Military Checkpoints Establishment Along Ayobo Road

Developing a Model Tool Using ArcGIS Model Builder for detecting jurisdictions for checkpoint establishment.

Oluwaseyi Ezekiel
March 26, 2024

Introduction

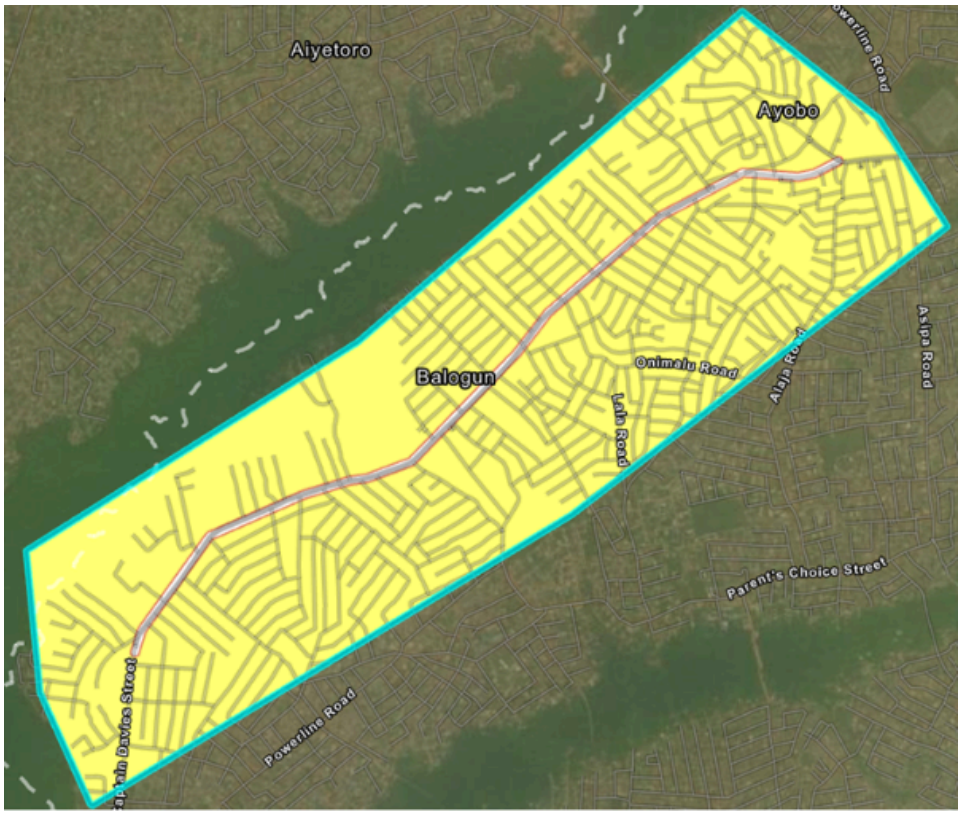
This project aims to develop a model tool to automate the identification of checkpoint locations along major roadways, specifically focusing on roundabouts. The tool will utilize spatial analysis techniques to detect roundabouts along road networks and create 200-meter jurisdictions around these areas. By automating this process, law enforcement agencies can efficiently establish checkpoint locations to enhance road safety and security.

