Capacity and Development (DRAFT)

Community Services and Utilities Departments

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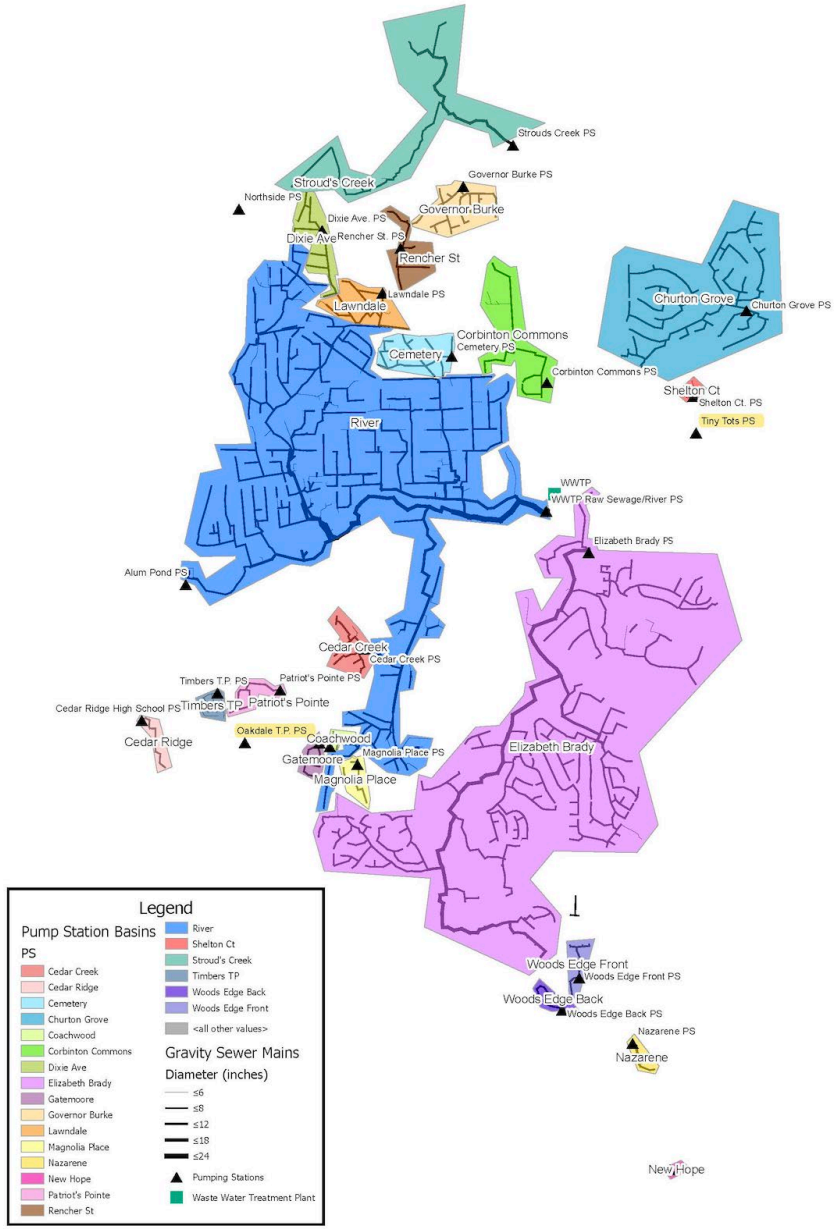
TOWN OF
HILLSBOROUGH

Introduction/Purpose

- Refresh and orient Board and Community on complexity of water/sewer capacity
- Review areas of town with capacity constraints
- Discuss Town's plans to address capacity constraints and timeline

Capacity Status

- Reported to Board on sewer capacity in Mar. and Aug. 2021, Nov. 2022
  - Projection through 2040.
    - Projects based upon water capacity spreadsheet provided by planning department – committed and potential
  - River basin is capacity constrained due to wet weather
  - Monitor Elizabeth Brady basin
  - Other smaller pumping stations projected capacity concerns.
- Currently working on water system capacity modeling
- Currently evaluating long term wastewater options



Former Way

Hillsborough Water Capacity Model

Link	Description
Summary	Water Usage Model Summary
Assumptions	Assumptions and Constants which drive the model
Population Model	Population Growth Model based on committed and potential residential development
Population Chart	Chart summarizing population growth model
Committed Res Dev	Residential developments with committed water service
Potential Res Dev	Residential developments that are not yet approved for water service
Commited Non-Res Dev	Non-residential developments with committed water service
Potential Non-Res Dev	Non-residential developments not yet approved for water service
Other Committed	Other water commitments

