Hazards of The Greenway

Let's keep this community trail beautiful for everyone.

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Introduction

The issue of hazards and pollution along the Greenway trail has been a problem for a few years. Of all the issues that are present on the greenway trail, pollution has to be one of the biggest problems followed by trail washouts, which cause danger to the actual structure of the trail. I used GIS technology such as Survey123 to collect data along the trail and convert to points on the map that show exactly where issues are present. Also I used data collected from the Arkansas Gis website to find streams within 10ft that could possibly be the reason behind these washouts and show how can we fix these issues. Let's breakdown what processes where done and who they will help:

Community

The greenway trail is a 40 mile, beautiful trail that stretches through 6 towns: Rogers, Bentonville, Bella Vista, Lowell, Springdale, and Fayetteville. It consists of both off-road and paved trails that connect schools, businesses, and cultural amenities. The trail is used for families, cyclist, runners, and walkers. It runs alongside multiple streams. Though this trail is a beautiful place for families and community members to gather and spend time, it has has many structures in need of maintenance. There are also pollution issues, flooding issues, and the trail itself suffers from breakage and roots growing under the trail .
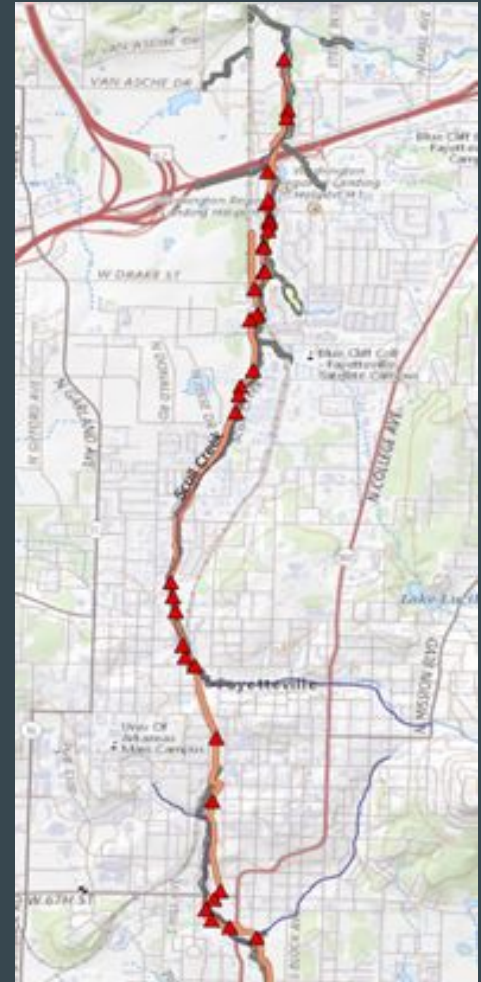
Project Overview and results

- Starting at mile marker 0, I realized that the city had already begun fixing the trail: replacing the concrete, replacing structures such as light posts and electrical boxes, and removing most vegetation from the edging of the trail.
- After running into city workers that explained to me what was being completed, I reached out but was unable to reach someone that directly worked with the GIS office. I was directed to an intern named Jessica who went into detail of the projects being completed and sections of the trail that would be closed off through Feb. 1. At this point, we discussed options to extend my research, so I had to take a bit of a curve and added pollution into my data collection of which there was plenty.
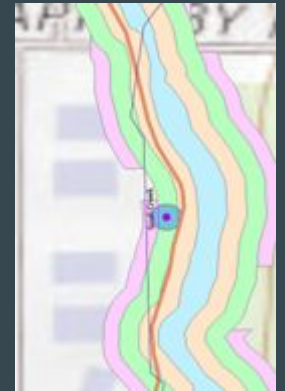
Project Overview and Results

- 42 of 54 surveys completed involved pollution along the trail.
- Most of the sets are in close proximity to each other in small groups. These pockets of trash were around high homeless populations.
- As seen in the pictures, trash is tossed along the trails, and a lot of it ends up into the streams. A few of these streams stem from Beaver Lake, water sources for the city's drinking water after filtration
- During this 8 mile stretch, I found that only 2 trash-cans were available.

Project Overview and Results

- Washouts were the main focus after the collection of trash.
- These washouts were measured by depth and width with a small measuring tape I carried.
- Though most washouts were relatively small ones, they definitely caught my eye. There was a washout coming from a parking lot above the trail, which could pollute the stream below with oil and/or other chemicals. This could be hazardous to the ecosystem surrounding the stream as well as the wild life.
- This washout was over 24 inches wide and 36 inches deep and had already began to wash away underneath the trail causing a potential for the trail to cave-in.
- Using select by attributes I created a single layer of washouts.

