

Land Use Planning and Water & Sewer Capacity Update

BOCC Presentation on Orange County Draft Land Use Plan

October 14, 2025



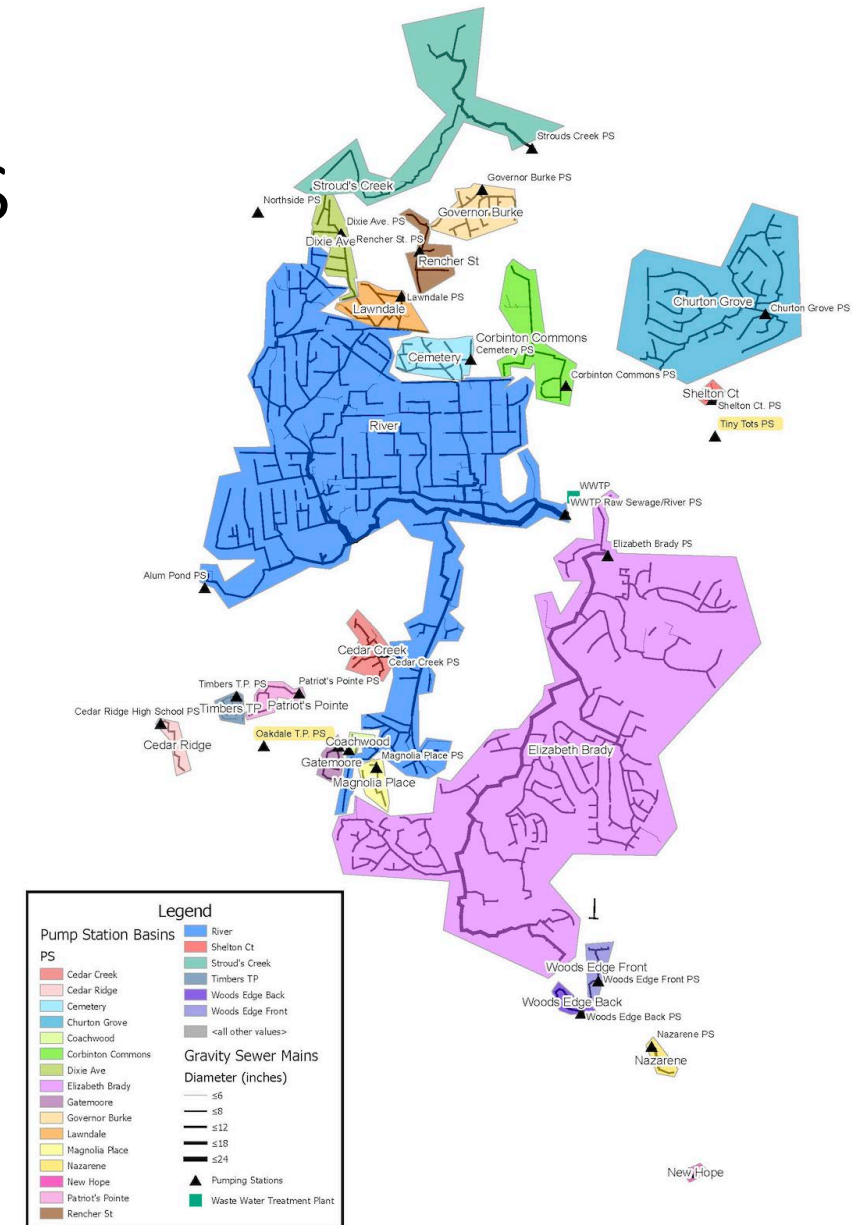
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Topics

- Town Water & Sewer Capacity Constraints and Updates
- Town and County Land Use Planning Updates and how Hillsborough is planning for sustainability through coordinated land use, utilities, and transportation planning

Water & Sewer Capacity Status

- Water treatment capacity remains, sewer treatment plant capacity is constricted by permit limits
 - Projection through 2040
 - Projects based upon water capacity spreadsheet provided by planning department – committed and potential
 - River sewer basin is capacity constrained due to wet weather
 - Monitor Elizabeth Brady sewer basin
 - Other smaller sewer pumping stations projected capacity concerns
 - Additional developments that are already approved will use more treatment plant capacity
- Currently working on water system capacity modeling
- Given the constraints with pressure and water quality, the Town is reserving the remaining sewer capacity for projects that can be served with better quality water at higher pressures.



