# Scrum Squad

# *TAMU Transit Final Review*

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## Sponsor:

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## Summary

The customer wants to improve the overall A&M community's navigation experience by providing users with an intuitive interface and directions involving bus routes. He needed a user interface similar to Google Maps so that users would feel familiar with the interface. Our customers main need was an easy method to figure out which bus routes to take. The current Texas A&M bus app does not provide users with an easy to use interface, nor does it give you the capability to find the most efficient route from point A to B. The client wants this application to be functional for everyone by providing accessible-friendly route recommendations if needed.

Our team met the user interface requirements by providing users with a similar experience to that of Google Maps. Our UI was closely modeled after their own in order to make the user experience intuitive. We have provided a proof concept for the bus routing aspect. This shows that it is possible to integrate the bus system with a user friendly application. Further work is needed in this area to fully satisfy the needs of the A&M community.

## User Stories information

### General overview of timeline and points per iteration:

| | | |
|---|---|---|
| Iteration 1<br>Due March 6 | **All front done**<br>-veoride checkbox<br>-dont do veoride parking front end<br>-bus option not implemented yet | **Points completed**<br>10 |
| Iteration 2<br>Due March 27 | **Searchable google maps**<br>-current location<br>-display text based directions<br>-add depart at/on this day option<br>**Veoride**<br>-veoride buttons added in bike and bus tabs (as optional) | **Points completed**<br>9 |
| Iteration 3<br>Due April 12 | **Searchable google maps**<br>-current location<br>-add depart at/on this day option<br>-swap destination/origin<br>**Busses**<br>-add bus stops through csv<br>-add walking routes to bus stops<br>-text directions displayed | **Points completed**<br>12 |
| (Iteration 3 continued work)<br>Due April 24 | **Busses**<br>-bus route time table search<br>**Wheelchair accessible**<br>-just use bus option (less | **Points completed**<br>12 |

| | | |
|---|---|---|
| | walking)<br>-doesnt care about timely-ness | |

**In depth user story by iteration:**

**Iteration 1:**

Handicap accessibility tab:

As a: Student/faculty at Texas A&M

I want to: access the accessibility tab

So that I can: find a route best for my disability

Points: 2

This tab is used to change the user interface to a new layout for the user to search for handicap accessible routes

Bus route tab:

As a: Student/faculty at Texas A&M

I want to: access the bus tab on my device

So that I can: find a route via bus to my destination

Points: 2

This tab is used to change the user interface to a new layout for the user to search for fastest bus routes

Bike route tab:

As a: Student/faculty at Texas A&M

I want to: access the bike tab on my device

So that I can: find a route via bike to my destination

Points: 2

This tab is used to change the user interface to a new layout for the user to search for bike routes on campus

Walk route tab

As a: Student/faculty at Texas A&M

I want to: access the walking route tab on my device

So that I can: find a route via walking to my destination

Points: 2

This tab is used to change the user interface to a new layout for the user to search for walk routes on campus.

Car route tab

As a: Student/faculty at Texas A&M

I want to: access the car tab on my device

So that I can: find a route via car to my destination

Points: 2

This tab is used to change the user interface to a new layout for the user to search for car routes.

**Iteration 2:**

Autofill search:

As a: user

I want to: type in a name for a building and it will autofill/autocorrect to the correct name near my location

So that: it will be fast to search up a building.

Points: 2

The autofill search was implemented to help the user fill in the building without having to type it in exactly, since it helps them fill in the rest by guessing the building based on a few letters.  This was done through the google places api.

Search buildings (start/stop location)

As a: Student/Faculty member at A&M

I want to: search a starting place/ input current location and search to a destination

So that I can: find the best route between the two places

Points: 2

The search building has two text boxes for start/stop location. We also added placeholder text that allows them to know which text box is which without us having to clutter the screen with labels everywhere. This start/stop location is used to be passed into the google maps api to find directions to the location the user is looking for.

Walk route backend

As a: Student/Faculty member at A&M

I want to: find the best walking route

So that I can: make it to my desired location cost free and fast as possible

Points: 1

The walk route is displayed on the map and also via text directions on the sidebar when the walking tab is being used. This is for those people who want to walk to locations but not use the bus/bike/car systems.

Bike route backend

As a: Student/Faculty member at A&M

I want to: find the best bike route

So that I can: make it to a location in the most convenient way (i.e. time/distance) using my personal bike

Points: 1

The bike route is displayed on the map and also via text directions on the side bar when the bike tab is being used. This is for those who want to bike to locations. But this also allows for veoride option (backend not implemented for veoride yet) if they would like to add the filter for veoride.

### Car route backend

As a: Student/Faculty member at A&M

I want to: find the best car route

So that I can: make it to a location in the most convenient way (i.e. time/distance)

Points: 1

Car route is displayed on the map and also via text directions on the side bar when the car tab is being used. This is for those who want to use the car to get to locations. However, this does not account for the time on campus where the gates are closed - our sponsor does not want that implemented unless we have extra time at the end of the project, so that is a stretch goal.

### Display route text

As a: Student/Faculty member at A&M

I want to: read the directions

So that I can: make sure what streets I turn onto

Points: 1

Displaying route via text on the sidebar is very helpful for those who cannot read a map very well or would rather like to read the direction since it is more detailed.

### Veoride optional box

As a: Student/Faculty member at A&M

I want to: filter for veoride

So that I can: find fastest routes or save money based on my preference

Points: 1

The veoride optional box is for the bike route tabs and bus route tabs to find closest Veorides for the user to use (backend not implemented yet for veoride). This button will be used in the next iteration when we find out how to find the nearest Veoride bike and route the user to the location of the veoride.

**Iteration 3:**

Current location tracker:

As a: Student/Faculty member at A&M

I want to: use my current location for starting location

So that I can: add the starting location in a fast and easy way if i'm looking for a building.

Points: 2

This current location tracker is helpful for the user to search with their current location so they can map to their destination without having to know their starting location.

Depart at certain time option:

As a: student/faculty member of A&M

I want to: search for a future time/current time

So that I can: plan my departure depending on if I need directions right now, or at a future time to fit the bus schedules.

Points: 2

This option was added so that a user can search for current time by default to find the best bus route, but also have the ability to search for a future time, since the bus schedules change according to time and day. This can be beneficial for those who want to look up a weekend schedule even though the current time is the weekday.

Swap destination/origin:

As a: student/faculty member of A&M

I want to: press a button to swap the destination and origin

So that I can: look at the route coming back from the location specified.

Points: 2

This swap is useful for the user if they want to map from the destination back toward their current location, or some other specified location without having to retype everything again.

