Investigation into Area Type and Walkability Measures

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Area Type

- Function of employment density and population density.
- Calculated based on 1-mile floating density.
- Used in:
  - Demographic Submodel: Vehicle Availability
  - Trip Generation (Trip attraction, truck trip generation, commercial vehicle trip generation)
  - Non-Motorized HBW Trip Model
  - Link free-flow speed and capacity calculation
- Motivation
  - New TAZ system
  - New land use
  - New calibration year

# Definition of Area Type

Version 2.2 Definition

Floating Population Density (Pop/Sqmi)	One- mile 'Floating' Employment Density (Emp/Sqmi)						
	0-100	101-500	501-1,500	1,501-5,000	1,501-15,000	15,001-35,000	35,001+
0-100	7	7	5	5	2	2	2
101-350	7	5	5	5	2	2	2
351-1,500	6	6	5	5	2	2	2
1,501-3,500	6	6	4	3	2	2	2
3,501-6,500	4	4	3	3	2	2	1
6,501-10,000	4	3	3	3	2	2	1
10,001+	3	3	3	2	2	2	1

New Definition

Floating Population Density (Pop/Sqmi)	One- mile 'Floating' Employment Density (Emp/Sqmi)						
	0-100	101-350	351-1,500	1,501-3,550	3,551-13,750	13,751-15,000	15,001+
0-750	6	6	5	3	3	3	2
751-1,500	6	5	5	3	3	3	2
1,501-3,500	6	5	5	3	3	2	2
3,501-6,000	6	4	4	3	2	2	1
6,001-10,000	4	4	4	2	2	2	1
10,000-15,000	4	4	4	2	2	2	1
15,001+	2	2	2	2	1	1	1

