Logan City GIS Master Plan

Term Project

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Introduction

Logan City has lots of data available for streets, canals, trails, zoning maps, and municipalities. When all of the data layers are being viewed it is hard to see everything on the map without having to zoom into the map. My project is to go through the process of making a data driven pages map book that will organize the data and make it easier to see all the data without having to be looking at the map in ArcGIS or print off on a single big map.

The features that I will be focusing on will be the streets, canals, trails, businesses and parks. There is data available for all of Cache Valley and through Logan canyon but it would create a map book too large, so I will be working within Logan City boundaries.

In this paper I will go through the process of creating a data driven pages map book and show how it breaks up the map of Logan City into smaller pieces.

Data driven pages is a tool built into ArcGIS that makes it easier to break up big maps into smaller pieces that make the data more accessible and easier to read. I will look at the best way to show the trails, parks and canals within the map book. Last I will be looking at who it will benefit and how the map book will be made available.

Map book

A data driven pages map book is a collection of pages that can be printed or exported that consist of maps, table, text and graphs (Figure 1).
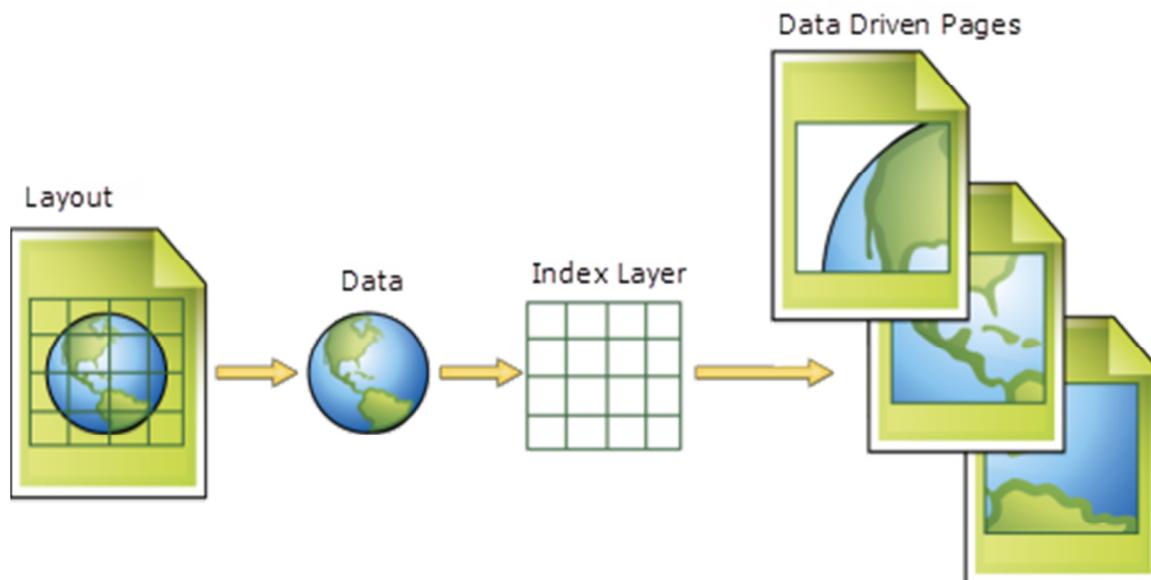

Figure 1. Process of creating a data driven pages map book (ESRI, 2012)

The benefit of a map book is that it breaks up a large map into smaller pieces that make it easier to see and interpret all the different data layers as opposed to creating a big map that will hang on the wall.

