Cargo Connect: Improving Airport Freight Flow

System Design vs 6.0

SE 6387 Advanced Software Engineering Project
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Revision History

| Version	Date	Decription	Authors
1.0	03/25/2025	Completed initial draft	FA, CE, SP, BS
2.0	04/01/2025	Completed second draft	FA, CE, SP, BS
3.0	04/17/2025	Completed third draft	FA, CE, SP, BS
4.0	04/24/2025	Completed fourth draft	FA, CE, SP, BS
5.0	04/29/2025	Completed fifth draft	FA, CE, SP, BS
6.0	05/09/2025	Completed final document	FA, CE, SP, BS

Contents

1. Use Case Realizations – UC1
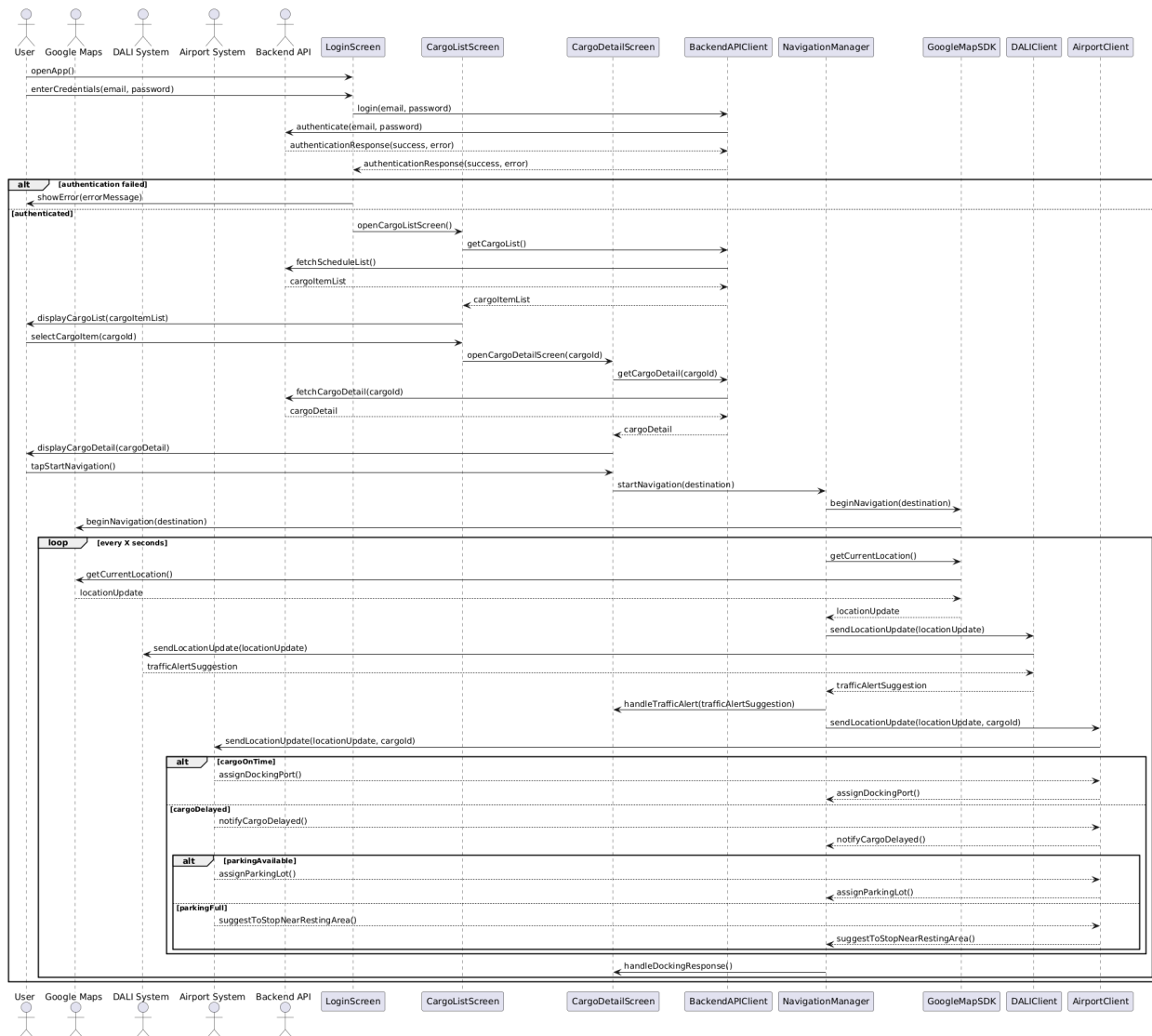
1.1. Black box sequence diagram UC 1
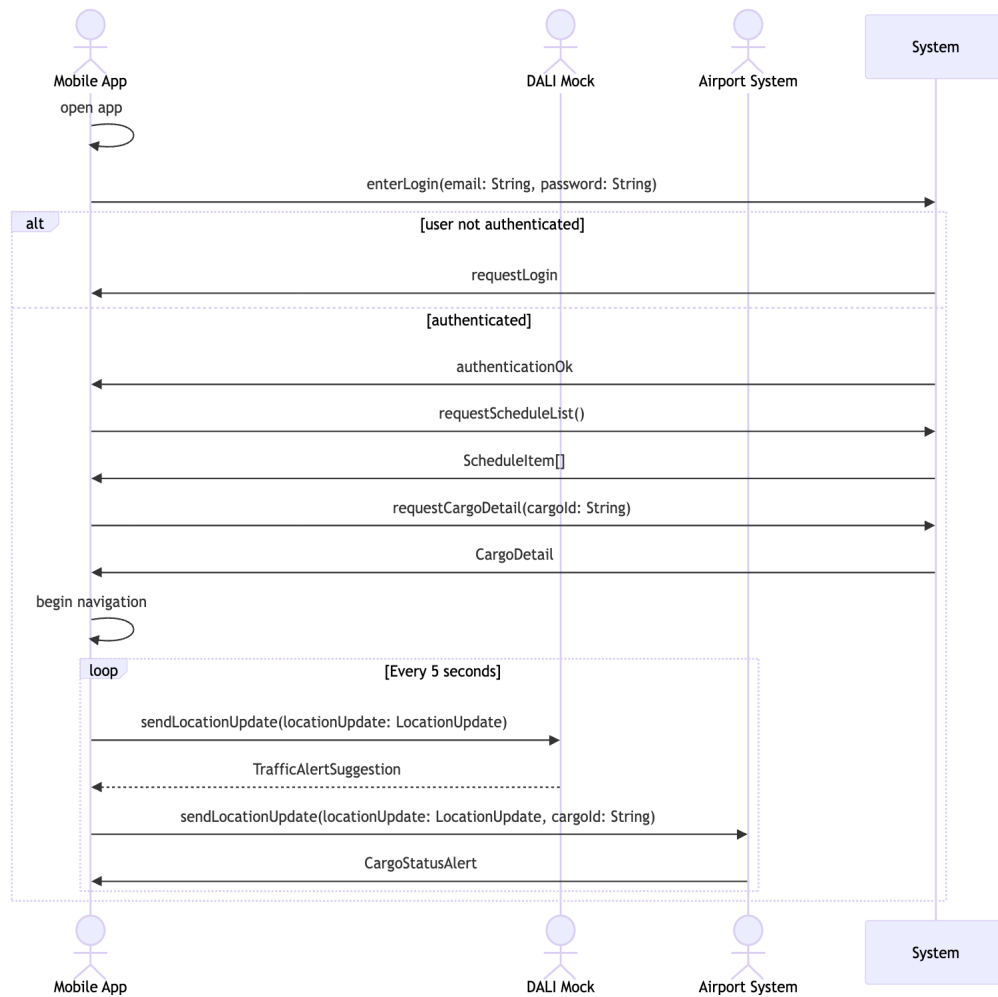