Area Type Map

AREA_TYPE

2	4	6
1	3	5
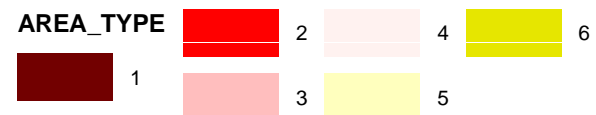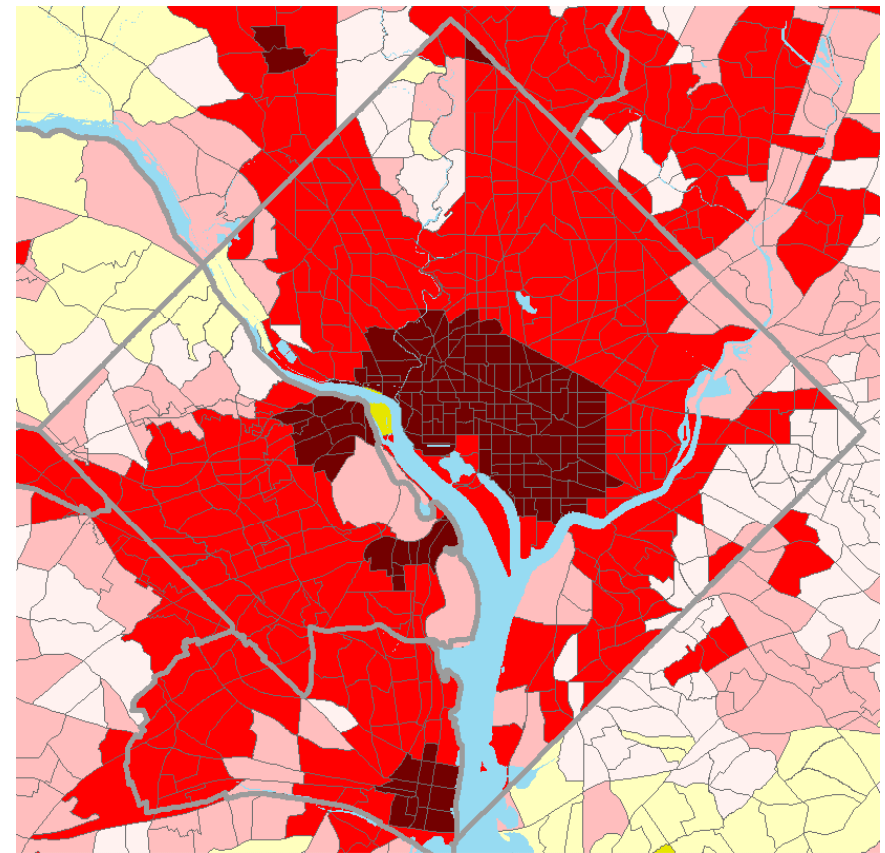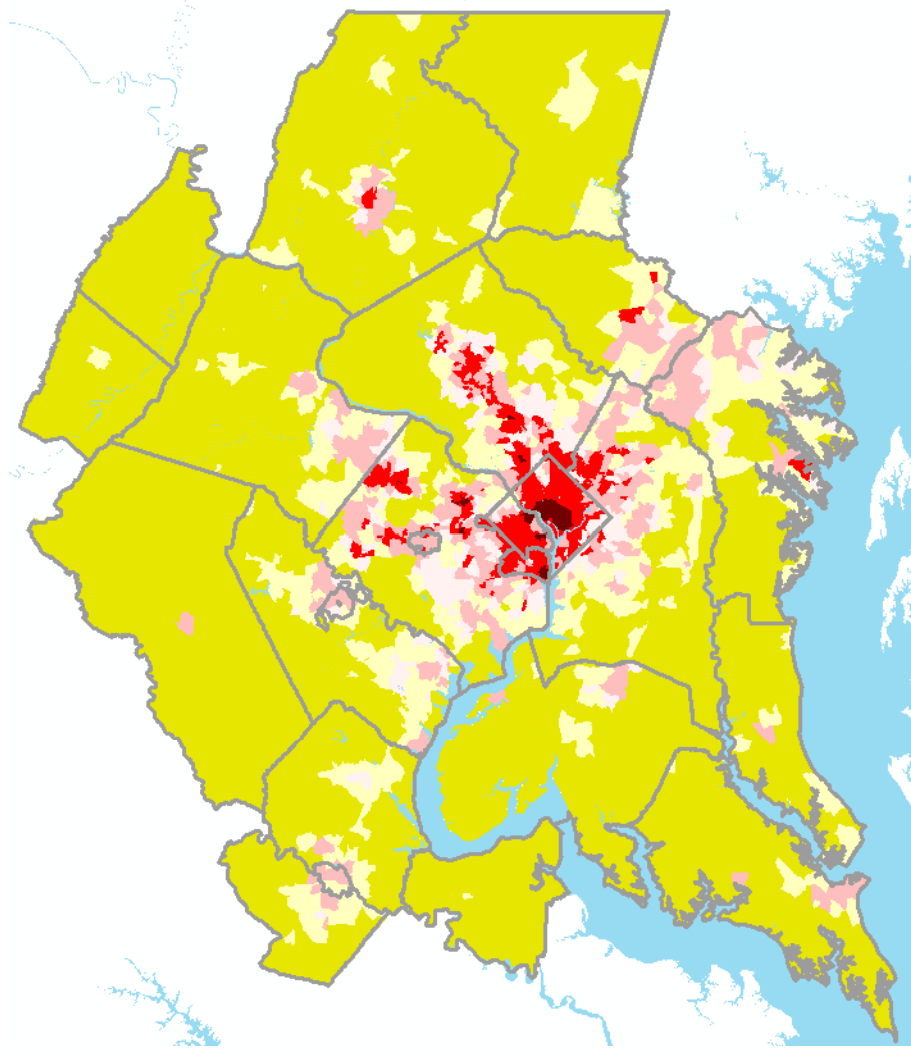
Accessibility Measures- PEF

- Other MPOs commonly use Pedestrian Environment Factor (PEF).
  - Consists of:
    - Sidewalk availability
    - Ease of street crossing
    - Connectivity of street/sidewalk
    - Terrain
  - Subjectively measured
- We don't have existing data and collecting it is infeasible for a large region.