Methodology

Data Collection

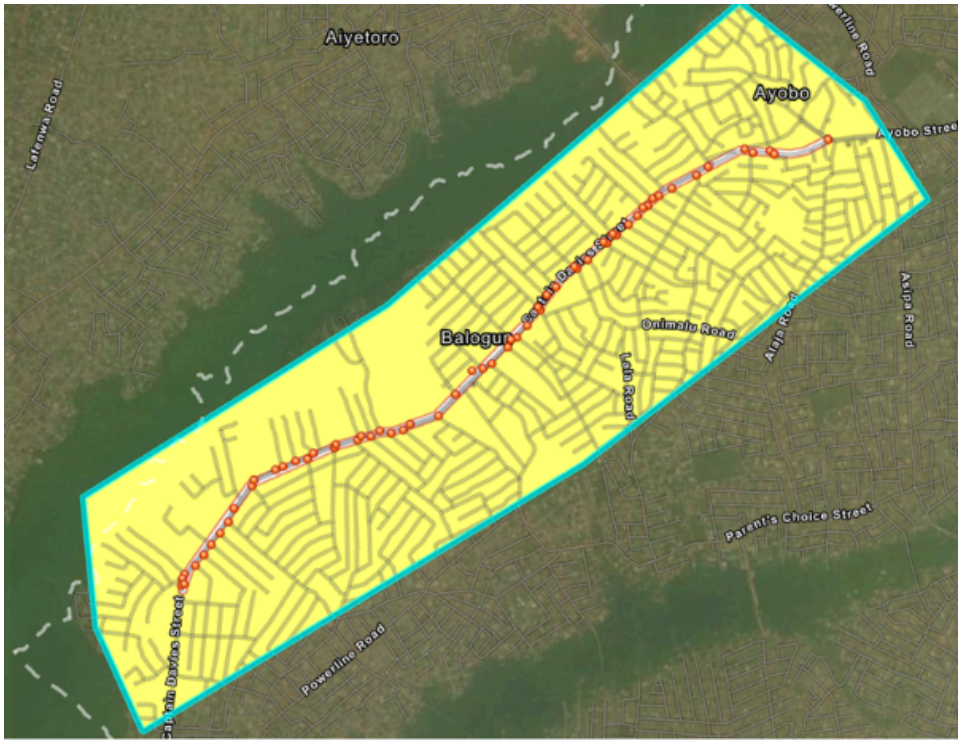
- A **point feature** layer was created in ArcGIS Online, and the Ayobo road was digitized along the World Street Map basemap using the **Sketch (line) tool** in ArcGIS Online.

- A new feature class (polygon) was created to define the geographical boundaries of interest



Ayobo area

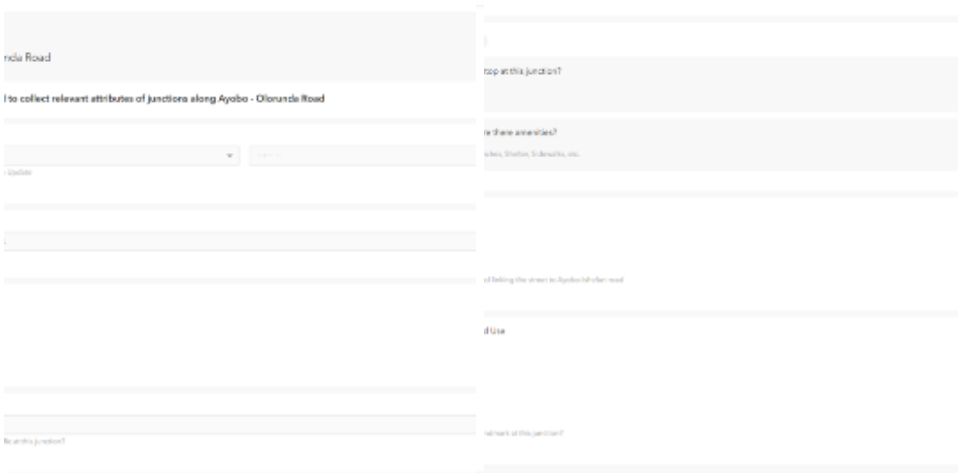
- Using the **ESRI ArcGIS FieldMaps,** a mobile application was created to collect the spatial information of the junctions along the road.



