

Transit App Technical Report

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Project Overview

DRTransit is an app that is designed to provide users located in Durham Region with easy access to transit information. It incorporates a beautiful and straightforward UI design that allows for intuitive use. That app itself contains a wide breadth of features that will ensure that no questions are left unanswered by any user that seeks to get from point A to point B. Our goal for this project is to have an app that can be considered an omni tool for Durham Regional Transit.

The development process for this app was lengthy and there were numerous complications, standard for any app of this undertaking. But through the trials and tribulations, we feel that we have created an application that all members of the group can be proud of. Throughout this report, there will be a detailed examination of the group contributions, the code design, the fulfillment of technical requirements, and a guide for any prospective user.

Group Contributions

Group Member	Contributions
Kyle Alvares	<ul style="list-style-type: none">• Multiple screens / navigation• Dialogs (reusable too)• Image and time picker• Custom snackbars• Sqlite (local storage) and other persistent storage• Firebase (cloud storage)• Designed UI• Chart• Google Maps API

Drake Doyle	<ul style="list-style-type: none"> • Sqlite (Local Storage) • HTTP Requests from Durham Open Data • Assisting With UI • UML Diagram • User Guide • Code Design Summary • Project Overview
Jackie Jiang	<ul style="list-style-type: none"> • Notifications • HTTP request from Durham Open Data • Query data from Durham Open Data • Mapbox Map • Display all DRT stops on map from api • Geolocator (Find and display current location) • Geocoding (Find and display searched location)

Code Design

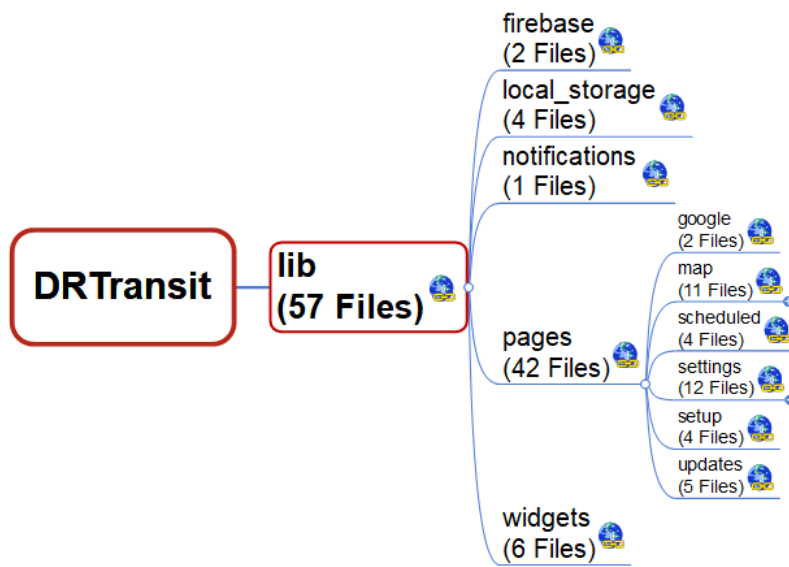
DRTransit: UML Diagram

FlutterFinalUML.svg

[Note: Download the file and open it in a web browser to properly view the UML Diagram]

DRTransit: Design Summary

Our app was designed to keep good coding practices in mind. All dart files for our app are organized into several folders with logical naming schemes. For example, any code related to the back-end local storage is stored in the local_storage folder. This organization ensures that debugging and searching for specific files is quick and simplistic.



Folder Directory Map

In addition, the code in the dart files are written to be as 'isolated' as possible. This means that if the code imports another file, that file is usually contained within the same general directory. For example, setup.dart imports privacy_policy.dart. Both of these files are contained within the 'pages' directory even if they might be in separate subdirectories.

