7-Days Passenger Forecasting (May 28,2025 – June 03,2025)

Date	Local Route	Light Rail	Peak Service	Rapid Route	School
2025-05-28	13984	9509	283	16664	3943
2025-05-29	13984	9509	283	16664	3943
2025-05-30	13984	9509	283	16664	3943
2025-05-31	3484	5169	0	7577	0
2025-06-01	3484	5169	0	7577	0
2025-06-02	13984	9509	283	16664	3943
2025-06-03	13984	9509	283	16664	3943

Overview:

The forecasting algorithm adopted is a Moving Average-based mode, designed for simplicity, interpretability, and practical utility. It uses recent trends in public transport usage to generate a 7-day forward forecast for five key service tyeps:

- Local Route
- Light Rail
- Peak Service
- Rapid Route
- School

The algorithm was implemented in Python using pandas and matplotlib and visualized over the historical + forecasted period.

Algorithm:

The algorithm processes historical passenger data to predict future demand by averaging recent observations, adjusted for weekday and weekend differences.

Steps:

1. **Preprocessing:** Load the dataset, convert dates to datetime, filter anomalies (Local Route < 100), and flag weekdays (Monday-Friday) versus weekends(Saturday-Sunday).
2. **Moving Average Calculations:** Compute separate 7-day moving averages for weekdays and weekends using the last 60 days of data for each service type.

3. **Forecasting:** Assign the appropriate average(Weekday or weekend) to each forecast day, setting Peak Service and School to zero on weekends, reflecting observed patterns.
4. **Output:** Generate a 7-day forecast table and visualize historical (last 30 days) and forecasted data.

The moving average smooths daily fluctutations, while the weekday/weekend split accounts for significant demand drops on weekends (eg. Local Route: 16,500 weekdays vs 3,500 weekends).

Mode Parameters:

Parameter	Value / Description
Forecast Horizon	7 days
Moving Average Window	7 days
Historical Lookback Window	60 days
Weekend Detection Logic	Weekday () >= 5
Special Weekend Rules	Peak Service, School set to 0 on weekends
Data Filtering Threshold	Local Route > 100 for anomaly removal
Forecast Start Date	2025-05-28