Bus route search:

As a: Student/Faculty member at A&M
I want to: find the best bus route
So that I can: make it to a location in the most convenient way (i.e. time/distance)
Points: 3

The bus route search is the hardest part of this project, since the Google maps API doesn't allow us to search using their transit API. We have to implement our own way to search busses and add the bus routes and path to our project. We have our bus route search completed in the sense that it finds the fastest bus route and displays it on the path, along with the walking routes to those locations. In the next week, we are making this bus search better by searching for the current time table schedules and searching the real time location of the bus to better find the time estimations to find the fastest route for the user.

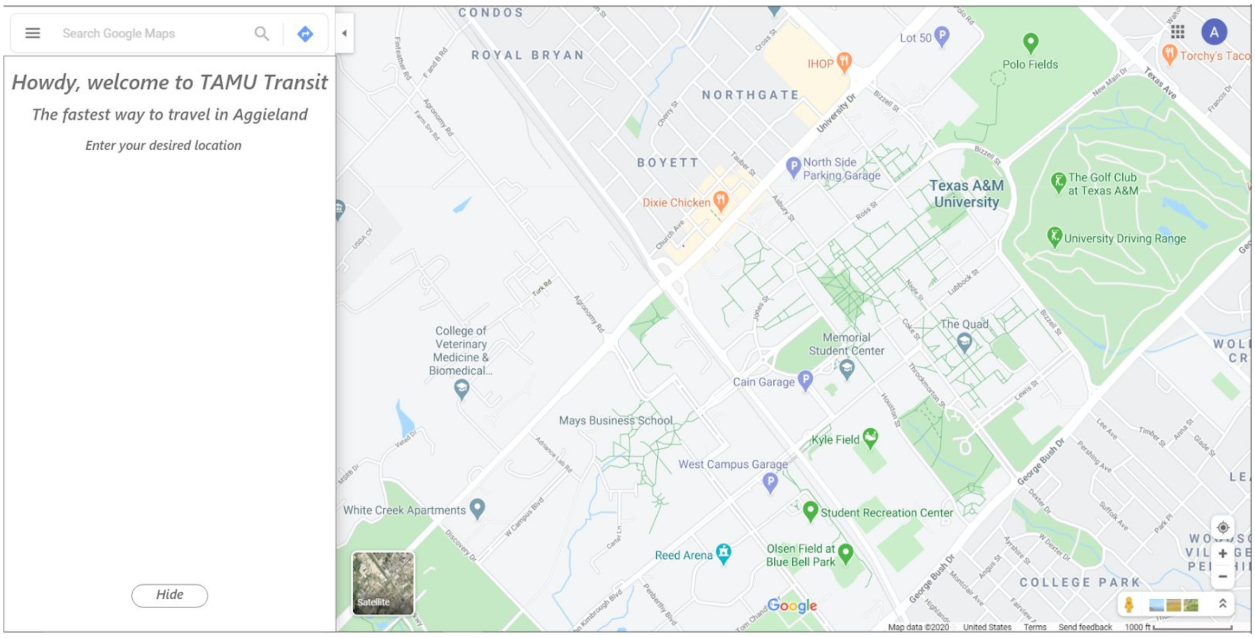
Bus route text directions

As a: student/faculty member of A&M
I want to: read the directions to get to the bus route, and know which stop to get off at
So that I can: conveniently get to my location with the  information conveyed over text directions
Points: 3

This one is different from the other searches (car, walk, bike). We have a bus stop, so we need to path the user to the bus stop, tell them to board the bus and then convey which stop they need to get off at, and then path the user from that bus stop to their destination. This will be built differently from the way we show directions on the other searches because we have to search twice and also figure out which bus stop to drop off at. This is important to have good text directions to inform the user when to get off, since the map might not be descriptive enough to inform the user when to get off the bus.

**Initial Mockup:**

1. Display of welcome page



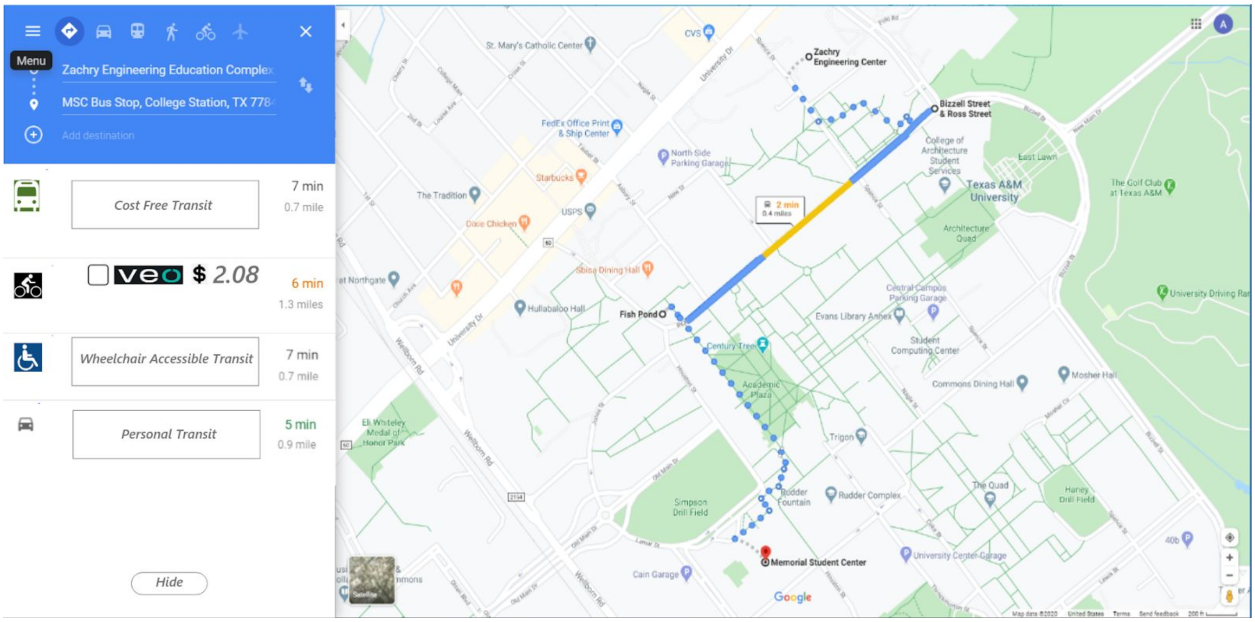
Howdy, welcome to TAMU Transit

The fastest way to travel in Aggieland

Enter your desired location

Enter destination on campus and click directions like google maps.

