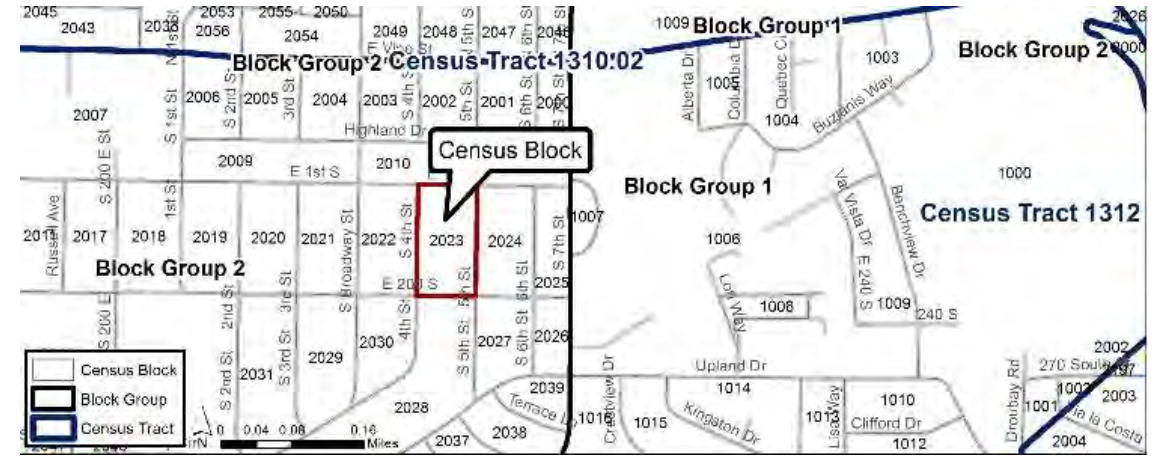


# 2020 Census Tabulation Blocks: How the Census Bureau Delineates Them and How They Relate to Other Geographic Boundaries

## What are Census Blocks?

- The smallest geographic areas that the Census Bureau uses to tabulate decennial data.
- Statistical areas bounded by **visible features**, such as streets, roads, streams, and railroad tracks, and by **nonvisible boundaries**, such as selected property lines and city, township, school district, and county limits.

- Generally small in area; for example, a block in a city bounded on all sides by streets. In rural areas, may be hundreds of square miles