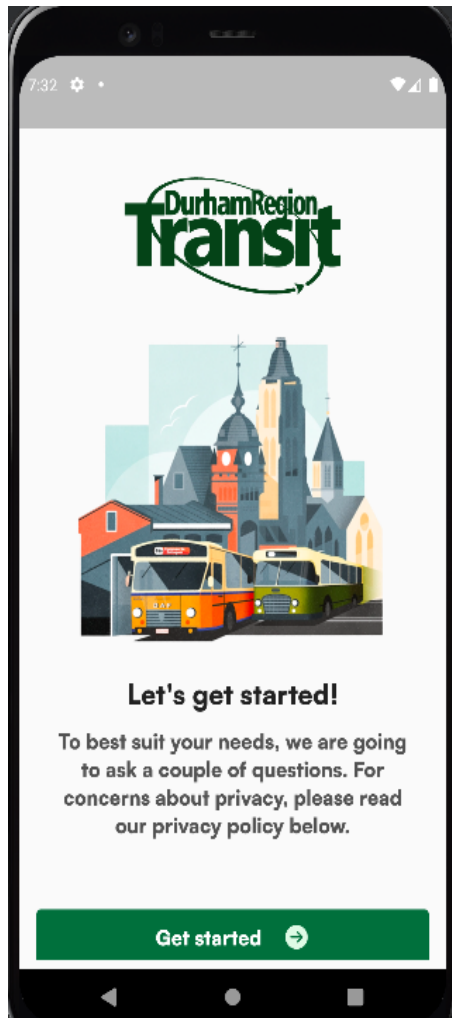
Any lengthy code blocks such as list initializations are written in a vertical manner to increase readability and to stay under the 80 character standard limit for code width as much as possible. Variables are named using camel case (Ex. Var firstName) and files are spaced by underscores (Ex. local_storage)

These are the code design standards that have guided the development of our app in companionship with general flutter design practices.

Functional Requirements (Tested on a Pixel 4 & 6)

Multiple Screens & Navigation

- This requirement is fulfilled throughout the app. But an example of this is when the user navigates from the starting screen to the name input screen.



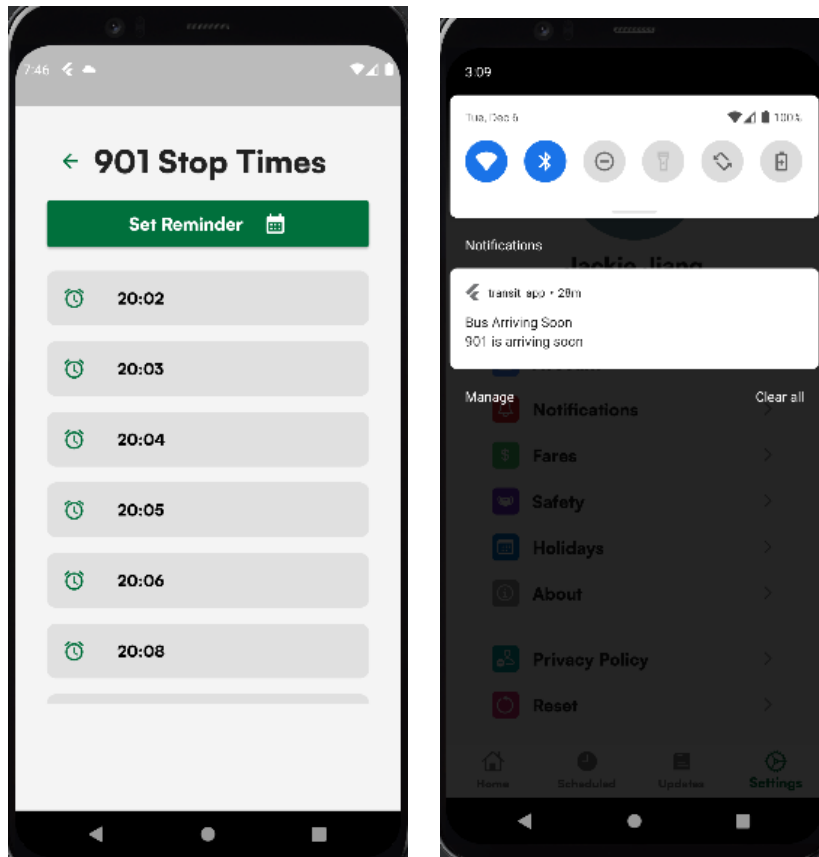
Get Started Screen

The image shows a smartphone screen displaying the 'Durham Region Transit' logo at the top. Below the logo is an illustration of four diverse people's faces in circular frames. The text 'Please enter the following details:' is displayed above two input fields: 'First name' and 'Last name'. At the bottom, there is a green button with the text 'Continue' and a right-pointing arrow.

