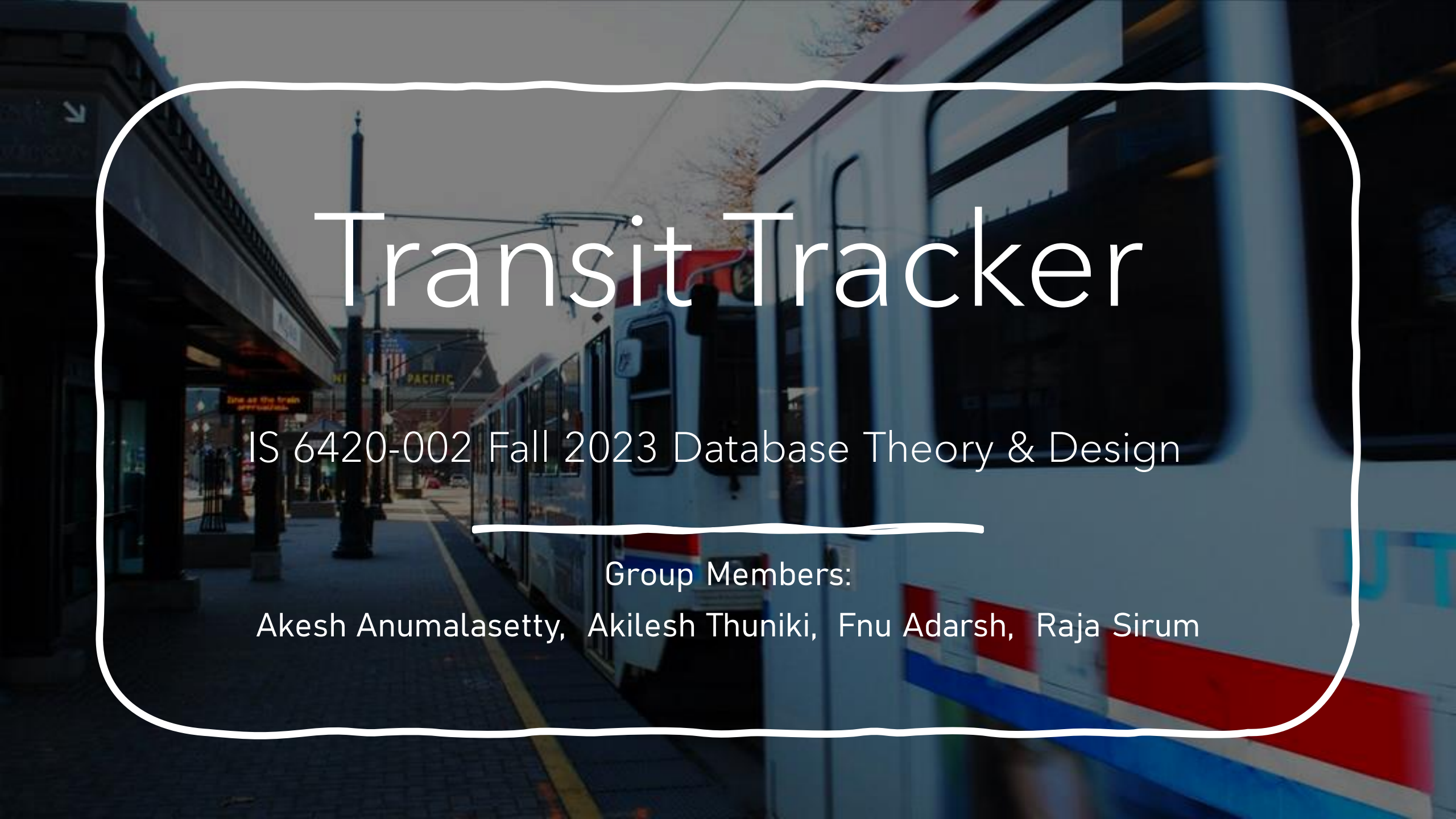


Transit Tracker

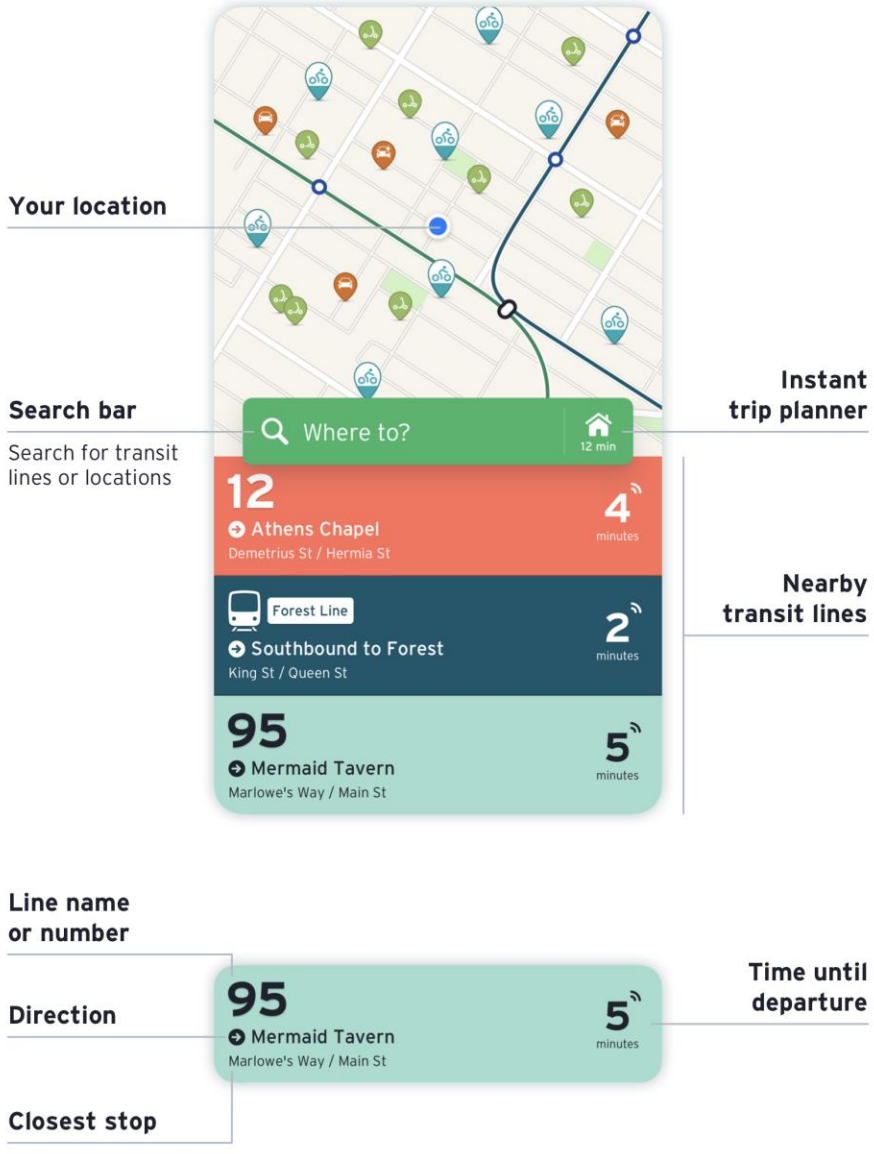
IS 6420-002 Fall 2023 Database Theory & Design

Group Members:

Akesh Anumalasetty, Akilesh Thuniki, Fnu Adarsh, Raja Sirum

AGENDA

- Application Overview
- Business requirement
- Transit App Snippets
- Conceptual, Logical & Physical Design Implementations
- Features
- Challenges encountered and future implementations



