

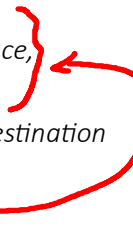





COMPREHENSIVE TRAVELLING SCHEDULER

SECTION 1. FUNCTIONAL REQUIREMENTS


1.1. Route Searching

- a. The user should be able to search for routes using a Starting Point and Destination, which could be a postal code, address, or name of place. 
- b. The app should automatically set the Current Location as the default Starting Point.
- c. As the user types in the Starting Point or Destination, the app should provide location suggestions.
- d. The app should display "Current Location" as an option when searching for a Starting Point or Destination.
- e. The user can select the mode of transport between Bus Only, Train Only, or Any
- f. The user can define a set of Route Filters to narrow and/or sort the search.
- g. Route Filters should include Departure Time, Arrival Time, Unsheltered Walk  Distance, Walking Distance and Estimated Fare. 
- h. The app will query SLA's OneMap Routing endpoint based on the Starting Point and Destination and will generate a list of Routes from it.
- i. The app will then filter and/or sort the list of Routes against the Route Filters.
- j. Each Route in the list of Routes should display the Services Icons for each Leg of the Path, Estimated Arrival Time, as well as the number of Potential Concerns.
- k. Estimated Arrival Time should be calculated  on the route's travel time, as well as the most optimistic and second most optimistic waiting times at the Origin of each leg of the Path if the user departs the Starting Point at the current time.
- l. Each route should be  andable to display the Route Details.
- m. Route Details should display Live Estimated Arrival Time, Path, Current Position Along Path, Live Waiting Times at each transfer, Additional Route Data, as well the list of Potential Concerns.
- n. Path displays the list of Legs.
- o. Each Leg displays the service icon, as well as the waiting times for the service, if applicable, as well as the list of Stops for the Leg.
- p. Each Stop displays the name of the Stop.
- q. Additional Route Data should display Estimated Fare, as well as Unsheltered Walking Distance.
- r. The user should be able to open the app from the calendar app to search for directions to an event to arrive at a specific time.
- s. If GPS is unavailable, the Route Details should indicate that live location data is unavailable.





1.2. Show Current Position Along Route in Route Details

- a. The Current Position Along Path is the Stop nearest to the user's current location.
- b. If GPS is unavailable, the Current Position Along Path is not highlighted. 

1.3. Show Live Estimated Travel Time in Route Details

- a. The Live Estimated Arrival Time is a live re-calculation of the Estimated Arrival Time, but factors in the user's Current Position Along Path 
- b. If GPS is unavailable, the Live Estimated Arrival Time should display the last known Estimated Arrival Time, the time of estimation.

1.4. Check for Potential Concerns

- a. Each Potential Concern includes a title, a message, as well as a Trigger Condition.
- b. The app will check all routes against each Potential Concern's Trigger Condition to determine if that route is affected.
- c. The user can manually define a single active route.
- d.  When a new Potential Concern is flagged for the currently active Route, a notification should be sent to the user, and an alternate list of Routes that do not trigger the same Potential Concern will be suggested based on the user's Current Location.
- e. The user can include/exclude additional Potential Concerns from a global list.
- f. The app should have a separate page that shows the global list of Potential Concerns.
- g.  The app queries LTA's Train Service Alerts endpoint and generates a Potential Concern ~~with a~~ relevant Trigger Condition based on ~~or~~ whether the route will transit through the affected stations.
- h.  The app queries LTA's Platform Crowd Density Real Time endpoint and generates a Potential Concern ~~with a~~ relevant Trigger Condition based on whether the route will start, transfer, or end at the affected stations.
- i.  The app should query a weather endpoint to determine the rain status over Singapore. If there is high risk of rain, a Trigger Condition is created based on the Unsheltered Walking Distance of a Route.

SECTION 2. NON-FUNCTIONAL REQUIREMENTS

- a. The app should not take more than 5 seconds to calculate the routes available to the user.
- b. The UI should require less than 3 clicks to arrive at the desired page.
- c. The app should be able to accommodate future updates and data sources without an app update where possible.
- d. ~~The app should be reliable, and there should be adequate failover such that~~ other parts of the app should remain operational even if any API endpoint becomes unavailable.
- e. For the demo app, the server should be able to handle 10 simultaneous queries.