The first step is to obtain the data of interest and then create an index layer or grid. The index layer can then be imported into the data driven pages tool in ArcGIS to create the data driven pages map book. The data that I focused on was within Logan City which was found by exporting the Logan City boundary into a layer separate from the municipality layer of Cache Valley. The Grid Index Feature tool was then used to create an index layer over the Logan City boundary shape file (Figure 2).
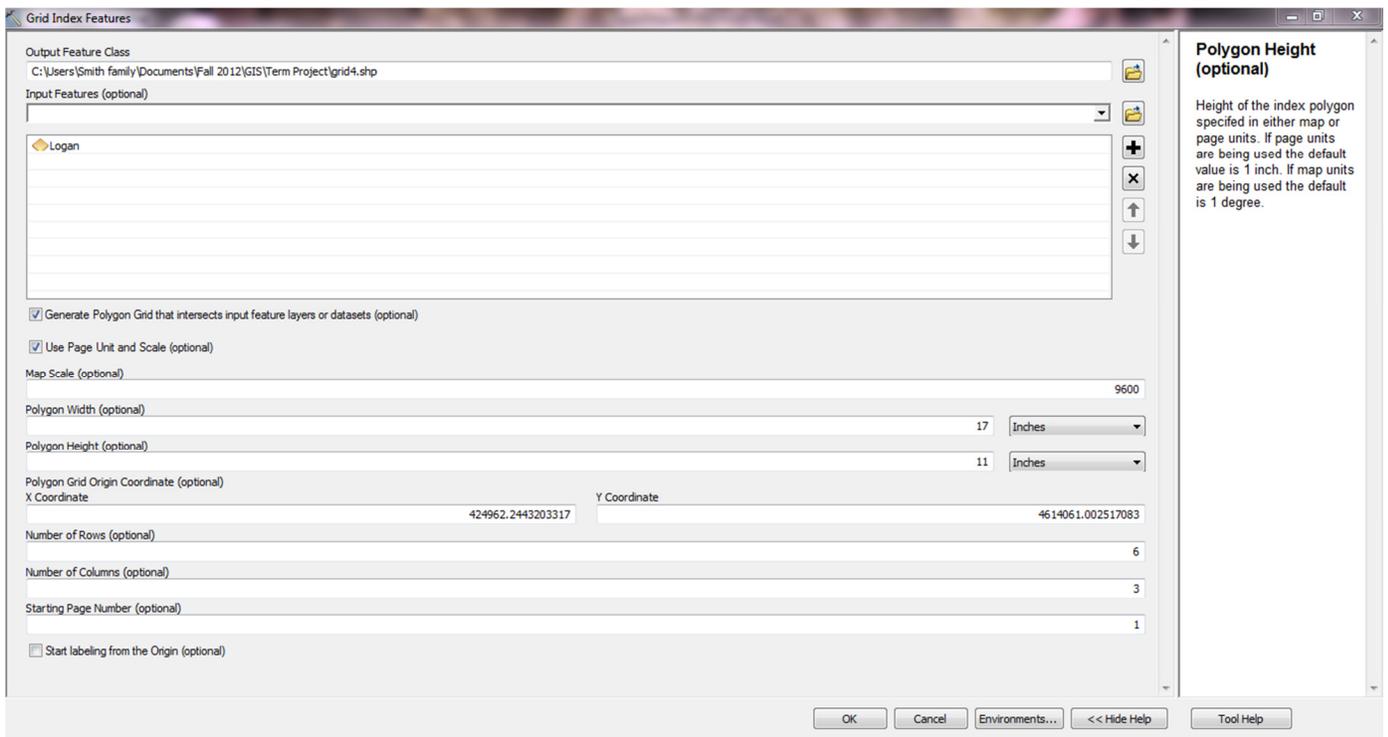

Figure 2. Creating a Grid Index Feature

The input feature was the Logan City boundary shape file and the grid will be created over that layer. If created without adjusting the scale, the grid index feature that is created is huge. I scaled it to 9600 which is 1-inch equals 800 feet and changed the polygon width and height to 17 inches and 11 inches respectively. Now the grid index feature that is created is now smaller and fits better over the shape file (Figure 3). I scaled it this way because on the data driven page it will show part of the surrounding pages as well, so if a layer has data on multiple pages it is easier to see what pages the data continues on.
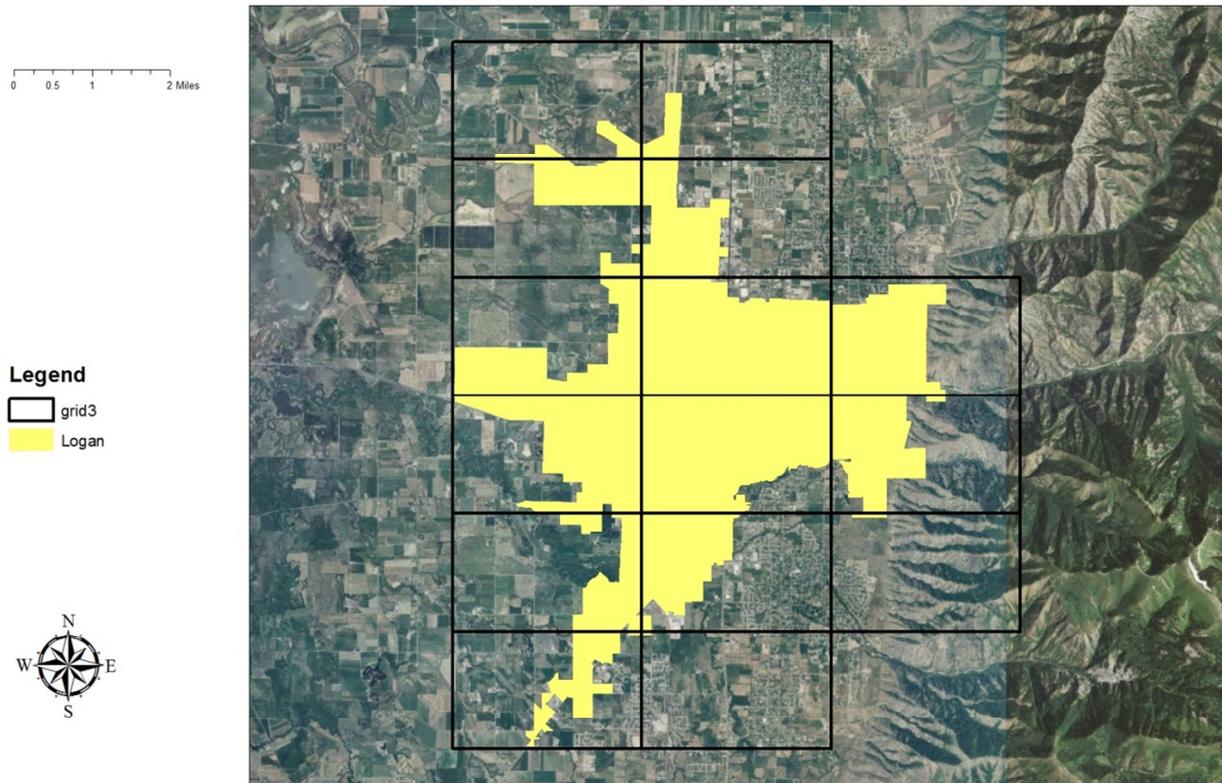
Figure 3. Grid Index Feature of Logan City Boundary