Water Supply

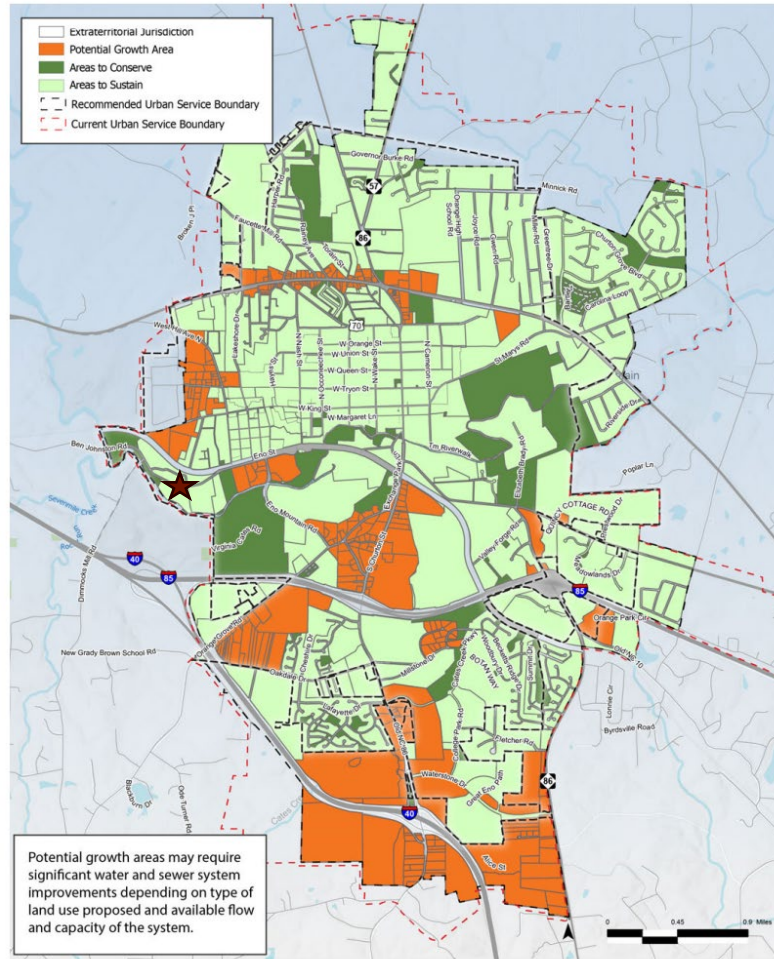
- WFER

Condition	Depth	Mean Elevation	Total Storage (gal)	Unusable Storage (gal)	Usable Storage (gal)	% Remaining Useable Storage (gal)	Current Average Daily Use (gpd)	Streamflow Augmentation (gpd)	Channel Loss Multiplier	Lake Orange Supplement (gpd)	Estimated Remaining Days of Storage	Days Remaining with 20% Evaporation
Phase 2 Full	53	643	1,829,157,124	7,692,649	1,821,464,475	100%	1,700,000	650,000	1.2		645.91	516.73

- Jordan Lake Allocation (1 MGD)

Water Quality

Figure 4.4. Potential Growth Areas



Source: The Town of Hillsborough

- Water service area reduced to decrease the distance from the Town's water plant
- The Urban Service Boundary was adjusted most significantly on the eastern side of the system, the water plant is on the western edge of the Town's service area.

Water Quality

- The further water gets from our water treatment plant, the longer it sits in the pipes and tanks
- Water age affects water quality. Older water has lower chlorine and increase risk of developing disinfection byproducts
- Town changes disinfection process and flushes annually to address water quality, but the volume of water required is significant

