

Maps Created with ArcMap Tools and Extensions

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Abstract:

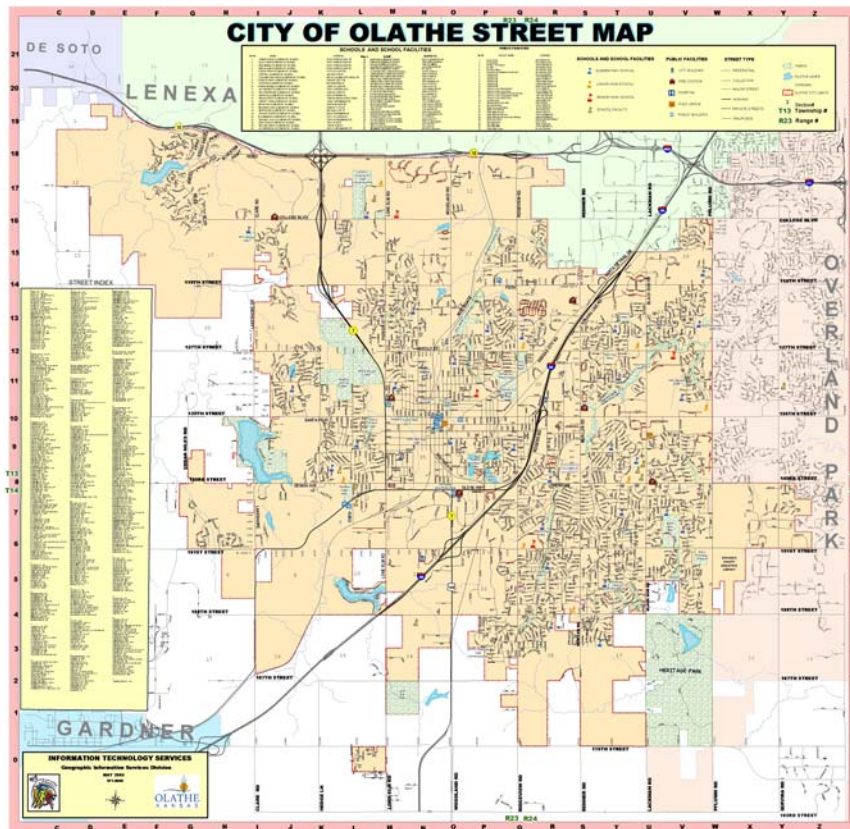
Maps are what are first associated with the Olathe GIS Division by the average Olathe citizen. The Olathe GIS Division produces street, zoning, address, and ward maps used routinely by various city departments and for public distribution. Maplex, map series, geodatabase, feature-linked annotation and CAD conversions are just a few of the tools and extensions used by the Olathe GIS Division to create professional looking maps. This is an examination of how a municipal GIS uses ArcMap to create maps.

Introduction:

The City of Olathe is the county seat of Johnson County, Kansas which is located in the southwest corner of the Kansas City Metropolitan Area. It is a rapidly growing community with a current population of 114,000. Olathe is a full service city which includes police, fire, water, sewer and trash pickup. Maps are a familiar, colorful, effective method of communication between various city departments and the public.

Background:

Only two decades ago Mylar sheets, Leroy pens, ink and light sensitive copy paper were the tools used to create maps in the City of Olathe. Updates were time consuming and limited to what was physically drawn on a Mylar sheet. There was no GIS Division. Around the mid 1980's the computer age for mapping arrived in Olathe. We began to use AutoCAD to create maps. About the same time Johnson County whose offices are directly across the street from Olathe's city hall began to implement its GIS. The promise of county wide data available to the cities in Johnson County encouraged Olathe to start paving the way for its own Geographic Information System. Fast forward to today both Johnson County and the City of Olathe have traveled the long arduous road to fully implemented Geographic Information Systems. Today cartography in the City of Olathe has changed due in part to the tools and extensions available in ArcGIS.



