




Appendix A
Wastewater Collection System

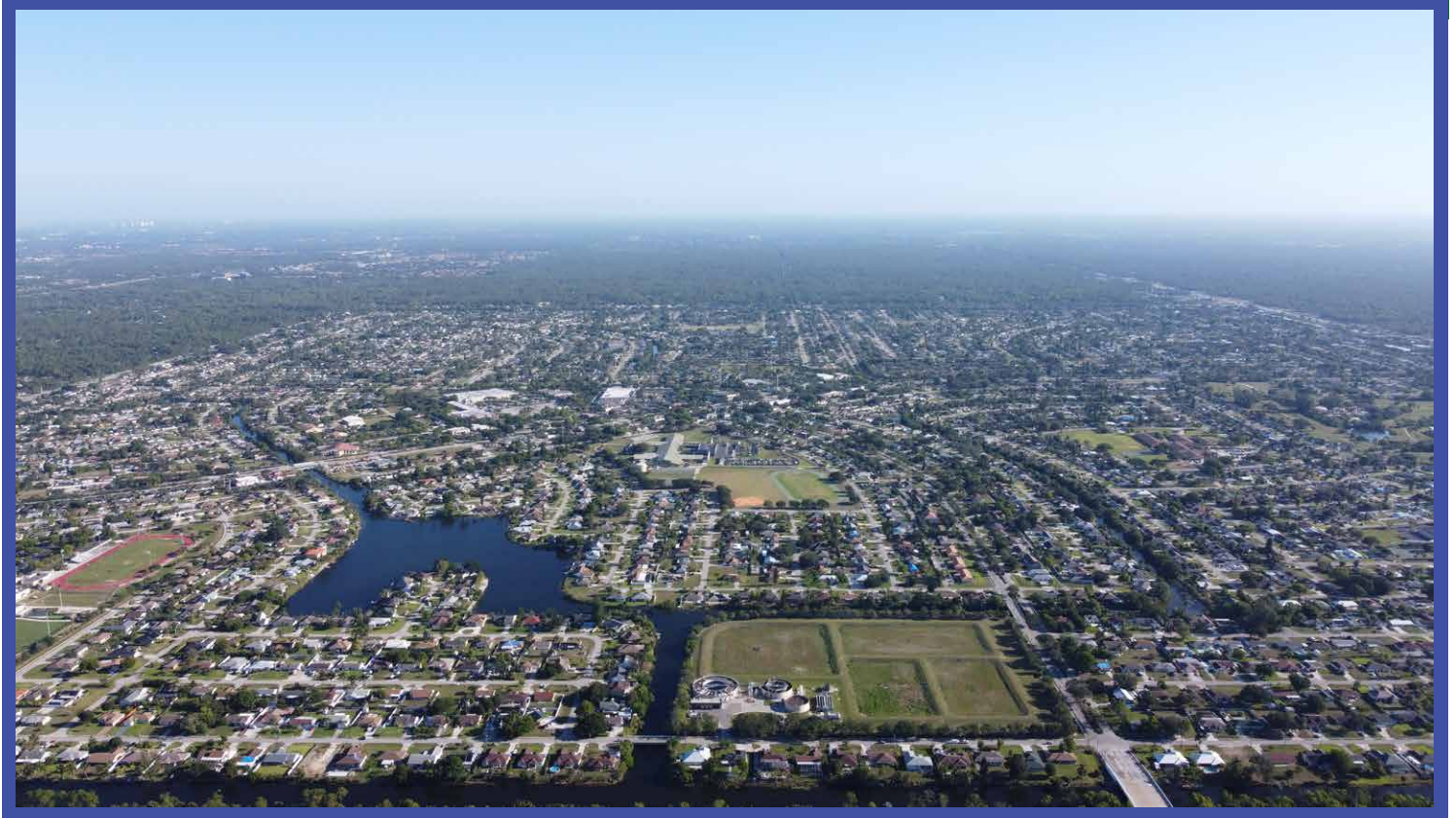


Appendix A.1
Wastewater Collection System Evaluation
Technical Memorandum

Golden Gate City Water Resource Protection - Restoration Master Plan

Wastewater Collection System Evaluation Technical Memorandum

August 2025



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1. Introduction

Collier County (hereinafter, "the County") was awarded a grant from the State of Florida Department of Environmental Protection for the Collier County Golden Gate City Water Resource Protection/ Restoration Master Plan (hereinafter, the "Golden Gate City Master Plan"). As part of the preliminary data collection and analysis, Jacobs reviewed the wastewater collection system within the Golden Gate City area and the information and recommendations provided in the *Collier County Water-Sewer District Golden Gate Wastewater System Master Plan* (hereinafter, the "2021 Wastewater System Master Plan") (Tetra Tech 2021).

The purpose of the Golden Gate City Master Plan is to develop an integrated master plan for the installation, repair, or replacement of existing infrastructure projects within the study area. The infrastructure projects include improvements to water distribution, wastewater collection, stormwater, sidewalks, bike paths, roadway, landscaping, irrigation, lighting, and fiber. The Golden Gate City Master Plan study area is an unincorporated area in western Collier County referred to as Golden Gate City, bounded to the north by Green Boulevard, to the east by Collier Boulevard, to the west by Santa Barbara Boulevard, and the south by the Golden Gate Main Canal. Figure 1 identifies the Golden Gate City Master Plan study area, the wastewater service area, and the Activity Center 9 service area.

Figure 1. Project Location Map



2. 2021 Wastewater Collection System Master Plan Review

The purpose of the 2021 Wastewater System Master Plan was to provide a guide for the expansion of the County's wastewater system in Golden Gate City. Currently, the Golden Gate service area consists of approximately 25,893 residents with 13,162 receiving central wastewater service as of 2025, primarily located in the northeast quadrant of Golden Gate City (Stolts, pers. comm. 2025b). The remainder of the service area is currently unsewered and uses septic tanks. The Golden Gate City Master Plan will develop capital improvements to ensure projected wastewater flows meet the County's level of service. The County has taken over utility service in the area with the ultimate goal of increasing wastewater treatment capacity and converting the area from septic tanks to a central wastewater collection system.

Jacobs's scope was to review the 2021 Wastewater System Master Plan to validate recommendations that will be included with the Golden Gate City Master Plan. The Wastewater System Master Plan consists of eight sections including introduction, existing wastewater treatment facilities, flow allocation and projections, regulatory review, capacity analysis and improvement, and existing and future improvements.

2.1.1 Data Source

The 2021 Wastewater System Master Plan data sources included the following:

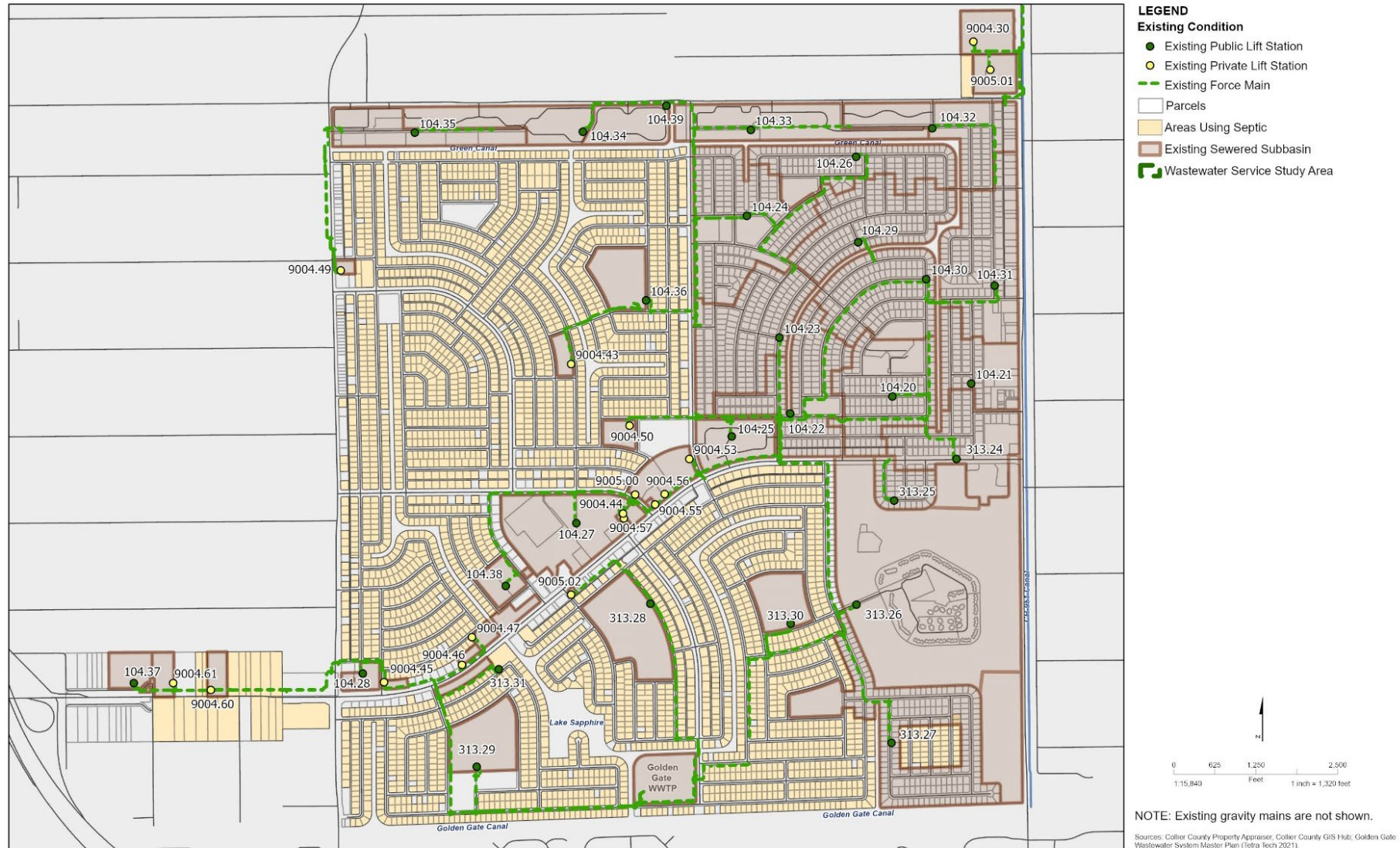
- Wastewater Treatment Plant (WWTP) Historical Flow Data (January 2017 to May 2020)
- Monthly Operating Reports
- County Property Appraiser and Collier County Schools Websites
- Florida Department of Health Rule 64E-6.001
- U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Protection Rules and Regulations for Permitting and Compliance
- Johnson Engineering's Field Database for the Golden Gate City Wastewater Pump Stations
- County's Geographic Information System (GIS) Database
- Parcel Data – Parcel Use Description
- 2020 U.S. Census
- Recent Field Investigation Reports
- Manufacturer's Performance Curves
- LIDAR (Light Detection and Ranging) Database for Land Elevations
- 10 States Standards – Recommended Standards for Wastewater Facilities
- InfoSWMM Software Sewer Information and Assumptions

2.2 Existing Wastewater Transmission System

The 2021 Wastewater System Master Plan reported that the existing wastewater collection system consists of the following:

- 129,000 feet of 8-inch- through 12-inch-diameter polyvinyl chloride (PVC) and vitrified clay gravity sewer

Figure 2. Existing Conditions



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- No modeling technical documentation was provided to explain model details including scenario description, purpose, total flows for each scenario, and calculated flows per parcel.
- The total flow for the existing model scenario is approximately 3.5 million gallons per day (mgd). In the 2021 Wastewater System Master Plan, a value of 1.2 mgd is listed for year 2020 and 2.77 mgd for year 2040.
- The existing model scenario shows a total pipeline length of approximately 94,000 feet, while Table 2-3 in the 2021 Wastewater System Master Plan shows a total linear footage of approximately 97,500 feet.
- The wastewater flow calculations for each parcel were based on the number of units, person per unit (2.5 person), and flows per person (250 gallon per capita per person). Jacobs calculated wastewater flow for a few subbasins (313.25, 104.20, and 313.24) and was not able to match the flow values in the 2021 Wastewater System Master Plan.

These discrepancies between the model and the 2021 Wastewater System Master Plan were communicated to Tetra Tech. Tetra Tech provided some background to the model and provided details on their approach regarding flow discrepancy but stated that the Wastewater System Master Plan and model are outdated and require update before including with the Golden Gate City Master Plan.

2.3.1 Existing Transmission System Evaluation

The Golden Gate City transmission system's pumping stations and force mains must be sized to accommodate current and projected peak flow conditions.

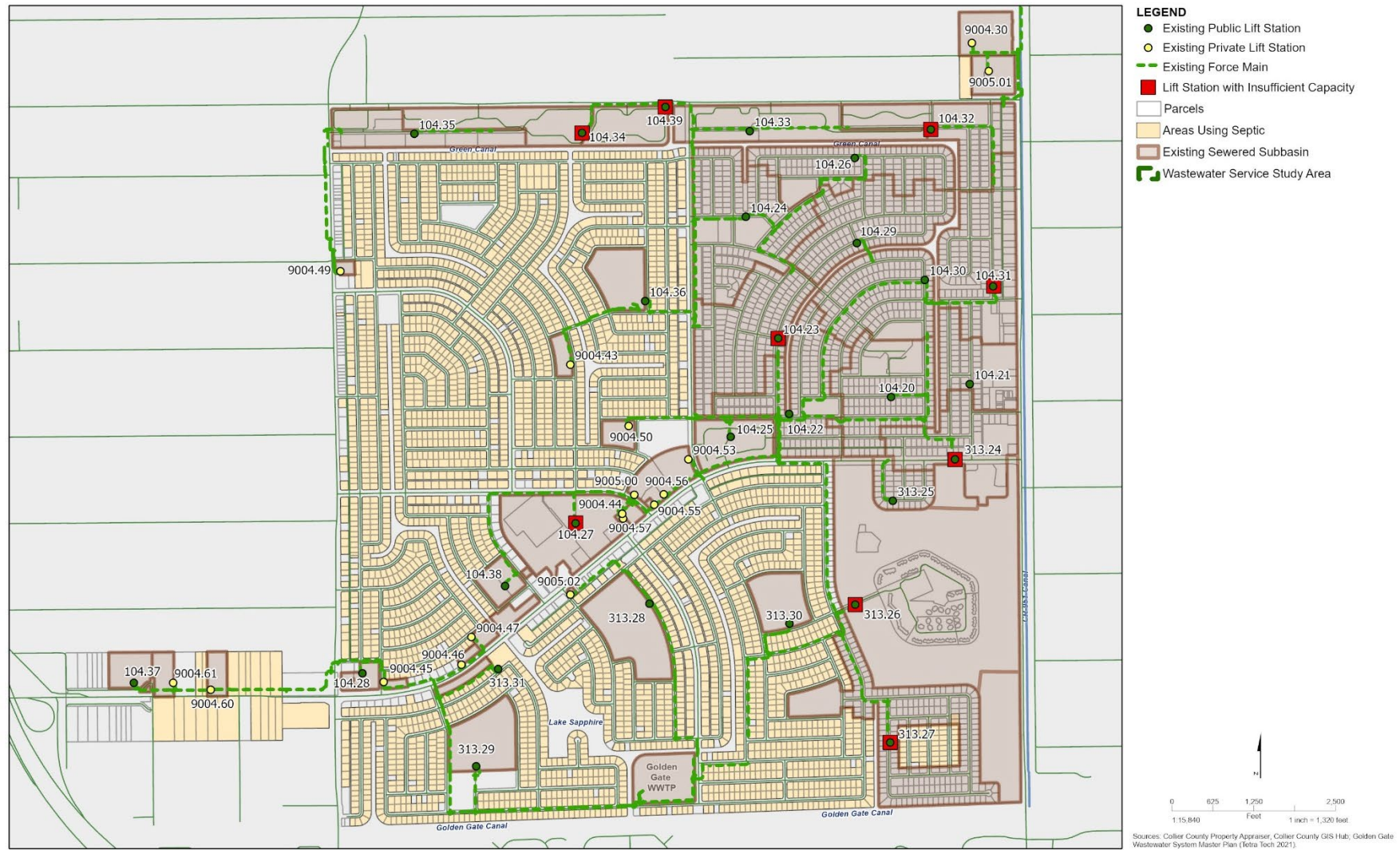
2.3.2 Existing Pump Evaluation

The hydraulic model of the existing wastewater pumping/transmission system was used to evaluate the ability of the existing 28 wastewater pump stations in meeting current expected peak flows. The design capacity of the pumps must exceed peak hour flow (PHF) to the station. The 2021 Wastewater System Master Plan identified that 10 of the 28 County-owned wastewater pump stations may not have sufficient pumping capacity to accommodate current (2020) PHFs. Those pump station identification (ID) numbers included 104.21, 104.23, 104.27, 104.31, 104.32, 104.34, 104.39, 313.24, 313.26, and 313.27.