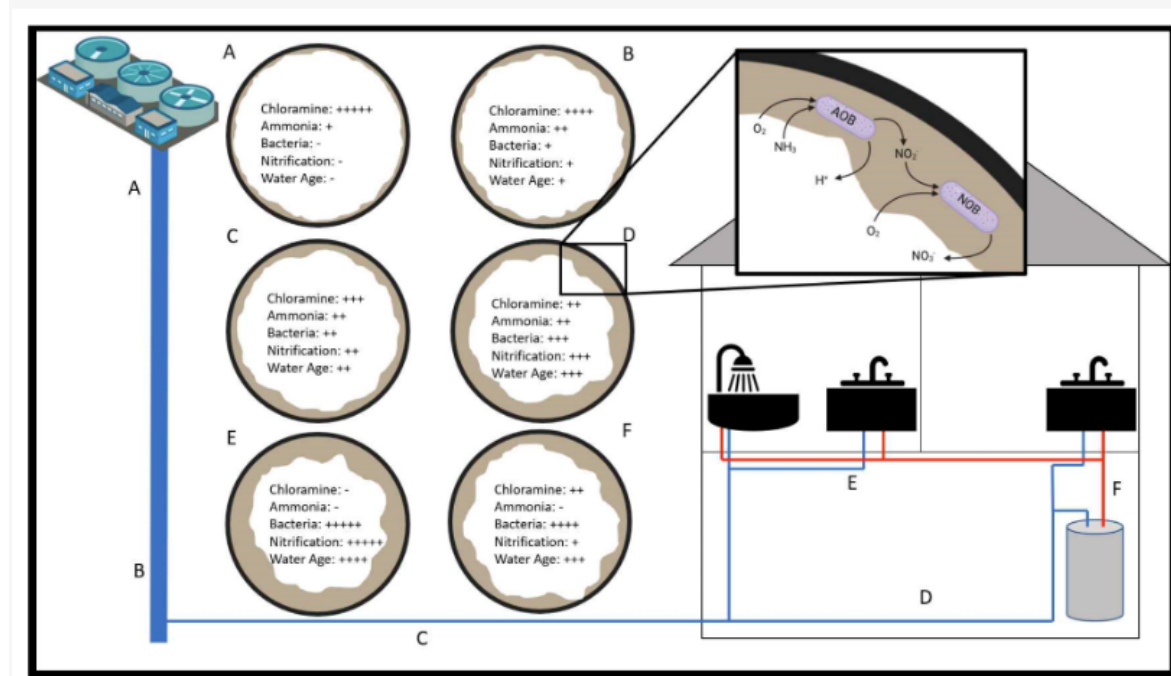
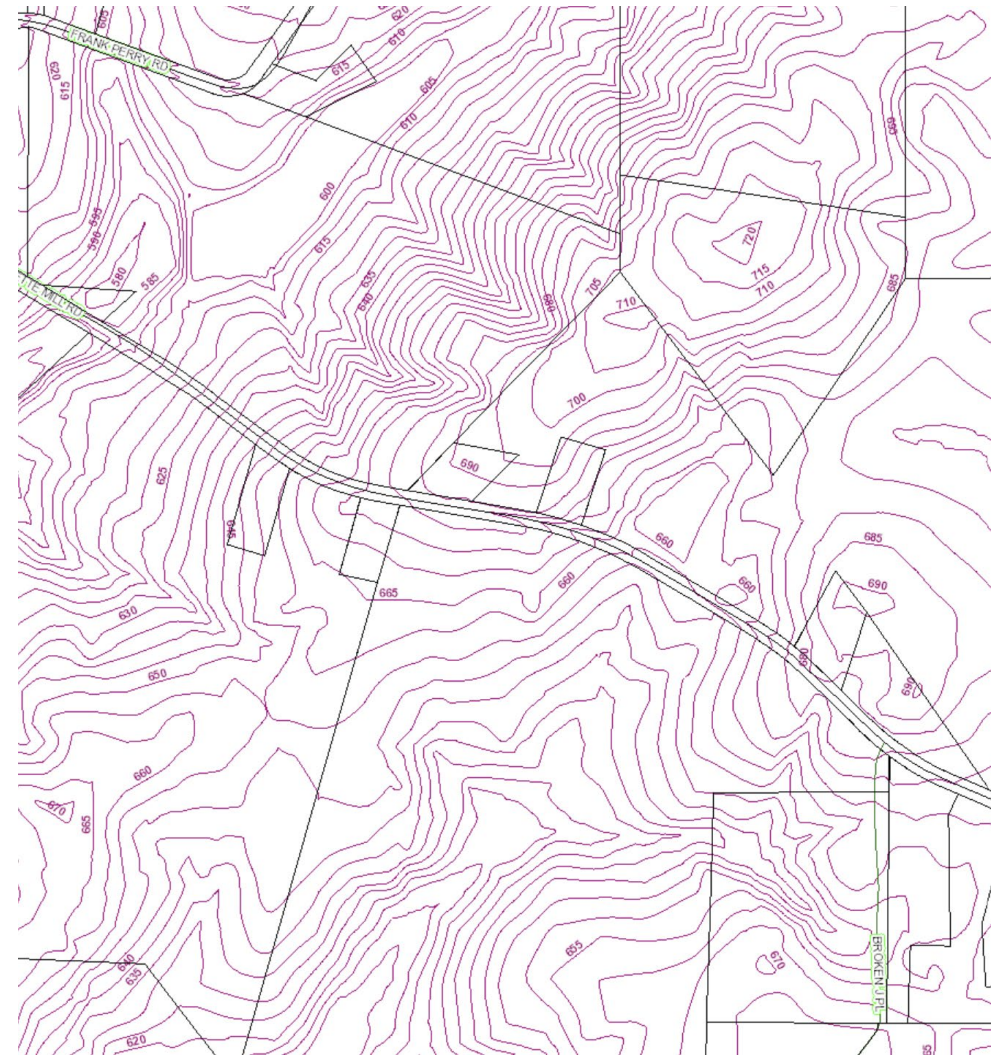


