

GEOG 653: Lab 4 (Network Analysis)

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Overview

For lab 4, we will explore Network Analysis.

Question 1.

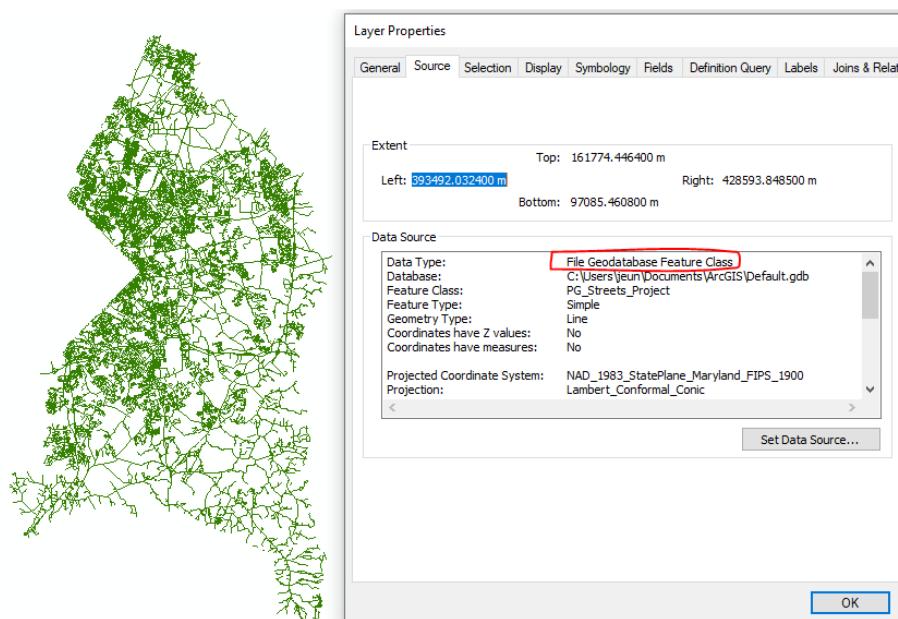


Figure 1: PG Streets Layer as a Geodatabase Feature Class (ArcMap).

Question 2.

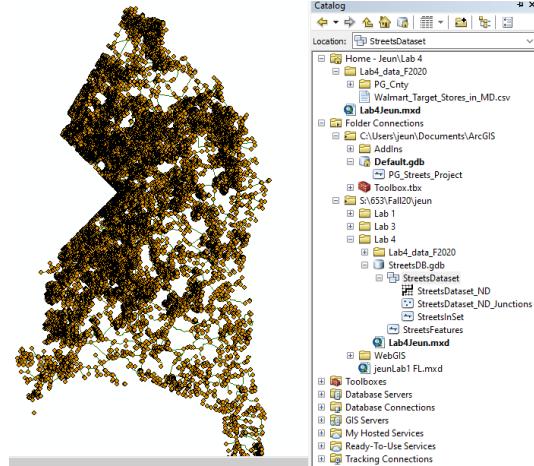


Figure 2: Network Dataset with ArcCatalog inset (ArcMap).

Question 3.

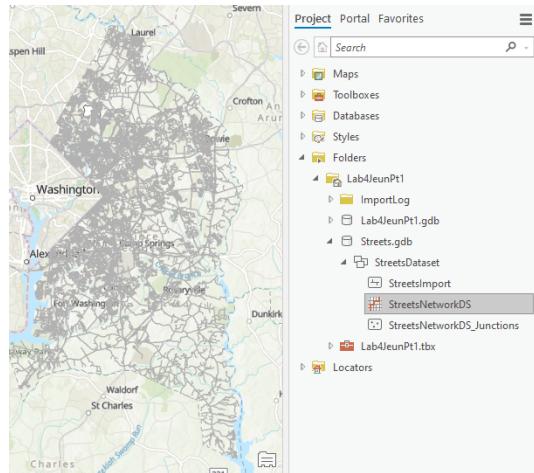


Figure 3: PG Streets Layer as a Geodatabase Feature Class (ArcGIS Pro).

Question 4.