Spatial Attributes Collected

As earlier shown in the form, some of the attributes of interest obtained at each point of data collection include:

- Geographical Coordinates
- Name of the Junction
- The traffic intensity around the junction (High, Medium, Low)
- The type of junction (Intersection, Roundabout, Terminal)
- Availability of amenities (Lighting, Benches, Shelter)
- Surrounding Land Use (Institutional, Residential, Commercial, Industrial)

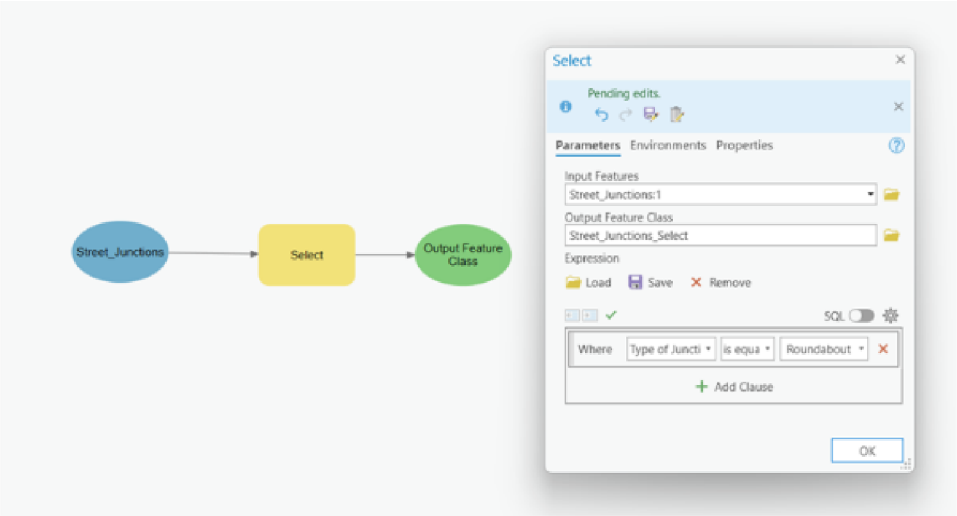


Data collection form for the ArcGIS Field Maps

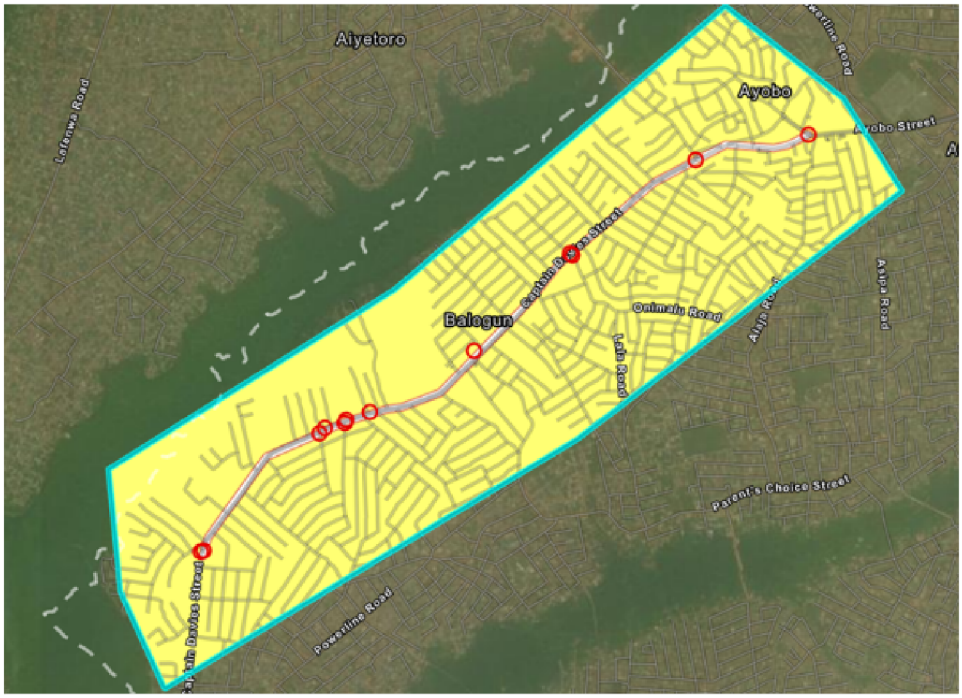
- The link to the data collection form can be found here.

