

# *Virginia Tech Intelligent Parking System (VIPs)*

Team 3

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*Parking and Transportation*



# *Agenda*

1. Client Overview
2. Product Overview
3. Design Process Summary
4. Usage Scenarios

## *Client Overview: Virginia Tech Parking and Transportation*

- Self-funded organization
- Oversees parking activities at Virginia Tech
- Works with various stakeholders around campus including:
  - Virginia Tech Athletics
  - Blacksburg Transit
  - Academic Departments

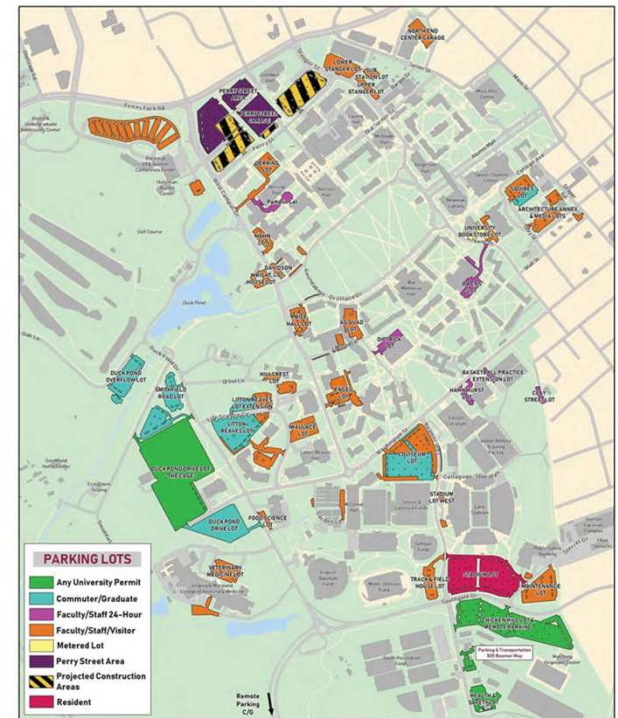


*Parking and Transportation*



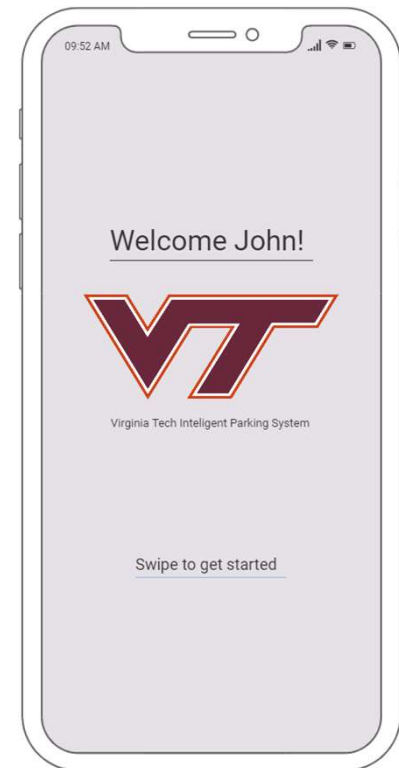
## *Problems of Current System*

- Current map is unclear and difficult to use
- Users waste time checking information every time
- Inconsistent information on parking map versions from different websites
- Lot closure due to game day and construction is not well communicated
- Users need to switch between parking map and navigation application



## *VT Intelligent Parking Services (VIPs)*

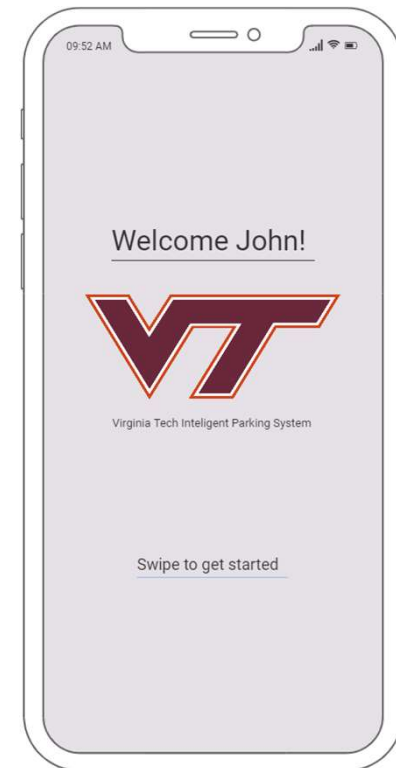
- Provides general information for parking
  - Lot closures, availability stats
- Utilizes user saved information to make parking recommendations
  - Permit type, day/time seeking parking, parking type
- Navigation instructions
- Allows user to pay for metered parking through application
- **Stress-free parking experience**
- Basic website UI for users and back-end users



## *VT Intelligent Parking Services (VIPs)*

### **Benefits:**

- Easy, quick, and stress-free parking experience
- No need to compare parking maps, campus maps, and google maps to inform parking decision
- Features (especially things like emotional impact, phenomenological aspects of interaction)
- Driving Mode for easy, clear, and safe navigation; focus on driving instead of interactions

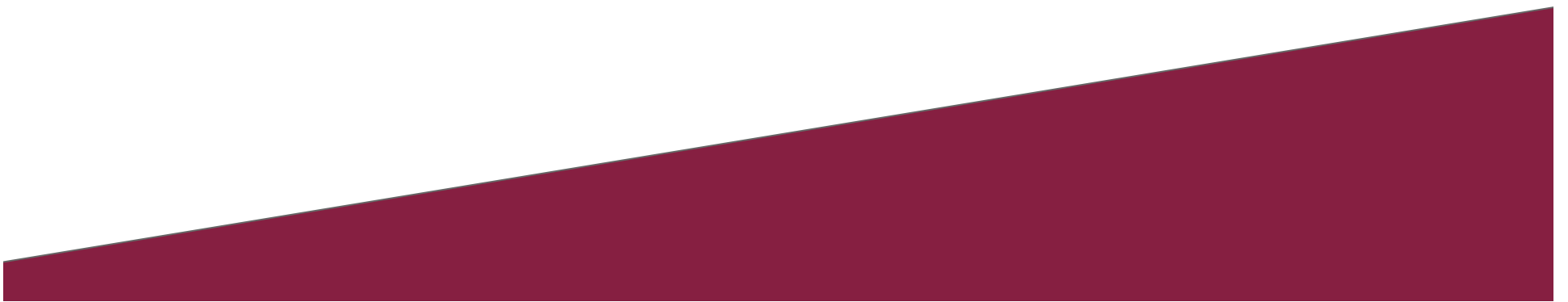


The VT Intelligent Parking System (VIPs) will be an **application**, supplementary to the Parking Services website, that **communicates parking lot availability** to students, faculty, staff, and visitors based on their permit type, weekday, time, special events, and user preferences.

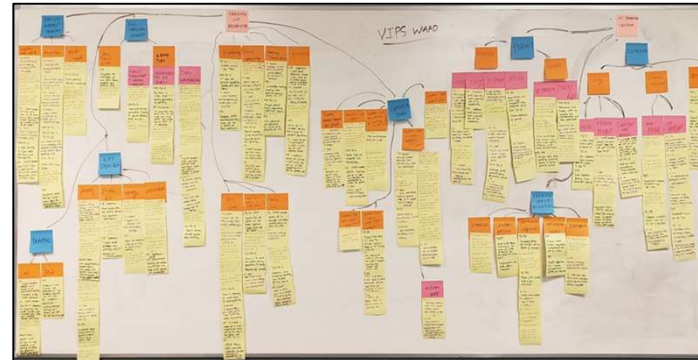
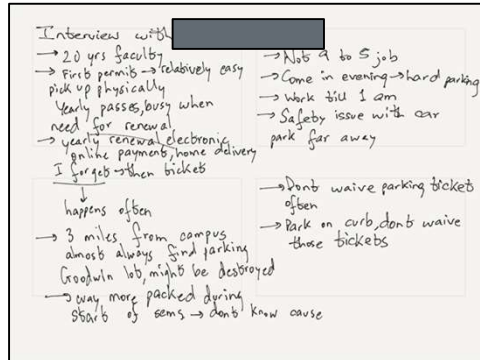
VIPs will automatically recommend and navigate users to available parking lots based on user-saved preferences, destination, alerts, road maintenance, and provides hands-free navigation and a digital map. These recommendations consolidate the information on the Parking Services website and provide a **stress-free parking experience** with minimal interaction that is also safe to use while driving.

