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BANA 614



# Parts Delivery Direct Analytics

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## Description of the Business

Parts Delivery Direct (PDD) is a dispatch company that specializes in assisting with the delivery of automobile part shipments. They typically offer logistics services between customers and trucking companies to ensure that goods are delivered safely and on time. When organizations order automobile parts a booking is placed and is assigned to a respective supplier. Within each supplier, each driver needs to meet a minimum kilometer requirement for each trip. Driver efficiency is observed by comparing the actual trip time versus the planned trip time.

## Executive Summary

Parts Delivery Direct is a trucking delivery company located in the Midwest of the United States where there are a variety of deliveries made such as auto parts and equipment. The trucking company's mission is to deliver these parts in a timely manner at a competitive price. After reviewing and comparing planned (Estimated Time of Arrival) ETA and actual ETA the delivery times, we believe the times can be closer to planned ETA by better planning. By reducing delivery times, our company can better meet customer expectations with faster delivery times.

Our focus is recognizing the vital step of efficient planning in meeting delivery commitments. Parts Delivery Direct is committed to enhancing our operational efficiency. Through careful review of our dataset and comparing the planned ETAs versus the actual ETAs, we have identified room for improvement in this area. By refining our delivery processes, we aim to bring actual delivery times closer to planned ETAs to optimize transportation for efficient deliveries.

Our strategy method is to focus on optimizing planning procedures to minimize delivery times. We will analyze and fine-tune the logistics involved in our trucking operations in order to achieve a significant reduction in delivery times. This not only enhances our ability to meet customer expectations promptly but also positions Parts Delivery Direct as a reliable and agile partner in the transportation industry.



At the heart of our mission is a commitment to meet customer satisfaction. We understand that in today's trucking industry, timely deliveries are important to customers. We hope by streamlining our operations and implementing efficient planning strategies by using our dataset, we aim to provide customers with better delivery times to enhance their satisfaction and loyalty to our company.

In today's competitive trucking market where efficiency is a key differentiator, Parts Delivery Direct's main goal is to improve these delivery times to gain a competitive edge against other competitors. We are aiming to consistently deliver on time and optimize our operational delivery processes and by doing so, we position ourselves as a preferred choice for businesses searching for reliable and efficient transportation services.

Parts Delivery Direct is dedicated to meet the expectations of our clients. Our commitment to optimizing delivery times through improved planning is a demonstration of our customer-centric approach. As we begin to improve our operational efficiency, we invite our business partners and clients to join us in setting the evolving standards of reliability in the trucking industry.



## Case Background

- Business Location: 12341 Harvey Street, Boise, Idaho, 17234
- Activities: Trucking Delivery Services
- Contact Person: Emely Callejas

## Business Problem

- Parts Delivery Direct currently facilitates deliveries by dispatching various drivers from suppliers they partner with. The company would like to analyze current operational processes and driver bandwidth in order to optimize delivery times by efficiently dispatching drivers.

## Project Scope

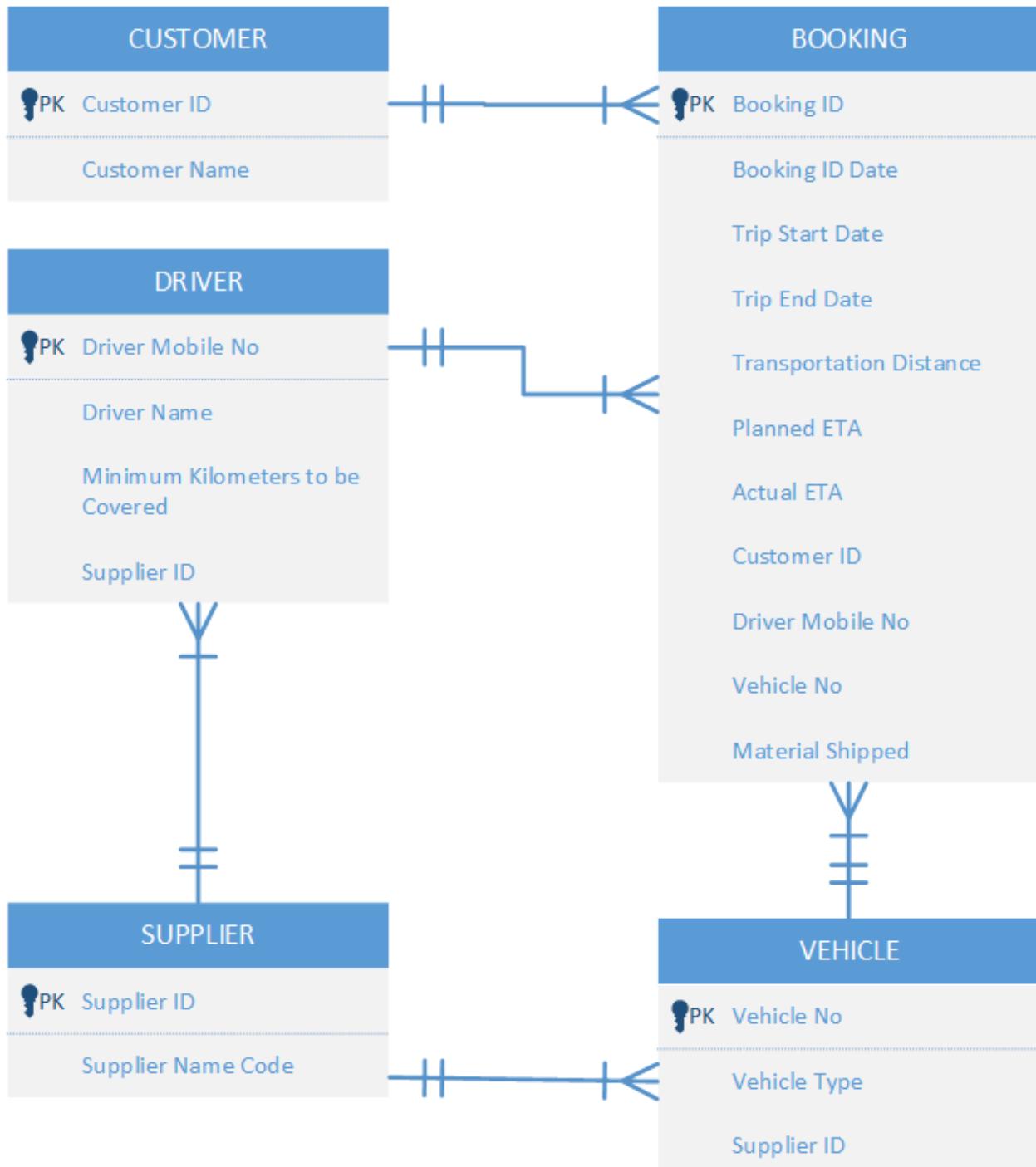
- PDD Analytics Team (5 members) – responsible for analyzing the dataset in its entirety (the dataset includes records from 2022 – 2023).
- Objectives: While reviewing the dataset, the analytics team should identify opportunities for improvement that would aid in optimizing delivery times and overall company efficiency.