Now that the grid index feature is created over the Logan City Boundary, data driven pages can now be created. Each rectangular grid cell will be a data driven page in the map book of Logan City. Data driven page tool can be accessed by turning it on under the tool bar settings. Data driven pages then needs to be enabled and the Grid Index Feature layer will be selected to create the data driven pages. In the Grid Index layer attribute table that was created by the Grid Index Feature, a field was created called Scale that was set to 9600 that will be used in creating the data driven pages. After enabling data driven pages and selecting the grid index that was created as the layer that it is going to use to create the data driven pages, now we can select the Extent tab and click on the data driven scale and set it to the scale column that was created in the grid index layer attribute table (Figure 4). Now the data driven pages can be created.

As stated earlier, a data driven pages map book takes a big map and breaks it up into smaller sections making it easier to see. After turning on the different layers for Logan City of the streets, canals, trails and businesses, it is hard to tell the layers apart when viewing the entire map (Figure 5). After creating the data driven pages for the Logan City boundary, it becomes much easier to see all the different layers by looking a at a single data driven page within the map book (Figure 6).
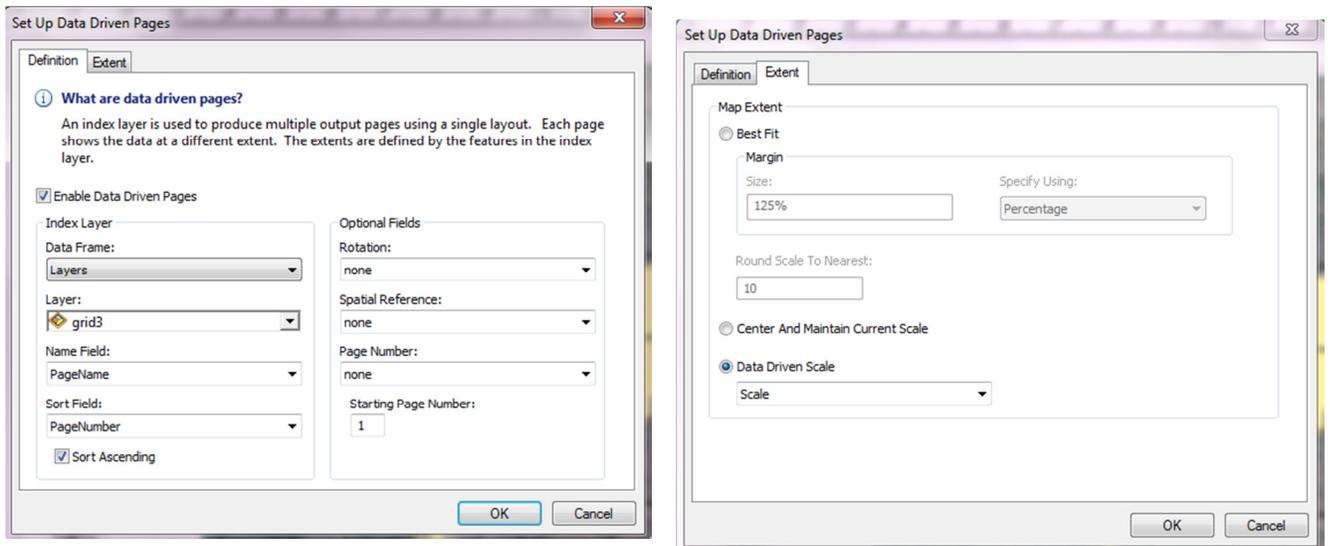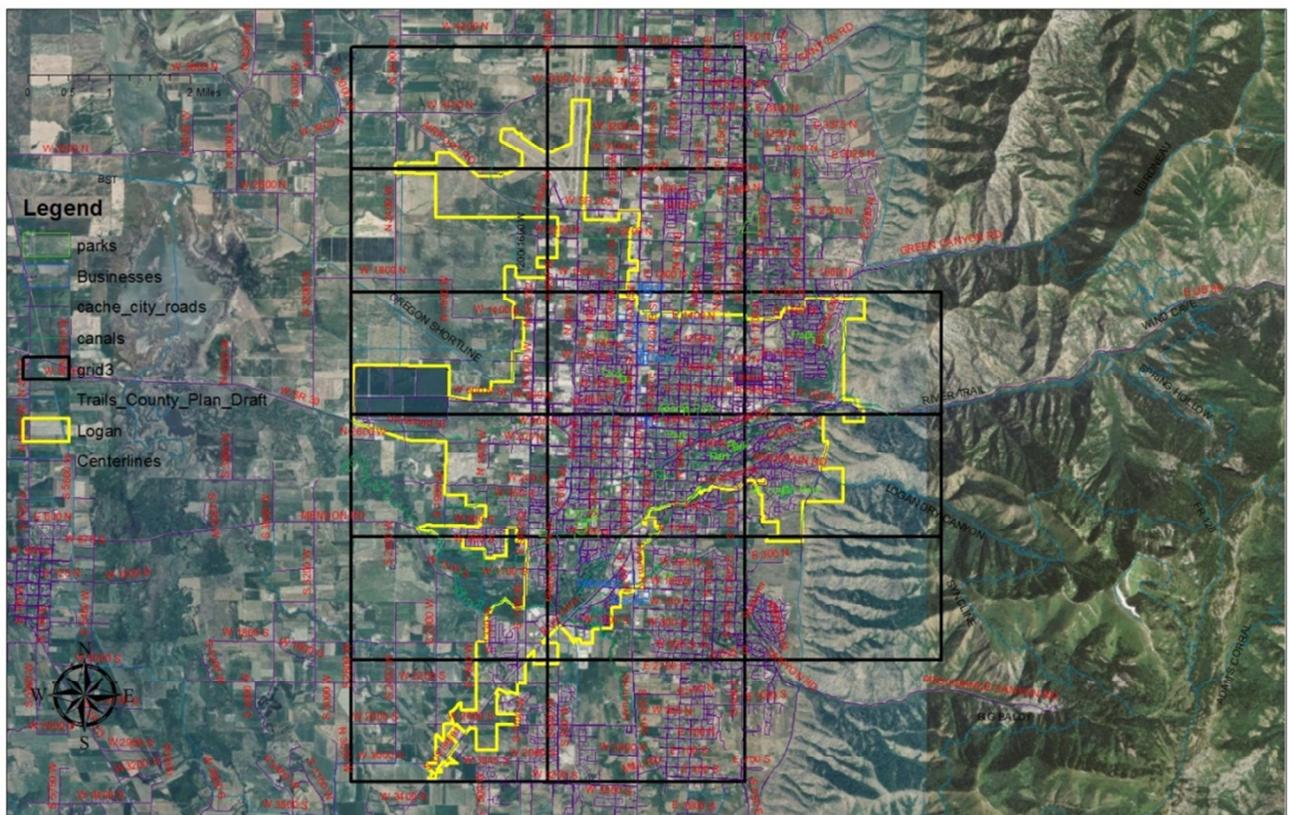
Figure 4. Data Driven Pages Setup