2. Display of all possible routes to your location on campus. Currently displaying the best route.



Menu

Zachry Engineering Education Complex

MSC Bus Stop, College Station, TX 778

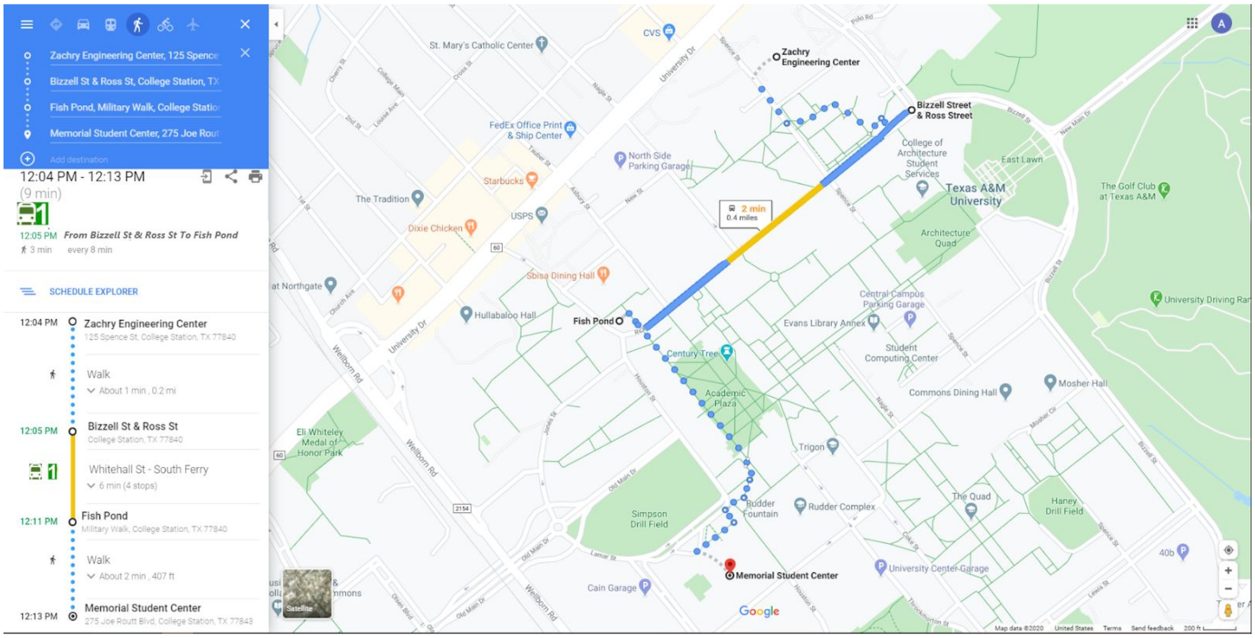
Add destination

| | | |
|---|---|---|
| | Cost Free Transit | 7 min<br>0.7 mile |
| | ☐ veo $ 2.08 | 6 min<br>1.3 miles |
| | Wheelchair Accessible Transit | 7 min<br>0.7 mile |
| | Personal Transit | 5 min<br>0.9 mile |

Hide

Select one of the routes you want to navigate. (routes shown in steps 3,4,5,6 and 7)

3. Display of “Cost Free Transit”



Zachry Engineering Center, 125 Spence

Bizzell St & Ross St, College Station, TX

Fish Pond, Military Walk, College Statio

Memorial Student Center, 275 Joe Rout

Add destination

12:04 PM - 12:13 PM
(9 min)

1

12:05 PM *From Bizzell St & Ross St To Fish Pond*
3 min every 8 min

SCHEDULE EXPLORER

12:04 PM Zachry Engineering Center
125 Spence St, College Station, TX 77840

Walk
About 1 min , 0.2 mi

12:05 PM Bizzell St & Ross St
College Station, TX 77840

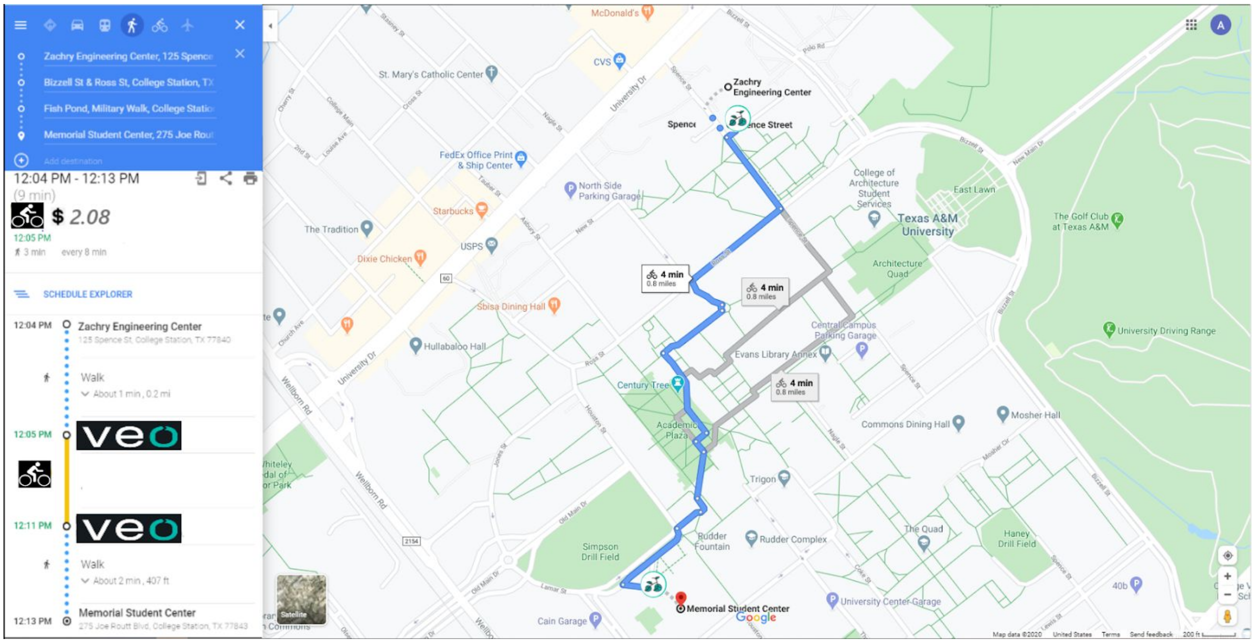
1 Whitehall St - South Ferry
6 min (4 stops)

