MEMORANDUM
To: Dr. Jeff LaMondia, City Engineer, Austin, TX
From: Lan Liu
Date: March 10, 2017
RE: Identification of best locations in Austin City for future development.

I. Purpose
This assignment is created to let students practice their skills on how to conduct suitability and raster analyses.

II. Methods of creating a map
A large map was created from four layers and an inset map was created from a data frame with two layers. The final layout was made with following steps:

- First, the data was downloaded and exported into a folder. And six layers (CAPCOG Counties, City Limits 2014, Road Centerlines 2014, Closed Landfills, 100-yr Floddplains, and Vacant Parcels) were selected to show up in ArcGIS. Travis County (from CAMPO Counties) was selected first, and a new layer of Travis county was created by exporting data. Then, a New Data Frame was added with two layers (CAPCOG Counties and Travis County, respectively) to create an inset map. By using clip, dissolve, and union tool, a new layer named Suitable Areas was created.
- Second, the spatial analysis was conducted by finishing four steps (Input datasets, derive datasets, reclassify datasets, weight and combine datasets). For this assignment, the existing urbanized areas (City Limits) needed to be found by using Euclidean Distance tool and Reclassify tool in toolbox. By doing these two steps, the straight distance to existing urbanized areas was identified and reclassified.
- Third, repeating two steps shown in the second part for Major Highways, Landfills, and 100-yr floodplain areas layers. After this step, these four factors would be weighted and combined based on designer's preferences. Based on the criteria (environmentalist vigilance regarding protecting the environment and mitigating environmental hazards that may arise from the vicinity to floodplain areas or landfill locations), higher weights were given for landfills and 100-yr floodplain areas. Raster Calculator and classify in toolbox were used to make this calculation.
- Forth, two layers were intersected (calculation layer made in third part and suitable area layer in first part) to show the ranking of site within the context of the future development zone. Then, the properties of this new layer was set to Graduated Colors and GRIDCODE was selected to present the best locations for future development in Austin City, TX.

III. Findings
In the map, it has shown that 10 reflects the most preferred areas for future annexation in the value field. And dark black is used to represent 10 as the best locations. Most of good locations are located around Austin City. And most of best locations are located at the right side of Austin City which is near to major highways.
Nearness to sources of operating power and finance are the factors might be considered. Since for future development, these two factors will create convenience and determine feasibility of the project.

IV. Caveats
The suitable areas shown in the map may not be desirable due to terrain limitation for example slope.

V. Appendices

CAPCOG Counties, City Limits, Road Centerlines---COPCOG Free Regional Data

http://regional-data-capcog.opendata.arcgis.com/datasets?sort_by=updated_at

Closed Landfills, 100-yr Floodplains, Vacant Parcels

http://jlamondia.weebly.com/civl-5410---gis-in-civil-engineering.html