TRANSIT APP OVERVIEW

- UTA's Transit application allows users to conveniently plan their travel from any point of location or their live location to the destination of their preference by indicating the available options and their timelines in real-time while allowing them to pay on the go and keeping them updated with any delays or deviations.

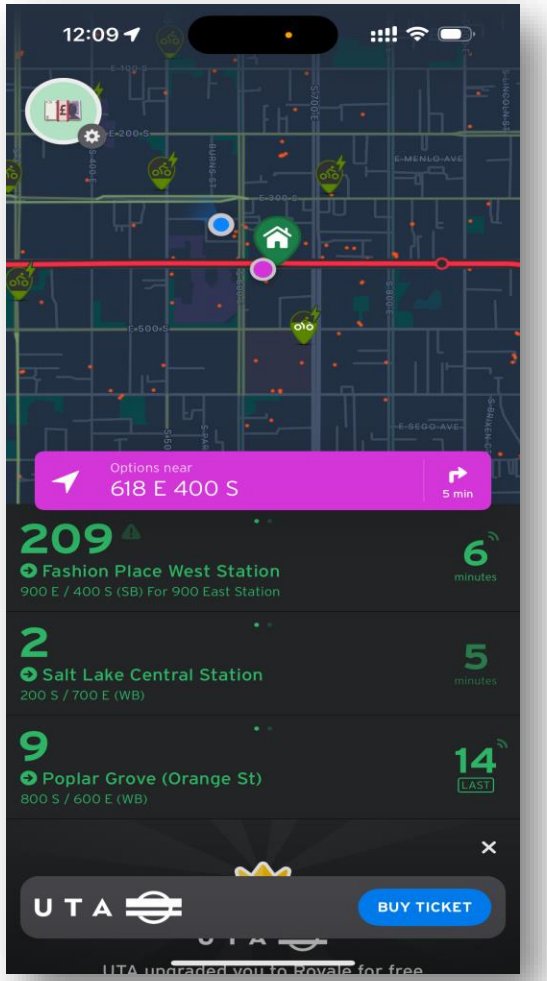
Did You Know ?