## Business Rules

- Each CUSTOMER can place one or many BOOKINGS
- Each BOOKING is placed by one and only one CUSTOMER
- Each DRIVER can be assigned one or many BOOKINGS
- Each BOOKING is assigned one and only one DRIVER
- Each DRIVER is employed by one and only one SUPPLIER
- Each SUPPLIER hires one or many DRIVERS
- Each VEHICLE is owned by one and only one SUPPLIER
- Each SUPPLIER owns one or many VEHICLES
- Each BOOKING is completed with one and only one VEHICLE
- Each VEHICLE can complete one or many BOOKINGS

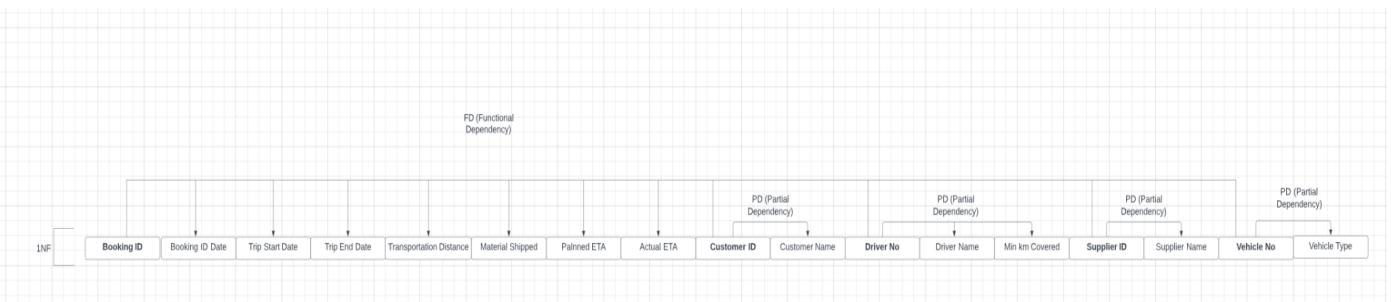


## ERD

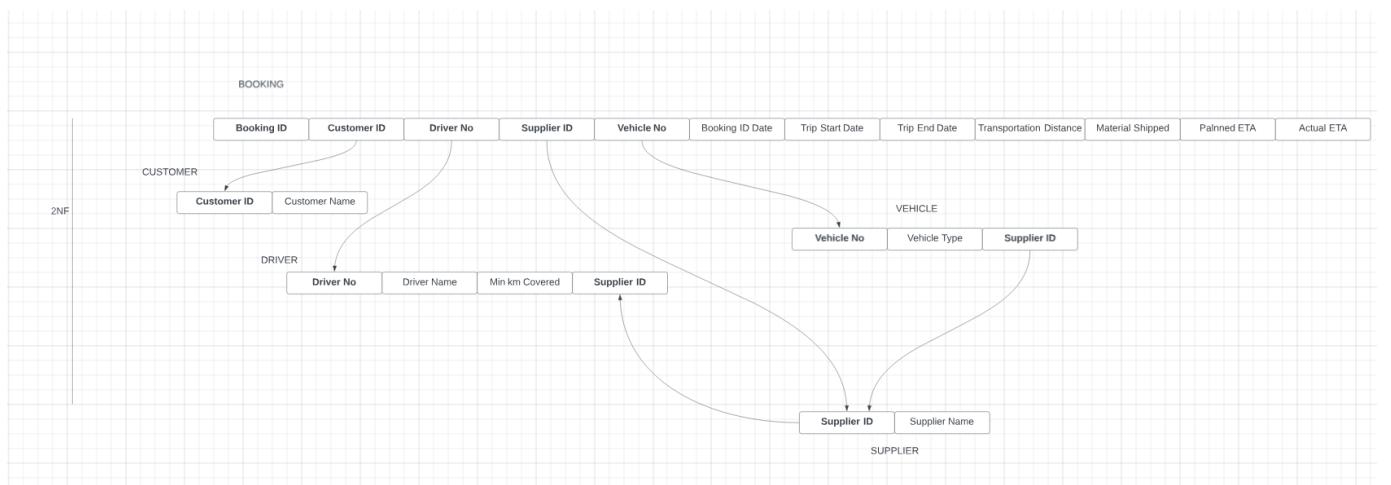




## Relational Data Model (1NF)



## Normalization(2NF)





## Queries

### Query 1: (Denise)

What percent of drivers have an unknown (999) supplier ID?

- Display the percentage of drivers that have '999' as their supplier ID

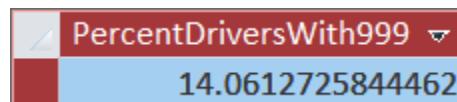
```
SELECT (COUNT(Driver_Name) * 100.0 / (SELECT COUNT(Driver_Name) FROM Driver)) AS PercentDriversWith999  
FROM Driver  
WHERE SupplierID = "999";
```

### Conclusion:

14% of the drivers are identified with an unknown supplier ID(coded as 999). By knowing what percent of the drivers with unknown supplier IDs, PDD can closely track the updates of their records to ensure accurate data quality and integrity as well as the operational efficiency which is crucial to logistics and fleet management.

### Recommendation:

Identify the potential gaps in onboarding and documentation processes that lead to selecting an unknown supplier ID. Addressing this issue will lead to a smoother operational efficiency and reduce likelihood of errors.





## Query 2: (Emely)

What is the average Transportation distance that is above the minimum 250 km?

