



Forecasting Bergen City Bike Demand

A Data-Driven Approach to Historical Analysis
and Predictive Modeling

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August 2025



(Our Ride Plan)

Data Snapshot

Future Trends Outlook

Oracle Database Design





Data Snapshot →



Most Popular Routes for 2024

1. Torgallmenningen → Nykirken
2. Nykirken → Torgallmenningen
3. Kronstad bybanestopp → Studentboligene
4. Torgallmenningen → C. Sundts gate
5. Busstasjonen 1 Nord → Møllendalsplass
6. C. Sundts gate → Torgallmenningen
7. Møllendalsplass → Busstasjonen 1 Nord
8. Thormøhlens gate → Florida Bybanestopp
9. Østre Murallmenningen nedre → C. Sundts gate
10. Torget → C. Sundts gate



Station Hubs 2024

Least Popular Station Hubs

Folke Bernadottesvei 38
Ortun Svømmehall
Vestlund Borettslag
Dag Hammarskjöldsvei 73
Lynghaug Borettslag
Ortustranden
Sælen
Lynghaugparken
Sælemyr busstopp
Holtet Borettslag

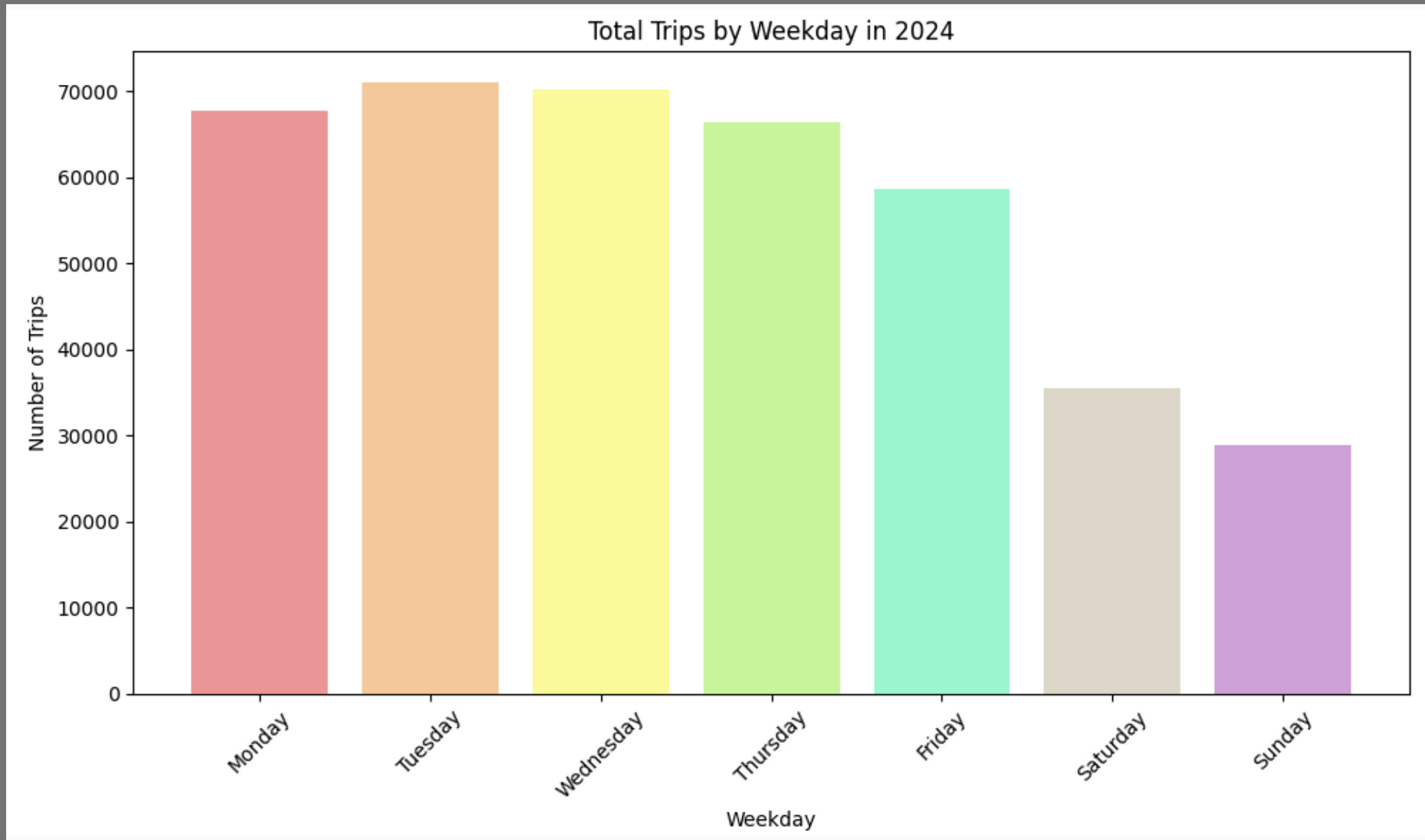
Top Station Hubs

Torgallmenningen
Møllendalsplass
Nykirken
St. Jakobs Plass
C. Sundts gate
Busstasjonen 1 Nord
Damsgårdsveien 71
Bergen jernbanestasjon
Kronstad bybanestopp
Florida Bybanestopp

