3-Dimensional Airspace Modeling
City of New Braunfels, Texas - Planning Department

GEO 4427: GIS Implementation and Design
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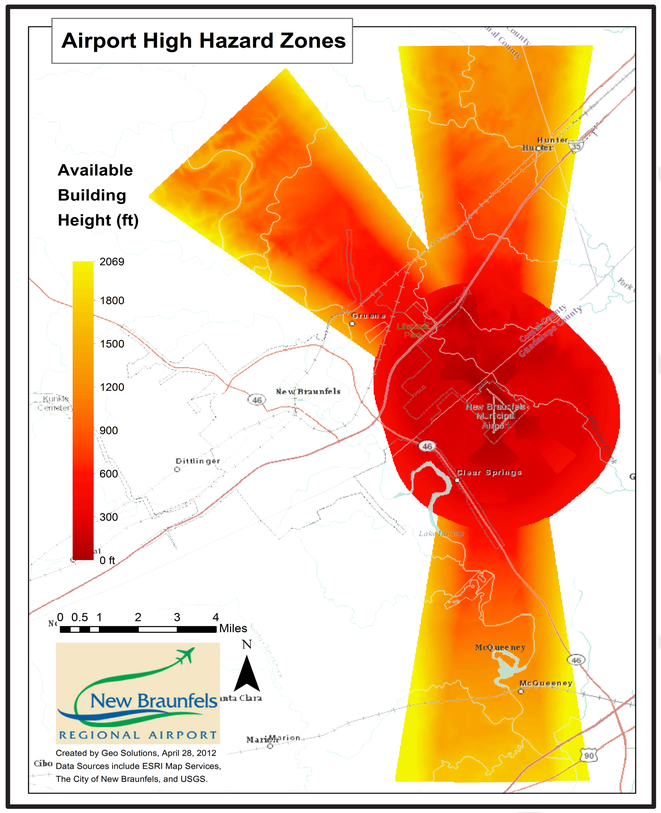
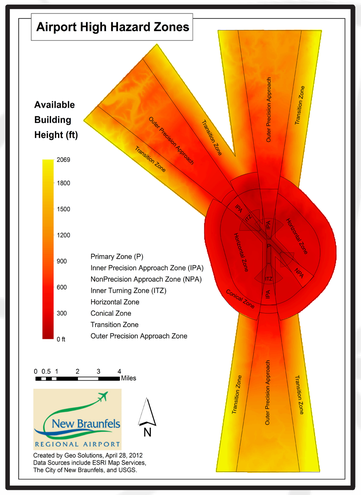
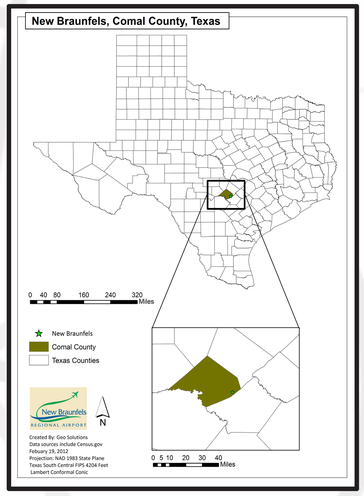
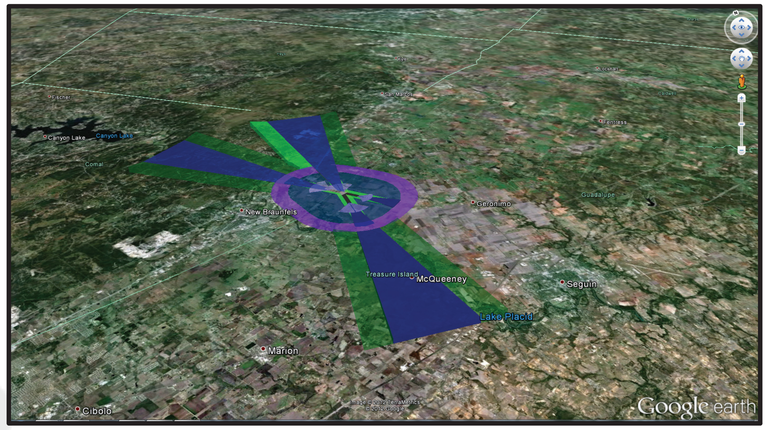