Jacobs's scope of work was to perform a review of the 2021 Wastewater System Master Plan and did not include the development of a new or updated hydraulic model. Therefore, assuming the hydraulic model and the PHF calculation completed and provided by Tetra Tech are correct, initial review confirmed that the model results show 9 of the 28 County-owned wastewater pump stations do not have enough pumping capacity to convey 2020 PHFs. These pump station IDs include 104.23, 104.27, 104.31, 104.32, 104.34, 104.39, 313.24, 313.26, and 313.27. Based on the data available in Table 6.3 of the 2021 Wastewater System Master Plan, the PHF and the modeled pumping rates show that the remaining County-owned pump stations, including pump 104.21, have sufficient capacity to accommodate the modeled 2020 PHF. Figure 3 shows pump stations with insufficient capacity for 2020 PHF.

Per the Collier County Water-Sewer District Utilities Standards Manual, the maximum allowable force main velocity is 6 feet per second. Also, force main pressures greater than 40 pounds per square inch are considered high because availability of submersible wastewater pumps becomes limited at operating total dynamic head (TDH) values greater than 100 feet.

Figure 3. Existing Pump Stations with Insufficient Capacity



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Jacobs ran the model provided by Tetra Tech and based on the hydraulic model results, initial model review findings align with the results reached by Tetra Tech. The model results show that some of the existing force main piping is undersized and demonstrates high pipeline velocities during the simulated peak flows. Also, high system pressures are observed at end segments of the system, including the areas north of Golden Gate Parkway, and the Gateway area (off the I-75 Interchange) primarily result from long pipeline distances to the WWTP.

2.3.3 Existing System Near-Term Improvement Recommendations

Based on Jacobs's initial review using the model results, changes to the list of recommended near-term improvements to the existing system to accommodate existing PHF are recommended. Recommended near-term improvement projects include:

For pump stations:

- Install a **new inline booster pump station** to repump flow (no need for a wet well) to address situations with lengthy force main travel distance. The inline booster pump station is recommended to be constructed near the corner of 23rd Avenue SW and 45th Street SW, which is downstream to six pump stations with insufficient capacity (pump station ID's **104.34, 104.39, 104.32, 104.31, 104.23, and 313.24**).
 - Note that the inline booster pump station was recommended in the 2021 Wastewater System Master Plan, however the location was changed because of parcel availability. Refer to Section 3.3 Future Wastewater Pump Station Sites for details.
- Improve pump stations with insufficient TDH, pump station ID's **313.26 and 313.27**, to have a higher horsepower, electric power supply, and control panel. The existing wet well and piping are likely adequate. However, the future improvement is to abandon pump station ID 313.27 and merge its subbasin flows to the future lift station (FLS) 23. At this stage, only improvement for pump station 313.26 is required. Refer to Section 3.4 Future System Improvement Recommendations for additional details.
- Replace or add a pump station to accommodate larger flow in pump station ID's **104.27 and 313.24**. Improvements may include capacity, TDH, piping, and a wet well.
 - Note that the recommendation to pump station ID 313.24 changes based on updates to the future system plan (refer to Section 3.4).

For Piping:

- **16-inch-diameter Force Main from Inline Booster Station to Tropicana Boulevard.** The proposed force main will begin at the location of the inline booster station and go south of Golden Gate Parkway where the existing 14-inch-diameter force main heads east, and will instead run west for approximately 1,200 feet along the Golden Gate Parkway right-of-way, then turn and run southeast at 47th Street SW, then run southwest at 25th Place SW, and then south along Tropicana Boulevard. The new force main will then tie into the existing 16-inch-diameter force main near Tropicana Boulevard, near where the existing force main increases in size from 14 inches to 16 inches in diameter. This path will allow the recommended new 16-inch-diameter force main to receive flows from a few future County wastewater pump stations along this route. It could also receive sewage flow from any future private wastewater pump stations along its path as needed.
- **Conversion of 8-inch-diameter Dry Line from Former Water Treatment Plant (WTP).** There is an existing 8-inch-diameter PVC dry pipeline (a former WTP brine line) from the former Golden Gate WTP site that terminates at the Golden Gate WWTP. The abandoned 7,200-foot-long, 8-inch-diameter

pipeline would be tied into the existing 14-inch-diameter force main near the former WTP on 44th Street SW. Further investigation is required to confirm if this dry line could be converted into a force main and reused for wastewater service. If this line cannot be converted into a force main, a new 8-inch-diameter force main must be installed parallel to the dry line to convey flow from FLS 13/pump station 313.30, FLS 23/pump station 313.27, and FLS 19 to the WWTP.

- **Replace 4-inch-diameter Force Main from Station 104.33 to Wastewater Pump Station 104.32 with New 6-inch-diameter Force Main.** The new 6-inch-diameter force main flowing west from **existing wastewater pump station 104.33** should connect with the 8-inch-diameter force main flowing south on Sunshine Boulevard to the WWTP (approximately 875 feet long).
- **Replace 6-inch-diameter Bottleneck Near Station 104.39 with New 8-inch-diameter Force Main.** The force main carrying the combined discharge of **wastewater pump stations 104.34 and 104.39** is a 4-inch-diameter force main, which is smaller than the upstream 6-inch-diameter force main from pump station 104.34. This undersized 4-inch-diameter force main should be replaced with a new 8-inch-diameter force main (approximately 600 feet long).
- **Replace 4-inch Force Main Near Station 104.31 with New 6-Inch-Diameter Force Main.** The existing 4-inch-diameter force main from **existing wastewater pump station 104.31** will be replaced with a new 6-inch-diameter force main (approximately 1,800 feet long). The force main will follow the existing force main west along 20th Place SW but then turn to the south on 42nd Street SW and connect to the existing 6-inch-diameter force main to the south. This includes one canal crossing.
- **Replace 4-inch-diameter Bottleneck from Station 104.21 with New 6-inch-diameter Force Main.** The existing 4-inch-diameter force main from **existing wastewater pump station 104.21** will be replaced with a new 6-inch-diameter force main. The new force main will follow the existing force main south then turn west on 23rd Place SW and connect to the existing 6-inch-diameter force main on the 41st Terrace SW (approximately 1,000 feet long).

Note that all piping projects were mostly carried forward from the 2021 Wastewater System Master Plan except for the parallel 6-inch-diameter force main near station 313.24 as the recommendations for that pump station change (refer to Section 2.4).

2.4 Future Transmission System Evaluation

Similar to the existing model scenarios, the future model scenarios were developed to evaluate projected future buildout conditions by year 2040 for the Golden Gate City wastewater transmission system. The 2021 Wastewater System Master Plan stated that projected future conditions were analyzed considering land use and wastewater flow for:

- Existing system flow
- Future wastewater flows
- Residential unit wastewater flows
- Planned unit developments and commercial/mixed use wastewater flows
- Planning for mixed use/commercial growth
- Planning for conversion of areas served by septic tanks

As with the existing system, the Collier County Water-Sewer District Utilities Standards Manual criteria was used to evaluate pumps and force main capacities. In addition to the existing system improvements that were recommended, Tetra Tech recommended a list of transmission system improvements including force mains and 23 wastewater pump stations to be added to the existing system in phases up to year 2040.

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However, the 2021 Wastewater System Master Plan did not identify how the future wastewater flows (for year 2040) were calculated and allocated.

Jacobs communicated these issues to Tetra Tech for explanation on future flow allocation and flow discrepancies. Tetra Tech staff recommended Jacobs update the calculations to determine current numbers. Also, Tetra Tech advised that the information and parcel counts in the previous report are now outdated and should not be used for planning purposes (Wainright, pers. comm. 2024).

3. Jacobs Update to the Future Transmission System Plan

3.1 Future Wastewater Flows and Allocation

Based on initial review and the direction provided by Tetra Tech regarding the need to update flows and allocation, Jacobs performed an update to 2021 wastewater flow future projections. Because Jacobs's scope did not include development of a model or wastewater flow projections, Jacobs and the County agreed that Jacobs would use recent water demand projection data recently developed by another engineering firm (Carollo) for the area. The water demand calculations provided by Carollo in a GIS file were developed at the parcel-level for Golden Gate City and can be used for future wastewater flow calculations and allocations.

The GIS data projections were first reviewed and evaluated against water distribution master plan for Golden Gate City, the *Technical Memorandum 1 Golden Gate Area Pipeline Asset Management Program* (Carollo 2024) that was also developed by Carollo. According to the GIS data, the initial future water demand had a total demand of 4.197 mgd on average, which did not match with the water demand (3.263 mgd) stated in the *Technical Memorandum 1 Golden Gate Area Pipeline Asset Management Program*. Jacobs communicated this discrepancy to Carollo, who subsequently submitted an update to the GIS file that revised the projected future demand to a total of 3.138 mgd (Dragash, pers. comm. 2024).

After another review of the updated GIS file, Jacobs found other items that needed correction, such as assigning flows to parcels with zero demand that would have demand in the future buildout condition. Details on the water demand future projection and the update to the GIS file performed by Jacobs can be found in the *Water Distribution System Evaluation Technical Memorandum* (Jacobs 2025b). After calculating these corrections, Jacobs calculated an update to the GIS file's water demand projection at an average of 3.249 mgd, which falls between the *Technical Memorandum 1 Golden Gate Area Pipeline Asset Management Program* total and the updated GIS file's total.

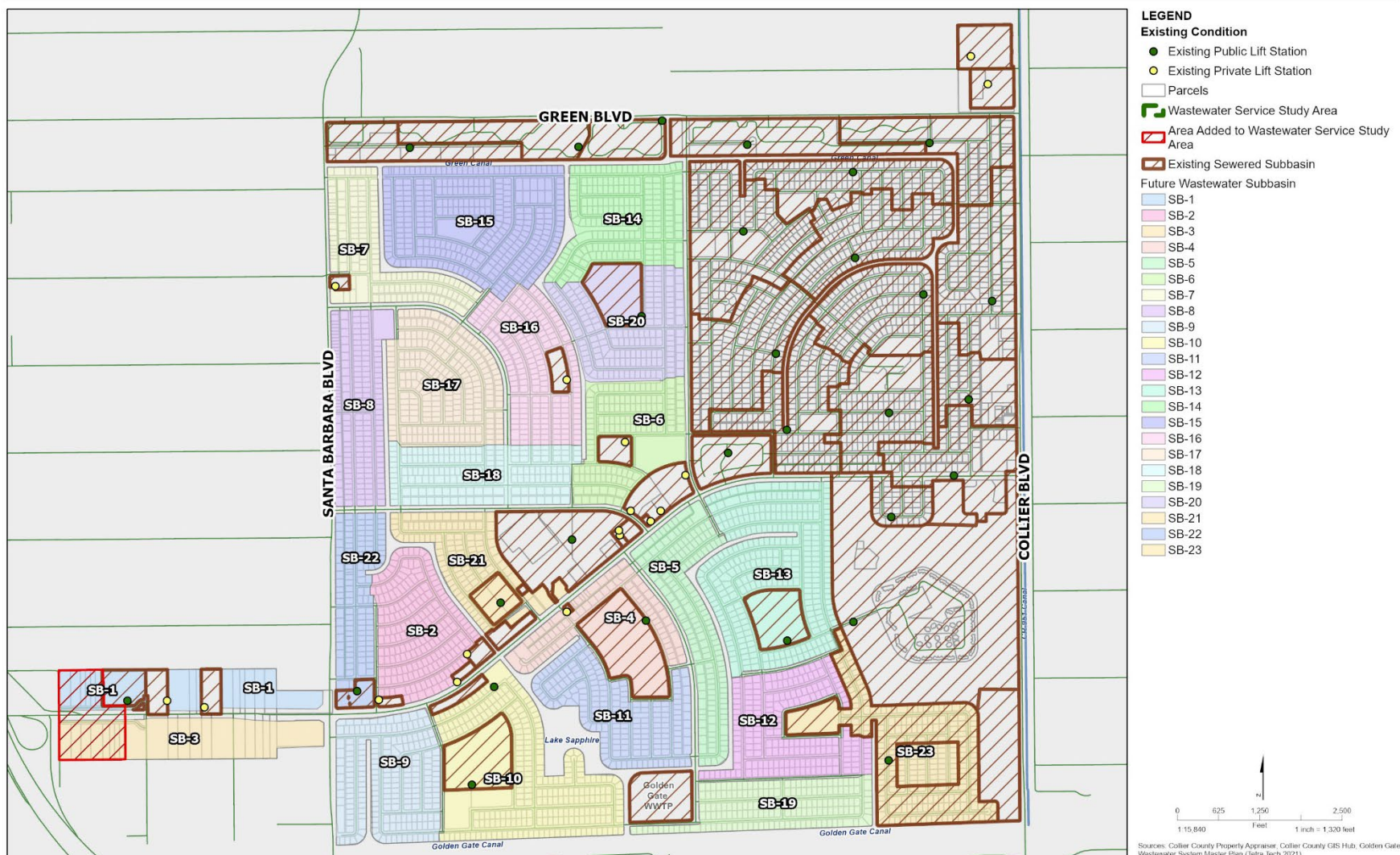
The future wastewater annual average daily flow (AADF) was calculated based on the following formula:

$$\text{Average daily wastewater flow} = 90\% \text{ of the average daily water demand}$$

The GIS file provided water demand projections for the boundary within Golden Gate City as well as the additional area of the wastewater service study area in the northeast, but did not include the additional boundary for the wastewater service study area west of Santa Barbara Boulevard. Therefore, the future wastewater flows were allocated to the entire Golden Gate City area except for the area west of Santa Barbara Boulevard. Jacobs updated the additional wastewater service study area located west of Santa Barbara Boulevard using the estimates in the Wastewater System Master Plan. Additionally, during Jacobs's review, the County requested an additional area be added to the wastewater service study area as shown in Figure 4 (refer to area shown in red hatching). The area west of Santa Barbara Boulevard along Golden Gate Parkway includes subbasins for existing wastewater pump stations 104.37, private wastewater pump stations 9004.60 and 9004.61, and FLS 1 and FLS 3.

Tetra Tech only provided subbasin boundary data for the existing sewered subbasins, as shown in Figure 3, which consisted primarily of the northeast quadrant and included private wastewater pump stations. Tetra Tech did not provide the subbasin boundary delineations for the FLSs identified in the 2021 Wastewater System Master Plan. Therefore, Jacobs approximated and delineated the future subbasin boundaries (areas currently served by septic tanks) based on the placement of the proposed FLS identified in the 2021 Wastewater System Master Plan maps. Figure 4 identifies the areas delineated by Jacobs for the future wastewater subbasins.

Figure 4. Future Subbasin Boundaries



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Table 1 identifies the updated future wastewater flows per subbasin for the existing wastewater service areas (28 County-owned wastewater pump stations and 17 private wastewater pump stations) in gallons per day (gpd). Refer to Figure 2 for pump station ID locations.

Table 1. Future Wastewater Flows for Existing Subbasins Including Private Areas

Ownership Type	Subbasin ID/ Pump Station	2040 Average Daily Water Demand (gpd)	2040 Average Daily Wastewater Flow (gpd)
County Wastewater Subbasin	104.20	51,750	46,575.0
	104.21	33,463	30,116.3
	104.22	42,407	38,166.5
	104.23	94,607	85,145.9
	104.24	170,070	153,063.4
	104.25	72,000	64,800.0
	104.26	33,727	30,354.2
	104.27	58,156	52,340.4
	104.28	7,762	6,986.2
	104.29	39,250	35,325.0
	104.3	41,145	37,030.6
	104.31	93,066	83,759.4
	104.32	87,950	79,154.9
	104.33	108,854	97,968.6
	104.34	75,000	67,500.0
	104.35	98,000	88,200.0
	104.36	29,619	26,657.4
	104.37 ^a	--	16,000.0
	104.38	23,474	21,126.9
	104.39	42,597	38,337.3
	313.24	260,226	234,203.6
	313.25	10,500	9,450.0
	313.26	2,134	1,920.3
	313.27	170,573	153,515.9
	313.28	85,836	77,252.5
	313.29	96,585	86,926.2
	313.30	7,392	6,652.8
	313.31 ^b	--	--

Table 1. Future Wastewater Flows for Existing Subbasins Including Private Areas

Ownership Type	Subbasin ID/ Pump Station	2040 Average Daily Water Demand (gpd)	2040 Average Daily Wastewater Flow (gpd)
	Subtotal		1,668,529
Private Wastewater Subbasin	9004.30	6,524	5,871.5
	9004.43	105,640	95,075.8
	9004.44	2,059	1,852.7
	9004.45	2,580	2,322.4
	9004.46	2,560	2,304.3
	9004.47 ^b	--	--
	9004.49	2,713	2,441.9
	9004.50	4,785	4,306.6
	9004.53	12,857	11,571.5
	9004.55	2,886	2,597.6
	9004.56 ^b	--	--
	9004.57	620	557.6
	9004.60 ^a	--	1,600.0
	9004.61 ^a	--	1,600.0
	Station_0001574 (9005.02) ^b	--	--
	Station_0001590 (9005.01)	13,892	12,502.7
	Station_0001592 (9005.00)	414	372.3
	Subtotal		144,977
Total Future AADF for the Existing System (gpd)			1,813,506

^a Subbasin west of Santa Barbara Boulevard; water demands data at the parcel-level was not provided; wastewater flow is estimated

^b Subbasin with zero water demand and thus zero wastewater flow

Table 2 identifies the future average annual daily wastewater flows per subbasin for the future wastewater service areas.

