Analysis of the transport network and Passenger load in the Valle de Aburrá

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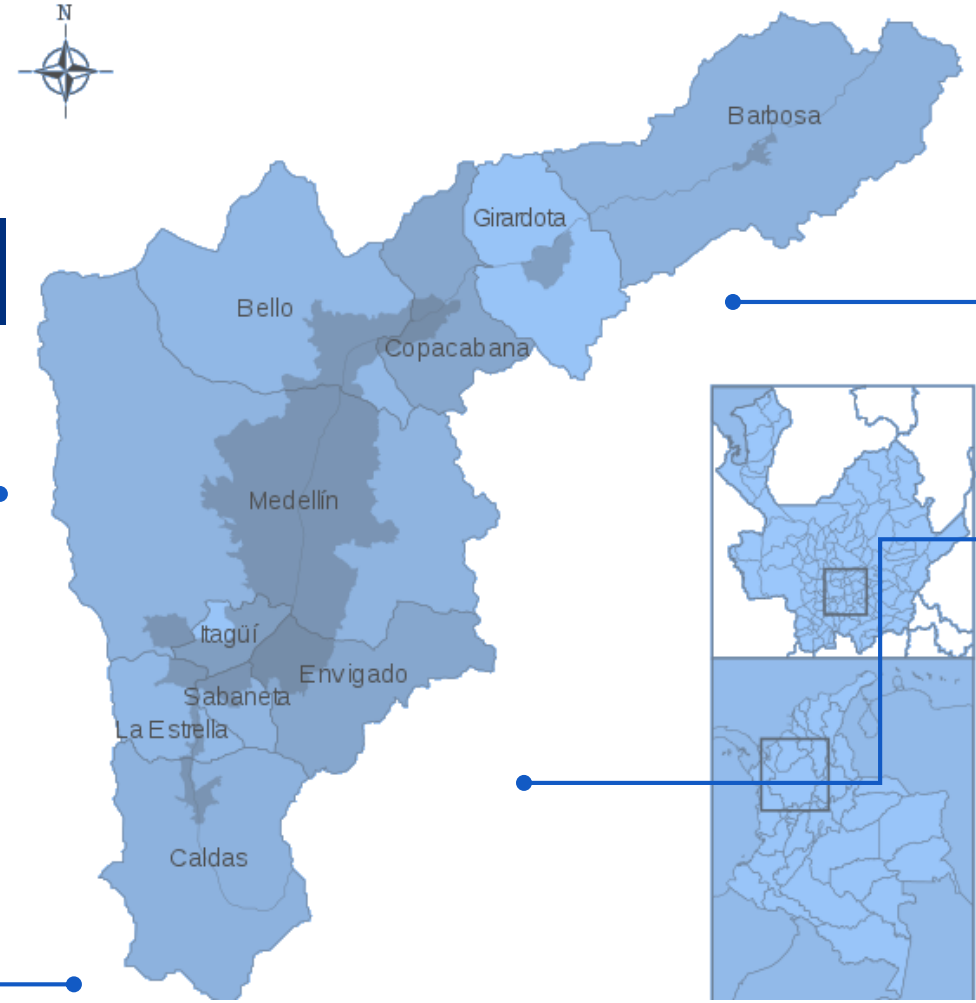
PROBLEM BACKGROUND

4 Million



255.200

TPC Daily passengers

1 Million

SITVA Daily passengers

42%

Public Transportation

SITVA

The Integrated transportation system of the Valle de Aburrá (SITVA) is conformoed by the Metro, Cable Transport, Tram-Train, exclusive buses and the Subsystem of collective public transport of passengers (TPC)

GOALS

A

Passenger Load

Calculate the passenger load for a specific arc (Link), vehicle, day and hour

B

Arc (Link)

Create an algorithm that associate the stops (events) to the nearest node of the network