# *Design Process Overview*

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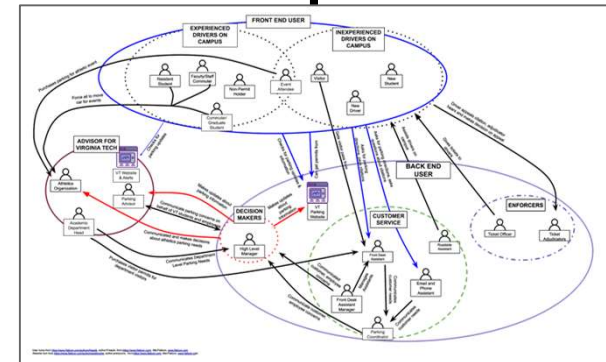


Information Gathering


Modeling

Interviews

WAAD building



## Design Process Overview: User Research



### Jessica Smith

"I'm not a sports fan. Sometimes I don't even know there's a game that day, but the lot is closed."  
"I wish the information gathering process about campus parking would be easier."

PARKING BEHAVIOR	PAIN POINTS
<ul style="list-style-type: none"> <li>Not very familiar with parking at Virginia Tech</li> <li>Commutes to campus daily</li> <li>Has meetings and club activities at different locations</li> <li>Often goes out around campus on weekends</li> </ul>	<ul style="list-style-type: none"> <li>Wasting time checking information online every time</li> <li>Current campus parking map is unclear and difficult to use</li> <li>Switching between webpage and navigation application</li> </ul>

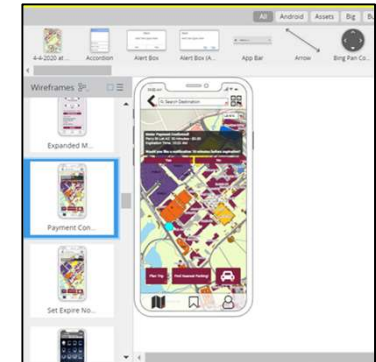
**MOTIVATIONS**

- Wants to get integrated real-time parking information and navigation easily and efficiently

**CORE NEEDS**

- Integrated parking information including special events arrangements and construction closures
- Filtered by permit type and current time / day of the week
- Built-in navigation feature

Photo credit: [https://lunafish.com/sharing/amy\\_apollo](https://lunafish.com/sharing/amy_apollo)



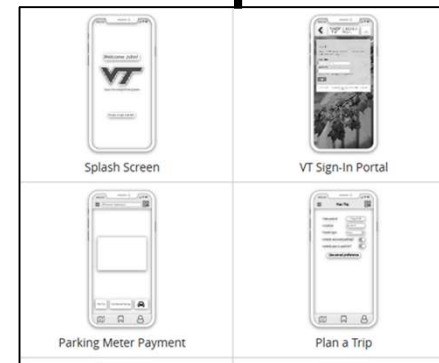
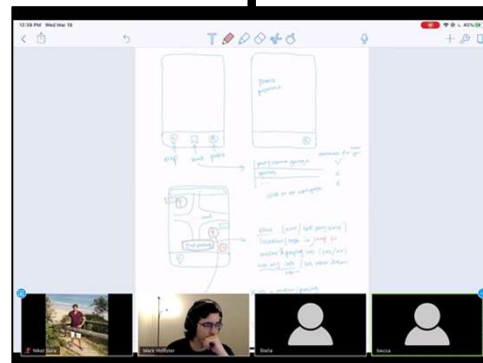
Sketching

Wireframing

Personas

Storyboarding

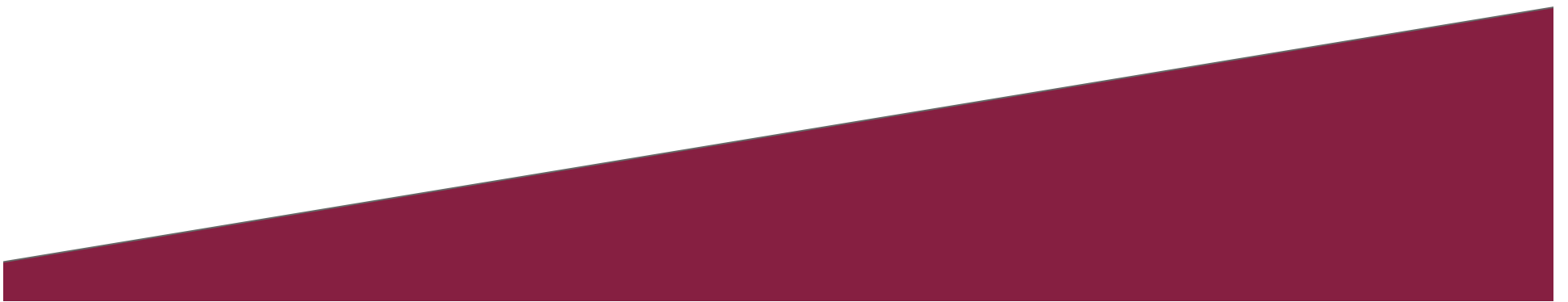
Prototyping



*Design Process Overview: Concept Development*

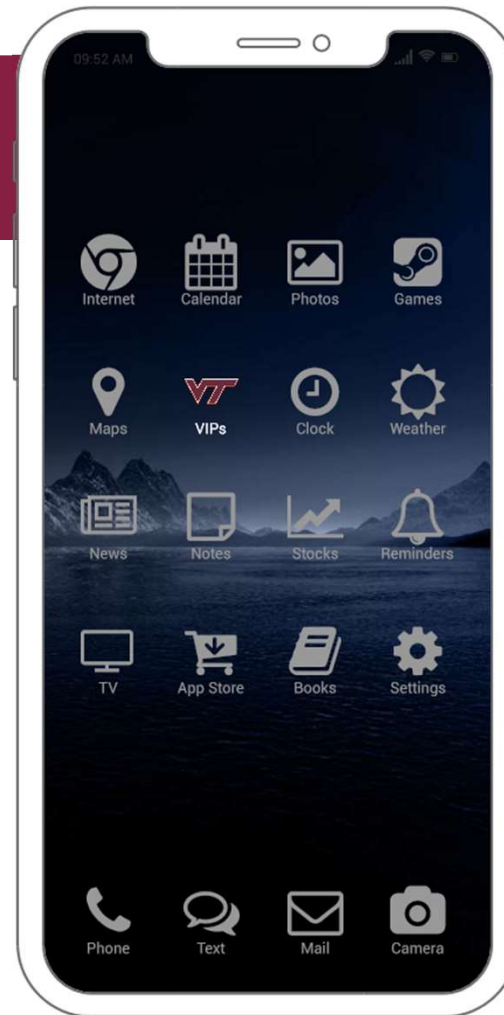
# *Usage Scenarios*

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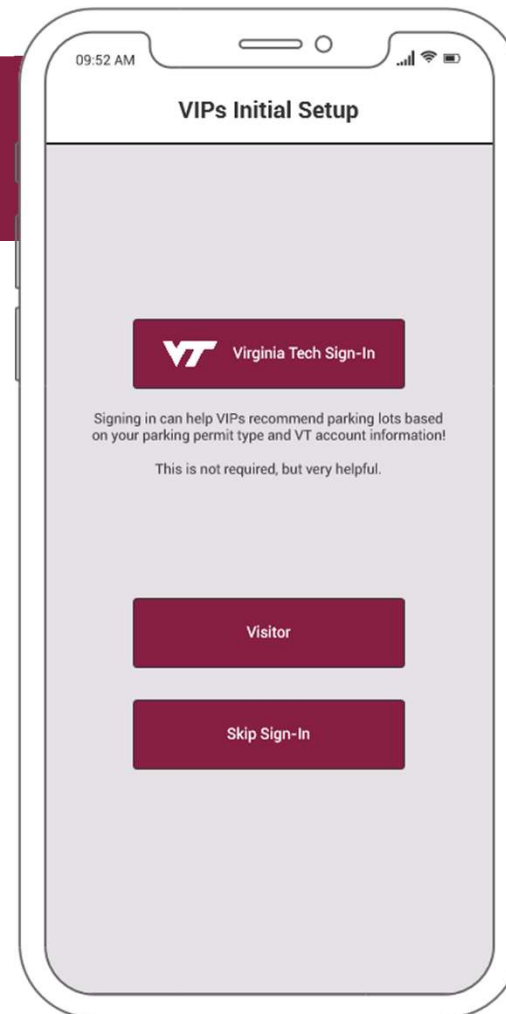


