METROPLAN ORLANDO

Bike/Ped Crash Analytics Methodology

Data Sources: xGeographic Wave (roadways, points of interest, U.S. Census overlays). Signal Four Analytics (bicycle and pedestrian crash locations).

Date: May 25, 2023

Step 1

Downloaded all bicycle and pedestrian crashes from Signal Four Analytics. Crash date range is 1/1/2013 to 12/31/2022 (10 years of data).

Step 2

Export xGeographic Wave roadway polyline database to include the following attributes: FL_ROADWAY, SPEED2, THRU_LANE, TURN_LANE, TOTL_LANE, MEDIANTYP2, SIDEWALK, FLUSH_SDWK, PAVED_SHLD, BIKE_SLOT, AADT, TRUCK_AADT, AADT_LANE, PCT_TRUCKS, LTS, RETRO_SPD, X_BANK, X_BARS, X_CITYHALL, X_COLLEGE, X_COMMCTR, X_CREDITU, X_ELEMSCHL, X_HIGHSCHL, X_HOSPITAL, X_LIBRARY, X_BUSSTOP, X_ALLMKT, X_MIDSCHL, X_PARK, X_POSTOFFC, X_RESTRNT, X_ALLENTV, X_LODGING, X_ALLPARK, X_PHARMACY, X_SCHOOL, X_SUPERMKT, N_DINING, N_ALLENTV, N_LODGING, N_SCHOOL, N_TRANSIT, P_NIGHT, P_JOBDENS, P_POPDENS, HS_GRADE, TRANS_DISV, GEOID, INCOME-ZERO_VEHCL, PCT_TRANSIT, MEDIAN_AGE, PCT_POVERTY.

Step 3

Split xGeographic Wave roadway file into two files, xWave_Minor and xWave_Major. xWave_Major included ROAD_TYPE Disney, FDOT, FDOT – Airport Access, FDOT – Construction, Main Local, Main Local Construction. xWave_Minor included Minor Local and Minor Local with Deviation. FDOT – Limited Access, FDOT – Limited Access Overpass and Local Construction roadways not included in either file and not included in the analysis.

Step 4

Stripped down bicycle and pedestrian crash shapefile into 3 fields: REPORT_NUMBER, MAJOR (new field) and MINOR (new field).

Step 5

Decided to use a radius of 70 feet to “catch” crashes on roadways by completing a qualitative map assessment of the proper radius in order to include the vast, vast majority of roadway crashes while not including parking lot crashes. Important: Parking lot crashes and crashes occurring on limited access highways and overpasses are not included in the assessment in order to be able to limit the crash assessment to roadway design and bicyclist and pedestrian behavior on/crossing roadways.

Step 6

Selected crashes within 70 feet of xWave_Major; populated MAJOR field with ‘1’ if selected.

Step 7

Selected crashes within 70 feet of xWave_Minor; populated MINOR field with ‘1’ if selected.

Step 8
Selected crash records where MAJOR = '1'. Records exported as Crash_Major.

Step 9
Selected crash records where MINOR = '1' and MAJOR not equal to '1'. Records exported as Crash_Minor.

Step 10
Spatial join of Crash_Major to xWave_Major, closest, no maximum radius (already incorporated).

Step 11
Spatial join of Crash_Minor to xWave_Minor, closest, no maximum radius (already incorporated).

Note: Joining to the closest roadway can slightly alter the output statistics at T intersections where two major roadways intersect. Some crashes occurring on one of the two roadways could be assigned to the other roadway in the T intersection. However, since the intersection is technically both roadways in one, the 'closest' spatial join was deemed appropriate in order to maximize accuracy. The impact on output statistics is estimated to be very minor, as the location of the crash records in the Signal Four Analytics database is determined to be accurate.

Step 12
Merged Crash_Major and Crash_Minor files.

Step 13
Merged xWave_Major and xWave_Minor files. Populated excel spreadsheet with total mileage for each applicable attribute (roadway characteristic mileage and point of interest counts) using specialized GIS data queries.

Step 14
Selected crash database using specialized GIS data queries matching the queries used in Step 13 in order to select the number of crashes matching each query criteria.

Step 15
Excel spreadsheet formatting.