**Task List**

**Project**

Setting up the project.

1. Determine requirements
   1. How much information do we need to store for this project?
2. Determine technology
   1. What is the most appropriate version control technology for our project?
3. Establish communication methods

**Server**

Setting up the central server for the application, receiving data from the camera/laser and storing it in a database, responding to data requests from the mobile application.

1. Determine requirements
   1. Determine server type
   2. What technologies will be required? (Linux? Apache? SQL? PHP? Java? etc.)
   3. How will we be storing our data? (SQLite, etc.?)
      1. Determine database schema
   4. Determine budget for server (if applicable)
2. Obtain server
   1. Research available servers (commercial/TAMUK)
   2. Determine the best server that suits our requirements and budget.
   3. Purchase/rent server
   4. Obtain access to server
      1. Confirm that we can read/write to server directory
3. Initial setup
   1. Put server files under version control
   2. Install required technologies
   3. Configure database
      1. Create database
      2. Define database schema
   4. Establish static IP
4. Establish data communication between camera system and server
   1. Enable wireless IP cameras
   2. Confirm video reception
5. Establish data communication between user applications and server
   1. Receive web request for parking lot data
   2. Send data
6. Retrain vehicle recognition algorithm with campus-specific information.
   1. Gather still frames from incoming video.
   2. Crop and label pictures as either containing a vehicle or not
   3. Retrain algorithm with updated photos
7. Process video
   1. Route incoming video through vehicle recognition algorithm
   2. Determine , frame by frame, if video contains a vehicle
      1. If it does, that vehicle is identified ,labeled and tracked
      2. If it does not, nothing happens
   3. Relay data to database
8. Testing

**Beam/Laser System**

Physically setting up the beam/laser system in the environment, sending information over WiFi, determining whether or not a car has passed in/out of the parking lot, running tests.

**Camera System**

Involves physically setting up the camera in the environment, sending an image over WiFi, determining the number of cars in the parking lot given an image (image recognition).

1. Determine requirements
   1. What type of camera(s) do we need?
      1. How are we going to communicate with the server?
      2. What are the minimum specs of the camera?
   2. What type of fastening equipment is needed?
      1. How will the equipment be placed?
      2. How will the camera be placed on the equipment?
      3. Environmental hazards
         1. People
         2. Vehicles
         3. Weather
   3. People/Obstacles
   4. What is the optimal camera configuration?
2. Deploy and enable camera modules
   1. Configure all cameras to send data to static IP
   2. Physically place camera modules at all ingress and egress locations for each parking lot on campus.
   3. Confirm video transmission

**Mobile Application**

Developing the accompanying mobile application that students/faculty will use to view open parking spaces.

1. Determine requirements
   1. What platform(s) are we targeting? (Android, Apple, etc.)
   2. What technologies will be required? (programming languages, libraries, etc.)
   3. Will the data have to be persistent?
      1. If so, how will we be storing our data?
2. Initial setup
   1. Create new mobile application project
   2. Put project under version control
   3. Download project onto test device and confirm it is working
3. Establish data communication between server
4. Download environment
5. Testing