Table 2. Future Wastewater Flows for Future Subbasins

Future Wastewater Pump Station/Subbasin ID	2040 Annual Average Daily Water Demand (gpd)	2040 Annual Average Daily Wastewater Flow (gpd)
FLS 1 ^a	--	77,560.0
FLS 2	52,750	47,475.0
FLS 3 ^a	--	98,880.0

Future Wastewater Pump Station/Subbasin ID	2040 Annual Average Daily Water Demand (gpd)	2040 Annual Average Daily Wastewater Flow (gpd)
FLS 4	59,519	53,566.9
FLS 5	75,764	68,187.5
FLS 6	46,007	41,406.4
FLS 7	65,326	58,793.2
FLS 8	84,992	76,492.7
FLS 9	69,820	62,838.0
FLS 10	69,105	62,194.1
FLS 11	52,892	47,603.1
FLS 12	48,750	43,875.0
FLS 13	91,000	81,900.0
FLS 14	62,250	56,025.0
FLS 15	76,063	68,456.4
FLS 16	47,552	42,797.2
FLS 17	68,376	61,538.2
FLS 18	78,750	70,875.0
FLS 19	41,000	36,900.0
FLS 20	50,067	45,060.6
FLS 21	52,994	47,694.8
FLS 22	51,000	45,900.0
FLS 23	11,500	10,350.0
Affordable Housing Apartments ^b	--	90,000.0
Nursing Home ^b	--	16,560.0
Total Future AADF for the Future System (gpd)		1,412,929

^a Subbasin west of Santa Barbara Boulevard; water demands data at the parcel-level were not provided; wastewater flow is estimated based off projections in the 2021 Wastewater Sewer Master Plan

^b Areas close to the golf course; water demands data at the parcel-level were not provided; wastewater flow is estimated based on projections in the 2021 Wastewater Sewer Master Plan

Based on these calculations, the total estimated buildout average annual daily wastewater flow updated by Jacobs was estimated as:

$$\text{Existing subbasin flows} + \text{Future subbasin flows} = 1.814 \text{ mgd} + 1.413 \text{ mgd} = 3.227 \text{ mgd}$$

This compares to the 2021 Wastewater System Master Plan's estimated buildout average of 2.770 mgd.

3.2 Wastewater Pump Stations Future Capacity

The design 2040 PHF was estimated by multiplying the AADF by a PHF factor. The equation for PHF based on population as presented in the *Recommended Standards for Wastewater Flows* (GLUMRB 2022) was used to calculate PHF for each wastewater pump station in the wastewater service study area. An equivalent population was estimated from the AADF to each station by dividing by 250 gallons/residence/day and multiplying by 2.5 persons per household (per U.S. Census 2020 data).

The PHF estimates for the wastewater pump stations were used to evaluate pumping capacity for projected future conditions. Wastewater pump stations should be designed to have sufficient pumping capacity for PHF with the largest pump out of service. The future peak hour wastewater flow projections were used to identify any existing or future wastewater pump stations that need to be upgraded or sized to provide sufficient capacity to year 2040.

3.2.1 Field Measurements for Existing Pump Station Capacities

The County wastewater pump stations do not have discharge flow meters to record flow rates. Therefore, in December 2024 Jacobs performed field measurements for the 28 existing County wastewater pump stations. These measurements were used to estimate the pumping rate in gallons per minutes (gpm) to each wastewater pump station. The pumping rate data obtained was used to check whether the existing County wastewater pumps are able to meet the future pumping flow rate requirement. Table 3 summarizes the measured flow rate for the existing County wastewater pumps. Attachment B shows the flow test results for the 28 pump stations.

Table 3. Existing Pump Station Capacity Flows

County Wastewater Pump Station ID	Field-Measured Pumping Flows (gpm)
104.20	282.0
104.21	195.8
104.22	293.8
104.23	951.8
104.24	634.5
104.25	246.8
104.26	88.1
104.27 ^a	N/A
104.28	246.8
104.29	73.4
104.30	1031.6
104.31	489.6
104.32	317.3
104.33	438.7

Table 3. Existing Pump Station Capacity Flows

County Wastewater Pump Station ID	Field-Measured Pumping Flows (gpm)
104.34	122.4
104.35	532.7
104.36	171.4
104.37	141.0
104.38	79.3
104.39	35.3
313.24 ^a	N/A
313.25	101.8
313.26 ^a	N/A
313.27 ^a	N/A
313.28	36.7
313.29	219.3
313.30	135.9
313.31	391.7

^a Station has been recommended to be improved/replaced with a larger station during the existing system analysis
 N/A = not available

3.2.2 Existing County Wastewater Pump Station Capacities

Table 4 lists the estimated design 2040 PHFs for each station for the 28 existing wastewater pump stations.

Table 4. Estimated 2040 Flow for the Existing Wastewater Pump Stations

County Wastewater Pump Station/Basin ID	2040 AADF to Wastewater Pump Station (gpd) (Refer to Table 1)	Service Population (1000s)	Estimated Peak Factor	2040 PHF to Wastewater Pump Station/Design Point Capacity (gpm)
104.20	46,575	0.5	4.0	129
104.21	30,116	0.3	4.1	85
104.22	38,166	0.4	4.0	107
104.23	85,146	0.9	3.8	227
104.24	153,063	1.5	3.7	390

Table 4. Estimated 2040 Flow for the Existing Wastewater Pump Stations

County Wastewater Pump Station/Basin ID	2040 AADF to Wastewater Pump Station (gpd) (Refer to Table 1)	Service Population (1000s)	Estimated Peak Factor	2040 PHF to Wastewater Pump Station/Design Point Capacity (gpm)
104.25	64,800	0.6	3.9	176
104.26	30,354	0.3	4.1	86
104.27	52,340	0.5	4.0	144
104.28	6,986	0.1	4.3	21
104.29	35,325	0.4	4.0	99
104.30	37,031	0.4	4.0	104
104.31	83,759	0.8	3.8	224
104.32	97,529	1.0	3.8	258
104.33	97,969	1.0	3.8	259
104.34	67,500	0.7	3.9	183
104.35	88,200	0.9	3.8	235
104.36	26,657	0.3	4.1	76
104.37	16,000	0.0	4.4	32
104.38	21,127	0.2	4.1	61
104.39	38,337	0.4	4.0	107
313.24	234,204	2.3	3.5	574
313.25	9,450	0.1	4.3	28
313.26	1,920	0.0	4.4	6
313.27	153,516	1.5	3.7	391
313.28	77,253	0.8	3.9	208
313.29	86,926	0.9	3.8	232
313.30	6,653	0.1	4.3	20
313.31	--	0.0	4.5	--

Table 5 summarizes projected future 2040 PHF to each existing station compared to field-measured pumping rates performed by Jacobs.

Note that wastewater pump stations 104.27 and 313.24 were previously identified and recommended for replacement/upgrade as part of the existing system near-term improvements. However, the future flow allocations shows that pump station 313.26 has a limited flow (7 gpm) assigned to it, so pump upgrade may not be needed for this pump station.

Additional pump stations that could not accommodate projected future flows were identified. Stations 104.29, 104.34, 104.36, and 104.39 will need to be upgraded to larger pumps. Pump station 313.31 has no flow assigned to it, therefore Jacobs recommends abandoning that pump station. Pump station 104.32 will have enough capacity because flows from pump 104.33 will no longer be discharged to pump station 104.32; flows from pump station 104.33 will discharge west to the force main on Sunshine Boulevard. Also, future pump stations are proposed in the northwest and south quadrants of Golden Gate City. Therefore, some existing County-owned pump stations will be abandoned and their flow will be directed to the new lift stations. The existing pump stations proposed to be abandoned are 104.28, 104.36, 104.37, 104.38, 313.27, 313.28, 313.29, and 313.30 (refer to Table 5).

Table 5. Existing Pump Station Capacity Comparison to 2040 Peak Flows

County Wastewater Pump Station/Basin ID	Peak Flow to WW Pump Station/Design Point Capacity (gpm)	Field-Measured Pumping Flows (gpm)	Sufficient Capacity (Y/N)
104.20	129	282.0	Yes
104.21	85	195.8	Yes
104.22	107	293.8	Yes
104.23	227	951.8	Yes
104.24	390	634.5	Yes
104.25	176	246.8	Yes
104.26	86	88.1	Yes
104.27 ^a	144	N/A	N/A
104.28 ^b	--	--	abandon pump and add subbasin flows to FLS 22
104.29 ^c	99	73.4	No
104.30	104	1031.6	Yes
104.31	224	489.6	Yes
104.32 ^c	258	317.3	Yes
104.33 ^c	259	438.7	Yes
104.34	183	122.4	No
104.35	235	532.7	Yes
104.36 ^b	--	--	abandon pump and add subbasin flows to FLS 20
104.37 ^b	--	--	abandon pump and add subbasin flows to FLS 1

Table 5. Existing Pump Station Capacity Comparison to 2040 Peak Flows

County Wastewater Pump Station/Basin ID	Peak Flow to WW Pump Station/Design Point Capacity (gpm)	Field-Measured Pumping Flows (gpm)	Sufficient Capacity (Y/N)
104.38 ^b	--	--	abandon pump and add subbasin flows to FLS 21
104.39 ^c	107	35.3	No
313.24 ^{a, b}	--	--	abandon pump and add subbasin flows to FLS-RL
313.25 ^b	--	--	abandon pump and add subbasin flows to FLS-RL
313.26 ^a	6	N/A	N/A
313.27 ^{a, b}	--	--	abandon pump and add subbasin flows to FLS 23
313.28 ^b	--	--	abandon pump and add subbasin flows to FLS 4
313.29 ^b	--	--	abandon pump and add subbasin flows to FLS 10
313.30 ^b	--	--	abandon pump and add subbasin flows to FLS 13
313.31 ^d	--	--	abandon pump

^a Pump station with insufficient capacity; pump was identified during the existing condition analysis

^b Abandon pump station; its flow will be directed to a new future pump station

^c Pump station with insufficient capacity; pump was identified during the future condition analysis

^d Abandon pump station, as no flow is assigned to it in the future condition

3.2.3 Future Wastewater Pump Station Capacities

The resulting design 2040 PHFs for each station are presented in Table 6 for the 23 future wastewater pump stations.

Table 6. Estimated 2040 Design Flow for the Future Wastewater Pump Stations

Future Wastewater Pump Station/Basin ID	Added Flow from Abandoned Existing Pump Station	Average Annual Daily Demand Flow to Wastewater Pump Station (gpd)	Service Population (1000s)	Estimated Peak Factor	Peak Flow to Wastewater Pump Station/Design Point Capacity (gpm)
FLS 1	includes 104.37 subbasin flow	93,560	0.9	3.8	248
FLS 2		47,475	0.5	4.0	131
FLS 3		98,880	1.0	3.8	261
FLS 4	includes 313.28 subbasin flow	130,819	1.3	3.7	338
FLS 5		68,188	0.7	3.9	185
FLS 6		41,406	0.4	4.0	115
FLS 7		58,793	0.6	3.9	161
FLS 8		76,493	0.8	3.9	206
FLS 9		62,838	0.6	3.9	171
FLS 10	includes 313.29 subbasin flow	149,120	1.5	3.7	381
FLS 11		47,603	0.5	4.0	132
FLS 12		43,875	0.4	4.0	122
FLS 13	includes 313.30 subbasin flow	88,553	0.9	3.8	236
FLS 14		56,025	0.6	3.9	154
FLS 15		68,456	0.7	3.9	185
FLS 16		42,797	0.4	4.0	119
FLS 17		61,538	0.6	3.9	168
FLS 18		70,875	0.7	3.9	192
FLS 19		36,900	0.4	4.0	103
FLS 20	includes 104.36 subbasin flow	71,718	0.7	3.9	194
FLS 21	includes 104.38 subbasin flow	68,822	0.7	3.9	186
FLS 22	includes 104.28 subbasin flow	52,886	0.5	4.0	145

Table 6. Estimated 2040 Design Flow for the Future Wastewater Pump Stations

Future Wastewater Pump Station/Basin ID	Added Flow from Abandoned Existing Pump Station	Average Annual Daily Demand Flow to Wastewater Pump Station (gpd)	Service Population (1000s)	Estimated Peak Factor	Peak Flow to Wastewater Pump Station/Design Point Capacity (gpm)
FLS 23	includes 313.27 subbasin flow	163,866	1.6	3.7	416
FLS-RL	includes 313.24 & 313.25 subbasins flow	260,214	2.6	3.5	631
Affordable Housing Apartments Private LS		90,000	0.9	3.0	239

FLS 23 was intended to serve the planned apartments and developments on the County-owned golf course. However, a force main was installed with Phase 1A of the Golden Gate City Transmission Water Main Improvements project and rerouted those flows to the north, then west along Golden Gate Parkway, then south to the WWTP, instead of directly to FLS 23 which then led to the WWTP. According to site development and permit plans, the planned apartments and developments on the County-owned golf course will be installing their own lift station onsite before discharging to the new force main.

Attachment C provides a network schematic diagram of the future transmission system (the existing system schematic diagram is provided in Attachment A). As shown in the schematic diagrams, flows from some existing wastewater pump stations discharge into other pump stations and/or gravity sewers then into the force main system leading to the WWTP. However, the County requested that no FLS should be designed to discharge to another pump station.

3.3 Future Wastewater Pump Station Sites

The 2021 Wastewater System Master Plan recommended a location for each future wastewater pump station. These recommended locations were shown in the maps and provided in a GIS file from Tetra Tech. Jacobs reviewed the recommended parcels for availability as the parcels have not been acquired and some sites have since been developed. Jacobs also reviewed pending building permit or site development applications for the proposed parcels to assess whether those parcels have sufficient space to include the lift station along with the planned development.

Approximately half of the proposed locations in the 2021 Wastewater System Master Plan are no longer available because of proposed or completed development. For those locations, Jacobs evaluated the next closest vacant parcel available to the center of the delineated subbasin area. Jacobs identified the preferred site, and an alternative site in case the property owner of the preferred site does not want to sell, is unwilling to negotiate on a fair price for the property, or does not want an easement on their property.

The acquisition of these future pump station sites is a priority because the vacant parcels are being developed and there are limited parcels to choose from. Additionally, after property acquisition is

completed, the wastewater model will need to be updated with revised areas for the subbasins to finalize their boundaries and the proposed force mains will need to be rerouted to connect to the relocated future pump station site.

The 2021 Wastewater System Master Plan identified the need for a regional inline booster pump station to support the existing network as a near-term improvement and would eventually support the proposed network in the northwest quadrant. The location of the inline booster identified in the 2021 Wastewater System Master Plan is not available, so Jacobs identified a recommended site and alternative sites for this pump station.

It is assumed the existing private pump stations will remain private and discharge directly to force mains. If the County includes the existing private pump stations with the proposed network, the model and master plan will need to be updated. Also, during the project workshop, the County advised that improvements should be made to the existing lift stations where feasible within the existing limits and that the northeast quadrant lift stations should not be relocated. This evaluation of future wastewater pump station sites and the recommendations are provided in the *Future Lift Station Assessment Technical Memorandum* (Jacobs 2025a).

3.4 Future System Improvement Recommendations

Based on the updates performed by Jacobs, modifications are needed for some future improvement projects identified in the 2021 Wastewater System Master Plan. The modifications primarily relate to pump station capacity, relocated future lift station sites and the routing of force mains, and lengths of gravity sewer.