C

Schedule optimization

Optimize schedules and bus frequencies

D

Pattern detection

Detect patterns trough data exploration and analysis

E

Forecast

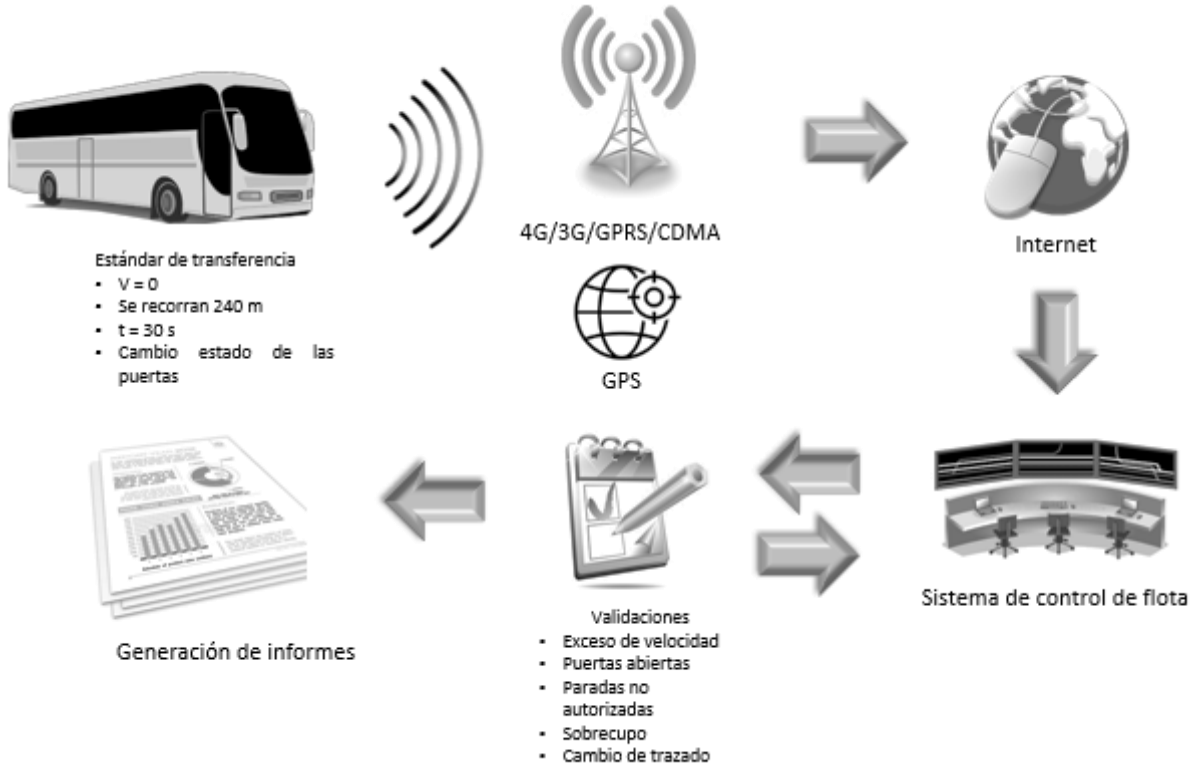
Apply models to predict the passenger load for upcoming dates

GATHERING DATA

75% Of the routes

3850 Vehicles

59 Companies



Vehicles with Sensors

Capture time, latitude, longitude, # of passengers boarding and alighting.