Blocks – Urban area



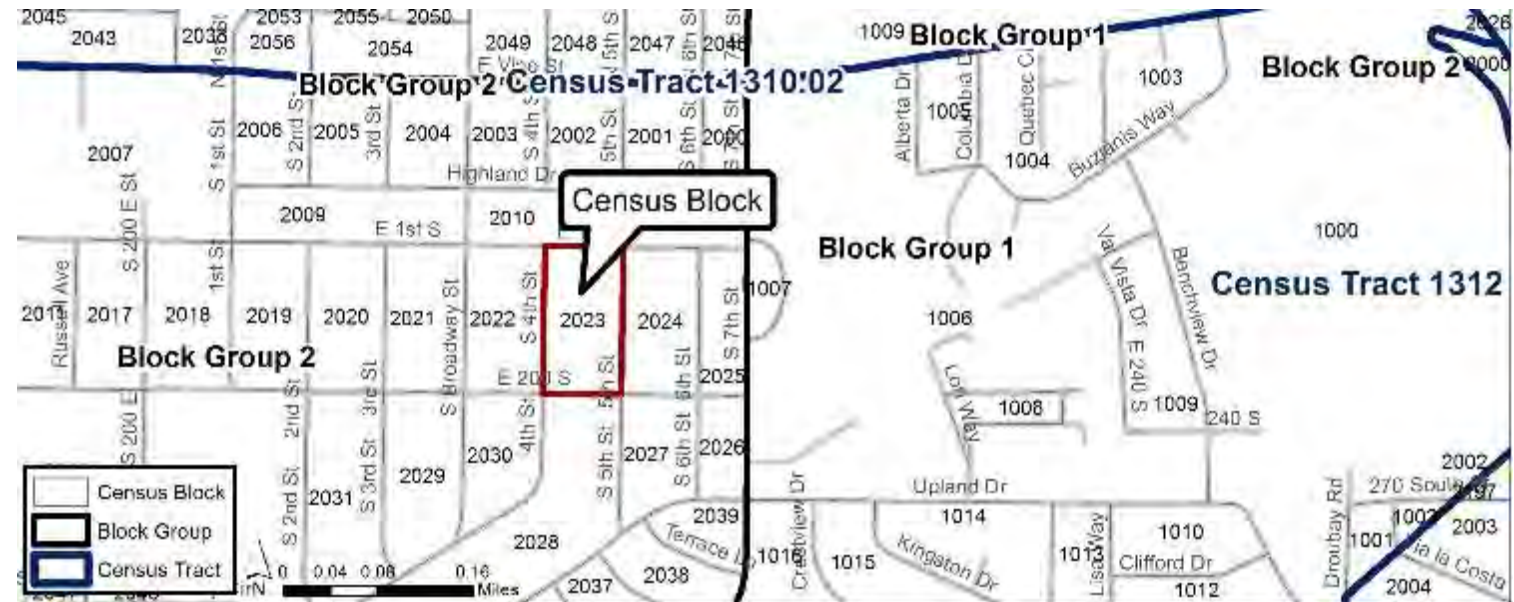
Blocks – Rural area

# Census Blocks...

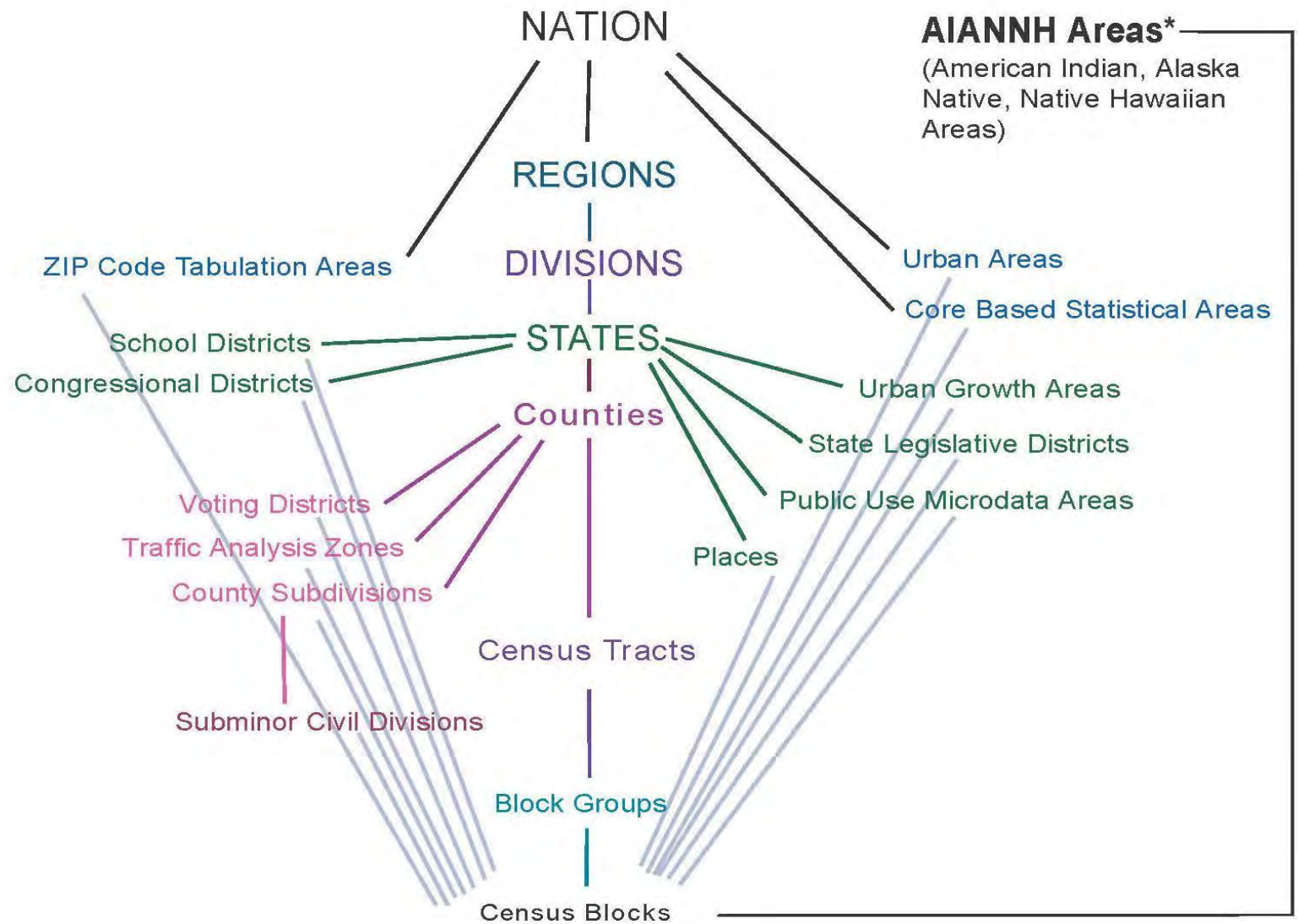
- cover the entire territory of the United States
- nest within all other tabulated census geographic entities and are the basis for all tabulated data.
- are defined once a decade and data are available only from the decennial census 100% data (age, sex, race, Hispanic/Latino origin, relationship to householder, and own/rent house).

# Census Block Numbers

- Census blocks are numbered uniquely with a four-digit census block number from 0000 to 9999 within a census tract, which nest within state and county
- The first digit of the census block number identifies the block group.