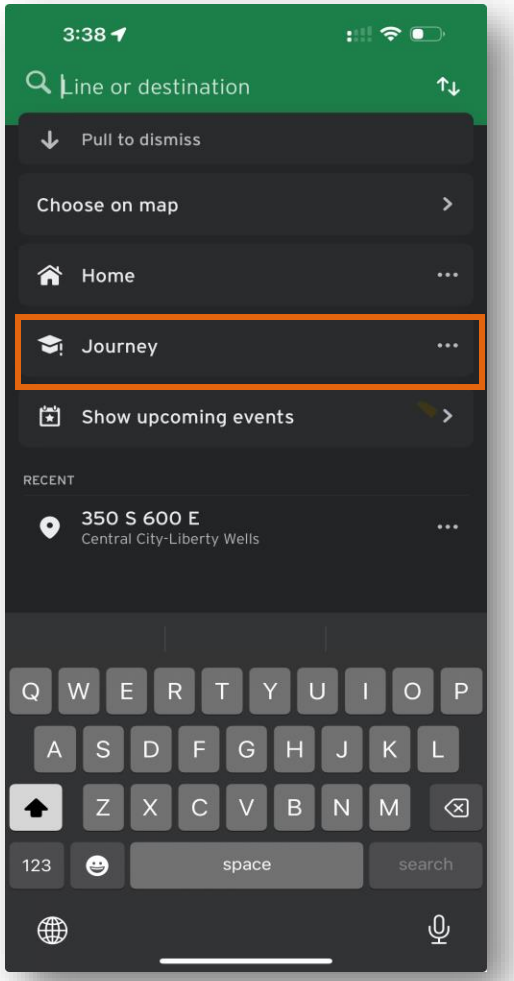
Approximately **65** million people use
Transit App for their travel needs daily

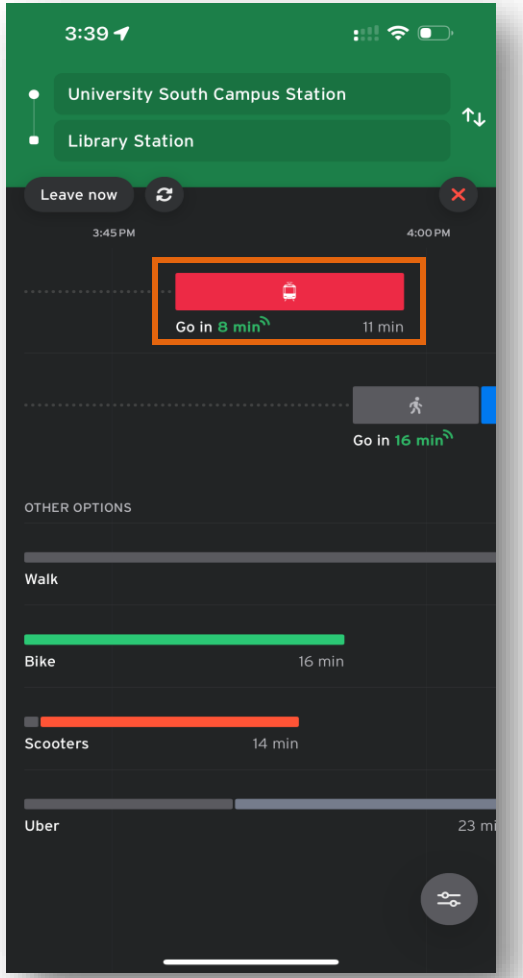
Business Requirement:

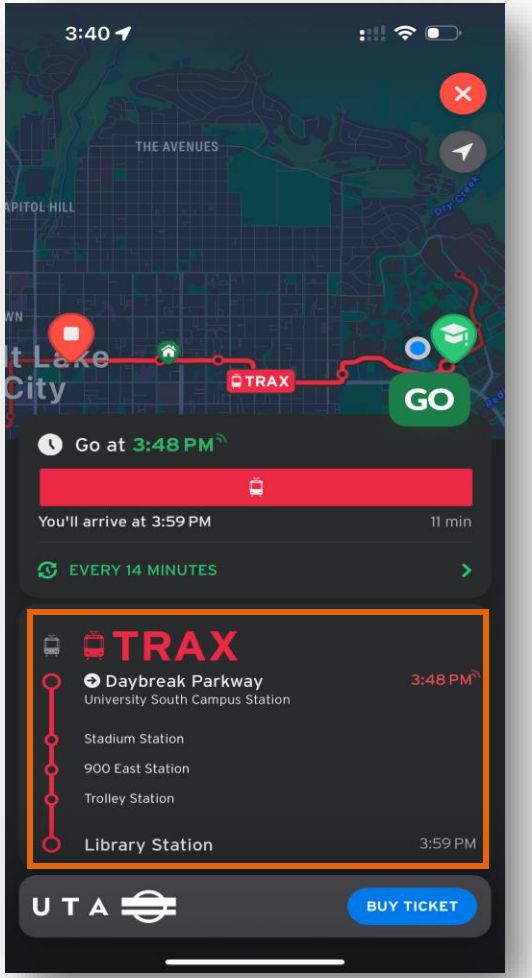
- Our primary goal is to re-engineer the relational interaction between the user application and the database of the Transit app, where we showcase the route options, timelines and provide transport options to the user as per their preference.
- This would allow us to have a more efficient way of handling the user information, route planning and schedule management.