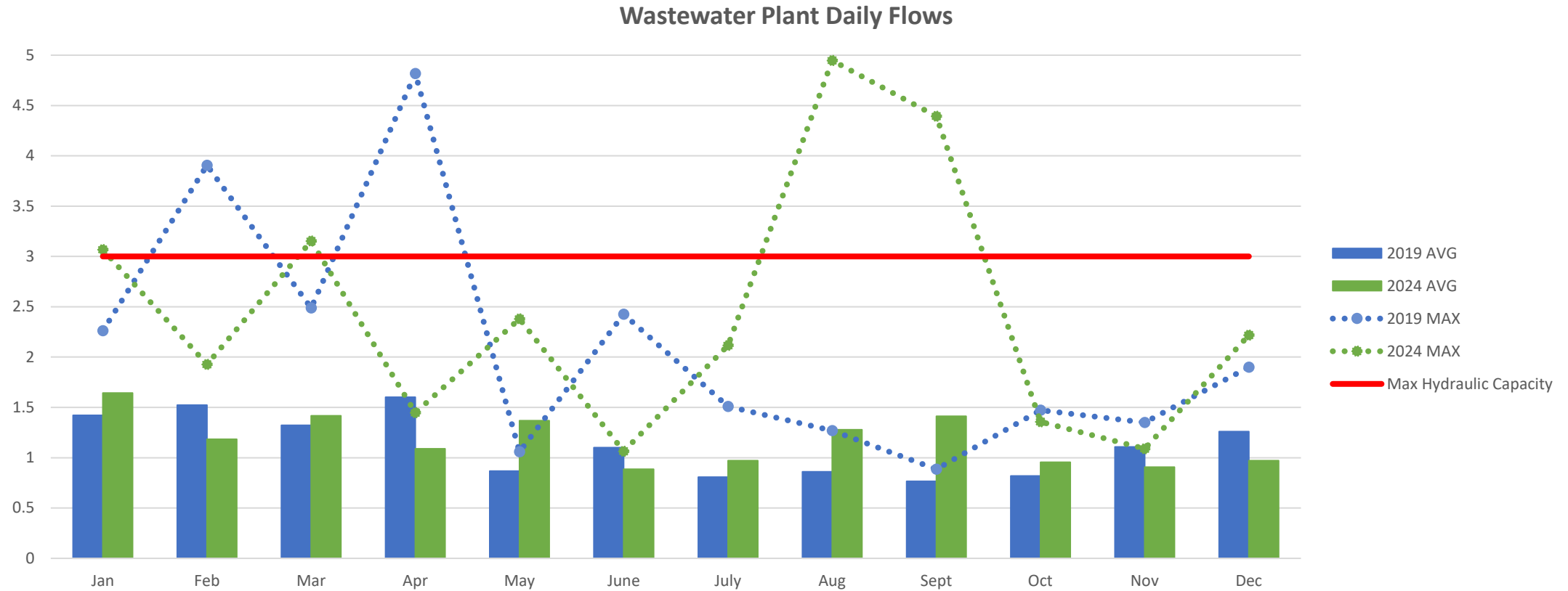
Figure taken from **Nitrification in Premise Plumbing: A Review**, Bradley, Hass, Sales. **Water Quality in buildings**, 2020. ammonia-oxidizing bacteria (AOB), Nitrobacter (NOB)