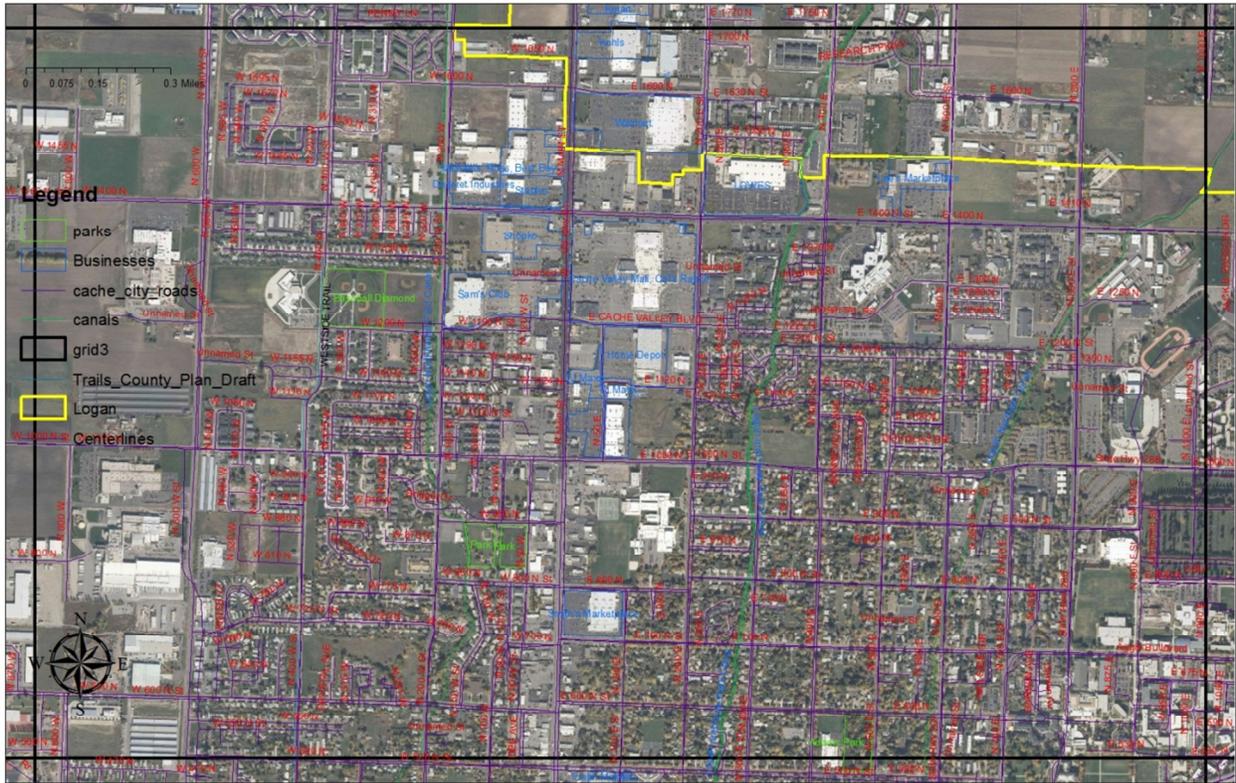**Figure 5. Data driven pages with entire Logan City boundary**

Figure 6. Data driven page within the map book of Logan City

Trails

I knew that Logan had lots of trails but I did not realize just how many (Figure 7). I found a different way of creating data driven pages for the map book by using the Strip Map Index Feature tool which is very similar to the Grid Index Feature tool. The setup is just like the Grid Index Feature tool. You select the input feature of the trail and then scale the grid so that it will fit over the trail. I set the scale to 960 which is 1-inch equals 80 feet and I created a field in the Strip Index Feature attribute called Scale and set it to 960 so that the data driven pages will know what scale to use from page to page. Instead of placing a uniform grid over the area it creates a grid that follows the trail itself, breaking it up into sections so each trail will have multiple consecutive data driven pages in the map book (Figure 8). It will be good to have a map book for each trail with a table about the trail and also data driven pages over the Logan City boundary.

As was explained earlier the data driven pages were scaled so that the edges containing parts of the surrounding pages were included around each page in the map book. This makes it easier to see if a trail continues onto another page and to see which page it continues onto. The West Side