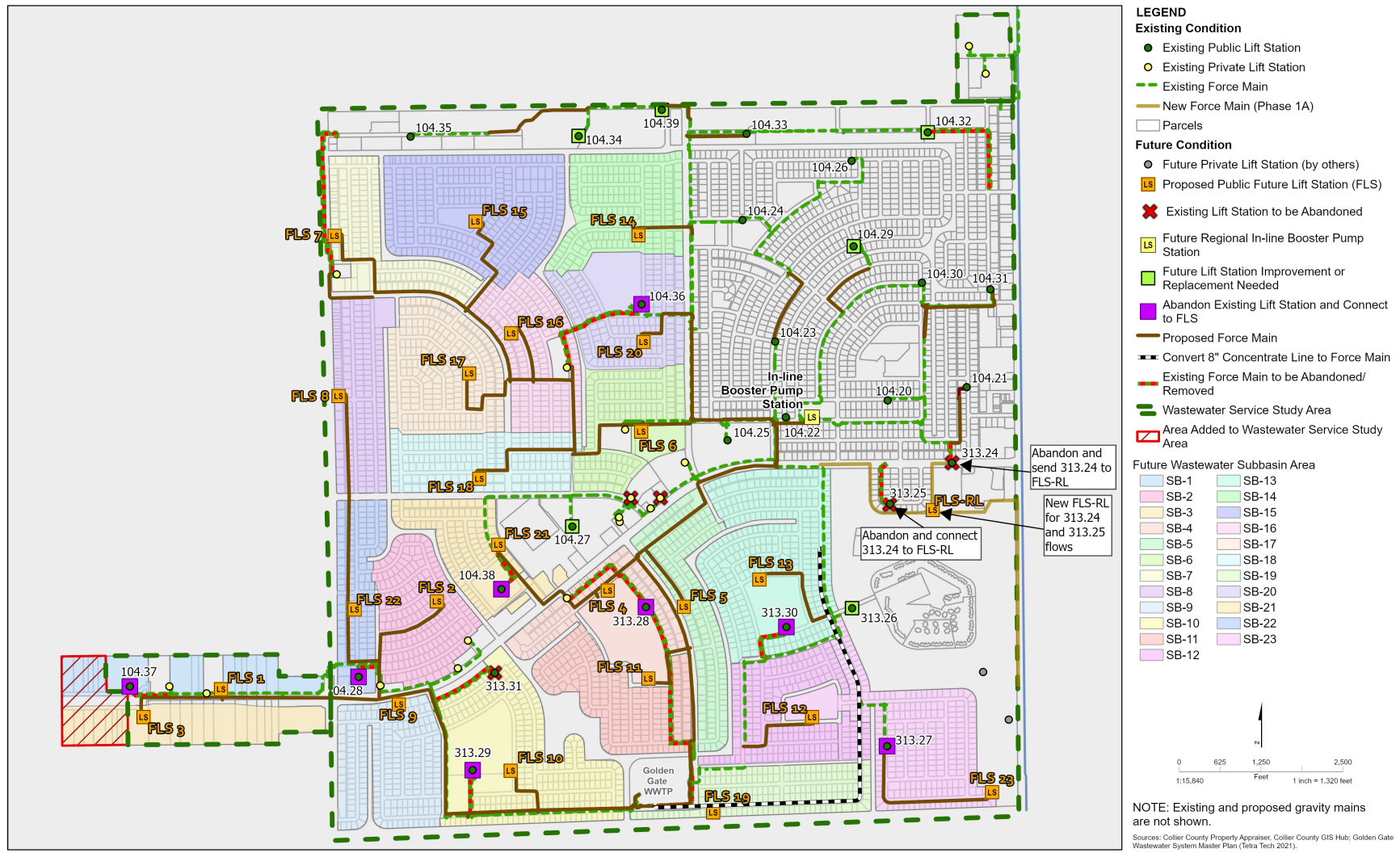
Several meetings were held with Jacobs and the County to discuss the updates to the 2021 Wastewater System Master Plan. During these meetings, the following changes/guidelines were made:

- Do not have any existing or new pump stations discharge to another pump station. The proposed pumps should only discharge to force mains.
 - Limited flows from private lift stations 9004.30 and 9005.01 (Station 1590) discharge to the existing pump station 104.32 (approximately 54 gpm). To connect and discharge the flows from the private lift stations to the closest force main on 20th Place SW, private lift station owners will need to upgrade their stations and extend the 4-inch-diameter force main to connect with the existing force main on 20th Place SW (approximately 5,000 feet long). Because of the long route to the force main, Jacobs recommends retaining the current discharge configuration for these two private lift stations.
- Because some roadways have existing and proposed force mains along the same roads, when the phase/project goes into design, right-of-way constraints will need to be evaluated to ensure all utilities will fit within the available limits.
- The County supports pump station reduction where feasible as follows:
 - The County supports combining the existing pump stations at the school properties with the proposed pump station nearby, as applicable, because both are now owned and maintained by the County.
 - Because the existing pump station 313.24 (in the Golden Gate Parkway roadway median) needs upgrades, it will be relocated from the roadway median to the County-owned golf course property to the south. The existing pump station will then be converted to a manhole. Because the existing pump station 313.25 is in proximity to the new location, it will be abandoned and flows routed to this new pump station site to reduce number of pump stations the County is required to maintain.

- Because FLS 23 is near the existing pump station 313.27, pump station 313.27 will be abandoned and flows routed to FLS 23.
- For the future pump stations required, the County wants to either acquire the whole parcel or obtain water-sewer easements for the area.
- For the existing pump stations in the northeast quadrant, the County wants to include feasible upgrades while maintaining the existing footprint. Improvements would include bringing the sites in compliance with the latest Collier County Water-Sewer District Utilities Standards and include site improvements such as adding bollards, reducing the footprint, adding landscaping to the homeowner's side, and so forth.
- Jacobs's scope of work did not include a wastewater pipelines condition assessment. It is assumed the existing gravity sewer pipelines will be replaced due to the material and age of the pipe.

Figure 5 illustrates the updated future improvements projects. Figure 5 also shows the recent construction of the force main built with Phase 1a of the Golden Gate City Transmission Water Main Improvements project as well as the recommended near-term improvements (refer to Section 2.3.3). These updated future improvement projects are summarized in the following subsections.

Figure 5. Future System Improvement Recommendations



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NOTE: Existing and proposed gravity mains are not shown.
 Sources: Collier County Property Appraiser; Collier County GIS Hub; Golden Gate Wastewater System Master Plan (Tetra Tech 2021).

3.4.1 Wastewater Pump Station Improvements

- Replace existing wastewater pump stations 104.29, 104.34, and 104.39, in addition to 104.27, 313.24, and 313.26 that were identified during the existing condition analysis.
- Install 23 future wastewater pump stations (FLS 1 to FL 23). However, because some parcels for these lift stations are no longer available, Jacobs recommends proceeding with the locations identified in the *Future Lift Station Assessment Technical Memorandum* (Jacobs 2025a).
- Abandon existing wastewater pump stations 104.28, 104.36, 104.37, 104.38, 313.27, 313.28, 313.29, and 313.30 and reroute flows to the future lift stations.

3.4.2 Force Main Improvements

- Improvements carried forward from the 2021 Wastewater System Master Plan
 - New 4-inch- and 6-inch-diameter force mains will be extended from the location of **FLS 2** to the tie in with the proposed 8-inch-diameter main from FLS 1 and 3.
 - A new 16-inch-diameter force main to be installed parallel to the existing 14-inch-diameter main on the discharge side of the proposed **inline booster pump station** down 45th Street SW (approximately 700 feet).
 - A new 6-inch-diameter main to extend approximately 900 feet from the location of **FLS 4** to the connection point with the 16-inch-diameter force main that is proposed with the existing system improvements.
 - A new 14-inch-diameter force main to be installed to replace to the existing 10-inch-diameter main on the suction side of the proposed **inline booster pump station** down Sunshine Boulevard (approximately 1,600 feet).
 - A new 16-inch-diameter force main to be installed to replace to the existing 10-inch-diameter main on the suction side of the proposed **inline booster pump station** along 23rd Avenue SW (approximately 1,250 feet).
 - A new 12-inch-diameter (2,280-foot) force main to be installed to replace to the existing 4-inch-diameter main on 23rd Avenue SW to accommodate flow from **multiple future wastewater pump stations**. It will tie into the force mains at the intersection of Sunshine Boulevard and 23rd Avenue SW on the suction side of the proposed inline booster pump station.
 - A new 6-inch-diameter force main to be extended from **FLS 10** due south on 52nd Terrace SW, due east on 31st Place SW, and due south on 52nd Street SW connecting to the new proposed force main on 32nd Avenue SW. The connection is at the approximate location where the new proposed force main transitions from 10-inch- to 12-inch-diameter. The total length is approximately 1,000 feet.
 - A new 4-inch-diameter force main to be extended from **FLS 11** due east on 28th Court SW, due north on 48th Terrace SW, and due east on 28th Avenue SW connecting to the proposed near-term 16-inch-diameter force main on Tropicana Boulevard. The total length is approximately 1,275 feet.
 - A new 4-inch-diameter force main will be extended from **FLS 13** due south on 44th Terrace SW, and due east on 27th Court SW connecting to the near-term 8-inch-diameter concentrate line conversion on 44th Street SW. The total length is approximately 1,075 feet.

- A new 4-inch-diameter force main will be extended from **FLS 14** east on 18th Court SW and connected to the existing 10-inch-diameter force main on Sunshine Boulevard. The total length is approximately 975 feet.
- A new 4-inch-diameter force main will be extended from **FLS 15** south on 52nd Terrace SW, east on 18th Court SW, south on 52nd Street SW, east on 19th Avenue SW, and south on 51st Terrace SW connecting to the new proposed 6-inch-diameter force main on Hunter Boulevard/ The connection is at the approximate location where the new proposed force main transitions from 4-inch- to 6-inch-diameter. The total length is approximately 1,900 feet.
- A new 4-inch-diameter force main will be extended from **FLS 17** south on 52nd Lane SW, east on 23rd Avenue SW, north on 52nd Terrace SW, east on 22nd Place SW, and north on Hunter Boulevard connecting to the new proposed force main near the intersection of Hunter Boulevard and 22nd Avenue SW. The connection is at the approximate location where the proposed new proposed force main transitions from 6-inch- to 8-inch-diameter. The total length is approximately 1,725 feet.
- A new 4-inch-diameter force main will be extended from **FLS 21** east on 27th Avenue SW, south on 52nd Terrace SW, east on Golden Gate Parkway, south on 50th Street SW, and east on 20th Place SW connecting to the new 6-inch-diameter force main new proposed near **Future Wastewater Pump Station 4**. The total length is approximately 2,900 feet.
- Improvements changed/updated from those identified in the 2021 Wastewater System Master Plan
 - A new 8-inch-diameter force main to be extended approximately 8,070 feet from the location of **FLS 1 and 3** from the Gateway area toward the WWTP. The force main size will change to a 10-inch-diameter main approximately 1,700 feet from the WWTP.
 - A new 4-inch-diameter main to extend approximately 1,200 feet from the location of **FLS 5** to the connection point with the 16-inch-diameter force main.
 - A new 6-inch-diameter force main to be extended from **FLS 23** and connected to the existing 12-inch-diameter force main on 44th Street SW. The total length is approximately 1,950 feet.
 - A new 4-inch-diameter force main (approximately 3,000 feet), 6-inch-diameter force main (approximately 1,400 feet), and 8-inch-diameter force main (approximately 2,000 feet) to be installed from **FLS 7** following existing right-of-way in a southeast direction to the tie in with **FLS 6** and the previously listed 10-inch-diameter force main on 23rd Avenue SW. This force main shall be installed to accommodate flow from several future wastewater pump stations and feed into the suction side of the proposed inline booster pump station.
 - A new 4-inch-diameter force main to be installed from **FLS 18** to the previously listed 10-inch-diameter force main on 23rd Avenue SW (approximately 1,770 feet).
 - A new 4-inch-diameter force main (approximately 2,420 feet) to be installed from **FLS 8** and connected to the existing 6-inch-diameter force main on 55th Street SW
 - A new 4-inch-diameter force main (approximately 200 feet) to be installed from **FLS 9** to the new proposed 8-inch-diameter force main on 29th Place SW.
 - A new 4-inch-diameter force main to be extended from **FLS 12** due west on 30th Avenue SW, due south on 46th Street SW, and due west on 30th Place SW connecting to the existing 14-inch-diameter force main on 47th Street SW. The total length is approximately 1,550 feet.
 - A new 4-inch-diameter force main will be extended from **FLS 19** and connected to the existing 8-inch-diameter force main on 32nd Avenue SW. The total length is approximately 100 feet.

- A new 4-inch-diameter force main will be extended from **FLS 22** and connected to the existing 6-inch-diameter force main on 55th Street SW. The total length is approximately 1,320 feet.
- A new 4-inch-diameter force main will be extended from **FLS 16** and connected to the new proposed force main on 22nd Avenue SW (940 feet).
- A new 6-inch-diameter force main will be extended from **FLS 20** and connected to the existing 10-inch force main on Sunshine Boulevard. The total length is approximately 1,100 feet.
- Improvements to connect pump stations to force mains instead of discharging to another pump station:
 - **Pump Station 104.35 Discharge Connection:** Wastewater pump station 104.35 is currently discharging to wastewater pump station 104.34. Connect pump station 104.35's discharge connection to connect directly into the force main upstream of wastewater pump station 104.34 flowing west on Whistlers Green Circle. There will be required piping work improvements from wastewater pump station 104.35 to tie it via 6-inch-diameter pipe into the existing 6-inch-diameter force main on Whistlers Green Circle (approximately 2,000 feet long).
 - **Pump Station 104.26 Discharge Connection:** Wastewater pump station 104.26 is currently discharging to wastewater pump station 104.23. Connect station 104.26 discharge connection to connect directly into the force main upstream of wastewater pump station 104.23 flowing on 45th Street SW. There will be required piping work improvements from wastewater pump station 104.26 to tie it via 6-inch-diameter pipe into the existing 6-inch-diameter force main on 45th Street SW (approximately 1,500 feet long).
 - **Pump Station 104.29 Discharge Connection:** Wastewater pump station 104.29 is currently discharging to wastewater pump station 104.30. Connect pump station 104.29's discharge connection to connect directly into the force main upstream of wastewater pump station 104.30 flowing on 44th Street SW. There will be required piping work improvements from wastewater pump station 104.29 to tie it via 6-inch-diameter pipe into the existing 6-inch-diameter force main on 44th Street SW (approximately 1,100 feet long).
 - **Private Lift Station 9004.43 Discharge Connection:** The lift station is currently discharging to wastewater pump station 104.36. Connect the lift station discharge connection to the new force main flowing south on 50th Terrace SW via 4-inch-diameter force main (approximately 500 feet long).
 - **Private Lift Station 9004.49 Discharge Connection:** The lift station is currently discharging to wastewater pump station 104.35. Connect the lift station discharge connection to the new force main flowing west on Hunter Boulevard via 4-inch-diameter force main (approximately 1,000 feet long).

More details on the abandonment of force main and gravity mains are provided in the future system schematic diagram in Attachment C.

3.4.3 Gravity Sewer Improvements

- Install 8-inch-diameter gravity sewer in the 23 future subbasins to collect wastewater and route it to their respective lift station. Table 7 provides an estimate of the length of gravity sewer pipe associated with each subbasin in length feet.
- Replace the existing gravity sewer system within the existing sewered areas.

Table 7. Future Gravity Sewer Pipe

Future Wastewater Subbasin ID	8-inch Gravity Sewer Pipe (Estimated in Length Feet)
FLS 1	2,737
FLS 2	9,628
FLS 3	3,978
FLS 4	13,769
FLS 5	13,151
FLS 6	13,757
FLS 7	18,226
FLS 8	7,579
FLS 9	12,940
FLS 10	14,853
FLS 11	10,763
FLS 12	12,516
FLS 13	18,782
FLS 14	20,331
FLS 15	21,274
FLS 16	9,337
FLS 17	17,072
FLS 18	10,537
FLS 19	6,382
FLS 20	5,389
FLS 21	8,835
FLS 22	8,852
FLS 23	2,053

3.5 Wastewater Level of Service Criteria

The County provided Jacobs with a list/table of wastewater level of service (LOS) standards and performance criteria to evaluate whether the criteria will be met with the Golden Gate City Master Plan. A summary of the County’s LOS table is provided in Attachment D. Jacobs added the column ‘GGCMP Evaluation’ to identify if the criteria were evaluated as part of this Golden Gate City Master Plan study or if it requires more data to evaluate.