12:11 PM Fish Pond
Military Walk, College Station, TX 77840

Walk
About 2 min , 407 ft

12:13 PM Memorial Student Center
275 Joe Routt Blvd, College Station, TX 77843

## 4.Display of bike route with “VeoRide” selected



Zachry Engineering Center, 125 Spence

Bizzell St & Ross St, College Station, TX

Fish Pond, Military Walk, College Statio

Memorial Student Center, 275 Joe Rout

Add destination

12:04 PM - 12:13 PM
(9 min)

$ 2.08

12:05 PM

3 min every 8 min

SCHEDULE EXPLORER

12:04 PM Zachry Engineering Center
125 Spence St, College Station, TX 77840

Walk
About 1 min , 0.2 mi

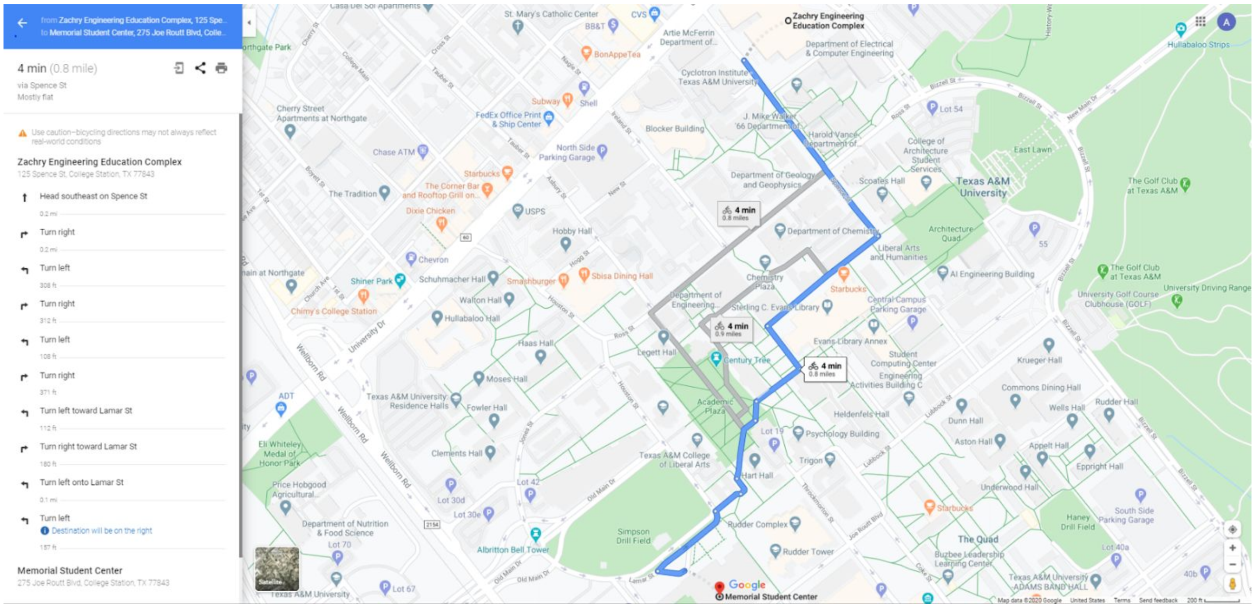
12:05 PM veo

12:11 PM veo

Walk
About 2 min , 407 ft

12:13 PM Memorial Student Center
275 Joe Routt Blvd, College Station, TX 77843

## 5.Display of bike route without “VeoRide” selected



from Zachry Engineering Education Complex, 125 Spe...
to Memorial Student Center, 275 Joe Routt Blvd, Colle...

4 min (0.8 mile)
via Spence St
Mostly flat

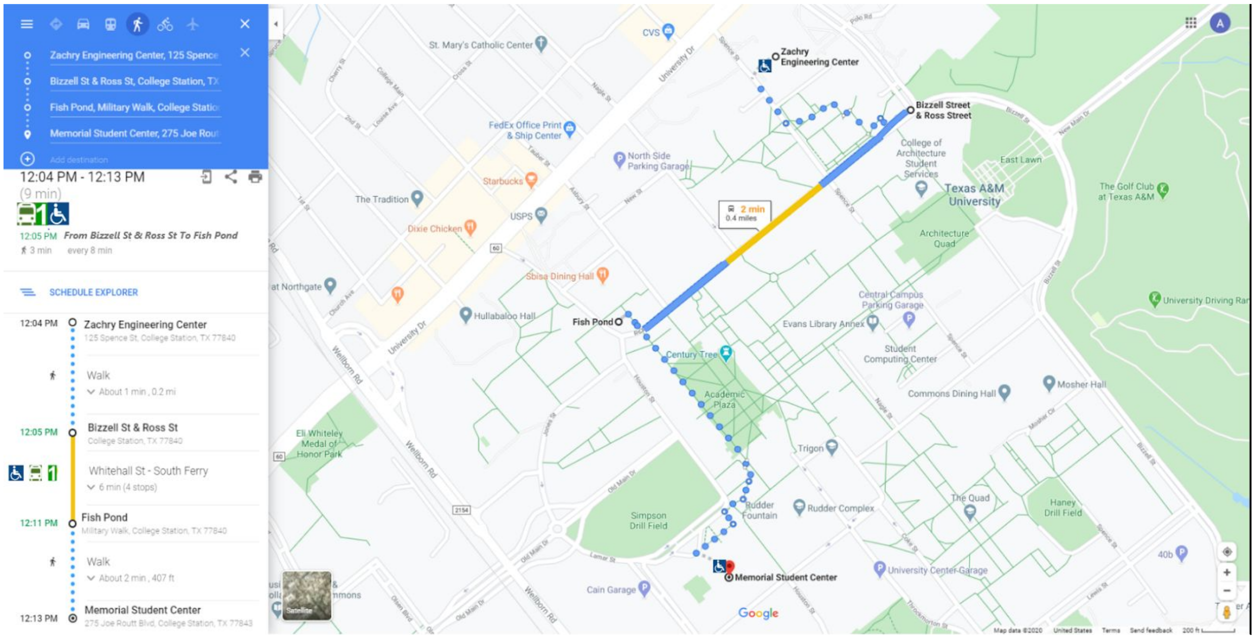
Use caution–bicycling directions may not always reflect real-world conditions

Zachry Engineering Education Complex
125 Spence St, College Station, TX 77843

- Head southeast on Spence St
  0.2 mi
- Turn right
  0.2 mi
- Turn left
  308 ft
- Turn right
  312 ft
- Turn left
  108 ft
- Turn right
  371 ft
- Turn left toward Lamar St
  112 ft
- Turn right toward Lamar St
  180 ft
- Turn left onto Lamar St
  0.1 mi
- Turn left
  Destination will be on the right
  157 ft

