CSE 522: Project

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Extract: We would like to develop a system depicting the management of a Transportation Services System. The entire environment is interdependent on each other and involves real time updates to add to the complexity. The main actors involved are a Central Control System, Drivers and Commuters. We intend to develop a transport system that aims at smooth functioning with zero inconvenience to commuters.

Nouns:

1. **Central Control System:** Entity that co-ordinates and maintains the transport system.
2. **Types of Vehicles:** Transportation services consists of Buses or Vans.
3. **Employees:** The employees of the Transportation Services include Bus Drivers, Supervisors, Emergency Staff, Support Staff, Central Control System staff.
4. **Routes:** Each route has separate set of vehicles operating. There are N1 Number of Buses, N2 number of Vans. Each Bus has a Route Map and operating timetable associated with it. Trip fare will depend on the routes as well and the no. of stops along the route
5. **Stops:** The different bus stops that are cataloged in the system
6. **Schedules:** Scheduling of buses needs to be managed correctly to avoid any convenience, overcrowding and long delays to users.
7. **Commuters:** The passengers using the bus service
8. **Fare Collector:** A smart card system installed on the bus which collects fares from commuters

Use cases:

1. Commuter retrieves Bus Map and calculated fare
2. Commuter retrieves Bus Schedule and real time location of buses
3. Bus driver informs Central Control System about the crowd status at a bus stop
4. Central Control System decides to ply additional buses on a route depending on crowd status and emergency situations
5. Bus driver posts location updates to Central Control System
6. Central Control System sends schedule updates, real time location updates and other notifications to bus stops and commuters
7. Fare Collector maintains a database of registered commuters and authorizes them accordingly to use the bus services.
8. Fare Collector sends information about total fare collected per trip to Central Control System.

Use Case	Actor
Retrieve bus map and fare	Commuter
Retrieve Schedule and Real Time location	Commuter
Update crowd status	Driver
Post real time location updates	Driver
Ply additional buses	Central Control System
Send notifications for schedule updates	Central Control System
Authorize commuters to ride the bus	Fare Collector
Update total fare collected per trip to Control System	Fare Collector

Class Diagram:

Central Control System

-routes
-stops
-schedule

+plyAdditionalVehicles()
+scheduleUpdateNotification()

Commuters

+retrieveMap()
+retrieveFare()
+retrieveRealTimeLocation()
+retrieveSchedule()

Vehicle

Employess

Buses

+updateCrowdStatus(): Enum
+realTimeLocationUpdate(): float

Vans

+updateCrowdStatus(): Enum
+realTimeLocationUpdate(): float

Drivers

+updateCrowdStatus(int stop)
+updateLocation()

+uses

+uses

FareCollector

+tripFareUpdate(): float
+commuterAuthorization(): boolean