**Lab Report**

Title: High Frequency Network

Notice: Dr. Bryan Runck

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**Project Repository:**[*https://github.com/Samikshya036/GIS5571*](https://github.com/Samikshya036/GIS5571)

**Time Spent:** Around 9 hours

**Abstract**

Within the Twin Cities Metropolitan area, transit service is available every 15 minutes (or better) on weekdays from 6:00 AM to 7:00 PM and on Saturdays from 9:00 AM to 6:00 PM, according to the High Frequency Network data layer. In this lab we have created a buffer across high frequency network using three different tools—ArcPro, Jupyter Notebooks in ArcPro, and Jupyter Notebooks in ArcOnline and results are compared. Al

**Problem Statement**

 To contrast and compare using three different tools—ArcPro, Jupyter Notebooks in ArcPro, and Jupyter Notebooks in ArcOnline—the same straightforward task of buffering a network dataset.

Table 1: Data requirement on High Frequency Network

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| --- | --- | --- | --- | --- | --- | --- |
| **#** | **Requirement** | **Defined As** | **(Spatial) Data** | **Attribute Data** | **Dataset** | **Preparation** |
| 1 | Road network | Raw input dataset | Road Geometry | NA | [Mn GeoSpatial Commons](https://gisdata.mn.gov/dataset/trans-roads-mndot-tis) | NA |

**Input Data**

Within the Twin Cites Metropolitan area, transit service is available every 15 minutes (or better) during weekdays from 6:00 AM to 7:00 PM and on weekends from 9:00 AM to 6:00 PM, according to the High Frequency Network data layer. This dataset is public domain under the Minnesota Government Data Practices Act

Table 2: Purpose for analysis of High Frequency Network data

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| **#** | **Title** | **Purpose in Analysis** | **Link to Source** |
| 1 | High Frequency Network | Raw input dataset for buffer analysis to compare using three different tools—ArcPro, Jupyter Notebooks in ArcPro, and Jupyter Notebooks in ArcOnline | [Mn GeoSpatial Commons](https://gisdata.mn.gov/dataset/trans-roads-mndot-tis) |

**Methods**

Diagram

Description automatically generated

Figure 1: Data Flow diagram for Methods

1. Downloaded the High Frequency Network data from [Mn GeoSpatial Commons](https://gisdata.mn.gov/dataset/trans-roads-mndot-tis).
2. Contrast and compare using three different tools ArcPro, Jupyter Notebooks in ArcPro, and Jupyter Notebooks in ArcOnline—the same straightforward task of buffering a network dataset.
3. Created Buffers in the network dataset
4. Model Builder ArcPro (Buffer Analysis)
5. Jupyter Notebooks in ArcPro

Code: arcpy.analysis.Buffer("main.HighFrequencyNetwork", r"C:\Users\samik\OneDrive\Documents\ArcGIS\Projects\High frequency network\High frequency network.gdb\main\_Buffer2", "500 Meters", "FULL", "FLAT", "NONE", None, "PLANAR")

1. Jupyter Notebooks in ArcOnline

Code: item = gis.content.get("54f36822a4724c6ab0c3e8cef56e932d")

item\_layer = item.layers[0]

from arcgis import features

road\_buffer = features.use\_proximity.create\_buffers(item\_layer,distances=[5], units = 'Miles')

**Results**

**Diagram, map

Description automatically generated**

Figure 2: Figure showing output on ArcGis Pro after Buffer

**Results Verification**

Results are verified because buffer appears in the map.

**Discussion and Conclusion**

This lab helped me to use three different tools ArcPro, Jupyter Notebooks in ArcPro, and Jupyter Notebooks in ArcOnline in basic way.

GitHub: Creating repositories went well. Had some confusion in the folder file.

**References**

N/A

**Self-score**

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| --- | --- | --- | --- |
| **Category** | **Description** | **Points Possible** | **Score** |
| **Structural Elements** | All elements of a lab report are included **(2 points each)**:  Title, Notice: Dr. Bryan Runck, Author, Project Repository, Date, Abstract, Problem Statement, Input Data w/ tables, Methods w/ Data, Flow Diagrams, Results, Results Verification, Discussion and Conclusion, References in common format, Self-score | 28 | **28** |
| **Clarity of Content** | Each element above is executed at a professional level so that someone can understand the goal, data, methods, results, and their validity and implications in a 5 minute reading at a cursory-level, and in a 30 minute meeting at a deep level **(12 points)**. There is a clear connection from data to results to discussion and conclusion **(12 points)**. | 24 | **24** |
| **Reproducibility** | Results are completely reproducible by someone with basic GIS training. There is no ambiguity in data flow or rationale for data operations. Every step is documented and justified. | 28 | **28** |
| **Verification** | Results are correct in that they have been verified in comparison to some standard. The standard is clearly stated **(10 points)**, the method of comparison is clearly stated **(5 points)**, and the result of verification is clearly stated **(5 points)**. | 20 | **20** |
|  |  | 100 | **100** |