Memorial Student Center
275 Joe Routt Blvd, College Station, TX 77843

## 6.Display of “Wheelchair Accessible Transit”



Zachry Engineering Center, 125 Spence
Bizzell St & Ross St, College Station, TX
Fish Pond, Military Walk, College Statio
Memorial Student Center, 275 Joe Rou
Add destination

12:04 PM - 12:13 PM
(9 min)
12:05 PM *From Bizzell St & Ross St To Fish Pond*
3 min every 8 min

SCHEDULE EXPLORER

12:04 PM Zachry Engineering Center
125 Spence St, College Station, TX 77840

Walk
About 1 min , 0.2 mi

12:05 PM Bizzell St & Ross St
College Station, TX 77840

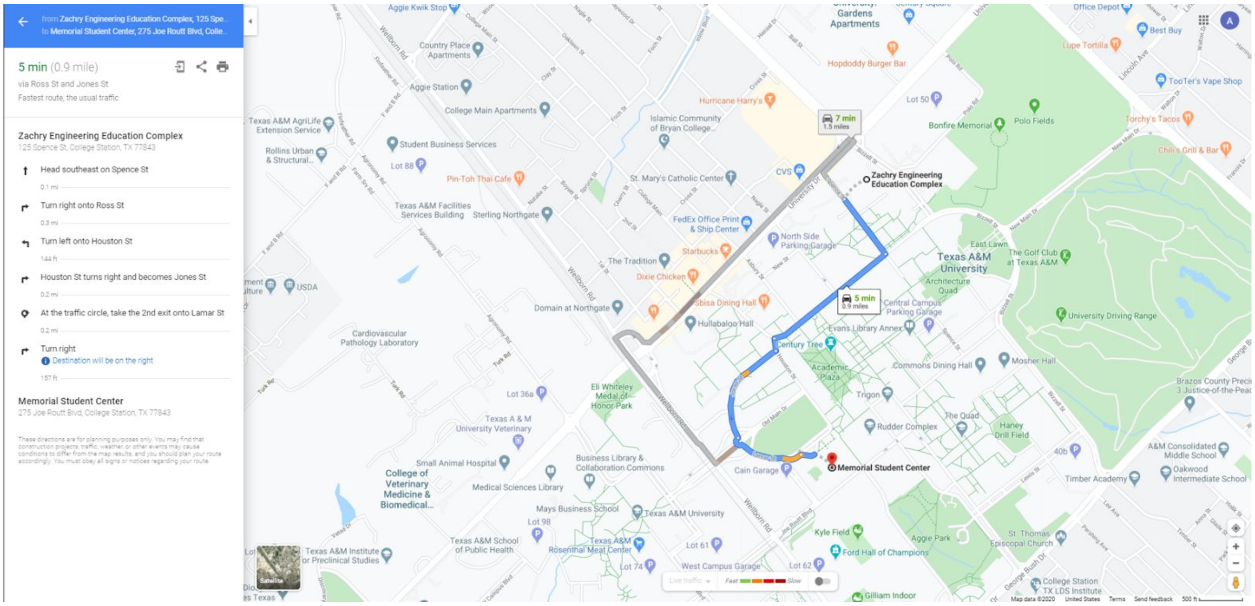
1 Whitehall St - South Ferry
6 min (4 stops)

12:11 PM Fish Pond
Military Walk, College Station, TX 77840

Walk
About 2 min , 407 ft

12:13 PM Memorial Student Center
275 Joe Routt Blvd, College Station, TX 77843

## 7.Display of “Personal Transit”



from Zachry Engineering Education Complex, 125 Spe...
to Memorial Student Center, 275 Joe Routt Blvd, Colle...

5 min (0.9 mile)
via Ross St and Jones St
Fastest route, the usual traffic

Zachry Engineering Education Complex
125 Spence St, College Station, TX 77843

Head southeast on Spence St
0.1 mi

Turn right onto Ross St
0.3 mi

Turn left onto Houston St
144 ft

Houston St turns right and becomes Jones St
0.2 mi

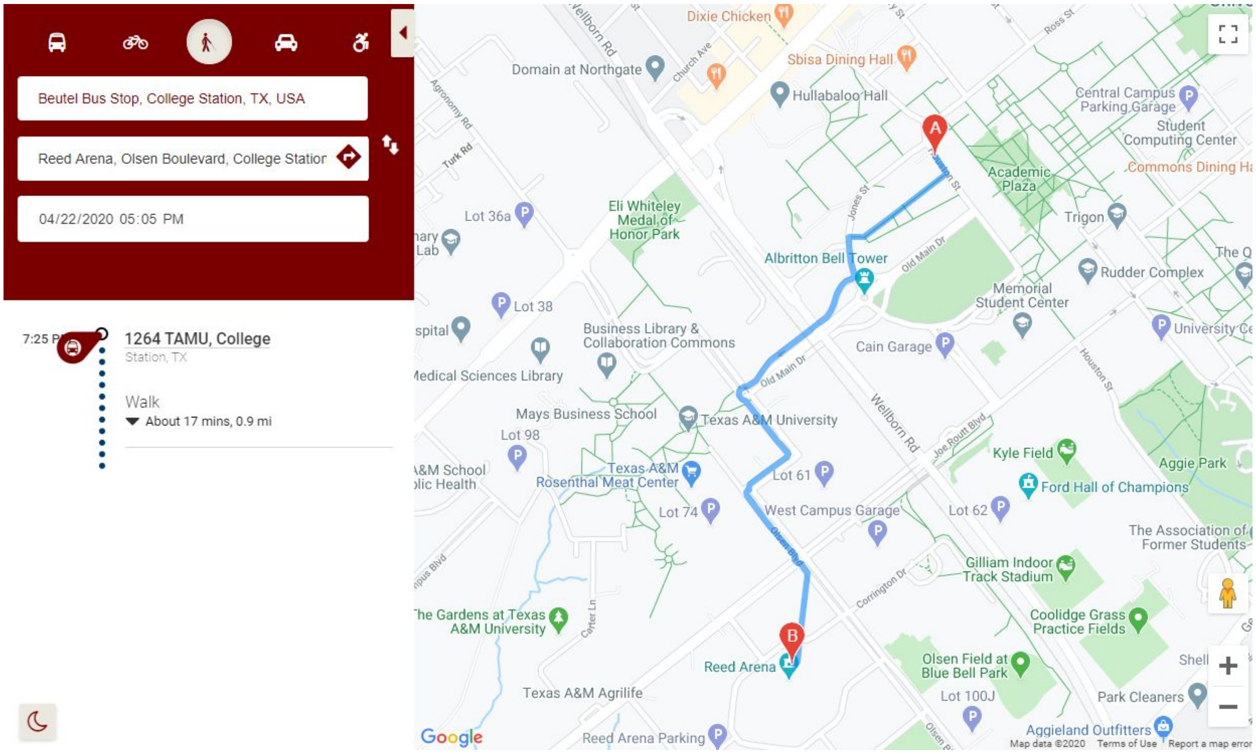
At the traffic circle, take the 2nd exit onto Lamar St
0.2 mi