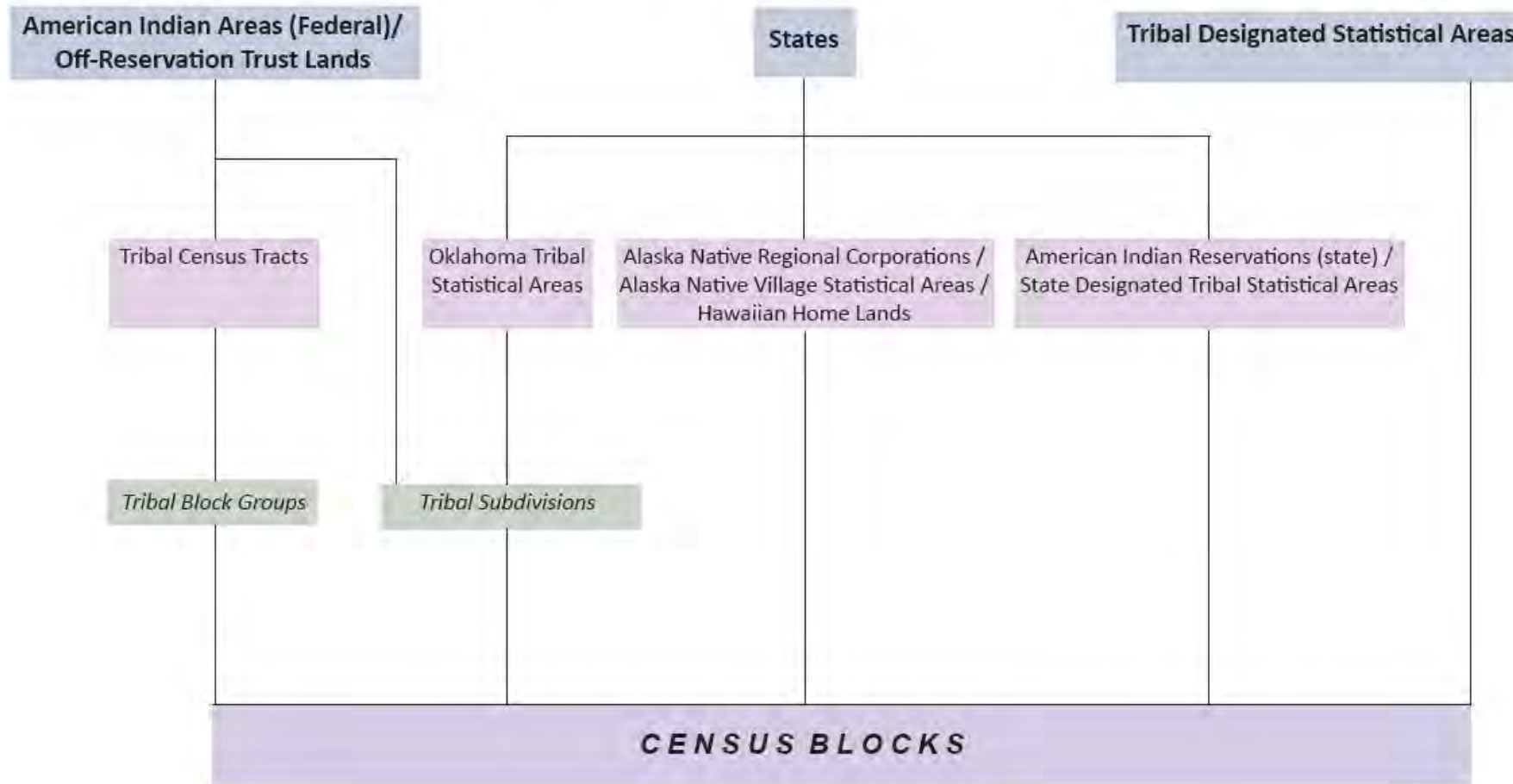


# Hierarchy of Census Geographic Entities



# Hierarchy of Census Tribal Geographic Entities

## *Hierarchy of American Indian, Alaska Native, and Native Hawaiian Areas*





# How are Census Blocks Delineated?

- Census Bureau Algorithm Applied Nationally
- Challenge: Visible features and nonvisible boundaries (potential block boundaries) are not evenly distributed nationwide
- How do you create a “one size fits all” algorithm?

