freight shipments and the lowest volatility in weekly weight charged.
- **Fix evident pricing errors for all Customers A, B, and C,** where priority pricing is cheaper than the economy or of equal price as the economy, which encourages choosing priority over economy services.
- **Incentivize dimensional weight reduction for Customer A:** 1) Introduce tiered discounts for shipments that meet specific dimensional weight efficiency thresholds. 2) Offer incentives for better packaging practices, such as rebates for shipments where the actual weight is closer to the charged weight.

## Increase Predictability

- Introduce a **contractual agreement to ensure consistent weekly volumes or caps on weekly volumes** on Europe-Americas priority shipments, especially for highly volatile and voluminous Customer B and, inconsistent Customer A, reducing strain during peak times.
- **Negotiate a flexible shipping agreement** - where Customers B and A allow shifting some priority shipments to next-day flights during peak times.
- **Promote and offer price incentives on alternate lanes where feasible for economy shipments to encourage redistribution of shipments.** This could free up capacity for priority products in the Europe-Americas lane.

Recommendations focus on two strategies: **1) efficient shipments** - prioritizing high-yield customers, fixing pricing errors, and reducing dimensional weight; **2) alleviating uncertainty of weekly priority volumes** using contractual obligations, enabling FedEx to plan better.

# Caveats and Next Steps

# Caveats and Next Steps

For improved analysis and future steps, consider the following:

## *Improved availability of data*

- Include cost data to calculate shipment profitability
- Include data for a longer period to allow grasping some areas of volatility like seasonality

## *Check validity of the recommendations*

- Validate recommendations with real-time data.
- Collaborate with Sales, Operations and Legal teams to test solutions.
- Set up weekly tracking and feedback mechanisms.

## *Look for reproach actions from customers*

- Monitor whether customers moved some shipping volumes to other logistics operators in response to our actions.
- Closely observe whether introducing contractual restrictions leads to increased churn.

# Appendix



# Technical Process

Dataset stats:

- **3** unique customers were analyzed
- **28,353** shipments were attributed to customers
- Data ranges from **01/02/2024** to **04/30/2024**

The analysis utilized a customer shipment dataset and a country dataset containing the following key shipment dimensions:

- **Category:** type of service (Priority, Economy, Freight, Parcel)
- **ID:** unique shipment identifier
- **Customer:** A, B, and C
- **Geographic:** Origin Country, Destination Country
- **Date:** Date of Shipment

The technical process included:

- Connecting tables, calculating metrics, and extracting insights in Excel
- Building a self-service dashboard for visualization in [Tableau](#)

# Charged-to-Actual Weight Ratio for Europe-Americas shipments- supporting table



Digging deeper into Europe-Americas priority shipments

Priority vs Economy	Priority			
EA Transatlantic	True			
Charged to Actual Weight Ratio	Column Labels			
Week		Customer A	Customer B	Customer C
1		5,38	1,01	1,05
2		4,21	1,00	1,09
3		2,54	1,01	1,13
4		2,07	1,01	1,09
5		2,14	1,01	1,15
6		1,20	1,01	1,14
7		1,55	1,08	1,18
8		1,51	1,05	1,11
9		2,09	1,06	1,23
10		1,27	1,03	1,20
11		1,79	1,01	1,08
12		1,57	1,01	1,06
13		1,40	1,01	1,07
14		2,00	1,01	1,20
15		1,76	1,01	1,11
16		2,90	1,02	1,17
17		1,24	1,03	1,37
18		2,80	1,02	1,37
Grand Total		1,67	1,02	1,15

## Interquartile Range - supporting chart

Digging deeper into the volatility of weight charged per customer



Thank you!