

***DATABASE DESIGN FOR GET-TO-  
PEDALIN***

## Cover Page

### Academic Integrity statement signed by all team members:

"In preparing this assignment our team has observed the requirements of the UNCC Code of Student Academic Integrity. The submitted deliverables are entirely the work of our team."

<b>Names</b>	<b>Roles &amp; Responsibilities</b>	<b>Sign here to show that you have read and have complied to the UNCC Academic Integrity</b>
Jalen Cole	Project Manager <ul style="list-style-type: none"><li>• Template</li><li>• Scheduling</li><li>• Format</li></ul>	Jalen Cole
Yetunde Ogunleye	Database designer <ul style="list-style-type: none"><li>• MS Visio</li></ul>	Yetunde Ogunleye
<b>Alexandra Johnson</b>	Business administrator <ul style="list-style-type: none"><li>• Access</li></ul>	Alexandra (Lexi) Johnson
<b>Ashley Persaud</b>	Business administrator <ul style="list-style-type: none"><li>• Access</li></ul>	Ashley Persaud
<b>Evan Maguire</b> <b>Josue Sosa</b>	Business analyst <ul style="list-style-type: none"><li>• Forms</li><li>• Report</li></ul>	Evan Maguire Josue Sosa

Relevant files:

ERD_06_11_23	Visio ERD
Database6_14_23V2	Access database
data_dictionary	Excel data dictionary
Optional	

Version control:

Version	Changes
Database6_14_23V2	Referential integrity (Access)
ERD_06_11_23V2	Removed Subscriber and bike subtypes (Visio)

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## Part I. Database Initial Study

### About the Model Company

Get-to-Pedalin' is a bike-share company that offers both electric and non-electric bikes for daily to monthly rides. The company currently faces a problem of limited availability, resulting in customers seeking alternative bike-share services. To address this issue and attract more customers, Get-to-Pedalin' needs to increase the number of bikes and stations throughout the city. Additionally, they aim to stay ahead of the competition by implementing convenient bike booking systems.

### Problems and Constraints

The primary problem is the insufficient availability of bikes, which leads to a loss of customers to other bike-share companies. The constraints include limited resources to expand our fleet and the need to compete with other established bike-share services in the market.

### Project Objectives and Business Needs

The main objective of Get-to-Pedalin' is to increase its customer base by addressing the problem of limited bike availability. To achieve this:

1. Increasing the number of stations and bikes by expanding its infrastructure, Get-to-Pedalin' can ensure wider availability of bikes throughout the city. Making it more convenient for customers to access its services.
2. Implement a bike booking system. Offering a bike booking feature will enhance accessibility and convenience for customers, enabling them to reserve bikes in advance and have peace of mind knowing a bike will be available when needed.
3. Stay ahead of the competition. Get-to-Pedalin' needs to maintain a competitive edge by providing superior services and incentives. Offering discounts to specific demographics, such as students and veterans, and providing special offers during city events can help attract more customers and differentiate their services from competitors.

### Scope and Boundaries

Get-to-Pedalin' Scope is:

4. Increasing the number of stations and bikes. This involves identifying suitable locations for additional stations, procuring more bikes, and establishing maintenance and repair services to ensure a reliable and well-maintained fleet.
5. Implementing a bike booking system. Get-to-Pedalin' will need to develop or adopt a reservation platform that allows customers to book bikes in advance, manage bookings, and integrate it with their existing operations.
6. Offering discounts to students and veterans. Get-to-Pedalin' will need to establish a verification process to ensure eligibility for these discounts and communicate the offers effectively to the target demographic.

7. Providing exclusive offers during events. Get-to-Pedalin' should identify relevant events in the city and create promotional campaigns to attract participants and attendees, leveraging the increased footfall during such occasions.

The boundaries are limited to our ability to expand our fleet, establish new stations, develop or adopt suitable booking systems, and offer discounts and specials.

## Deliverables

Booking Form	
Subscriber ID:	
Arrival Date:	
Arrival Time:	
Bike Type:	
Station Address:	

Booking Report	
Subscriber ID:	
Arrival Date:	
Arrival Time:	
Bike Type:	
Station Address:	
Bike Status:	
Booking ID:	

## Part II. Database Design

### Business Rules

#### Trip:

- A trip can have one and only one bike and each bike can have Zero to many trips.