What is the maximum Planned ETA?

- Since the minimum km to be covered in a day is 250, we wanted to show the average distance in km equal to or greater than to 250 km
- Displays the average of the of each Supplier and Driver Number
- Displays Maximum Planned ETA

```
SELECT D.SupplierID, D.Driver_MobileNo, MAX(B.Planned_ETA) AS MAXPLANNEDETA,  
AVG(B.Transportation_Distance) AS AVGDistanceinKM  
FROM Booking B, Driver D  
WHERE D.Driver_MobileNo = B.Driver_MobileNo  
AND B.Transportation_Distance >= 250  
GROUP BY D.Driver_MobileNo, D.SupplierID
```

### Recommendation:

The average distance in KM was around 1175 KM. Since the minimum distance to be traveled is 250 KM, the Suppliers and Drivers should try to aim for more than 1175 KM traveled to be efficient.

SupplierID	Driver_MobileNo	MAXPLANNEDETA	AVGDistance
57878	6006291329	6/21/2023 1:41:41 PM	1900
75567	6006450076	8/6/2023 5:28:49 PM	2262.5
57828	6201994678	7/24/2023 4:09:00 AM	531
57828	6202125568	6/20/2023 8:30:00 PM	623
58152	6203975611	2/6/2023 9:22:28 AM	451
999	6204355364	7/28/2023 5:46:37 AM	2238
57828	6205420594	3/20/2023 9:18:21 PM	293
57828	6205430187	1/15/2023 8:32:26 PM	293
57828	6207362527	7/9/2023 5:52:00 PM	591
67883	6260225039	8/4/2023 8:16:10 AM	1178
59524	6261189483	8/17/2023 3:28:44 PM	1400
68027	6261326541	8/17/2023 1:14:56 AM	2425
58152	6264766781	7/9/2023 5:37:00 PM	601
999	6280304216	8/1/2023 5:18:52 AM	2116
67829	6282860353	7/28/2023 7:26:19 PM	1199
55471	6289598802	1/30/2023 4:48:53 AM	400
55471	6290171045	7/11/2023 12:14:00 PM	601
78384	6294471721	7/22/2023 2:00:00 AM	427
999	6305434550	8/8/2023 2:08:06 PM	2424
67881	6306261659	8/10/2023 2:54:55 PM	2600
67881	6306866913	7/30/2023 3:51:41 PM	2600
76414	6350012805	6/16/2023 1:53:05 PM	1975
75567	6350246640	7/17/2023 3:33:59 AM	1400
67883	6351010831	7/22/2023 3:32:36 PM	1626
67883	6351773196	8/13/2023 1:11:46 PM	1394.25
999	6352038550	7/19/2023 1:38:01 AM	1823
68005	6362435934	9/1/2023 8:36:47 PM	1900
50898	6363053890	8/26/2023 9:15:39 PM	1290
57828	6369248907	7/9/2023 4:39:00 PM	818

SupplierID	Driver_MobileNo	MAXPLANNEDETA	AVGDistanceinKM
67928	6378281336	6/10/2023 6:07:21 PM	2455
68041	6379080613	9/2/2023 1:54:23 PM	1290
68007	6379294770	8/13/2023 8:07:18 PM	525
67789	6380609743	8/16/2023 5:02:48 PM	400
67737	6381622638	8/31/2023 10:39:48 PM	365
67829	6382193274	7/21/2023 3:49:46 PM	1269.75
75656	6382356927	8/24/2023 2:12:06 PM	2412.5
999	6383018039	1/3/2023 4:22:35 AM	320
67829	6383778121	7/23/2023 8:01:08 PM	1192.5
67786	6383778267	8/31/2023 8:52:09 PM	1759.444444444444
67883	6386493187	7/23/2023 4:01:24 PM	1626
75656	6387494503	8/18/2023 2:37:05 PM	2405
55471	6389221441	1/25/2023 7:19:20 AM	671
68005	6396821437	8/31/2023 1:55:08 PM	1740
67871	6397292730	8/3/2023 10:54:31 AM	1178
59500	6397315334	8/24/2023 3:35:19 PM	2750
75567	6397705580	6/15/2023 4:15:29 PM	2750
67871	6397795593	8/5/2023 3:03:38 PM	1775
68027	6398334178	7/30/2023 3:58:48 PM	2445
73142	6398414860	7/3/2023 11:56:46 PM	2750
999	6398514943	8/15/2023 9:51:17 PM	2230
76249	6398669272	7/12/2023 3:36:16 PM	1175
75656	7000037648	8/27/2023 1:53:44 PM	2425
67883	7000364205	7/31/2023 7:51:04 AM	1178
67779	7002423062	8/27/2023 2:40:06 PM	1567.5
67829	7002675889	8/5/2023 6:17:51 PM	1199
75656	7007339353	8/16/2023 2:37:59 PM	2425
999	7010440944	7/19/2023 10:43:07 PM	314
67730	7010768048	8/26/2023 3:27:17 PM	1229.666666666667



### Query 3: (Ashley)

What is the bandwidth of each supplier? Which supplier has the longest average trip duration?

- Display the Supplier ID, Supplier Name Code, Count of Drivers for each Supplier, and the average trip time for each Supplier

```
SELECT DISTINCT B.SupplierID, S.Supplier_Name_Code, COUNT(D.Driver_MobileNo)
AS CountDrivers , AVG(Trip_Elapsed_Time) AS AvgTripTime
FROM Booking B, Supplier S, Driver D
WHERE B.SupplierID=S.SupplierID
AND S.SupplierID = D.SupplierID
AND B.Driver_MobileNo = D.Driver_MobileNo
GROUP BY B.SupplierID, Supplier_Name_Code
ORDER BY AVG(Trip_Elapsed_Time) DESC
```

### Conclusion:

Overall Average Count of Drivers is 14 drivers per each supplier. Suppliers with less than 13 drivers have the longest Average Trip Time at 8.5 days per trip.  
Suppliers with 13+ Drivers have an Average Trip time of 5.6 days per trip.

### Recommendation:

Cease partnership with Suppliers that have less than 13 drivers to optimize average delivery times.