Accessibility Measure- GIS

- Various authors suggest using objective GIS-based measures to assess accessibility.
- These include:
  - Street Density (Major& Minor)
  - Intersections (Number of 4-way & 3-way intersections)
  - Number of cul-de-sacs
  - Number of street blocks
  - Average street block size
- These measures are easier to calculate based on the existing network than the PEF and are arguably just as effective.
- Input network can be either highway network or NAVTEQ street network.

Street Density
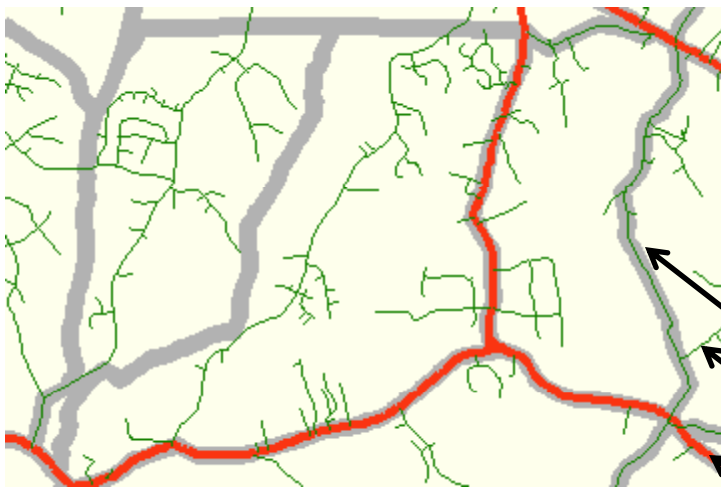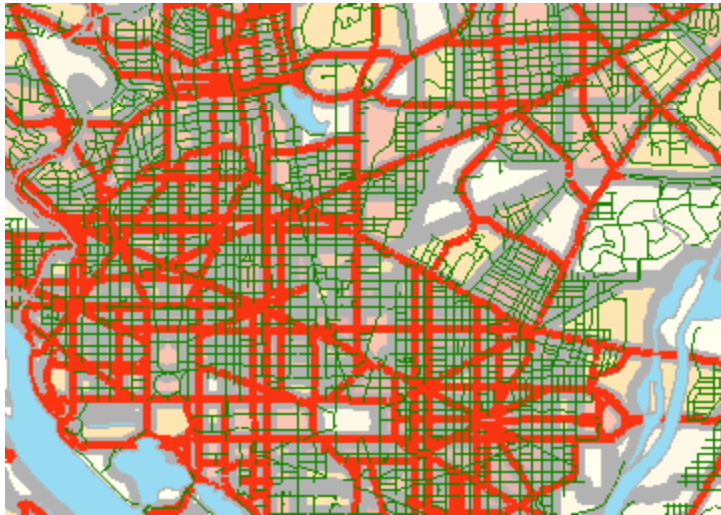
- A more extensive street network allows for shorter trips and thus encourages non-motorized travel.