- A trip can have one to many trip\_station and each trip\_station can have one and only one trip.

- A trip can have one and only one subscriber and each subscriber can have one too many trips.

**Trip\_station:**

- A trip\_station can have one and only one station, and each station can have one to many trip\_stations.

**Subscriber:**

- A subscriber can have one and only one subscription type either weekly or monthly.

**Bike:**

- A bike can have one and only one bike type either traditional or electric.
- A bike can have Zero to many repair orders and each repair order can be associated with one or only one bike.

**Repair\_Order:**

- A repair order can have one to many Employee Repairs and each employee repair can have one and only one repair order.

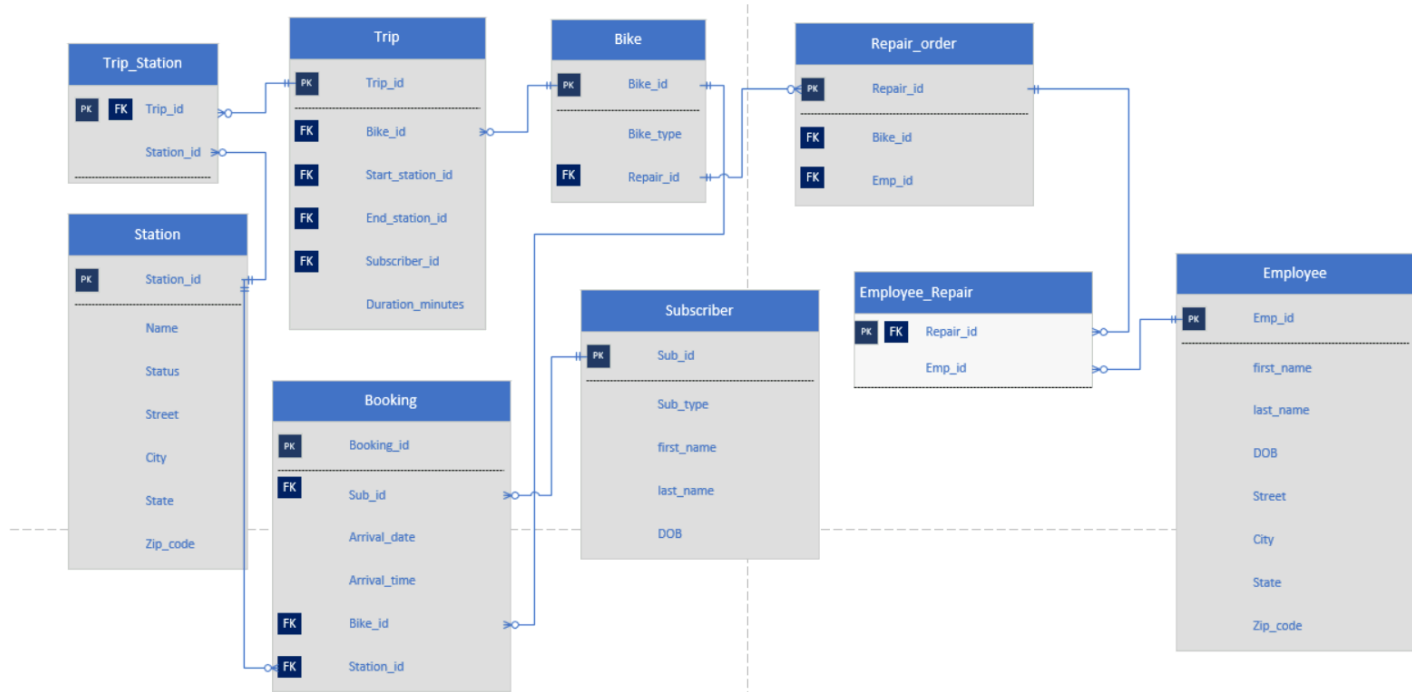
**Employee \_Repairs:**

- An employee repair can have one and only one employee and each employee can be associated with one-to-many employee repairs.

**Booking:**

- A subscriber can have zero-to-many bookings and each booking has one and only one subscriber.
- A bike can have zero-to-many bookings and each booking has one and only one bike.
- A station can be associated with one-to-many bookings and each booking has one and only one station.