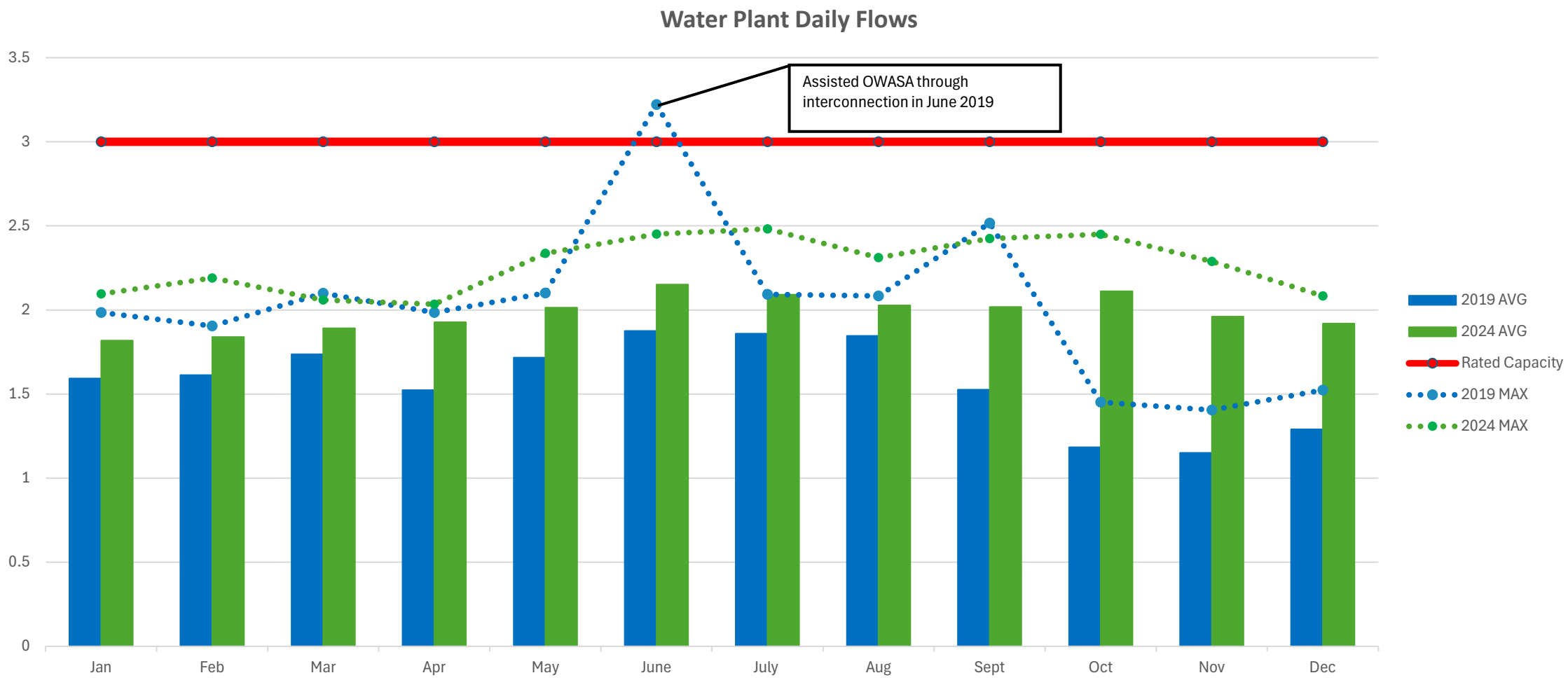
Water Supply

- WFER

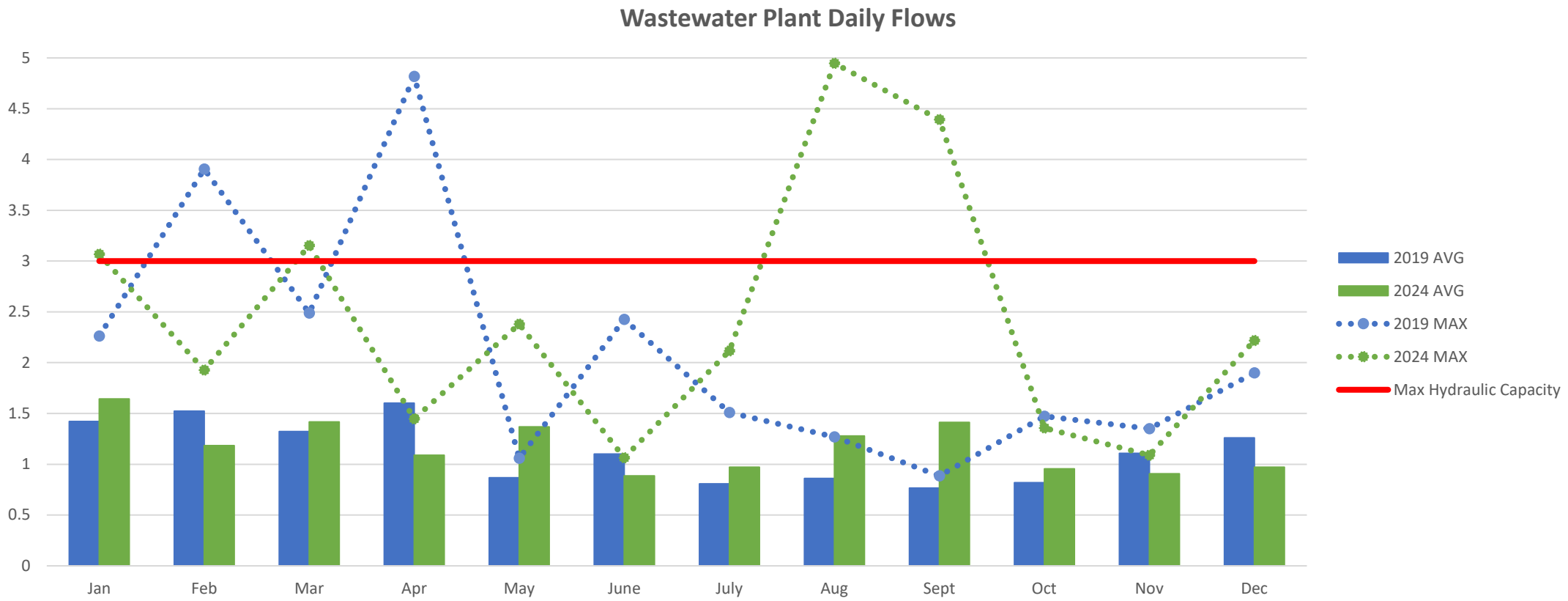
Condition	Depth	Mean Elevation	Total Storage (gal)	Unusable Storage (gal)	Usable Storage (gal)	% Remaining Useable Storage (gal)	Current Average Daily Use (gpd)	Streamflow Augmentation (gpd)	Channel Loss Multiplier	Lake Orange Supplement (gpd)	Estimated Remaining Days of Storage	Days Remaining with 20% 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)