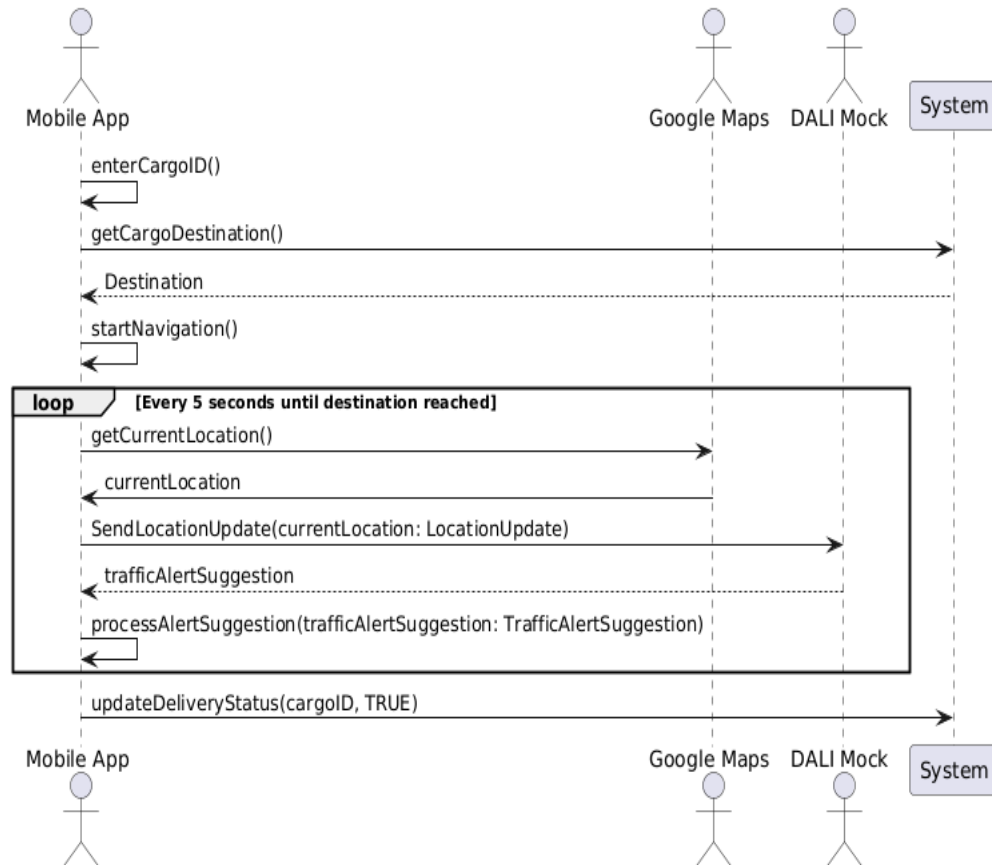## 1.2. UC1 UCR - Scheduling trucks to the airport.
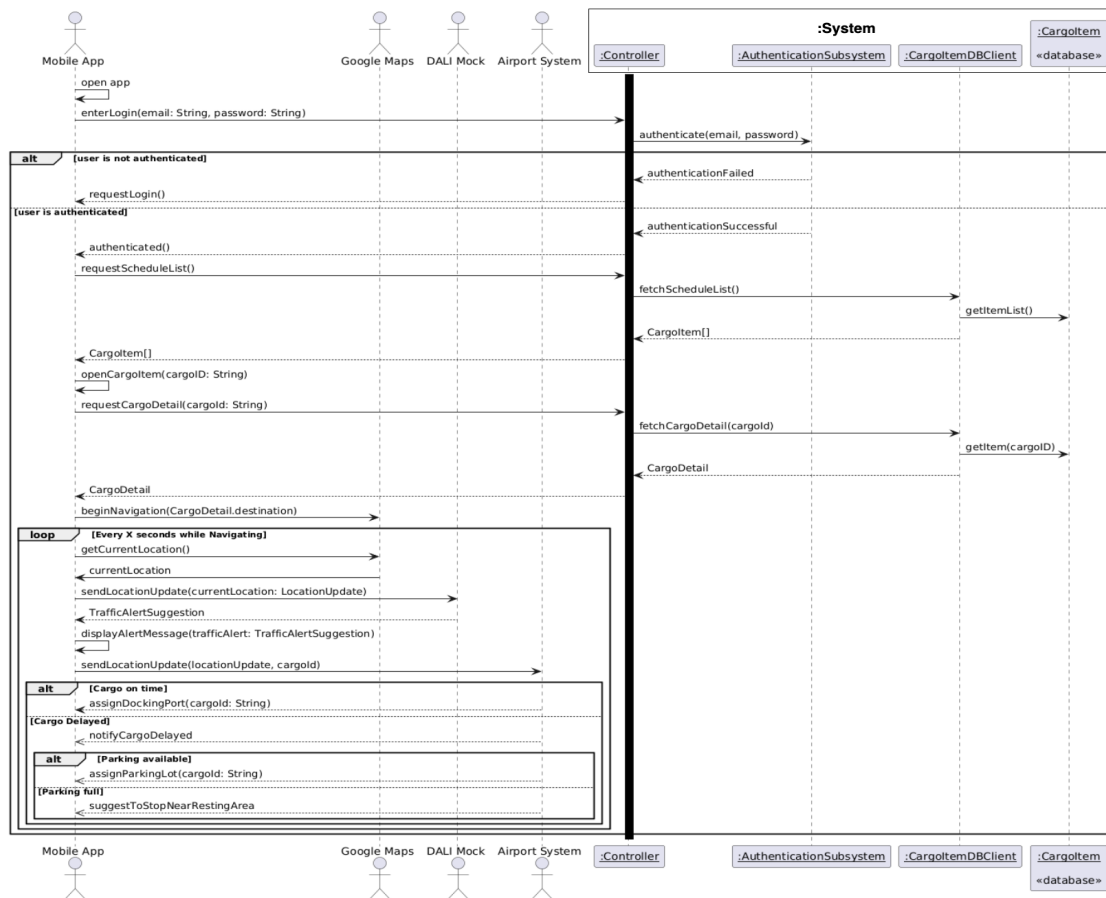
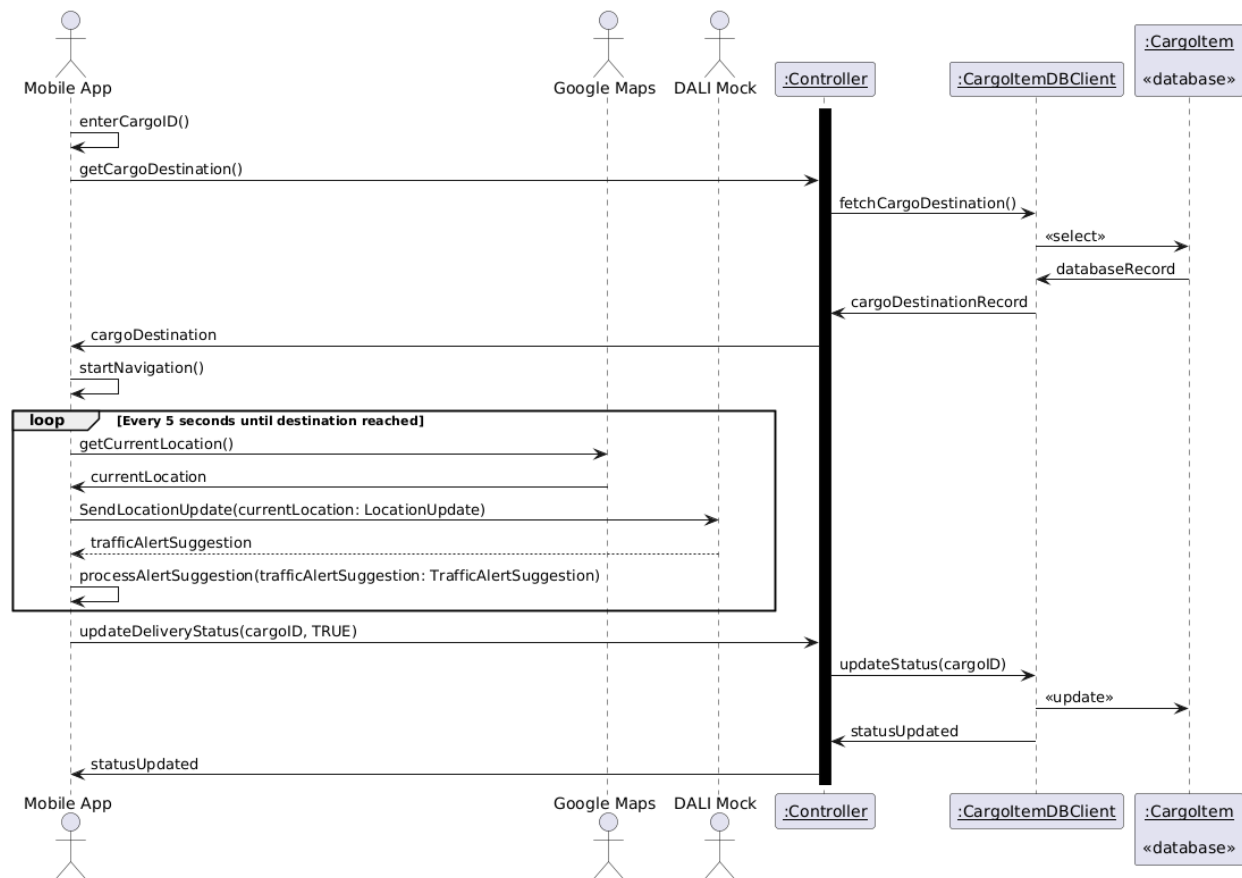**This UCR is focused on Mobile application external services.**