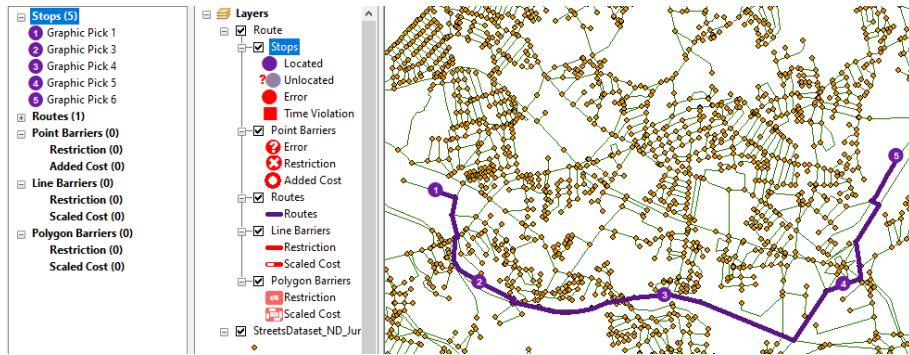


Figure 4: Solving shortest path in ArcMap.

Question 5.

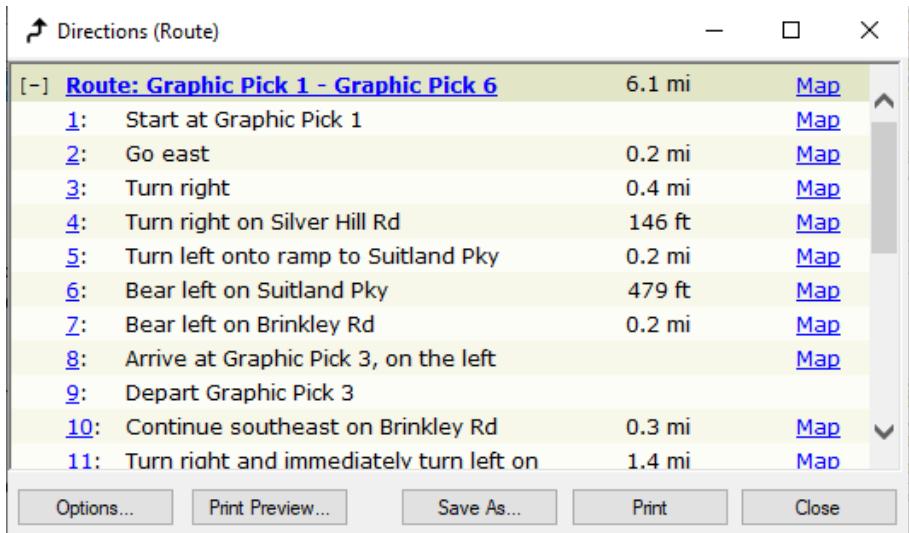


Figure 5: Network Analyst Directions in ArcMap.

Question 6.

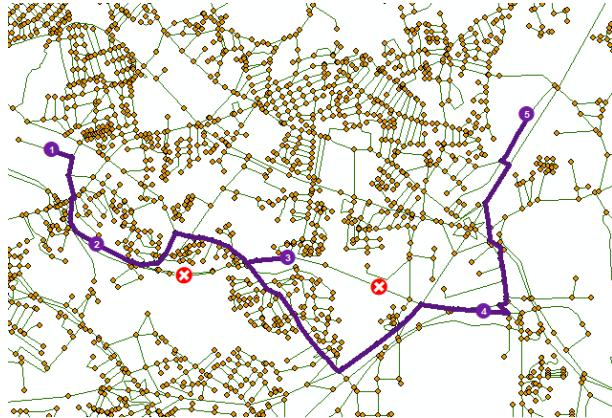


Figure 6: Network shortest path with barriers (ArcMap).

Question 7.



Figure 7: Hospital Network shortest path (ArcMap).

Question 8.

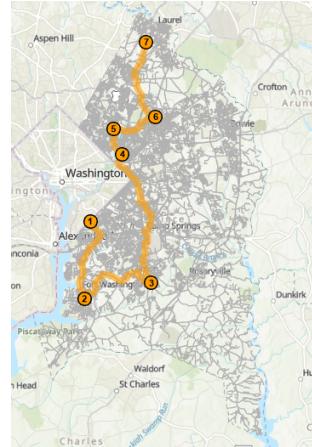


Figure 8: Hospital Network shortest path (ArcGIS Pro).

