

Guiding Land Preservation Through Value Based Proximity Analysis

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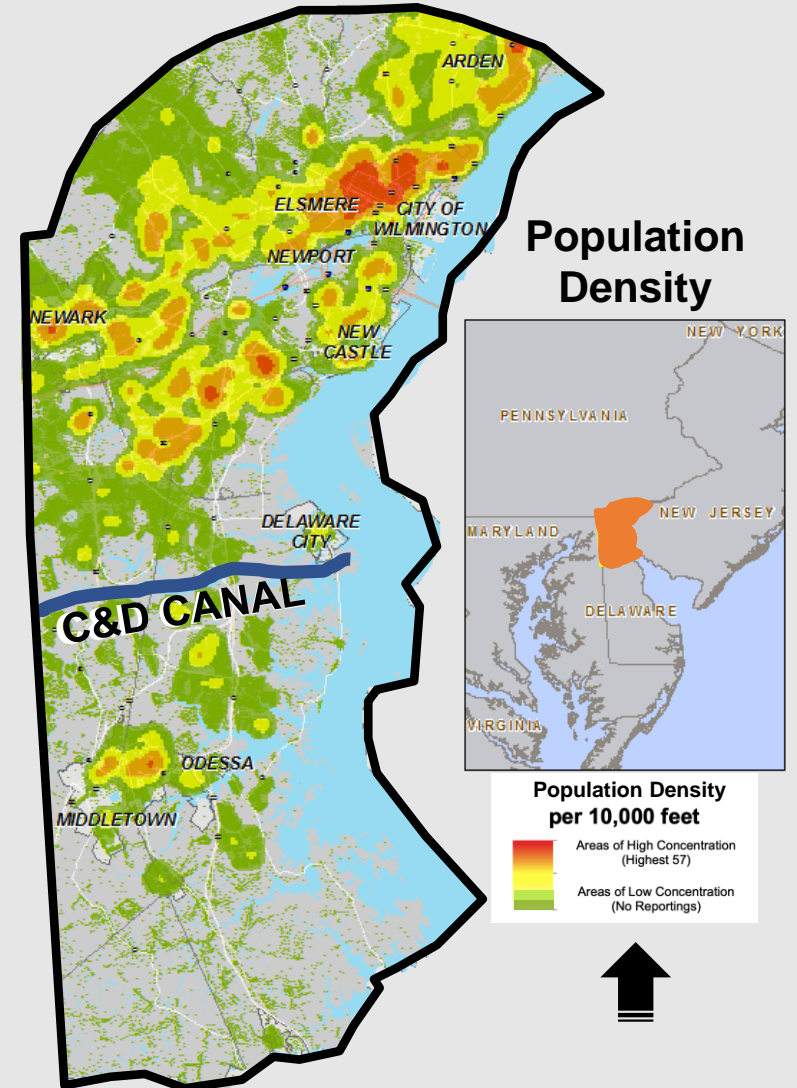
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Overview

- In order to interpret the value of preserving land, a defensible and reproducible approach is required that is broadly applicable.
- Pocketed planning allows an even distribution of land use, preservation of non-developed areas, & strengthens infrastructure.
- Urban Planning begins with defining a limiting boundary, while annexations can expand those boundaries, skyward development preserves open space & reduces cost from energy transportation.
- Environmental initiatives and the motivation for land development intersect through dollars spent.

Background, concerns, & efforts

- Population growth has raised awareness to concerns in our current process essentially reactionary versus proactive planning.
- Automation is being introduced to plan review process for developer feedback.
- GreeNCC Program (implemented 2019)
 - Sewer & Stormwater Management
 - Open Space Turnover
 - Land Preservation