## *Usage Scenarios*

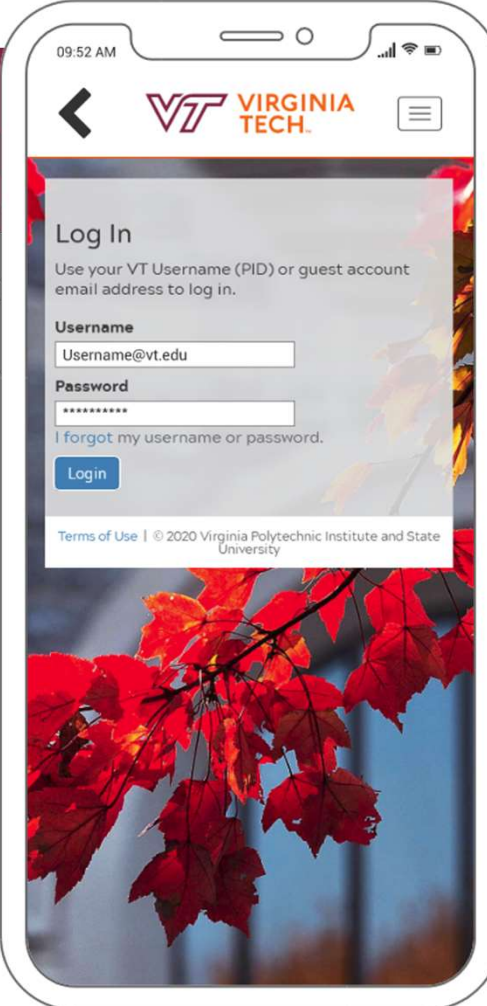
- Four scenarios were used to scope the app prototype:
  - Navigating to a Parking Lot
  - Planning a Future Trip
  - Using Metered Parking
  - Back-end Admin Tasks






# *Signing In*



## Signing In



09:52 AM

### Log In

Use your VT Username (PID) or guest account email address to log in.

**Username**

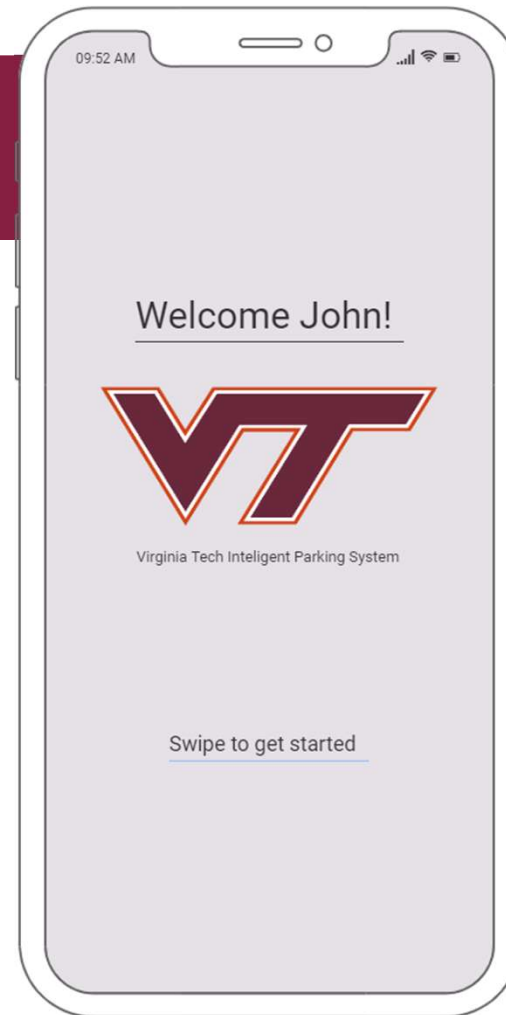
**Password**

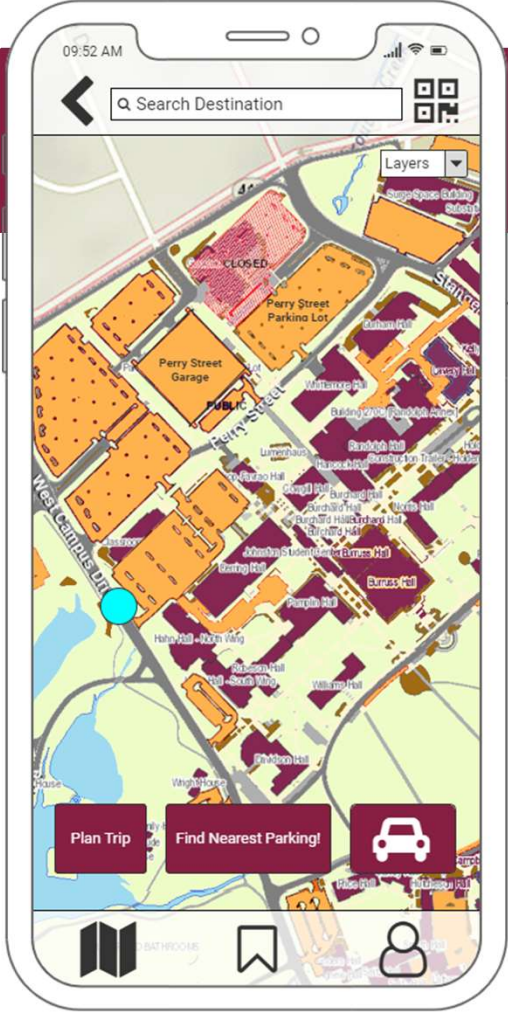
[I forgot my username or password.](#)

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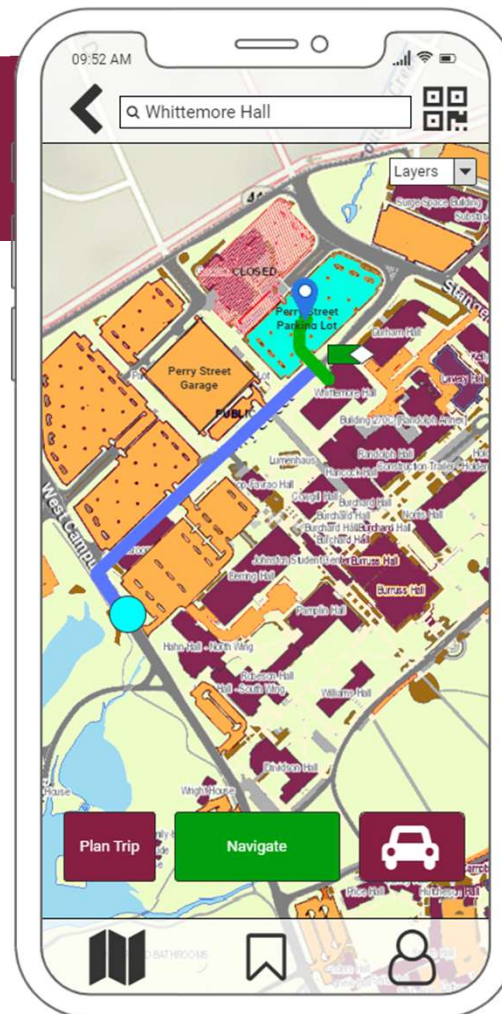
## *Navigating to Nearest Parking*