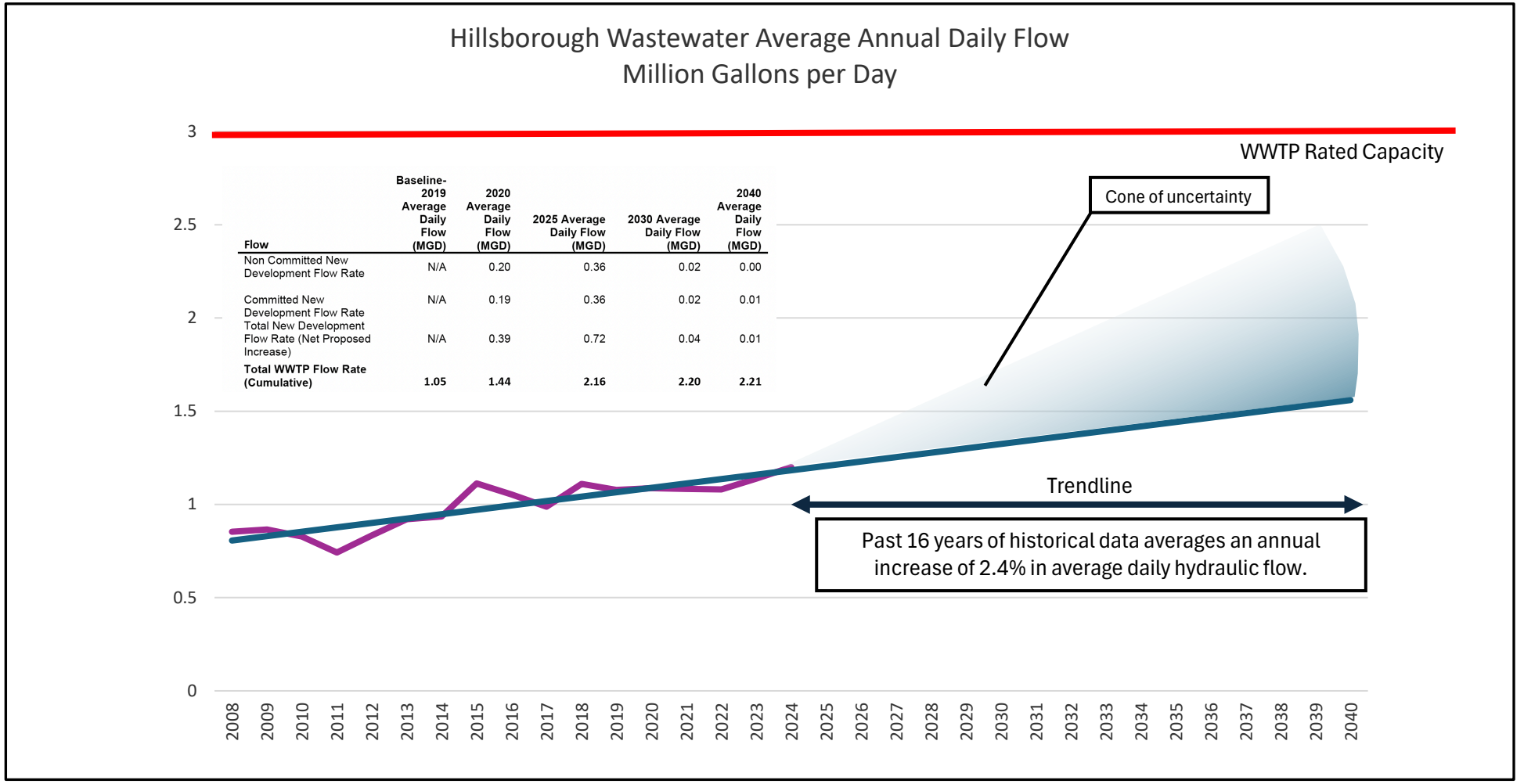
Water Plant


Water Plant Daily Flows
Assisted OWASA through interconnection in June 2019
3.5
3
2.5
2
1.5
1
0.5
0
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Oct
Nov
Dec
2019 AVG
2024 AVG
Rated Capacity
2019 MAX
2024 MAX

Wastewater Plant



Future Wastewater Flow Projection



Flow	Baseline-2019 Average Daily Flow (MGD)	2020 Average Daily Flow (MGD)	2025 Average Daily Flow (MGD)	2030 Average Daily Flow (MGD)	2040 Average Daily Flow (MGD)
Non Committed New Development Flow Rate	N/A	0.20	0.36	0.02	0.00
Committed New Development Flow Rate	N/A	0.19	0.36	0.02	0.01