4. Conclusion

Jacobs's scope was to perform a review of the 2021 Wastewater System Master Plan to verify recommendations that will be included with the Golden Gate City Master Plan incorporating all infrastructure within the study area. The 2021 Wastewater System Master Plan was reviewed along with a copy of the wastewater hydraulic model provided by Tetra Tech. The wastewater hydraulic model did not identify how the future wastewater flows (for year 2040) were calculated and allocated and the model did not include gravity mains. GIS files were received for recommended force main layout and proposed lift station locations. However, no GIS information was provided to support the existing and future wastewater flows calculation or delineation of the subbasin boundaries.

Jacobs reviewed available information received and identified a few discrepancies between the 2021 Wastewater System Master Plan and the wastewater hydraulic model, identifying data gaps including future flows, future pump station locations no longer available due to land development, and future flows allocation. The total future wastewater flows calculated by Tetra Tech was 2.77 mgd while the flow updated by Jacobs is 3.23 mgd. As a result of the updates by Jacobs, several improvement projects required modification including pump station improvements, force mains, and gravity sewers. The occupancy (number of people per housing unit) and wastewater flow should be verified during design.

Additionally, Jacobs recommended reducing the number of pump stations the County would need to maintain as well as abandoning nearby public pump stations at the schools and combining those flows with new future lift stations, where feasible. The County also requested that no pump stations be connected to another pump station and they should only discharge to force mains, which changes recommendations made in the 2021 Wastewater System Master Plan.

Based on the revisions to the model, changes to the layout of the proposed wastewater infrastructure, and direction during meetings with the County, the recommended projects were revised to those detailed in Section 3.4 and Figure 5. Jacobs recommends the County update the wastewater hydraulic model to (1) better determine the TDH for each proposed pump station and (2) optimize system operations. In addition, the County recently installed an 8-inch-diameter wastewater force main with Phase 1A of the Golden Gate City Transmission Water Main Improvements project and proposed developments on the golf course, which will need to be added to the model.

Because some roadways have existing and proposed force mains along the same roads, when the project phase goes into design, a utility analysis should be performed to ensure all existing and proposed utilities will fit within the available right-of-way.

The acquisition of the proposed future lift station sites is the first priority because the limited remaining vacant parcels within the study area are being developed. For sites no longer vacant/available, Jacobs evaluated an alternative site and identified a preferred site and an alternative site in case the property owner of the preferred site does not want to sell, is unwilling to negotiate on a fair price for the property, or does not want an easement on their property. Based on the site the County can acquire for each respective proposed lift station, the layout of the force mains and subbasin boundaries may change from the recommendations in this memorandum. After property acquisition is completed, the wastewater model will need to be updated with revised areas for the subbasins to finalize their boundaries, as they may be subject to change.

5. References

Carollo Engineers, Inc. 2020. *Technical Memorandum 1 GOLDEN GATE AREA PIPELINE ASSET MANAGEMENT PROGRAM*. August.

Carollo Engineers, Inc. 2024. *Technical Memorandum 1 GOLDEN GATE AREA PIPELINE ASSET MANAGEMENT PROGRAM*. December.

Dragash, Kristiana, Carollo Engineers Inc. 2024. Personal communication (email) with Felica Kirby, Jacobs. November 13.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (GLUMRB). 2022. *Recommended Standards for Water Works*. 2022 Edition. October 17.

Jacobs. 2025a. *Future Lift Station Assessment Technical Memorandum*. April.

Jacobs. 2025b. *Water Distribution System Evaluation Technical Memorandum*. February.

Stolts, Anthony, Collier County Public Utilities. 2025a. Personal communication (email) with Felicia Kirby, Jacobs. March 4.

Stolts, Anthony, Collier County Public Utilities. 2025b. Personal communication (email) with Felicia Kirby, Jacobs. June 27.

Tetra Tech, Inc. 2021. *Collier County Waste-Sewer District Golden Gate Wastewater System Master Plan Report*. June.

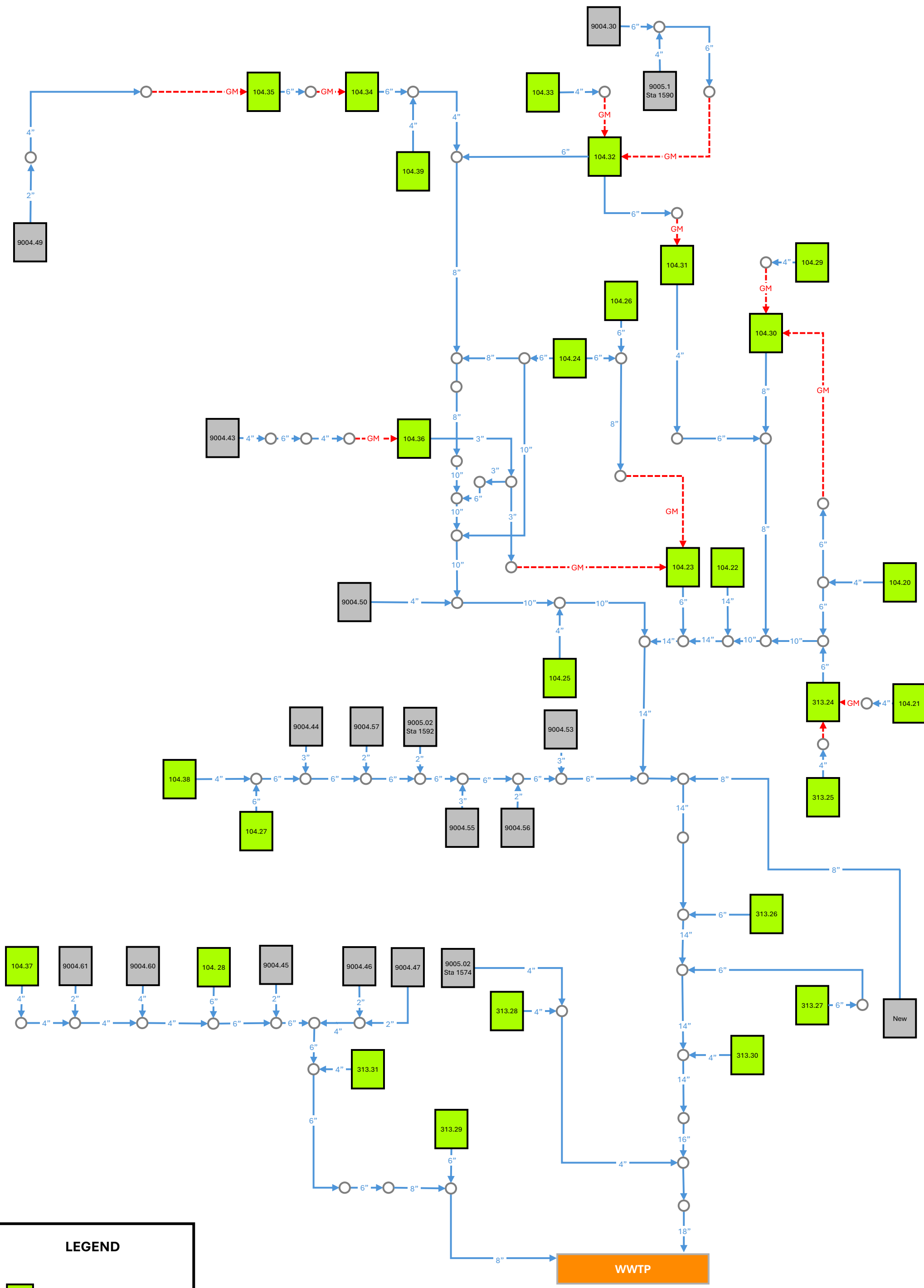
U.S. Census Bureau (USCB). n.d. <https://www.census.gov/en.html>. Accessed December 12, 2024.

U.S. Environmental Protection Agency (EPA).1974. *Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability*. EPA-430-99-74-001. Office of Water Program Operations.

Wainright, Tyler, Tetra Tech Inc. 2024. Personal communication (email) with Diana Francois, Jacobs. October 25.



Attachment A
Existing System Schematic Diagram



LEGEND

- Existing Lift Station
- Private Lift Station
- Existing Force Main
- Existing Gravity Main
- Junction



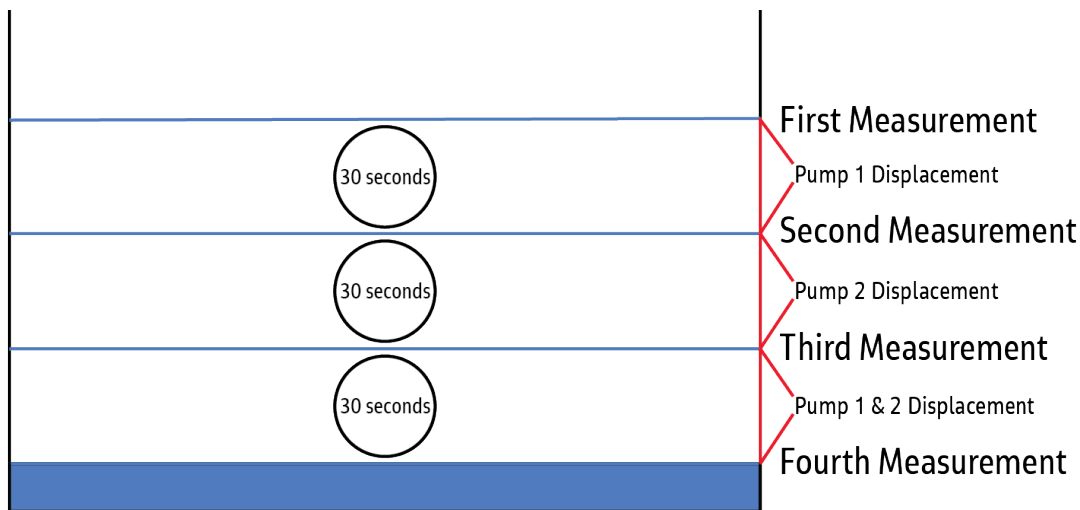
Attachment B
Drawdown Testing Field Measurements

Attachment B. Drawdown Testing Field Measurements

In a typical wastewater pump station drawdown test, pumping rate and average flow are computed from measured water level changes and the known wet-well diameter. Water level changes are converted to volume in gallons based on the wet-well diameter, and then dividing volume by time interval in minutes provides the desired flow rate measurement.

The drawdown test procedure starts with turning off all pumps and lowering a sufficiently long tape measure to the wastewater surface elevation. Once a measurement is taken, another individual should be at the control panel to start Pump 1 with a timer for 30 seconds. After 30 seconds, the pump should be switched off and another measurement taken at the new water surface elevation. After this measurement, Pump 2 should be run for 30 seconds and another elevation measurement taken at the end of the time. Finally, both Pumps 1 and 2 should be run for 30 seconds and a final elevation measurement taken. From these displacements, the volume displaced can be determined by using the diameter of the wet wells to find the area and then multiplying by the vertical displacement. With volume, the flow rate in gallons per minute (gpm) can be found by dividing by the time of the test (0.5 minutes, in this case). Figure B-1 provides an example diagram of the measurements taken during the drawdown test

Figure B-1. Drawdown Testing Procedure Example Diagram



Drawdown test results for the 28 pump stations are summarized in Table B-1. Note that because of wastewater levels at the time of testing, some pumps could not be running the entire 30 seconds. The radius for each lift station was obtained through as-builts received from the County. Note that as-builts were not received for pump stations 104.22, 104.27, and 313.31 and an estimate was used. For cuboid pump stations, the formula for volume was adjusted accordingly.

Table B-1. Drawdown Test Results for Existing Pump Stations

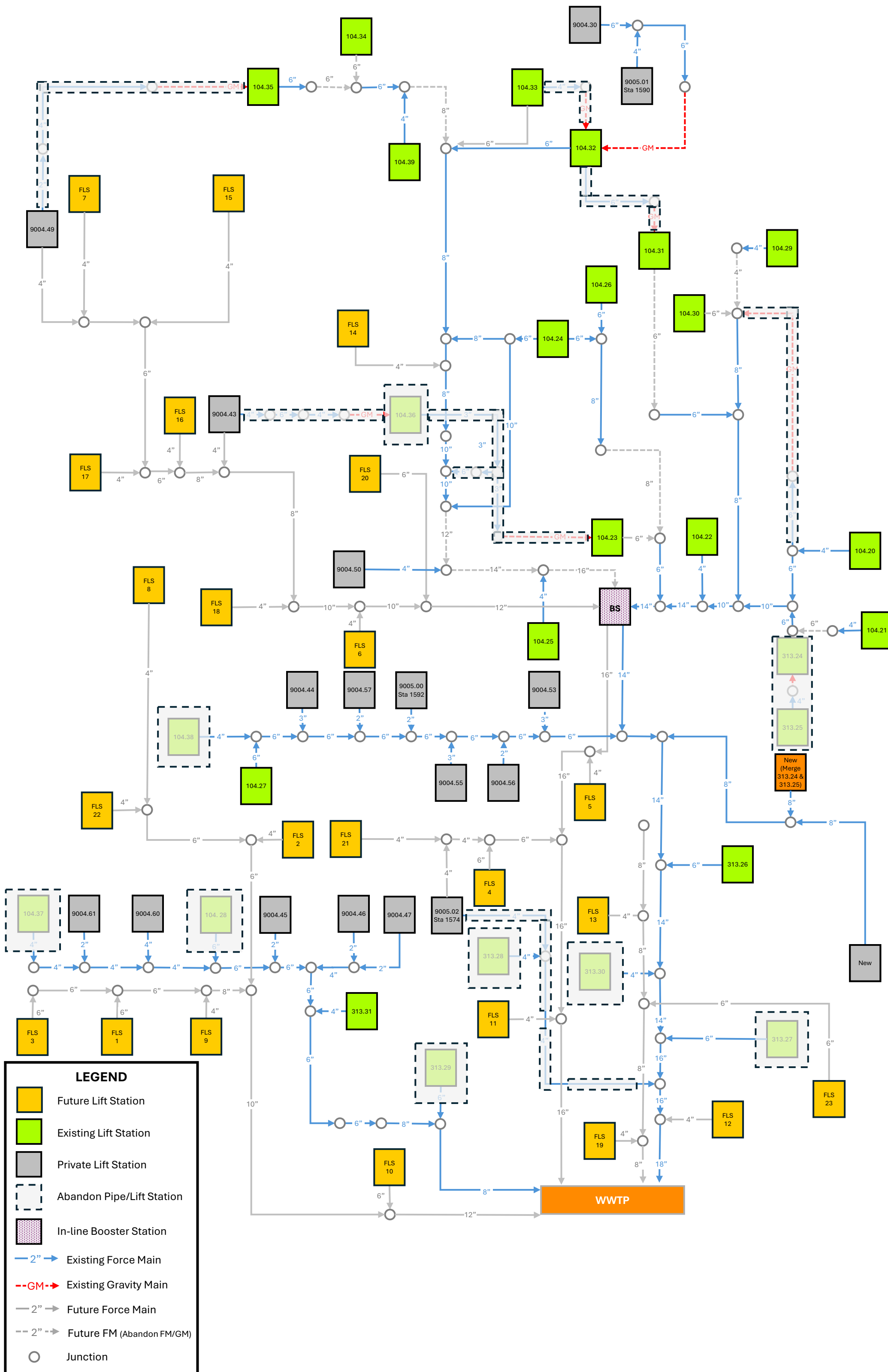
Lift Station ID	Initial Height (feet)	Influent Height (feet)	Pump 1 New Datum (feet)	Pump 1 Height (feet)	Pump 2 New Datum (feet)	Pump 2 Height (feet)	Both Pumps New Datum (feet)	Both Pumps (feet)	Δ 1 (feet)	Δ 2 (feet)	Δ Combined (feet)	Testing Time (min)	Radius (feet)	gpm Influent	gpm Pump 1
104.37	7.83	7.83	0	8.17	0	8.38	0	8.75	0.33	0.21	0.38	0.5	3	0.0	141.0
313.29	8.04	8.04	0	8.33	0	8.58	0	9.08	0.29	0.25	0.50	0.5	4	0.0	219.3
313.31	11.38	11.42	0	11.75	0	12.08	0	12.50	0.33	0.33	0.42	0.5	5	0.0	391.7
313.28	8.46	8.46	0	8.58	0	8.92	0	9.33	0.13	0.33	0.42	0.5	2.5	0.0	36.7
313.30	11.13	11.13	0	11.33	0	11.67	0	12.17	0.21	0.33	0.50	0.5	3.725	0.0	135.9
313.26	12.08	12.08	0	12.92	0	13.46	0	14.58	0.83	0.54	1.13	0.5	2.5	0.0	244.8
313.27	13.75	13.58	0	13.83	0	14.50	0	15.17	0.25	0.67	0.67	0.5	3	70.5	176.3
313.25	7.38	7.21	0	7.58	0	8.00	0	8.42	0.38	0.42	0.42	0.5	2	31.3	101.8
313.24	10.63	10.46	0	10.50	0	10.50	0	10.63	0.04	0.00	0.13	0.5	4	125.3	156.7
104.21	9.50	9.08	0	8.67	0	8.92	0	9.21	-0.42	0.25	0.29	0.5	2.5	122.4	195.8
104.31	10.00	9.50	0	10.67	10	10.92	9.13	10.33	1.17	1.00	1.21	0.5	2.5	146.9	489.6
104.32	11.67	11.33	0	11.75	0	12.08	0	12.79	0.42	0.33	0.71	0.5	3	141.0	317.3
104.33	13.42	13.33	0	13.83	0	14.25	0	14.75	0.50	0.42	0.50	0.5	4	62.7	438.7
104.39	14.42	14.42	0	14.50	0	14.83	0	15.25	0.08	0.33	0.42	0.5	3	0.0	35.3
104.34	12.17	12.08	0	12.21	0	12.46	0	12.83	0.13	0.25	0.38	0.25	2.5	49.0	122.4
104.35	10.13	10.00	0	10.58	0	11.04	0	12.00	0.58	0.46	0.96	0.5	4	94.0	532.7
104.24	10.00	9.42	0	10.33	0	11.08	0	11.92	0.92	0.75	0.83	0.5	3	246.8	634.5
104.26	10.92	11.00	12.33	12.54	11.63	12.25	12.29	12.50	0.21	0.63	0.21	0.5	3	0.0	88.1