## How are Census Tabulation Blocks Delineated?

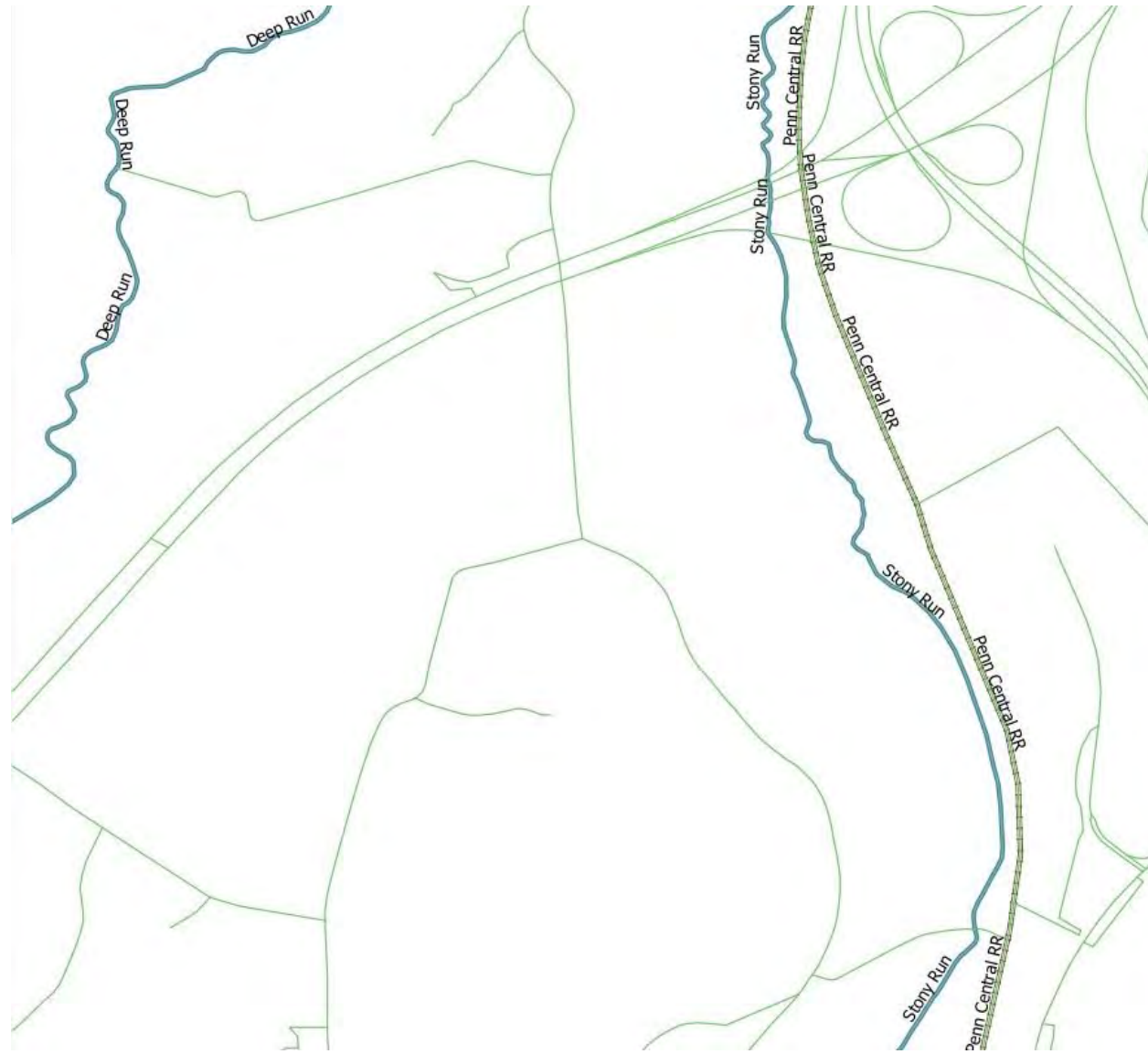
# 1. Generate the base block layer of physical features (Hydro and Non-Hydro)

