

# Project Title: Logistics & Transportation- Fleet Performance & Delivery Efficiency

## Project steps:

\*Below the question, answer description and respective screenshots attached.

## 1. Data Cleaning & Modeling:

Q1a) Fix missing fuel consumption values (use avg. per vehicle type)?

The missing fuel value was replaced with the **average fuel consumption for its vehicle type** (Trip ID T050, Vehicle ID,V06 Van) using the **Group By method in Power Query**. The calculated average was **81.38 litres**, and this value was used to fill the null using replace values.

### Group By

Specify the column to group by and the desired output.

☒ Basic ☐ Advanced

Vehicle Type

New column name

Average Fuel

Operation

Average

Column

Fuel\_Consumed\_L

OK

Cancel

= Table.Group(#"Removed Blank Rows",	
Vehicle Type	Average Fuel
1 Mini-Truck	105.7144444
2 Van	81.38809524
3 Truck	95.57210526

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Group By Use First Row as Headers Count Rows Table

Data Type: Decimal Number Replace Values Unpivot Columns

Split Column Format Parse

Statistics Standard Scientific Rounding Information

Date Time Duration Run R Run Python script

Queries [1]

Table

31 Delhi 1188 92.84 On-Time 2/

32 Kolkata 398 43.89 Late 2/

33 Chennai 385 31.03 Late 1/2

34 Hyderabad 818 94.24 Late 2/1

35 Kolkata 1806 121.36 On-Time 2/1

36 Pune 424 37.63 On-Time 2/1

37 Bangalore 909 70.4 On-Time 1/1

38 Mumbai 1404 151.36 Late 2/2

39 Pune 555 37.39 On-Time 1/1

40 Kolkata 705 62.94 Late 1/1

41 Delhi 64 4.96 Late 1/2

42 Chennai 1245 95.14 On-Time 2/1

43 Bangalore 116 8.71 Late 1/

44 Mumbai 1259 87.59 Late 1/2

45 Chennai 1803 211.34 On-Time 2/1

46 Hyderabad 1096 100.52 Late 1/2

47 Delhi 572 61.6 On-Time 1/2

48 Bangalore 1441 140.79 Late 2/2

49 Mumbai 1685 119.01 Late 2/1

50 Delhi 1233 81.388 On-Time 1/1

10 COLUMNS, 50 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 10:04 PM

Query Settings

PROPERTIES

Name

Trip\_Data

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Blank Rows

Replaced Value(MissingValue...

Q1b) Relate Trips with Vehicle Master?

A **One-to-Many** relationship was created between **Vehicle Master (1)** and **Trips (\*)** using **Vehicle ID** as the key, with a **single-direction cross filter** from Vehicle Master to Trips.

The screenshot displays the Power BI Desktop interface. In the center, a diagram shows a relationship between two tables: **Trip\_Data** and **Vehicle\_Master**. The **Trip\_Data** table is on the left, and the **Vehicle\_Master** table is on the right. A line connects them, with a '1' on the **Vehicle\_Master** side and a '\*' on the **Trip\_Data** side, indicating a One-to-Many relationship. The **Vehicle\_ID** column in **Vehicle\_Master** is highlighted as the key.

The **Properties** pane on the right shows the relationship details:

- Relationship**:
  - Table**: Trip\_Data
  - Column**: Vehicle\_ID
  - Cardinality**: Many to one (\*:1)
- Table**: Vehicle\_Master
- Column**: Vehicle\_ID
- Make this relationship active**: Yes (toggle is on)
- Cross-filter direction**: Single
- Apply security filter in both directions**: No (toggle is off)

The **Data** pane on the right shows the semantic model structure:

- Tables**: (2)
  - Trip\_Data**
  - Vehicle\_Master**
- Relationships**: (1)
  - Trip\_Data[Vehicle\_ID] <--- Vehicle\_...