SupplierID	Supplier_Name_Code	CountDrivers	AvgTripTime	SupplierID	Supplier_Name_Code	CountDrivers	AvgTripTime
11443	SRI HARI ROADWAYS	2	47.711458333384	67779	EKTA TRANSPORT COMPANY	243	5.4275607233331
69656	SUREKHABEN KALUBHAI NAKUM	1	41.0223379629606	999	UNKNOWN	224	12.9288103235708
67759	CTC TRANSLOGISTIC PVT LTD	2	33.8954166666663	68027	TRANS CARGO INDIA	184	6.11736937830682
78747	TROCKO LOGI PRIVATE LIMITED	2	33.0538194444453	67829	KRC LOGISTICS	166	4.41208982610664
53713	INSTANT TRANSPORT SOLUTION PRI	1	31.9372106481533	68045	VJ LOGISTICS	99	3.45842604524622
79893	SRI OM CARGO CHENNAI	1	31.1688657407431	55471	SUNITA CARRIERS PRIVATE LIMITED	95	7.31214268124522
52996	SURESH N	1	24.9109375000044	66395	A P R TRAILLER SERVICE	75	8.78429908769088
68898	SKYWING CARRIERS PVT. LTD.	1	23.798460648155	68004	SREE SAKTHI TRANSPORT	73	0.899893422067382
66198	BALAJI FREIGHT CARRIER	3	20.5696141975277	58152	AS LOGISTICS	73	6.79842512217025
73920	MATAJI ROADLINES	5	19.1445740740746	57828	SHRI GANESH TRADERS AND TRANSI	63	5.69950945216127
8609	CHATURBUJU LOGISTICS DELHI	1	18.8892824074137	75567	RAJDHANI ROADWAYS	63	5.97618606701895
65522	FAST TRADERS	4	17.450462962964	75656	R.SAI LOGISTICS INDIA PVT.LTD	61	4.87386836128555
57827	AS CARGO MOVERS	2	17.3438252314845				
67928	SAHIL CARGO CARRIERS	8	16.6030497685188				
70331	VNV ENTERPRISES	2	16.4657002314816				
58090	SENGAR ROAD LINES	10	16.262408693414				
67998	SRK TRANSPORT	1	15.9257060185191				
68317	RATHI ROAD LINES	2	15.8900231481493				



#### Query 4: (Robert)

What percentage of Customers receive their booking by its planned ETA?

- Display CustomerID, Customer Name, and the percentage of bookings that were received on time (by its planned ETA)

```
SELECT Customer.CustomerID, Customer.Customer_Name,  
IIf(Count(Booking.BookingID) = 0, 0, (Sum(IIf(Booking.Actual_ETA <=  
Booking.Planned_ETA, 1, 0)) / Count(Booking.BookingID)) * 100) AS  
PercentageOnTime  
FROM Customer  
INNER JOIN Booking ON Customer.CustomerID = Booking.CustomerID  
GROUP BY Customer.CustomerID, Customer.Customer_Name;
```

#### Conclusion:

From the database, it is showing that 4 out of the 29 customers who put in an order receive an on time delivery rate of 90% or higher. That means 86% of the rest of the clientele do not receive their shipments on time. The implication here is that there are bottlenecks when the shipment leaves the facility and there needs to be an in-depth analysis into what causes these delays whether it be internal factors or external.

#### Recommendation:

The company needs to analyze what is bottlenecking its operations when it comes to delivery times. The Company should look into areas such as route projections, vehicle operations, driver training, and so forth in order to optimize its effectiveness when delivering its products to customers on time.

CustomerID	Customer_Name	PercentageOnTime
ALLEXCHE45	ASHOK LEYLAND LIMITED	90
AVCEXCHEIP	AMALGAMATIONS VALEO CLUTCH PVT	0
BILGCCHE02	BRAKES INDIA PRIVATE LTD	29.1390728476821
CMHEXPUNMB	CUMMINS TECHNOLOGIES INDIA PVT LTD	50
CSYEXCHEM2	COMSTAR AUTOMOTIVE TECHNOLOGIES PVT LTD	50
DMREXCHEUX	DAIMLER INDIA COMMERCIAL VEHICLES PVT LT	51.5021459227468
ERCEXPUNGT	ERICSSON INDIA PRIVATE LIMITED	10.5
FILEXCHE19	FORD INDIA PRIVATE LIMITED	41.6793893129771
GTIEXHAL80	GETRAG TRANSMISSIONS INDIA PVT LTD	75
GTKEXGURJS	G-TEKT INDIA PVT LTD.	58.3333333333333
JBLEXGURT6	JAY BHARAT MARUTI LIMITED	0
JIDEXPUNTB	JINDAL POLY FILMS LTD	13.3333333333333
JMAEXPUNJY	JBM MA AUTOMOTIVE PVT LTD	0
KOVEXTNUD4	KONE ELEVATOR INDIA PRIVATE LIMITED	1.47058823529412
KUAEXPAD0L	KUSAUTO INDIA PVT LTD	33.3333333333333
LTEXMUM40	LARSEN & TOUBRO LIMITED	34.426295081967
LUTGCCHE06	LUCAS TVS LTD	41.7721518987342
NEMEXGURH5	NEEL METAL PRODUCTS LTD	0
OTIEXHOSJM	OTIS ELEVATOR COMPANY (INDIA) LTD	2.77777777777778
RCKEXGURBP	ROCKMAN INDUSTRIES LIMITED	91.6666666666667
SCTGCMAD13	TVS SRICHAKRA LIMITED	30.4347826086957
SPIEXPUNJ4	SPICER INDIA PRIVATE LTD	23.5294117647059
SRIEXCHE05	TVS SRICHAKRA LIMITED	0
SVDEXHOS48	CONTINENTAL AUTOMOTIVE COMPONENTS INDIA	100
TELGCCHE03	TURBO ENERGY PVT LTD	0
TMGCCHE05	TVS MOTOR COMPANY LIMITED	58.0952380952381
VLEEXPADHC	VALEO INDIA PRIVATE LTD	50
WABGCCHE17	WABCO INDIA LTD	100
WENEXBAN18	WIPRO ENTERPRISES PVT LTD	12.3287671232877

Record: 14 | 1 of 29 | Back | Next | No Filter | Search |



### Query 5: (Ashley)

How many bookings had a Trip\_Elapsed\_Time that was at least 2x greater than the average booking Trip\_Elapsed\_Time of each Customer? Is there a relationship between a longer trip time and Material Shipped?

