Texas A&M University

**Semester Project, Report 1**

**#2: Data Uncertainty Testing on TxDOT Overpass Expansion Drone and Survey Project**

Asa Hayes

GEOG-352

Lyle

11 February, 2019

Section 1: Background Information

As the need for proper infrastructure in the U.S. grows, the amount of time necessary to survey and inspect new sites (or update old surveys) is becoming constrained by the amount of geoscientists available, which is unlikely to grow to scale.. As with most industries, trends are turning towards automation to remedy this deficiency. Automation of parts of the surveying process via remote imaging would remove the need for as many (or any) geoscientists to be on site, eliminating the associated costs as well. Additionally, this could be extended to assist clients in inspection of sites via the use of explorable 3D recreations generated from these surveys. If a streamlined process combining these two factors was established and found to be accurate/useful, this would be a significant step in alleviating the severe need for qualified surveyors.

Section 2: Research Question and Significance

The main question of this project is to determine if this newly developed method of automated surveying is as accurate and/or useful as a typical, manual survey. The significance, if the new drone-scanning method is at least equivalent, would reduce need for physical surveying in many applications and make surveying more affordable due to reducing costs needed for manual survey.

Section 3: Hypothesis

The project’s hypothesis is that, due to the showings of Datumate, that the resultant 3D model will be within TxDOT standards compared to the manual survey that is also being conducted.

Section 4: Data Collection & Justification

The methodology for the project is as follows: after arranging with needed properties, the team is to conduct 2 surveys of the bridge. The first survey, a standard manual survey, will serve as the control to compare the 2nd, drone-assisted survey. From these surveys, 2 3D models will be created, and the points will be compared for accuracy. For the secondary function of the project, the team will take the models, convert them into DEMs (which removes the bridge structure), and import them into the Unity3D Engine. If all steps go as planned, the resultant procedure would grant many in the geosciences the benefits listed above, as well as allowing clients to have a better sense of the area they will be building on.