Transmitted

Data Transmitted online each 3 minutes or less or also in batch to the GTPC

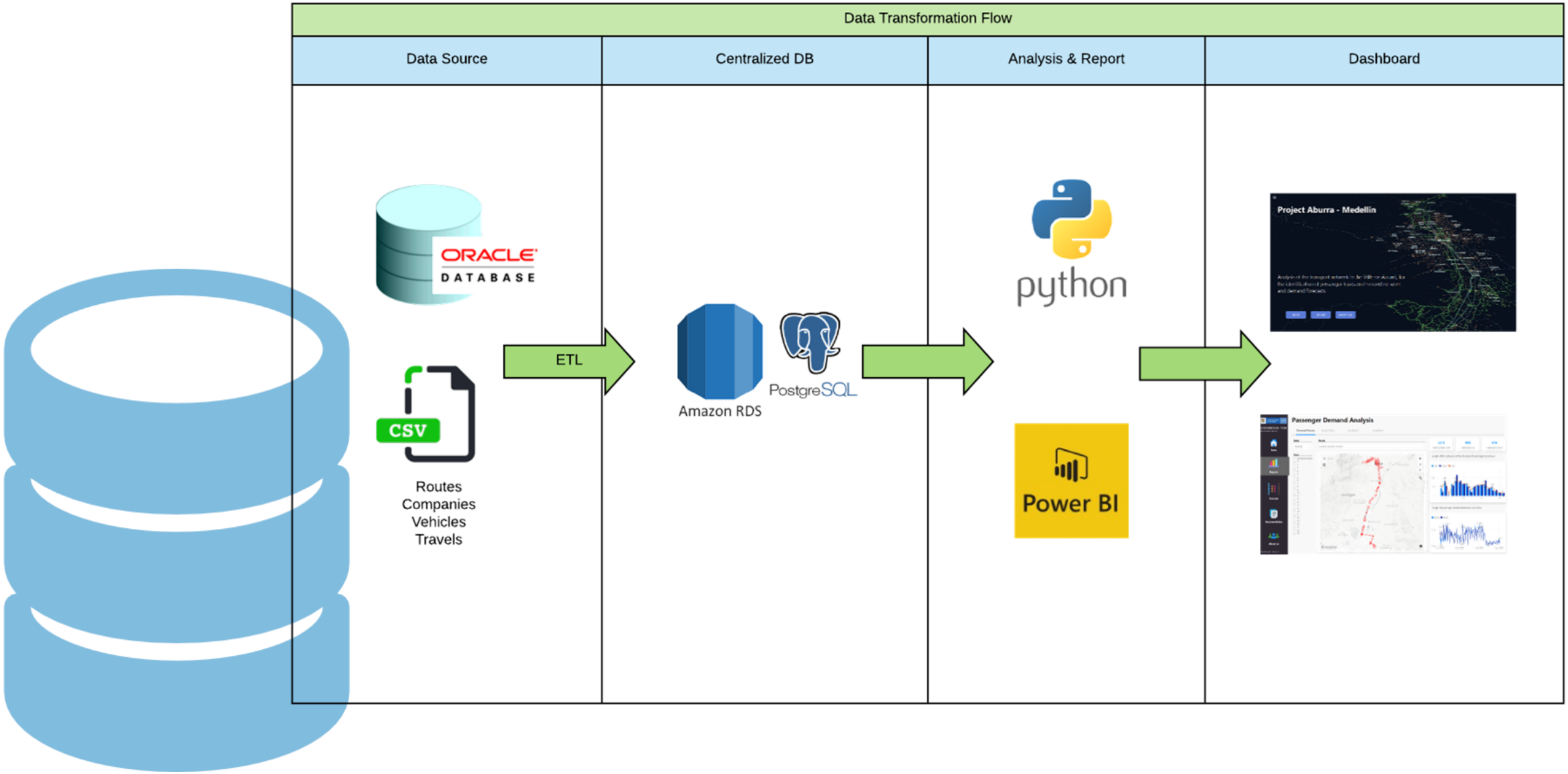
KML Files

XML file for route visualization within 2D and 3D maps

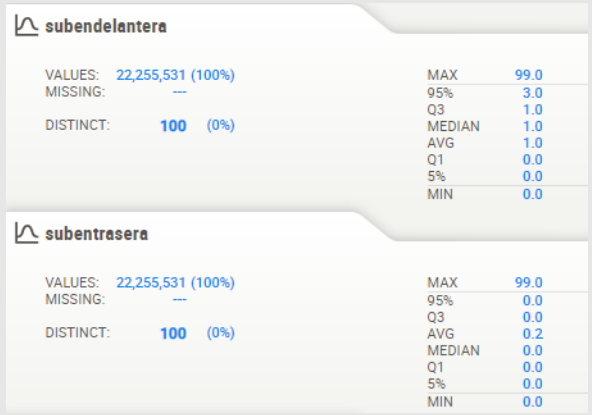
DATA

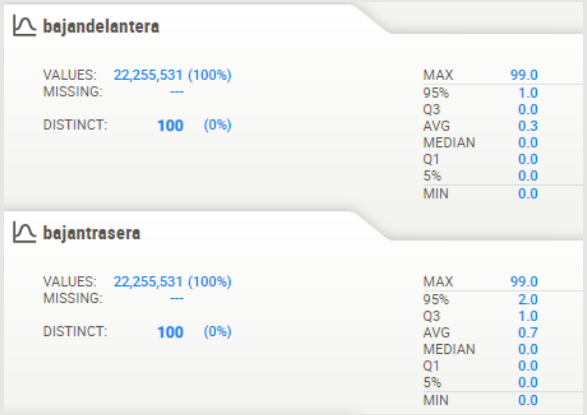
2019-11 to 2020-05
6 Million records avg per day

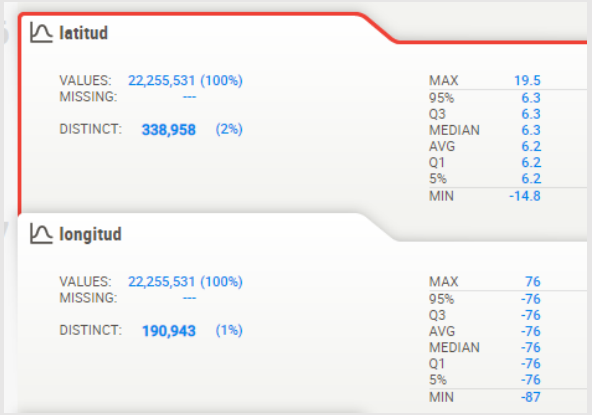
TECHNICAL ARCHITECTURE



DATA CLEANSING & FINDINGS







1

Values between 0 and 99 for the number of Passengers boarding and alighting.

2

Latitude and longitude that don't belong to the Valle de Aburrá Metropolitan Area.