- Display Customer ID, Booking ID, Trip Elapsed Time, Average Elapsed Time for each customer, and Material Shipped

```
SELECT OutsideT.customerID, BookingID, Trip_Elapsed_Time,
(SELECT AVG(Trip_Elapsed_Time)
FROM Booking AS B
GROUP BY B.customerID
HAVING B.customerID = OutsideT.customerID) as AvgElapsedTime, MaterialShipped
FROM Booking AS OutsideT
WHERE Trip_Elapsed_Time >=
2*(SELECT AVG(Trip_Elapsed_Time)
FROM Booking AS B
GROUP BY B.customerID
HAVING B.customerID = OutsideT.customerID)
ORDER BY Trip_Elapsed_Time DESC
```

#### Conclusion:

There were 200 bookings that had a Trip\_Elapsed\_Time that was at least 2x greater than the average booking Trip\_Elapsed\_Time for each customer.

There was no clear relationship between Material Shipped and a longer than average trip elapsed time. However, approximately 42% of the bookings in the query were marked as shipping a generic "AUTO PARTS" under Material Shipped.

#### Recommendation:

PDD should incorporate Material Shipped size and/or weight information in their company data. These details could contribute to a longer trip time if materials are larger or heavier than average.

customerID	BookingID	Trip_Elapsed_Time	AvgElapsedTime	MaterialShip
LTLEXMUM40	AEIBK2018196	57.88	7.68229542259872	AUTO PARTS
LTLEXMUM40	AEIBK2018192	57.82	7.68229542259872	AUTO PARTS
LTLEXMUM40	AEIBK2018226	57.76	7.68229542259872	58273M68P00-1
LTLEXMUM40	AEIBK2018280	57.00	7.68229542259872	AUTO PARTS
LTLEXMUM40	AEIBK2018281	56.89	7.68229542259872	M12 BANJO-ST
LTLEXMUM40	AEIBK2018304	56.86	7.68229542259872	SUPP ASSY BOD
LTLEXMUM40	AEIBK2018305	56.76	7.68229542259872	AUTO PARTS
LTLEXMUM40	AEIBK2018195	55.99	7.68229542259872	SOLENOID ASS'
OTIEXHOSJM	AEIBK2019932	47.71	17.5129327417703	AUTO PARTS
LTLEXMUM40	AEIBK2018307	46.87	7.68229542259872	BKT FUEL TANK
LTLEXMUM40	AEIBK1910558	44.78	7.68229542259872	AUTO PARTS
LTLEXMUM40	AEIBK2011323	43.79	7.68229542259872	Ball Bearing
LTLEXMUM40	AEIBK1906953	41.02	7.68229542259872	AUTO PARTS
OTIEXHOSJM	AEIBK2022763	37.98	17.5129327417703	SOL SWITCH AS
OTIEXHOSJM	AEIBK2020540	37.79	17.5129327417703	AUTO PARTS
OTIEXHOSJM	AEIBK2020581	37.01	17.5129327417703	AUTO PARTS
OTIEXHOSJM	AEIBK2020139	36.91	17.5129327417703	GRS STARTER
OTIEXHOSJM	AEIBK2023416	36.81	17.5129327417703	ARMATURE ASS'
DMREXCHEUX	AEIBK2021813	36.69	4.50146820846103	HOOK,LUGGAG
LTLEXMUM40	AEIBK2011179	36.04	7.68229542259872	SOLENOID ASS'
OTIEXHOSJM	AEIBK2020797	35.61	17.5129327417703	AUTO PARTS
DMREXCHEUX	AEIBK2021499	33.05	4.50146820846103	STIFFNER FOR C



### Query 6: (Angelica)

How does the average delay in arrival times vary among suppliers? Are there suppliers consistently experiencing higher or lower delays in their trip arrivals?

- Display Supplier ID, Supplier Name Code, and the Average Delay in Minutes (by using Actual ETA – Planned ETA)

```
SELECT s.SupplierID, s.Supplier_Name_Code,
AVG((b.actual_eta - b.Planned_ETA) * 24 * 60) AS avg_delay_minutes
FROM Supplier AS s
INNER JOIN Booking AS b ON s.SupplierID = b.SupplierID
WHERE b.Planned_ETA IS NOT NULL
AND b.actual_eta IS NOT NULL
GROUP BY s.SupplierID, s.Supplier_Name_Code
ORDER BY s.SupplierID;
```

#### Conclusion:

Supplier TAMIL TRANSPORT, and SUREKHABEN KALUBHAI NAKUM demonstrate higher average delays compared to others, this would imply potential issues in their operations.

#### Recommendation:

Analyze common routes among suppliers that experience higher delays to attempt to identify potential issues and alter the routes for better efficiency.

SupplierID	Supplier_Name_Code	avg_delay_minutes
67236	TAMIL TRANSPORT	216585.5392166663
69656	SUREKHABEN KALUBHAI NAKUM	59112.937283339
60901	K.RAMACHANDRAN TRANSPORTS	54624.1674057146
59070	VINOD KAPOOR AND SONS	52163.5242208335
68018	TCI SUPPLY CHAIN SOLUTIONS	50866.6922944423
11443	SRI HARI ROADWAYS	47451.3953916711
60862	KADAVATH RAVI	39750.9770833317
55556	A S TRANSPORTS	39355.9674838092
63916	SHRI SAI ENTERPRISES	35101.5541287369
67707	ADM LOGISTICS	28846.5316166589
53713	INSTANT TRANSPORT SOLUTION PRI	27282.6021666604
79893	SRI OM CARGO CHENNAI	23225.3128666693
70489	K M R TRANSPORT	21005.6815643927
55559	DISTRIBUTION LOGISTICS INFRASTRU	20132.5362793341
58481	BABA LINGARAJ ENTERPRISES PVT L	19858.3515978788
67759	CTC TRANSLOGISTIC PVT LTD	18181.2157250033
62767	BIG TRUCK TECHNOLOGIES PVT LTD	16676.2557499926
68912	JUPITER EXPRESS CARRIER PVT. LTD	16629.6029842108
55471	SUNITA CARRIERS PRIVATE LIMITED	16598.0957820828
52996	SURESH N	16589.0897166647
66198	BALAJI FREIGHT CARRIER	16220.783149997
67928	SAHIL CARGO CARRIERS	16192.094277084
68317	RATHI ROAD LINES	15367.7833333367
67992	SRI VINAYAKA TRANSPORT	14766.4360273822
66395	A P R TRAILLER SERVICE	13982.3083655567
45372	RAHUL KUMAR	13841.5143333294
79734	CONDOR SUPPLY CHAIN SOLUTIONS	13682.8848833393
999	UNKNOWN	13223.2832890057
67883	PAWAN R LOGISTICS	12678.3063638882