Table B-1. Drawdown Test Results for Existing Pump Stations

Lift Station ID	Initial Height (feet)	Influent Height (feet)	Pump 1 New Datum (feet)	Pump 1 Height (feet)	Pump 2 New Datum (feet)	Pump 2 Height (feet)	Both Pumps New Datum (feet)	Both Pumps (feet)	Δ 1 (feet)	Δ 2 (feet)	Δ Combined (feet)	Testing Time (min)	Radius (feet)	gpm Influent	gpm Pump 1
104.29	7.75	7.75	0	8.00	0	8.33	0	8.83	0.25	0.33	0.50	0.5	2.5	0.0	73.4
104.30	9.00	8.83	0	10.29	10.08	10.67	0	11.50	1.46	0.58	0.83	0.25	3.5	191.9	1031.6
104.20	8.00	7.75	0	7.83	8.42	8.58	8.25	8.42	0.08	0.17	0.17	0.25	3	211.5	282.0
104.22	9.75	9.67	0	9.83	0	9.83	0	10.00	0.17	0.00	0.17	0.5	5	97.9	293.8
104.23	9.83	9.50	0	11.42	9.83	10.54	0	11.75	1.92	0.71	1.21	0.5	3	141.0	951.8
104.25	11.83	11.75	0	12.25	0	12.79	0	13.33	0.50	0.54	0.54	0.5	3	35.3	246.8
104.36	6.33	6.25	0	6.75	0	7.38	7.08	7.42	0.50	0.63	0.33	0.5	2.5	24.5	171.4
104.27	13.42	13.25	0	13.50	0	13.58	0	13.83	0.25	0.08	0.25	0.5	4	125.3	313.3
104.38	12.17	12.17	0	12.29	0	12.50	12.63	12.79	0.13	0.21	0.17	0.33	3	0.0	79.3
104.28	10.33	10.33	0	10.92	0	11.25	0	11.67	0.58	0.33	0.42	0.5	3	0.0	246.8



Attachment C
Future System Schematic Diagram



LEGEND

- Future Lift Station
- Existing Lift Station
- Private Lift Station
- Abandon Pipe/Lift Station
- In-line Booster Station
- Existing Force Main
- Existing Gravity Main
- Future Force Main
- Future FM (Abandon FM/GM)
- Junction



Attachment D
Wastewater Level of Service Criteria

Table D-1. Wastewater Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Wastewater

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Units of Measure	Driver	Reference Material	GGCMP Evaluation
Capacity & Access	Annual average day per capita demand	90 LOS Standard	gpcd	Design	FAC 62-604.300(9), Historical Data Analysis	The projected annual average day demand for the Golden Gate City Service Area for the year 2040 (buildout) is 3.585 million gallons. The Golden Gate city population for the year 2020 was 25,321 and the expected percent increase is approximately 0.5% per year (USCB n.d.). Based on these data, the projected population for the year 2040 is approximately 28,000. The annual average day per capita demand is approximately 128, which is higher than the LOS standard (90 gpcd).
Capacity & Access	Maximum month daily flow process design basis		Max Month	Design	Collier County Water Sewer District requirements that exceed Florida Department of Environmental Protection (FDEP) guidelines (treatment process design is based upon Maximum Month Daily Flow) to address peak flows and load more reliably	Per Tetra Tech Preliminary Engineering Report dated 8/30/2024, the Max Month for the new Golden Gate WWTP is 7.9 mgd. Based on historical data, the max month has been less than 1.6 mgd.

Table D-1. Wastewater Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Wastewater

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Units of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Conveyance system minimum scour velocity	2	feet per second (fps)	Design	2014 Recommended Standards for Wastewater Facilities Sec 49.1 by The Great Lakes - Upper Mississippi River Board of State and Provincial Health and Environmental Managers	Based on the estimated design flow, the velocity for all future and existing force main pipes is above 2 fps, except for few segments including: 8-inch-diameter recently constructed pipe from the Affordable Housing Apartments going north, 6-inch-diameter discharge pipe from the existing 104.27 lift station, 8-inch-diameter discharge pipe from the existing 104.30 lift station, and 6-inch-diameter discharge pipe from 313.26 existing lift station.

Table D-1. Wastewater Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Wastewater

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Units of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Conveyance system maximum scour velocity	8	fps	Design	2014 Recommended Standards for Wastewater Facilities Sec 49.1 by The Great Lakes - Upper Mississippi River Board of State and Provincial Health and Environmental Managers	Based on the estimated design flow, the velocity for all future and existing force main pipes is lower than 8 fps.
Environment & Sustainability	Effluent quality to comply with FDEP permit requirements	Treatment plant effluent complies with the plant permit requirements		Regulatory	FDEP Permit# FL0141399 and FL0141356	Jacobs does not have enough data to check this LOS performance criterion. Jacobs did not collect effluent quality data as part of the GGCMP. This performance criterion should be checked by the Golden Gate WWTP designer.

Table D-1. Wastewater Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Wastewater

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Units of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Unit operations in the main wastewater treatment system shall be designed such that, with the largest flow capacity unit out of service, the hydraulic capacity of the remaining units shall be sufficient to handle peak wastewater flow (Class I Reliability)		mgd	Reliability	EPA-430-99-74-001 Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability, Sect. 212: Component Backup Req & FAC 62.600-540 (2)	Jacobs does not have sufficient data to check this LOS performance criteria. Jacobs has not been involved with the design of the Golden Gate WWTP. This performance criteria should be checked by the Golden Gate WWTP designer.
Quality & Reliability	Reliable treatment plant wet weather capacity	Max Day Flow	mgd	Reliability	Collier County recommendation to reliably handle wet weather flow	Jacobs does not have sufficient data to check this LOS performance criteria. Jacobs has not been involved with the design of the Golden Gate WWTP. This performance criteria should be checked by the Golden Gate WWTP designer.

Table D-1. Wastewater Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Wastewater


Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Units of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Reliable capacity for deep injection well for effluent disposal	Max Day Flow	mgd	Reliability	FDEP Permit# FL0141399 (NCWRF) and FL0141356 (SCWRF)	Jacobs does not have sufficient data to check this LOS performance criteria. This performance criteria should be checked by the Golden Gate City WWTP designer.

Notes: Per capita flow is an LOS standard. Remaining items are performance criteria.

Source: (Stolts, pers. Comm. 2025a).

LOS = level of service

gpcd = gallon(s) per capital per day



Appendix A.2
Future Lift Stations Assessment
Technical Memorandum

Golden Gate City Water Resource Protection - Restoration Master Plan

Future Lift Stations Assessment Technical Memorandum

July 2025



1. Introduction

Collier County (hereinafter, "the County") was awarded a grant from the State of Florida Department of Environmental Protection for the Collier County Golden Gate City Water Resource Protection/Restoration Master Plan (hereinafter, the "Golden Gate City Master Plan"). As part of the preliminary data collection and analysis, Jacobs was tasked with reviewing the wastewater distribution system within the Golden Gate area and the information provided in the *Collier County Water-Sewer District Golden Gate Wastewater System Master Plan* (hereinafter "2021 Wastewater System Master Plan") (Tetra Tech 2021).

The project team conducted a thorough review of the source data to enhance their understanding of the current wastewater system and any planned projects for the area. A key component of the 2021 Wastewater System Master Plan is the recommendation of 23 future lift stations to improve the existing wastewater infrastructure. These lift stations were strategically positioned in areas lacking current sewer connections or requiring enhanced service. They were evenly distributed across the service area and are each capable of serving a sewer line travel distance of approximately 1,500 feet. The strategic placement of the lift stations aims to minimize the total number of required pump stations.

2. Future Lift Stations

The primary goal of identifying the 23 future lift stations in the 2021 Wastewater System Master Plan is to extend wastewater service coverage and improve the overall efficiency of the system. Each lift station is estimated to service approximately 1,500 feet of sewer line. Additional detail on the future lift stations is provided in the following subsections.

2.1 Lift Station Requirements

All the future lift stations will be small, duplex, submersible wet-pit-type stations, designed to efficiently handle wastewater in the designated areas. Each proposed lift station was evaluated for an approximate available area of 60 feet by 60 feet, which is standard for this type of infrastructure. Future lift stations shall be constructed in accordance with the latest codes and standards including the Collier County Utilities Standards Manual. Additionally, the placement of the lift stations on the site shall meet requirements for setback from private drinking water wells (Collier County 2025).

The construction of each lift station shall include the following essential components:

- **8-foot-diameter (minimum) well containing two pumps:** The well will house two submersible pumps.
- **Electrical/control panels:** The panels will house the electrical and control systems necessary for the operation of the lift station.
- **Generator:** A backup generator will be installed to ensure continuous operation during power outages.
- **Odor control:** Odor control measures will be implemented to minimize any unpleasant smells, reducing any potential negative impacts on the surrounding area.
- **Force main piping:** The piping will transport the wastewater from the lift station to the treatment facility or another designated point in the system.
- **Fencing:** The entire lift station area will be enclosed with fencing to secure the site and prevent unauthorized access.

Jacobs recommends including an area for parking if space is available on the site.

2.2 Parcel Assessment

Each parcel identified as a potential location for a future lift station in the 2021 Wastewater System Master Plan was evaluated for availability. Aerial imagery from Collier County Property Appraiser was used to determine each parcel’s development status (Collier County 2024). Parcels that were developed were examined to determine whether it has the necessary available space (60-foot by 60-foot area) to construct a lift station. If the aerial imagery indicated that the parcel was undeveloped, public records were reviewed to determine whether the parcel had any existing or pending building permit or site development plan applications in the Collier County Permitting Portal. For properties with an active application, the application documents were reviewed to determine whether the developed site would have sufficient space for a lift station after construction completion. If a developed parcel could not accommodate a 60-foot by 60-foot area, the property was determined to be unavailable. If the required area could be incorporated into the site, the property was determined to be available. Figure 1 summarizes this evaluation process. Refer to Attachment A for supporting information from Collier County Property Appraiser and the Collier County Permitting Portal.

Table 1 summarizes the parcel assessment analysis and identifies whether a new parcel needs to be evaluated. This analysis was performed based on available data as of November 18, 2024. Figure 2 shows the current availability of the future lift station sites recommended in the 2021 Wastewater System Master Plan, noting those that are no longer available.

Figure 1. Future Lift Station Evaluation Process

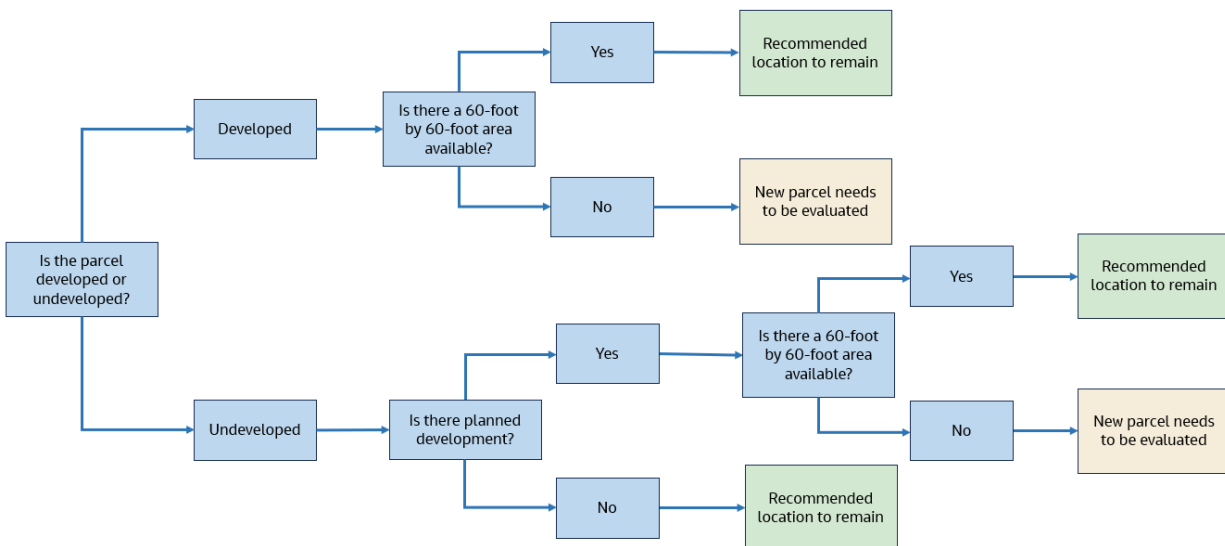


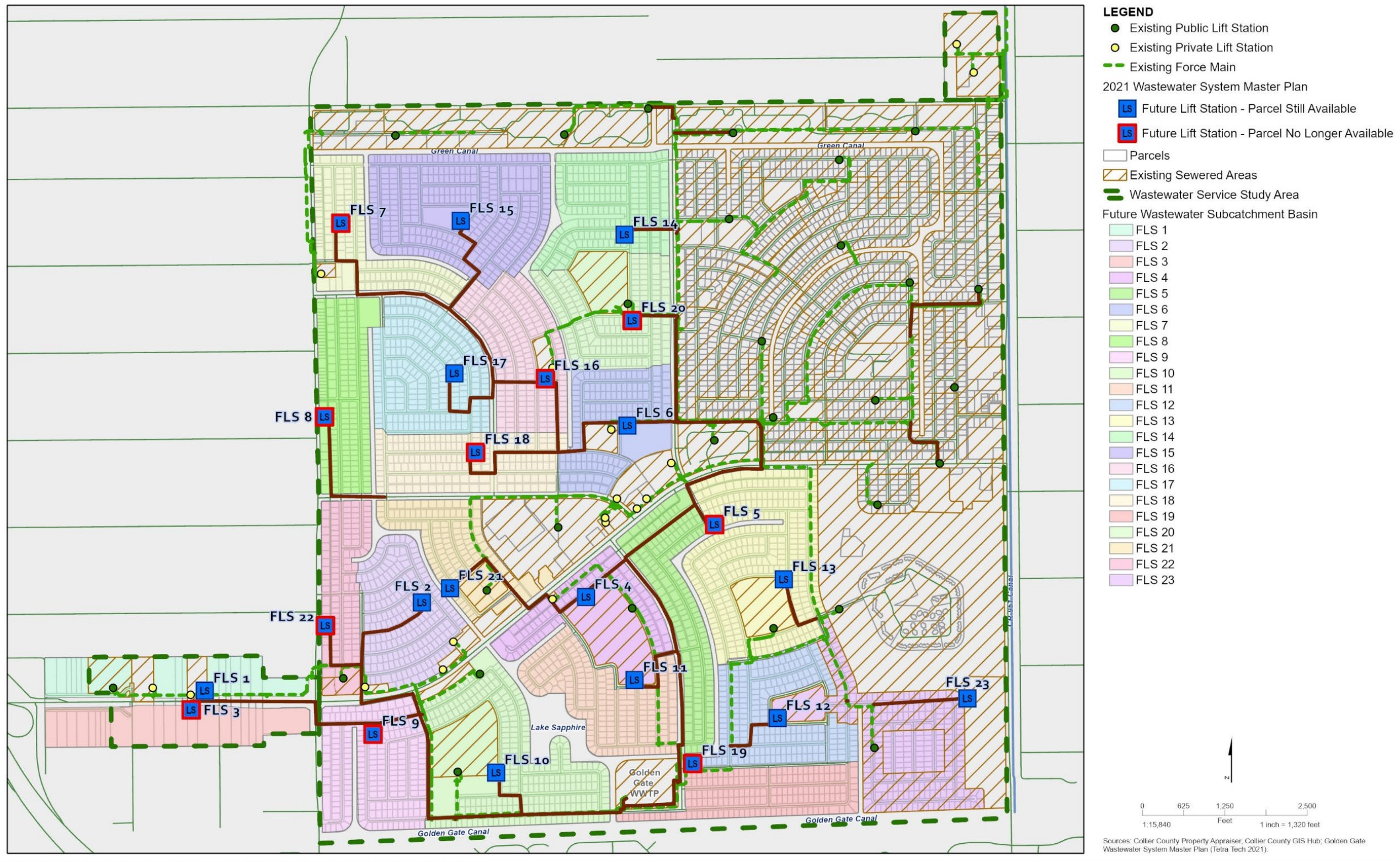
Table 1. Future Lift Station (FLS) Parcel Assessment