TRANSIT APP

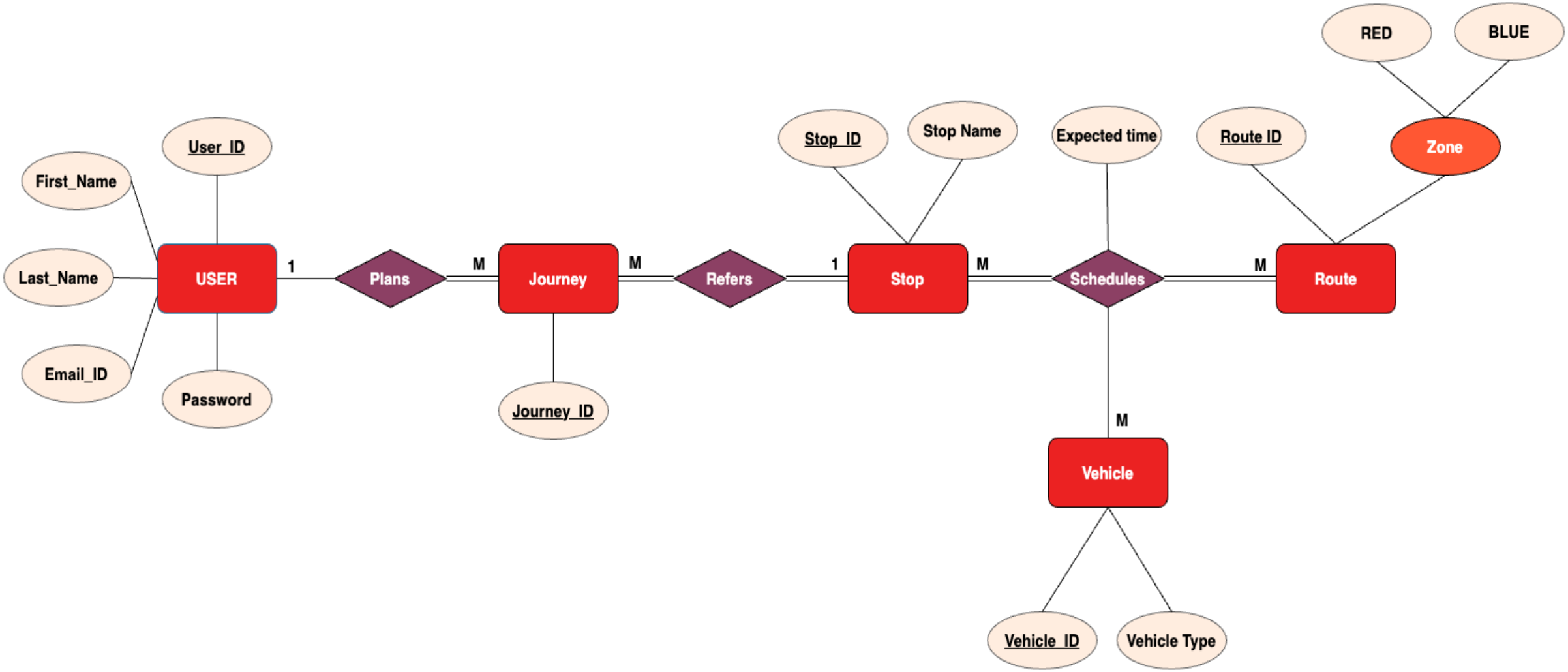

12:09
Options near
618 E 400 S
5 min
209
Fashion Place West Station
900 E / 400 S (SB) For 900 East Station
6
minutes
2
Salt Lake Central Station
200 S / 700 E (WB)
5
minutes
9
Poplar Grove (Orange St)
800 S / 600 E (WB)
14
LAST
UTA
BUY TICKET


3:38
Line or destination
Pull to dismiss
Choose on map
Home
Journey
Show upcoming events
RECENT
350 S 600 E
Central City-Liberty Wells
space
search