Total New Development Flow Rate (Net Proposed Increase)	N/A	0.39	0.72	0.04	0.01
Total WWTP Flow Rate (Cumulative)	**1.05**	**1.44**	**2.16**	**2.20**	**2.21**

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

Future Nutrient Projections

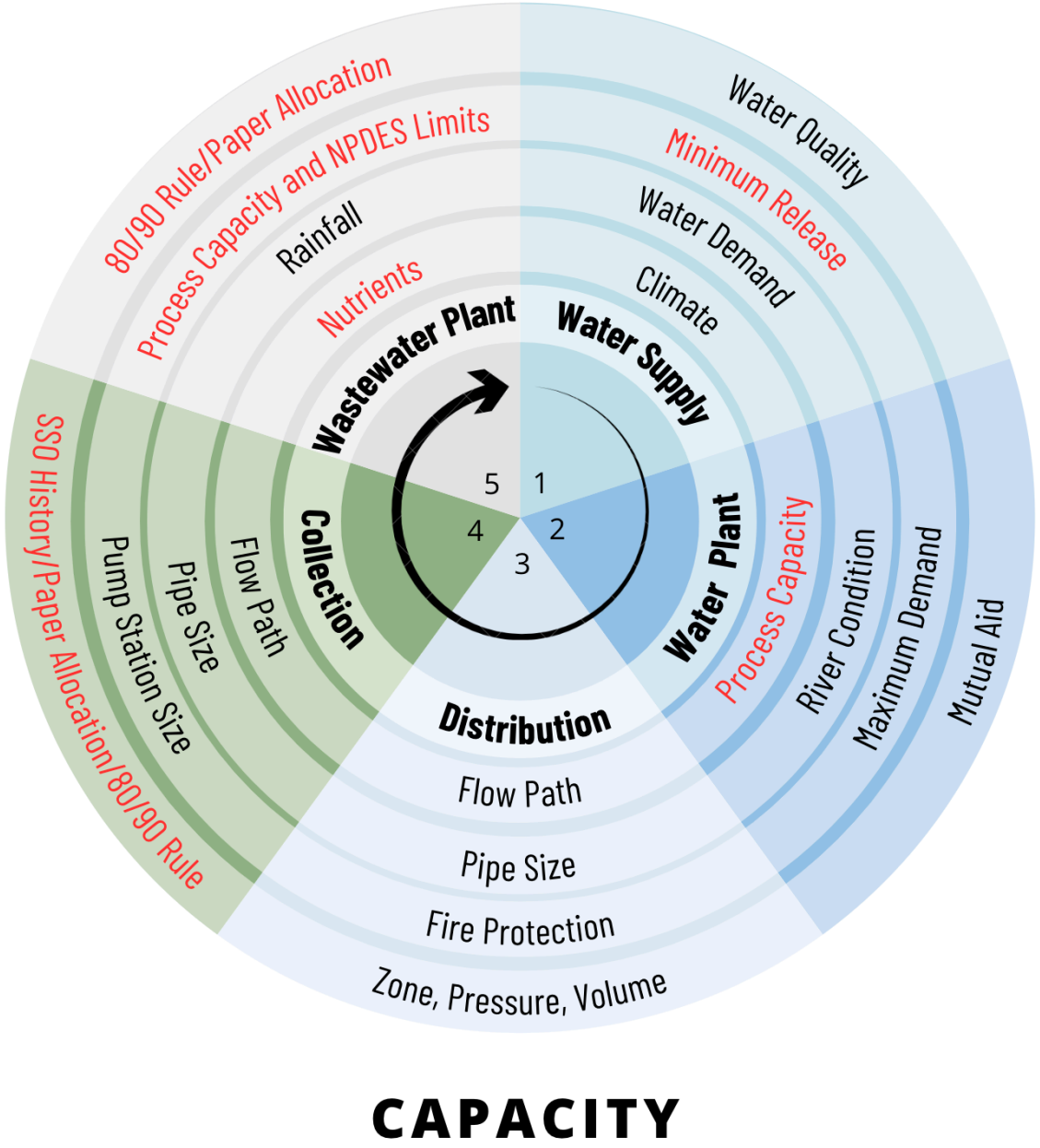
- At the current allocation, we could reach the nitrogen discharge limit in 5 – 7 years
  - IF the plant can keep up with the excellent nutrient removal we have been experiencing
- Would require advanced treatment plant process upgrades or alternative solutions
- Working with Upper Neuse River Basin Association on proposed revisions to Falls Lake rules
  - Deeper dive forthcoming!