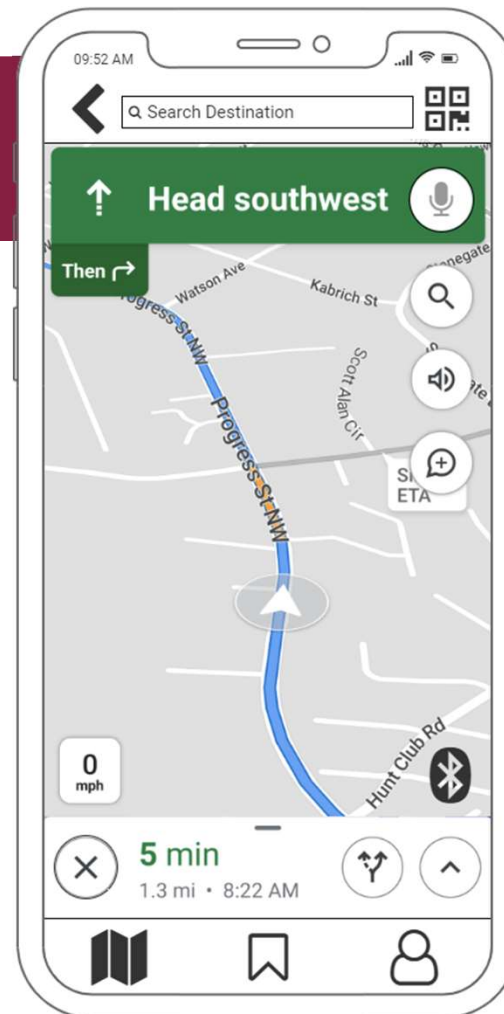




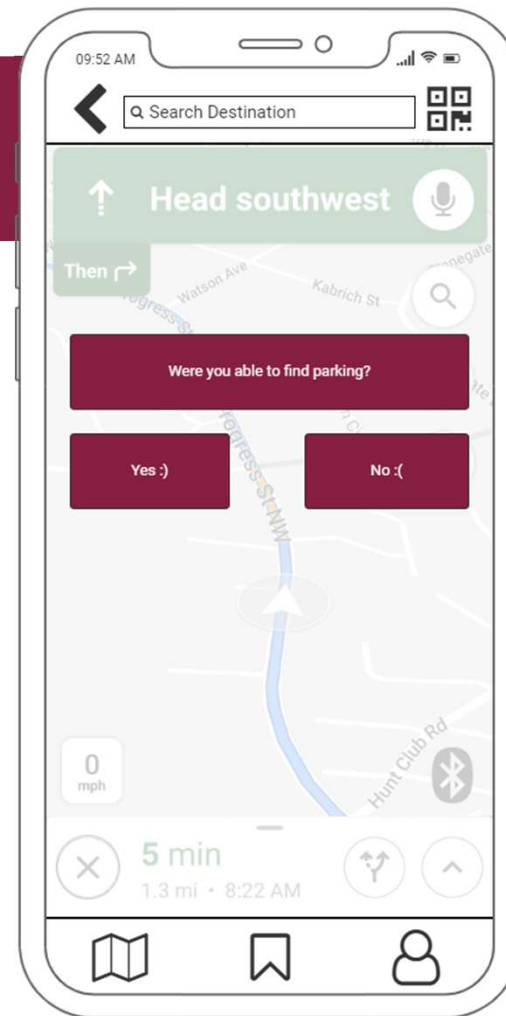
## *Navigating to Nearest Parking*



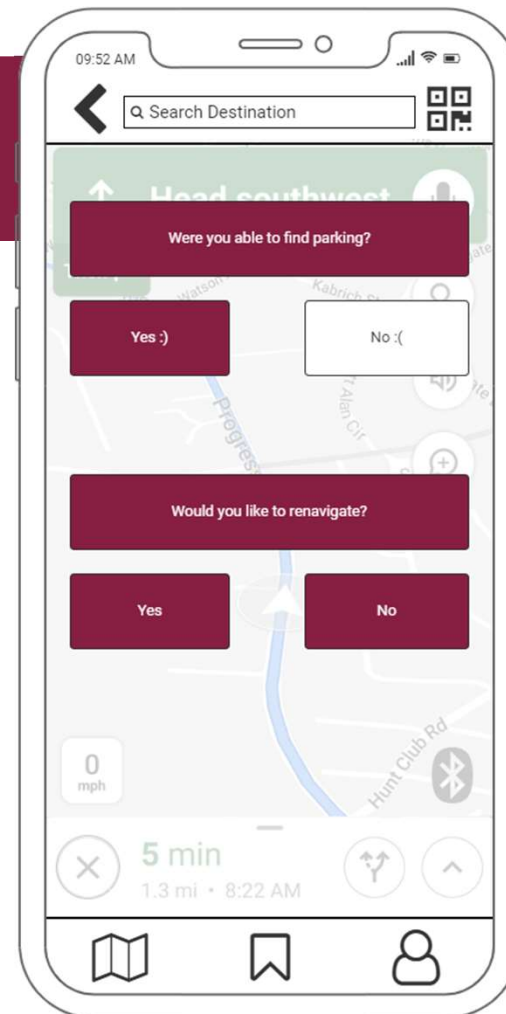
## *Navigating to Nearest Parking*



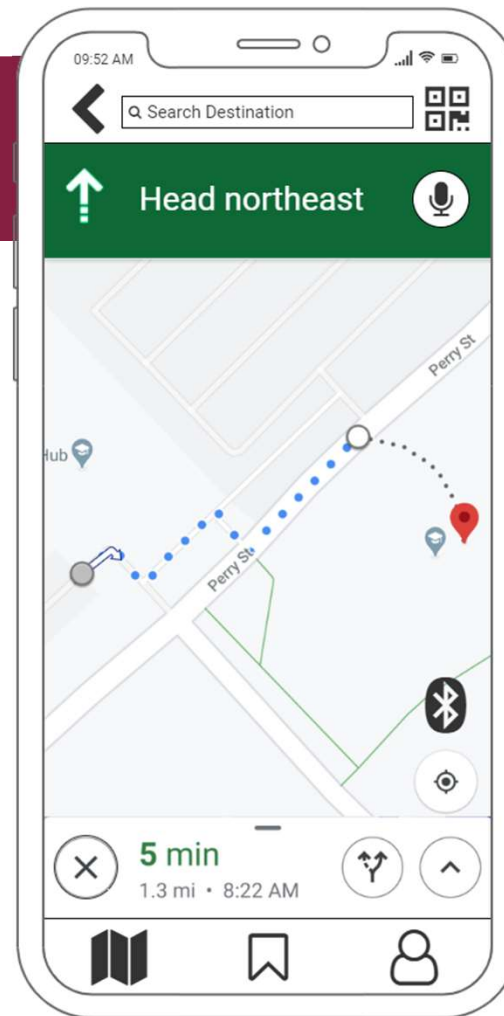
## *Navigating to Nearest Parking*



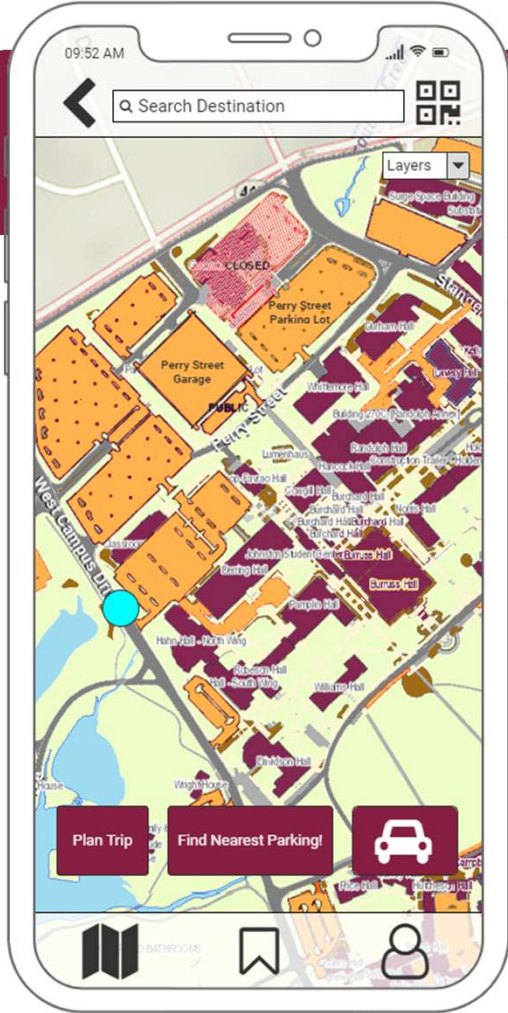
## *Navigating to Nearest Parking*



## *Navigating to Nearest Parking*



# Planning a Future Trip



## *Planning a Future Trip*

09:52 AM

Plan Trip

Time Period

Location

Permit type

Include metered parking? ☒

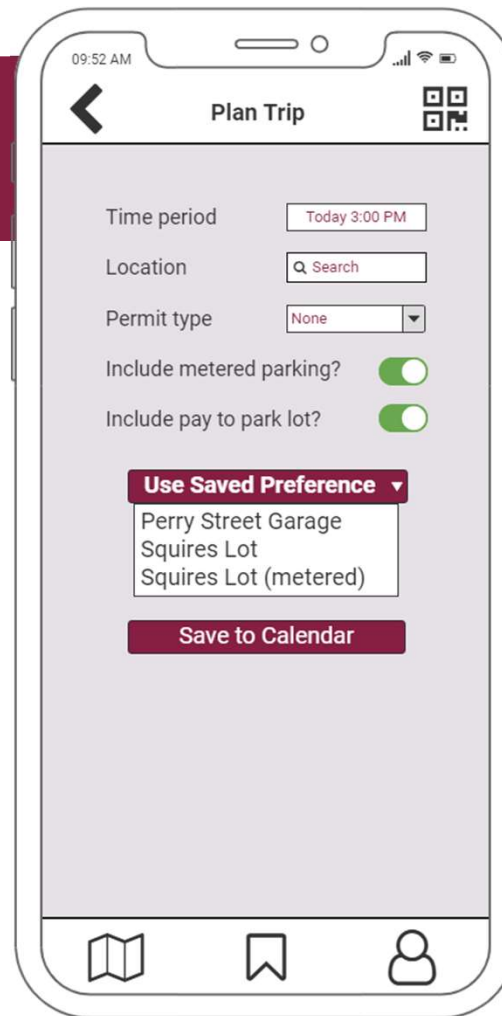
Include pay to park lot? ☒

**Use Saved Preference** ▼

**Save to Calendar**

Map icon, Bookmark icon, User icon

## *Planning a Future Trip*



The image shows a smartphone screen with the 'Plan Trip' app. The status bar at the top shows the time as 09:52 AM and various icons. The app's header includes a back arrow, the title 'Plan Trip', and a QR code icon. The main form contains several input fields and toggle switches. The 'Time period' field is set to 'Today 3:00 PM'. The 'Location' field has a search icon and the text 'Search'. The 'Permit type' field is a dropdown menu currently showing 'None'. Below these are two toggle switches, both of which are turned on: 'Include metered parking?' and 'Include pay to park lot?'. A maroon button labeled 'Use Saved Preference' with a dropdown arrow is positioned above a list of three options: 'Perry Street Garage', 'Squires Lot', and 'Squires Lot (metered)'. At the bottom of the form is a maroon button labeled 'Save to Calendar'. The bottom of the screen features a navigation bar with three icons: a map, a bookmark, and a user profile.

09:52 AM

Plan Trip

Time period Today 3:00 PM

Location Search

Permit type None

Include metered parking? ☒

Include pay to park lot? ☒

Use Saved Preference ▾

- Perry Street Garage
- Squires Lot
- Squires Lot (metered)