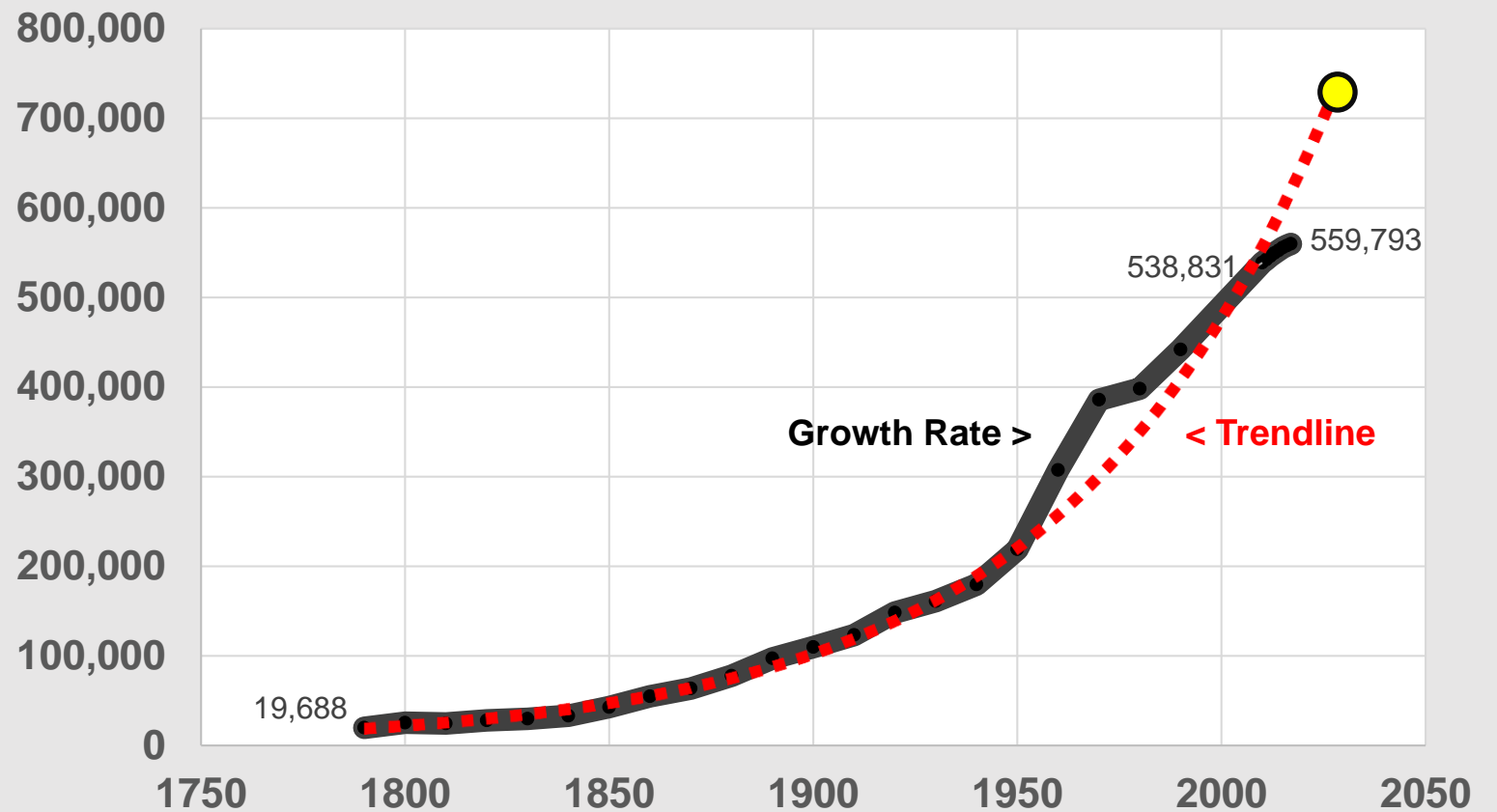
Acknowledging population growth

Census trends:
no decrease in
growth rate since
1810

2016 to 2017:
.35% growth

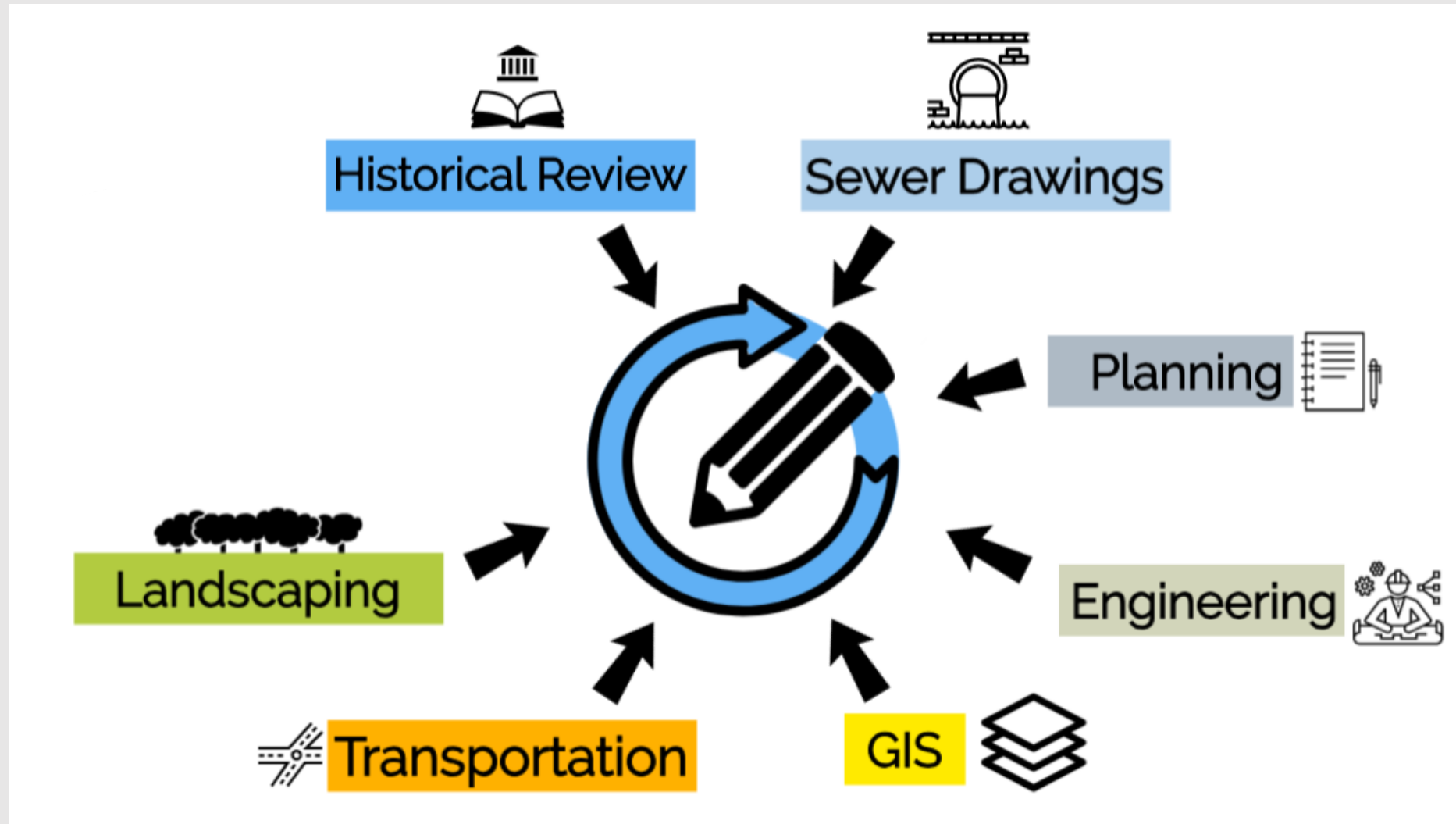
Estimated 2027
population
720,000

New Castle County Population Growth (1790 - 2017)



<http://worldpopulationreview.com/us-counties/de/new-castle-county-population/>

Current Project Plan Review Process



Land Preservation approach

- Agreeing to develop a “green map” prioritizes proper planning
 - Parks, Nature Areas, Sport Complexes, Plazas
 - Open spaces considered oases of greenery & heritage in a concrete desert ^[4]
- Repurposing abandoned roads to bike trails creates neighborhood connectivity to retail and parks
 - Improves quality of life
 - Reduces stress from densification
 - Feeds the local economy through consumerism
- Attempting to show value through models ^[1]

Goals and Objectives

- GIS analysis-based evaluation process has been developed & offers consistency, documentation, and reproducibility.
- Introducing land preservation strategies with the intent to improve quality of life for residents in New Castle County.
- Development pressure threatens land preservation, pocketed planning areas (near environmental areas) will be protected.
- Slow the expansion of poorly planned residential neighborhoods.