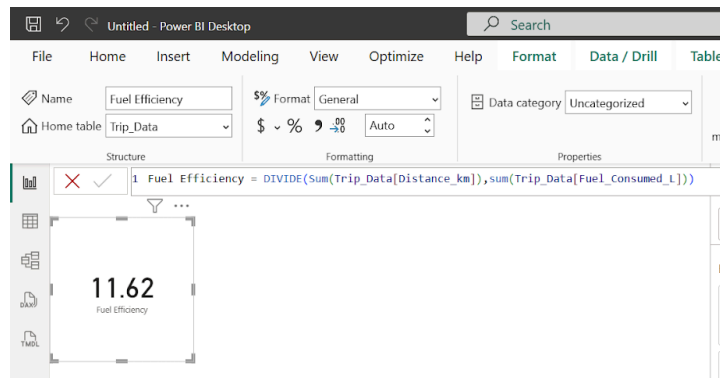
## 2. Dax Measures:

Q2a) Fuel Efficiency = Distance / Fuel Consumed?

A calculated measure was created for aggregated fuel efficiency, to be used in KPIs and charts, and a calculated column was created for per-trip fuel efficiency.

~Syntax:

*Fuel Efficiency = DIVIDE(Sum(Trip\_Data[Distance\_km]),sum(Trip\_Data[Fuel\_Consumed\_L]))*



~Syntax:

*Fuel Efficiency Per Trip = DIVIDE(Trip\_Data[Distance\_km],Trip\_Data[Fuel\_Consumed\_L])*

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The 'Name' field is 'Fuel Efficiency Per Trip'. The 'Data type' is 'Decimal number'. The formula bar displays the DAX measure: `Fuel Efficiency Per Trip = DIVIDE(Trip_Data[Distance_km],Trip_Data[Fuel_Consumed_L])`. The 'Format' dropdown is set to 'Decimal number'. The 'Data category' is 'Uncategorized'. The 'Table' view shows a table with columns: Driver\_ID, Origin, Destination, Distance\_km, Fuel\_Consumed\_L, Delivery\_Status, Delivery\_Date, and Fuel Efficiency Per Trip. The table contains 50 rows of data. The 'Data' pane on the right shows the hierarchy: Trip\_Data > Fuel Efficiency Per Trip.

