A logo for university of engineering

Description automatically generated

**ENGO 641 - Design and Implementation of Geospatial Information Systems**

Assignment 3 part 2

|  |  |
| --- | --- |
| **COURSE INSTRUCTOR:** | **DR. EMMANUEL STEFANAKIS** |

|  |  |
| --- | --- |
| **DATE OF SUBMISSION:** | **2023 – 10 – 31** |

|  |  |
| --- | --- |
| **NAME** | **UCID** |
| AMRESH SHARMA | 30233389 |
| ISSAC KWABENA AGYAPONG | 30222691 |
| UJJAL BANIYA | 30232571 |

***Information of Geopackage***

We utilized the CanVec feature from the Government of Canada's Geospatial Data Extraction Tool <https://maps.canada.ca/czs/index-en.html> to extract GeoPackage (.gpkg) data. The extracted data(canvec\_231031\_433813.gpkg) covers a geographic region of approximately 100 x 100 km, centred around Calgary. We specifically selected hydrographic and transport characteristics for extraction. The hydrographic layer is composed of the network of Canadian surface waters this includes entities such as watercourse, water linear flow, hydro obstacles (falls, rapids…), waterbody (lake, watercourse…), permanent snow and ice, water well, and spring. The transport layer is composed of, among others, the National Road Network (NRN), and the National Railway Network (NRWN) which includes entities such as Nautical Facility, Track Segment, Track Junction, Railway Station, Track Crossing, Track Marker Post, Track Structure, Rail Ferry, Road Segment, Road Ferry, Road Junction, Blocked Passage, Toll Point, Aerial Cableway, Footbridge, Trail, Navigational Aid, Marina, and Runway. The GeoPackage data contains multiple layers, but we are focusing on three key layers: road\_junction\_0(POINT), road\_segment\_1(LINESTRING), and water\_body\_2(POLYGON). These layers are essential for visualization and attribute analysis. The road\_segment\_1(LINESTRING) is particularly used in queries. For detailed geographic information, we have chosen a 1:5000 scale and utilized the NAD83 CSRS projection (EPSG:4617) for the GeoPackage settings. These settings allow us to examine the data in-depth and facilitate visualization and analysis:

A screenshot of a computer

Description automatically generated

Figure 1: Attributes of selected Geopackage

A screenshot of a computer

Description automatically generated

Figure 2: Selected Clipping Area

***Metadata of Selected Layers***

The Metadata along with visualization of layers road\_junction\_0(POINT), road\_segment\_1(LINESTRING), and water\_body\_2(POLYGON) is shown below:

1. ***road\_junction\_0(POINT):***

A screenshot of a computer

Description automatically generated

Figure 3: Metadata of road\_junction\_0

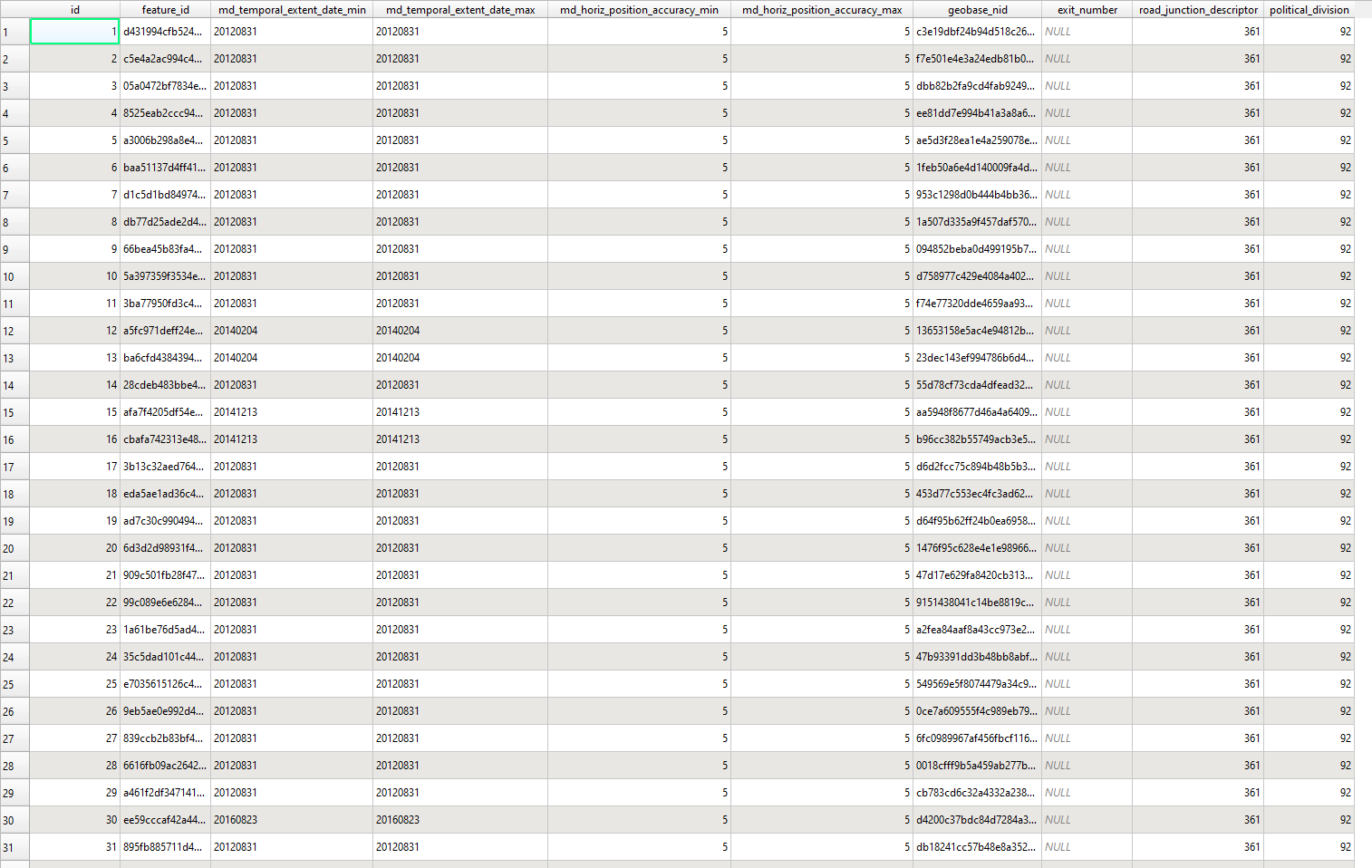


Figure 4: Attribute Table of road\_junction\_0

Visualization:

*A group of small pink squares

Description automatically generated*

Figure 5: Visualization of road\_junction\_0

1. ***road\_segment\_1(POINT):***

A screenshot of a computer

Description automatically generated

Figure 6: Metadata of road\_segment\_1

A screenshot of a computer screen

Description automatically generated

Figure 7: Attribute Table of road\_segment\_1

Visualization:

A map of a city

Description automatically generated

Figure 8: Visualization of road\_segment\_1

1. ***water\_body\_2(POINT):***

***A screenshot of a computer

Description automatically generated***

Figure 9: Metadata of water\_body\_2

A white grid with black dots

Description automatically generated with medium confidence

Figure 10: Attribute Table of water\_body\_2

Visualization:

A red and white bird

Description automatically generated with medium confidence

Figure 11: Visualization of water\_body\_2

***Visualization of All three layers:***

A screenshot of a computer

Description automatically generated

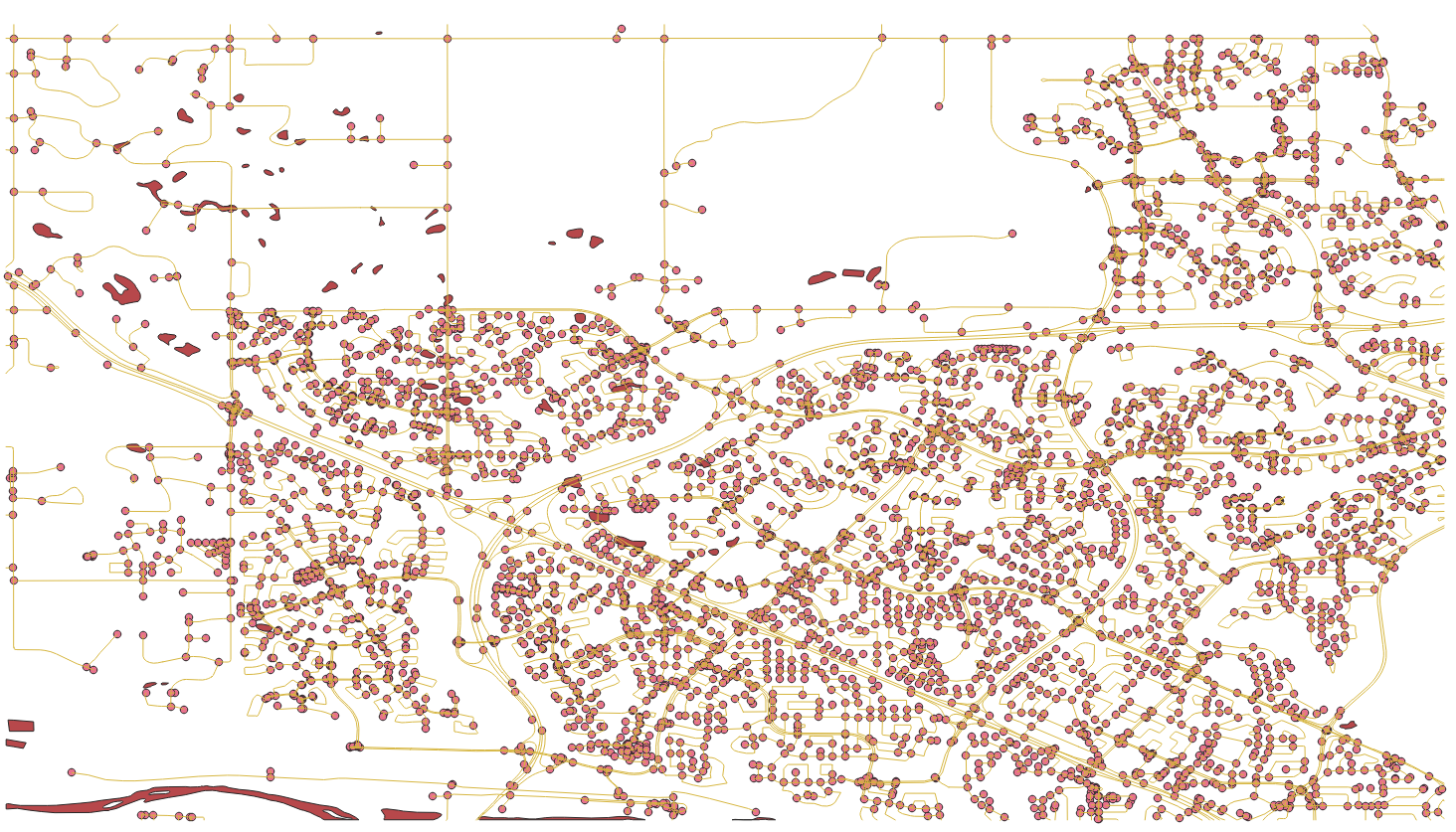


Figure 12: Visualization of All Three Layers