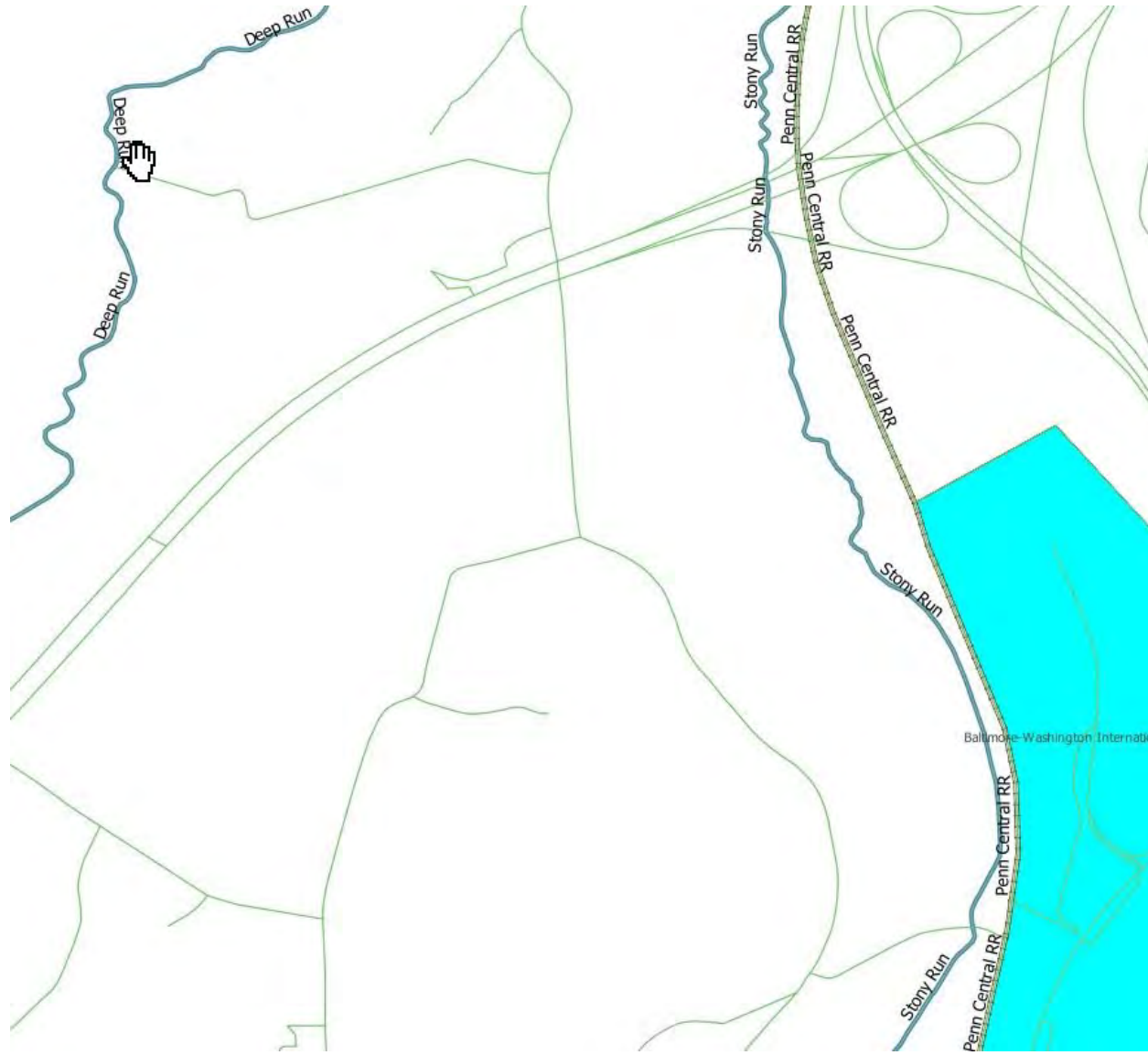
- (Roads (primary, secondary, neighborhood, alleys, service drives, private roads, dirt 4WD vehicular trails, railroads, streams/rivers, canals, power lines, pipelines)
- Geographic area boundaries (e.g. counties, places, tracts, reservations, voting districts)
- Includes any edges that form a polygon with other edges