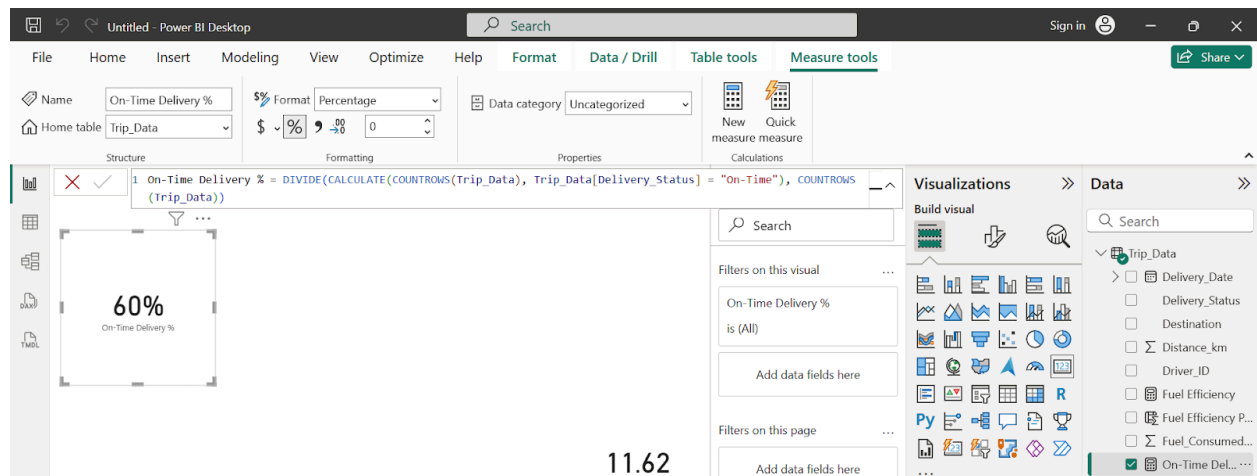
Driver_ID	Origin	Destination	Distance_km	Fuel_Consumed_L	Delivery_Status	Delivery_Date	Fuel Efficiency Per Trip
D01	Delhi	Pune	1173	108.42	On-Time	Friday, January 27, 2023	10.82
D08	Mumbai	Bangalore	1727	161.33	On-Time	Tuesday, February 21, 2023	10.70
D08	Mumbai	Pune	1459	154.7	On-Time	Friday, February 17, 2023	9.43
D09	Hyderabad	Pune	382	26.6	On-Time	Saturday, February 18, 2023	14.36
D08	Pune	Mumbai	398	33.2	On-Time	Wednesday, February 15, 2023	11.99
D07	Chennai	Mumbai	1275	85.04	Late	Saturday, February 25, 2023	14.99
D03	Chennai	Kolkata	752	58.08	On-Time	Thursday, January 19, 2023	12.95
D10	Delhi	Pune	74	5.24	On-Time	Sunday, January 1, 2023	14.12
D07	Delhi	Hyderabad	186	16.22	On-Time	Thursday, February 23, 2023	11.47
D02	Bangalore	Hyderabad	1375	105.21	Late	Thursday, February 2, 2023	13.07
D03	Kolkata	Hyderabad	419	31.17	On-Time	Saturday, January 21, 2023	13.44
D01	Kolkata	Delhi	751	51.77	On-Time	Wednesday, February 15, 2023	14.51
D04	Kolkata	Chennai	1571	188.52	Late	Thursday, February 2, 2023	8.33
D05	Hyderabad	Bangalore	1524	104.51	On-Time	Thursday, February 16, 2023	14.58
D06	Kolkata	Mumbai	1956	179.88	On-Time	Saturday, January 21, 2023	10.87
D06	Bangalore	Mumbai	858	92.7	Late	Wednesday, January 18, 2023	9.26
D07	Pune	Kolkata	1269	102.91	On-Time	Monday, January 16, 2023	12.33
D10	Pune	Delhi	1565	107.23	On-Time	Sunday, February 12, 2023	14.59
D10	Hyderabad	Pune	1796	155.52	On-Time	Tuesday, February 28, 2023	11.55
D02	Mumbai	Bangalore	1640	148.87	On-Time	Friday, January 6, 2023	11.02

Q2b) On-Time Delivery % = On-Time Trips / Total Trips?

A measure was created to calculate the percentage of on-time trips out of total trips to find On-Time delivery %:

~Syntax:

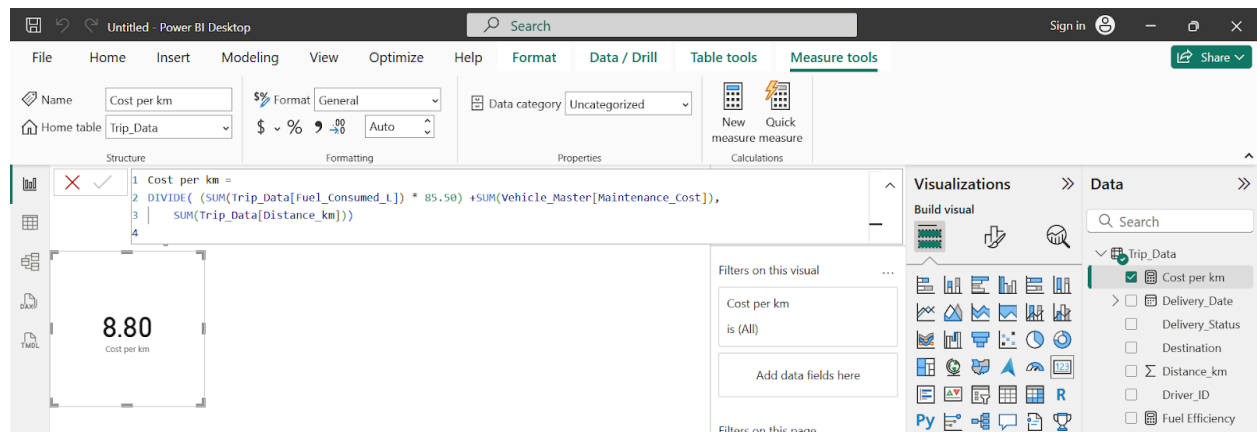
On-Time Delivery % = DIVIDE(CALCULATE(COUNTROWS(Trip\_Data),  
Trip\_Data[Delivery\_Status] = "On-Time"), COUNTROWS(Trip\_Data))