Name Input Screen

Notifications

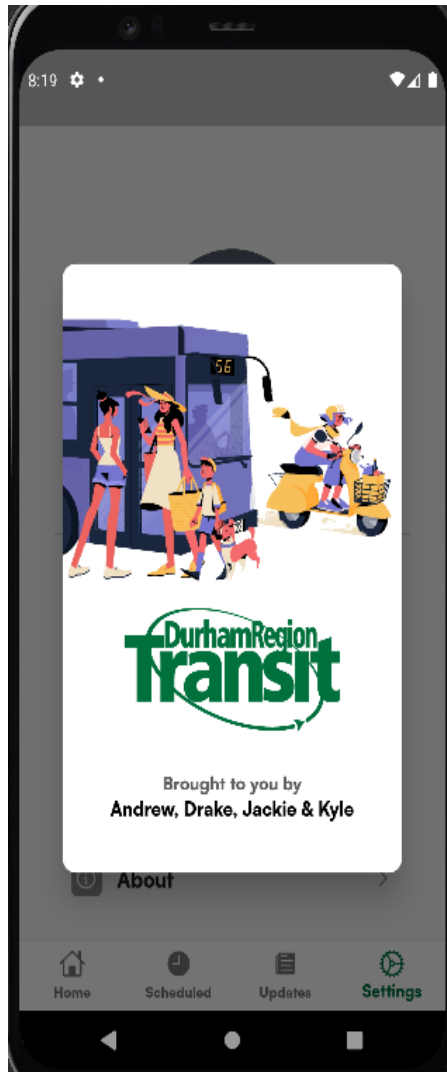
- An example of this requirement is allowing the user to set a notification for when a bus will arrive. The notification will alert the user 15 minutes before the bus arrives.



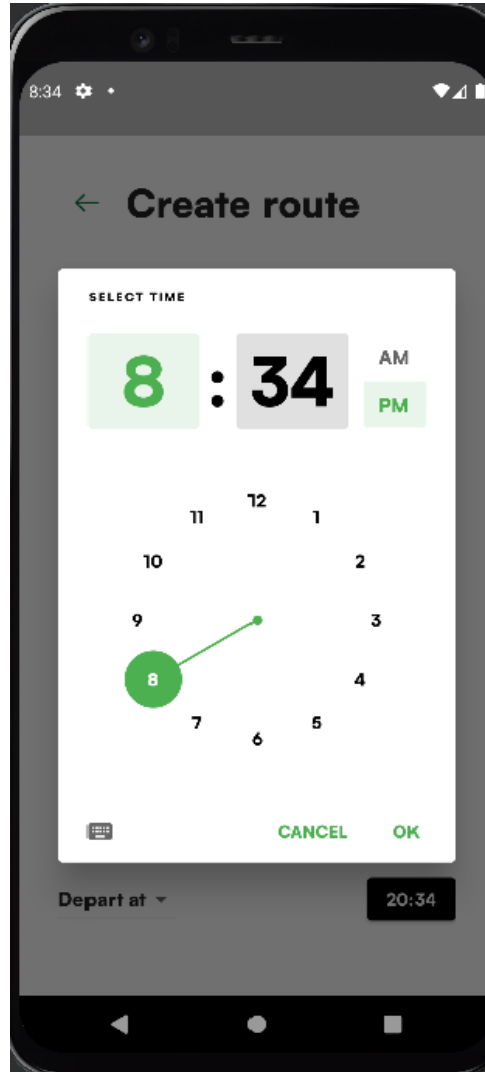
Notification Example

Dialogs & Pickers

- An example of a dialog in our app is when clicking on the 'Fares' button in the settings screen. This will open a dialog which will show the different information regarding the age groups that can ride the transit system.
- An example of a picker in our app is when a user selects a time for their scheduled route departure/arrival times.