Trail got split up onto different pages, but it is easy to see which pages to flip to in order to see where it continues (Figure 9).
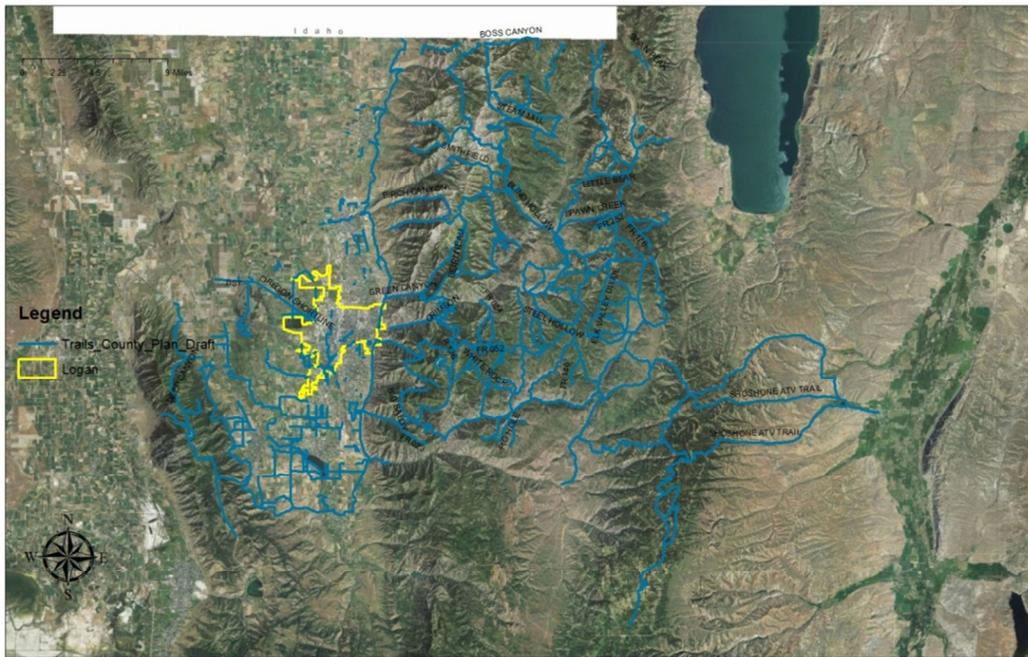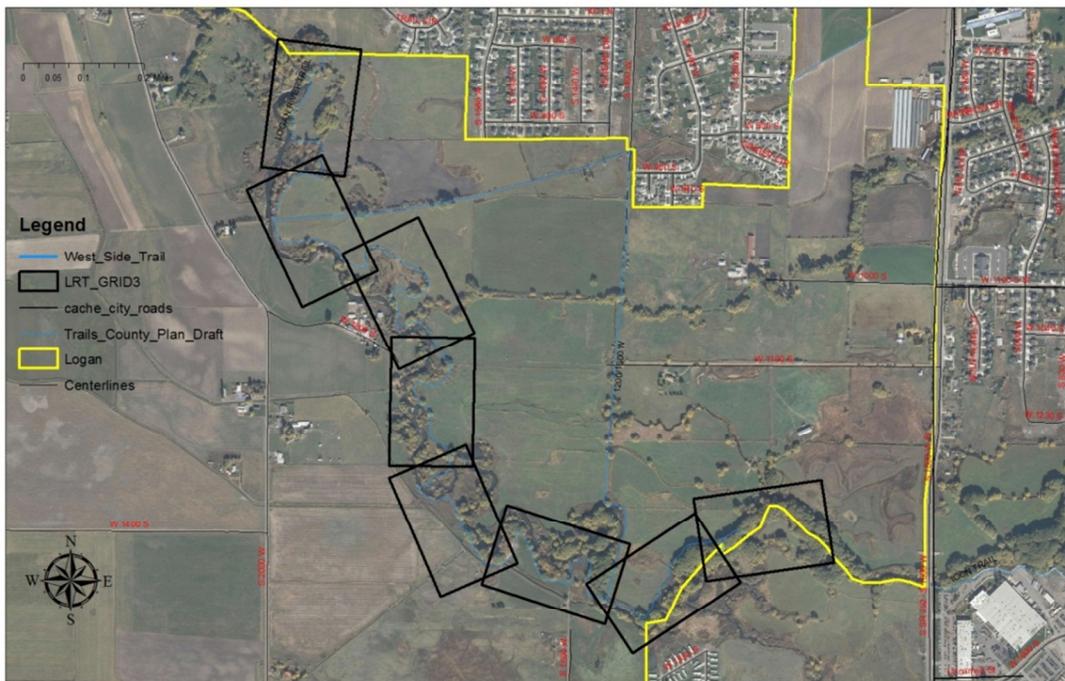