Question 9.

From Question 8, we can see a few differences, namely the segment from 6 to 7.

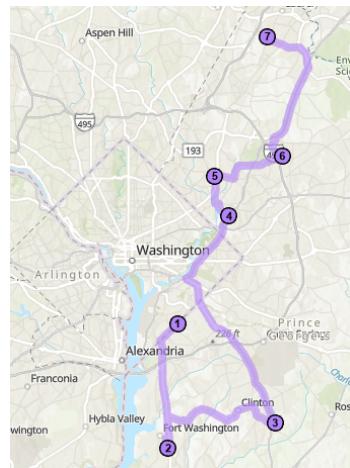


Figure 9: Hospital Network shortest driving distance (ArcGIS Pro).

Question 10.

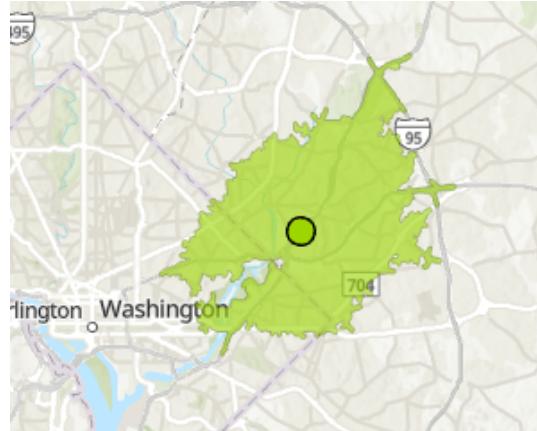


Figure 10: 10-minute service area from Prince George's Hospital Center

Question 11.

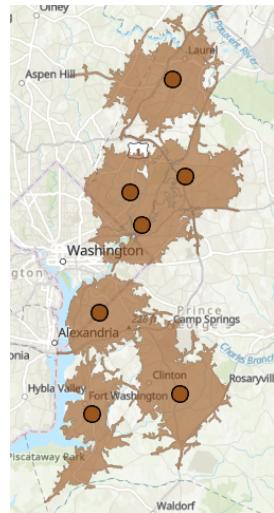


Figure 11: 10-minute service area from Hospitals in PG County

Question 12.

For this question, we can export the 10 minute service polygon as a separate layer. From there we can intersect with the Accidents Layer to produce our results. From the table we can see 5,374 total results.

OBJECTID *	Shape *	FID_TenMinuteServiceArea	FacilityID	Name	FromBreak	ToBreak	FID_PG_CarAccidents	Status
1	Point	4	2	FT WASHINGTON MED...	5	10	22	T
2	Point	4	2	FT WASHINGTON MED...	5	10	64	T
3	Point	4	2	FT WASHINGTON MED...	5	10	199	T
4	Point	4	2	FT WASHINGTON MED...	5	10	463	T
5	Point	4	2	FT WASHINGTON MED...	5	10	627	T
6	Point	4	2	FT WASHINGTON MED...	5	10	929	T
7	Point	4	2	FT WASHINGTON MED...	5	10	937	T
8	Point	4	2	FT WASHINGTON MED...	5	10	1103	T
9	Point	4	2	FT WASHINGTON MED...	5	10	1236	T
10	Point	4	2	FT WASHINGTON MED...	5	10	1237	T
11	Point	4	2	FT WASHINGTON MED...	5	10	1473	T
12	Point	4	2	FT WASHINGTON MED...	5	10	1746	T
13	Point	4	2	FT WASHINGTON MED...	5	10	1930	T

Figure 12: Car Accidents within the 10-minute service area of PG Hospitals

Question 13.

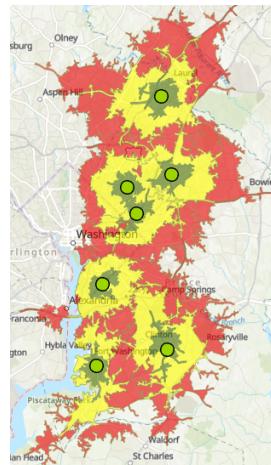


Figure 13: Multiple Ring Service Area (Green: 5, Yellow: 10, Red: 20)

Question 14.