Popular Ride Times (2024) ➔

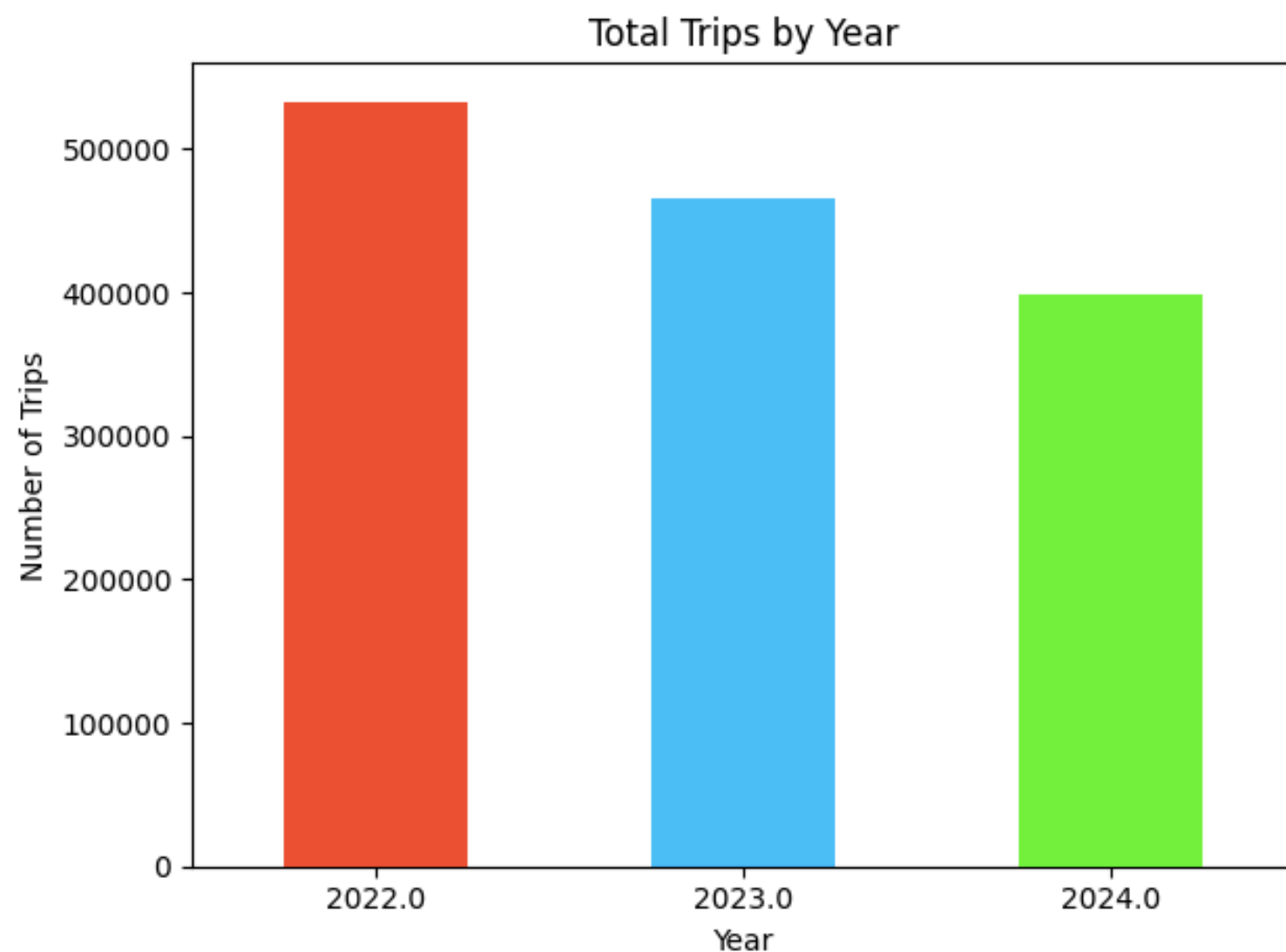
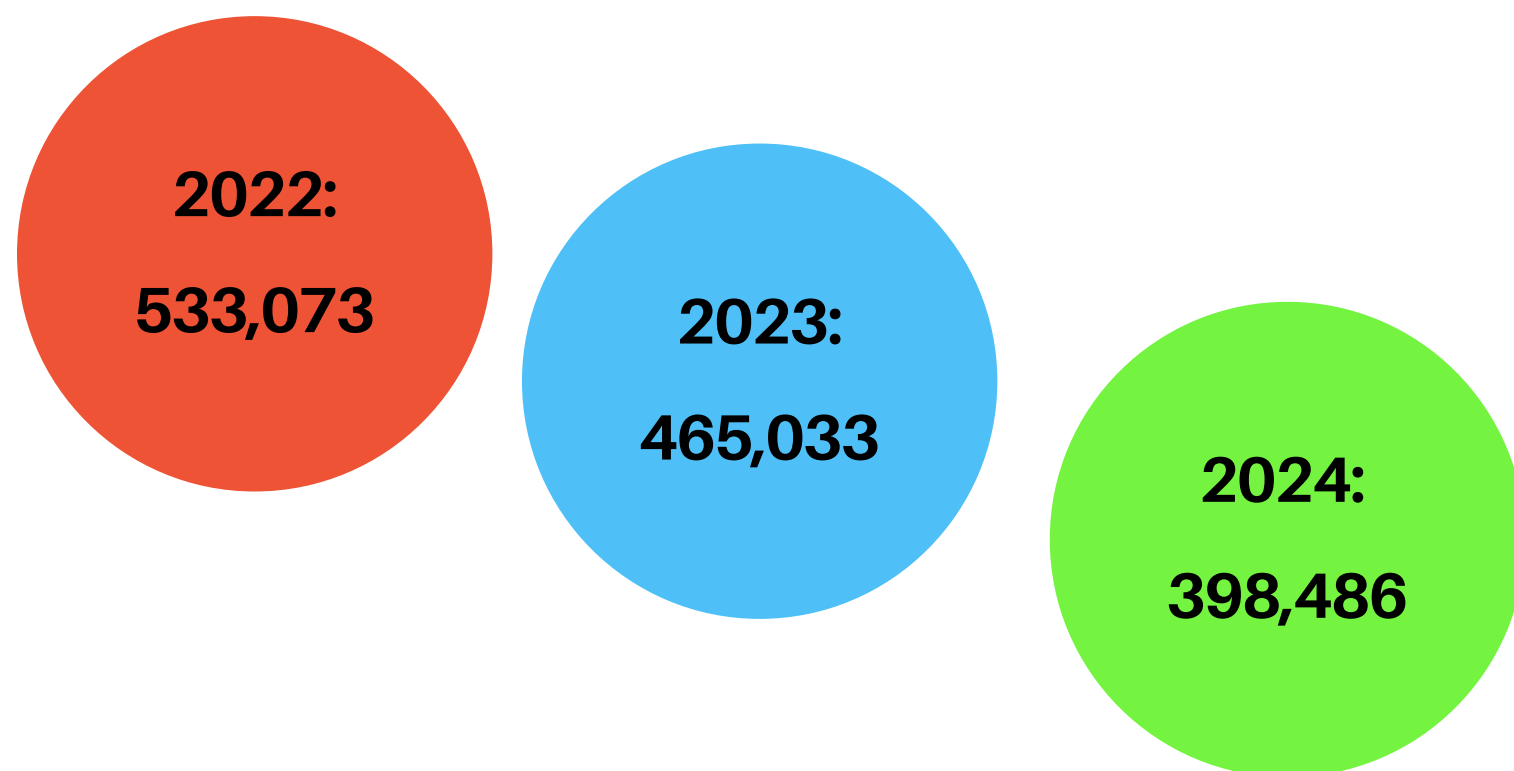
Peak Hours	Time of Day	Low Hours	Time of Day
7	7:00 AM	0	12:00 AM
8	8:00 AM	1	1:00 AM
14	2:00 PM	2	2:00 AM
15	3:00 PM	3	3:00 AM
16	4:00 PM	4	4:00 AM
17	5:00 PM	5	5:00 AM

Bike Usage by Day of Week



Days with the most riders are **Tuesdays** and **Wednesdays**.

