Regional Crosswalks Layer

GIS Methodology

xGeographic
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Overview

This methodology document outlines the steps taken to create the regional crosswalks layer and other associated layers in ArcGIS.

File Listing

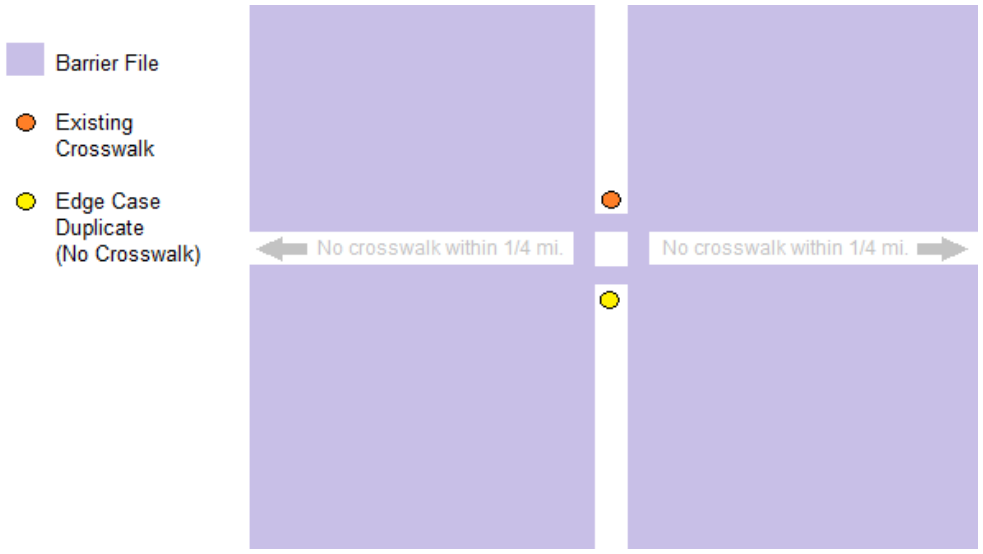
- Major Roads: GIS polyline file that includes the roads for which the crosswalk analysis will be completed.
- Crosswalks: GIS point file that identifies crosswalks that *cross* the major roads included in the analysis.
- Barrier File: GIS polygon file that defines the area for which Euclidean distance can be run in order to find the distance to the nearest crosswalk. The barrier defines the space that the distance function cannot go through.

GIS Methodology Steps

- Major Roads
    - The xWave GIS polyline file uses the FDOT RCI layer to identify roadways that are included in the statewide GIS layer. All RDOT RCI file roadways are included in the major roads file except for 1) limited access highways, and 2) limited access roadways on Disney World property or limited access roadways on Orlando International Airport property.
    - The xWave GIS polyline file has a secondary set of major roads that are called “Main Local” roadways. These roadways typically have more than two lanes and are primary connector roads that 1) serve numerous single-access neighborhoods, or 2) are critical connections between FDOT RCI roadways. The process of designating a roadway as a Main Local is qualitative and not based on any county, regional or FDOT standard, however, the roadways themselves are important to the overall transportation network. These roadways are included in the Major Roads layer.
    - The third set of roadways that are included in the Major Roads layer are roadways serving schools that are not included in the FDOT RCI Layer or the Main Local designation. Typically, a roadway is defined as school-serving if the bus loop or parking lot entrance is connected to the roadway. The extent of inclusion of these roadways begins from the school access point to the nearest FDOT or Main Local Roadway in order to create a connected network that does not include non-connected roadways.

- Crosswalks File
    - The crosswalks included in the analysis must cross over the Major Roads included in the analysis. Crosswalks that cross adjacent roadways are not included. xGeographic used 2022-2023 satellite imagery provided by Bing in order to place the points. The following crosswalks are included:
        - Painted crosswalks (colors vary, but typically white, with or without cross-hatching)
        - Brick or stamped concrete crosswalks
        - Brick or stamped concrete intersections (primarily in downtown areas)
        - Speed bumps that double as painted crosswalks that are connected to sidewalks (typically mid-block crossings). Standalone speed bumps without painted markers and those that are not connected to sidewalks are not included.
    - Some severely faded crosswalks may not be included in the database, however this is a very rare occurrence.
    - Some crosswalks located in heavily shaded areas may not be included in the database, however this is a very rare occurrence. Google Street View was used to identify crosswalks in heavily shaded areas.
    - Fields included in the database are listed below with descriptions:
        - ID: Automatic identification number provided for each crosswalk