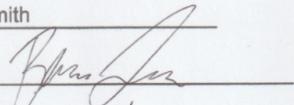
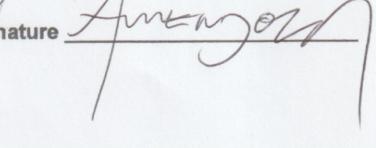
## Recommendations for the Business

To enhance the operational efficiency and ensure a timely delivery of automobile parts, Parts Delivery Direct (PDD) should focus on upgrading the onboarding and documentation processes. This improvement would reduce the risk of engaging with non-validated supplier IDs, ensuring a more reliable supply chain. Additionally, by encouraging suppliers and drivers to consistently surpass the average distance traveled to 1175 KM per journey, PDD can maximize driver productivity and logistical efficiency. PDD would also benefit from reevaluating its current supplier partnerships and consider terminating arrangements with suppliers that particularly manage less than 13 drivers to optimize average delivery times and enhance customer satisfaction. PDD should embark on an in-depth analysis of the factors contributing to delivery delays. Focusing on improving areas such as logistical routing, vehicle operation and a driver education program could uncover critical insights for potential improvements to the company. PDD can gain valuable knowledge that may lead to significant advancements in operational efficiency. Additionally, PDD should incorporate material size and weight data into their records, as these factors can substantially influence trip duration. Lastly, a detailed analysis of common routes prone to delays should be conducted since it could unveil specific inefficiencies, allowing for strategic alterations to improve the overall service quality. Through the integration of these recommendations, PDD can anticipate a significant uplift in its logistical efficiency and enhanced delivery performance.



## Appendix

### Delivery Receipt Example

DELIVERY RECEIPT			
Company Name: <u>Parts Delivery Direct (PDD)</u>	Street Address: <u>12341 Harvey Street</u>	City, State, Zip: <u>Boise, ID, 17234</u>	Phone: <u>1 (800) 123-4567</u>
Fax: <u>N/A</u>	Email: <u>E.Callejas@ShippingPDD.com</u>	Website: <u>N/A</u>	
Date: <u>1/1/2023</u>	BOOKING #: <u>AEIBK1906955</u>		
Delivery Information			
Description of delivered item(s): _____			
CustomerID: <u>LTLEXMUM40</u>			
GRS STARTER			
Delivered to: <u>LARSEN &amp; TOUBRO LIMITED</u>		Street Address: <u>777 W River Street</u>	
City, State, Zip: <u>Boise, ID, 83709</u>		Phone: <u>(xxx) xxx-xxxx</u>	
Summary of Charge			
Payment Method: <input checked="" type="checkbox"/> Cash <input type="checkbox"/> Other: _____	<input type="checkbox"/> Credit (No. _____) <input type="checkbox"/> Check (No. _____)	Delivery Charge Tax Rate Total Tax Total Amount Due	\$xx.xx \$xx.xx \$xx.xx \$xx.xx
Comments: <u>Shipping packaging slightly damaged upon arrival, recipient accepted delivery.</u>			
Received by: <u>John Smith</u>			
Recipient Signature			
Delivery Person Signature	 <b>e</b>		
Page 1 of 1			



## Materials Invoice Example

MATERIALS INVOICE			
<b>FROM</b>		<b>DETAILS</b>	
COMPANY: Parts Delivery Direct (PDD)		DATE: 11/29/2022	
ATTN: Emely Callejas		BOOKING #: AEIBK1906955	
ADDRESS: 12341 Harvey Street		ETA: 12/10/2022	
CITY, STATE: Boise, ID			
ZIP: 17234			
PHONE: 1 (800) 123-4567			
E-MAIL: E.Callejas@ShippingPDD.com			
<b>BILL TO</b>		<b>SHIPPING</b>	
COMPANY: LARSEN & TOUBRO LIMITED		COMPANY: LARSEN & TOUBRO LIMITED	
ATTN: John Smith		ATTN: John Smith	
ADDRESS: 777 W River Street		ADDRESS: 777 W River Street	
CITY, STATE: Boise, ID		CITY, STATE: Boise, ID	
ZIP: 83709		ZIP: 83709	
PHONE: (xxx) xxx-xxxx		PHONE: (xxx) xxx-xxxx	
E-MAIL: J.Smith01@Laresen.Toubro.com		E-MAIL: J.Smith01@Laresen.Toubro.com	
MATERIALS	QUANTITY	UNIT PRICE	AMOUNT (\$)
GRS STARTER	1	\$xx.xx	\$xx.xx
NOTES / SPECIAL REQUESTS: N/A		SUBTOTAL	\$xx.xx
		DISCOUNT	N/A
		TAX / VAT	\$xx.xx
		SHIPPING	\$xx.xx
		TOTAL	\$xx.xx
THANK YOU FOR YOUR BUSINESS			