Sociotope Mapping: Alexander Stahl

- People share use values but that every open space has a unique set of values.
- Pocketed development guides planned development.
- Mapping commonly perceived direct use values of a place by a specific culture or group.
- Part of the communicative turn in postmodern urban planning, focusing on dialogue and citizen participation. ^[2]

GIS Analysis

- Land value types of open space, farm land, protected lands, and parks are assessed for their proximity to each other, sewer access, and public transportation.
- Calculated proximity scores are then used to assign a land valuation to be considered during the approval stage of a proposed land development.
- Through the assessment of pre-determined criteria and the determined valuation in the land review process, long-range planning, assessment, and the management of existing and proposed open space can develop. ^[3]

Analysis Criteria

New Castle County Datasets:

- Parcel Features
 - ownership, parcel id, & property class
- Sewer customers
 - database with parcel id & address
- Agricultural Land
 - assessment records by parcel id
- Parks & Open Space
 - name, acreage, & status

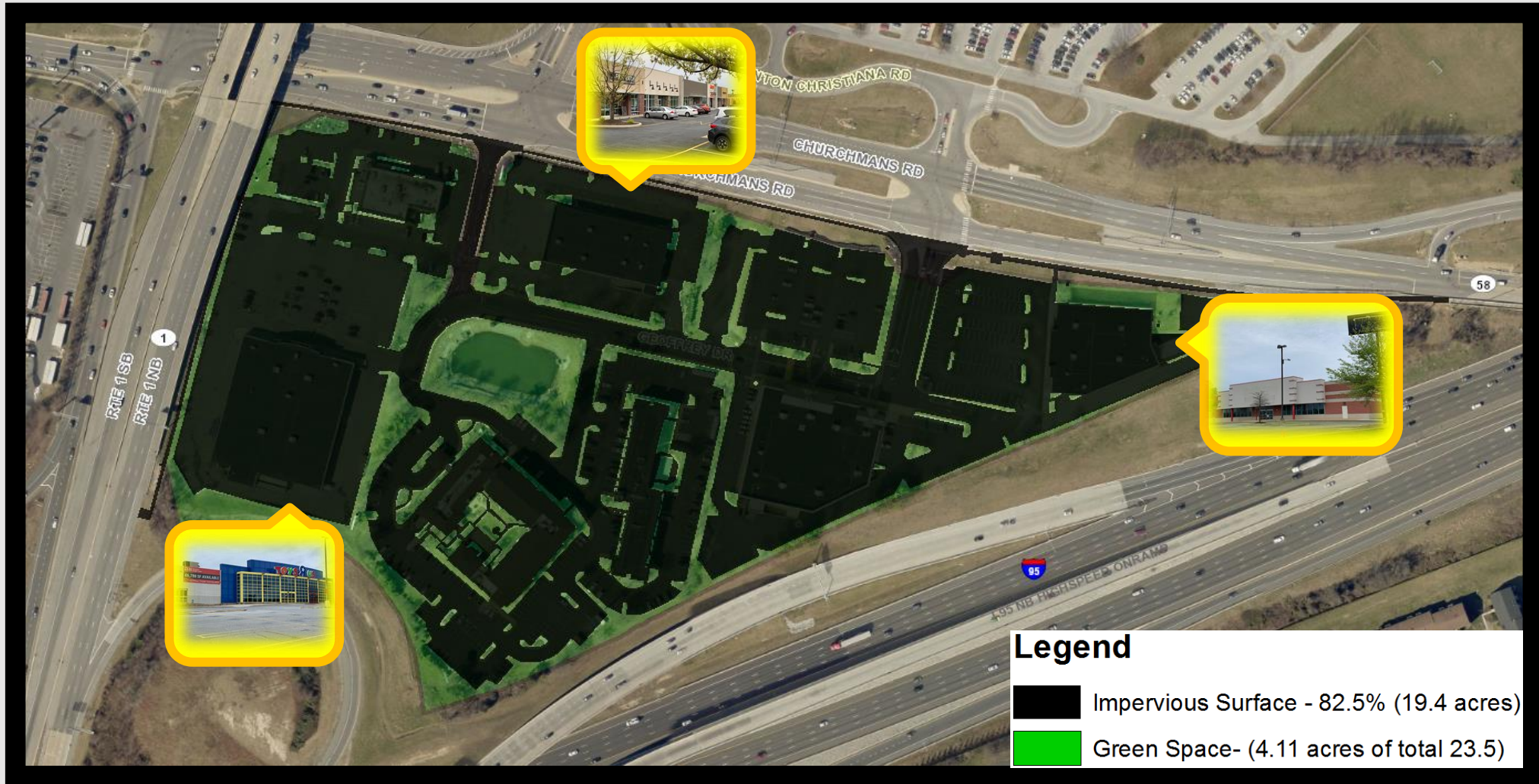


Study Area: Stafford Metro Center



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Impervious surface creep



Data Sources

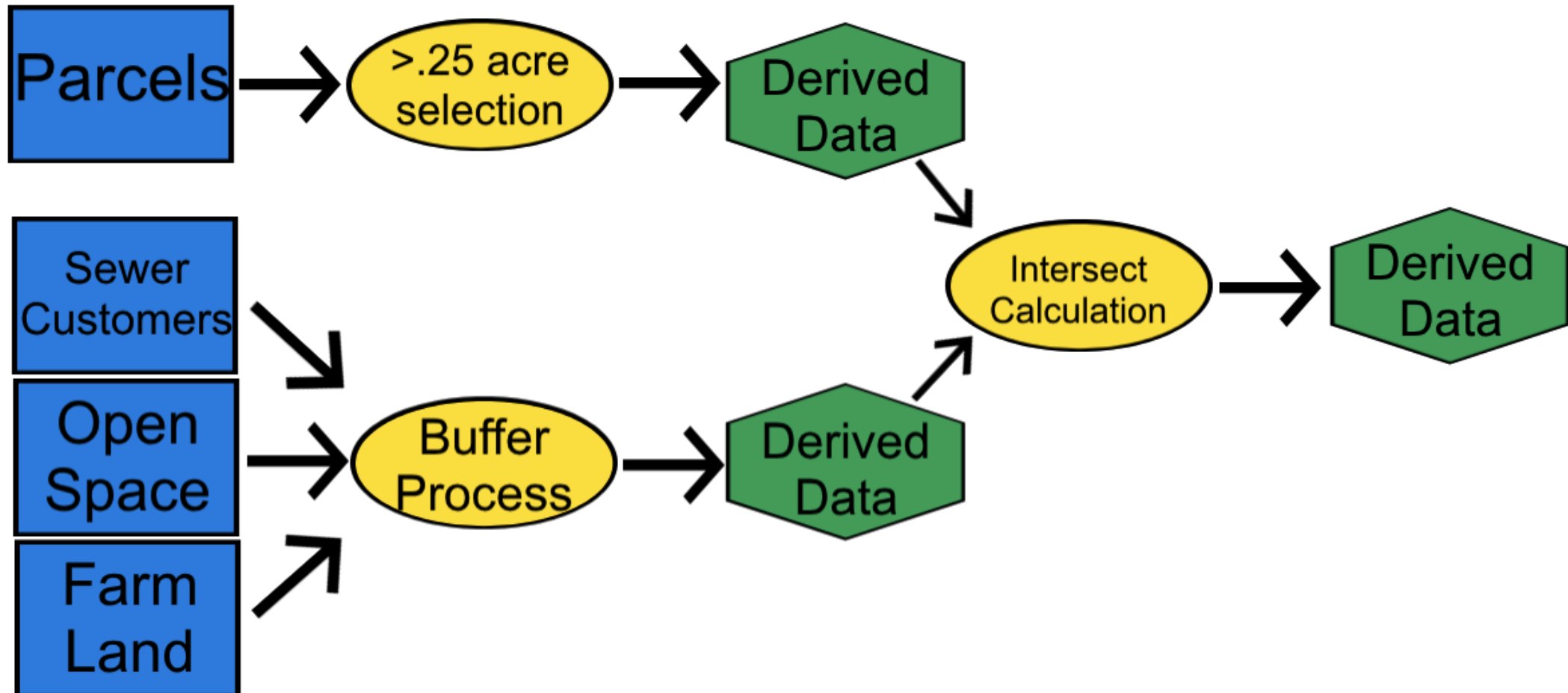
- Beginning with obtaining authoritative GIS datasets, the source is New Castle County Department of Land Use- GIS Services.
- Identifying PERTINENT data holistically includes environmental data types: agricultural lands, open space, parks, state lands.
- Land based data includes parcels, centerlines, & sewer assets.
- Property sale values recorded in the New Castle County computer assisted mass-appraisal system (CAMA) provide dollar amounts.