-By using the buffer tool, I then created a 20ft buffer around washout and added data showing the elevations by unique values. The particular washout shown was below a stream and normally is a flooded area along the trailside.
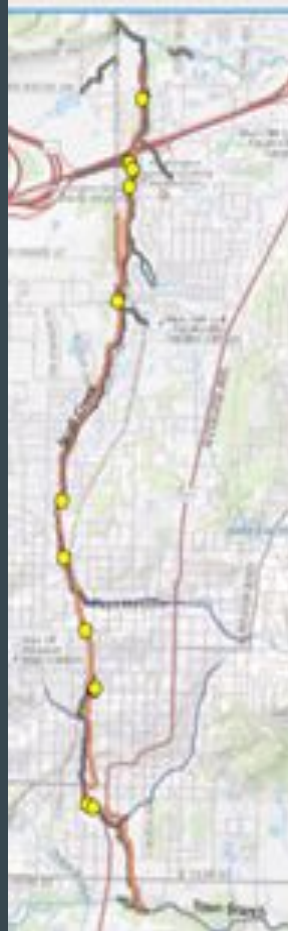
Flood Areas

Project overview and Results

-Next were the structures in need of maintenance. There where multiple lamp posts in need of new covers because the existing covers were exposing open wiring.
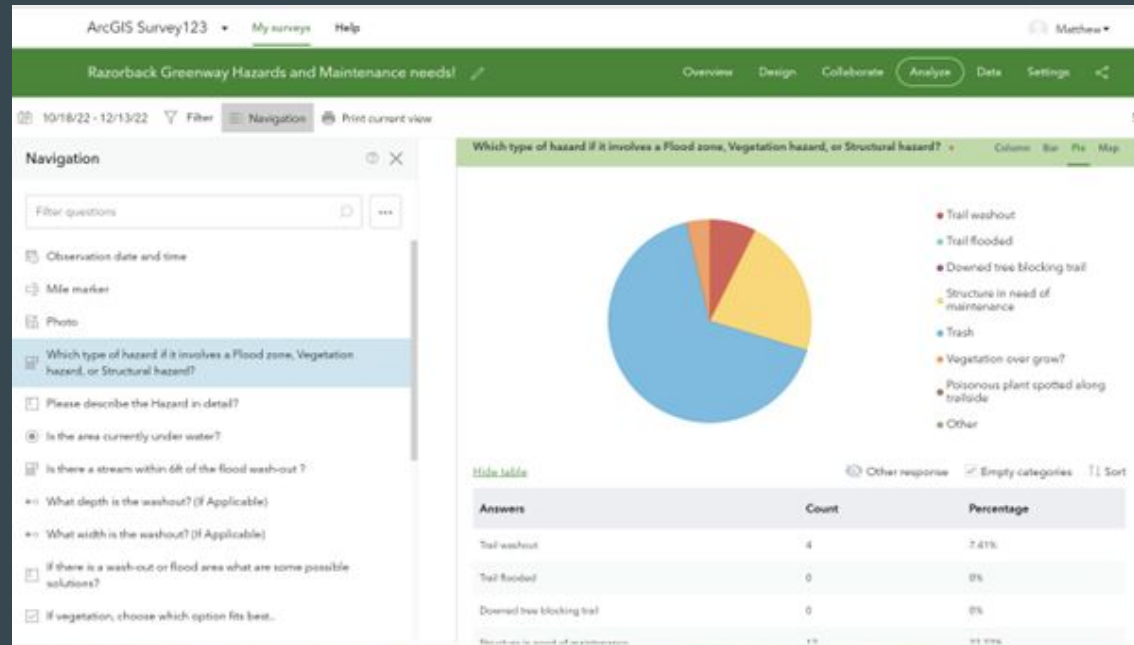
- One electrical box had been broken and wires were hanging out causing possible hazards for children that walk along the trail as well as possible dangerous situation from night walkers that need these lamps to feel safe.

-Another thing found in need of maintenance was the trail itself. There were multiple examples of this including washouts, roots growing underneath the trail causing small raised portions of the concrete, and the natural settling of the concrete.

Survey123 data

This is a preview of the data collected on Survey123.

Project overview and Results
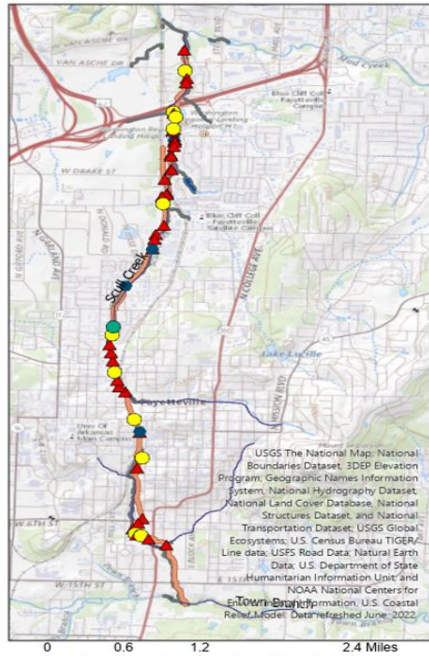
Below is a snip of the data that was collected. To view the full file refer to citations/links.