Analysis

Using the ArcGIS Pro Model Builder, a simple model is created to identify roundabouts along the road.

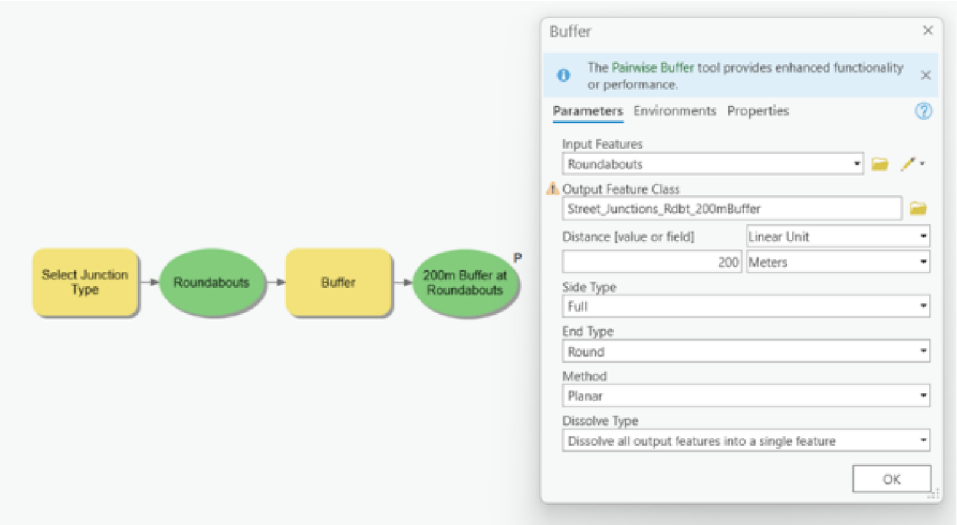


Model to identify roundabouts

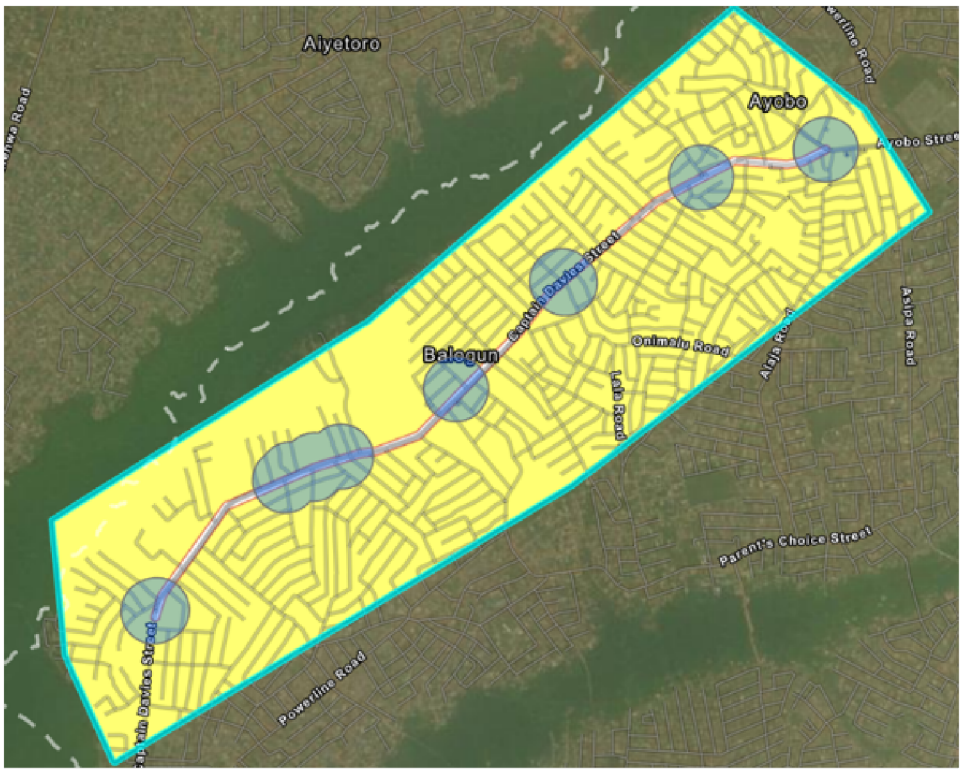


Roundabouts along the Ayobo road

Within the ArcGIS Pro Model Builder, a nested model is created to delineate the 200m jurisdiction around roundabouts along the road.