Lift Station ID	Site Address	Parcel Number	Is the parcel developed or undeveloped? ^a	Building Permit Application Status	Is there a 60'x60' area available? ^b	Is a new parcel/site required?
FLS 1	5865 GOLDEN GATE PKWY	38166600002	Developed	None	No – only available space at back of property. Would require directional drill under parking lot. However, the site may accommodate a 30'x30' area behind the existing dumpster enclosure area.	No
FLS 2	5407 27TH AVE SW	36323280005	Undeveloped	None	Yes	No
FLS 3	5860 GOLDEN GATE PKWY	38166640004	Developed	None	No – would require impacts to existing landscaping (privacy bushes) and the driveway or would require directional drill at back of property.	Yes
FLS 4	2701 48TH TER SW	36443960001	Developed – Golden Gate Middle School (School District)	None	Yes	No
FLS 5	4672 25TH AVE SW	35989320009	Undeveloped	Application Number: PRFH20240520104 Application Type: 1-2 Family Home Date Issued: 6/27/2024	No	Yes
FLS 6	4701 GOLDEN GATE PKWY	36111520003	Developed – Golden Gate Community Center (Collier County)	None	Yes	No
FLS 7	1836 55TH TER SW	36232400002	Developed	None	No	Yes
FLS 8	2290 SANTA BARBARA BLVD	36305480001	Undeveloped	Application Number: PL20230014891 Application Type: Site Development Plan Application Date: 9/19/2023	No	Yes
FLS 9	2972 54TH LN SW	36431600001	Developed	None	No	Yes
FLS 10	3000 53RD ST SW	36439840009	Developed – St. John Neumann Catholic High School	None	Yes	No
FLS 11	2701 48TH TER SW	36443960001	Developed – Golden Gate Middle School (School District)	None	Yes	No
FLS 12	2965 44TH TER SW	36002520002	Developed – Lavern Gaynor Elementary School (School District)	None	Yes	No
FLS 13	2711 44TH TER SW	35998440006	Developed – Golden Gate Terrace Elementary School (School District)	None	Yes, but location is placed within the existing drainage dry retention pond. Jacobs recommends shifting the location on the parcel to the west.	No
FLS 14	4900 18TH CT SW	36124280000	Undeveloped	None	Yes	No
FLS 15	5305 18TH CT SW	36251080005	Developed – Rita Eaton Park (Collier County)	None	Yes	No
FLS 16	5055 20TH PL SW	36242200001	Developed – Herbert Cambridge Elementary (School District)	None	No	Yes
FLS 17	2190 52ND LN SW	36377800004	Undeveloped	None	Yes	No
FLS 18	2364 52ND TER SW	36311000006	Undeveloped	Application Number: PRFH20240417541 Application Type: 1-2 Family Home Date Issued: 6/10/2024	No	Yes
FLS 19	4779 31ST AVE SW	35992360001	Developed - residential property	None	No	Yes
FLS 20	4868 20TH PL SW	36122360003	Developed - residential property	None	No	Yes
FLS 21	2701 53RD TER SW	36374160006	Undeveloped	None	Yes	No
FLS 22	2660 SANTA BARBARA BLVD	36325080009	Developed - residential property	None	No	Yes
FLS 23	4150 GOLDEN GATE PKWY	36560040008	Developed - Golf Course (Collier County)	Application Number: PRMFH20240833648 Application Date: Multi-Family Home Application Date: 8/14/2024 Note: Space for FLS will still be available.	Yes	No

^aBased on 2024 aerial imagery.

^b Availability was evaluated for open space adjacent to right-of-way (ROW). Existing septic areas were considered as space not available. Analysis was performed November 18, 2024.

Figure 2. Future Lift Station Assessment



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2.3 Lift Station Reduction

Since the County acquired the Golden Gate Utility System from Florida Governmental Utility Authority in 2018, the County now owns and maintains all the public lift stations in Golden Gate City. Therefore, the County supports lift station reduction wherever feasible and supports combining the existing lift stations at the school properties with the proposed FLSs, as applicable.

Combining lift stations is proposed with the following sites:

- FLS 1 and 104.37
- FLS 4 and 313.28
- FLS 10 and 313.29
- FLS 13 and 313.20 - These may be able to be combined or the locations may remain as two separate lift stations on the school parcel (to be evaluated during design).
- FLS 20 and 104.36
- FLS 21 and 104.38
- FLS 22 and 104.28
- FLS 23 and 313.27 - Because FLS 23 is near the existing pump station 313.27, pump station 313.27 will be abandoned and flows routed to FLS 23.
- Relocated 313.24 and 313.25 - Because the existing pump station 313.24 (in the Golden Gate Parkway roadway median) needs upgrades, Jacobs proposes relocating it from the roadway median to the County-owned golf course property to the south. The existing pump station will then be converted to a manhole. Because the existing pump station 313.25 is in proximity to the new location, Jacobs recommends abandoning and rerouting the flows to this new pump station site to reduce number of pump stations the County is required to maintain.

The County will need to coordinate with the schools to determine easements required and final placement of the lift stations on school parcels.

2.4 Future Lift Station Reevaluation

Based on the analysis, 10 of the 23 proposed FLS locations are no longer available because of recent construction or pending building or planning permit applications. New sites for the 10 FLS sites were evaluated based on the closest available parcel to the center of the delineated subbasin area. If the closest vacant parcel was not available because of pending building or planning permit applications, the next available parcel was evaluated as the new proposed location.

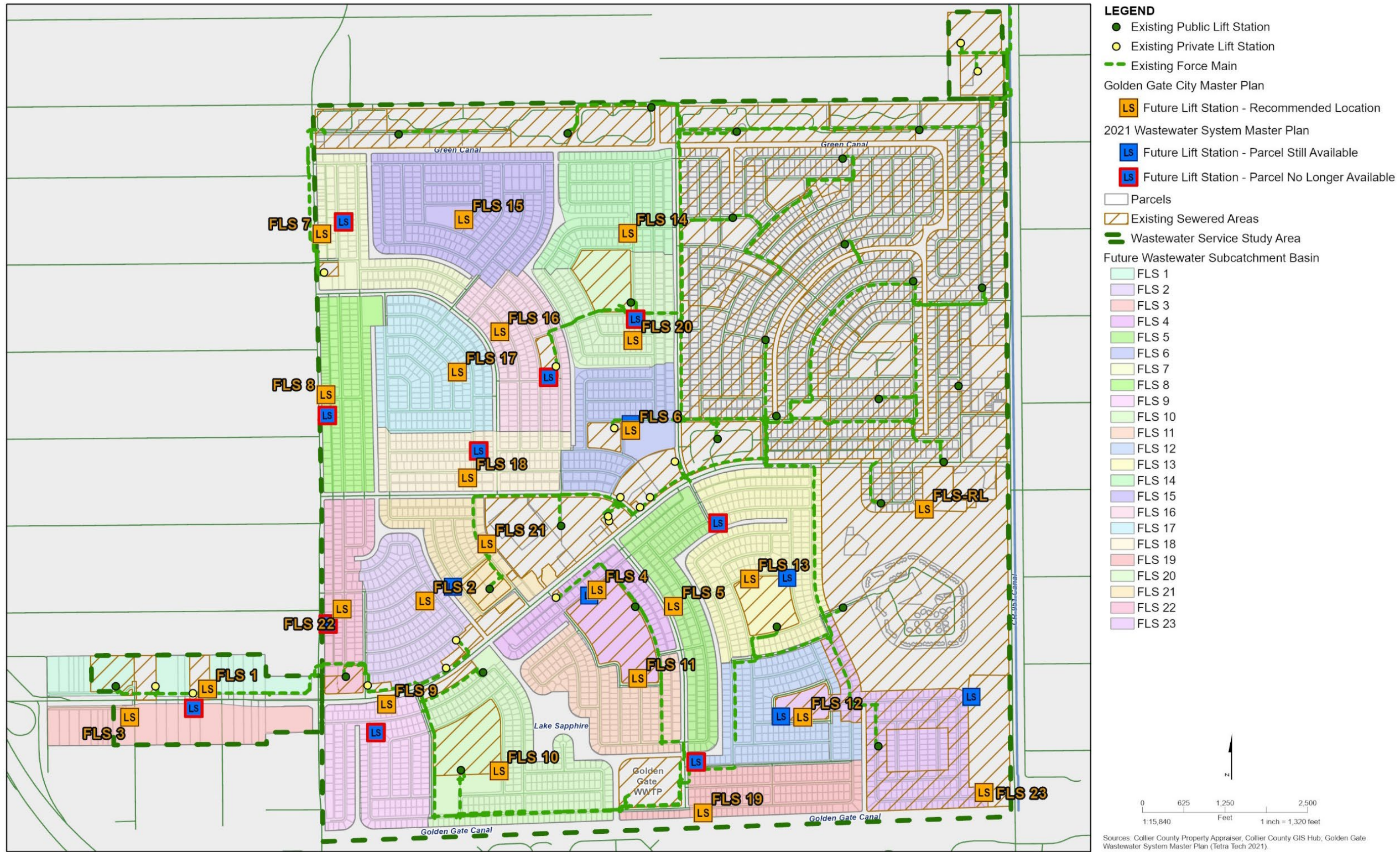
Additionally, because subbasin areas were not provided by Tetra Tech, the subbasin areas shown were delineated by Jacobs. One FLS site was relocated because of better placement within the basin boundary delineated to accommodate slopes for gravity mains. Table 2 summarizes the parcel reevaluation and recommendations. Figure 3 shows the final recommended FLS locations in relation to the sites previously identified in the 2021 Wastewater System Master Plan. Figure 4 shows the final recommendations for the Golden Gate City Master Plan and the existing lift stations that are recommended to be abandoned and combined with an FLS.

Table 2. FLS Parcel Reevaluation

FLS ID No.	2021 Wastewater System Master Plan FLS Parcel No.	Relocated Site Evaluation		
		New Proposed Parcel No.	Building Permit Application ^a	Notes
3	38166640004	38164120005	None	
5	35989320009	35985120009	None	
7	36232400002	36230760003	None	
8	36305480001	36305320006	Application No. PL20230014891 Application Type: Site Development Plan Amendment (7 Food Market)	New location was evaluated because this parcel has planned development.
8	36305480001	36303560004	None	
9	36431600001	36430320007	None	Preferred location because an area of the subbasin is separated by the canal.
16	36242200001	36239960008	None	Parcel might be easier to acquire than the one identified in the 2021 Wastewater Master Plan because it is only approximately 40 feet wide.
18	36311000006	36307920006	None	
19	35992360001	36007480008	Application No. PRFH20240308343 Application Type: 1-2 Family Home	New location was evaluated because this parcel has planned development.
19	35992360001	36010560009	None	
20	36122360003	36121320002	None	A new force main line may be needed to service this area. The pipe size may also need to be upgraded.
21	36374160006	36316680007	None	Although the parcel identified by the 2021 Wastewater System Master Plan is undeveloped, this location is more centrally located within the subbasin and therefore preferred.
22	36325080009	36325320002	None	
23	36560040008	36512280007	None	County staff requested to locate FLS 23 at this County parcel.

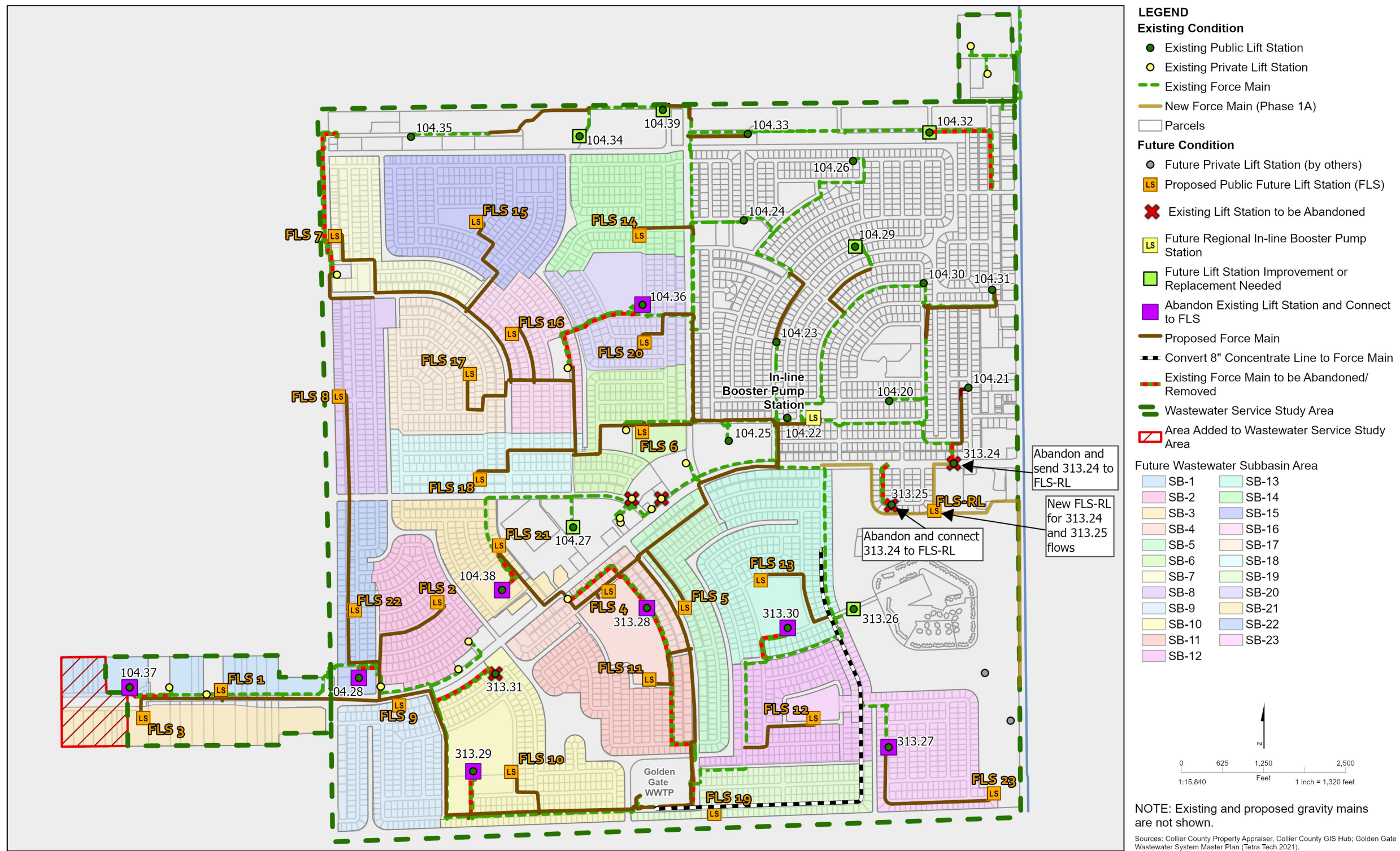
^a Analysis performed on November 18, 2024, based on available data on the Collier County Building Department permitting portal

Figure 3. Future Lift Station Site Evaluation and Recommendations



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Figure 4. Future Lift Station Site Recommendations with Lift Station Reduction



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2.5 Property Acquisition and Easements

Of the recommended future lift station sites, two sites (FLS 15 and FLS 23) are proposed on property owned by Collier County. Therefore, the use of those sites would only require internal coordination, and no easements would be required.