Capacity Tracking – External Regulation

- How the state monitors capacity
  - Weekly water withdraw report (supply)
  - WTP MORs
  - WWTP DMRs (80/90 rule)
  - Water and sewer extension permits
    - Sewer flow allocations
    - Pumping station capacity tracking
    - Water extension engineering report
      - Water storage, connections, maximum day demands

Capacity Considerations

- It can no longer be a static number
- Multiple physical and regulatory considerations
- Other non-utilities related considerations



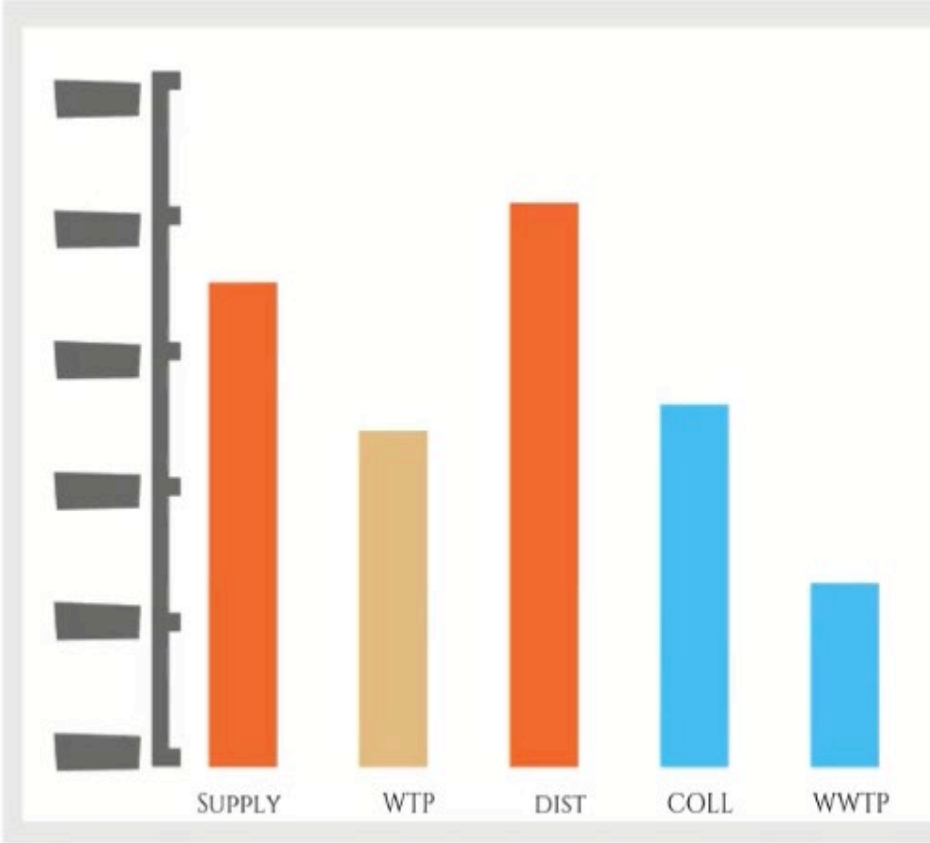
Other Project Recommendation Considerations