Figure 7. Trails in Logan Area

Figure 8. Logan River Trail in sections using Strip Map Index Feature tool
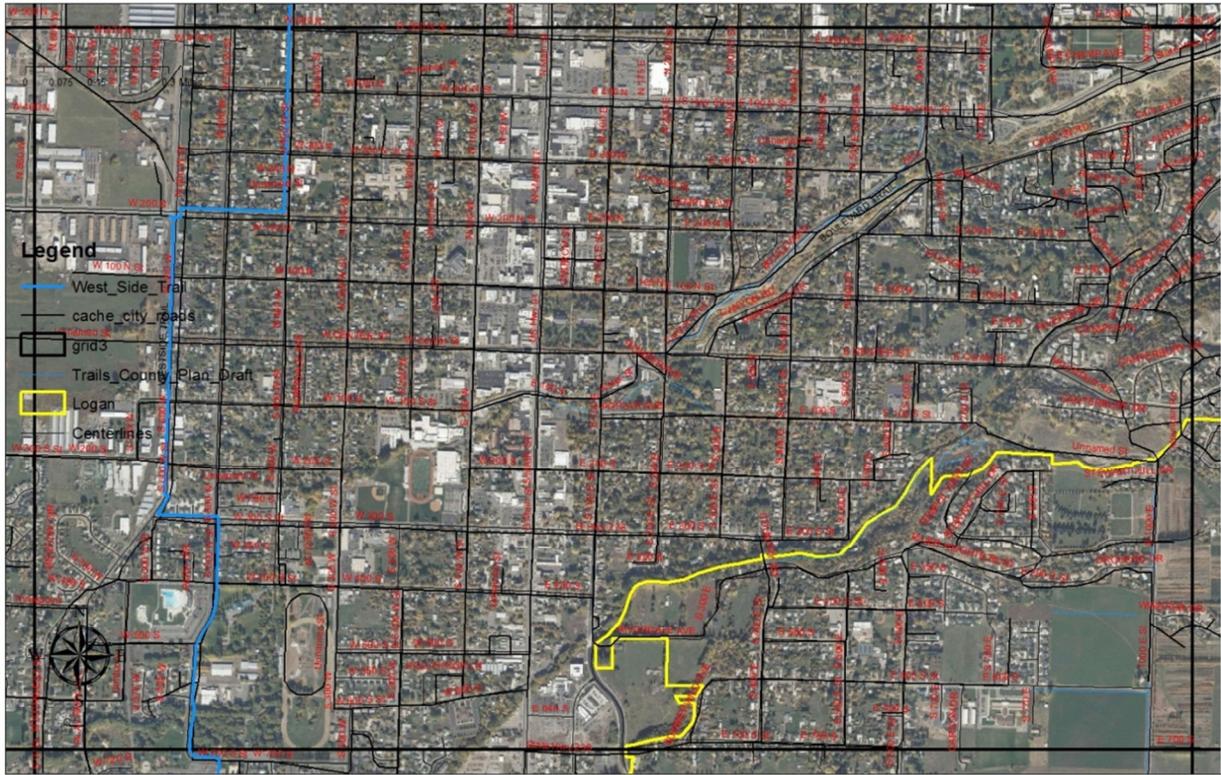
Figure 9. West Side Trail continuing into the pages above and below