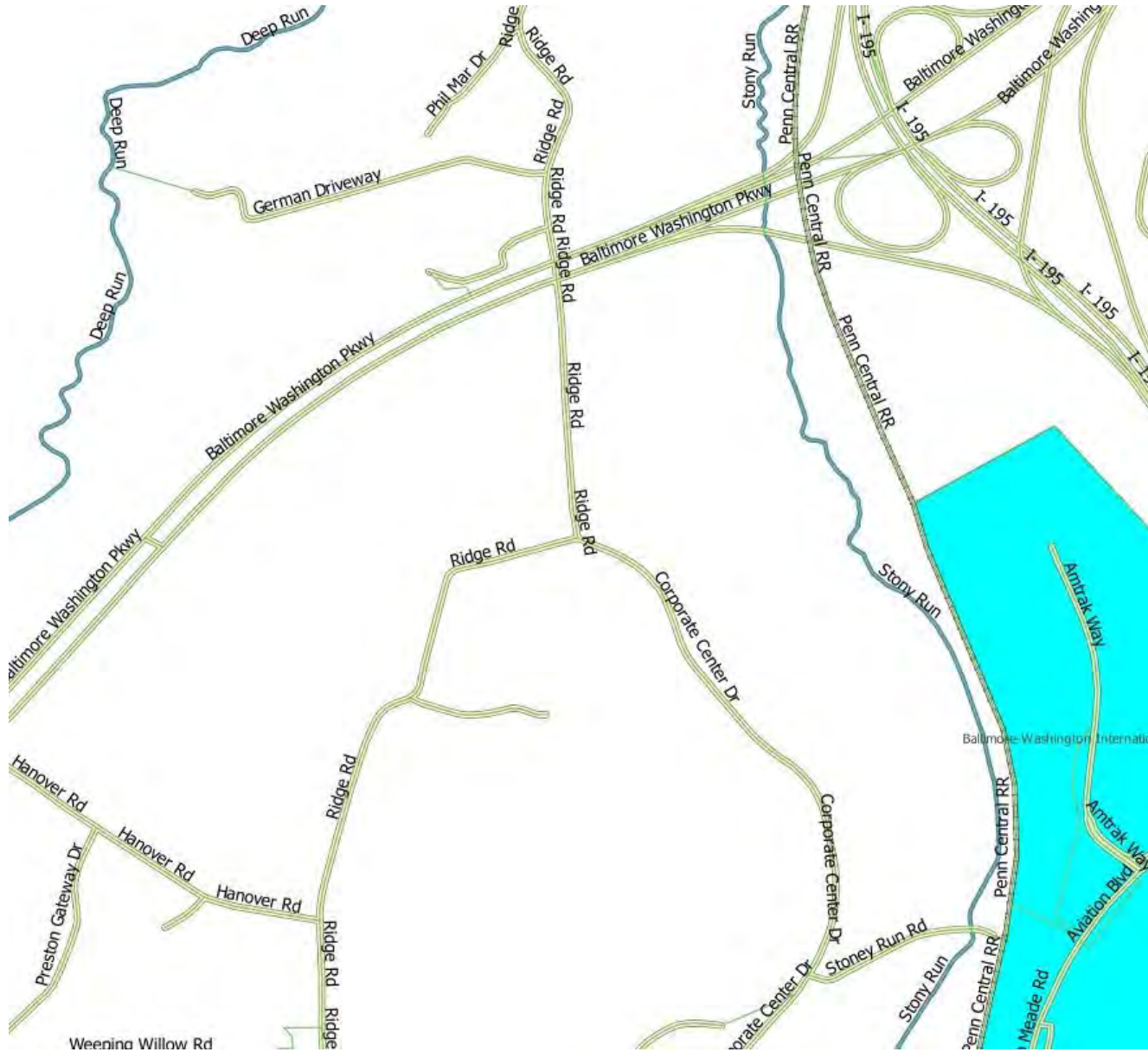
# Start with Existing Edges

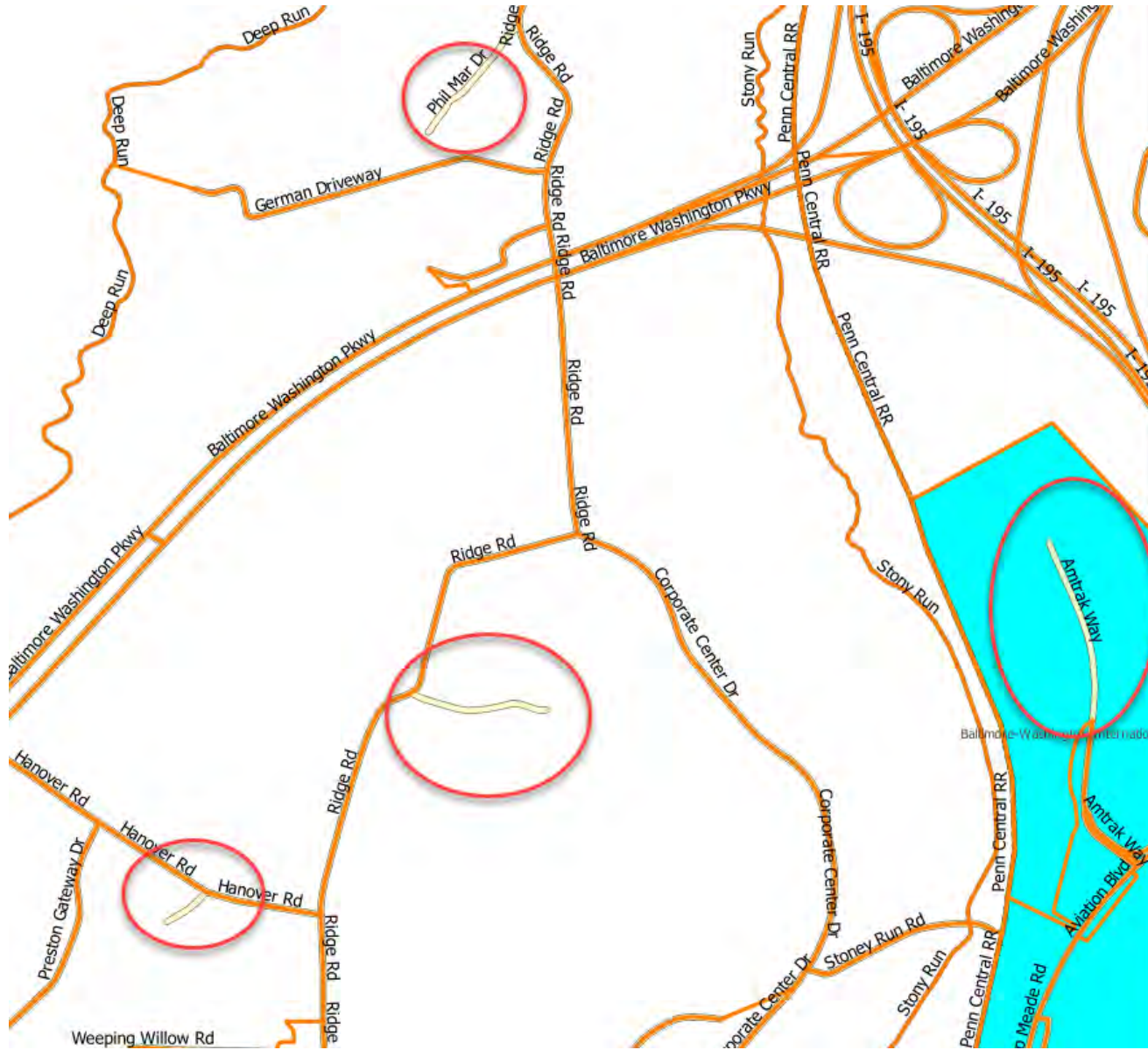














# How are Census Tabulation Blocks Delineated?

2. Assign priority values to each edge
3. Conduct merges based on priority values

## Edge Priority Values

- Priority values assigned to each edge, 0-99
- The higher the priority value, the less likely it is to be merged across

- Priority values assigned based on the following combination of characteristics
  - Type of feature (MAF/TIGER Feature Class Code or MTFCC)
  - If feature is named
  - Size of the preliminary block
  - Number of addresses in the preliminary block
  - Relationship to other polygons (e.g. is it a water block surrounded by another water block?)

