Numerical Input Features

Feature Name	Description
distance_km	Total distance of the route in kilometers.
average_speed_kmph	Average speed of the vehicle during the trip, in kilometers per hour (km/h).
fuel_consumed_liters	Total amount of fuel consumed for the trip, measured in liters.
elevation_change_m	Change in elevation during the trip, measured in meters. Positive values indicate uphill travel.
cargo_weight_tons	Weight of the cargo being transported, measured in metric tons.

Categorical Input Features (converted to numerical via encoding)

Traffic Level (Ordinal Encoding)

Feature Name	Description
traffic_level	Traffic congestion level along the route. Coded as: 1 = Low, 2 = Medium, 3 = High.

Vehicle Type (One-Hot Encoded)

Feature Name	Description
vehicle_type_air_cargo	1 if the vehicle is an air cargo aircraft, else 0.
vehicle_type_cargo_ship	1 if the vehicle is a cargo ship, else 0.
vehicle_type_diesel_truck	1 if the vehicle is a diesel-powered truck, else 0.
vehicle_type_electric_truck	1 if the vehicle is an electric truck, else 0.
vehicle_type_freight_train	1 if the vehicle is a freight train, else 0.

Fuel Type (One-Hot Encoded)

Feature Name	Description
fuel_type_aviation_fuel	1 if the vehicle uses aviation fuel, else 0.
fuel_type_diesel	1 if the vehicle uses diesel, else 0.
fuel_type_electric	1 if the vehicle is electric, else 0.

Engineered Features

Feature Name	Description
fuel_efficiency	Distance traveled per liter of fuel, calculated as distance_km / fuel_consumed_liters. Higher values indicate better fuel efficiency.
emission_intensity	Emissions per kilometer, calculated as estimated_emissions_kg / distance_km (only available during training). Used to normalize emissions impact per unit distance. Defaults to 0 during prediction.