- Planning and Financial Considerations
  - Current and Future Land Uses (Town, ETJ, County)
  - Comprehensive Sustainability Plan
  - Transportation Planning
  - Utilities Capital Improvement Planning
  - Financial Benchmarks
  - Water and Sewer Area Planning Boundary Agreement
  - Already Committed Projects and Status
  - Town Resources
  - Political Will

Capacity Takeaway

Utilities Staff Concerns in Priority Order

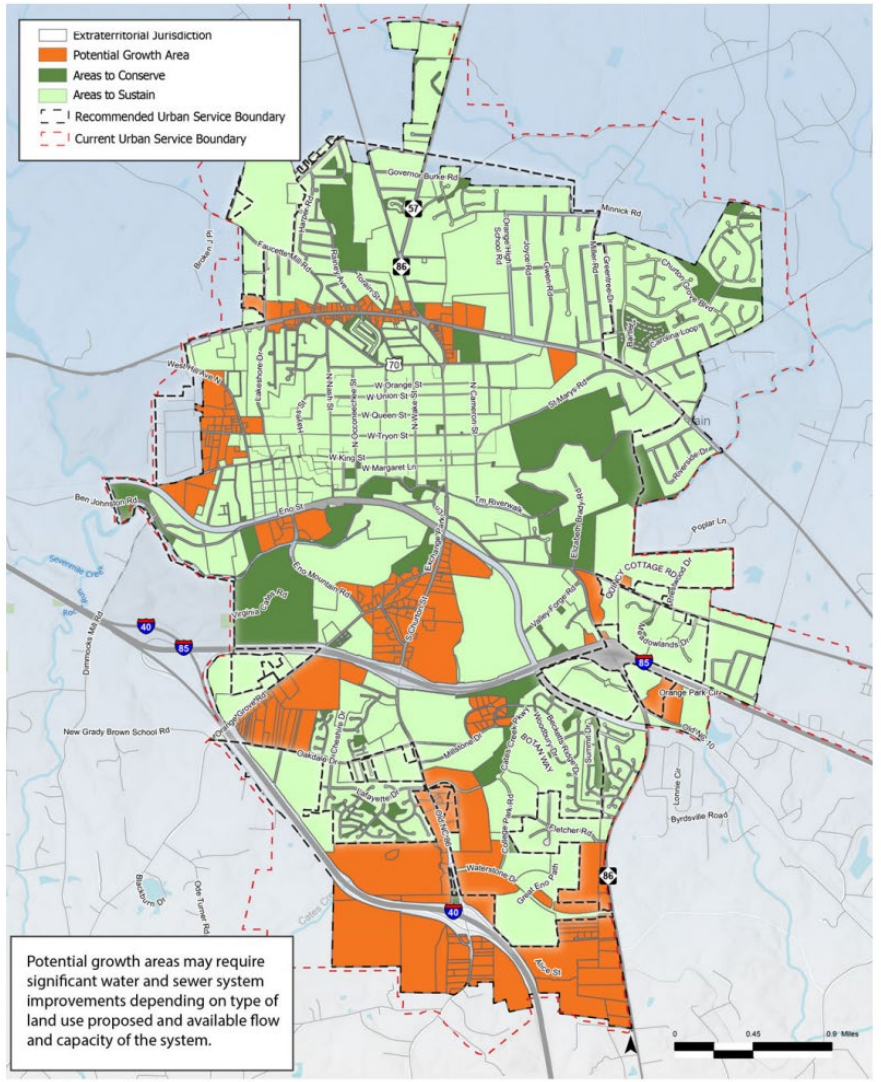
1. Collection system
2. Distribution system
3. Nutrient wastewater limits
4. Water treatment process limits
5. Water storage/fire protection
6. Water supply



Connection to Land Use Plans

- The CSP recommendations:
  - Reduction of the Urban Service Boundary to prevent/reduce sprawl and encourage consolidated infrastructure
  - Future growth areas along the 70 corridor, South Churton Street commercial areas, and at the I-40 interchange
  - Future alignment of the FLUM with Fig. 4.4 (Potential Growth Areas)
  - Adjusting the UDO during the re-write to include more flexibility through zoning for lot size, density, and housing types