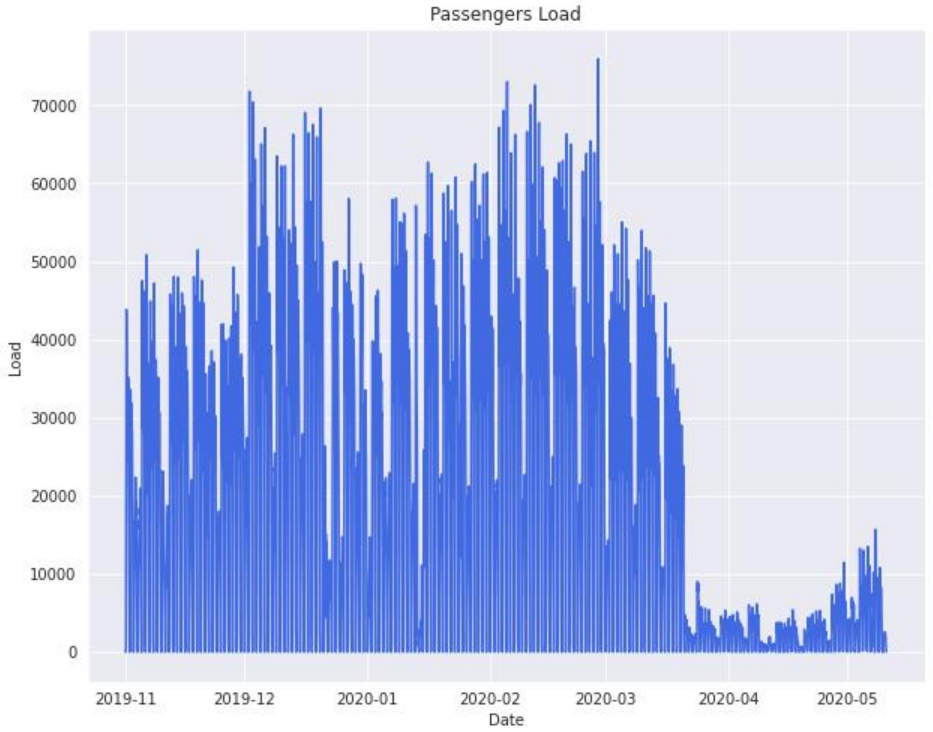
3

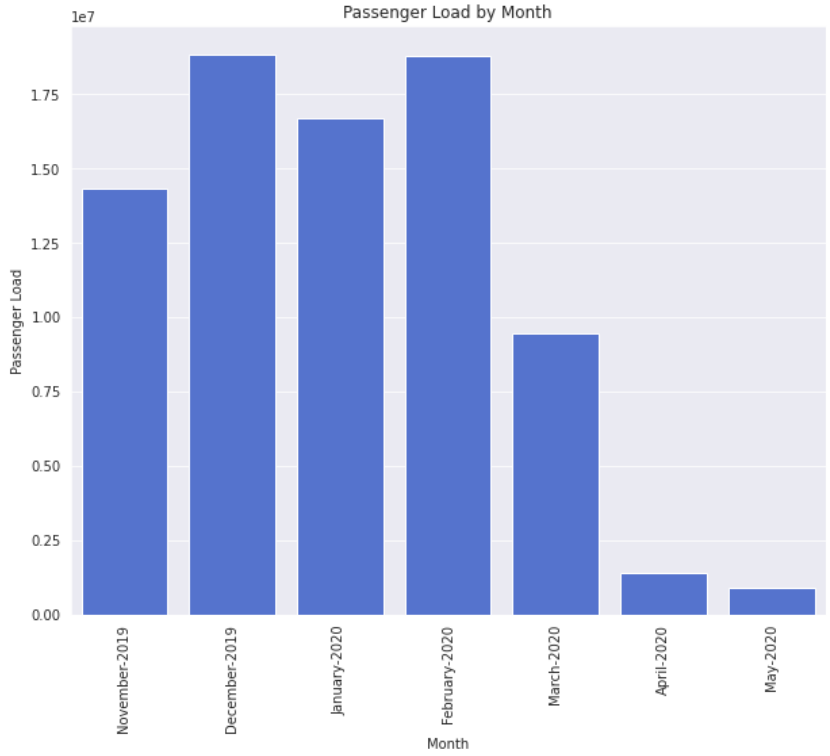
Records in unconventional hours.

