**Executive Summary**

In this capstone project, I want to look at a variety of data to explore the accessibility, equity, and quality of outdoor recreation across Tennessee. Using geospatial and demographic data, the project identifies underserved communities, evaluates the physical and environmental features of existing recreational infrastructure, and offers data-driven recommendations for expanding access to parks and trails.

**Motivation**

I want to find the best trails, that align with my own hiking preferences, as hiking is good for the mind, body and soul. This is something that I enjoy to do with my family and it would be nice to easily search for family friendly trails.

**Data Question**

How accessible is outdoor recreation in Tennessee, and where should future trail or park investments be prioritized?

Are there rail segments that run near parks or residential areas that are inactive and could be repurposed?

Which ZIPs have high public land (parks + trails) density but low population density?

Where are the largest trail gaps between parks, rails, and residential areas?

What proportion of residents live within 500m of both a park and a trail?

Which ZIP codes have the longest cumulative trail lengths?

What percentage of parks are directly connected to a trail segment?

Are there 'trail deserts'—ZIPs or areas with no trails within 1 mile?

How much of each ZIP code is covered by recreational infrastructure (trail buffers + park land)?

Do highly urbanized ZIP codes have less parkland per capita?

Do ZIPs with lower income or minority-majority populations have less trail access?

How does racial diversity vary across ZIPs with high vs. low recreation access scores?

Can we rank ZIPs for trail expansion priority?

Which ZIP codes generate the most outdoor reservations?

What is the average number of people per reservation, and does that correlate with proximity to parks/trails?

Is there seasonality in reservation locations or trail use intensity?

Are there trail-rich areas with few reservations?

Do lower-income or rural ZIP codes make fewer reservations?

**Minimum Viable Product (MVP)**

I want to deliver a reproducible spatial analysis of outdoor recreation access across Tennessee, highlighting underserved areas and prioritizing where new parks or trails could be developed.

**Data Sources**

* [Tennessee Transportation (GPKG)](https://prd-tnm.s3.amazonaws.com/StagedProducts/Tran/GPKG/TRAN_Tennessee_State_GPKG.zip)
* [TN State Parks Points](https://gis.tnstateparks.com/datasets/d4ef724303da4619ba2972e00e716f03_0/explore)
* [TN Public Trails](https://gis.tnstateparks.com/datasets/d67ab502132f4b12ac2c1ab34eb8cac6_0/explore)
* [TN Public Parks (API)](https://services1.arcgis.com/YuVBSS7Y1of2Qud1/arcgis/rest/services/Tennessee_Statewide_Trails_Lines_Public/FeatureServer/0/query?where=1%3D1&outFields=*&outSR=4326&f=json)
* [USGS Elevation (EPQS)](https://apps.nationalmap.gov/epqs/)????
* [USGS ScienceBase Geodata](https://www.sciencebase.gov/catalog/item/62a96b9bd34ec53d2770f2c0)
* [Protected Areas/Trail Data](https://www.sciencebase.gov/catalog/item/652d4f80d34e44db0e2ee45c)
* [Recreation.gov Facility Data (RIDB)](https://ridb.recreation.gov/download)
* [Census Data Access](https://data.census.gov/)
* [US Census API Signup](https://api.census.gov/data/key_signup.html)

**Known Issues and Challenges**

I know that with the amount of data I have gathered, I will be able to do a thorough analysis. I also recognize that there will be many struggles cleaning the data and ensuring compatibility. The data I had initially opted to use, was not a viable option and I am hoping that this new data will lend to a robust and fruitful capstone project.