# Crashspot Project – Week 1 Report

Timeframe: Sept 1–7, 2025

Research Title: Geospatial Analysis of Road Conditions and Accident Hotspots for Safer Transportation Networks

## 1. Objective of Week 1

The main goal was to establish the project foundation by:
- Setting up the environment (Python, QGIS/ArcGIS Pro, folder structure).
- Downloading and organizing crash datasets.
- Filtering and cleaning data for Louisiana and Monroe (Ouachita Parish).
- Saving clean GeoJSON copies for further analysis.
- Generating first maps as proof-of-concept.

## 2. Tasks Completed

✅ Environment Setup
- Created isolated Python environment with geospatial libraries (geopandas, folium, scikit-learn, etc.).
- Organized project folders: data_raw/, data_clean/, outputs/, scripts/, docs/.

✅ Data Acquisition
- Downloaded FARS 2022 & 2023 National Crash Data (CSV) from NHTSA.
- Extracted ACCIDENT.CSV tables (crash-level data with coordinates).

✅ Data Preparation
- Combined 2022 and 2023 datasets into one file.
- Filtered to Louisiana crashes (STATE = 22) → 1,607 crashes.
- Filtered further to Ouachita Parish / Monroe (COUNTY = 73) → 60 crashes.
- Removed invalid/missing coordinates (zeros/NaN).

✅ Data Export
- Saved two cleaned outputs:
  - fars_la_2022_2023.geojson (statewide)
  - fars_monroe_2022_2023_clean.geojson (Monroe subset)

✅ Visualization
- Created static matplotlib scatter plot of Monroe crashes.
- Generated interactive Folium map of Monroe crashes (2022–2023) → exported to outputs/maps/monroe_fars_2022_2023.html.

## 3. Results & Checks

- Louisiana crashes (2022–2023): 1,607 records
- Monroe crashes (2022–2023): 60 records
- Verified that saved GeoJSONs load correctly and map without geometry errors.
- Interactive map successfully shows Monroe crashes with basic popups.

## 4. Reflections

- Workflow from raw CSV → cleaned GeoJSON → map works smoothly.
- Data cleaning (removing missing/zero coordinates) was essential to avoid errors in Folium.
- Current scope includes only fatal crashes (FARS); for broader analysis, CARTS Louisiana crash dataset may be requested in future.

## 5. Next Steps (Week 2 Preview)

- Conduct further cleaning (standardize columns, dates, severity codes).
- Produce exploratory maps:
  - Heatmaps of crash density (Kernel Density Estimation).
  - Parish-level crash summaries.
- Begin logging dataset metadata in docs/data_sources.md.
- Download and prepare road network data (OSM) for overlay in Week 3.

## Deliverables Produced

- Cleaned Louisiana & Monroe crash GeoJSON files.
- Interactive crash map (Monroe).
- Project folder & environment fully set up.