4

Trips that start with people alighting

TIME SERIES





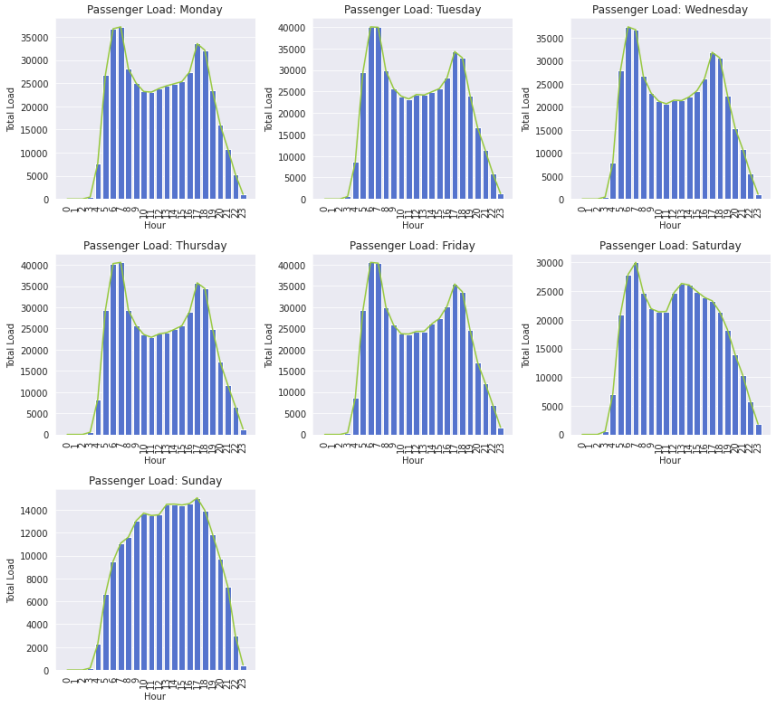
Passenger Load

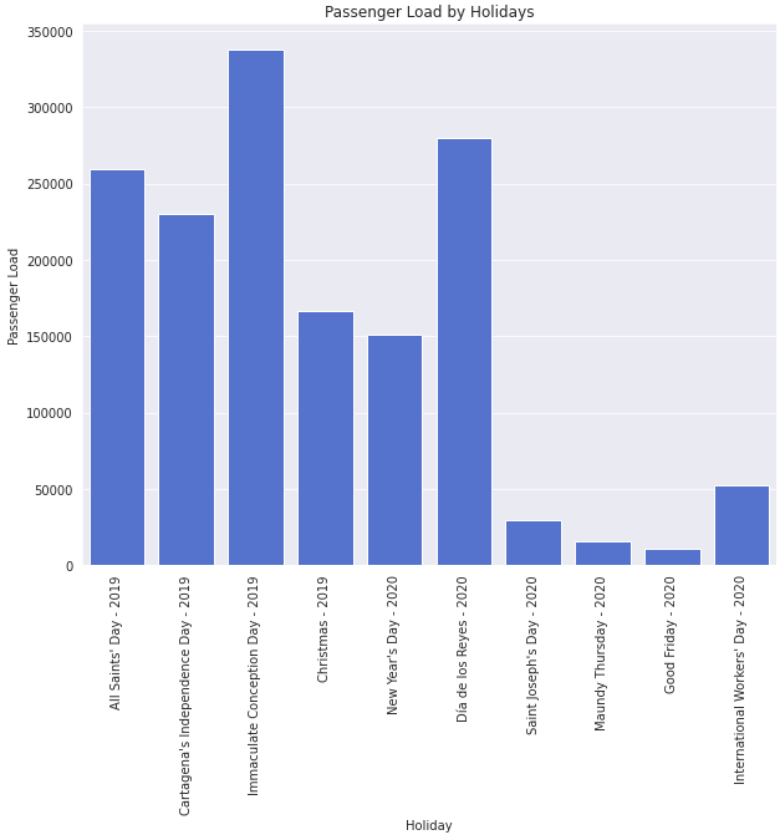
There is a stational pattern that repeats as weeks goes by.

Passengers Load by Month

The maximum demand was reached around February and the minimums are reached after the lockdown as a result of the COVID-19 pandemic

TIME SERIES





Passengers by day

There is a stational pattern that repeats as weeks goes by.