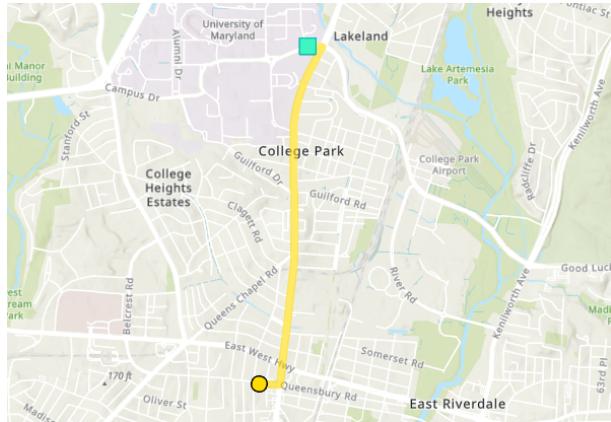


Figure 14: Closest hospital to incident on Campus Dr.

Question 15.

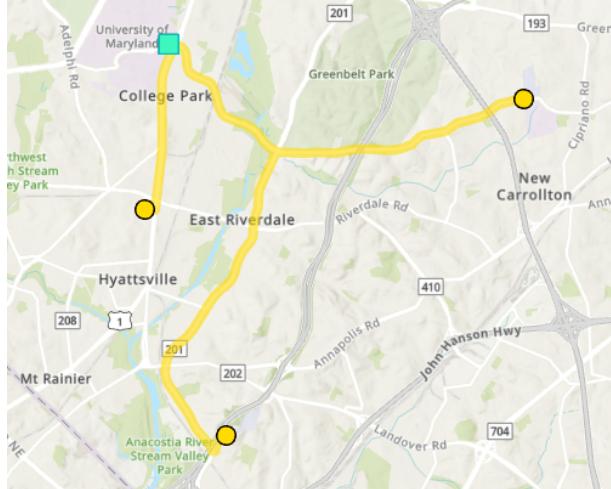


Figure 15: Closest 3 hospital facilities to incident on Campus Dr.

Question 16.

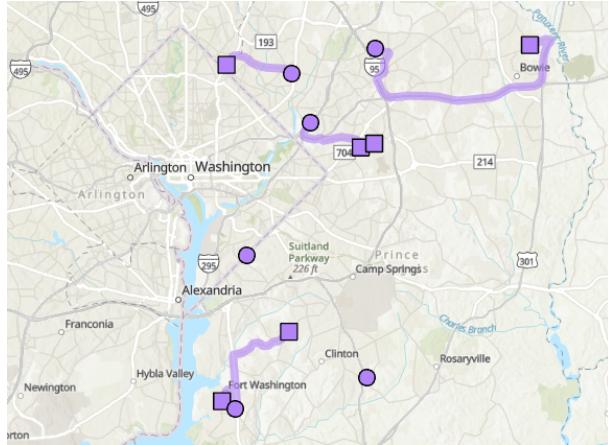


Figure 16: Closest hospital facilities to serious car accidents

Question 17.

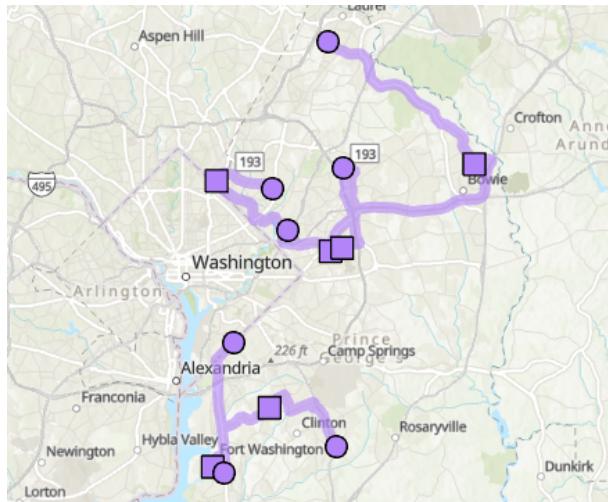


Figure 17: Closest 2 hospital facilities to serious car accidents

Question 18.