## Snapshot of Database Tables

### Booking Table

BookingID	BookingID_F	trip_start_date	trip_end_da	Trip_Elapsed	Transporta	Planned_ET	actual_eta	customerID	Driver_Mobi	vehicle_no	supplierID	MaterialShip
AEIBK1906953	11/29/2022	11/29/2022 15:17	1/9/23 15:50	41.02	25	11/30/22 17:41	1/10/23 18:54	LTEXMUM40	9399996965	GJ27X6294	69656	AUTO PARTS
AEIBK1906955	11/29/2022	11/29/2022 15:10	1/1/23 14:24	32.97	25	11/30/22 17:34	12/10/22 3:36	LTEXMUM40	894927522	GJ15U7437	66198	GRS STARTER
AEIBK1908445	12/13/2022	12/13/2022 19:48	2/13/23 10:18	61.60	632	12/15/22 9:54	6/14/23 19:19	LTEXMUM40	8121325599	CG04MM6741	55471	AUTO PARTS
AEIBK1909461	12/20/2022	12/20/2022 15:06	1/10/23 12:56	20.91	25	12/21/22 17:30	1/10/23 16:13	LTEXMUM40	7349404436	GJ18AU8838	999	72382M68P00
AEIBK1909663	12/20/2022	12/20/2022 18:48	1/10/23 17:16	20.94	148	12/22/22 9:00	1/1/23 3:39	LTEXMUM40	6201994678	NL01K7906	57828	AUTO PARTS
AEIBK1910132	12/25/2022	12/25/2022 19:56	1/10/23 17:16	15.89	98.1	12/27/22 5:21	1/4/23 2:59	LTEXMUM40	6201157407	NL01D5206	57828	PLUG MODG
AEIBK1910558	12/27/2022	12/27/2022 19:56	2/10/23 14:37	44.78	531	12/29/22 7:44	3/22/23 5:57	LTEXMUM40	9943352912	CG04MA6993	55471	AUTO PARTS
AEIBK1910732	12/29/2022	12/29/2022 18:23	1/10/23 20:49	12.10	78.5	12/31/22 1:55	1/7/23 2:36	LTEXMUM40	8650072232	OD14L7676	999	SOLENOID SWI
AEIBK1910975	12/30/2022	12/30/2022 16:25	1/10/23 17:16	11.04	275	1/1/23 18:49	1/7/23 5:56	LTEXMUM40	7645876810	NL01D4532	57828	AUTO PARTS
AEIBK2010988	12/30/2022	12/30/2022 18:48	1/10/23 20:49	11.08	210	1/1/23 14:57	1/7/23 5:21	LTEXMUM40	9163693717	WB11B2152	55471	AUTO PARTS
AEIBK2010994	12/30/2022	12/30/2022 21:36	1/10/23 20:49	10.97	51	1/1/23 2:29	1/7/23 1:49	LTEXMUM40	6290171045	WB76A1852	999	EMPTY TRAYS
AEIBK2011093	12/31/2022	12/31/2022 21:39	1/13/23 14:31	12.70	320	1/3/23 4:22	1/27/23 21:19	LTEXMUM40	6383018039	GJ01DV8505	999	T BOLT CLAMP-
AEIBK2011173	1/4/2023	1/4/2023 14:29	2/3/23 10:12	29.82	160	1/6/23 5:50	2/3/23 12:56	LTEXMUM40	9355651335	UP17AT8554	66395	LUCAR PLADE
AEIBK2011174	1/4/2023	1/4/2023 14:30	2/3/23 10:12	29.82	160	1/6/23 5:51	2/3/23 13:22	LTEXMUM40	7611203050	UP17AT1709	66395	SOLENOID SWI
AEIBK2011176	1/4/2023	1/4/2023 14:30	1/24/23 15:51	20.06	160	1/6/23 5:51	1/24/23 18:31	LTEXMUM40	6392131993	UP17AT7376	66395	CAP ASY FU/TN
AEIBK2011177	1/4/2023	1/4/2023 14:30	2/2/23 9:35	28.79	160	1/6/23 5:51	2/2/23 12:09	LTEXMUM40	7838612886	UP17AT1630	66395	solenoid fixing
AEIBK2011179	1/4/2023	1/4/2023 14:30	2/9/23 15:29	36.04	160	1/6/23 5:51	2/4/23 2:48	LTEXMUM40	8433419375	UP78DN2409	66395	SOLENOID ASS'
AEIBK2011181	1/4/2023	1/4/2023 14:40	1/21/23 12:08	16.89	160	1/5/23 17:16	1/21/23 13:20	LTEXMUM40	8941008186	UP17AT0447	68317	SOLENOID ASSI
AEIBK2011232	1/5/2023	1/5/2023 15:04	1/12/23 12:21	6.89	48	1/6/23 19:40	3/16/23 16:07	LTEXMUM40	9494970389	TS15UD5174	70489	Empty CB
AEIBK2011280	1/5/2023	1/5/2023 18:50	1/20/23 12:43	14.74	282	1/7/23 21:54	1/14/23 4:45	LTEXMUM40	9163693717	NL01D3087	55471	Empty trays
AEIBK2011283	1/5/2023	1/5/2023 18:50	1/10/23 22:11	5.14	30	1/6/23 21:42	1/10/23 23:14	LTEXMUM40	9928911104	NL01G0056	55471	AUTO PARTS
AEIBK2011318	1/5/2023	1/5/2023 21:17	1/22/23 11:48	16.60	30	1/7/23 0:09	1/22/23 13:00	LTEXMUM40	9938166517	OR14T0317	59070	BRACKETRHFOI
AEIBK2011320	1/5/2023	1/5/2023 21:22	2/2/23 15:36	27.76	30	1/7/23 0:14	1/19/23 1:34	LTEXMUM40	9938936309	OR14U6631	55471	AUTO PARTS
AEIBK2011323	1/5/2023	1/5/2023 21:12	2/18/23 16:13	43.79	200	1/7/23 16:24	3/13/23 21:04	LTEXMUM40	9090516731	OR02AM3651	58481	Ball Bearing



