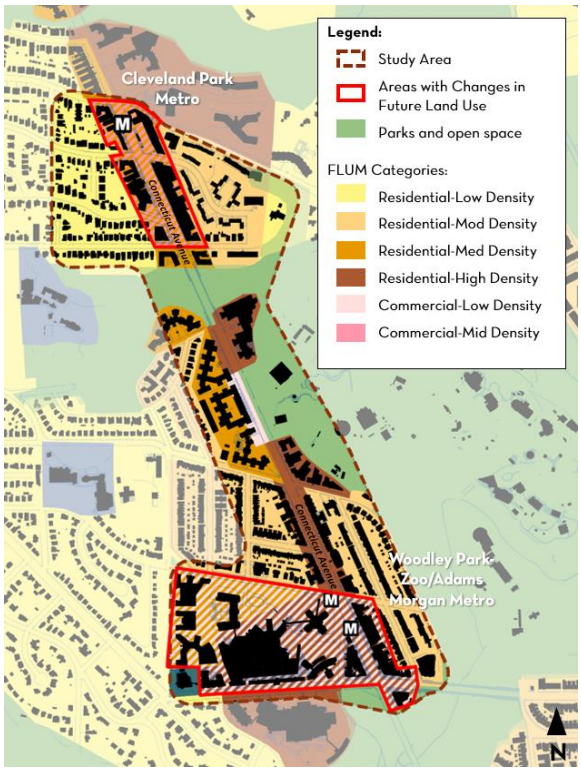
Connecticut Avenue Development Guidelines:
Infrastructure Assessment

November 30, 2023

Executive Summary:

This infrastructure assessment[i], prepared in connection with the *Connecticut Avenue Development Guidelines,* evaluates infrastructure demand and capacity in the Upper Connecticut Future Planning Analysis Area.[ii] The Comp Plan future land use policy as detailed through the *Connecticut Avenue Development Guidelines* (figure 1) will likely lead to an increase in population, households, and jobs within the study area. These new residents and workers will likely increase the demand for electricity, water, multimodal transportation, and solid waste management.

Figure 1: *Map of Connecticut Avenue Development Guidelines Study Area and Future Land Use Policies.*



The increased demand for infrastructure systems identified in this assessment are not anticipated to occur within the next twenty-five years, the time horizon of the District's long-range population, households, and jobs forecast[iii]. Infrastructure is planned at a high level over the long term, which can range from ten years to more than fifty years depending on the system and is updated on an annual basis as needs evolve.

In comparing future demand to existing infrastructure, it is important to note the following:

- Infrastructure planning occurs through well-established processes that the District and regional utilities use to ensure infrastructure systems are continually improved to meet demand.
- The District has a 5-year Capital Improvement Plan (CIP) that funds transportation improvements and waste management facilities. The CIP is updated annually.
- Regional utilities and authorities, including WMATA, Pepco, and DC Water, use long-range population and employment forecasts to ensure the District's current and future residents and businesses can access clean water, electricity, and public transportation.

This assessment does not account for the economic feasibility of construction or market conditions that would indicate when development might occur. Additionally, this assessment does not consider how changes in technology or consumer preference could impact future infrastructure demand. For these reasons, this assessment should not be interpreted as a development forecast but rather as an exercise to evaluate infrastructure improvements that could be needed over the long term.

Analysis Overview:

This assessment has two components:

- Demand Assessment – an evaluation of how new real estate development could impact infrastructure use. This assessment was conducted by OP.
- Capacity Assessment – an evaluation of existing infrastructure systems to determine if they can accommodate potential new demand. Utilities and District agencies provided OP with information about the capacity of the infrastructure they manage.

The assessment looks at three scenarios to understand how potential new development could impact infrastructure:

1. The Baseline Scenario evaluates the study area's existing conditions. OP estimated the current number of households, population, jobs, and infrastructure demand from the existing gross building area (GBA) of buildings within the study area. Using industry-standard factors, OP also used GBA to estimate current infrastructure demand based on area, density, and occupancy by each parcel's land use classification.

2. The Theoretical Full Buildout Scenario estimates households, populations, jobs, and infrastructure demand using the theoretical maximum GBA under the 2021 FLUM for every property with any additional building capacity within the study area. For this scenario, future GBA estimates are derived from OP's land use capacity analysis**.** This scenario is very unlikely to occur because many of these sites are unlikely to be financially beneficial to redevelop as this scenario envisions, and redevelopment of some sites are limited by factors that are not considered, such as challenging site conditions including steep slopes and irregular parcel shapes.

3. The 2021 FLUM Buildout Scenario estimates households, populations, jobs, and infrastructure demand generated by properties within the study area where FLUM land use designations were updated as part of the 2021 amendment to the Comp Plan. These are the areas where land use policy is most likely to result in changes in use and intensity. For this scenario, the future theoretical GBA estimates are derived from a massing model produced through the planning process, which reflects the most likely way these parcels might be developed.

Both scenarios two and three includes large redevelopment projects currently planned or under construction within the study area, including the Marriott Wardman Park hotel to residential conversion in Woodley Park and the Macklin mixed-use infill development in Cleveland Park. The estimates generated for both future scenarios are greater than the District's long-range forecast, which covers a 30-year period (2020-2050). Based on the District's long-range forecast, the growth in population, households, jobs, and infrastructure demand would likely extend beyond 2050.