Topography

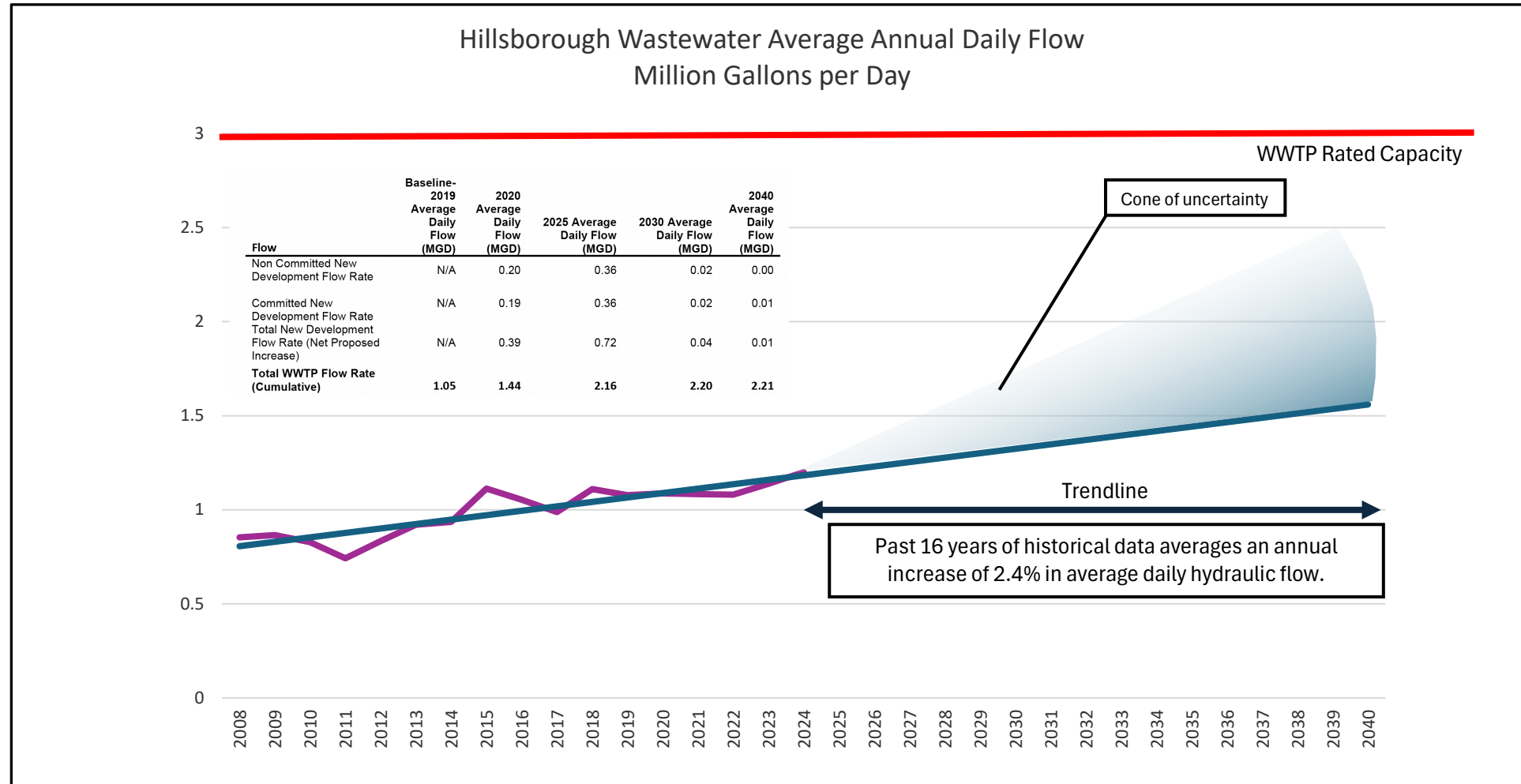
- The Town's water system is divided into three pressure zones. These zones are defined the elevation of the water tank that serves them
- The north zone's tank is at an elevation of 814'. There are isolated areas in this zone that are over 700' in elevation. These areas would likely not have enough pressure.



Wastewater Plant



Future Wastewater Flow Projection



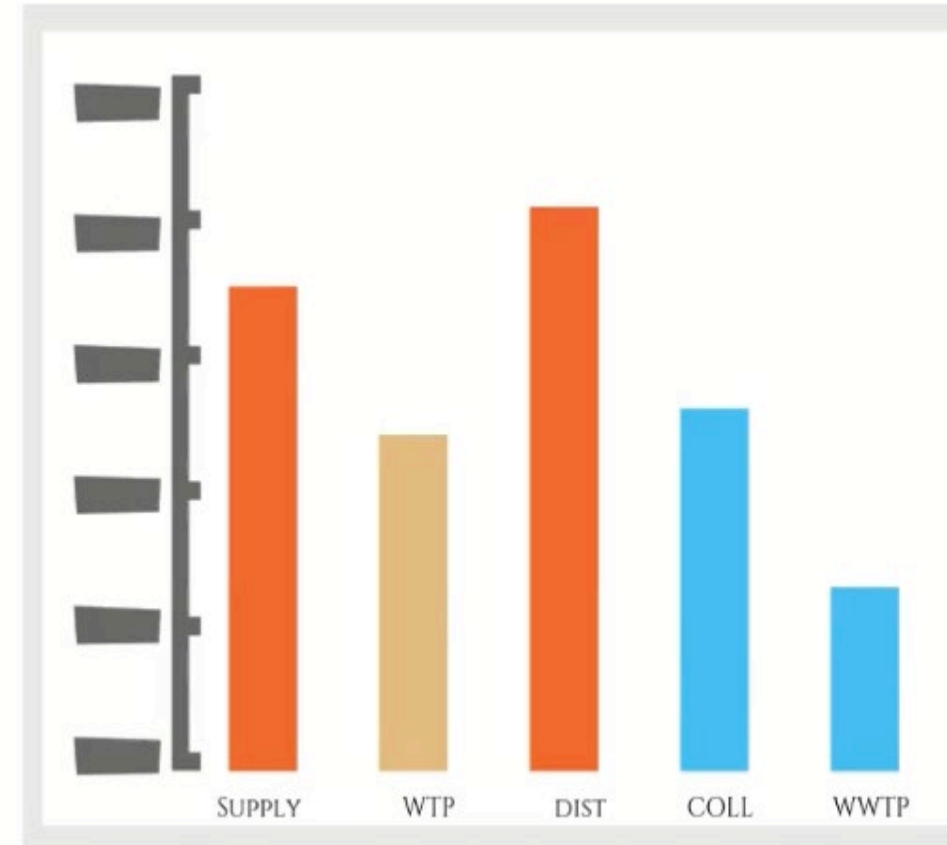
Nutrient Limitations

- Falls Lake Rules
 - Town wastewater permit limits pounds of nitrogen and phosphorus discharged annually
 - No concentration permit limit for these but measured in mg/L and converted to pounds
- Nitrogen is of main concern
 - Found in organic waste (i.e., mostly human and food sources)
 - Limited to 10,422 lbs. per year
 - Used 68% in 2024
 - Noticeable increase in 2023 and 2024