Save to Calendar



## *Planning a Future Trip*

09:52 AM

Plan Trip

Time Period

Location

Permit type

Include metered parking? ☒

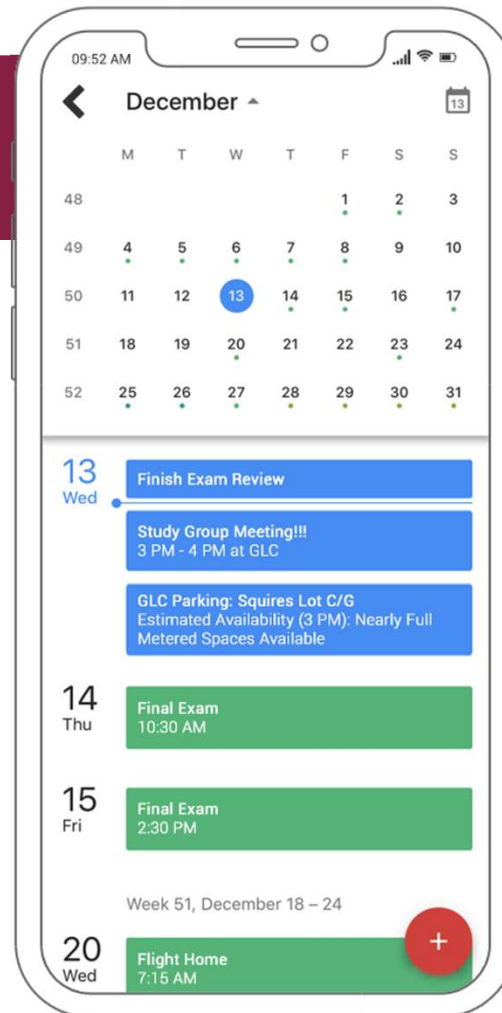
Include pay to park lot? ☒

**Perry Street Garage** ▼

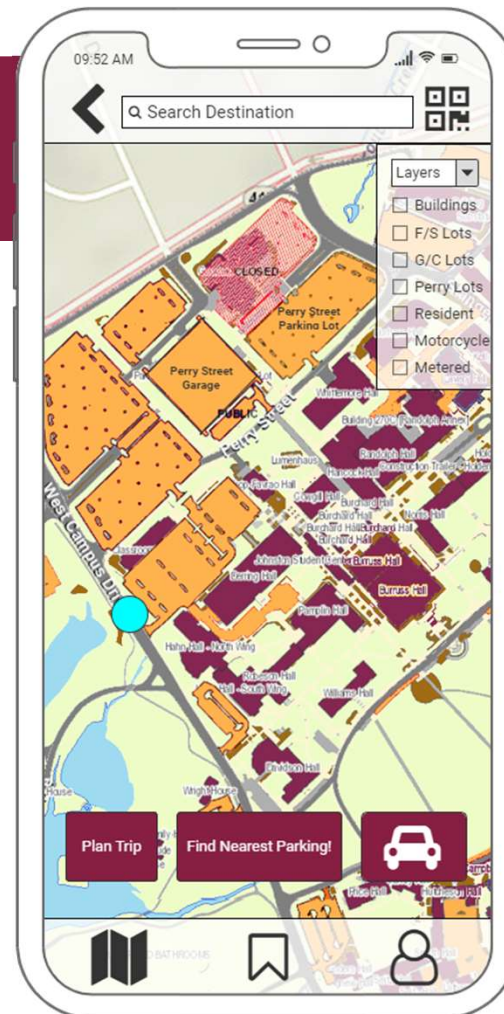
**Save to Calendar**

Map icon, Bookmark icon, User icon

# Planning a Future Trip



# Finding Metered Parking



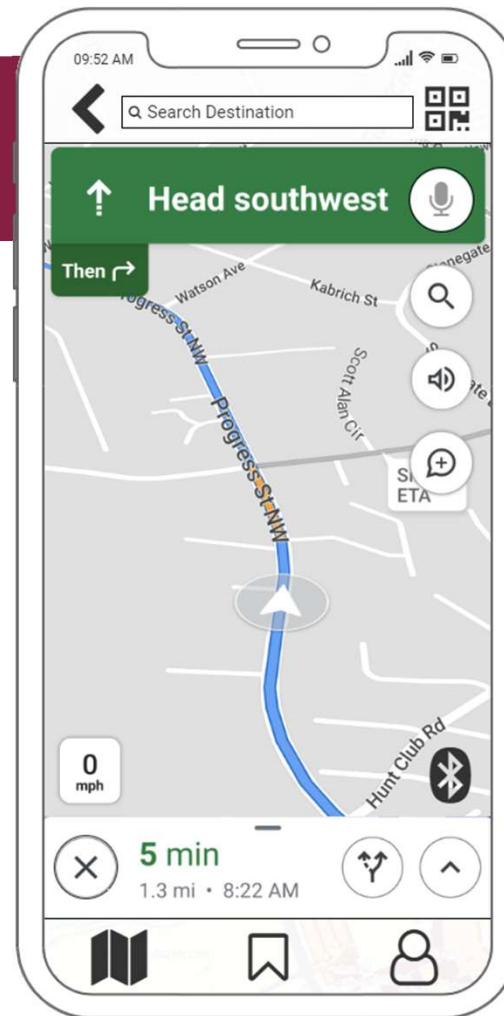
# Finding Metered Parking



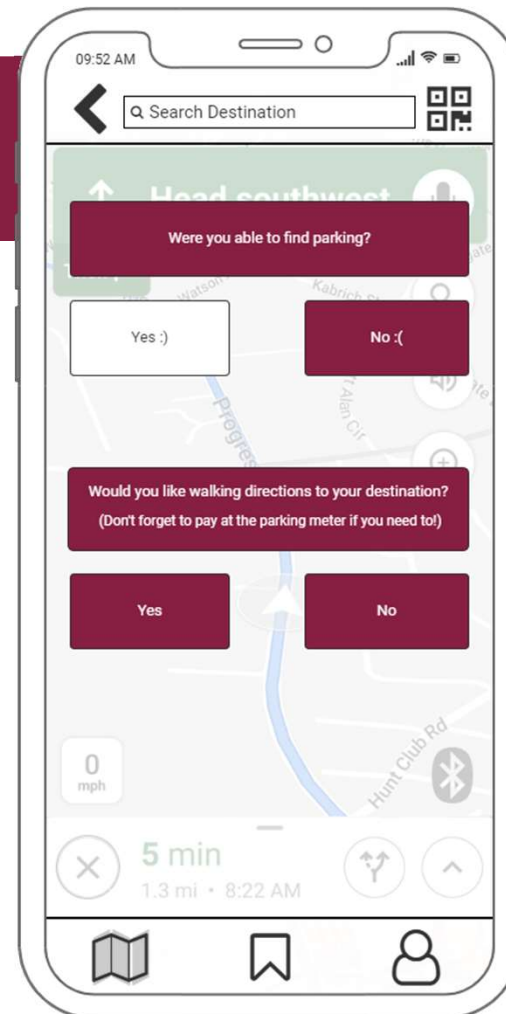
# Finding Metered Parking



## *Finding Metered Parking*



## *Finding Metered Parking*

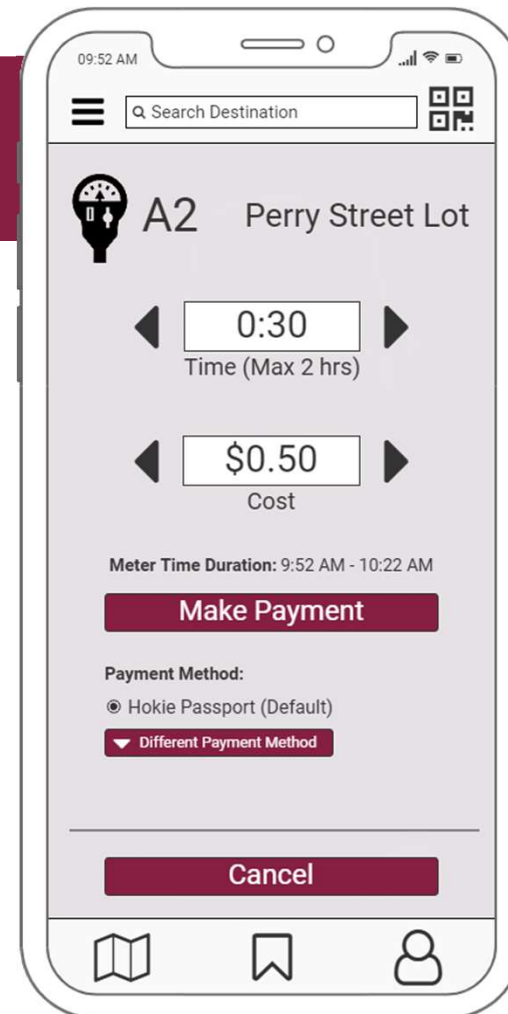


## *Using Metered Parking*

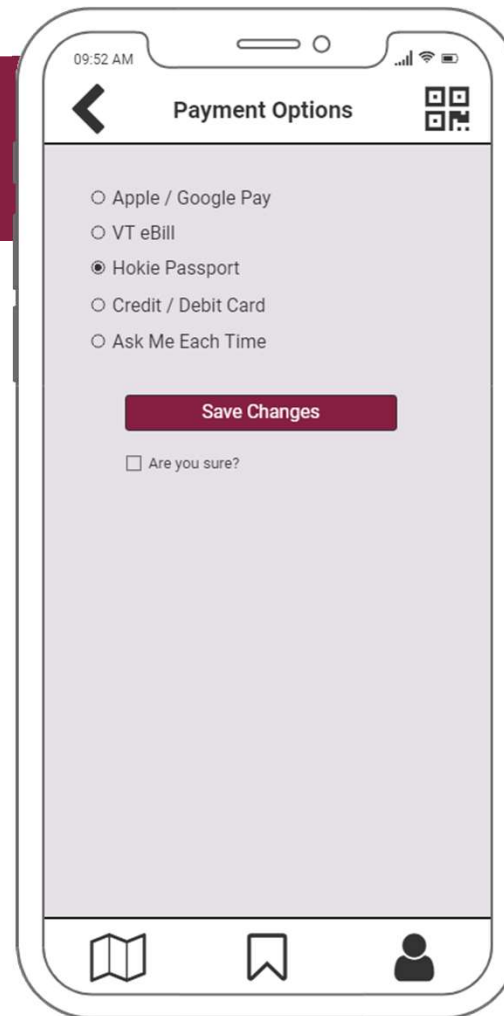