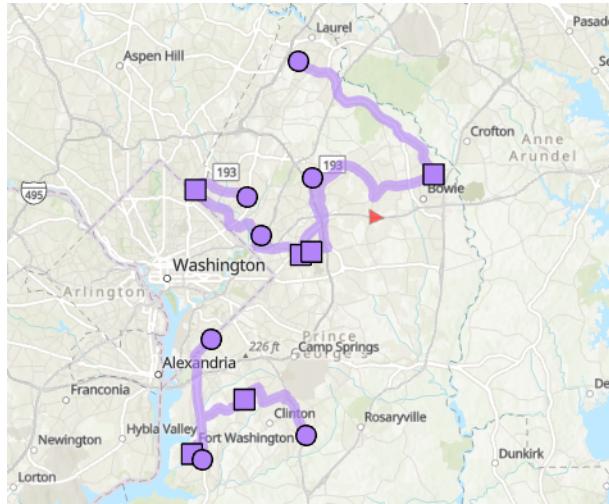


Figure 18: Closest 2 hospital facilities to serious car accidents with polygon barrier.

Question 19.

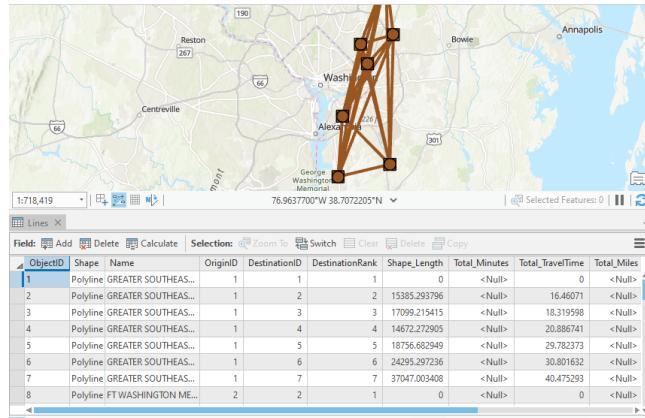


Figure 19: OD Cost Matrix for PG Hospitals with Lines Attribute Table.

Question 20.

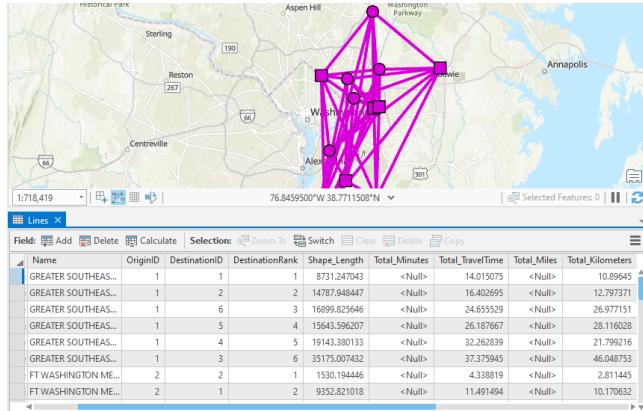


Figure 20: OD Cost Matrix for PG Hospitals and Serious Car Accidents with Lines Attribute Table.

Question 21.

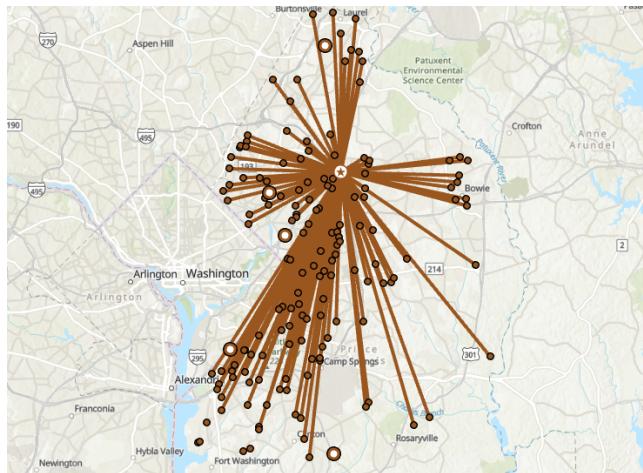


Figure 21: Minimized Weighted Impedance Location-Allocation Analysis between PG Hospitals and Schools

Question 22.