Capacity Takeaway

Utilities Staff Concerns in Priority Order

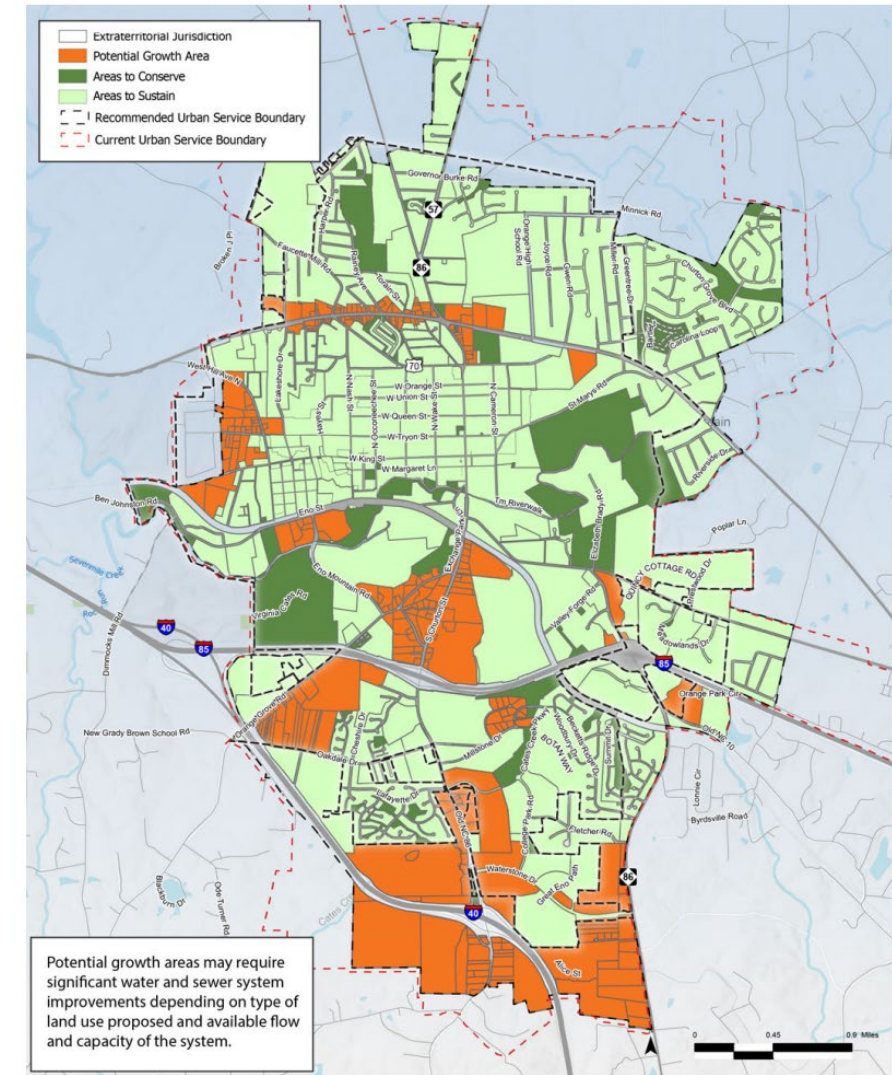
1. Collection system
2. Distribution system
3. Nutrient wastewater limits
4. Water treatment process limits
5. Water storage/fire protection
6. Water supply



Sewer Capacity Connection to Land Use Plans

- The Town's Comprehensive Sustainability Plan recommendations:
 - **Reduction of the Urban Service Boundary** to prevent/reduce sprawl and encourage consolidated infrastructure and easier system maintenance. This will impact the WASAMPBA agreement and necessitate updates.
 - Adjusting the UDO during the re-write to include **by-right flexibility** through zoning for smaller lot sizes, more density, and varied housing types **to focus growth within town limits and encourage contiguous annexation**
 - Future alignment of the FLUM with Fig. 4.4 (Potential Growth Areas) This will impact the COCA agreement and JPA with Hillsborough and Orange County. This may also impact established EDD areas.