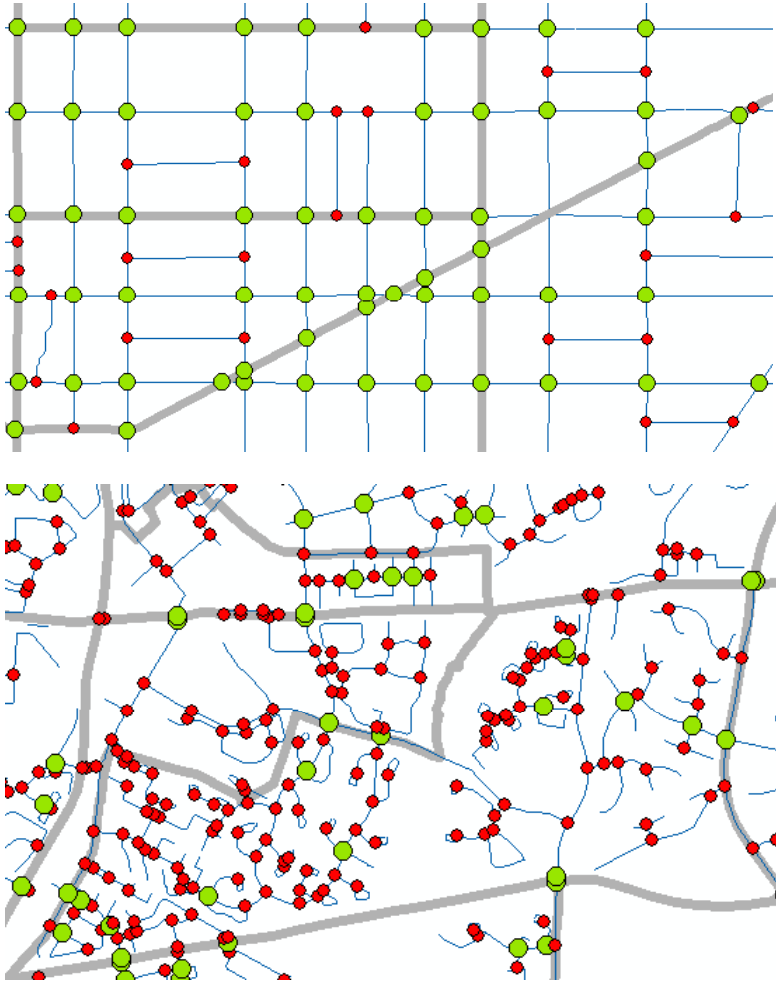- Calculated based NAVTEQ network with no freeways and ramps.