The Trails Attribute Table only contains information of trail name and trail length. I would also include information on terrain, trail head location (GPS) and elevation. I think that this data would be most beneficial to the residents of Logan City as well as any tourists. They can look through the map book and find the trail closest to them or a trail they would like to go on and on the data driven pages they can find the information about the trail.

Canals

The data driven pages for the canals were created the same way as the trails. The same setup and scale were used in the Strip Grid Index Feature tool and the grid was created over the length of the canal (Figure 10).
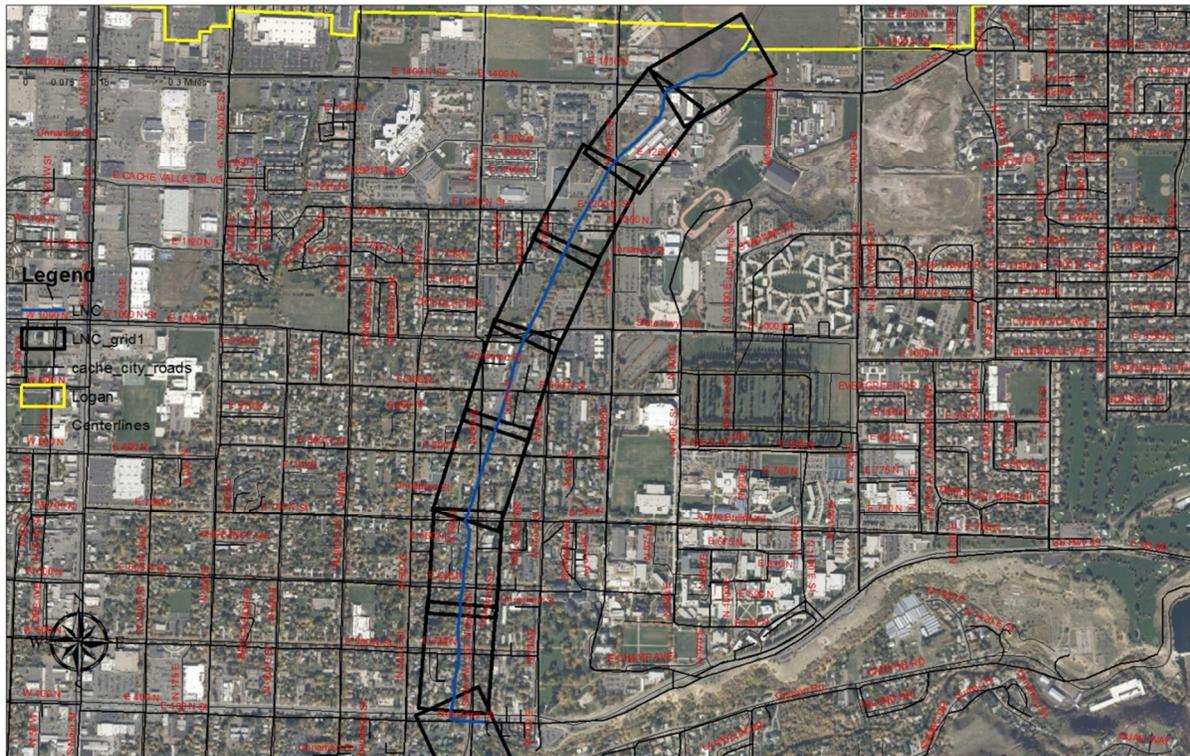
Figure 10. Logan North Canal Strip Map Index Feature

Just like with the trails, it is good to have both data driven pages map book for each canal and data driven pages for the entire Logan City boundary. When the canals were on multiple pages the data driven pages were scaled so that the surrounding pages can been seen, making it possible to see what page it continues onto.

The Canal Attribute Table contains information on the name of the canal, length, and source. I would add even more information on the canal dimension, flow rate, diversion structures, locations and water right users. This would be most beneficial for a municipality but also the residents because it provides an easy access for the municipality to the information about their canals and lots of residents like to walk along the canal for the scenery as well as the wild life.

