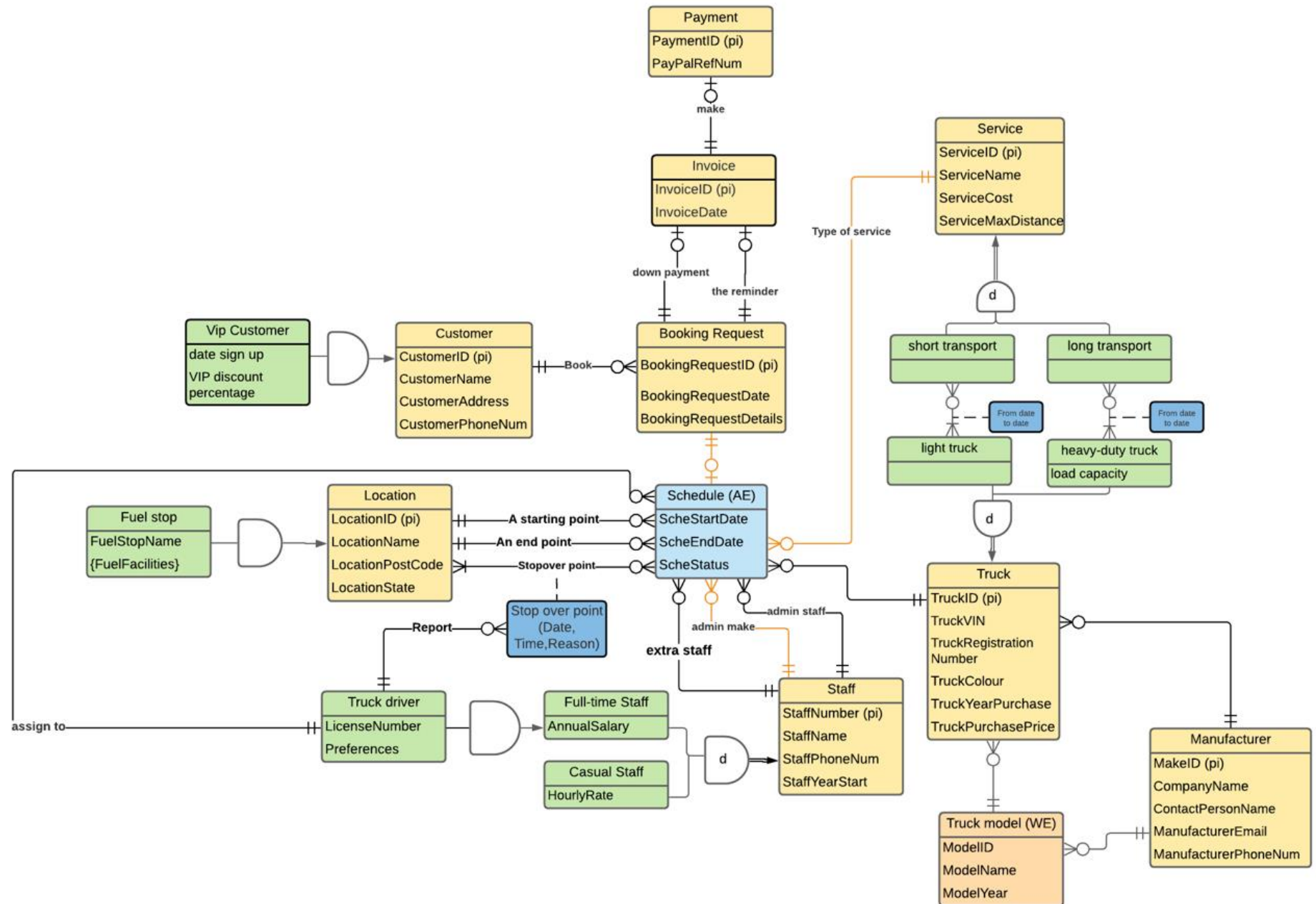Task 1: EER Diagram

Assumptions, if any:

- Assume that one schedule just only can have one extra staff.
- Assume that in some cases, customer can book a request and then change their mind and do not want to book so that there is no invoice and payment after that.
- Assume that customers can only book 1 service at a time.

Step1:Strong Entities:

- Customer (**CustomerID (pk)**, CusName,CusAdress, CusPhoneNum)

- Location (**LocationID (pk)**, LocaName,LocaPostCode,LocaState)

- Staff (**StaffID (pk)**, StaffName, StaffPhoneNum, StaffYearStart)

- Truck (**TruckID (pk)**, TruckVNI,TruckRegisNum, TruckColour, TruckYearPurchase, TruckPurchasePrice)

- Manufacturers (**MakeID (pk)**,CompanyName, ContactPersonName, ManufacturerEmail, ManufacturerPhoneNum)

- Service (**ServiceID (pk)**, ServiceName, ServiceCost, ServiceMaxDistance)

- Booking Request (**BookingRequestID (pk)**,BookingRequestDate, BookingRequestDetails)

- Invoice (**InvoiceID (pk)**, InvoiceDate)

- Payment (**PaymentID (pk)**, PayPalRefNum)

Step2:Weak entities:

- Truck Model (**MakeID (pk, fk)**, **ModelID (pk)**, ModelName, ModelYear)