## Using Metered Parking




## *Using Metered Parking*



## Using Metered Parking

09:52 AM

Search Destination

 A2 Perry Street Lot

◀ 0:30 ▶  
Time (Max 2 hrs)

◀ \$0.50 ▶  
Cost




Meter Time Duration: 9:52 AM - 10:22 AM

**Make Payment**

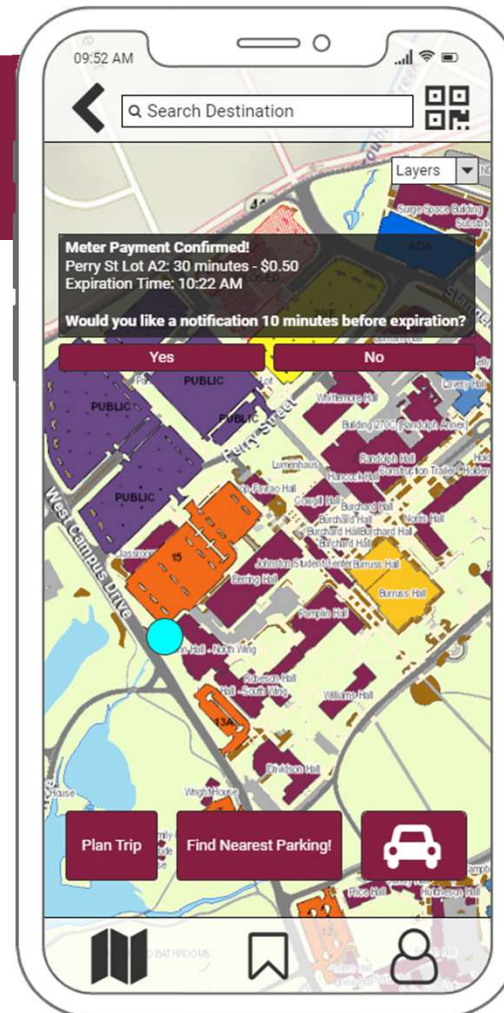
Payment Method:

- ☒ Hokie Passport (Default)
- ☐ Apple / Google Pay
- ☐ VT eBill
- ☐ Credit / Debit Card

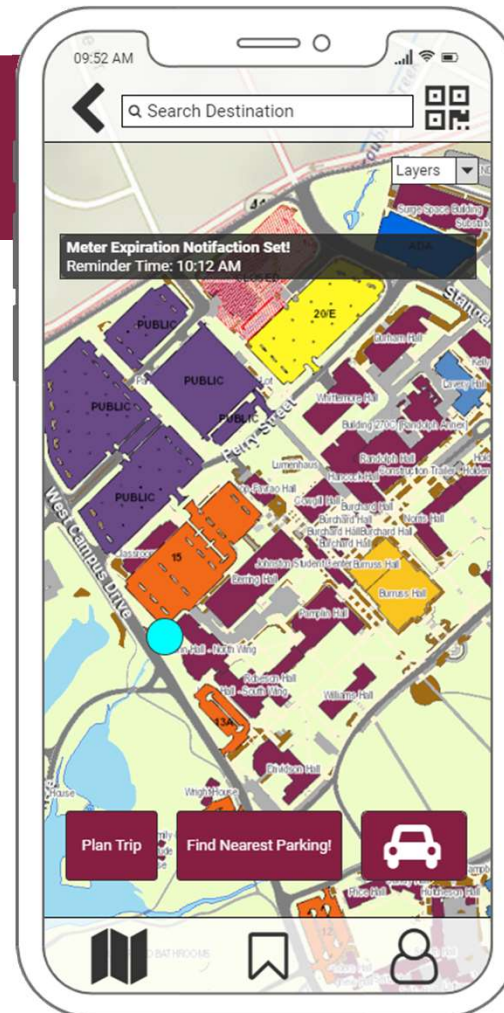
**Cancel**

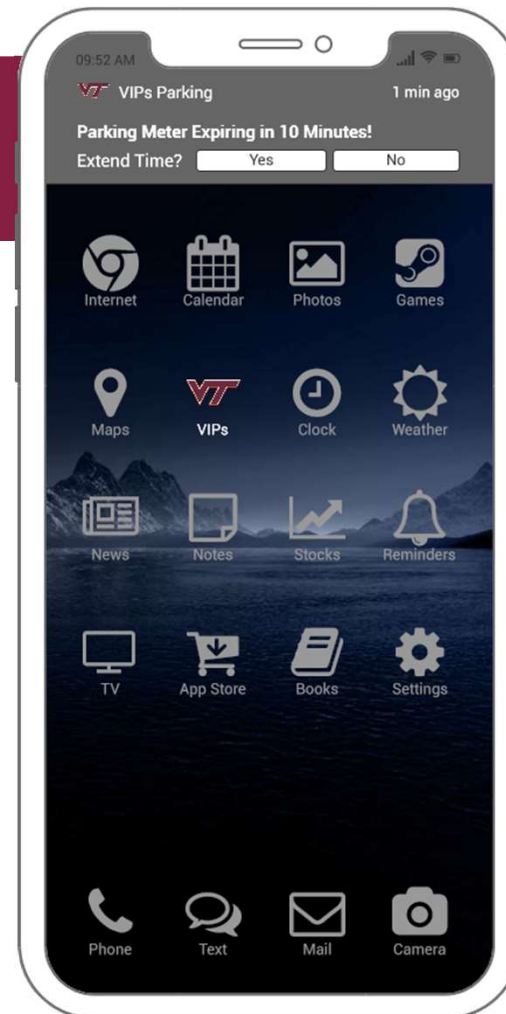
## Using Metered Parking



## Using Metered Parking




## *Using Metered Parking*



## Using Metered Parking

09:52 AM

Search Destination

 A2 Perry Street Lot

◀ 0:30 ▶  
Time (Max 2 hrs)