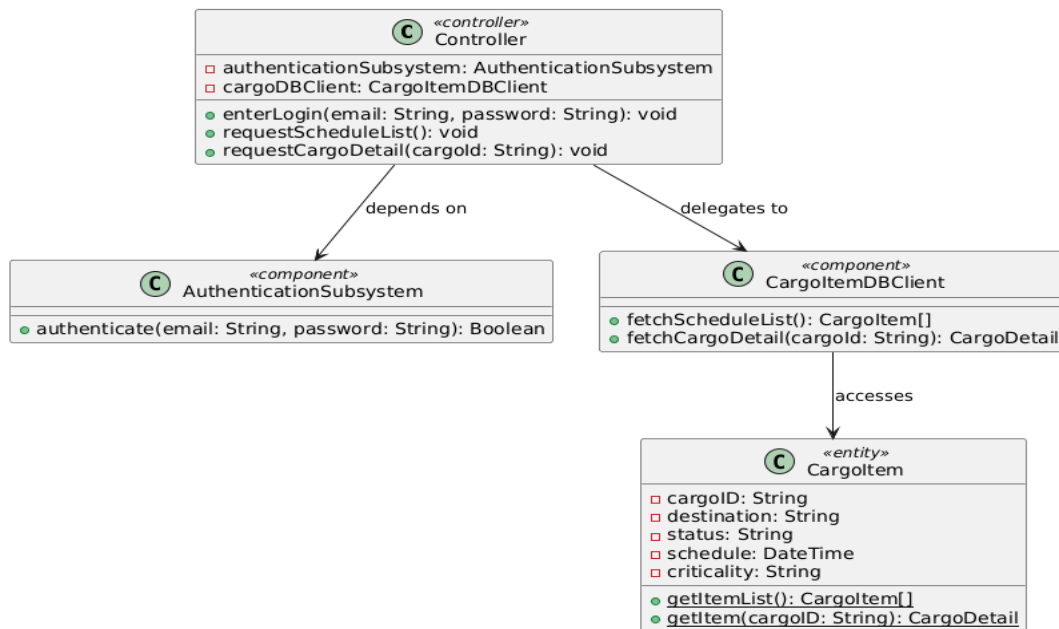## 2. Use Case Realizations – UC2

2.1. Black box sequence diagram UC 2
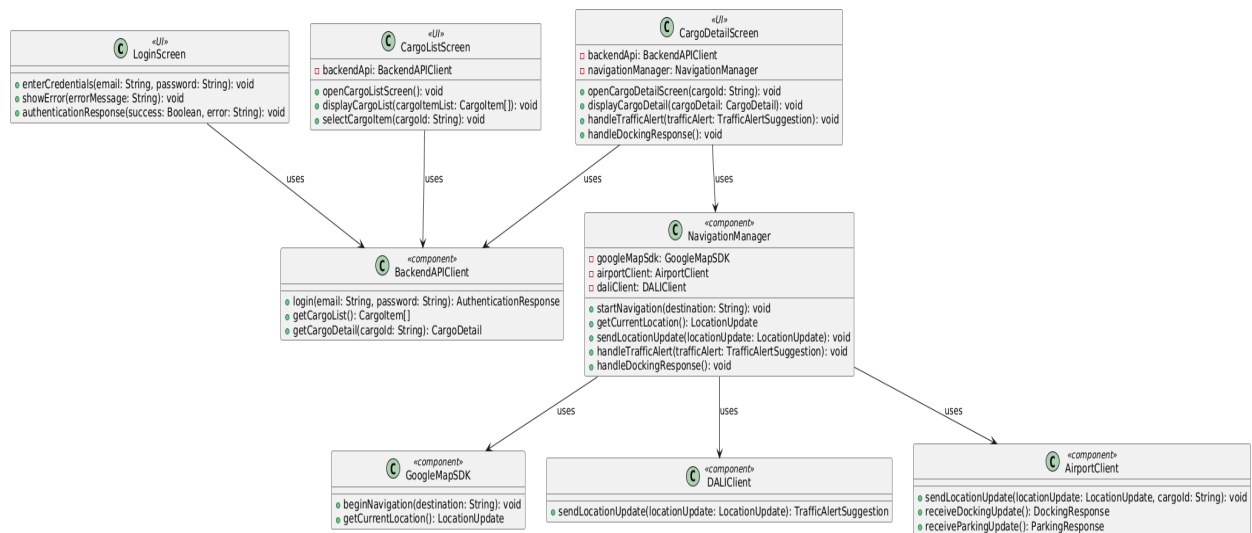
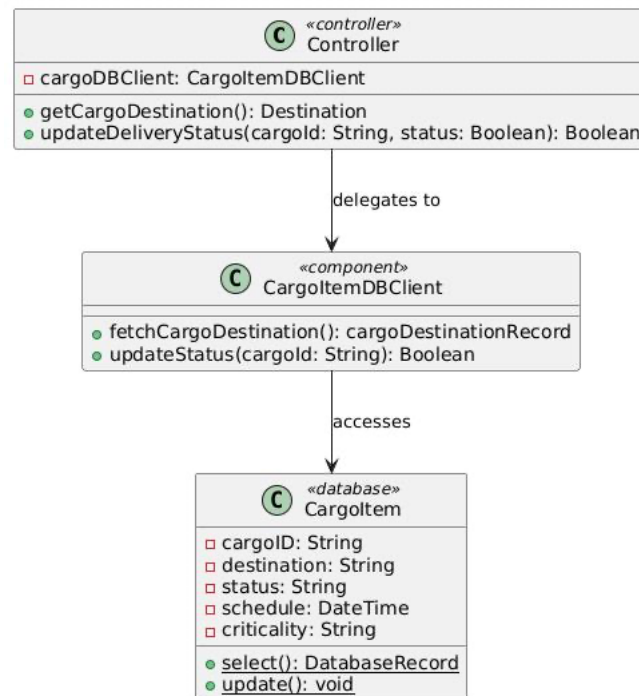## 2.2. UC2 UCR - Scheduling trucks from the airport.

3. Design Class Diagrams

3.1. UC1 DCD : Schedule trucks to the airport

Mobile App DCD :

3.2. UC2 DCD : Schedule trucks from the airport

«controller»
C Controller

☐ cargoDBClient: CargoItemDBClient

● getCargoDestination(): Destination
● updateDeliveryStatus(cargoId: String, status: Boolean): Boolean

delegates to

«component»
C CargoItemDBClient

● fetchCargoDestination(): cargoDestinationRecord
● updateStatus(cargoId: String): Boolean

accesses

«database»
C CargoItem

☐ cargoID: String
☐ destination: String
☐ status: String
☐ schedule: DateTime
☐ criticality: String

● select(): DatabaseRecord
● update(): void

4. ER Diagram

E Cargo

● cargo_id : UUID

description : TEXT
weight : NUMERIC(6,2)
type : VARCHAR(50)
status : VARCHAR(20)
hazardous : BOOLEAN

scheduled in

E Schedule

● schedule_id : INTEGER

cargo_id : UUID
pickup_time : TIMESTAMP
delivery_time : TIMESTAMP
pickup_loc_id : INTEGER
dropoff_loc_id : INTEGER
vehicle_id : INTEGER
status : VARCHAR(20)
criticality : VARCHAR(20)

pickup from   *dropoff at*   *transported by*

E Location

● id : INTEGER

name : VARCHAR(100)
address : TEXT
coordinates : POINT

E Vehicle

● id : INTEGER

status : VARCHAR(20)
capacity : NUMERIC(6,2)

Appendix A: Glossary

Term	Definition
Cargo Info	Data that includes truck ID, dock location, estimated time of arrival (ETA), and cargo availability status.
DALI	A traffic analysis system providing real-time driving instructions and alerts to ensure efficient navigation for trucks.
Dock	A designated loading or unloading location at the airport for trucks
ETA	The expected time when a truck will reach its designated dock at the airport.
Main System	The core software system responsible for coordinating truck scheduling, managing cargo information, and assigning docks.
Position	A class representing the spatial data of a truck's current location.

Appendix B: References

[1] https://learn.saylor.org/mod/book/view.php?id=72371&chapterid=67339

[2]. https://roshanchi.tripod.com/Documents/Study/OOAD/Notes/DCD.pdf