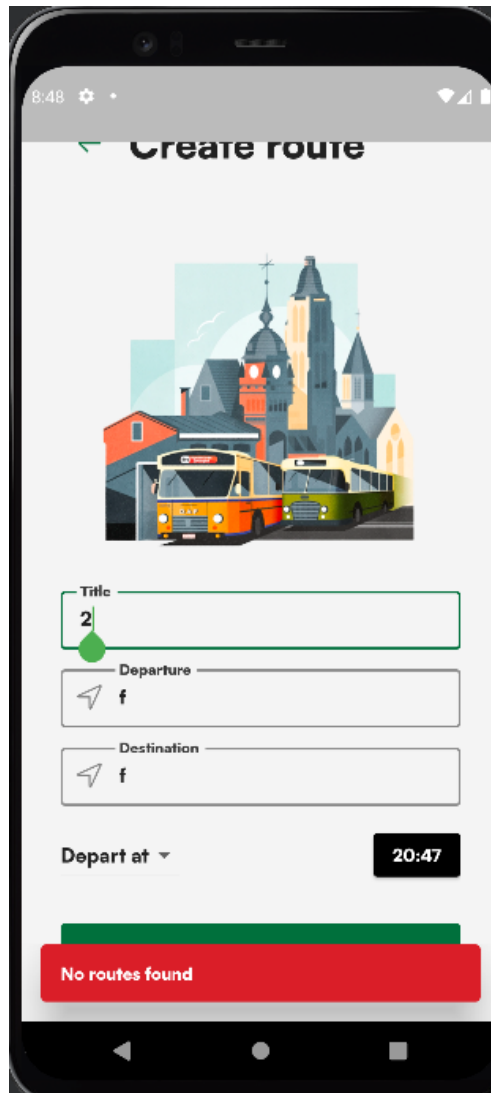
Dialogs Example



Pickers Example

Snackbars

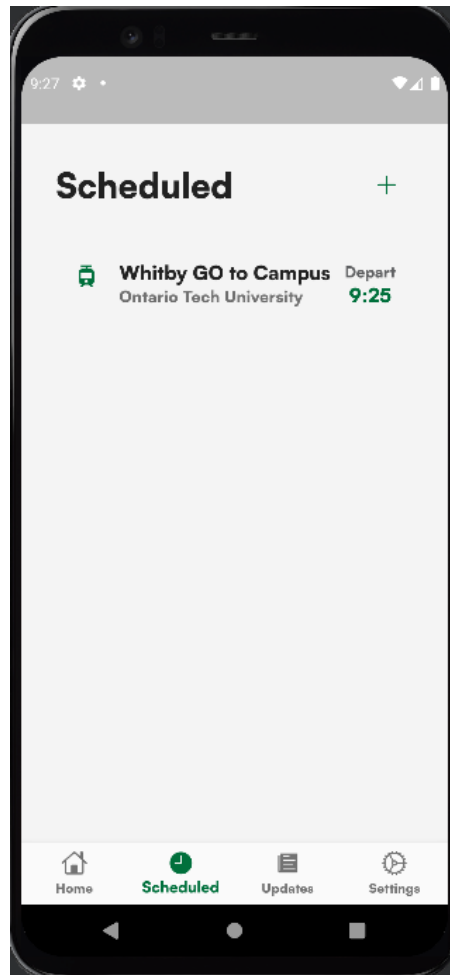
- An example of snackbars in our app is when a user who is inputting a scheduled route uses an invalid address which results in a 'no route found' snackbar to appear.