Q2c) Cost per km = (Fuel Cost + Maintenance Cost) / Distance?

A measure was created to calculate the cost per kilometre, considering fuel and maintenance cost. This measure uses the given fuel price (₹85.50 per litre) and adds maintenance cost from the vehicle master table.

~Syntax:  $Cost\ per\ km = \frac{SUM(Trip\_Data[Fuel\_Consumed\_L]) * 85.50}{SUM(Trip\_Data[Distance\_km])} + SUM(Vehicle\_Master[Maintenance\_Cost])$



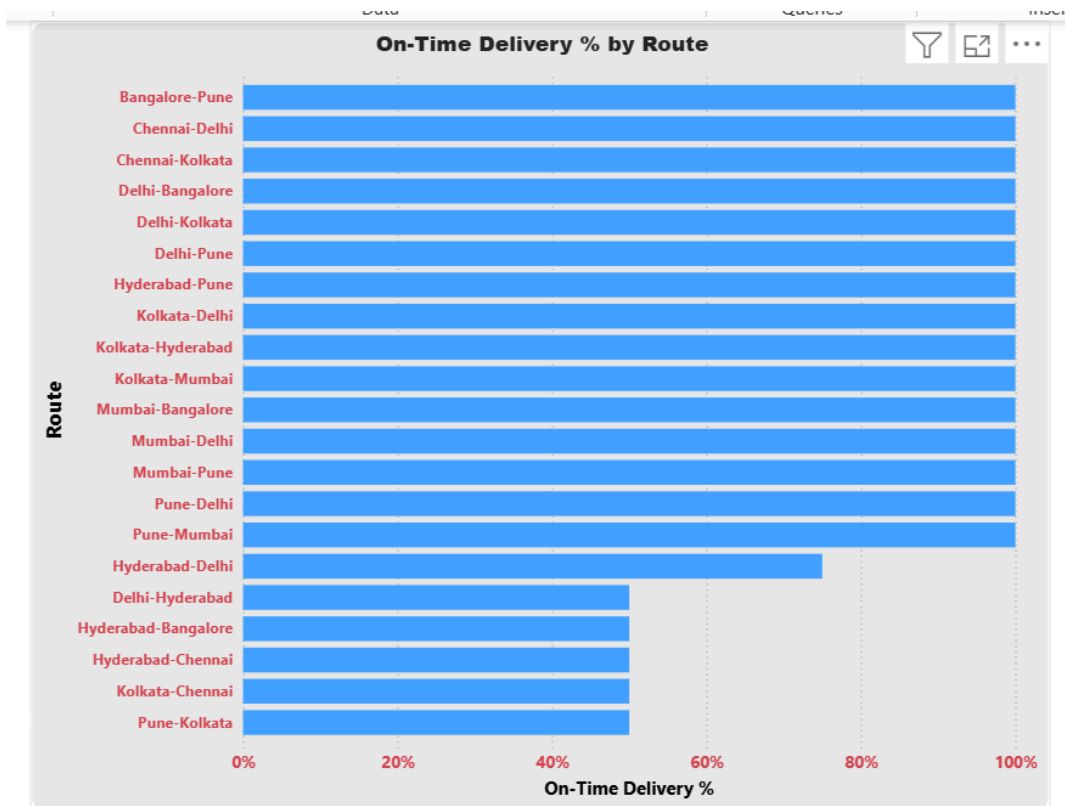
### 3. Visualisation

Q3a) Bar chart: On-Time Delivery % by Route?