◀ \$0.50 ▶  
Cost




Meter Time Duration: 9:52 AM - 10:22 AM

**Make Payment**

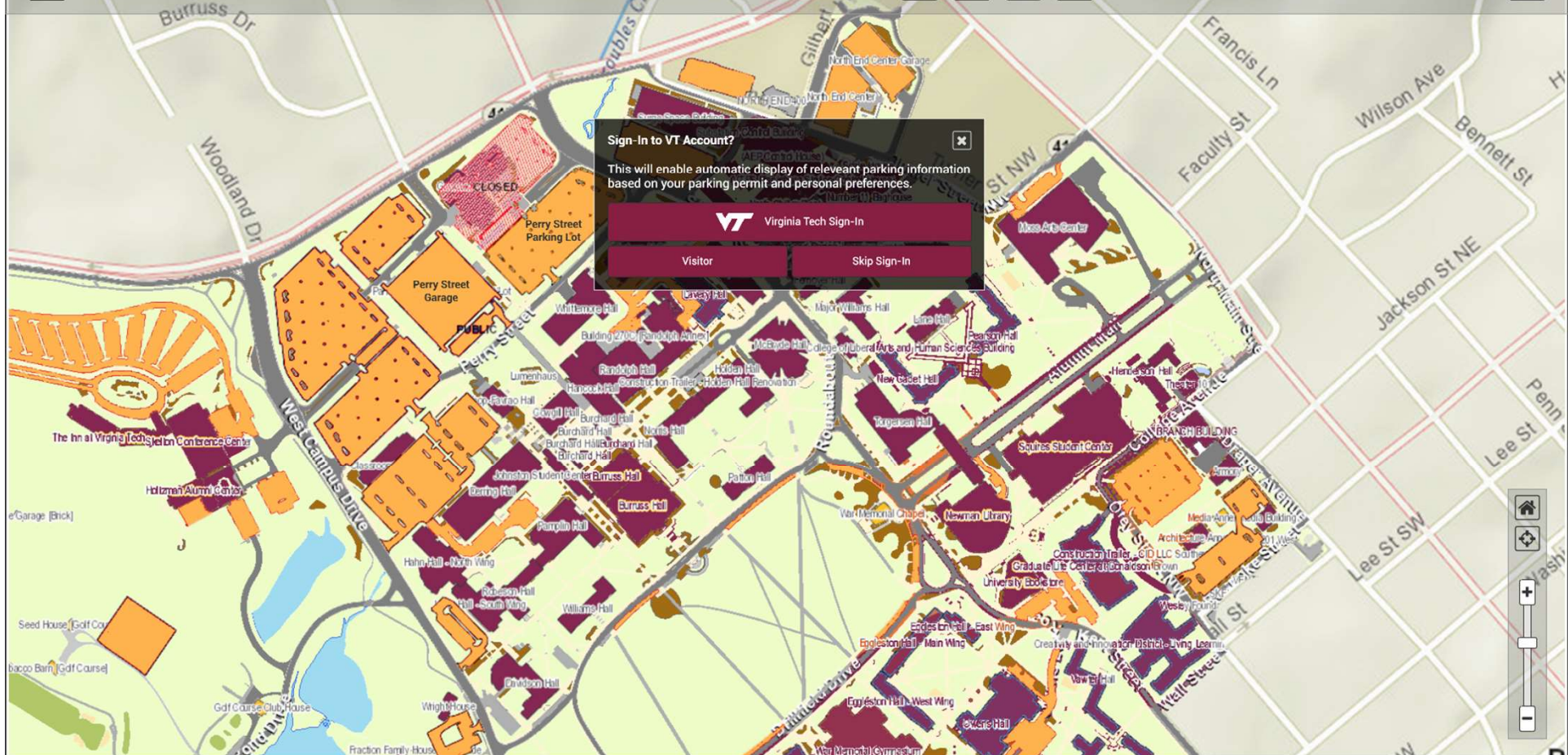
Payment Method:

- ☒ Hokie Passport (Default)
- ☐ Apple / Google Pay
- ☐ VT eBill
- ☐ Credit / Debit Card

**Cancel**







<https://www.maps.unirel.vt.edu/parking/>

Search Destination

Advanced Search

Layers



Find Nearest Parking!

Plan Trip

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## LOGIN SERVICE

HELP

## Log In

Use your VT Username (PID) or guest account email address to log in.

Username Password [I forgot my username or password.](#)[Login](#)[Terms of Use](#) | © 2020 Virginia Polytechnic Institute and State University



<https://www.maps.unirel.vt.edu/parking/>

Search Destination

Advanced Search

Layers



Find Nearest Parking!

