**Project Diagrams**

The change of the alternative fueling station since 2014, including the hydrogen and CNG (compressed natural gas) station, may not be significant in its quantity. However, the discrepancy of data will cause inaccuracy of the generated path and stations, then affects the user experience of the tool. For example, the user could be led to a nonexistent station because the station may have been removed in 2020.

The project includes collecting data sets in 2020 for the AFV stations, using scripting to generate shortest distance pairs, and updating the user interface of the app. Due to the requirement of large computational power, the distance between all pairs of nodes is pre-generated by python programming and Esri’s ArcGIS online geocoding service. I regenerated the distance of the nodes because of the update of the station-location data will affect the result of the previously generated road network (OD Matrix).

The capstone project involves the tools and technologies such as *Python, PostgreSQL,* *PostGIS* extension, etc. In Figure 2 and 3 below, the two diagrams that show the detailed differences between the 2014 and 2020 versions of the map applications.

A close up of a device

Description automatically generated

Figure 2. Diagram of the Architecture of the 2014 App.

A close up of a piece of paper

Description automatically generated

Figure 3. Diagram of the Architecture of the updated 2020 App.