Figure 4.4. Potential Growth Areas



Source: The Town of Hillsborough

Sewer Capacity Connection to Land Use Plans (cont.)

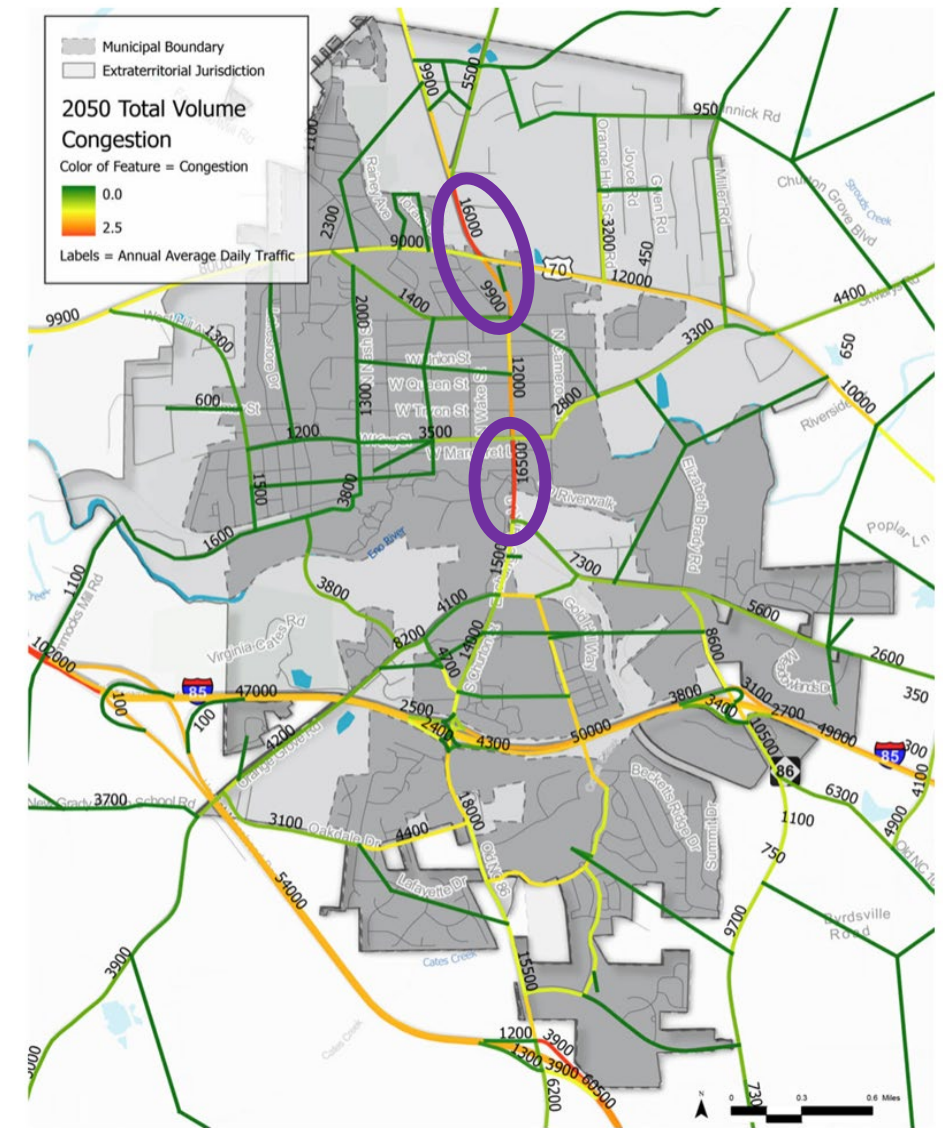
- The Town's Comprehensive Sustainability Plan recommendations:

- **Not concentrating density or large development projects north of US HWY 70** due to transportation impacts on the Churton Street corridor

Already congested intersections projected to continue to be congested based on the 2050 regional model include:

- N Churton Street and US HWY 70/NC 86 N
- S Churton Street and US HWY 70A
- Develop and maintain a safe, efficient, and sustainable multimodal transportation system (including bicycle, pedestrian, and transit options) **that offers alternatives to single-occupancy vehicle trips** and promotes health and access to jobs, destinations, and services in town.