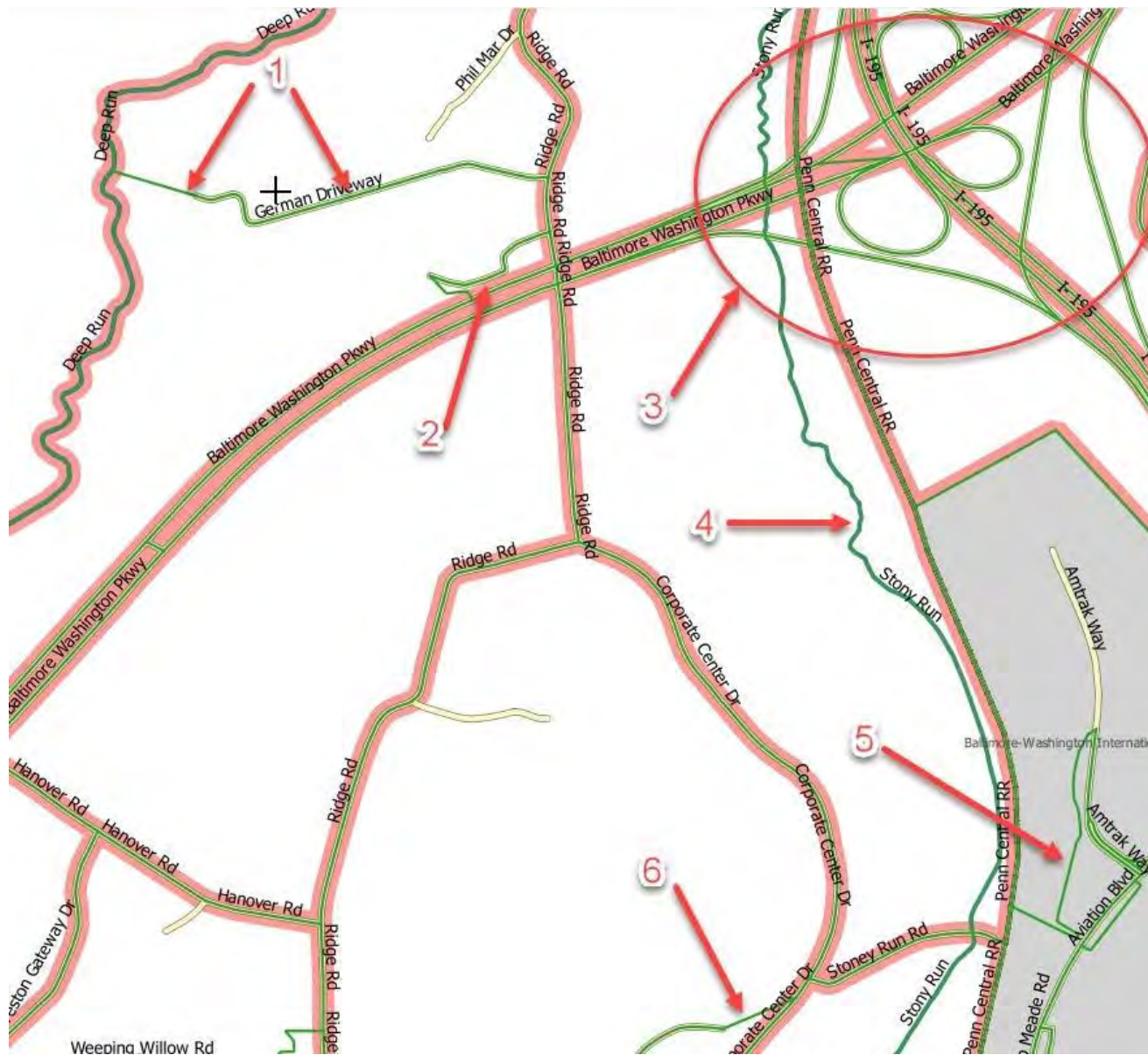
## Examples of Priorities Based on MTFCCs and Names:

- Boundaries for geographic entities have the highest priority
- Primary roads (e.g. state highways) generally have a higher priority than neighborhood roads • Named neighborhood roads generally have a higher priority than unnamed neighborhood roads
- Neighborhood roads generally have a higher priority than service roads or ramps
- Roads generally have a higher priority than power lines