In this operation we specify the number of facilities as 3. We can see that the network is allocating demand from these 3 separate facilities.

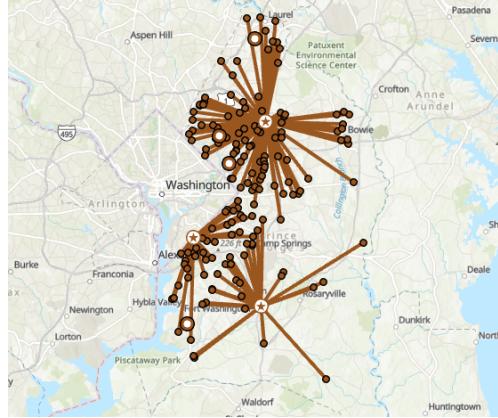


Figure 22: Minimized Weighted Impedance Location-Allocation Analysis between PG Hospitals and Schools with 3 facilities.

Question 23.

Here we can see a smaller radius as our cutoff went from 30 to 15 minutes

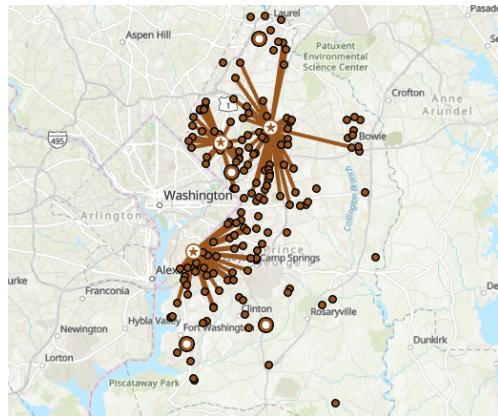


Figure 23: Minimized Weighted Impedance Location-Allocation Analysis between PG Hospitals and Schools with 3 facilities and 15 min. cutoff.

Question 24.

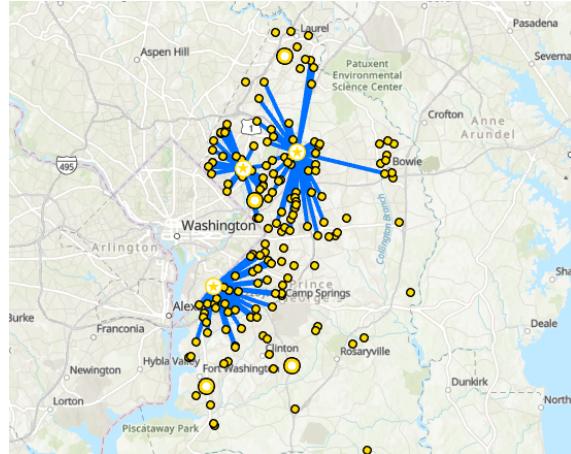


Figure 24: Maximized Coverage Location-Allocation Analysis between PG Hospitals and Schools with 3 facilities and 15 min. cutoff.

Question 25.

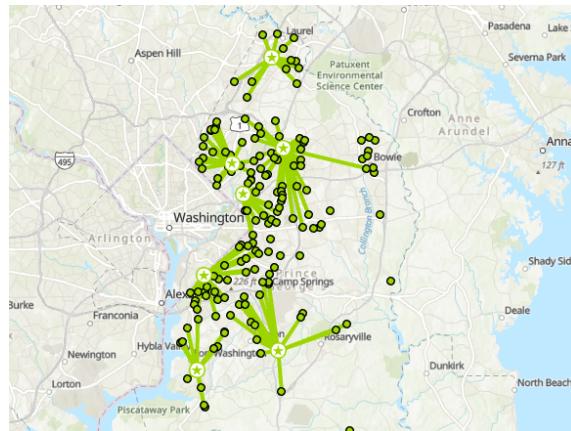


Figure 25: Maximized Coverage with Minimum Facilities Location-Allocation Analysis between PG Hospitals and 15 min. cutoff.