Data Analysis

- Multi-ring buffered analysis determines proximity.
- As each dataset is assessed for relationship to an associated buffer region, fields are added and populated with appropriate score.
- As process is complete, scores are summed into final attribute column and can fluctuate based on buffer range and number of datasets assessed.
- Entire manual process will be converted to Model Builder/Python script for review of “Land-Preservation” component in plan review.

Scoring Priority with Technology

Model Builder: Processing lots for proximity to supporting data

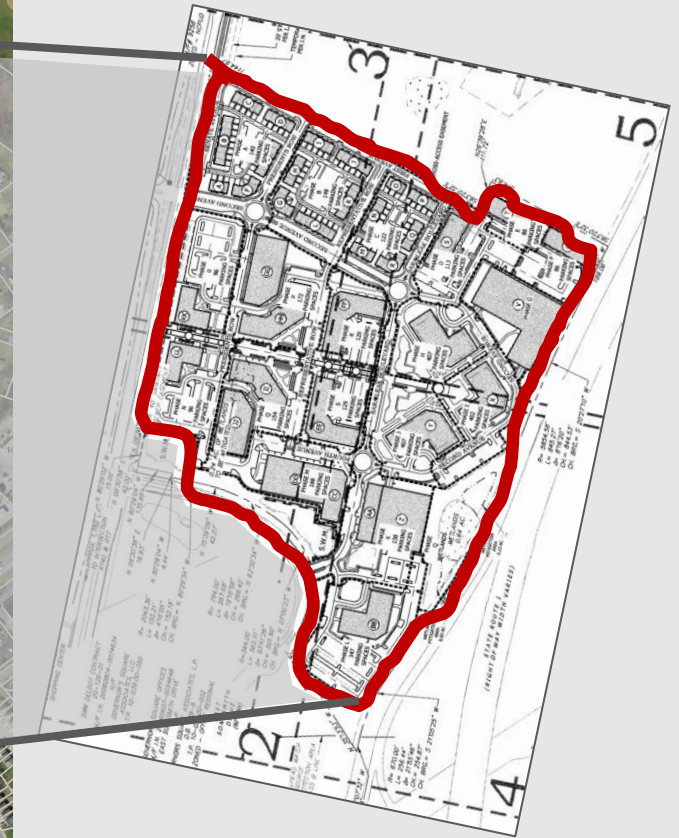


Study Area: Lincoln Center

56 acres
shopping
center

Approved plan
since 2013, no
ground
broken

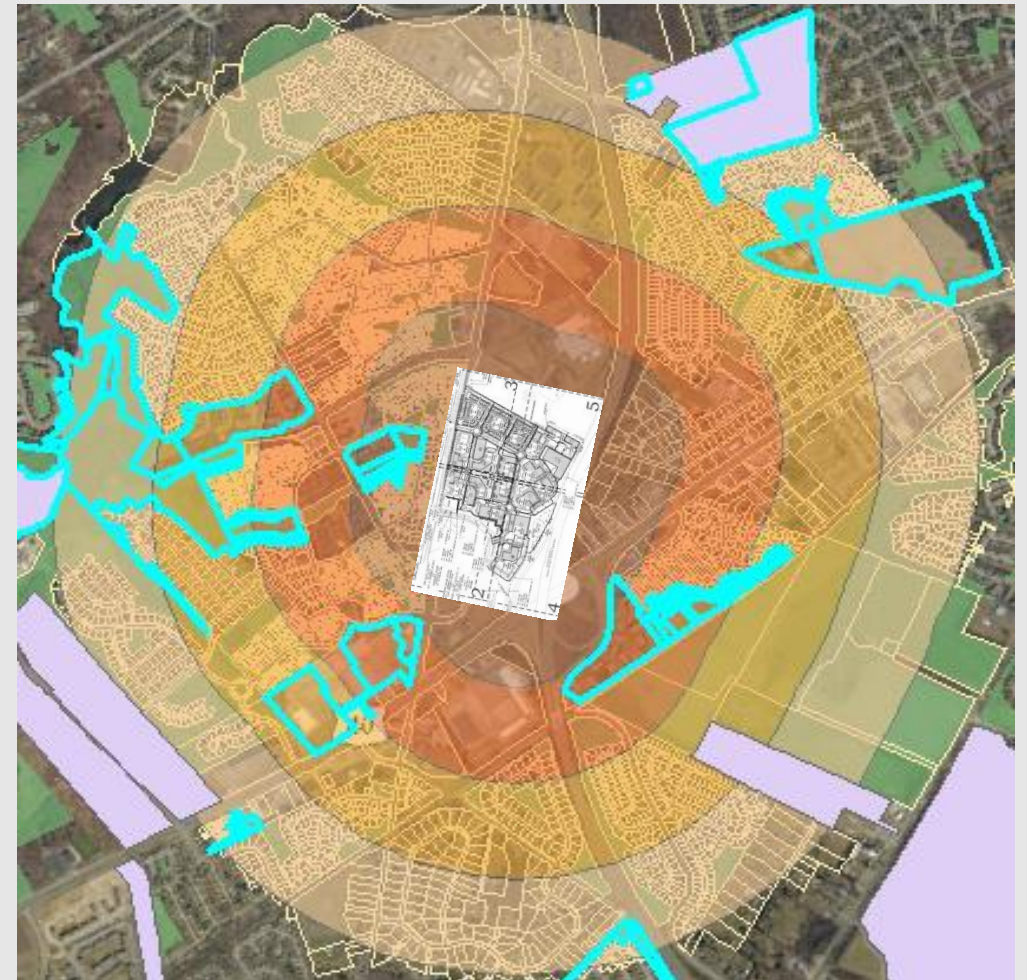
Nearby
cemetery



Study Area: Lincoln Center

Count: 5408
 Minimum: 0
 Maximum: 16109049.4286
 Sum: 22976787478.72942
 Mean: 4248666.32373
 Standard Deviation: 1542334.402932
 Nulls: 0

Parcel ID	Open Space	Sewer	Park	Farmland	High Sales	Calculated Total
