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HummingBird (Bus Navigation System)

Description

HummingBird is navigation system useful for bus rider. Unlike heavyweight GPS system using turn by turn navigation, ***HummingBird*** provide simple notification when approaching checkpoints or transfer stations.

Image in a crowded bus, in rainy day, or in a foreign country, you can't see or understand next stop sign, or can't see outside where you are. ***HummingBird*** provide the crucial data, like estimated arrival time, and distance for your next checkpoints, and give you notification when approaching stop you need to get off.

Intended User

Travelers who want to travel freely via transit system.

Features

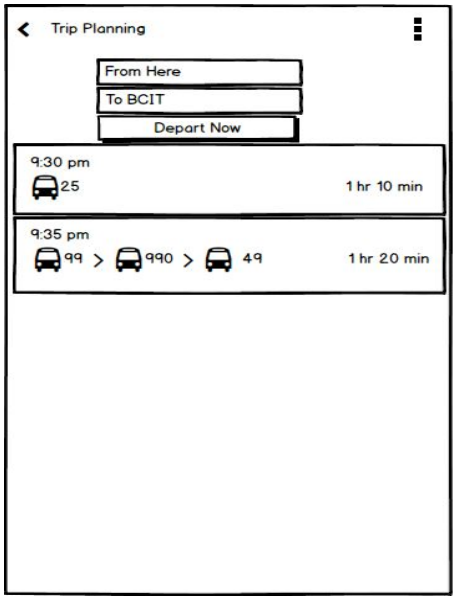
- Trip Planning
- Navigation
- Checkpoints Notification

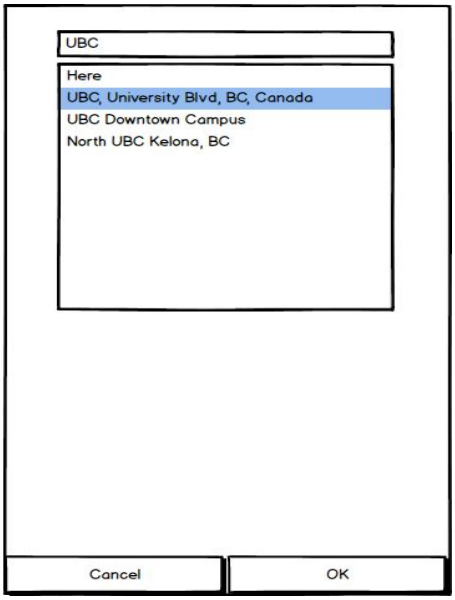
User Interface Mocks

Startup Menu

Startup menu to change settings, select saved trips, or use search icon to start a new trip.

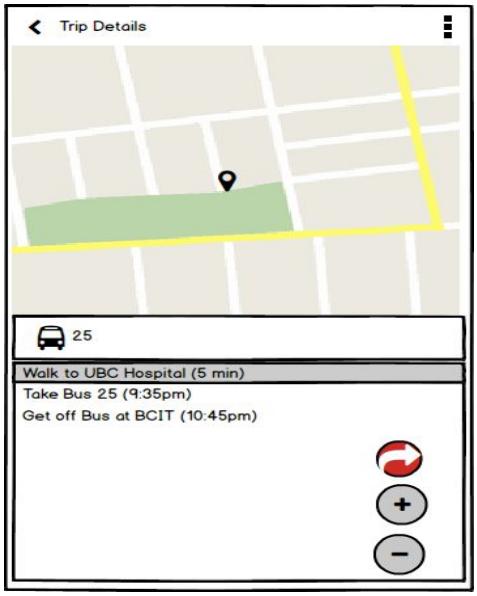
Trip Planning





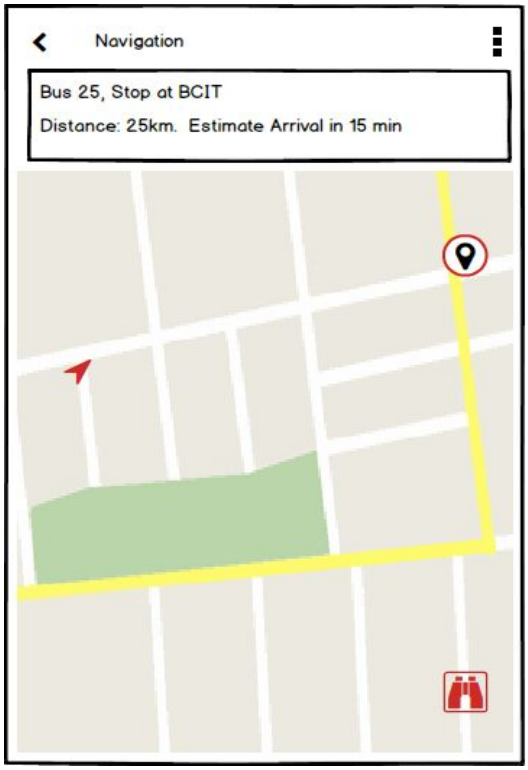
Create a new trip by entering departure and arrival position. Search to places or enter address.