## Normalized ERD- Visio



## Simplified Data Dictionary



Bike	
Fields	Description
Bike_id (PK)	Bike identification
Bike_type	If the bike is traditional or electric
Repair_id (FK)	Repair identification
Repair Order	
Fields	Description
repair_id (PK)	repair identification
repair_cost	cost of repair
Bike_ID (FK)	bike identification
Trips	
Fields	Description
trip_id (PK)	trip identification
bike_id (FK)	bike identification
Start_station_id(FK)	Bike pickup station identification
end_station_id (FK)	Bike dropoff station identification
duration_minutes	Length of trip(min)
subscriber_id(FK)	subscriber identification
Subscriber	
Fields	Description
sub_id(PK)	Subscriber identification
sub_type	Weekly or monthly subscription
first_name	Subscribe first name
last_name	Subscriber last name
DOB	Subscriber date of birth
Employee Repair	
Fields	Description
repair_id (PK,FK)	repair identification
emp_id (PK,FK)	Employee number
Trip_station	
Fields	Description
trip_id (PK, FK)	trip identification
station_id (PK, FK)	station identification
Booking	
Fields	Description
Booking_id (PK)	Booking identification
Sub_id (FK)	Subscriber identification
Arrival_date	Date of arrival
Arrival_time	Time of arrival
Bike_id (FK)	Bike identification
Station_id (FK)	Bike station identification
Employee	
Fields	Description
Emp_id (PK)	Employee Number
Emp_Fname	Employee first name
Emp_Lname	Employee last name
DOB	Date of birth
Street_Address	Street name
City	city
State	state
Zip_code	Zip code
Station	
Fields	Description
station_id (PK)	Bike station identification
name	name of the station
status	If the station is closed or open
street_Address	street name
city	city
state	state
zip_code	zip code

## Notes explaining design decisions and assumptions

I also created two bridge entities named Trip\_station and Employee\_repair. To break the M:M relationship between the trip table to the station table, and the repair\_order table to the employee table.

## Part III. Implementation and Loading - Access Business Reports

1. This is to see which Station is our hottest ticket item.

Most popular station				Tuesday, July 9, 2024	
				10:49:47 AM	
name	street	station_id	frequency		
8th & Guadalupe	800 Guadalupe St.	1003	5		
South Congress & Academy	1199 S. Congress Ave.	2570	4		
22nd 1/2 & Rio Grande	710 W. 22 1/2 St	11	1		
23rd & San Gabriel	915 W 23rd St	111	1		
OFFICE/Main/Shop/Repair	1000 Brazos	1001	1		
6th & Navasota St.	1308 W. 6th St.	1002	1		
Red River & LBJ Library	2322 Red River Street	1004	1		

```

SELECT
    name,
    street,
    booking.station_id,
    COUNT(booking.station_id) AS frequency
FROM booking INNER JOIN station ON station.station_id = booking.station_id
GROUP BY booking.station_id, name, street
ORDER BY COUNT(booking.station_id) DESC;

```

2. This Report helps to see the trend of bookings by date.

Number of bookings per day			Tuesday, July 9, 2024 10:50:25 AM
arrival_date	Num_of_people	day	
11/1/2023	1	Wednesday	
11/2/2023	1	Thursday	
11/3/2023	2	Friday	
11/4/2023	1	Saturday	
11/6/2023	2	Monday	
11/7/2023	1	Tuesday	
11/8/2023	4	Wednesday	
11/9/2023	2	Thursday	
11/10/2023	1	Friday	
11/13/2023	1	Monday	
11/14/2023	2	Tuesday	
11/16/2023	1	Thursday	
11/17/2023	1	Friday	
11/20/2023	2	Monday	
11/21/2023	2	Tuesday	
11/23/2023	1	Thursday	
11/24/2023	2	Friday	

SELECT

arrival\_date,

COUNT(arrival\_date) AS Num\_of\_people,

FORMAT(arrival\_date, 'dddd') AS [day]

FROM booking

GROUP BY arrival\_date;

3. Based on the bookings per day which day gets the most traffic.

which most booked day is the most frequent			Tuesday, July 9, 2024 10:50:42 AM
day	frequency		
Friday	4		
Wednesday	3		
Tuesday	3		
Monday	3		
Thursday	1		
Sunday	1		
Saturday	1		
7			

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4. This data spans two months. This helps us to see the percentage of popularity that builds more on the last report.

SELECT

Count(\*) AS day\_popularity,

FROM booking

GROUP BY Format(arrival\_date,'dddd');