1004500001	1	1	0	1	5369683.1428	16109049.4286
1003320001	0	1	1	1	4189683.1428	12569049.4286
1002800036	0	1	1	1	3669718.1428	11009154.4286
1004510022	0	1	0	1	5379704.1428	10759408.2857
1004510021	0	1	0	1	5379703.1428	10759406.2857
1004510007	0	1	0	1	5379689.1428	10759378.2857
1004420060	0	1	0	1	5289742.1428	10579484.2857
1004420059	0	1	0	1	5289741.1428	10579482.2857
1004420058	0	1	0	1	5289740.1428	10579480.2857
1004420057	0	1	0	1	5289739.1428	10579478.2857
1004420056	0	1	0	1	5289738.1428	10579476.2857
1004420055	0	1	0	1	5289737.1428	10579474.2857
1004420054	0	1	0	1	5289736.1428	10579472.2857
1004420053	0	1	0	1	5289735.1428	10579470.2857
1004420052	0	1	0	1	5289734.1428	10579468.2857
1004420051	0	1	0	1	5289733.1428	10579466.2857
1004420050	0	1	0	1	5289732.1428	10579464.2857
1004420049	0	1	0	1	5289731.1428	10579462.2857
1004420048	0	1	0	1	5289730.1428	10579460.2857
1004420047	0	1	0	1	5289729.1428	10579458.2857
1004420046	0	1	0	1	5289728.1428	10579456.2857
1004410081	0	1	1	0	5279763.1428	10559526.2857
1004010011	0	1	1	0	4879693.1428	9759386.28572