Demand Assessment:

OP estimated infrastructure demand for the *Connecticut Avenue Development Guidelines* study area. Metrics used to evaluate infrastructure demand include:

- Electricity Demand – *Kilowatts (KW)*[iv]
- Water Demand – *Gallons consumed per day (gal/day)*
- Waste Generation – *Pounds produced per day (lbs. /day)*
- Trip Generation and Attraction[v] – *Frequency of person trips per day*[vi]. Trips includes mode split during peak hours for trips made by transit (bus and metro), walking, biking, and vehicles.[vii]

Tables 1 and 2 provide of overview of the demand assessment results for the Baseline, Theoretical Full Buildout, and 2021 FLUM Buildout scenarios.

Table 1: *Infrastructure demand by scenario. All estimates are rounded to the nearest hundreds place.*

Scenario	Households	Population	Jobs	Electricity (KW)	Water (gal/day)	Waste (lbs./day)	Trip Gen (person trips/day)
1. Baseline	5,600	7,600	1,100	29,600	1.53 M	37,900	50,100
2. Theoretical Full Buildout	9,100	12,000	1,800	47,600	2.42 M	58,700	97,000
% Change from Baseline	61%	58%	55%	61%	58%	55%	94%
3. 2021 FLUM Buildout	7,400	9,900	1,300	38,400	2.03 M	48,600	69,000
% Change from Baseline	31%	30%	14%	30%	32%	28%	38%

Table 2: *Trip generation and attraction with mode split by scenario. All estimates are rounded to the nearest hundreds place.*

Mode	Transit (people/day)	Walk (people/day)	Bike (people/day)	Vehicle (vehicles/day)
Mode Split	35%	22%	3%	40%
Scenario				
1. Baseline	17,500[viii]	11,000	1,500	16,900
2. Theoretical Full Buildout	34,000	21,300	2,900	32,900
Net Increase from Baseline	16,500	10,300	1,400	16,000
3. 2021 FLUM Buildout	24,200	15,200	2,100	23,400
Net Increase from Baseline	6,700	4,200	600	6,500

Capacity Assessment:

For the capacity assessment, OP requested input from District agencies and utilities to understand each infrastructure current system capacity and the process for capital improvement planning that can meet future demand.

Pepco (electricity capacity): Based on the demand assessment, Pepco anticipates that the current infrastructure in this area of Connecticut Avenue Development Guidelines study area will have adequate capacity to supply the load growth for both scenarios presented. Growth in surrounding areas may affect Pepco's existing facilities. Pepco conducts an annual forecast of the distribution system by analyzing the load versus capacity for each feeder and substation to identify any planning criteria violations in within the next ten years and determines actions to mitigate the violations, if any. Some ways Pepco mitigates those violations are with the addition of new substations, transformers, feeders, and non-wire alternatives.

DC Water (sewer and water capacity): DC Water is unsure if the sewer and water systems have the capacity for the Theoretical Full Buildout and FLUM Build Out scenarios. This area's existing local sanitary sewer systems are running at full capacity. Wastewater generated by future developments may impact some local sanitary sewers. Additionally, the existing water system in this area is running at full capacity. For adequate future demand, DC Water recommends developers consider upgrading existing water mains, local sewers, and water lines in affected areas.

District Department of Transportation (DDOT) (transportation systems capacity): These land use changes could require additional multimodal transportation capacity over the long-term. DDOT's Development Review Program will evaluate the impacts of land development actions on the District's multimodal transportation network as specific properties develop in the future.

DC Department of Public Works (DPW) (waste management capacity): The new development considered in this analysis would not have a serious impact on current waste management capacity. DPW manages solid waste removal for residential structures with four or fewer units. New development would almost exclusively produce buildings with more than four units. Property owners for these new buildings would be responsible for procuring private waste management services, which are readily available.

[i] The District's *Comprehensive Plan* (Comp Plan) calls for planning within Future Planning and Analysis Areas (FPAAs) to evaluate how changes to the Future Land Use Map (FLUM) could affect infrastructure at full buildout. For this analysis, "full buildout" refers to a property maximizing the available gross building area based on the lot size and floor-area ratio (FAR) allowed under existing or future land use designations. See Appendix A for the Study Area Geography and Future Land Use Policy Maps. See appendix A for the Study Area geography and future land use policy maps.

[ii] The District's Comprehensive Plan defines FPAAs as "large tracts and corridors where future analysis is anticipated to plan for inclusive, equitable growth and climate resilience." (Policy LU-1.1.1).

[iii] OP prepares a long-range (30 year) forecast of job, household, and population growth approximately every two years for the Metropolitan Washington Council of Governments' (COG) regional transportation planning efforts.

[iv] OP developed estimates for existing and future electricity demand, in kilowatts, using general electricity demand rates typically used in the Washington DC area.

[v] The demand assessment for transportation utilizes *trip generation* and *trip attraction*, which differs from *Annual Average Daily Traffic (AADT). AADT* Takes in all vehicle trips on a segment of road or highway during a yearlong interval in both directions and then divides the total by 365 days to arrive at the average number of daily trips. On the other hand, *trip attraction* and *trip generation* predict the number of trips originating or destined for a particular area.

[vi] *DDOT's multi-modal approach to site-level development is to view trip generation in terms of person-trips rather than vehicle-trips. See DDOT's Guidance for Comprehensive Transportation Review for details.*

[vii] DDOT provided OP with estimations for mode split for the Connecticut Avenue Corridor.

[viii] *Baseline transit trips are not based on the WMATA ridership data from Calvert Street to Cleveland Park Metro segments or local bus services. Additionally, these estimates do not account for the significantly reduced ridership in 2021 due to the COVID-19 pandemic.*