Snackbars Example

Local Storage

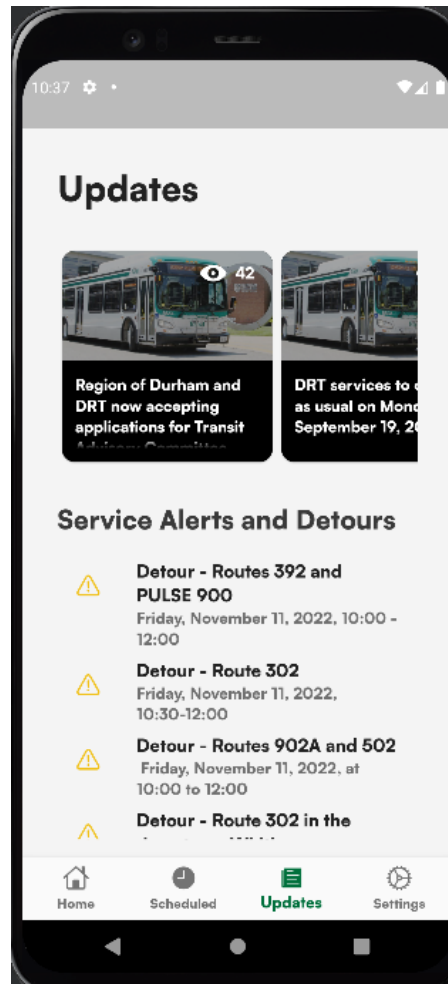
- An example of this requirement is our scheduled routes functionality. If a user creates a scheduled route, it will be stored in a sqlite database.



Local Storage Example

Cloud Storage

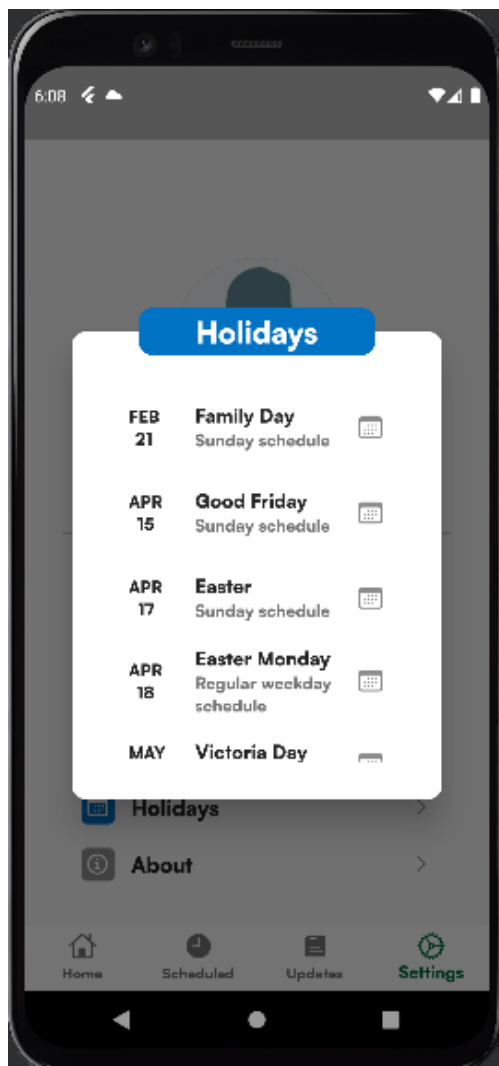
- An example of this requirement would be the firebase storage that is providing data for the updates page.



