BobcatCommute

A web application by Bobcat Technologies

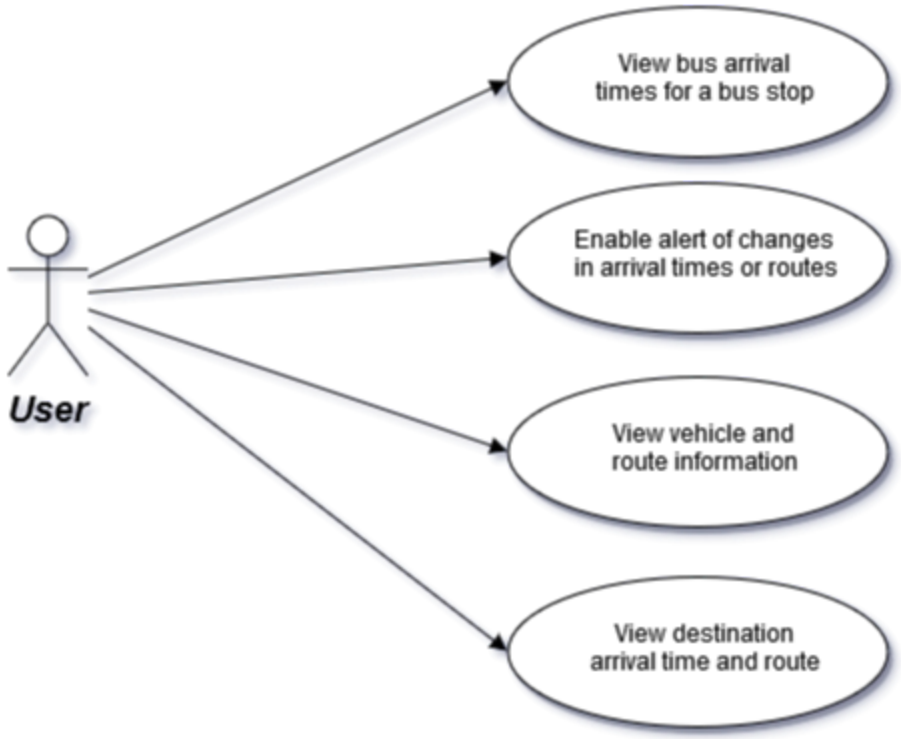
System Requirements

BobcatCommute is a web-based application that will help users navigate the CTfastrak bus routes and plan their commutes. The user interface will consist primarily of an interactive Google map centered on the Greater Hartford region. Overlaid on the map will be icons representing bus stops and CTfastrak bus locations, as well as lines which trace the various bus routes. Users will be able to select any of the bus stop or vehicle icons to get real-time information specific to those objects. Selecting bus stops will display the next several bus arrival times, and have a user-selectable option to alert the user to any changes in vehicle arrival times or changes to the bus stop's inclusion in routes (for example, if the stop becomes closed due to construction). Selecting a vehicle will display the route it is travelling, the next few bus stops it will reach and the associated arrival times. Vehicles will also have a user-selectable option to alert the user to any changes in that vehicle's arrival times or route (such as for detours). Users will also have the ability to specify their current location (if their device does not provide it automatically), and to specify their destination. The application can then compute the optimal route from their current location to their destination, and present the starting bus stop, the destination bus stop, route names and vehicle identifiers, estimated arrival time at destination, and if any transfers are needed to different routes/vehicles at a particular bus stop.

The bus stop and vehicle icons will also provide a visual indicator of whether that stop or vehicle currently has any deviations in expected arrival times. For example, a green dot in the icon means the vehicle and bus stop arrival times are within 5 minutes of expected times. A yellow dot means the arrival times have deviated from expected by 5 to 10 minutes, and a red dot is shown for deviations of greater than 10 minutes.

The real-time data containing the vehicle locations and arrival and departure times will be obtained through the CTtransit real-time data feed in JSON format, and fed into the Google Maps API. This data will be imported for use in our application using AJAX requests which will allow our web application to continuously query and CTtransit data without reloading the webpage every time a query is made. General web page layout will be handled with HTML and CSS.

Use Case Diagram



User Stories

1. As a user, I want to see what time the next bus will arrive for a particular bus stop on a particular route, so that I can plan for when I need to be there.

   Pre-Conditions: A bus stop has been selected on the map.

   Post-Conditions: A pop-up box shows the next arrival time of a bus at that stop, as well as a few following arrival times.

   Complexity: This user story is a simple 1-step process that does not need to be broken down.

2. As a user, I want to be alerted if a bus on a particular route is behind schedule or if the route's arrival times for a particular bus stop change, so that I'm aware of changes to my commuting schedule.

   Pre-Conditions: A vehicle or bus stop is selected and the pop-up option to get alerts for that object is selected.

Post-Conditions: If CTFastrak sends a service alert for a route that includes the selected vehicle or the selected bus stop, that service alert will be presented to the user.

Complexity: This user story is a simple process involving just 2 “clicks” from the user, then at a later time a possible pop-up notification from the application. This may or may not need to be broken down into smaller steps.

3. As a user, I want to view information about particular buses or routes, so that I can know when to meet someone who is riding the bus, or just to familiarize myself with how the routes work.

   Pre-Conditions: A bus/route is selected by the user.

   Post-Conditions: A pop-up box displays information about the selected route (or the route of the selected bus). The route name is displayed along with a list of bus stops that make up the route and the bus’s arrival time for each stop.

   Complexity: This user story is a simple 1-step process that does not need to be broken down.

4. As a user, I want to specify my destination and be presented with the best route to take and what my arrival time at the destination would be, so that I can plan my commute and know when it will be complete.

   Pre-Conditions: The user clicks on the map and selects the option to mark their destination, or the user enters an address as their destination. The user has also entered their current location or allowed their device to provide their current location.

   Post-Conditions: The application presents the route, starting bus stop, and ending bus stop that provides the quickest travel time from the user’s current location to their destination.

   Complexity: This user story may need to be broken down into smaller steps since it is currently a multi-step process. It consists of the user providing their current location (may happen automatically depending on device), and providing a destination. There may be situations in which the application has more than one suggested route, in which case the user would also have to choose their preferred route from the suggestions.

Non-Functional Requirements

1. Response times from when a user selects an object to when that object's information is displayed should be less than 1 second.
2. Response times for calculating a user's optimal route to a chosen destination should be under 3 seconds.
3. The application will be browser-based and should work on all major web browsers.
4. The application will not collect or store any personal information from users.

Glossary

Term	Description
AJAX	Asynchronous Javascript and XML
CSS	Cascading Style Sheets, a style sheet language used to finely control the presentation (layout and design) of a web page.
HTML	Hypertext Markup Language, a standardized system used for general web page design and layout.
JSON	JavaScript Object Notation, a data format used by CTtransit real-time feeds.
Route	A collection of bus stops that a vehicle will visit in order. Can be represented on the map as a series of connected lines. In data feeds, a transit route is a group of trips.
Trip	A sequence of two or more bus stops that a vehicle will visit at a particular time. In data feeds, trips are grouped together to form routes.