Plan Trip

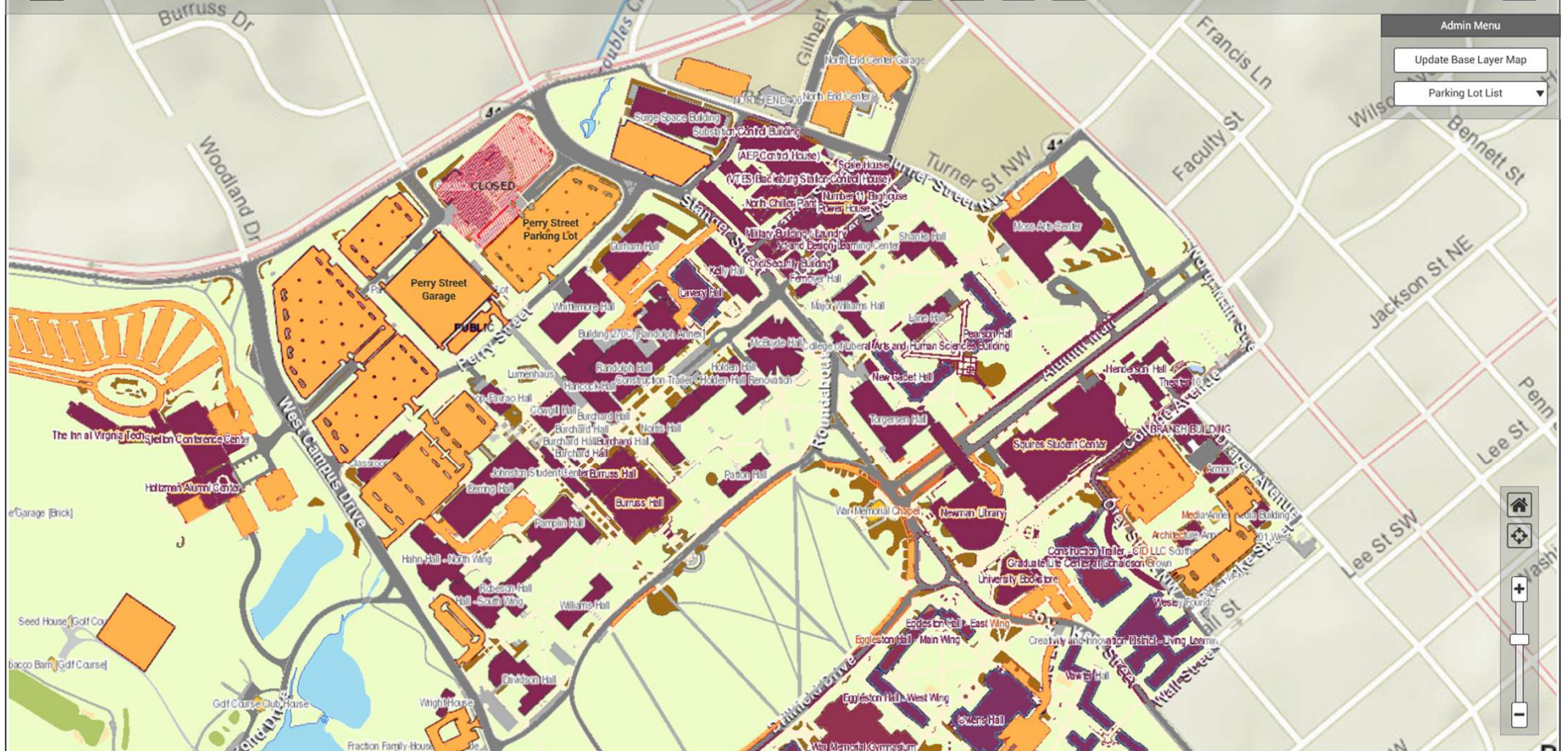
Admin Mode



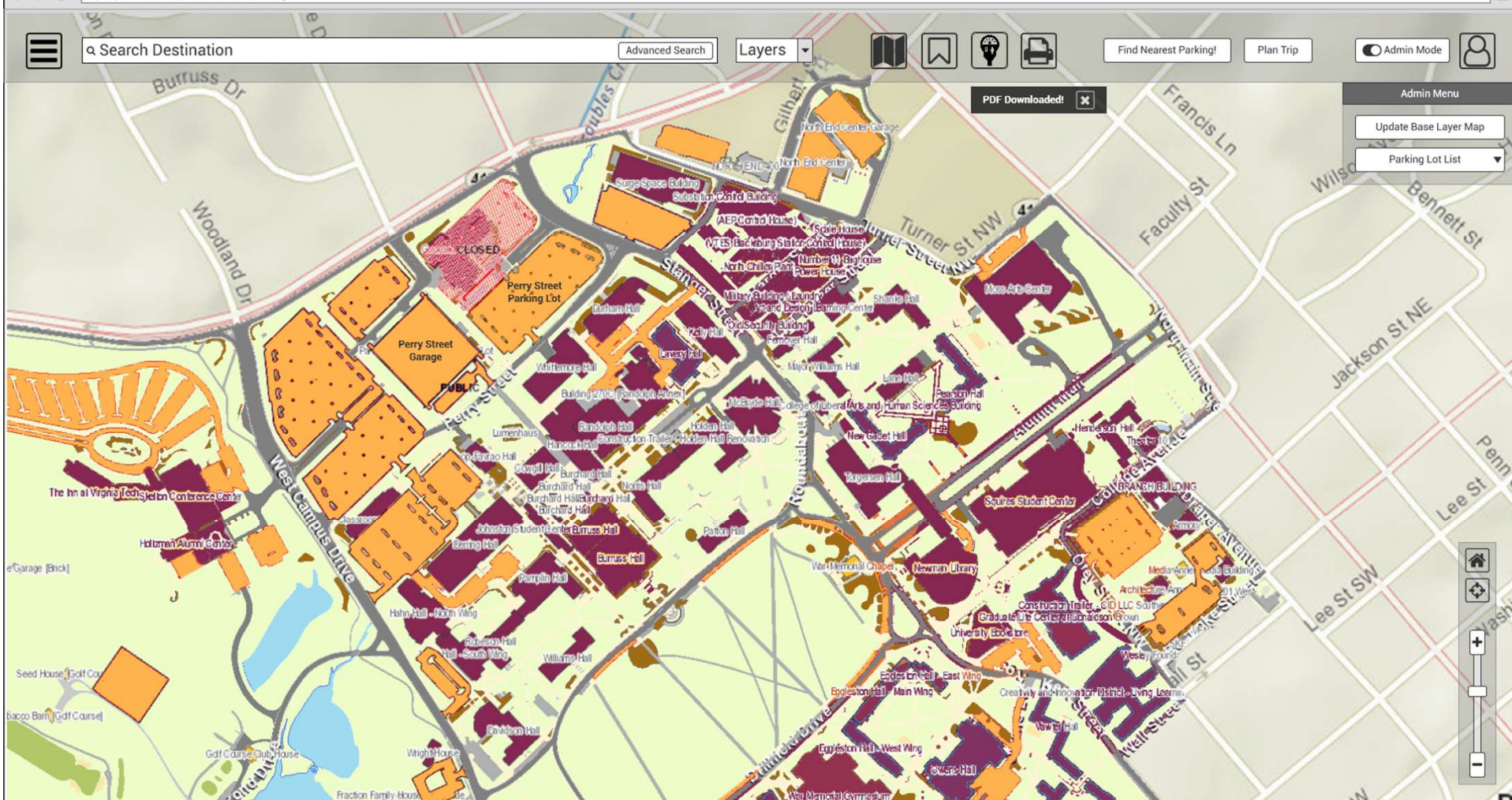
Admin Menu

Update Base Layer Map

Parking Lot List









<https://www.maps.unirel.vt.edu/parking/>

Search Destination

Advanced Search

Layers

Find Nearest Parking!

Plan Trip

Admin Mode

Admin Menu

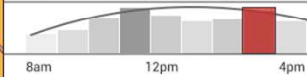
Update Base Layer Map

Parking Lot List

User Reports:

- 11:55am - "Parking is Full!"
- 12:50pm - "A few spots available now."
- 2:45pm - "And it's full again."

Availability Estimates:



Upcoming Closures:

- 12/16/20 - Pre-Game Day Closure
- 12/17/20 - Game Day Closure

Edit Parking Lot Properties



<https://www.maps.unirel.vt.edu/parking/>

Search Destination

Advanced Search

Layers

Find Nearest Parking!

Plan Trip

Admin Mode

Admin Menu

Update Base Layer Map

Parking Lot List

417 Clay Street Lot  
Basketball Facility Extension  
Dietrick Lot  
Hahn Hurst Lot  
Owens Lot  
Pamplin Lot  
Perry Street Lot  
Perry Street Garage  
University Bookstore Lot

Back to Parking Lot Status

## Upcoming Closures:

12/16/20, 9pm - 12am: Pre-Game Day Closure  
Allowed Permits: Football Pass

12/17/20, 12am - 3pm: Game Day Closure  
Allowed Permits: Football Pass

## Permits Allowed (7am - 5pm M-F):

F/S, C/G

Properties Successfully Updated!

## Future Development

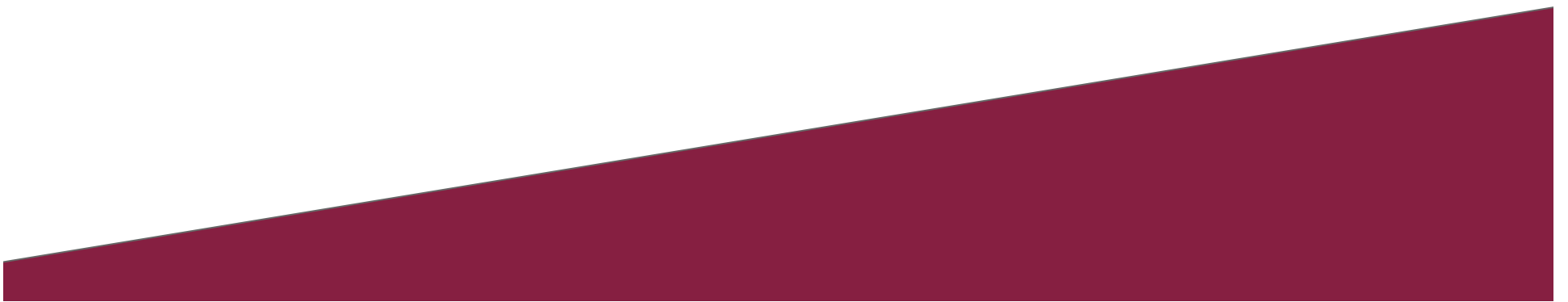
- Second iteration of graphic styling, adding a dark theme, and new logo
- Second iteration prototype with final graphics and more realistic interactions
- Solve recently identified UX problems: make functions more intuitive
  - Driving Mode Button
  - Layers Drop Down Menu
  - Plan Trip Location/Save Preference
  - Navigate Button in Selected Lot Pop-up
  - Add Tutorial Mode for first time use with overlays, highlights, and callouts



# *Thank You!*

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*Questions or Comments?*



## *Overall Experience Comments*

Nik- "Ensuring that the whole team was on board for making the necessary changes led to thought provoking discussions"