Parks and Businesses

At first I thought that the businesses were going to be an important part of the project. After exporting the information needed from the zoning maps, the Attribute Table only contained the property owner's name and the lot size. The availability of the internet makes it much easier to find business locations so I only included in the map book the biggest stores (Figure 6).

In contrast I found that the parks have become important to my project. Logan City has some of the most beautiful parks and playgrounds for those that live here and those visiting to enjoy. It is not always easy to find a good playground that works best for you and a map book would make it easier. I have created a data driven pages map book just for the parks in Logan City Boundaries.

When creating the data driven pages I did not have to create a Grid Index Feature over the parks since they were already marked out in individual parcels. I had to select the parcels that contained the parks and export them into an individual table and then use the parks layer to create the data driven pages (Figure 11-12). Each park will be a data driven page in the map book.

The Park Attribute Table contains information on the park's name and park's area. I would also include information on what is at the park, suggested playground ages, restrooms, drinking fountains and pet restrictions. This information would be most helpful to the residents and those visiting the Logan area so they can choose the park that best works for them.
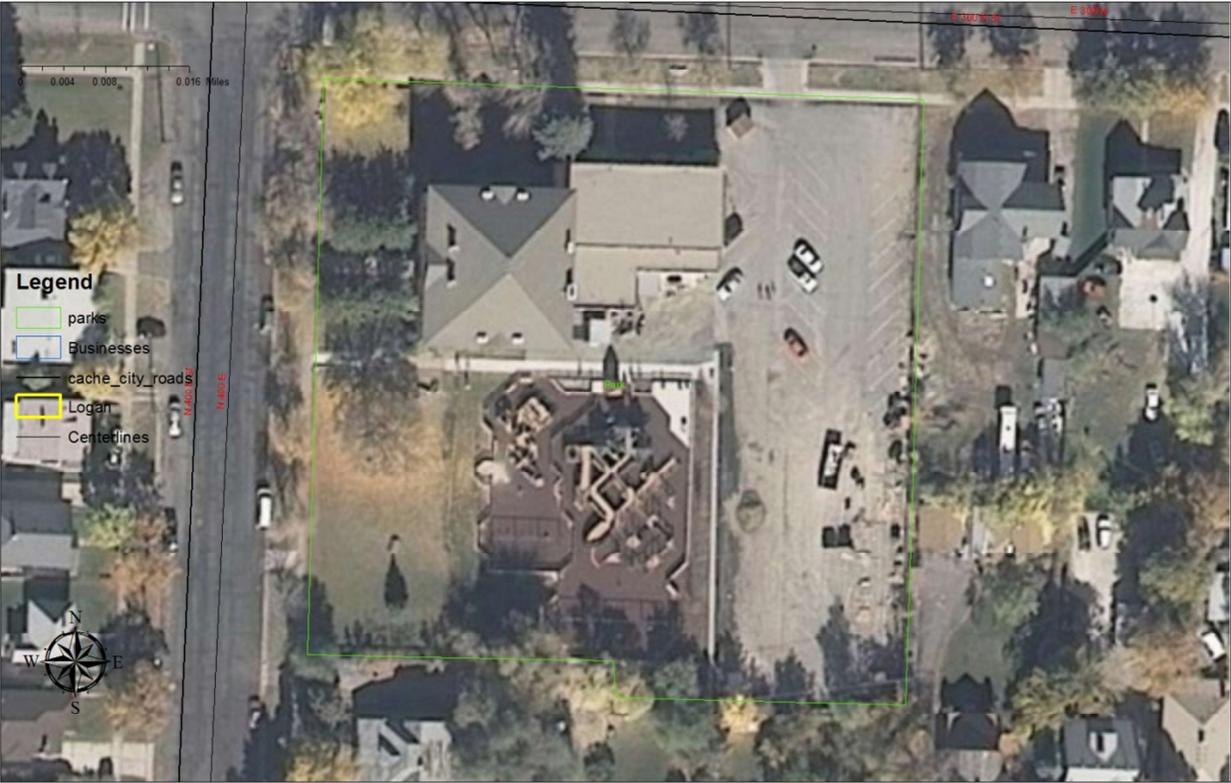

Figure 11. Logan City Playground

Figure 12. Data Driven Page of Logan City Park

Benefits

After creating data driven pages of the streets, canals, trails, parks and businesses I have decided to gear my project toward helping the residents and for anyone visiting, so that they can have more information available to them. Logan City has great parks and trails and making the data available to the residents and those visiting will help them use them more frequently. Data driven pages map book is a great tool to organize the data and create maps and tables with the information that can be exported together and made available online for everyone to view.

References

ESRI (2012). "Building map books With ArcGIS."
<http://resources.arcgis.com/en/help/main/10.1/index.html#//00s90000002s000000> (Nov. 26, 2012).