Our project will focus on creating a bus route building application for public schools to use when scheduling their bus routes. We plan to use a graphical information system to create a system of points that will represent each stop on our bus route. These stops could be physical addresses of individual students or street corners for multiple passengers. Using these points and the GIS software we will build a search tree to find the shortest route and hopefully a fastest route using multiple different start points. Each start point would be a separate bus that the school will be using and start points will be variable in number to allow for addition and subtraction of different bus resources. We will also add functionality for updating routes on a one-time basis in case of absent drivers or automotive malfunctions.

For the structural aspect of the system, our Data Structures (CS 2028C) and Database Design and Development (CS 4092) coursework will be most beneficial. We will need a data base to house all of the different routes that we build, as well as a storage location for each individual stop. Our data will need to be formatted in such a way that weights can be added to each node in order to find the shortest path for each route. The algorithmic aspect of the project will require the knowledge we’ve gained from our Design and Analysis of Algorithms (CS 4071) and A.I. Principles and Applications (CS 4033) courses. We will need to weigh each path based on the distance between nodes and use that to create a shortest route that is also dependent on the number of busses available.

The front-end design of the application will hinge on our co-op experiences. I worked with front-end design at Marathon Petroleum as a IT Developer Co-op as did Bryan Huddleston, and both Braden Lance and Nathan Boehringer have worked with front end development at ITI and Siemens respectively. We will also base the project structuring in a way that we are all familiar with. With an agile methodology we should be able to mimic our different work environments in the sense that the project will be run, organized, and tracked in standard agile sprints.

My personal motivation for the project is that my father was a transportation supervisor for my local high school, and he would complain about the fact that the software they had lacked the functionality they needed to do their jobs efficiently. He gave me specific pain points of the system that the school used and explained how the process worked and what an ideal software would provide. Our approach will be to gather information from possible users and create a prototype application that will have very basic functionality and hopefully use that to walk through the process of building out different routes for a test school.

The overall goal will be to have a working version of the application that builds out routes and stores addresses. In the beginning we will do our research and design phases to build out required functionality for a basic application and different features that would be ideal. From that design phase we can break down the basic required functionality into sections that can be assigned to each individual based on interest and skills. Each portion will be divvied up between the group members, and contribution will be based off of the progress made on those specific portions. The final deliverable will include a current state document to document the end result. That document will include the implemented functionality along with the possible functionality that could be implemented to improve the product