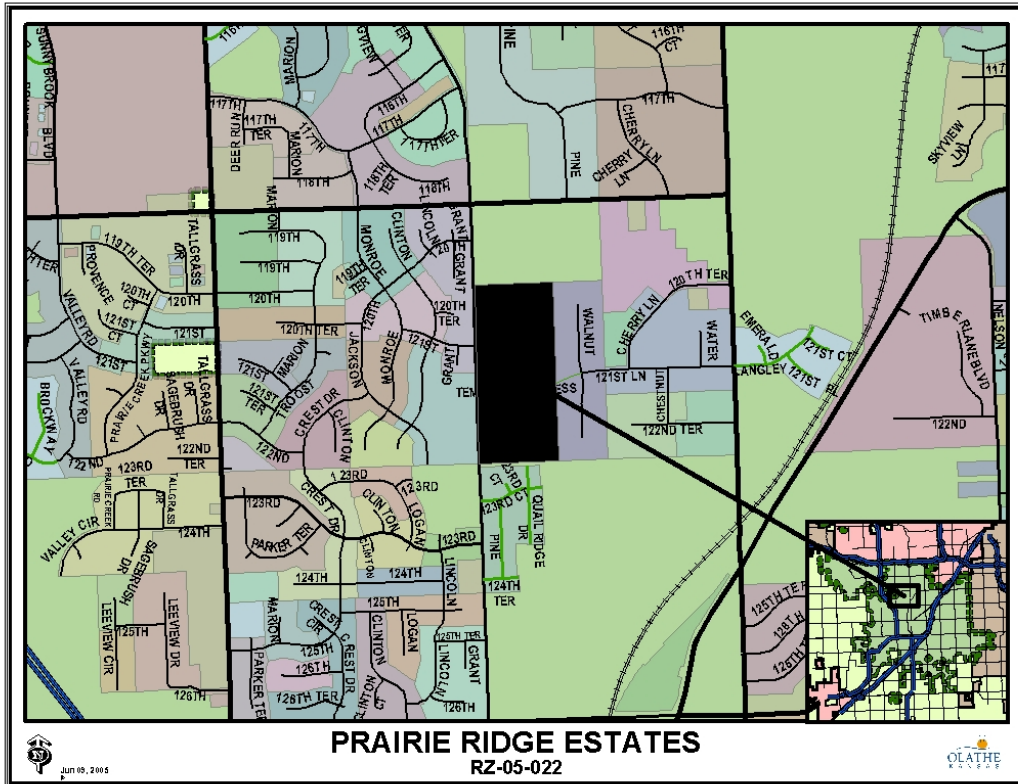
Olathe Street Map

The Olathe Street Map is used throughout the cities' departments and sold to the public as a general reference map. For many years the Olathe Street Map was an AutoCAD drawing file. Street annotation for our maps has always been a challenge. Editing annotation was easier with AutoCAD than with earlier versions of ArcMap. The on-the-fly labeling with the Standard ESRI Label engine still required a great deal of manipulation to get the annotation to look right. Improvements in the Standard ESRI Label engine such as the follow the feature option and later Maplex encouraged us to convert the Olathe Street Map from an AutoCAD drawing file to an ArcMap document. With Maplex the user can define parameters to control the position and size of the labels. It has eight different label styles for line features. The labels can be modified or reduced to allow more placements in a constrained area. In short more initial control with the labeling meant less time needed to manually edit street names to look right on a map. The basic information on the CAD file and the now ArcMap document remained the same. The size of the map remained the same. The CAD map had been printed in black and white while the ArcMap produced map is now printed in color.

We had the basic information such as streets, major highways, parks, large water bodies, Olathe city limits and surrounding city boundaries as layers in SDE to use in the ArcMap version. The CAD file was brought into the ArcMap document because it contained other necessary information such as address number blocks that was useful and would not have to be recreated. Once the basic data was added work on the map layout followed. Placement of the title, street index, title block, legend, and north arrow was decided.