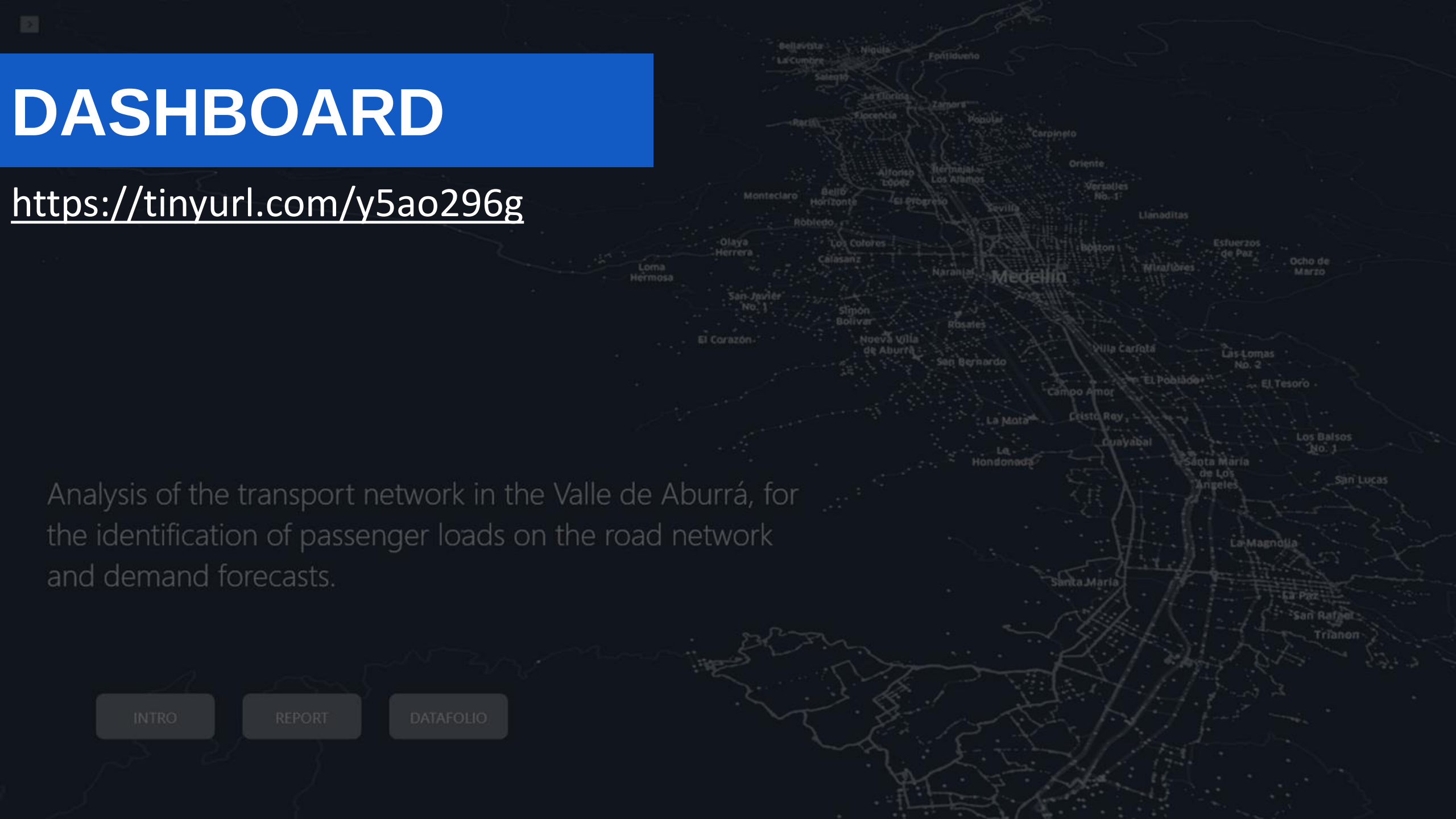
Passengers by Holidays

The Immaculate Conception Day is the one for which there's a higher public transportation demand;

PREDICTIVE MODEL

DASHBOARD

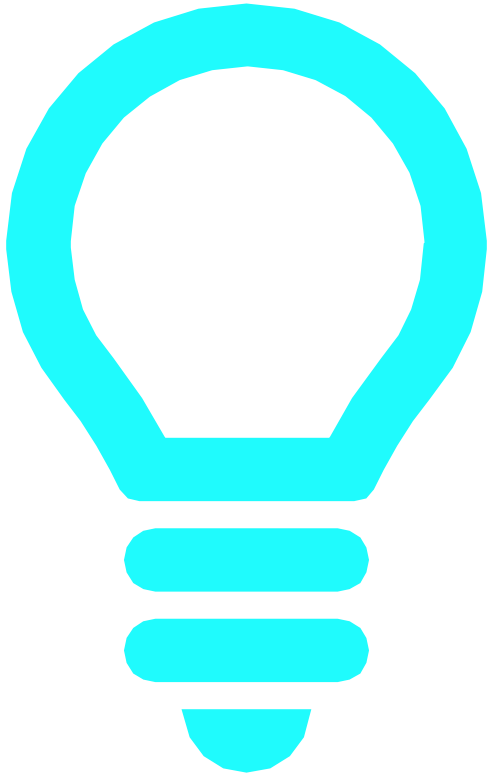
https://tinyurl.com/y5ao296g



Analysis of the transport network in the Valle de Aburrá, for the identification of passenger loads on the road network and demand forecasts.

INTRO REPORT DATAFOLIO

CONCLUSIONS AND SUGGESTIONS



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CONCLUSION 1

2

CONCLUSION 2

1

SUGGESTION 1

2

SUGGESTION 2


THANK YOU