Step 3:One-one relationship:

- Invoice (**InvoiceID (pk)**, InvoiceDate, **BookingRequestID (pk,fk)**)

- Payment (**PaymentID (pk)**, PayPalRefNum, **InvoiceID (pk,fk)**)

Step 4:One-many relationship:

- Truck (**TruckID (pk)**, TruckVNI,TruckRegisNum, TruckColour, TruckYearPurchase, TruckPurchasePrice, **MakeID (pk,fk)**, **ModelID (pk,fk)**)

- Booking Request (**BookingRequestID (pk)**,BookingRequestDate, BookingRequestDetails, **CustomerID (pk,fk)**)

Step 5:Many-many relationship:

No many - many relationship

Step 6: No Multi-valued attributes:

No multi-valued attributes

Step 7: Associative entity/Ternary relationship:

- Schedule (**ScheduleID (pk)**, **StaffNumber (pk,fk)**, **BookingRequestID (pk,fk)**, **ServiceID (pk,fk)**,ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (ScheduleID (pk), StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk),ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (ScheduleID (pk), StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (ScheduleID (pk), StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ExtraStaffID (pk,fk), ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (<u>ScheduleID (pk)</u>, StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ExtraStaffID (pk,fk), StartingPointID (pk,fk),ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (<u>ScheduleID (pk)</u>, StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ExtraStaffID (pk,fk), StartingPointID (pk,fk), EndPointID (pk,fk), ScheStartDate, ScheEndDate, ScheStatus)

- Schedule (<u>ScheduleID (pk)</u>, StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ExtraStaffID (pk,fk), StartingPointID (pk,fk), EndPointID (pk,fk), TruckerID (pk,fk), ScheStartDate, ScheEndDate, ScheStatus)

- Stopover Point (Schedule (pk,fk),LocationID (pk,fk), Start Time, End Time, Reason)

Step 8a:

- Vip Customer (**CustomerID (pk,fk)**,DateSignUp, DiscountPercentage)

- Full-time Staff (**FullStaffID (pk,fk)**, AnnualSalary)

- Casual Staff (**CausualStaffID (pk,fk)**, HourlyRate)

- Trucker (**TruckerID (pk,fk),** LicenseNumber, Preferences)

- Short Transport (**ShortTranSportID (pk,fk)**)

- Long Transport (**Long TranSportID (pk,fk)**)

- Light Truck (**LightTruckID (pk,fk)**)

- Heavy-duty Truck (**HeavyTruckID (pk,fk)**)

- Fuel-stop (**FuelStopID (pk,fk)**, FuelStopName)

Repeat Steps 2-7

Step 2: No Weak entities

Step 3: No one-one relationship

Step 4: One-many relationship:

- Stopover Point (**Schedule (pk,fk),LocationID (pk,fk)**, **TruckerID (pk,fk)**, Start Time, End Time, Reason)

Step 5: Many-many relationship:

- History 1 (**ShortTransportID (pk,fk), LightTruckID (pk,fk)**, DateToDate)
- History 2 (**LongTransportID (pk,fk)**, **HeavyTruckID (pk,fk)**, DateToDate)

Step 6:Multi-valued attributes:

- Fuel Facilities (**FuelStopID (pk,fk)** FacilityName (pk))

Step 7: Associative entities/Ternary relationship

No Associative entities/Ternary relationship

Final table list:

- Customer (**CustomerID (pk)**, CusName,CusAdress, CusPhoneNum)

- Location (**LocationID (pk)**, LocaName,LocaPostCode,LocaState)

- Staff (**StaffID (pk)**, StaffName, StaffPhoneNum, StaffYearStart)

- Manufacturers (**MakeID (pk)**,CompanyName, ContactPersonName, ManufacturerEmail, ManufacturerPhoneNum)

- Truck (**TruckID (pk)**, **MakeID(pk,fk),**TruckVNI,TruckRegisNum, TruckColour, TruckYearPurchase, TruckPurchasePrice)

- Model (**MakeID (pk, fk)**, **ModelID (pk)**, ModelName, ModelYear)

- Service (**ServiceID (pk)**, ServiceName, ServiceCost, ServiceMaxDistance)

- Booking Request (**BookingRequestID (pk)**,BookingRequestDate, BookingRequestDetails)

- Invoice (**InvoiceID (pk)**, **BookingRequest(pk,fk)**, InvoiceDate)

- Payment (**PaymentID (pk)**, **InvoiceID (pk,fk)**, PayPalRefNum)

- Schedule (<u>ScheduleID (pk)</u>, StaffNumber (pk,fk), BookingRequestID (pk,fk), ServiceID (pk,fk),TruckID (pk,fk), AdminStaffID (pk,fk), ExtraStaffID (pk,fk), StartingPointID (pk,fk), EndPointID (pk,fk), TruckerID (pk,fk), ScheStartDate, ScheEndDate, ScheStatus)

- Vip Customer (**CustomerID (pk,fk)**,DateSignUp, DiscountPercentage)

- Full-time Staff (**FullStaffID (pk,fk)**, AnnualSalary)

- Casual Staff (**CausualStaffID (pk,fk)**, HourlyRate)

- Trucker (**TruckerID (pk,fk),** LicenseNumber, Preferences)