B.R.A.S.S.


Dr. Yizong Cheng


Braden Lance


Bryan Huddleston


Nathan Boehringer


Timon Mannings

OVERVIEW:

The Bus Route Administrative Scheduling System or B.R.A.S.S. is a solution designed to help simplify the process of building out and editing bus routes for transportation supervisors. The application allows its users to build out a database of different students and build efficient bus routes that will minimize time while ensuring coverage. The higlight of the application is the application's ability to update bus routes as students are added to the database with minimal interruption to the overall route layout.

OBJECTIVES:

- To build out shool bus routes from a database of student and school information
- To create a node building system to group bus stops that are within a certain distance into one stop
- To display an interactive map of the bus routes and allow transportation supervisors to view bus routes.
- To provide an easy to use and intuitive front end for transportation supervisors to interact with

DEVELOPMENT:

The bulk of the route building and map presentation was created using an ArcGIS javascript API. The API supplies the functionality to read and plot the different addresses onto a map and also for building out the route displays. We created an algorithm with a specific distance limitation to combine multiple stops in close proximity into one collective stop. The back end of the system is a sql database that is mapped to the front end using a Entity Framework. The front end and application are implemented as a .NET Core MVC application.

BUS ROUTE ADMINISTRATIVE SCHEDULING SYSTEM

CHALLENGES & ACCOMPLISHMENTS:

- The largest learning curve for this application was the implementation of the ArcGIS API. The API has manny different features and understanding what to use in the library was challenging throughout.
- We were able to implement most of the map presentation functionality and at least present the important data that would be relevant to the route building process.

RESULTS:

- We were able to fully develop our front end and database for the application and create the necessary connection between the two to make the data viewable. We have successfully built out and represented our routes on maps that can be displayed on our web pages. We have successfully been able to take in a set of student addresses, a school location, and bus information and build out multiple routes. We have also successfully implemented our stop combining algorithm and are working on improving the regioning aspect of the route building process.

FUTURE PLANS:

- Separating out the backend of the system so that it can be applied to a pre-existing database of students.
- Adding a regioning system to the routes so that the routes will not overlap regions unless absolutely neccessary.
- Adding a Driver's View to allow drivers to interact with the application.

TECH STACK:

ArcGIS

.NET Core

Microsoft SQL Server

Entity Framework Core