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TABLE 1. Paris Arrow Transport Vehicle Assets:

UNF:

VEHICLE (vehicle_id, vehicle_reg_num, vehicle_make, vehicle_model, vehicle_year, vehicle_odometer, vehicle_seatnum, (feature_name))

UNF -> 1NF:

VEHICLE (<u>vehicle_id</u>, vehicle_reg_num, vehicle_make, vehicle_model, vehicle_year, vehicle_odometer, vehicle_seatnum)

VEHICLE_FEATURE (<u>vehicle_id</u>, <u>feature_name</u>)

<u>Candidate(s) Key:</u>

- vehicle_id
- vehicle_reg_num

<u>Partial Dependencies:</u>
    None

1NF -> 2NF:

VEHICLE (<u>vehicle_id</u>, vehicle_reg_num, vehicle_make, vehicle_model, vehicle_year, vehicle_odomter, vehicle_seatnum)

VEHICLE_FEATURE (<u>vehicle_id</u>, <u>feature_name</u>)

<u>Transitive Dependencies:</u>

- vehicle_model -> vehicle_make

2NF -> 3NF:

VEHICLE (<u>vehicle_id</u>, vehicle_reg_num, vehicle_model, vehicle_year, vehicle_odomter, vehicle_seatnum)

VEHICLE_FEATURE (vehicle_id, feature_name)

VEHICLE_MANUFACTURER (vehicle_model, vehicle_make)

Full Dependencies:

- vehicle_id -> vehicle_reg_num, vehicle_model, vehicle_year, vehicle_odometer, vehicle_seatnum
- vehicle_model -> vehicle_make

TABLE 2. Paris Arrow Transit Driver Job Sheet:

UNF:

TRIP(trip_id, vehicle_id, vehicle_reg_num, driver_id, driver_name, official_id, official_name, trip_passnum, pickup_location_id, pickup_location_name, pickup_location_type, pickup_location_address, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, dropoff_location_name, dropoff_location_type, dropoff_location_address, trip_intended_dropoff_time, trip_actual_dropoff_time)

UNF -> 1NF:

TRIP(trip_id, vehicle_id, vehicle_reg_num, driver_id, driver_name, official_id, official_name, trip_passnum, pickup_location_id, pickup_location_name, pickup_location_type, pickup_location_address, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, dropoff_location_name, dropoff_location_type, dropoff_location_address, trip_intended_dropoff_time, trip_actual_dropoff_time)

Candidate(s) Key:

- trip_id

Partial Dependencies:

None

1NF -> 2NF:

TRIP(trip_id, vehicle_id, vehicle_reg_num, driver_id, driver_name, official_id, official_name, trip_passnum, pickup_location_id, pickup_location_name, pickup_location_type, pickup_location_address, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, dropoff_location_name, dropoff_location_type, dropoff_location_address, trip_intended_dropoff_time, trip_actual_dropoff_time)

Transitive Dependencies:

- vehicle_id -> vehicle_reg_num
- driver_id -> driver_name
- official_id -> official_name
- pickup_location_id -> pickup_location_name, pickup_location_type, pickup_location_address
- dropoff_location_id -> dropoff_location_name, dropoff_location_type, dropoff_location_address

2NF -> 3NF

TRIP(trip_id, vehicle_id, driver_id, official_id, trip_passnum, pickup_location_id, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, trip_intended_dropoff_time, trip_actual_dropoff_time)

VEHICLE(vehicle_id, vehicle_reg_num)

DRIVER(driver_id, driver_name)

OFFICIAL(official_id, official_name)

PICKUP_LOCATION(pickup_location_id, pickup_location_name, pickup_location_type, pickup_location_address)

DROPOFF_LOCATION(dropoff_location_id, dropoff_location_name, dropoff_location_type, dropoff_location_address)

Full Dependencies:

trip_id -> vehicle_id, driver_id, official_id, trip_passnum, pickup_location_id, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, trip_intended_dropoff_time, trip_actual_dropoff_time

vehicle_id -> vehicle_reg_num

driver_id -> driver_name

official_id -> official_name

location_id -> location_name, location_type, location_address

Attribute Synthesis:

Merge PICKUP_LOCATION and DROPOFF_LOCATION into LOCATION(location_id, location_name, location_type, location_address) since they are identical relations.

Final 3NF Relations for Table 2:

TRIP(trip_id, vehicle_id, driver_id, official_id, trip_passnum, pickup_location_id, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, trip_intended_dropoff_time, trip_actual_dropoff_time)

VEHICLE(vehicle_id, vehicle_reg_num)

DRIVER(driver_id, driver_name)

OFFICIAL(official_id, official_name)

LOCATION(location_id, location_name, location_type, location_address)

COLLECTED 3NF RELATIONS:

1. VEHICLE (vehicle_id, vehicle_reg_num, vehicle_model, vehicle_year, vehicle_odomter, vehicle_seatnum)
2. VEHICLE_FEATURE (vehicle_id, feature_name)
3. VEHICLE_MANUFACTURER (vehicle_model, vehicle_make)
4. TRIP(trip_id, vehicle_id, driver_id, official_id, trip_passnum, pickup_location_id, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, trip_intended_dropoff_time, trip_actual_dropoff_time)
5. VEHICLE(vehicle_id, vehicle_reg_num)
6. DRIVER(driver_id, driver_name)
7. OFFICIAL(official_id, official_name)
8. LOCATION(location_id, location_name, location_type, location_address)

Join together relations which have identical PK:

1&5: VEHICLE (<u>vehicle_id</u>, vehicle_reg_num, vehicle_model, vehicle_year, vehicle_odomter, vehicle_seatnum)

FINAL 3NF Relations:

VEHICLE (<u>vehicle_id</u>, vehicle_reg_num, vehicle_model, vehicle_year, vehicle_odomter, vehicle_seatnum)

VEHICLE_FEATURE (<u>vehicle_id</u>, <u>feature_name</u>)

VEHICLE_MANUFACTURER (<u>vehicle_model</u>, vehicle_make)

TRIP(<u>trip_id</u>, vehicle_id, driver_id, official_id, trip_passnum, pickup_location_id, trip_intended_pickup_time, trip_actual_pickup_time, dropoff_location_id, trip_intended_dropoff_time, trip_actual_dropoff_time)

DRIVER(<u>driver_id</u>, driver_name)

OFFICIAL(<u>official_id</u>, official_name)

LOCATION(<u>location_id</u>, location_name, location_type, location_address)