## Customer Table

CustomerID	Customer_Name
ALLEXCHE45	ASHOK LEYLAND LIMITED
AVCEXCHEIP	AMALGAMATIONS VALEO CLUTCH PVT
BILGCCHE02	BRAKES INDIA PRIVATE LTD
CMHEXPUNMB	CUMMINS TECHNOLOGIES INDIA PVT LTD
CSYEXCHEM2	COMSTAR AUTOMOTIVE TECHNOLOGIES PVT LTD
DMREXCHEUX	DAIMLER INDIA COMMERCIAL VEHICLES PVT LTD
ERCEXPUNTG	ERICSSON INDIA PRIVATE LIMITED
FILEXCHE19	FORD INDIA PRIVATE LIMITED
GTIEXHAL80	GETRAG TRANSMISSIONS INDIA PVT LTD
GTKEXGURJS	G-TEKT INDIA PVT LTD.
JBLEXGURT6	JAY BHARAT MARUTI LIMITED
JIDEXPUNTB	JINDAL POLY FILMS LTD
JMAEXPUNJY	JBM MA AUTOMOTIVE PVT LTD
KOVEXTNUD4	KONE ELEVATOR INDIA PRIVATE LIMITED
KUAEXMAD0L	KUSAUTO INDIA PVT LTD
LTEXMUM40	LARSEN & TOUBRO LIMITED
LUTGCCHE06	LUCAS TVS LTD
NEMEXGURH5	NEEL METAL PRODUCTS LTD
OTIEXHOSJM	OTIS ELEVATOR COMPANY (INDIA) LTD
RCKEXGURBP	ROCKMAN INDUSTRIES LIMITED
SCTGCMAD13	TVS SRICHAKRA LIMITED
SPIEXPUNJ4	SPICER INDIA PRIVATE LTD
SRIEXCHE05	TVS SRICHAKRA LIMITED
SVDEXHOS48	CONTINENTAL AUTOMOTIVE COMPONENTS INDIA
TELGCCHE03	TURBO ENERGY PVT LTD
TMCGCCH05	TVS MOTOR COMPANY LIMITED
VLEEXMADHC	VALEO INDIA PRIVATE LTD
WABGCCHE17	WABCO INDIA LTD
WENEXBAN18	WIPRO ENTERPRISES PVT LTD



## Driver Table

Driver_MobileN	Driver_Name	Minimum_kg	SupplierID
8617848627	Om Prakash Giri	250	78384
8638196131	Kapil Ahmed Barbhuiy	250	58152
8650072232	Bilal Ali	250	999
8650082434	Ram Kishan	250	999
8658465655	Pradeep Kumar Swain	250	58481
8688080339	Pydi Naidu G	250	63916
8694949408	Sonu Chuodhry	250	999
8697033116	Harendra Kr Prasad	250	58090
8709734953	Neyazuddin	250	999
8481880430	Lalmani Shukla	250	55471
8482020224	Mahendra Shaw	250	58091
8486948996	Manirul Mia	250	58152
8501005811	Koteesu Akkireddy	250	63916
8544049575	Jagat Ray	250	58152
8569321245	Devaraj V	250	60901
8582884280	Bijay Prasad	250	63682
8583946223	Raj Narayan Mahato	250	58152
8584053660	Prabhu R	250	999
8585805935	Binay Kumar Ram	250	55471
8596454585	Jai Prakash Yadav	250	63916
8596494345	Vijay Mahto	250	58152
8597437316	Ratan Kumar Yadav	250	55471
8600515308	Asadulla	250	63449
8608405788	Devaraj M	275	67236
8754327654	Amresh Kumar Ray	250	55471
8754567654	Sarfaraj Khan	250	55556
8755153273	Vvinod Kumar Pal	250	66261
8790507430	Govind	250	63916
8800326718	Rajesh Yadav	250	64093



## Supplier Table

SupplierID	Supplier_Name_Code
777	S.M EXPRESS
790	MRM TRANSPORT
999	UNKNOWN
1615	AKR TRANSPORT
2785	SREE MAHAA ROADLINES
2837	WDSI TRANSPORT
6415	SV GLOBAL_MARKET VEHILCE
6961	NEW GOLDEN ROADINES CHENNAI
8205	JAI GANGA TRANSPORT COMPANY
8530	SAKTHIVEL C P
8590	SUNITA
8609	CHATURBHUJ LOGISTICS DELHI
9028	K.L.TRANSPORT
9482	RDA ROADWAYS
10107	P V LOGISTICS
11443	SRI HARI ROADWAYS
21810	UNIQUE INDUSTRIES
24512	AKS
24521	AMMAI APPA
24555	AST TRANS
24619	GST
24674	KANNAN THUNAI
24699	KPR SANKARI
24782	MPR SEKAR
24794	MS ROADWAYS
24805	MURUGAN THUNAI
24808	MURUGAVEL 85
24825	NEW PKS



## Vehicle Table

vehicle_no	vehicleType	SupplierID
AP02TA9639	40 FT 3XL Trailer 35MT	59381
AP02TC7075	19 FT Open 7MT - MCV	999
AP02TH5553	19 FT Open 7MT - MCV	57827
AP03TA8998	22 FT Taurus Open 16MT - HCV	999
AP03TF2576	28 FT Open Body 25MT	55804
AP03X3293	40 FT Flat Bed Multi-Axle 27MT - Trailer	55471
AP04TT7799	24 / 26 FT Taurus Open 21MT - HCV	63682
AP04TW0521	19 FT Open 7MT - MCV	999
AP04TW1166	40 FT 3XL Trailer 35MT	60169
AP04TW3777	24 / 26 FT Taurus Open 21MT - HCV	9028
AP04TX7857	24 / 26 FT Taurus Open 21MT - HCV	63682
AP04V0830	40 FT Flat Bed Single-Axle 20MT - Trailer	62950
AP04X2715	40 FT Flat Bed Multi-Axle 27MT - Trailer	63060
AP04Y3165	40 FT Flat Bed Multi-Axle 27MT - Trailer	55471
AP05TG4914	19 FT OPEN BODY 8 MT	62573
AP05TU9677	31 FT Open Body 18MT	55471
AP07TD9869	24 / 26 FT Taurus Open 21MT - HCV	63682
AP07TF5166	26 FT Taurus Open 27MT - HCV	41378
AP07TG2129	24 / 26 FT Taurus Open 21MT - HCV	63682
AP07Y3859	22 FT Taurus Open 16MT - HCV	25457
AP10T8685	40 FT Flat Bed Multi-Axle 27MT - Trailer	59662
AP12V4807	40 FT 3XL Trailer 35MT	59018
AP12V4822	40 FT 3XL Trailer 35MT	55471
AP12V6358	40 FT Flat Bed Multi-Axle 27MT - Trailer	59662
AP13X6669	40 FT 3XL Trailer 35MT	63916
AP16TB0369	40 FT Flat Bed Multi-Axle 27MT - Trailer	62950
AP16TB1358	40 FT 3XL Trailer 35MT	58410
AP16TB7865	40 FT 3XL Trailer 35MT	58410
AP16TB8404	40 FT Flat Bed Multi-Axle 27MT - Trailer	55471