









### **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.

## **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.

# 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 out 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 while filling the buses to capacity. We have also successfully implemented out stop combining algorithm and are working on improving the regioning aspect of the route building process.

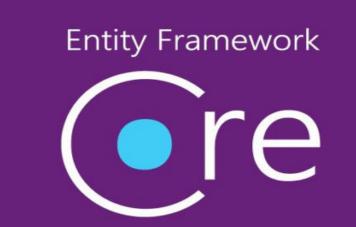
## **TECH STACK:**











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