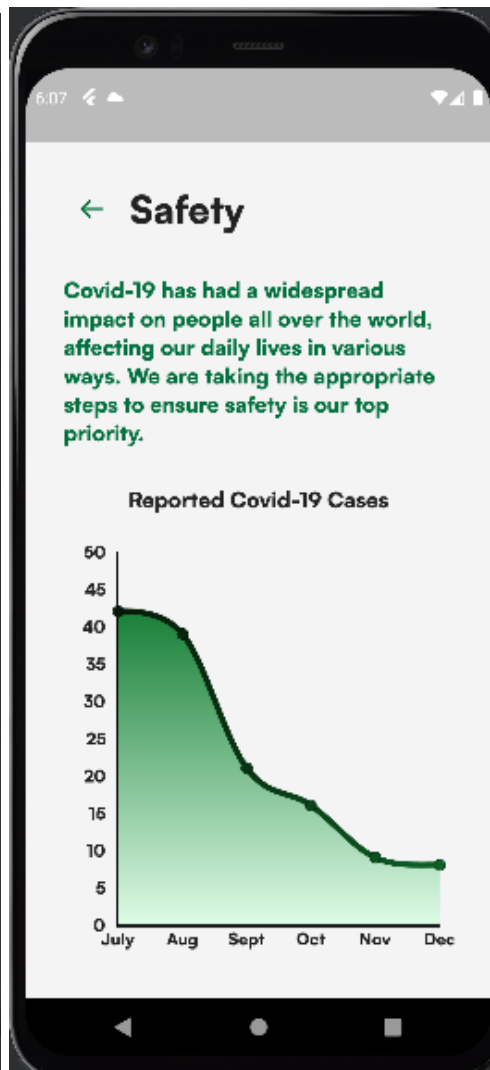
Cloud storage example

Datatable & Charts

- An example of datatable would be the Holidays
- An example of Charts would be the charts displaying the reported Covid-19 cases



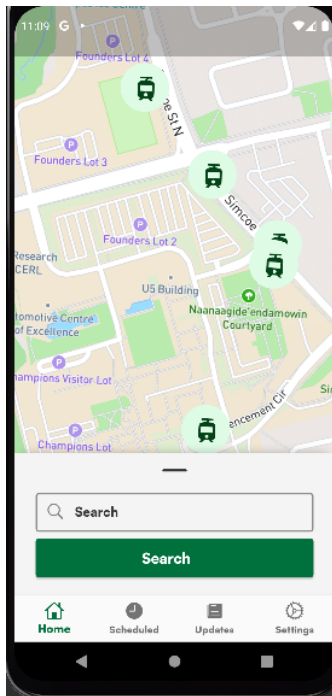
Datatable of holiday



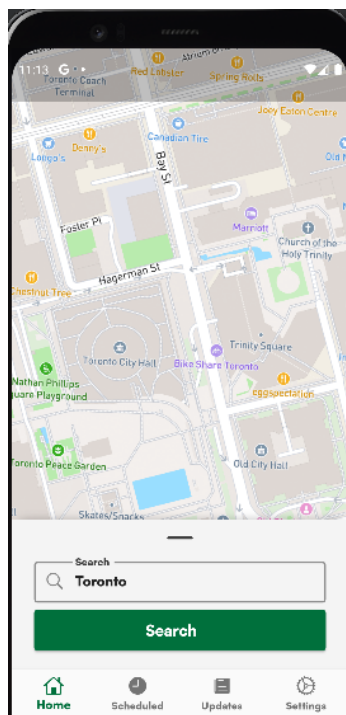
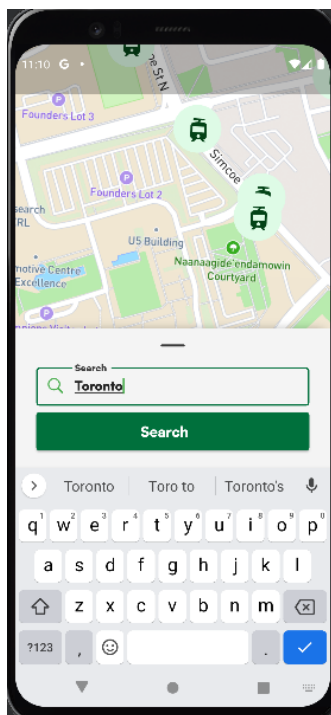
Reported Covid-19 Cases Chart

Maps & Geolocation & Geocoding

- An example of this requirement is the fact that the user can see bus stops on the map screen.