A clustered bar chart was created to display the On-Time Delivery Percentage for each route. A calculated Route column was created by combining Origin and Destination fields. The On-Time Delivery % measure was used as the value.

X-Axis - On-Time Delivery%

Y-Axis - Route

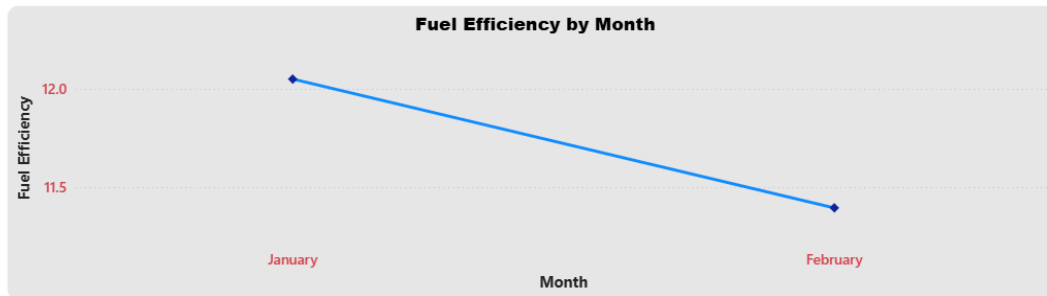


Q3b) Line chart: Fuel Efficiency trend by month?

A line chart was created to show the Fuel Efficiency trend across months using the measure Fuel Efficiency. This visualisation helps analyse how fuel efficiency changes over time and supports decisions to improve fleet performance.

X-Axis - Delivery Date (Hierarchy Month)

Y-Axis - Fuel Efficiency measure



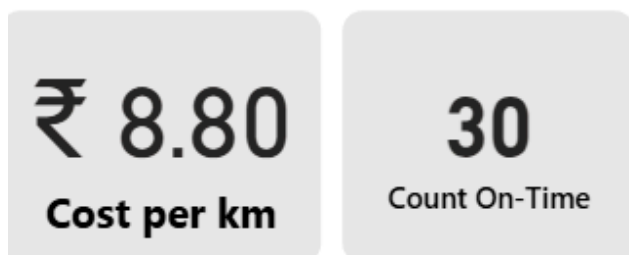
Q3c) KPI Card: Avg. Delivery Time, cost per km?

Avg. Delivery Time - As the dataset only includes the delivery status column (on-time/late) card visual was created based on the **count of on-time deliveries**.

~Syntax - Count On-Time = CALCULATE(COUNTROWS(Trip\_Data),FILTER(Trip\_Data, Trip\_Data[Delivery\_Status]="On-Time"))

**Cost Per Km** - Measure was created to calculate the cost per kilometre for card visual.

~Syntax:  $Cost\ per\ km = \frac{SUM(Trip\_Data[Fuel\_Consumed\_L]) * 85.50}{SUM(Vehicle\_Master[Maintenance\_Cost]) + SUM(Trip\_Data[Distance\_km])}$