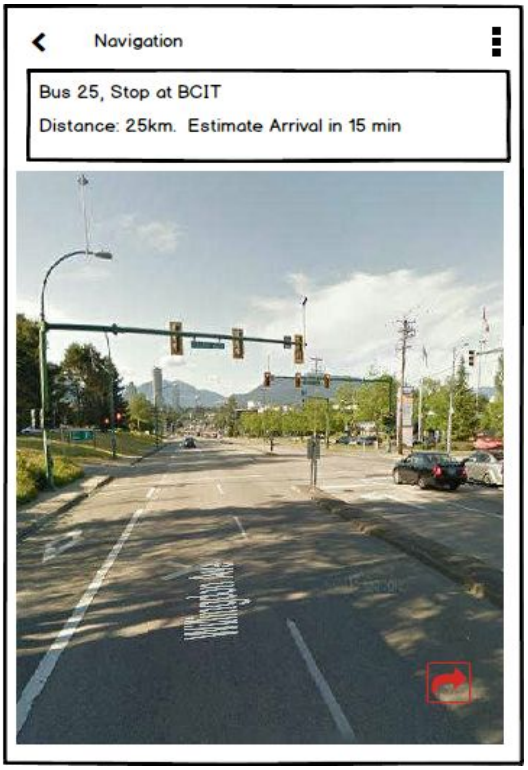
Trip Details



Selected trip details. Start navigation or save this trip.

Navigation





Display current position, distance from destination, and estimated arrival time. Switch between street view and map view.

Checkpoints Alert

Alert and notification when approach destination stop or transfer bus stop. The notification can also alert the android wear watch if available.

Key Considerations

Data Persistence

Trip Content Provider

Create a content provider for current trip and saved trips.

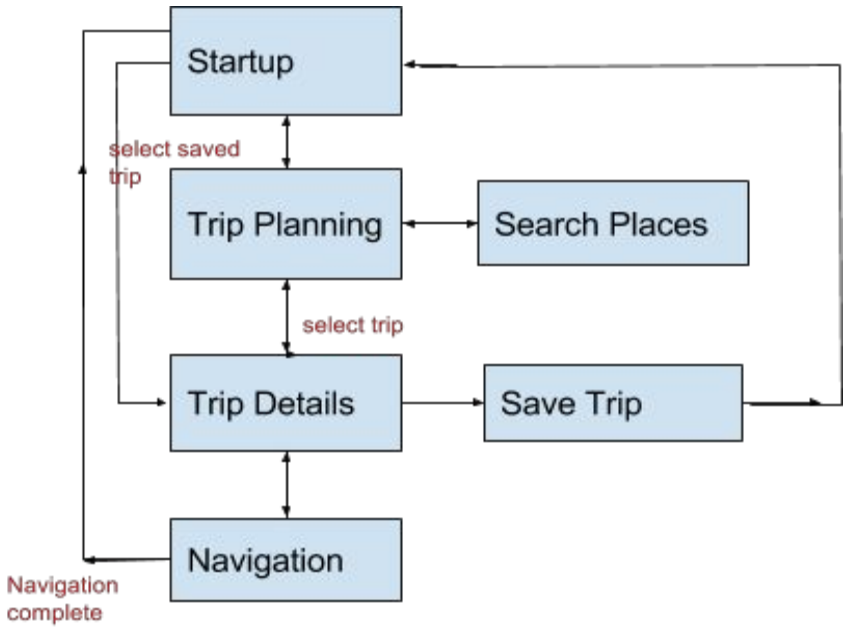
Places Content Provider

Also build another content provider to cache Google place API result.

Google Maps Directions API and Google Places API

The trip planning feature use Google Maps Directions API. Google Places API is used to enter place name instead of address. We need to apply for API key for these services. Also there are usage limit for these services.

UX Flowchart



Use Libraries

Retrofit

Use Square Retrofit to query and parsing JSON result.

Schematic

Use “schematic” to build content provider for trips and places query.

Next Steps: Required Tasks

This is the section where you can take the main features of your app (declared above) and decompose them into tangible technical tasks that you can complete incrementally until you have a finished app.

Task 1: Google Map Directions API and Database

- Google Map Directions API

Use the URL to query trip informations.
https://maps.googleapis.com/maps/api/directions/json?origin=75+9th+Ave+New+York,+NY&destination=MetLife+Stadium+1+MetLife+Stadium+Dr+East+Rutherford,+NJ+07073&mode=transit&arrival_time=1391374800&key=YOUR_API_KEY

- From the query JSON result, create trip database.
- Use schematic to build Content Provider

Task 2: Google Map Places API

- Test Place Autocomplete retrieve place ID or address for the trip planner.

Task 3: Implement UI for Search Places

- Use Place Autocomplete function of Google Map Places API to build Search Place Activity.

Task 4: Implement UI for Trip Planning

- Build Trip Planning Activity UI for trip planning.
- Use Search Places Activity to enter origin and destination.
- Use retrofit to query Google Map Directions API web service.
- Insert data into trip content provider.
- Load result into trip list.

Task 5: Implement Trip Detail UI

- Build Trip Detail Activity UI for Trip Details.
- Implement “Save Trip” function.
- Implement “Delete Trip” function.

Task 6: Implement Map Navigation

- Use location API to find current location.
- Draw MapView to for path, checkpoints, and destination.
- Calculate trip estimated arrival time with trip data.
- Use geofencing function to find out arrival of destination.

Task 7: Implement Street View Navigation

- Display location in StreetViewPanoramaView. Use last and current location to calculate camera direction.

Task 8: Custom View for Trip Summary

- Build Custom view for summary of trip.

Task 9: Settings

- Implement Settings for different unit (imperial or metric).

Task 10: Main Drawer Menu Implement My Trip

- Each saved trip is a menu item.