Introduction

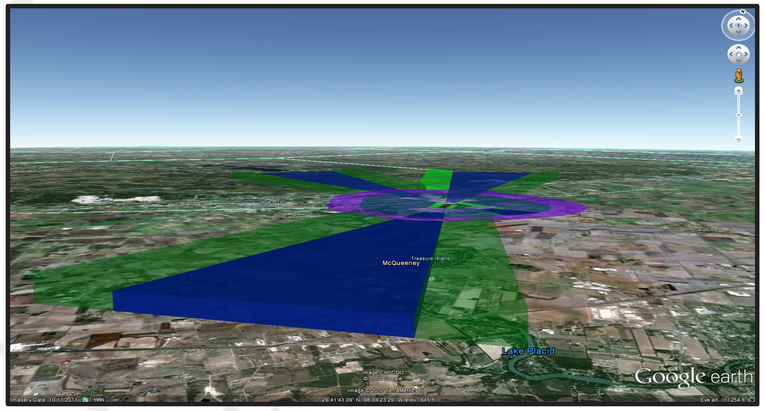
The key to an economically progressive and viable airport is protecting the land around it, and especially the airspace. To protect the safety of incoming planes as well as the people underneath, the Federal Aviation Administration created the Airport High Hazard Zoning Districts, limiting the heights of structures in critical areas around airports. Unfortunately, these zoning districts have a complex geometry, making them difficult to calculate the maximum building heights at a specific point and even more difficult to visualize the zones in real life. This project was designed to create visual representation of the restricted airspace zones so they may be easily understood by city staff and the public.





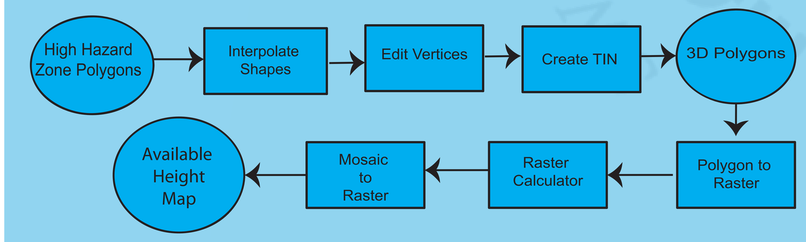


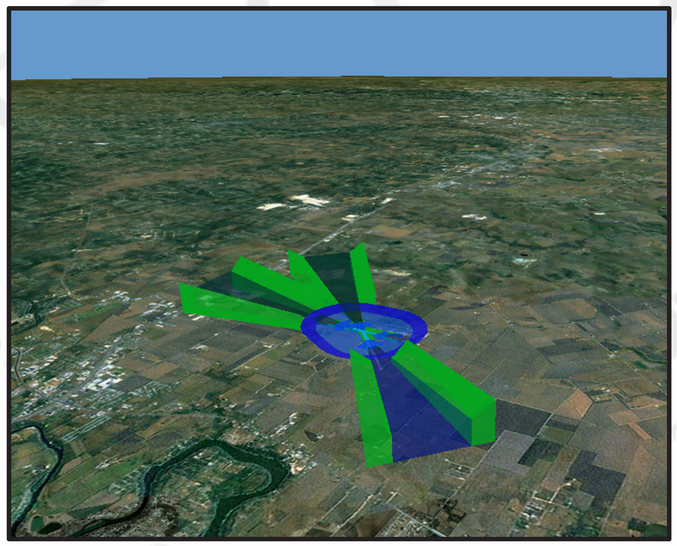
Google Earth Examples



Interactive Mapping Tool Methodology

1. Assign height values to airspace restricted polygon.
2. Create a 3-dimensional slope surface for each polygon.
3. Calculate the difference between the restricted zone polygons and elevation to get available building height values.
4. Combine all the building height layers to produce a master *Available Building Height* layer.
5. With this master layer, city staff can point and click anywhere on the map to identify the maximum available building height at that location.

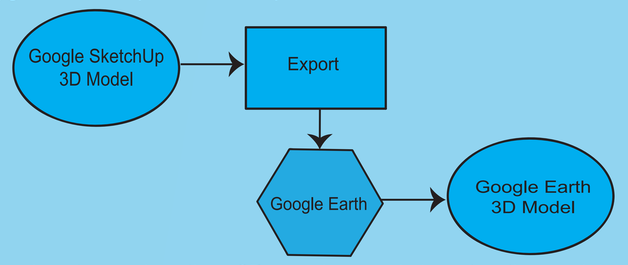




ArcGlobe Example (model 5x exagerated)

3D Model Methodology

To create the 3-dimensional model of restricted airspace zones, we first established a 30 meter DEM (digital elevation model) in ArcGlobe. The 3D polygons representing the restriction zones were created in Google SketchUp, and then imported into ArcGlobe. Within ArcGlobe, the polygons were placed on top of the terrain.



In order to make the 3D model available to the public, and somewhat interactive, the Google SketchUp model was imported into Google Earth. The Google Earth file will be available for download off the City of New Braunfels website for viewing to the general public.

Special Thanks

Stacey Snell, New Braunfels Planning Department and Community Development Manager
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References

ESRI Help Online, Google SketchUp Pro, City of New Braunfels Data Extraction Page, Google Earth, Adobe Create Suite CS5

City of New Braunfels

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