Map and Geolocation example



Geocoding example (Searching Toronto)

User Guide

Foreword: Hello! Thank you for choosing DRTransit for all your transit navigation needs! We hope that our app will give you all the tools you need to get to where you want to go. The following guide will assist you in learning how to use our app.

Section 1: Getting Started

Assuming that you have installed our app, you will be at a starting splash screen where you will be given the following two options:

- **'Get Started'** which allows you to continue onto the setup process.
- **'Privacy Policy'** which will provide you with details on how we will respect your privacy rights and your personal data.

Feel free to take the time to read our policy as we strive for transparency! But once you're ready to continue, please select the **'Get Started'** button. This will begin the personal account process:

- Input your first name and last name before selecting **'Continue'**
- Select the age group that your age falls within, this is important to correspond with the proper fare cost. Select **'Continue'** once you have done this.
- Select your profile picture by selecting the **'Edit'** and using the file picker to choose the image you would like to use for your profile. If you wish not to use a custom picture, that's alright. Select **'Continue'** once you're satisfied.

This will complete your account setup process. Once the app loads, you will be given a prompt for the app to allow location services. Please select **'While using this app'** to prevent any errors.

That's it! It's that simple, you have now completed the account setup process!

Section 2: Map Screen

Once you have completed the account setup, you will be brought onto the first main tab out of four. This is the 'home' tab where you will have access to all the bus stop locations and a search bar for easy navigation. Here are the important tips to be aware of:

- To navigate the map, simply use your fingers to drag the map around and pinch to zoom in or out.
- The search bar will bring the map towards the address that you desire. Once you have input an address, simply select the **'Continue'** button to complete the search.
- Pulling the search bar upwards will show a list of popular destinations around the address that you have inputted.
- Bus stops on the map are marked by a green bus/tram icon. Select the icon to receive information on the routes that frequent the stop. Selecting a bus route will provide you with a list of times in which you can choose before selecting the **'Set Reminder'** button which will give you a notification shortly before the bus arrives.

Section 3: Scheduled Routes Screen

Let's say that you have a transit route that you take repeatedly and would like to keep that information in a handy location. Well, this is the tab for you! Here's how it works:

- Select the '+' icon on the top-right corner of the screen to open the scheduled route creation page.
- Input the 'title' of your desired scheduled route. (Ex. Home to Work)
- Input the departure and destination addresses for the specified route.
- Select the departure/arrival time by pressing on the timestamp which will provide a picker to select the appropriate time.
- Once you have completed inputting the information of your desired route, press the 'Submit' button. This will save your route in the scheduled routes where you can check back on it as many times as you'd like!

Once you have a saved route, selecting it will provide you with a simple overview of the route destination and arrival, the duration of travel, the distance traveled, and all the directions needed for navigation.

But if you're not happy with your current route, you can always modify it by swiping left on the designated route. This will provide you with two options:

- An 'Edit' button which will allow for the route title to be changed.
- A 'Delete' button which will remove the route from your scheduled routes storage.

Section 4: Updates Screen

This page will simply display any Durham Region Transit related news as well as provide service alerts and detours. The functionality is quite straightforward:

- Swipe left or right on the updates to see the selection of news stories related to transit.
- Scroll up or down to see all the service alerts and detours.

Section 5: Settings Screen

Here you will find all the configurable settings to customize your DRTransit experience to your personal preferences. Here is an overview of each of the pages contained within:

- The 'Account' button will allow you to modify the first name, last name, profile picture, and age group associated with the account.
- The 'Notifications' button will allow you to view all the notifications set
- The 'Fares' button will allow you to get detailed information on the cost of a single PRESTO tap, the cost of a monthly PRESTO pass, and the cost of using cash for the associated age group.
- The 'Safety' screen provides a chart of the COVID-19 cases over the recent months as well as provide simple but important tips to keep safe while using Durham Transit.
- The 'Holiday' button displays a list of all the holidays that will result in alternative route schedules that what you're normally used to.
- The 'About' screen gives credit to all the developers of the app. (That's us!)

→ The '*Privacy Policy*' button simply provides easy access for you to read our privacy policy.