Robert Mulford
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Summary

The project incorporates a feasibility study of proposed freeways in to a web service to assist property owners in discovering if their land will be affected by the freeway construction. Paths for the proposed freeways were obtained from a 1950's Sacramento County transportation planning map. The paths were overlaid on to current map layers obtained from Sacramento County's GIS website, layers include: existing roads, water features, parks, and parcels. Also included were Zip Code and neighborhood layers for use in navigating through the map. The web application is designed to allow property owners to focus in on the location of their property and identify potentially impacted areas. A map service for Sacramento County and the tool services select by attribute, buffer, clip, and clip and ship were incorporated in to the web application.

Data Development

Paths for the proposed freeways were obtained by importing an image of the planning map to ArcMap, rectifying it with the outline of Sacramento County, and tracing lines over the freeway paths. Optimizing the map display was accomplished using the "Visible Scale Range" and "Label Scale Range" in functions in ArcMap, combined with a lot of trial and error. The end result should be a map that remains clear, attractive, and orderly as users zoom in through the layers.

Web Services Development

Once the map was created and desired symbology configured, a map service was created using ArcServer manager. Each tool needed for the project must be configured using

Model Builder within a map document. For best performance each tool should be located in its own toolbox and stored in a separate copy of the map document. It is strongly recommended that ESRI help is consulted and the Geoprocessing examples studied before attempting to create web service tools. A good understanding of ESRI terminology, such as “Feature Dataset” or “Feature Layer,” is also required.

Web Application Development

Web application development begins with a working map service. Once established, each tool should be added individually using the Add Task function in ArcServer Manager. Alternatively tasks can be added by creating a tool layer in a separate map document. A tool layer is created by simply dragging the working model. The map document is then loaded as a geoprocessing service in Server Manager. Each task should be tested before any tasks are added. A tool that functions properly in ArcMap may net work properly in the web server environment. Any task not functioning properly will need to be examined in ArcMap. The process of troubleshooting can be lengthy and difficult and a good amount of time will be spent reconfiguring tools to function properly

Geoanalysis Process Development

The analysis process begins with the user targeting the area of the map their property is located in. This can be done using the neighborhood or ZIP code layers, or simply panning and zooming. If a proposed freeway runs near the property, the freeway line is then buffered. Next, the buffer polygon is used to clip features from the polygon layer. The result is a layer displaying the impacted properties. Parcels are labeled by street number and streets labeled, so

that users can determine exactly which polygon is their property. Once located, the clip and ship tool is used to copy the information from all layers within a user defined area.

Issues Encountered

During development of the web application many problems were encountered. Most notably, was configuring the individual tool parameters. As mentioned above, special attention must be paid to the data types of input and output files. Tools will not function properly if the inputs are not the proper data type. For example, the Buffer tool uses a Feature Layer as an input, but its output is a feature class. A great deal of time was spent fine tuning the details of the models. Another issue is that just because a model works in ArcMap, there is no guarantee it will work properly in the server environment. ESRI's online help shows a number of geoprocessing examples, but does not explicitly state whether a given tool will operate as a geoprocessing service.

Conclusions

In designing this web service a good deal of knowledge was gained about the different file types used as inputs and outputs. I come away with a clearer understanding of, for example, exactly what a feature set is, as opposed to a feature layer. Familiarity with tools and their use in ArcMap does not guarantee success in using those same tools in the server environment. Simpler models, involving one of two tasks, are better than more complex ones. More time must be budgeted for researching the parameters of tools, their inputs and outputs, and whether or not they function in the server environment. Also, more time must be allotted for creating and testing models. There is a lot of trial and error in web service design and the process took longer than planned. Despite these difficulties, or maybe because of them, I come

away from this project with a better understanding of ArcMap, especially with regard to file types, and the function of the various tools. In completing this project I gained a solid understanding of ArcServer basics and where to research more information on the processes involved in designing a web service.

Although I am convinced that the processes listed in this document will work, the web service was not fully executed by the end of the semester. Only the Buffer and Clip & Ship tools functioned properly. With more time better progress could have been made. This only reinforces the need for research, planning and organization, as mentioned above.