Turn right
Destination will be on the right
157 ft

Memorial Student Center
275 Joe Routt Blvd, College Station, TX 77843

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

**Final user interface and design:**Walk Route search:



Beutel Bus Stop, College Station, TX, USA

Reed Arena, Olsen Boulevard, College Statior

04/22/2020 05:05 PM

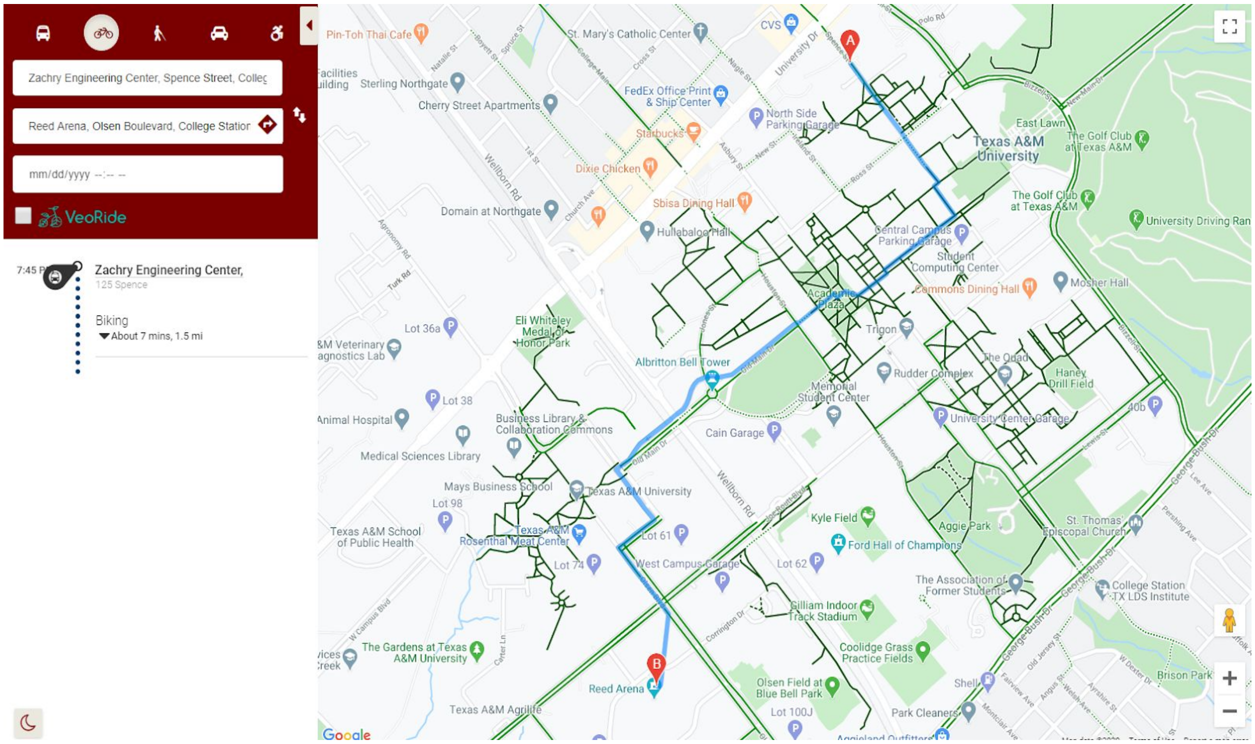
7:25 P

1264 TAMU, College Station, TX

Walk

▼ About 17 mins, 0.9 mi

Bike Route search:



Zachry Engineering Center, Spence Street, Colleç

Reed Arena, Olsen Boulevard, College Statior

mm/dd/yyyy --:-- --

☐ VeoRide

7:45 P

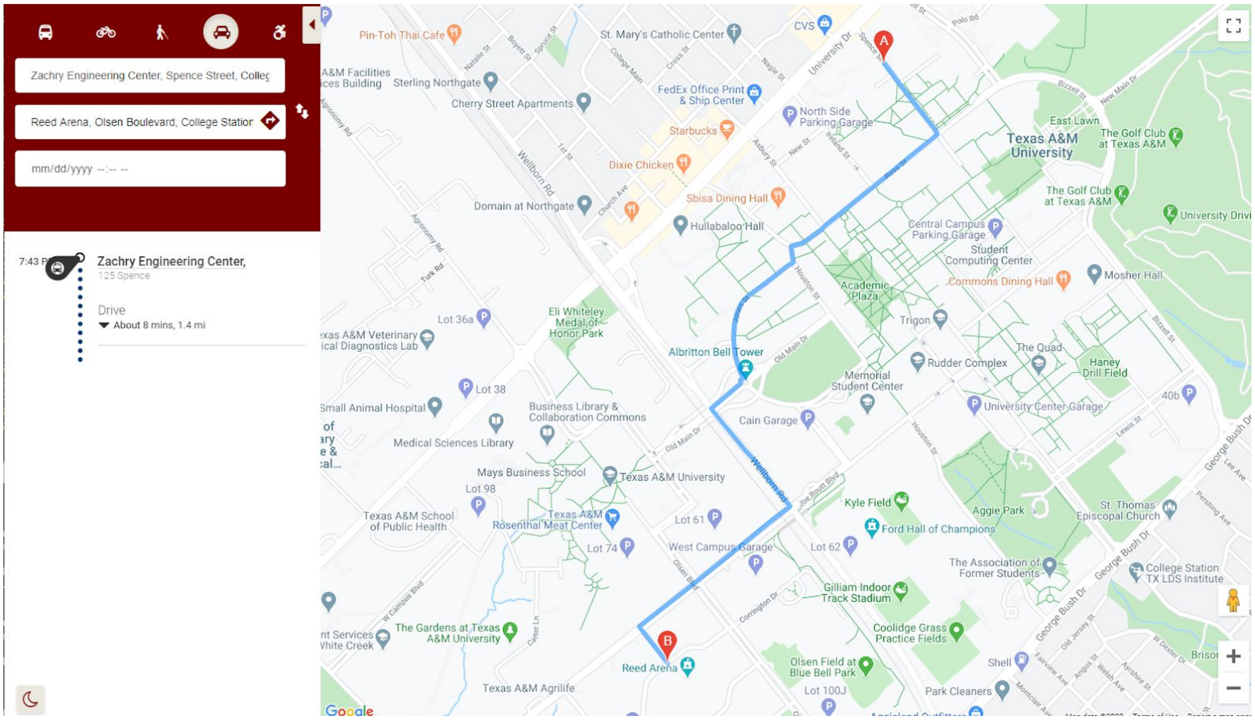
Zachry Engineering Center,

125 Spence

Biking

▼ About 7 mins, 1.5 mi

## Car Route search:



Zachry Engineering Center, Spence Street, Colleg

Reed Arena, Olsen Boulevard, College Statior

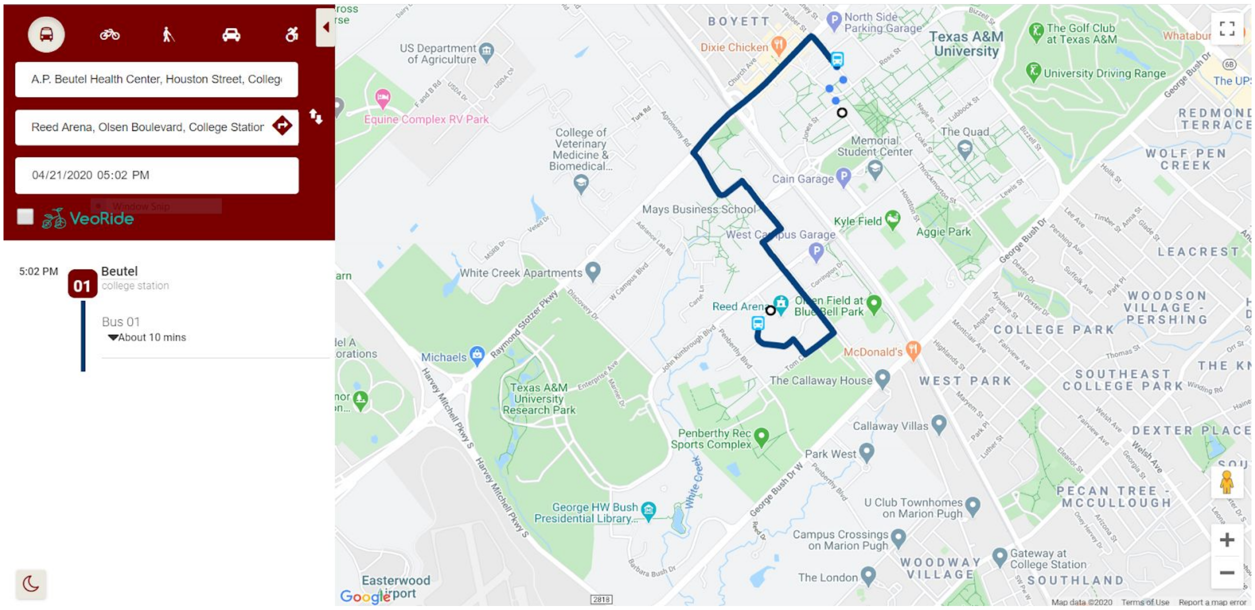
mm/dd/yyyy --:-- --

7:43 P

Zachry Engineering Center,
125 Spence

Drive
About 8 mins, 1.4 mi

## Bus Route search:



A.P. Beutel Health Center, Houston Street, Colleg

Reed Arena, Olsen Boulevard, College Statior

04/21/2020 05:02 PM

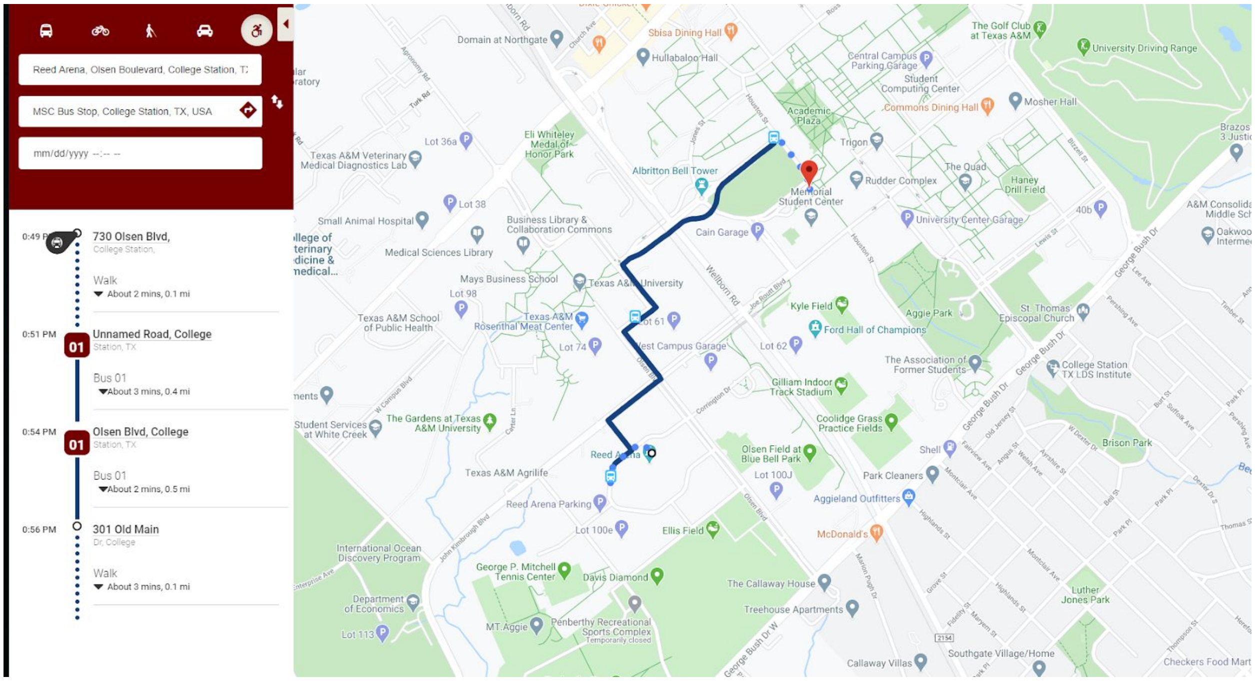
□ VeoRide

5:02 PM

01 Beutel
college station

Bus 01
About 10 mins

Wheelchair Route search:



Reed Arena, Olsen Boulevard, College Station, T:

MSC Bus Stop, College Station, TX, USA

mm/dd/yyyy --:-- --

0:49 P 730 Olsen Blvd, College Station,
Walk
About 2 mins, 0.1 mi

0:51 PM 01 Unnamed Road, College Station, TX
Bus 01
About 3 mins, 0.4 mi

0:54 PM 01 Olsen Blvd, College Station, TX
Bus 01
About 2 mins, 0.5 mi

0:56 PM 301 Old Main Dr, College
Walk
About 3 mins, 0.1 mi

**Team Roles:**

Scrum Master: Cole Bui

Product Owner: Erik Swanson

Developers: Cole Bui, Alizain Ali, Edgardo Garcia, Emmanuel Oyervides, Erik Swanson, Jose Garza

No changes were made to the roles during the duration of the project due to the coronavirus epidemic and the circumstances we were forced to work under. It was essential to maintain our roles in order to keep the flow of the project as smooth as possible.