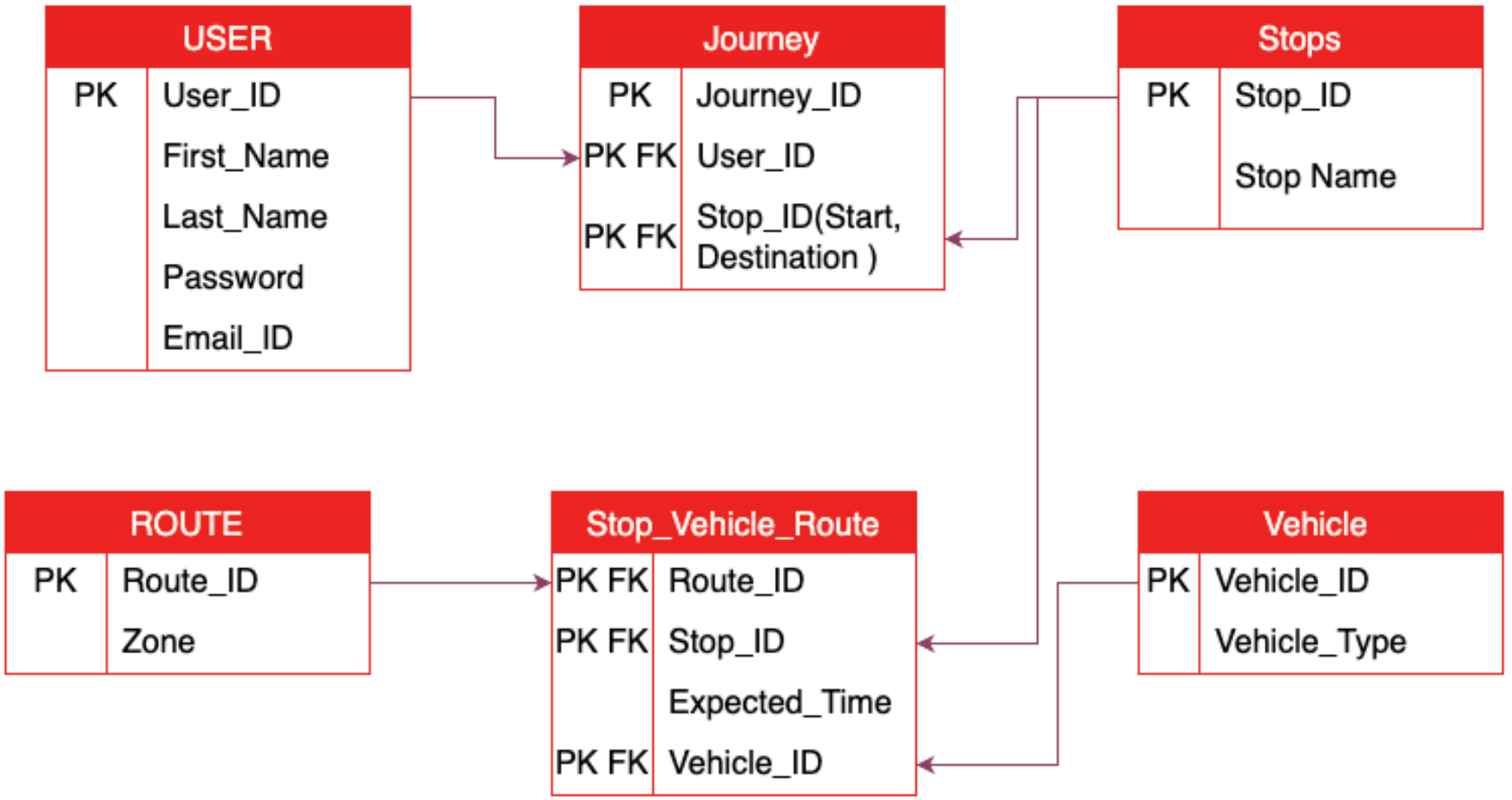

3:39
University South Campus Station
Library Station
Leave now
3:45 PM
4:00 PM
Go in 8 min
11 min
Go in 16 min
OTHER OPTIONS
Walk
Bike
16 min
Scooters
14 min
Uber


3:40
THE AVENUES
TRAX
GO
Go at 3:48 PM
You'll arrive at 3:59 PM
11 min
EVERY 14 MINUTES
TRAX
Daybreak Parkway
University South Campus Station
3:48 PM
Stadium Station
900 East Station
Trolley Station
Library Station
3:59 PM
UTA
BUY TICKET