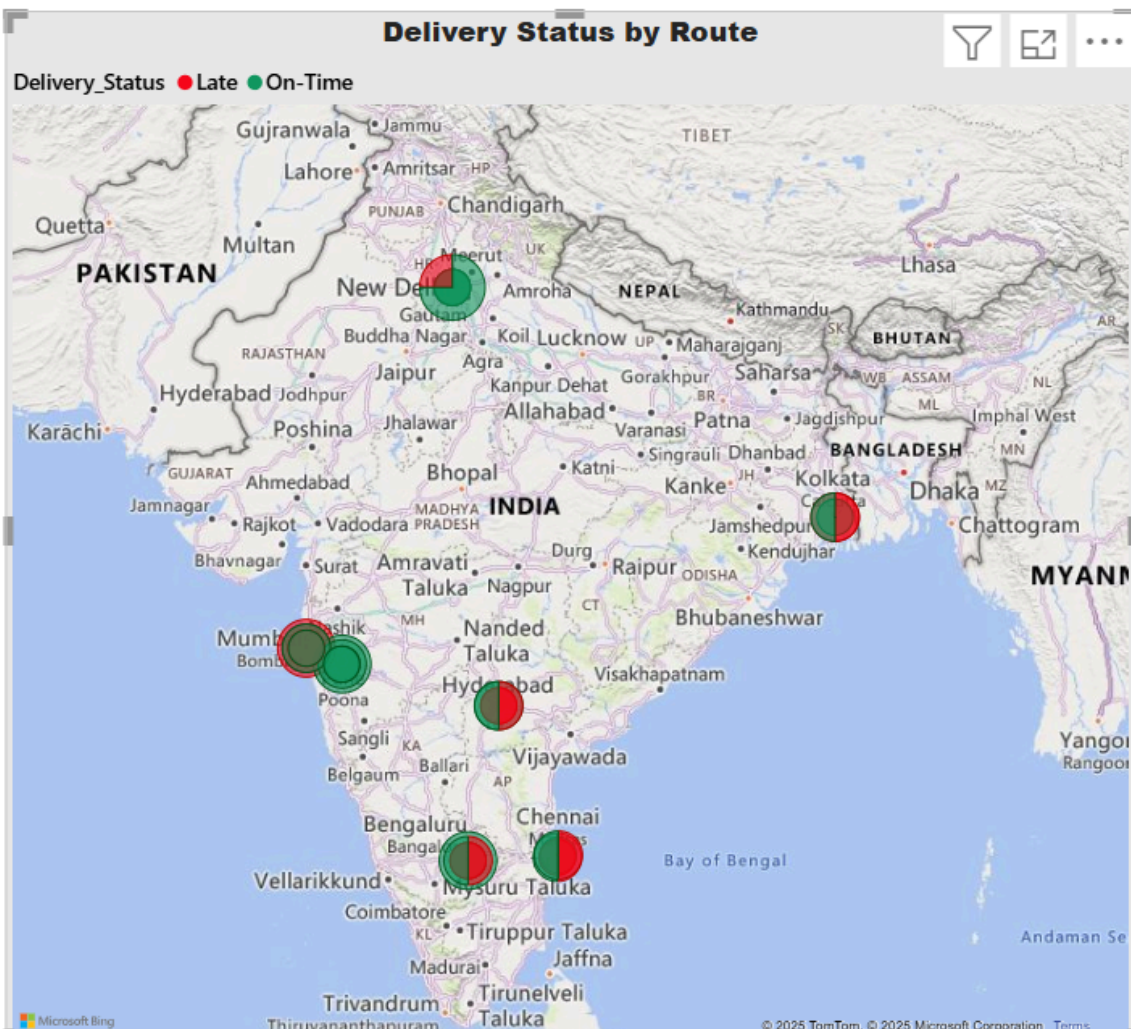
Q3d) Map Visual: Delivery Performance by route (Origin-Destination) ?

A map visual chart created to display the delivery performance by route.

Location - Route

Legend - Delivery Status

Tool Tips - Fuel Efficiency / Vehicle ID





4. Dashboard :

This dashboard presents key metrics for transport fleet performance and delivery efficiency. It highlights the cost per km, total on-time deliveries and allows filtering by Vehicle ID and delivery status. Visuals include a bar chart of on-time percentages by route, a route map showing delivery status, and a line graph of monthly fuel efficiency, offering a quick and clear view of operational performance and delivery reliability.