Figure 4.4. Potential Growth Areas



Source: The Town of Hillsborough

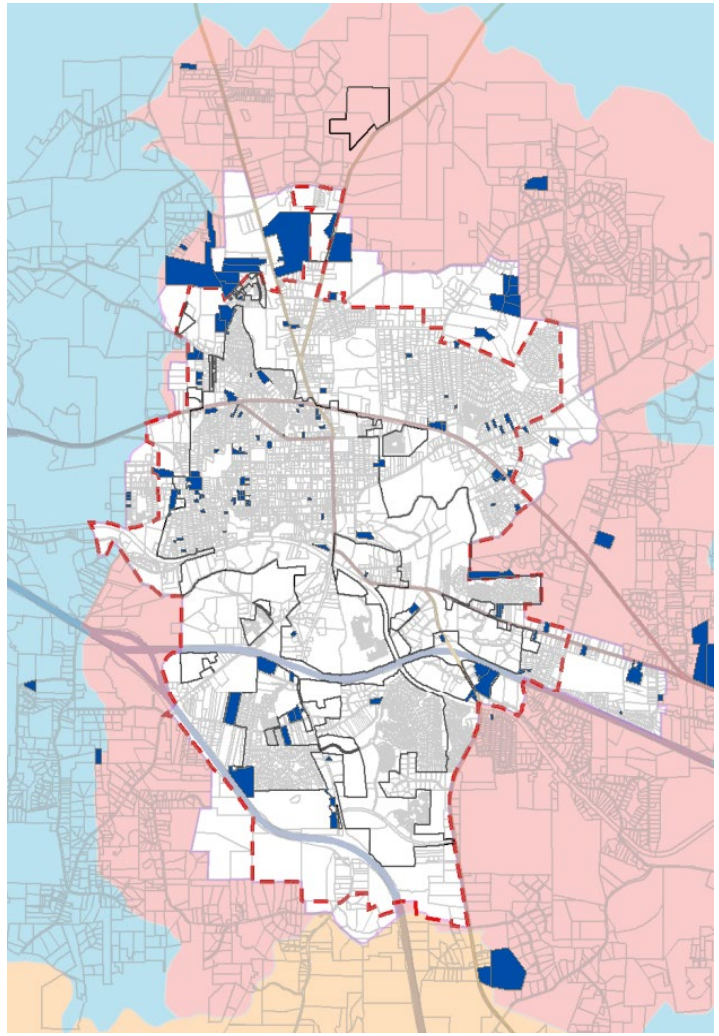
Connection to Land Use Plans

- There are 1,532 units approved that have not yet been built that we've committed capacity
- Differences in development approvals vs capacity allocations
- Continued development approvals without building capacity and improving the current systems may overwhelm the system capacity

Residential Units Approved but Not Yet Built		
Project Name	**Type of Units Approved**	**# of Units Approved**
Collins Ridge Pod D	Apartments	326
Collins Ridge Phase 2	Townhomes	51
Collins Ridge Phase 2	Single-family	79
East Village at Meadowlands	Townhomes (Habitat)	75
Persimmon Phase 1	Townhomes (Rental)	30
Persimmon Phase 1	Apartments	316
Waterstone South	Apartments	450
Waterstone South	Townhomes	205
Total		**1,532**

Connection to Land Use Plans

- Availability Inquiries
- Anticipated growth areas/parcels
  - Owls Woods
  - Paliouras Tract
  - Waterstone Parcels
  - UNC Hospital Expansion
  - Daniel Boone Redevelopment (60 ac)
  - Orange County/Hillsborough EDD
  - Moren parcel (Persimmon)
  - Oakdale Dr. area



CIP Projects and Timelines

- Overview of adopted CIP projects that relate to development
  - Cates Creek Outfall
  - Elizabeth Brady PS and Force Main Upgrade
  - River PS Replacement
  - Eno River Interceptor Upgrade – East
  - Eno River Interceptor Upgrade - West
  - Exchange Club Interceptors
  - US 70 Business Waterline Replacement
  - Hasell Water Tank Replacement