Weekends have less riders than weekdays.



Yearly Ride Comparison

Rides are down 14.29% from 2023 to 2024.

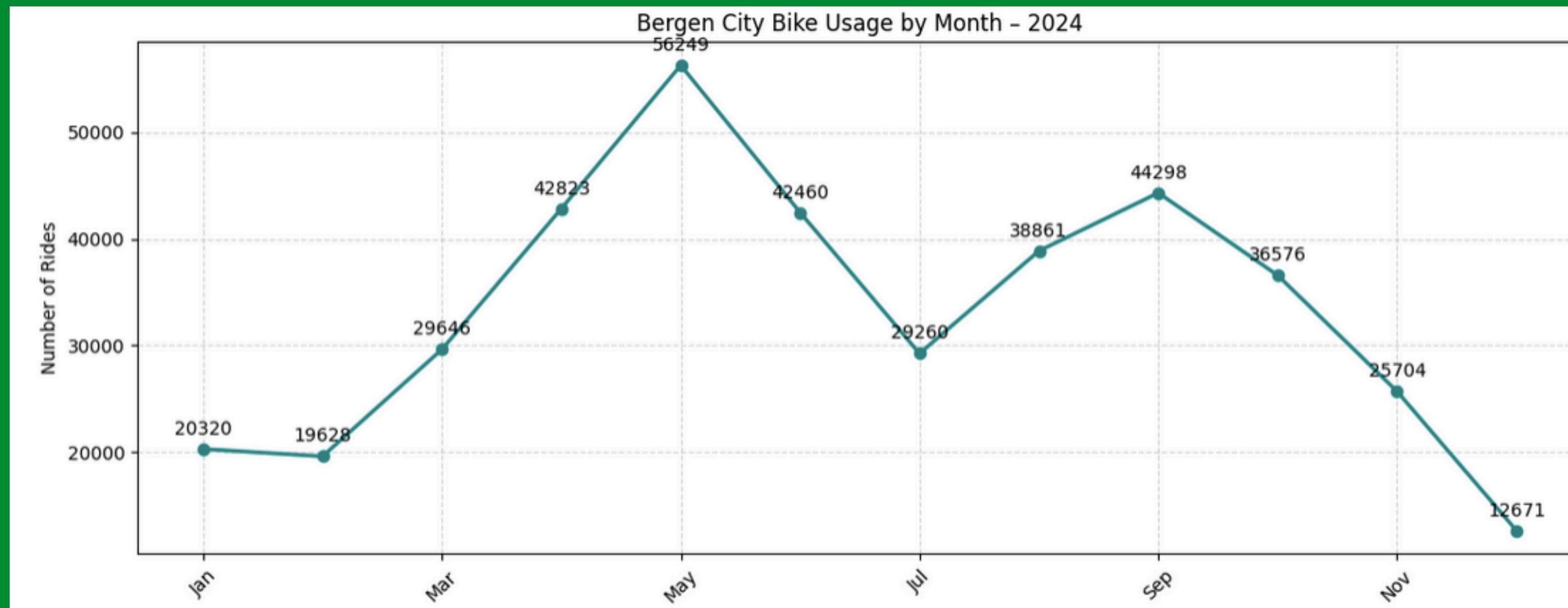
Rides by Month (2024)

Months with the **most** rides:

- May
- September
- April
- June

Months with the **least** rides:

- December
- January
- February
- October





Future Trends →

(12 Month Forecast with Prophet Model Implementation Overview)

Using the Prophet time series model, I forecasted monthly ride volumes through 2025. The model incorporates seasonality, holiday effects, and a custom regressor for weekday density — which helps account for calendar-driven fluctuations in demand.