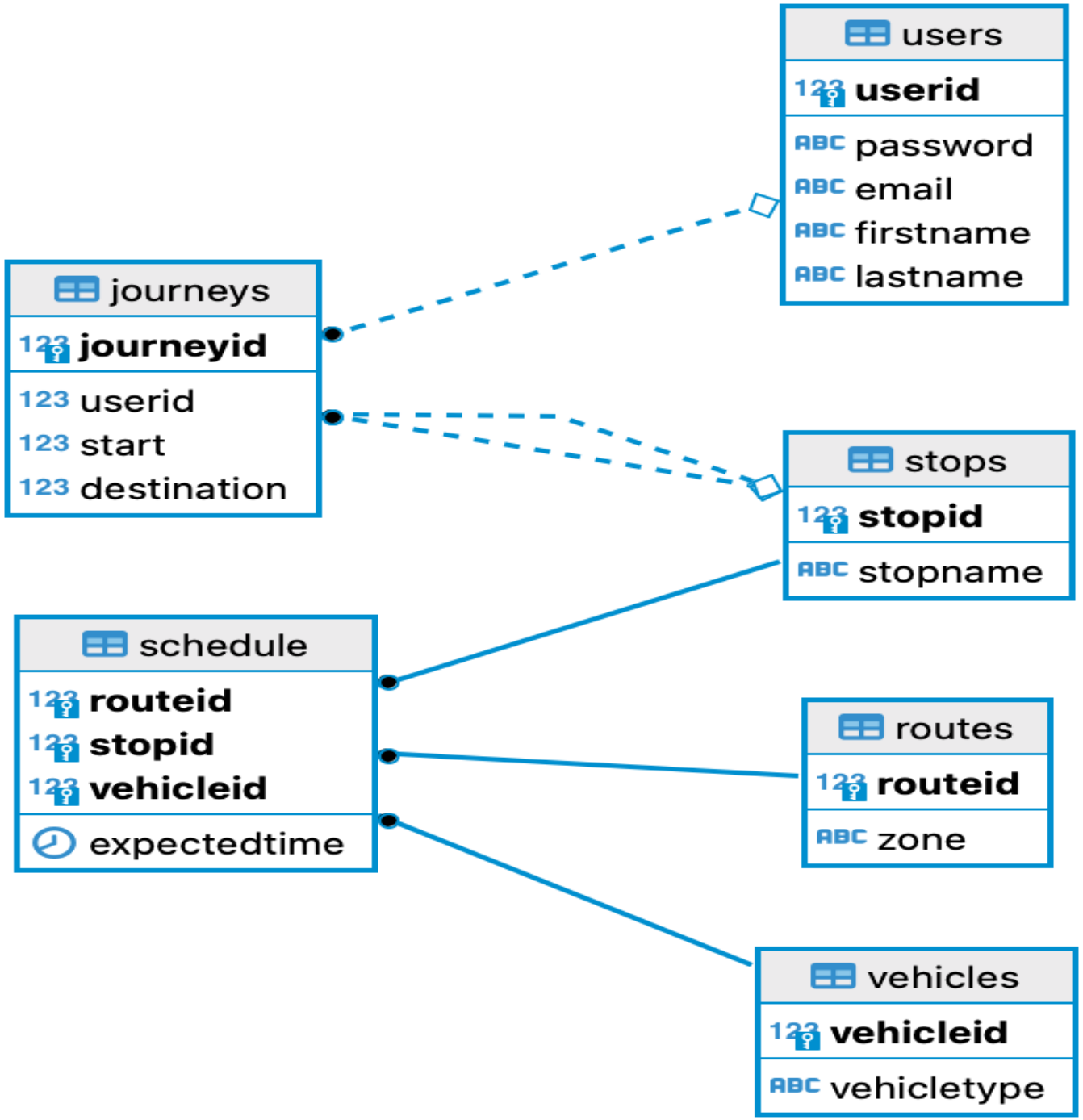
CONCEPTUAL DIAGRAM



LOGICAL DIAGRAM



PHYSICAL DIAGRAM



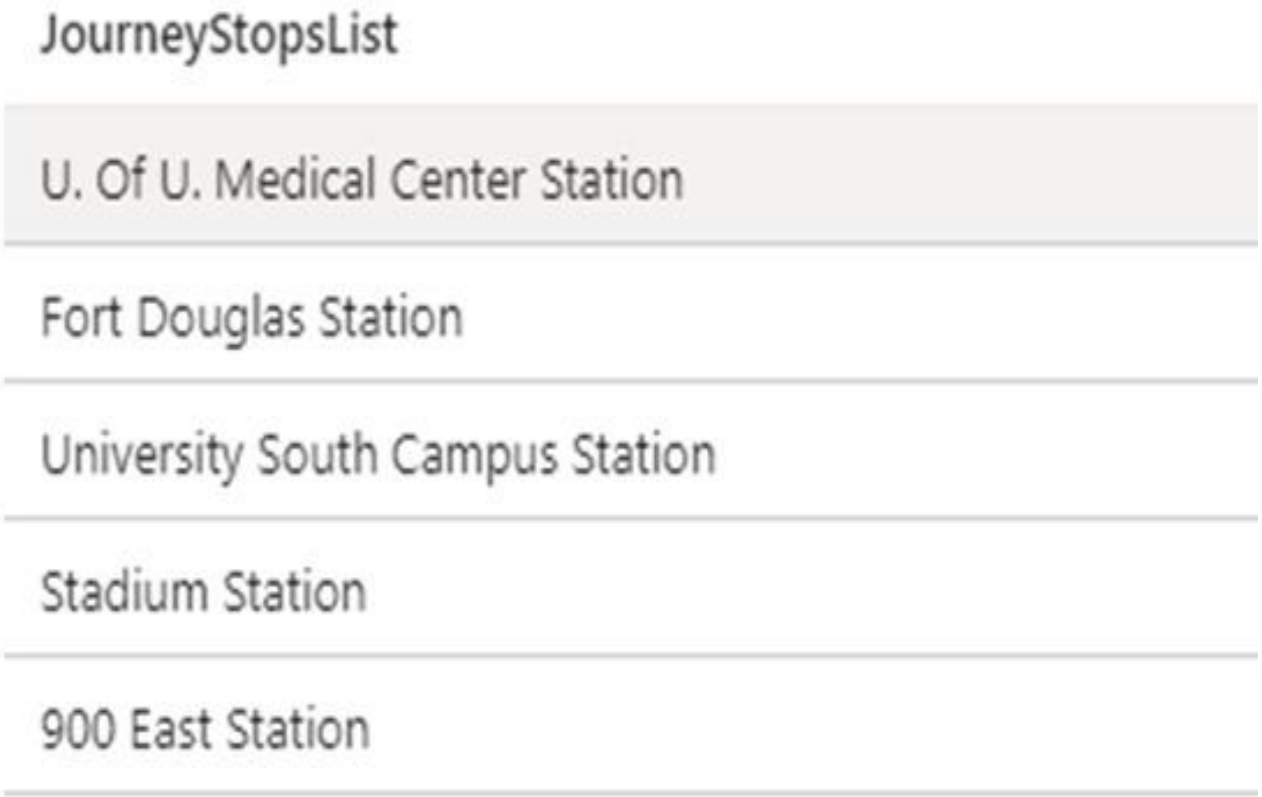
MY DATABASE

```
--Stops
INSERT INTO  [TRANSIT].[Stops] (StopID, StopName)
VALUES
(101, 'U. Of U. Medical Center Station'),
(102, 'Fort Douglas Station'),
(103, 'University South Campus Station'),
(104, 'Stadium Station'),
(105, '900 East Station'),
(106, 'Trolley Station'),
(107, 'Library Station'),
(108, 'Courthouse Station'),
(109, '600 South Station'),
(110, '900 South Station'),
(111, 'Ballpark Station'),
(112, 'Central Pointe Station'),
(113, 'Millcreek Station'),
(114, 'Meadowbrook Station'),
(115, 'Murray North Station'),
(116, 'Murray Central Station'),
(117, 'Fashion Place West Station'),
(118, 'Bingham Junction Station'),
(119, 'Historic Gardner Station'),
(120, 'West Jordan City Center Station'),
(121, '2700 W Sugar Factory Rd Station'),
(122, 'Jordan Valley Station'),
(123, '4800 W Old Bingham Hwy Station’),
(124, '5600 W Old Bingham Hwy Station'),
(125, 'South Jordan Parkway Station'),
(126, 'Daybreak Parkway Station');
```

```
--Journey
INSERT INTO [TRANSIT].[Journeys] (JourneyID, UserID, Start, Destination)
VALUES
    (301, 1, 101, 105),
    (302, 2, 102, 106),
    (303, 3, 119, 121),
    (304, 4, 126, 120),
    (305, 5, 124, 115),
    (306, 6, 110, 114),
    (307, 7, 143, 144),
    (308, 8, 145, 142),
    (309, 9, 143, 147),
    (310, 10, 144, 142);
```

1ST FEATURE

When a user organizes a travel by selecting start and destination locations, the app displays all the stops that are present between the start and end points, allowing the user to obtain an overview of all the stops that are present in his journey.