In the CAD file the schools and public facilities information were in their own layers symbolized as stars and rectangles. The data was exported to shapefiles as polygons. The feature to point tool was used to get the centroid of those polygons. Additional attribute information such as the name of the school or facility, address and legend number was added to the table of the schools and public facilities point files. The point file of the schools and public facilities was then symbolized. ArcMap has a wealth of symbols to choose from. Plus customization of symbols is easy and fun with the symbol properties editor. It can take awhile to “play” with shadows, masks, and colors to get the symbols just right. The reference scale was set at this time to maintain the ratio of the feature size to symbol size on the map during any pans or zooms.

The next task was to label the streets. Maplex allows review of labels it can't place. This was also the time to experiment with font sizes and color. It was important to run test plots to see how things actually looked on a hard copy. Once the labels were placed as-good-as-they-could-get they were converted to feature-linked annotation stored in a geodatabase. Feature-linked annotation is automatically updated when features are created, modified, or deleted. Johnson County maintains a street centerline shapefile that we can access. To update the street annotation geodatabase we copy and paste any new streets from the Johnson County shapefile to our street annotation geodatabase. All attribute information comes along with it. The annotation automatically is displayed according to the parameters originally set in the street annotation geodatabase. There is nearly always need for further editing to get it placed just right, but it is a very simplified task. Though Maplex did reduce the amount of editing this was still the most time consuming part of the conversion. The street annotation is now used for property maintenance, ward, sewer, corridor studies, and location maps. It is also used for those incidental maps such as a historic sites tour map when the need arises. The work was worthwhile. A Spanish version of the Olathe Street Map was created for the growing Hispanic community in Olathe.



Other Maps

The Map Book Developer found on the ESRI Developer Online site has proven useful in the Planning Department, Fire Department and the GIS Division in several different ways. The option in the Map Book Developer to create an index for features from a database was used to create the street index for the Olathe Street Map. Many times one map creates a demand for other similar maps. Our Programmer/Analyst in the Police Department received a request for street maps with street indexes of other cities in Johnson County. He used the same option in the Map Book Developer for the street indexes.

The planning department uses Map Book Developer to create location maps for Planning Commission packets. Each case submitted for approval is drawn into a Planning Commission case layer with the appropriate coordinate placement, Planning Commission meeting date, developer's name and other attribute information. The GIS Analyst then queries by PC meeting date for the map sheets where the upcoming cases are located. With a few simple alterations location maps are printed so each planning commissioner gets a location map of each case in his packet for the upcoming meeting. The GIS Analyst for the Planning Department created a map series to help organize the zoning maps and recorded plat maps. The series allows for easy printing of all the maps or just the sheets with updates. Updated hard copy sets of zoning and plat maps are made available for the planners and public. The planners can access the entire series via the network from their computers.

The Map Book Series is used by the Olathe Fire Department for their address map books carried in each fire truck. These maps have address, streets, building footprints, and fire

hydrant information. The updating and printing has been simplified for the two firemen tasked with this duty.

The GIS Division used the Map Book Series for an address verification project. A team of nine interns were sent out to verify all the addresses and street signs in the City of Olathe against an address database. Every morning for about two months each team of three interns were given maps of the area they were to verify. The Map Book Series made it easy to provide work maps for the interns and keep track of the progress being made.

Conclusion

Cartography in the City of Olathe has changed significantly over the past two decades. It progressed from manual drawings to CAD to GIS generated maps. This paper describes the conversion of the Olathe Street Map from an AutoCAD drawing to an ArcMap document using several tools in ArcMap with an emphasis on Maplex and the Map Book Developer. The creation of one map produced by-products such as the feature-linked annotation geodatabase that were valuable for the creation of other maps. One tool like the Map Book Developer could be used in several different ways. ArcGIS has changed how maps are created in the City of Olathe with its many tools and extensions, but it still requires thought and time to create a useful map.

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