This will show you all of the following:

- Location
- Type
-

Project Results

By using Survey123 and ArcGis mapping tools such as Buffer, select by attributes, select by locations, downloading shapefiles, creating a feature layer, creating a domain, and creating a layout view, I was able to produce a detailed map for easy reference. This map should be used to help fix hazards, to create more possible areas for trash cans, to reduce pollution, and to find a way to divert washouts away from the trails or build wall barriers to protect the structure of the trails.

Curriculum

During this project, I was able to hit on a few tools learned from this course such as:

- Upload shapefiles from other websites.
- Create a layout with a legend.
- Use these tools: Create a feature layer, How to create Domains, Import data from survey123 to ArcGis, Select by attributes, and Select by location.
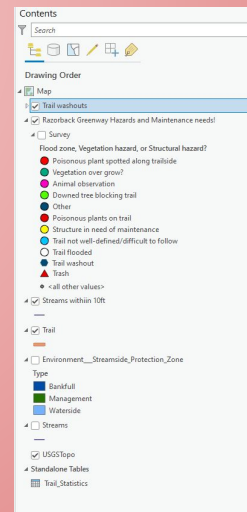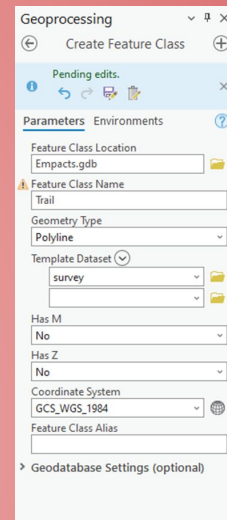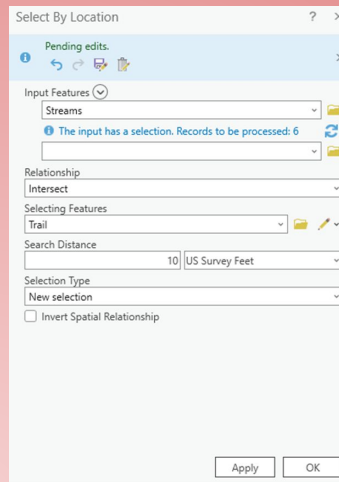
Methodology

- Greenway Trail washouts, pollution, and maintenance of items along the trail.
- Collected data using GIS technology Survey123 (Measurements, photos, location).
- Used data from external sources of stream data.
- Created a data map showing issues along the trail to help the City of Fayetteville better this beautiful trail.
- Spoke with City Hall front desk intern Jessica.

Issues that occurred

- City had already begun this project.
- Vegetation was already cut back for easier access to the streams for the public.
- Sections of the Greenway will be closed on and off up to Feb 1 to replace sections of the trail.

Data collection

- Created a survey on Survey123 for data collection and took the data creating map icons consisting of particular issues that are present along the greenway.
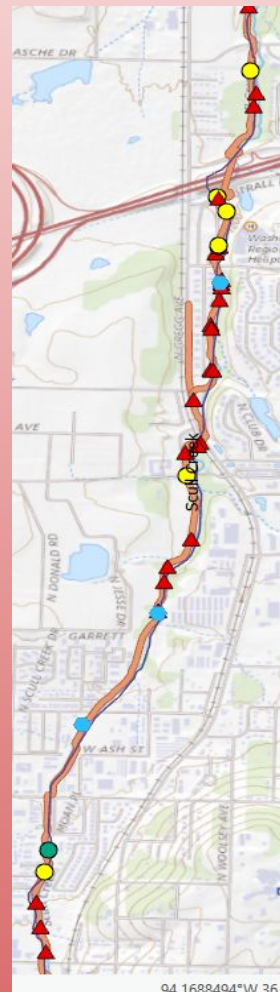
Personal Data Collection

- Survey123 - Used to collect what type of type of damage or hazard is involved, GPS coordinates, pictures, structures, and possible solutions.
- ArcGis - Used to create the map and show separate data to break down certain types, importance, streams within 10ft of the trail, and a map of the section of trail that the data was collected

Outside Data Collection

- Fayetteville.org GIS maps
- Arkansas GIS Office

Map creation

- Uploaded stream data from the Arkansas Gis to show where possible flooding can occur.
- Laid that data over a map of the trail I created by making a domain and tracing the path of the trail.
- Uploaded the data from survey123 into the map and used the symbology window to use unique values to separate the types of hazard.
- Laid all of that data onto the basemap USGS National Map.

Citations/Links

Checkout | Arkansas GIS Office - data used to build map

My Surveys (arcgis.com) - Data I collected

GIS Maps | Fayetteville, AR - Official Website (fayetteville-ar.gov) - map created using the data and tools

S123_65707b29f14a4187bb9ed2e0905db4e9_EXCEL.xlsx (live.com) - breakdown of data on excel

ArcMap GIS link

Razorback Greenway Hazards and Maintenance needs!_fieldworker - Overview (arcgis.com)

Acknowledgements

- Dr. Galloway
- Dr. Sonya G. Zawada
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- Fayetteville City Hall