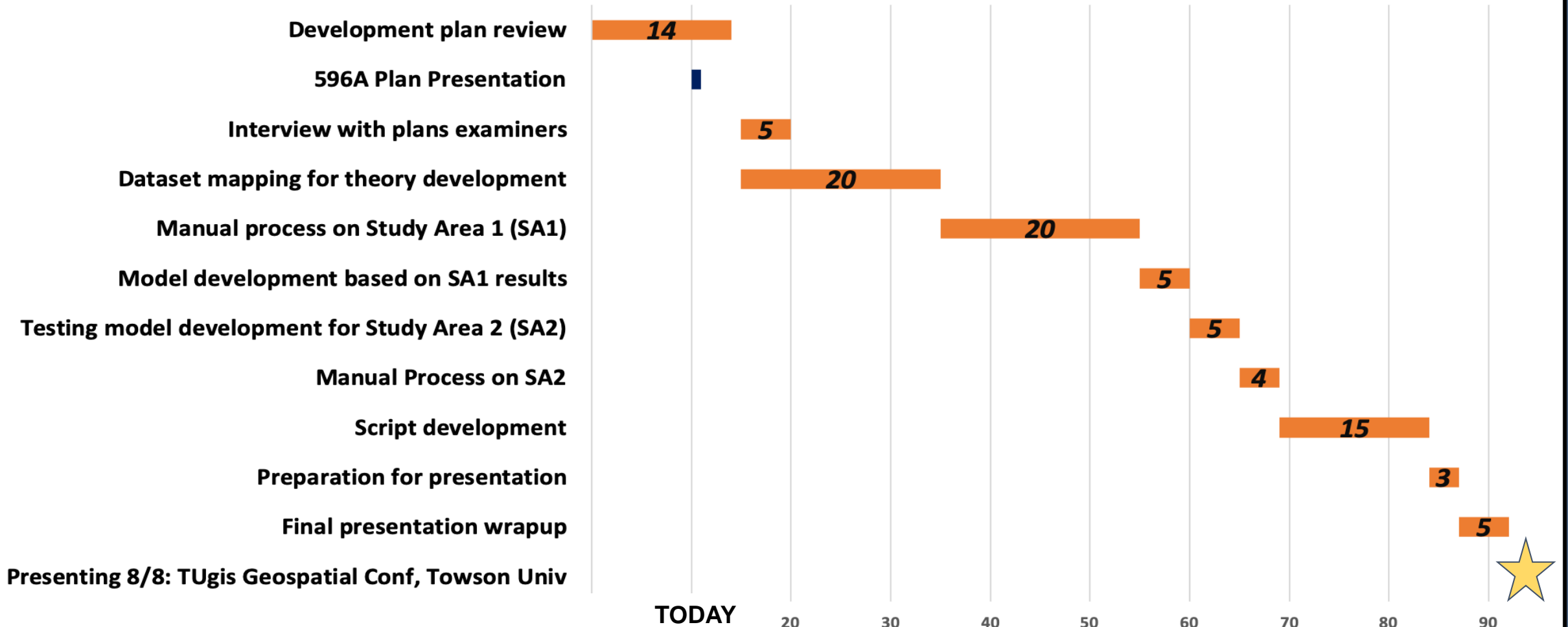


Anticipated Results & Implications

- Agricultural land and open space calculated acreage will slow in pace of consumption.
- Pocketed Planning will begin to develop- prioritizing land preservation and mixed-use residential development plans.
- Commercial development will congregate in centralized areas.
- Sewer infrastructure planning will guide expansion below C&D Canal for growing housing demand.
- Reduced approval of commercial development on unbroken land.

Project Timeline

Scope of Land Preservation Maintenance Plan



References

1. Mincozzi, Joseph (2019) Mapping Dollar and Sense of Land Use. Location: Esri Geodesign Conference. Retrieved from: <https://youtu.be/uQ25P8gB4d4>
2. Ståhle, Alexander (2006) Sociotope mapping- exploring public open space and its multiple use values in urban and landscape planning practice. Location: Nordic Journal of Architectural Research Volume 19.
3. Vajjhala, Shalini P (2005) Integrating GIS and participatory mapping in community development planning. Paper for the Esri Int. Conf. Retrieved from: <http://proceedings.esri.com/library/userconf/proc05/papers/pap1622.pdf>
4. Willet, Kendis (2000) An interactive GIS approach in open space planning using a multiple criteria ranking system. Location: Winnona, Minnesota. Retrieved from: <http://www.gis.smumn.edu/GradProjects/WilletK.pdf>

Questions?