01

Ran grid search across 60 parameter combinations

02

Added Norwegian holidays & weekend ratio to model

03

Selected best parameters based on lowest MAE

04

Forecasted 12 months ahead with confidence intervals

Model Accuracy

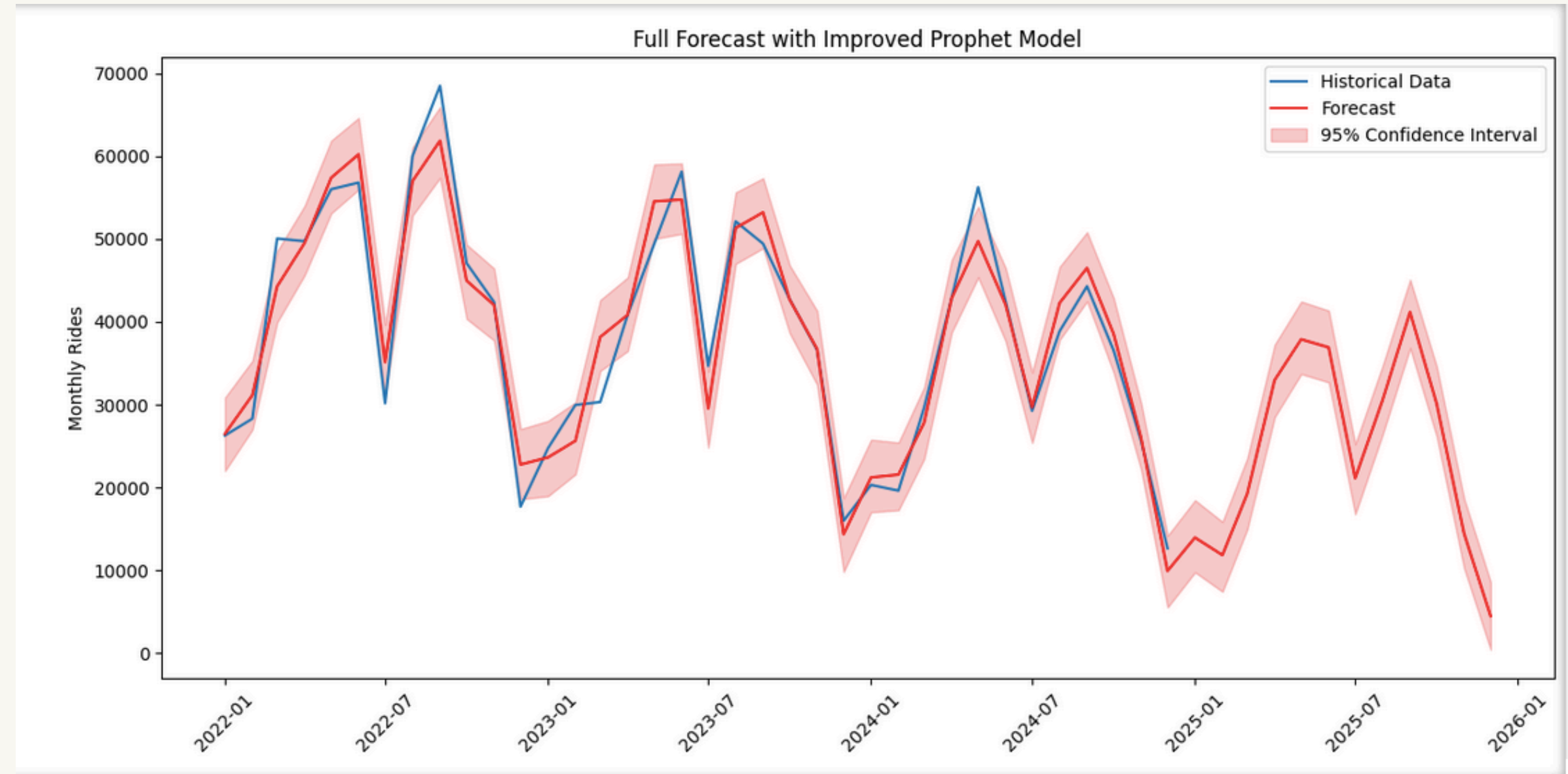
MAPE - 7.3%

- predictions are, on average, within 7.3% of actual observed values.

Predicted rides for 2025:

294,825

(12 Month Forecast with Prophet Model Results)



Total rides are expected to decrease by 26% for 2025.