Figure 6.7. Volume and Congestion Map — Triangle Regional Model



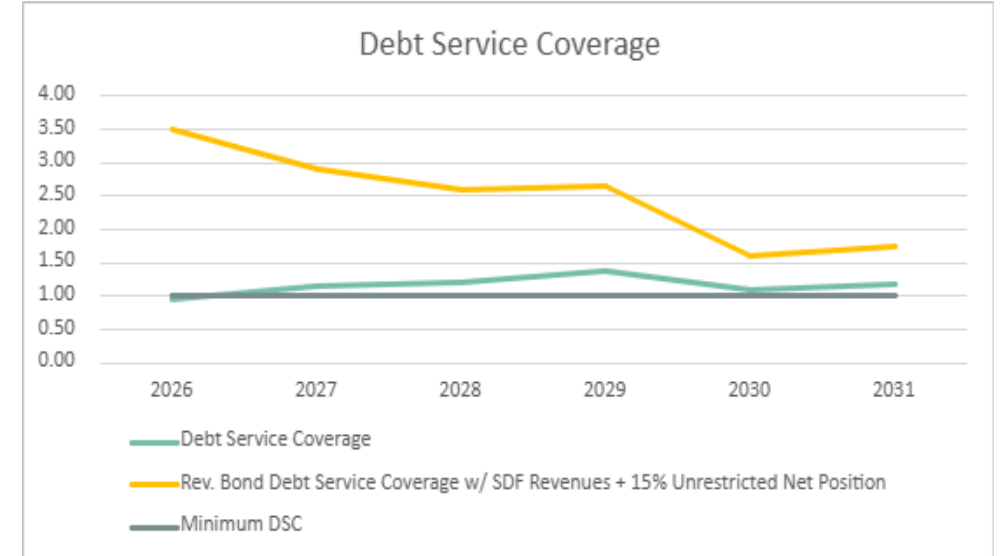
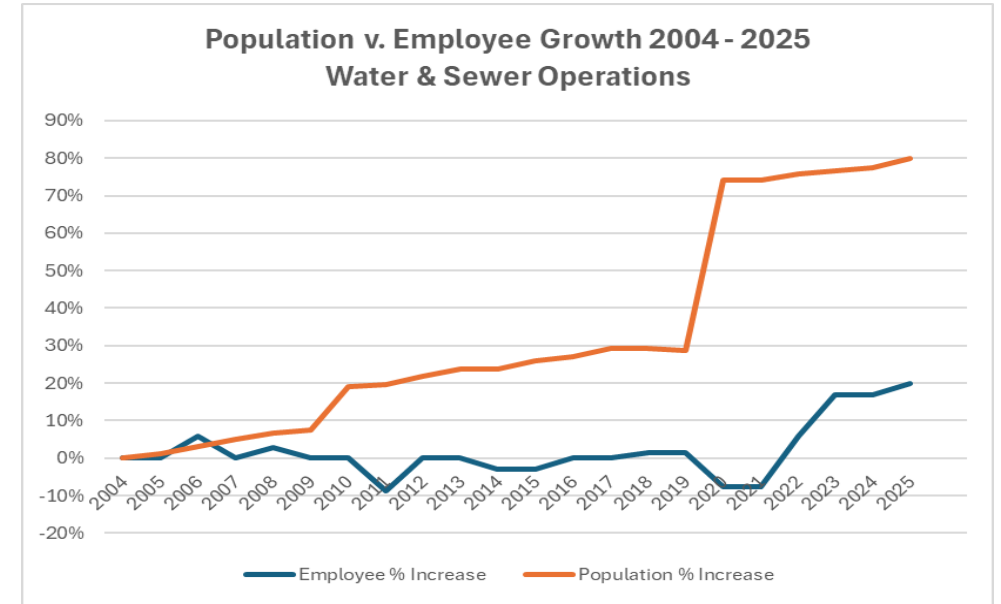
Source: Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
6-17

Communicating About New Projects with Developers

- There is limited capacity for development projects that will use a large amount of water/sewer, at this time, especially those outside of town limits or non-contiguous to town limits
- Utilities will evaluate potential available capacity for projects at the pre-development meeting, but capacity is not guaranteed until a Water and Sewer Extension Contract is executed (construction drawings)
- **There are options for developer cost sharing and/or modifying scheduled water/sewer improvements to keep pace with development demand** through conditional zoning and development agreements with developers
- Properties that want to develop immediately, located on the edges of town or outside of town may look to evaluate cost/benefit of developing in the County with traditional large lot well/septic vs. annexation into the town

Financial Constraints

- High utility bills, particularly for out-of-town customers
- Tight operating ratios – cost of operations and debt service increasing faster than revenues
- Significant CIP needs - \$50m by FY32 – not including any plant upgrades
- Adding significant customers may increase revenues, but also increases need for system improvements



Orange County Land Use Plan updates & how we can align

- In order for the County to align with the Town's growth strategy, areas outside of the Town's new recommended Urban Service Boundary **should remain zoned and planned for as agricultural and/or rural residential with a focus on agricultural uses and large lot (1 ac +) subdivisions that can be served with traditional well and septic systems**
- **Density and large development projects should be encouraged within the municipality** and not out in the County, where traffic generation and private sewer systems may cause operational issues within the town
- Expansion of existing commercial nodes between municipalities, in the County, that can be destinations connected with future greenways and transit stops (example: Blackwood, Calvander)

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