**AACOUNTY - SNOW PLOW ROUTES SLOPES - MAY 2019**

The derived road slope values can be viewed on [Carto.com](https://sirgeo.carto.com/builder/bf90a2ff-4360-4ee5-b226-0b31f2340f6f/embed)

Methodology used to create initial slope data for all of the county's roads:

1. Densify in QGIS to create 100 meter segments of all AA County streets... 70660 records in the Streets shp after this step.
2. 2017 DEM used thanks to Melissa's existing county wide DEM she created, copied it from her flash drive.
3. Input 100m Streets and 2017 DEM into ArcGIS 3D Analyst > Add Surface > produces Avg Slope for all 100m road segments.
4. Checked using basic slope formula: ([Z\_Max] - [Z\_Min]) / [Shape\_len] \*100
5. Google Street View and Pictometry's Ground Slope also used to check slope accuracy.

Methodology used for false positives with bridges and DEM:

1. Select by location all streets that intersect Bridges\_and\_Overpasses.shp
2. From this selection, now select all the ones with slopes greater than 3.5
3. In this selection, change all selected's Avg\_Slope to 2... these are the more or less flat bridges that have 2% with +- 1% discrepancies.
4. Used Google / Bing Street Views and Pictometry's Ground Slope to spot check about 50 of them and all looked correct.

Methodology for finding "cold spots" aka streets over all streams:

1. Select by location all Streams that intersect Streets > creates new line file Streets\_xing\_Streams.shp
2. Select by location all Streets that intersect Streams > creates new line file Streams\_xing\_Streets.shp
3. Intersect > Streets\_xing\_Streams.shp and Streams\_xing\_Streets.shp > creates new point file Streets\_xing\_Streams\_POINTS
4. Join Streets\_xing\_Streams.shp and Streets\_xing\_Streams\_POINTS > creates new line file Streets\_xing\_Streams\_join.shp

Known caveats:

1. Where new streets have been planned but not built yet (or built after 2017) there will be erroneous slope values.
2. Bridges and overpasses produce false positives. Work around by setting all of them to slope = 2% which results in +- 1% discrepancies in most cases.
3. Some of the smaller bridges (not listed in the Bridges shp) were not accounted for e.g. Buckingham Place, Patuxent River Rd, etc.
4. There are a few errors in the Bridges shp that result in "select by location" missing the target e.g. Conway Road at Little Patuxent 6.
5. "Shoreline" values in Streams shp produced a few oddities in the cold spot streets.