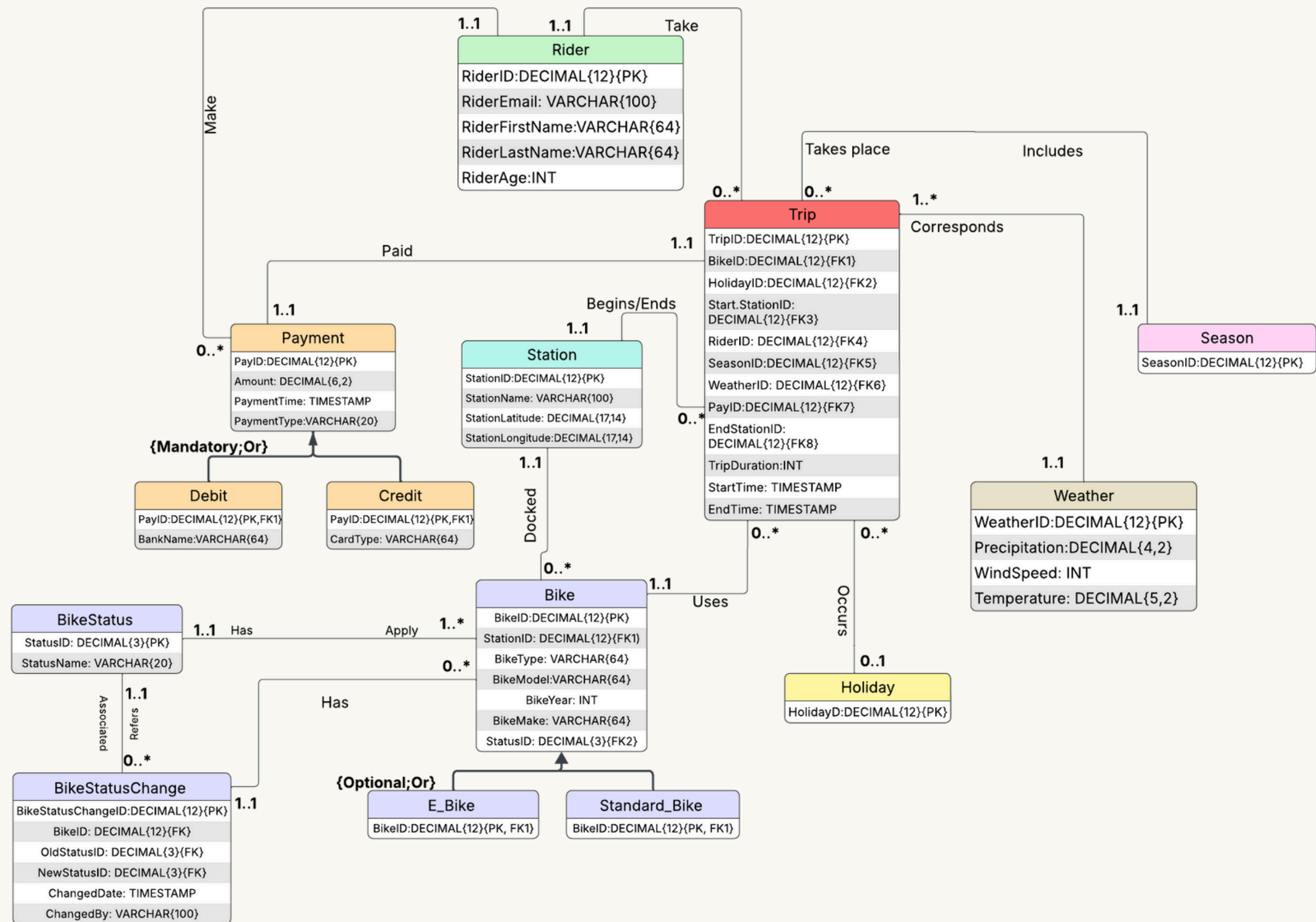
Database Design →

Use Case Example: Data Analysis - Popular Routes

1. The data analyst logs into the database
2. The data analyst queries the Trip table for start_station_name, end_station_name, start_time, end_time, duration.
3. The data analyst groups the data by start_station_name and end_station_name and counts the number of trips per route.
4. The system returns the routes by total trip count.

Database Design Overview

For Bergen City Bike, this database will provide an opportunity to house their bike sharing data in one place, understand rider behavior, optimize bike placements, and enhance data driven decision making.



(DBMS Physical ERD)



(Recommendations)

Optimize maintenance scheduling and resource allocation

- Schedule preventive maintenance and upgrades in December–February.
- Increase staffing and bike availability in April–June
- Scale back operations in December–February to reduce idle capacity.

Enhance Data Collection & Integration

- database can be leveraged to enrich forecasting and operational decisions.
- Integrate weather, station usage, and rider demographics for deeper insights.