**Customer meeting dates:**

2/11/2020 at 1:45 pm

Discussed his vision and summary of what the sponsor wants for the project.

2/20/2020 at 12:45 pm

Discussed more in depth and created some more user stories of things specifically he wants in the transit app.

3/17/2020, 2:15 pm, HRBB 514A

Discussed our story boards and what we have for mock ups to show him and get feedback on our initial design and code.

04/01/2020 1:00pm, Zoom

Showed Iteration and our walk,bus and car routes. He gave us feedback on the front end and we plan to change the front end to his specifications for more user friendly features.

04/15/2020 1:00pm, Zoom

Showed the bus route search that is not based on time tables. This shows how to map using the routes along the bus route paths. After discussion, we decided there was not enough time to fully implement the time table search, so we would create a proof of concept for future development for time table search.

04/21/2020 2:00pm, Zoom

Discussed roadblocks with time tables and got feedback.

04/24/2020 12:00pm, Zoom

Final demo of the time table search working for source and destination. Asked for an exit interview, and customer satisfaction survey.

## BDD/TDD Process

The Behavior Driven Development process of this project originated at the biweekly meetings held with our sponsor. JD would articulate and breakdown the ideal functionality for the product. Recording these goals of his, we would then develop high level scenarios to test the expectations. In this process we focused primarily on the functionality of the new features.

The Test Driven Development process, on the other hand, consisted of breaking down each component of the software and making sure each unit worked efficiently and reliably on its own. We generated unit tests to have a regression testing scheme, which would give us insight as to the reliability of each unit. Given that our software's backend was not data heavy, it made more sense to not test with data, but with element visibility, responsiveness, and consistency.

We benefited by using these processes since it allowed our developers to have a clear understanding of what needed to be done, how it needed to work, and finally determine whether it worked accordingly. We repeated this process throughout the semester and for the most part it worked in our favor. It did , however, pose some problems. We came across several issues with the Google Maps API which became limiting obstacles to our process. We had difficulty for some time having a solid base which restricted us to practice the processes.

## Configuration Management Approach

Using Agile, we were able to create user stories, chores, and spikes to our project such that we could create meaningful work items that get our project moving at a fast and consistent pace. We had some spikes in the sense that we had stories that did not know how much time would take until we started it. We also had on average 3 branches at a time that we would work on individually and then merge together. We often used paired programming so two people would be working on one branch at a time. After each iteration, we had a release of our project to show our sponsor and get feedback.

## Heroku deployment

We ran into some issues with deploying to Heroku initially the first couple weeks, but after figuring out some issues with the GEM files, we were able to get it deployed every iteration so that we have a release.

Here is our new algorithm Heroku deployment link:

https://mighty-wildwood-62042.herokuapp.com

Here is our old algorithm Heroku deployment link:

https://powerful-savannah-86477.herokuapp.com

During implementation we decided to use the AWS console and the Cloud9 environment that comes with it. This allowed us to work remotely from any computer with an internet connection and provided us with the necessary tools to test and compile the website. We had no issues while using any of these products as they are great resources to have. Using these tools allowed us to stay on track, especially when one of our member's computers got damaged, he was able to log in into his online console in AWS and keep working on the project despite the setback this might have caused.

## Tools/Gems used

In this application we decided to use ruby 2.2.0 and rails 4.2.10 to make sure the other tools needed were compatible with our project. In terms of development, our application uses a lot of JavaScript combined with HTML/CSS. Therefore, we added uglifier as the javascript compressor and sass-rails for CSS stylesheets. Although we didn't use the project database a lot, we still had to initialize one for the project. In order to compile this database in development mode we used sqlite3, and pg for production mode.

The following GEMs are used in the project:

- Ruby 2.2.0
- Rails 4.2.10
- Sass-rails 5.0
- Uglifier 1.3.0
- Coffee-rails 4.1.0
- Jbuilder 2.0
- Sdoc 0.4.0
- Sqlite3 1.3
- Web-console 1.3
- Haml
- Jquery-rails
- Rails-erd
- Rails_12factor
- Guard-rspec
- Rspec-rails

Resources/Helpful Links/APIs

- http://aggiemapsm.appspot.com/
- http://aggiemapsapi.appspot.com/

- https://github.com/danielabreo/aggiemaps
- https://developers.google.com/maps/documentation/directions/intro
- https://developers.google.com/maps/documentation/javascript/tutorial

**Demo video link**

Link: https://youtu.be/XdE2nFBIM0s

**Customer exit interview**

Link: https://youtu.be/uBzp9ob5qbk

**Github Repositories:**

**Master branch:** https://github.com/colebui/TAMU-Transit

This branch is a proof of concept showing that our application can generate routes depending on departure time and A&M bus time tables.

After deploying using Cloud9 how to test the functionality of this application:

1. Enter any date with the time being either 5:02 PM or 5:05 PM
2. Enter start location as Beutel Health Center
3. Enter end location as Reed Arena
4. Depending on the departure time you selected you will be shown a corresponding route

**Oldmapsearch branch:** https://github.com/colebui/TAMU-Transit/tree/oldmapsearch

This branch shows that we have integrated the google maps API to accurately calculate routes to start and stop locations. Also, This branch clearly displays text directions for walking, driving, biking, and wheelchair accessibility. Furthermore, all features work except the departure time input.

Bus tab: creates fastest bus path

Bike tab: creates fastest biking path

Walking tab: creates the fastest walking path

Driving tab: creates the fastest driving path

- In this tab the bus route number gets displayed, this is a bug

Wheelchair tab: creates the least amount of walking path

- Uses the same searching scheme as the bus tab

After deploying using Cloud9 how to test the functionality of this application:

1. Enter any desired start location on campus
2. Enter any desired end location on campus
3. Select the prefered way of travel
4. Route will display according to the tab selected
5. Use reverse arrows to flip the start and end locations