- PAINTED: 0 equates to not painted, 1 equates to painted. For the purpose of this exercise, brick and stamped concrete is included as painted due to the differentiation from the road surface. All crosswalks included in the exercise are provided a value of 1.
- FADED: 0 equates to not faded, 1 equates to faded. This assessment was qualitative. Generally, if the crosswalk is 30% faded or more, then a 1 was placed in the Faded field.
- ABOVE: 0 equates to at-grade crossings, 1 equates to above-grade crossings.
- EDGEDUP: 0 equates to non-edge case duplicate, 1 equates to edge case duplicate. This is a rare edge case. As part of this exercise, an edge case duplicate point is placed on the opposite side of a crossing road from an existing crosswalk in circumstances where 1) the intersection is a 4-way intersection, and 2) the crossing road does not have a crosswalk within one-quarter of a mile. Thus, edge case duplicates are points placed where a crosswalk does not exist, but where the Euclidean distance function would be in error if a point was not placed. See the image below:



- Wave Fields: A spatial join, closest, was performed on the Crosswalks layer in order to join the crosswalk with the roadway segment it was crossing. This resulted in the following xWave roadway polyline field being appended to the Crosswalks file
    - SPEED2: *Posted speed limit.*
    - THRU_LANE: *Through lanes. Rule of 1 through lane per side of road, minimum.*
    - TURN_LANE: *Turn-only lanes and center turn lanes.*
    - RAMP_LANE: *Highway on-offramp lanes running parallel to the road.*
    - BUS_LANE: *Bus-only lanes.*
    - TOTL_LANE: *Total lanes (the sum of the four lane fields above).*
    - MEDIAN_TYP: *Median type description.*
    - MEDIAN_TP2: *Median type code. G = Grass, P = Paved, B = Brick, O = Other, M = Multiple*
    - AADT: *AADT, annual average daily traffic. Source: FDOT RCI.*
    - TRUCK_AADT: *Truck AADT, annual average daily truck traffic. Source: FDOT RCI.*
    - X_ALLPARK: *Distance, in feet, to the nearest public or HOA park. Note: The field indicates the distance from the centroid of the joined roadway centerline to the nearest park, not the crosswalk itself.*
    - X_SCHOOL: *Distance, in feet, to the nearest public school, not including colleges. Note: The field indicates the distance from the centroid of the joined roadway centerline to the nearest public school, not the crosswalk itself.*
    - X_TRANSIT: *Distance, in feet, to the nearest LYNX bus stop. Note: The field indicates the distance from the centroid of the joined roadway centerline to the nearest LYNX bus stop, not the crosswalk itself.*

- Barrier File
    - The barrier file was first generated by performing a buffer function of 20 feet on the Major Roads layer, creating a Major Road Buffer file. This file then underwent a Union function with the a county boundary layer, creating the Major Road Union file, and the area that was originally part of the Major Road Buffer file was removed from the Major Road Union file by deleting records with an original OBJECT ID matching records in the Major Road Buffer file.
    - Roadways that intersected with the 3-County regional boundary were then quality assured one-by-one and custom cuts were made to the barrier file (IE, removing portions of the barrier file) to include a connection from the Major Road to an existing crosswalk within one-quarter-mile of the County boundary. This ensures that crosswalks located outside of the 3-County area that are within a quarter mile of major roads within the region were included in the analysis.
    - As crosswalk points were being placed by xGeographic, the barrier file was then edited at intersections in circumstances where one roadway had crosswalks and the other did not (reference the image located in the Crosswalks File portion of this methodology). This was primarily the case at T intersections where one of the two roadways did not have an intersection present.

- Barrier Distance File
    - This file shows the distance to the nearest crosswalk, imbedded into geographic rasters (pixels).
    - Maximum Distance: 1,320 ft. (due to file size and computer memory limitations)
    - Cell Size: 15 ft. x 15 ft. (due to file size and computer memory limitations)
    - Please contact PJ Smith at pjsmith@xgeographic.com for access to this file, or use the Euclidean Distance tool in ArcGIS to create a file from scratch. Ensure that the barrier file is included if running the Euclidean Distance function.