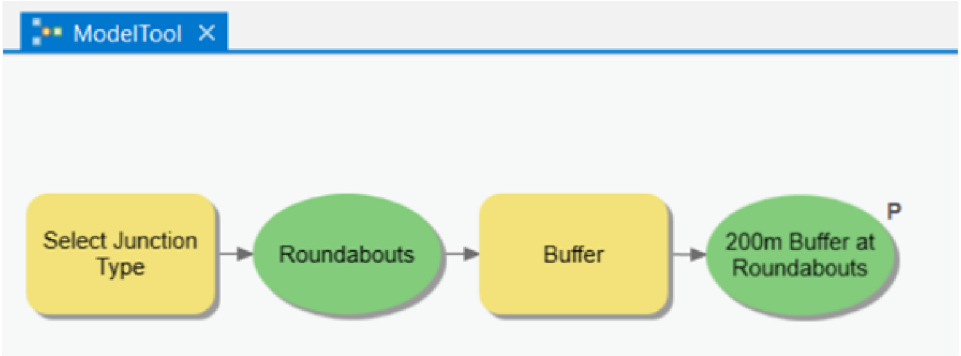
Model to define 200m boundary around the selected roundabouts



200m Jurisdiction around roundabouts along Ayobo road

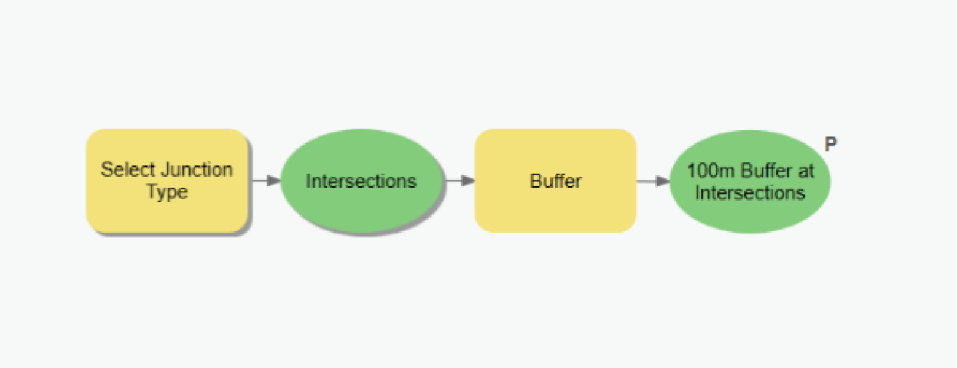
Creating the Model Tool

Following the aforementioned steps, this tool can be used to visualize 200m jurisdiction around roundabouts on other major roads.



Model tool to define 200m jurisdiction around Roundabouts along Ayobo road

By altering the model parameters (as shown below), other features of interest, for example siting checkpoints within 100m jurisdiction around intersections along the road can be visualized using this tool.



100m Jurisdiction around intersections along Ayobo road

Conclusion

This automated process empowers law enforcement agencies to strategically designate checkpoint locations based on identified roundabouts, enabling effective traffic monitoring and regulation. By harnessing the capabilities of ArcGIS ModelBuilder, authorities can proactively manage traffic congestion, deter criminal activities, and ensure the safety of road users within the designated jurisdictions.

References

- ESRI ArcGIS Online, ArcGIS Pro.

- Seneca Polytechnic, Canada
- https://secetmcs.maps.arcgis.com/apps/fieldmaps/maps/166f7ab655b449f4b2ca56b47ec54a3c/forms/18e0e64e269-layer-2/form