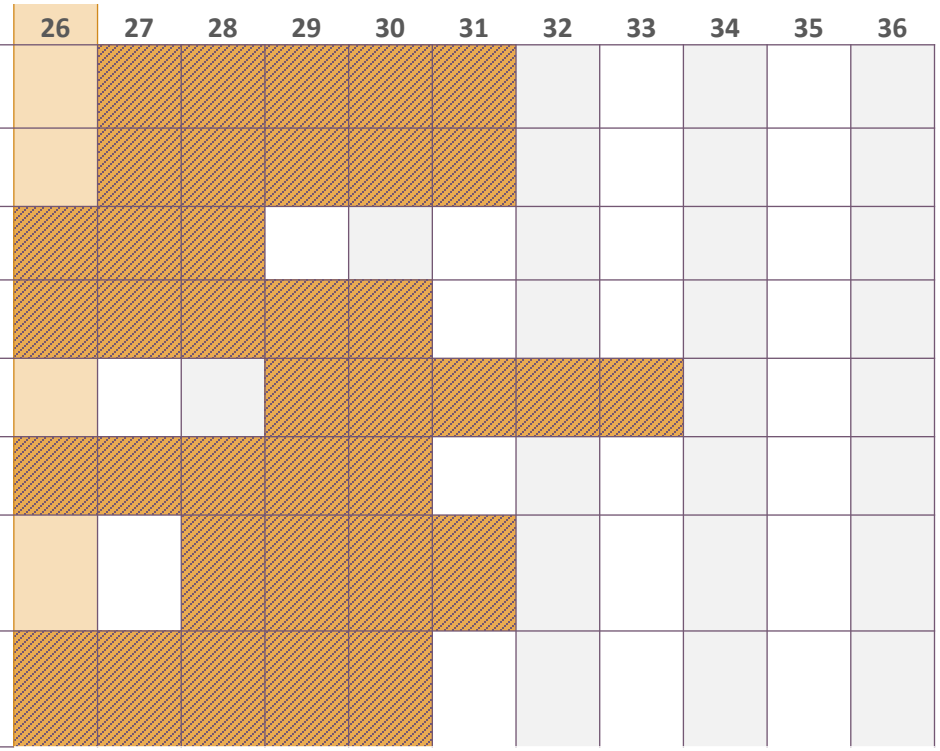
CIP Projects (DRAFT)

- Add CIP map

CIP Projects and Timelines

https://hillsboroughnc.maps.arcgis.com/apps/instant/basic/index.html?appid=8b5b55d40c774a25acf220bec941c591

CIP Project	FY START	DURATION (by FY)
Cates Creek Outfall	27	5
Elizabeth Brady PS	27	5
River PS	26	3
Eno Interceptor - East	26	5
Eno Interceptor - West	29	5
Exchange Club Interceptors	26	5
US 70 Business Waterline Replacement	28	4
Hasell Water Tank Replacement	26	5



What Have We Done to Date?

- Cleaned and televised the Eno River Outfall East going to River pumping station to ensure full available capacity
- Evaluated alternative system equalization and piping modifications to relieve flow on the Eno River Outfall East
- Submitted funding applications for CIP projects
- Upgraded pump impeller size at Elizabeth Brady pumping station and adjusted motor speed to push more flow to treatment plant
- Replaced air release valves on sewer force mains to ensure pump operation and efficiency
- Began analysis of potential wastewater plant solutions for hydraulic and nutrient limitations
- Installed sewer flow monitors in the project area
- Serviced the three pumps/motors at River pumping station to ensure maximum production
- Budgeted a study on receiving water from Durham more routinely
- Participating in Falls Lake Rule revision proposals through Upper Neuse River Basin Association
- Joined Neuse River Compliance Association to keep abreast of and protect existing nutrient allocations
- Performed fire flow, redundancy and water main looping analysis
- Received funding for and are working to bid the Lawndale sewer project which will rehabilitate the leakiest sewer basin contributing to the River sewer basin

Concepts to Expedite and Accommodate

- Potential re-evaluation of SDF strategy?
  - Hybrid or forward-looking CIP-based vs. past-looking completed improvements
- Approve capacity allocation earlier in development process (planning)
- Better align Water and Sewer Extension Contract and land use entitlement deadlines (planning)
- Utilize Jordan Lake allocation (water supply)
- Letter to Industry, hold meters (control/planning)
- Advocate for revised Falls Lake rules that would:
  - Eliminate Phase 2 more stringent discharge limits
  - Provide more nutrient allocation based on permitted flow

Communicating About New Projects

- There is limited capacity for development projects that will use a large amount of water/sewer in both basins, at this time
- 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 with developers through conditional zoning and development agreements

In Summary

- Capacity is significantly limited due to variety of factors when considering new development
  - Are accommodating single-family infill and redevelopment (including ADUs)
- Major capacity and nutrient constraints trying to address in next 3-5 years
- Capacity is not just one number that is static

- Town has built a plan and funding strategy to address limited capacity in most areas in anticipation of future growth
  - Funding = Grants, developer contributions/SDFs, retained earnings, rate structure
- Must continue to invest in water/sewer infrastructure through the CIP budget
  - Still should prioritize on "taking care of what we have" by rehabilitating our aging core system