TAZ Boundary

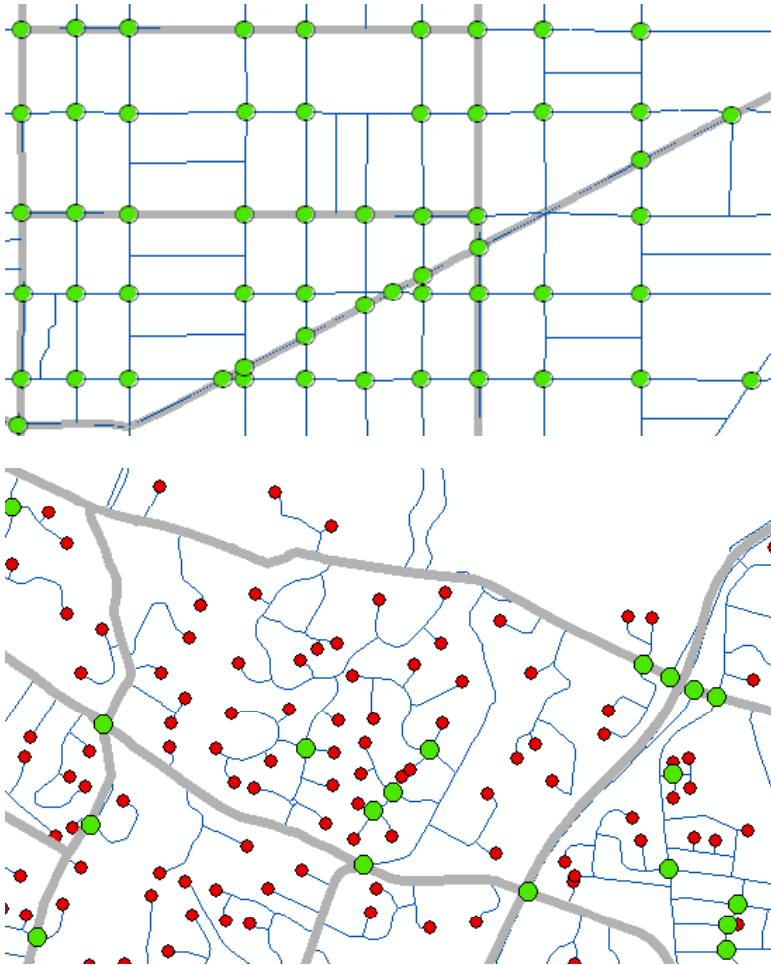Local Street

Arterial Street

Intersections

- 4-way intersections represent a well connected street network and promote walking.

- 3-way intersections make the path to destination longer and deter non-motorized travel.
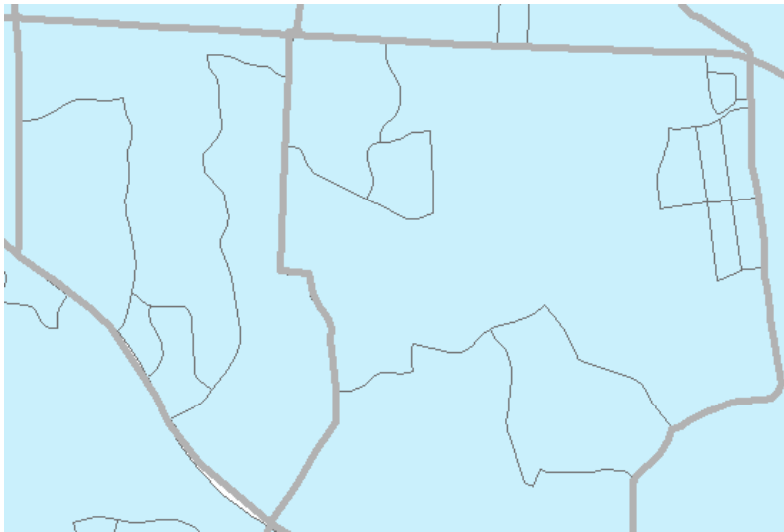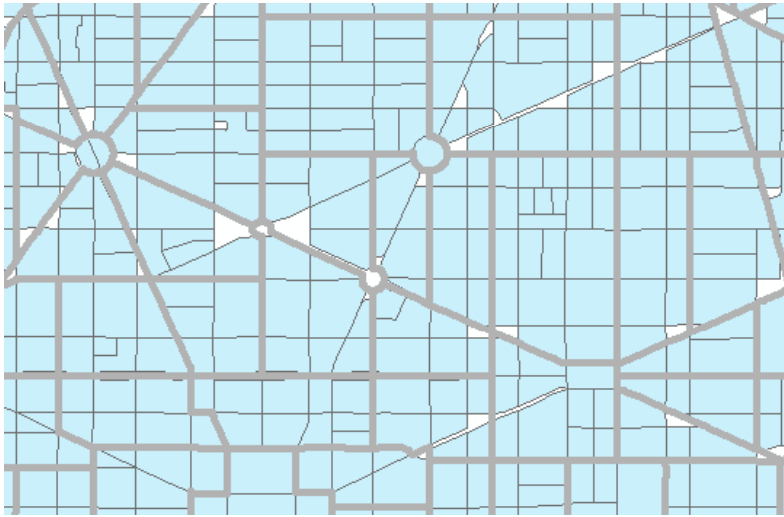
Cul-de-Sacs

- Cul-de-sacs make walking and biking more difficult because of the lack of network connectivity.

Blocks

- Fewer blocks per area indicate a poorly interconnected network of streets.

- Large block sizes make walking distances longer.

- Instead of street blocks, census blocks may be used as a proxy.

Next Steps

- Obtain non-motorized trip patterns from the Household Travel Survey

- Estimate non-motorized trip model based on GIS accessibility variables, employment density, and population density.

- Determine which accessibility factors have an impact on non-motorized travel.

Acknowledgements

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References

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