Results Messages

Search to filter items...

Zone	VehicleTy	Vehicle_No	Stops	ExpectedTime
Red	Trax	801	Fort Douglas Station	08:15:00
Red	Trax	801	University South Campus Station	08:30:00
Red	Trax	801	Stadium Station	08:45:00
Red	Trax	801	900 East Station	09:00:00
Red	Trax	801	Trolley Station	09:15:00
Red	Trax	803	Fort Douglas Station	11:15:00
Red	Trax	803	University South Campus Station	11:30:00
Red	Trax	803	Stadium Station	11:45:00
Red	Trax	803	900 East Station	12:00:00
Red	Trax	803	Trolley Station	12:15:00

2ND FEATURE

- Once the user picks the start and end points, we are showcasing the vehicles running in that route along with the stop information with anticipated timelines for the convenience of the user

Results Messages

Search to filter items...

VehicleTy	Vehicle_No	Stops	ExpectedTime
Bus	17	Sunnyside Ave & Guardsman Way	10:30:00
Bus	17	1300 S & 1500 E	11:00:00
Bus	17	900 E & 1700 S	11:30:00
Bus	17	State & 1700 S	12:00:00
Bus	17	Central Pointe Station	12:30:00

3RD FEATURE

- Based on the user 9 declared start and end points, the database showcases the available transport mode in that route with anticipated timelines, which is a bus in this scenario.

Results | Messages

Search to filter items...

Zone	VehicleTy	Vehicle_No	Stops	ExpectedTime
Red	Trax	802	Daybreak Parkway Station	08:00:00
Red	Trax	802	South Jordan Parkway Station	08:15:00
Red	Trax	802	5600 W Old Bingham Hwy Station	08:30:00
Red	Trax	802	4800 W Old Bingham Hwy Station	08:45:00
Red	Trax	802	Jordan Valley Station	09:00:00
Red	Trax	802	2700 W Sugar Factory Rd Station	09:15:00
Red	Trax	802	West Jordan City Center Station	09:30:00