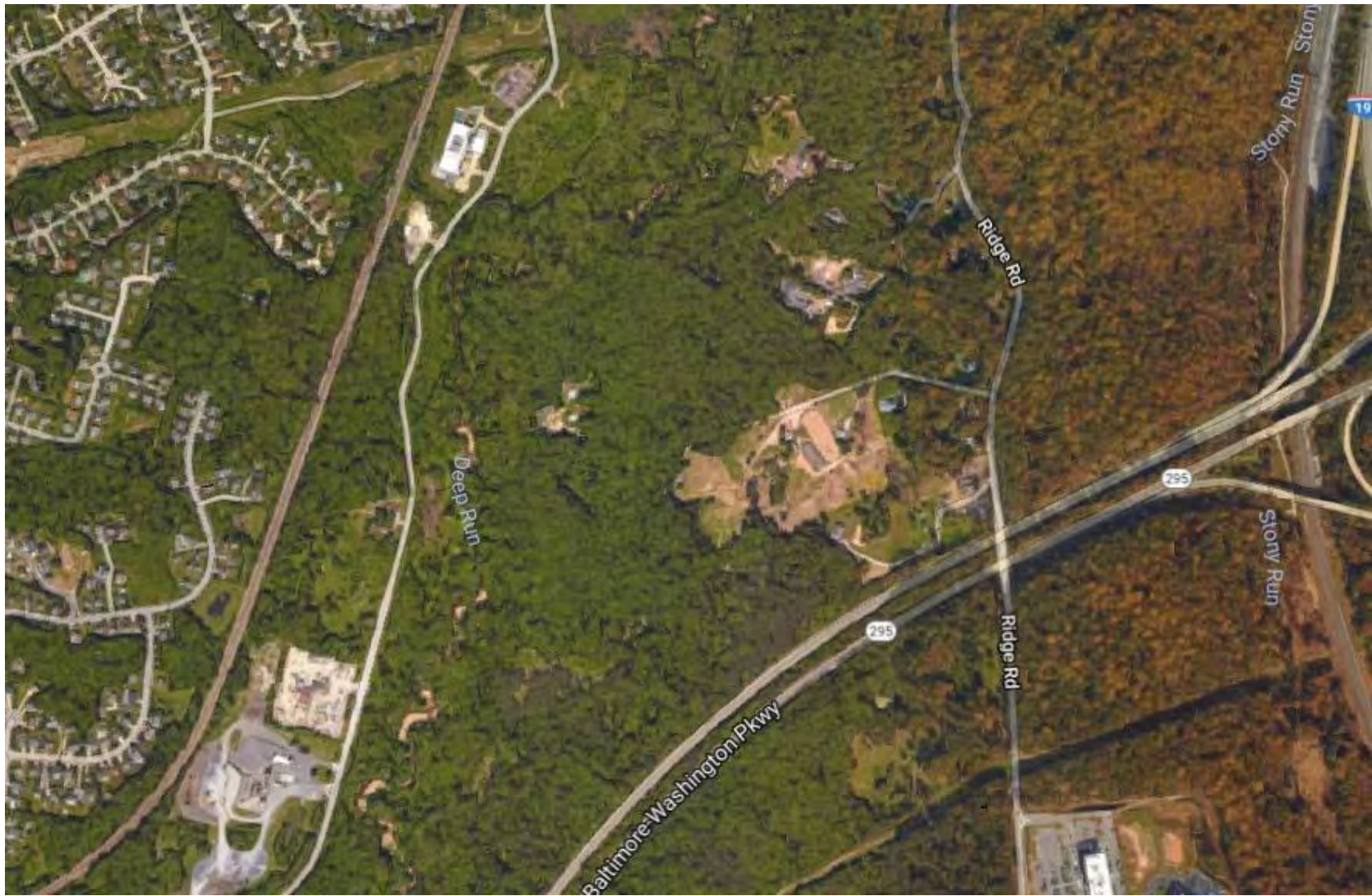
## How Block Size and Addresses

# Impact Merges

- May merge across a named neighborhood road if the block size area is small and there are few to no addresses, but not if the block is larger in size area and has many addresses
  - Or if block is small but with lots of addresses (dense urban area)
  - Or if block size is large with fewer addresses (rural areas)











# Census Block Algorithm at Work

Small blocks  
bound by  
unnamed  
local roads  
(S1400)



# Census Block Algorithm at Work

Blocks  
created by  
roads in



cemeteries

# Census Block Algorithm at Work

## Highway ramps and intersections (S1630)



# Census Block Algorithm at Work

Excessive  
blocks  
within  
water areas





# Census Block Algorithm at Work

Islands  
within small  
water  
bodies



# Census Block Algorithm at Work

Traffic  
circles/triangles  
and cul-de-sac  
like circles



# Final Thoughts

Although the Census Bureau delineates blocks internally, our geographic partners have a large say in what the blocks look like.

Our Blocks are only as good as the underlying geography

Are the features spatially accurate?

Is the topology of features and boundaries accurate?

Are nesting and co-incident relationships accurate?