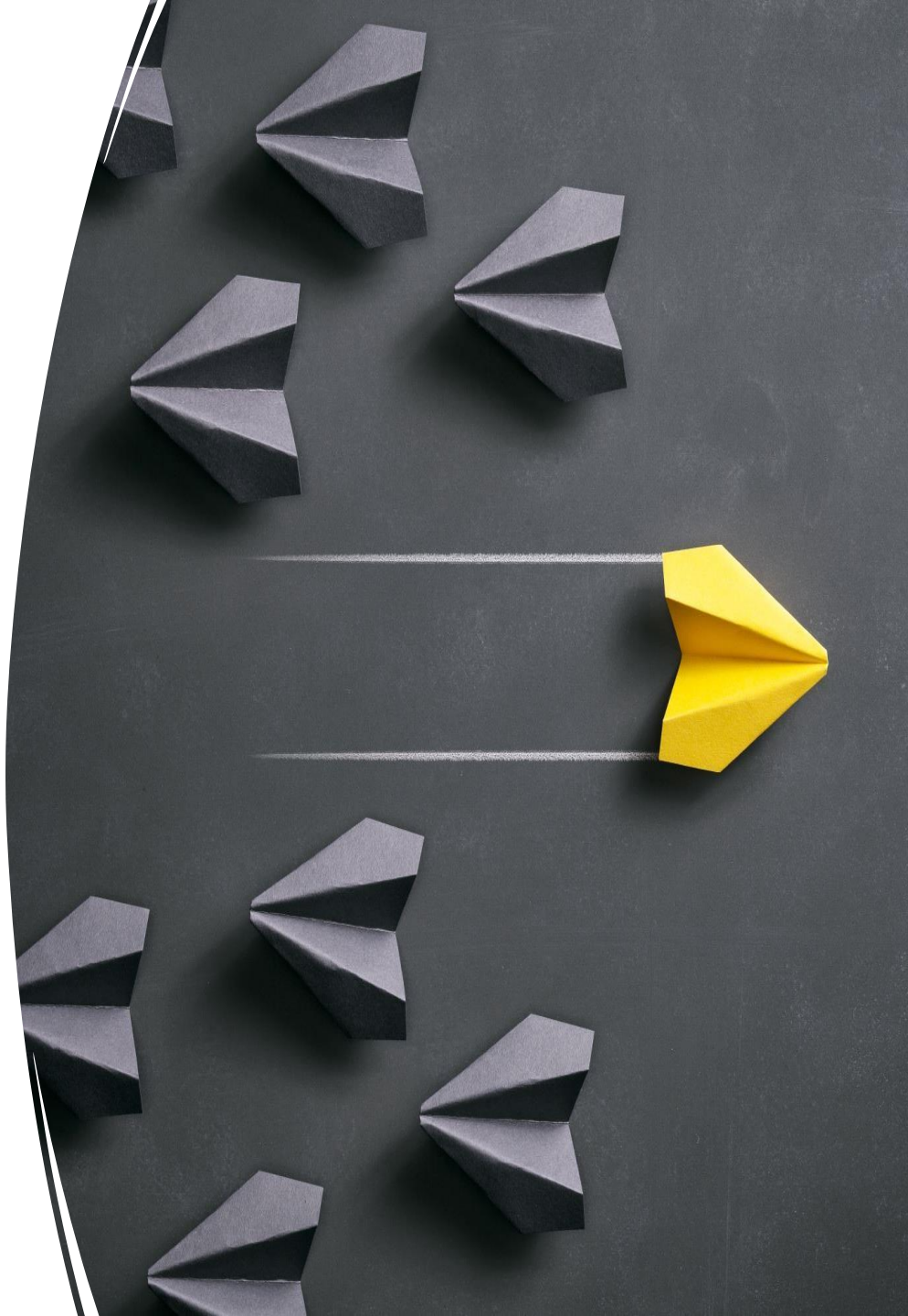
4TH FEATURE

- This is an enhancement of feature 2, where the user is travelling in counter direction of the same route.

CHALLENGES ENCOUNTERED

Key challenges faced during the different phases of the project:

- Deriving the relation between route, stop and vehicle was quite ambiguous and much more redundant, hence we picked ternary relation which helped us clearly dissipate the relation among the three entities involved.
- Assigning multiple vehicles in the same route with different start times..
- Allocating a vehicle in counter direction.
- Creating vehicle routes with shared intersections isn't practical within the scope of our project.



FUTURE DEVELOPMENTS

- Integration of multiple route paths with common stops.
- Providing Transit Time comparison for Multi-Modal Transport for user convenience.
- Live Location & Proximity-Based Transit point suggestions.
- Real-Time Transit Tracking and Delay relay :
    - Real-Time Data Synchronization
    - Delay Analysis and Prediction
- Enhanced User Experience, Advanced Mapping with Real-Time Data Synchronization


Q&A

THANK YOU

WE APPRECIATE YOUR SUPPORT

REFERENCES

- Picture in slide1- This Photo by Unknown author is licensed under CC BY-ND.
- Slide 2 image was taken from UTA official website
- Picture in slide 4:- This Photo by https://help.transitapp.com/article/93-how-to-use-transit
- Canva free templates