For the potential sites located either on private property or on Collier County School District property, a construction easement or property acquisition would be required. Collier County should proceed with the property or easement acquisition as quickly as possible to ensure the subbasins for those areas will not change. The recommended sites were identified within the center of the subbasins to accommodate the slope needed for gravity mains to drain to the lift stations. Therefore, if such FLS site(s) become unavailable, the wastewater subbasins may need to be reevaluated and remodeled to accommodate the change.

2.6 Alternative Future Lift Station Sites

Alternative sites were evaluated for each FLS in case the property owner of the preferred site does not want to sell, is unwilling to negotiate a fair price for the property, or does not want an easement on their property.

If the County cannot proceed with the preferred FLS site, they can proceed with a feasible alternative site, if identified. However, Jacobs requests that they be contacted if the County proceeds with the acquisition of a feasible alternative site.

2.6.1 Alternative County-Owned Parcels

There are two undeveloped properties that are owned by the County that could be used as FLS sites. However, during coordination with the County, County staff indicated that these parcels were acquired for drainage purposes and are not anticipated to have available space to also include an FLS at the site.

If the County determines there is available space to also include an FLS at these existing County parcels, Jacobs recommends use of these sites for the FLS within a subbasin to avoid additional costs for property acquisition. The vacant County parcels shown on Figure 5 are the preferred location for FLS sites 8 and 22, if feasible. The parcel identification (ID) numbers for the two County parcels shown on Figure 5 include:

- Future Lift Station 8 alternate location to County Parcel ID 36379960007
- Future Lift Station 22 alternate location to County Parcel ID 36324760003

If these existing County parcels are used as the FLS sites, the configuration and length of future force main would change to route to the new site location.

Figure 5. Alternate Future Lift Station Sites



2.6.2 Alternative Privately Owned Parcels

Based on Collier County 2024 aerial imagery, preferred sites were identified for undeveloped parcels within the center of the subbasin to accommodate the slope needed for gravity mains to drain to the lift stations. Alternative sites were evaluated for any other undeveloped properties that did not have pending building or permit applications. Should these preferred sites be chosen, a topographic survey will be required prior to starting design efforts. Note that if a preferred site cannot be obtained and an alternative site is purchased, the subbasin area for that subbasin may require adjustments to accommodate slopes for gravity mains. Jacobs’s scope did not include the development of a wastewater model. During the design phase, Jacobs recommends that an analysis is performed based on the final site for the FLS and survey data to determine the subbasin area that the lift station can accommodate. Table 3 summarizes the assessment of alternative sites for the FLSs.

2.7 In-line Booster Pump Station

The 2021 Wastewater System Master Plan identifies the need for a regional in-line booster pump station to support the existing network as an immediate term (2021–2023) capital improvement. The 2021 Wastewater System Master Plan located the pump station at the southeast corner on the intersection of 23rd Avenue SW and 45th Street SW. However, this proposed location is a developed residential parcel. Therefore, Jacobs evaluated four alternative locations for the in-line booster pump station (refer to Figure 6).

Table 4 summarizes the advantages, disadvantages, and ranking of each alternative site. Jacobs recommends locating the in-line booster pump station at Option 3, Aaron Lutz Park which is already County-owned.

Figure 6. In-line Booster Pump Station Alternatives

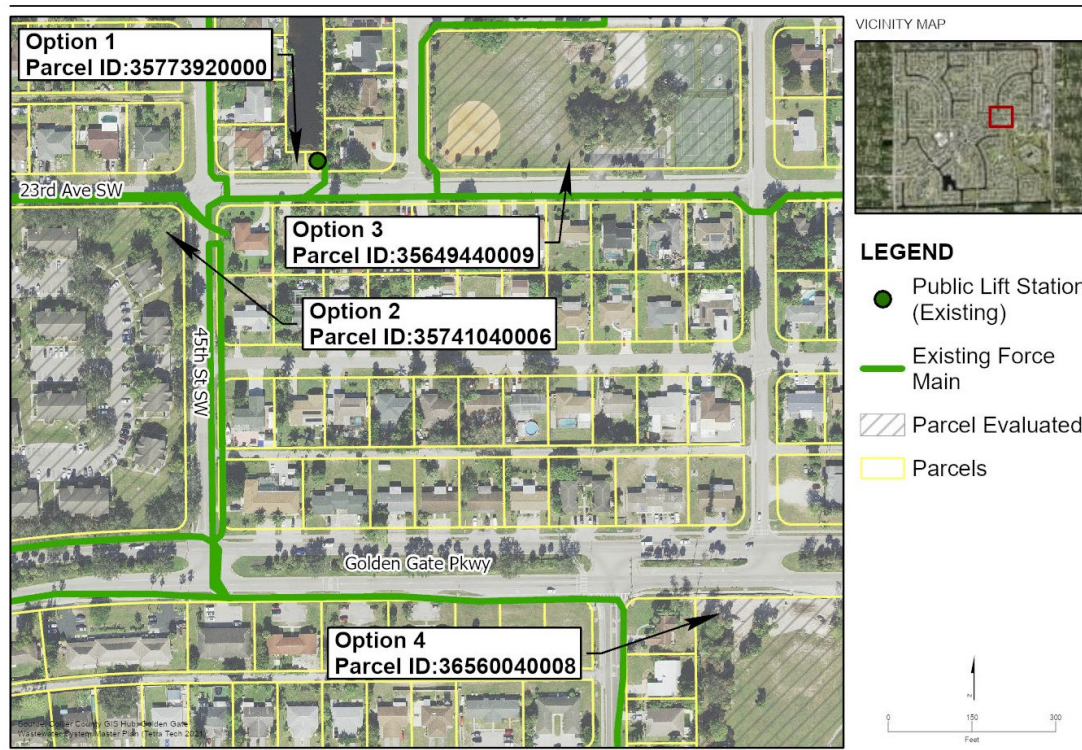


Table 3. Future Lift Station Parcel Alternative Site Assessment

Name	Alternative Site Address (Street No. & Name)	Alternative Site Parcel Number	Is There a Permit Application? ^a	Is This a Feasible Alternative Site?	Notes
FLS 1	5927 GOLDEN GATE PKWY	38165640005	Application No. PRCS20240936891 Application Type: Commercial Building	No available area in site plan. If it can be accommodated in the design, this is the recommended location. If it cannot, Jacobs recommends to work with the recommended location in the 2021 Wastewater System Master Plan.	Development of County-owned and -maintained center (owned by David Lawrence Mental Health Center).
FLS 1	Not yet assigned	38170000009	Application No. PL20230003129 Application Type: Commercial Building	No, this parcel has planned development.	Application for 10,000-square-foot commercial building. Will not recommend relocating to this parcel. Jacobs recommends to negotiate using the parcel identified in the 2021 Wastewater Master Plan Wastewater System Master Plan on the already developed site.
FLS 2	5425 28TH AVE SW	36321080003	None	Yes, feasible alternative 1. However, it is not preferred because the location is not in the center of the subbasin. May require subbasin re-delineation.	
FLS 2	5421 28TH AVE SW	36321040001	None	Yes, feasible alternative 2. However, it is not preferred because the location is not in the center of the subbasin. May require subbasin re-delineation.	
FLS 2	2632 54TH ST SW	36381880007	None	Yes, feasible alternative 3. However, it is not preferred because the location is not in the center of the subbasin. May require subbasin re-delineation.	
FLS 3	Not yet assigned	38164120005	PL20240001022 – Proposed Church	Yes, feasible alternative if coordinated before the planning application is approved.	
FLS 4	5200 GOLDEN GATE PKWY	36442000001	None	Yes, feasible alternative 1. However, it is not preferred. Location may result in very deep lift station to collect by gravity, and further investigation would be required. May require subbasin re-delineation.	
FLS 4	5208 GOLDEN GATE PKWY	36441960003	None	Yes, feasible alternative 1. However, it is not preferred. Location may result in very deep lift station to collect by gravity, and further investigation would be required. May require subbasin re-delineation.	
FLS 5	2618 TROPICANA BLVD	35985160001	None	Yes, alternative 1.	
FLS 6	N/A	N/A	N/A	N/A	Recommended FLS location is on a County-owned park. There is sufficient space at the park to include the lift station.
FLS 7	1848 SANTA BARBARA BLVD	36230720001	None	Yes, feasible alternative.	
FLS 7	1858 SANTA BARBARA BLVD	36230680002	None	Yes, feasible alternative.	
FLS 7	1900 SANTA BARBARA BLVD	36230640000	None	Yes, feasible alternative.	
FLS 7	1937 55TH TER SW	36232000004	PL20210000401 – duplex	No, this parcel has planned development.	
FLS 8	2348 SANTA BARBARA BLVD	36305320006	Application No. PL20230014891 Application Type: Site Development Plan Amendment (7 Food Market)	No, a new location will need to be evaluated because this parcel has planned development.	If site can be negotiated.
FLS 8	2240 SANTA BARBARA BLVD	36303600003	None	Yes, feasible alternative.	Vacant commercial.
FLS 8	2230 SANTA BARBARA BLVD	36303640005	None	Yes, feasible alternative.	Vacant commercial.
FLS 8	2220 SANTA BARBARA BLVD	36303680007	None	Yes, feasible alternative.	Vacant institutional - owned by church that is built on adjacent property.
FLS 9	5472 GOLDEN GATE PKWY	36430280008	PL20230016469 – Planned for a fitness/health and wellness center	No, planned construction.	

Table 3. Future Lift Station Parcel Alternative Site Assessment

Name	Alternative Site Address (Street No. & Name)	Alternative Site Parcel Number	Is There a Permit Application? ^a	Is This a Feasible Alternative Site?	Notes
FLS 9	5424 31ST PL SW	36434520007	PRFH20230938817 – New single-family residence construction approved in 2024	No, the building will be constructed shortly.	
FLS 9	5350 GOLDEN GATE PKWY	36430400008	None	Yes, feasible alternative 1.	
FLS 9	5300 GOLDEN GATE PKWY	36430440000	PL20240013507 – Used for fireworks sales and tent	Yes, feasible alternative 2.	
FLS 9	3116 54TH LN SW	36431240005	None	Yes, feasible alternative 3.	
FLS 9	3124 54TH TER SW	36432760005	None	Yes, feasible alternative 4.	
FLS 10	3000 52ND TER SW	36439040003	None	Yes, but it is not preferred because it is in the middle of the basin and may be challenging to have gravity mains drain here.	
FLS 10	5030 31ST PL SW	36436520005	PRFH20231250431 – New family home construction in progress.	No, construction is in progress.	
FLS 11	2901 50TH ST SW	36443880000	None	Yes, as alternative 1 (best alternative option).	
FLS 11	3024 49TH LN SW	36448400003	None	Yes, as alternative 2.	
FLS 12	N/A	N/A	N/A	There are no undeveloped parcels within this subbasin. If the lift station cannot be constructed on Lavern Gaynor Elementary School property, a lift station may have to be placed on the County-owned golf course (36560040008) and the subbasin areas changed for subbasin 19 and 12.	
FLS 13	4150 GOLDEN GATE PKWY	36560040008	County-owned golf course	Yes, feasible alternative but not preferred because there will be conflicts with the existing force main.	The school property is recommended because there is an existing force main along 44th St SW where the gravity mains would have to cross if the lift station was located on the County parcel. The elevation of the existing pipe and proposed gravity mains would need to be evaluated.
FLS 13	4584 26TH AVE SW	35995760006	None	Yes, alternative 2. This is the only other undeveloped parcel aside from the recommended location.	
FLS 14	1828 48TH ST SW	36127000009	PL20240011212 – planning application closed on 10/18/2024 for verification for duplex. Appears the property may be submitting for duplex	No, planned development.	If site can be negotiated.
FLS 14	1873 SUNSHINE BLVD	36126560003	PL20230014111 – Planning application complete; PRMFH20231251633 – Building permit application rejected 8/3/24	No, planned development.	Owned by Habitat for Humanity.
FLS 14	1819 SUNSHINE BLVD	36127600001	PL20190002038 – Planning application complete September 2019	No, planned development.	If site can be negotiated.
FLS 14	4911 20TH PL SW	36124760009	Golden Gate Elementary School	Yes, feasible alternative but not preferred because it is not located in the center of the subbasin.	
FLS 15	N/A	N/A	N/A	N/A	Recommended FLS location is on a County-owned park. There is sufficient space at the park to include the lift station.
FLS 16	2035 51ST TER SW	36239880007	None	Yes, feasible alternative. It is likely easier to acquire than Alternative 2 because parcel is only approximately 40 feet wide.	Will require additional length of force main but may be easier to acquire or obtain easement because owned by adjacent property.
FLS 16	2054 HUNTER BLVD	36240680005	None	Yes, feasible alternative 2.	
FLS 17	2153 52ND TER SW	36378200001	None	Yes, feasible alternative.	The only other vacant parcel in this subbasin is not recommended because it is not in the center of the subbasin.
FLS 18	5164 23RD CT SW	36314880003	None	Yes, feasible alternative but not preferred because it is not located in the center of the subbasin.	

Table 3. Future Lift Station Parcel Alternative Site Assessment

Name	Alternative Site Address (Street No. & Name)	Alternative Site Parcel Number	Is There a Permit Application? ^a	Is This a Feasible Alternative Site?	Notes
FLS 18	5197 CORONADO PKWY	36316120004	PRMFH20231043365 – Building permit issued 12/09/2024	No, planned development.	
FLS 19	4412 31ST AVE SW	36007480008	Application No. PRFH20240308343 Application Type: 1-2 Family Home, issued and inspections commenced	No, planned development.	The only available parcel for FLS 19 is the recommended site.
FLS 19	N/A	36010440006	School District parcel that includes the bridge and utilities.	Feasibility of the site will have to be evaluated based on existing utilities and setback requirements. If the preferred site cannot be obtained, this site may be analyzed for feasibility.	
FLS 20	4911 20TH PL SW	36124760009	Developed Parcel - Golden Gate Elementary School	No other parcels are undeveloped within this subbasin. The only alternative to the recommended parcel is to negotiate an easement to place it at Golden Gate Elementary School. This was not identified as the FLS location by the 2021 Wastewater System Master Plan and, therefore, it was not identified as the preferred alternative. It would be recommended to place the lift station adjacent to the Golden Gate Elementary School's private lift station. May have minor impacts to the property's drainage swale.	
FLS 21	2572 52ND TER SW	36316720006	None	Yes, feasible alternative 1.	
FLS 21	2701 53RD TER SW	36374160006	None	Yes, feasible alternative 2.	This is the site identified in the 2021 Wastewater System Master Plan.
FLS 21	2536 52ND TER SW	36316760008	None	Yes, feasible alternative 3.	
FLS 22	2592 SANTA BARBARA BLVD	36323880007	PL20230016958 – Planning application to allow commercial development (pending)	Yes, if property can be obtained, if property can be acquired, alternative 2.	Along Santa Barbara Boulevard, but zoned vacant residential.
FLS 22	2581 55TH TER SW	36324840004	PL20210002630 – Planning application for confirmation to allow duplex	Yes, if property can be acquired, alternative 2.	
FLS 23	N/A	N/A	N/A	No, there are no undeveloped parcels within the FLS 23 subbasin. The proposed location is on County-owned property.	Evaluate the capacity of the existing lift station 313.27 to add the additional properties.

^a Building permit status was reviewed based on Collier County Permitting Portal data available January 9, 2025.

Table 4. In-line Booster Pump Station Alternatives Evaluation

Option No.	Parcel ID No. / Land Use	Advantages	Disadvantages	Alternative Ranking No.
1	35773920000/ Single-Family Residential	<ul style="list-style-type: none"> ▪ In line with the regional system; can serve existing stations and FLSs in the northwest quadrant ▪ Undeveloped area of parcel ▪ Adjacent to Lift Station 104.22 	<ul style="list-style-type: none"> ▪ Property acquisition or easement required. ▪ Need to evaluate location of existing utilities to determine feasibility for an FLS (evaluate utility conflicts). There is an existing stormwater pipe. ▪ Within South Florida Water Management District ROW. 	3
2	35741040006/ Multi-Family 10 Units or More	<ul style="list-style-type: none"> ▪ In line with the regional system; can serve existing stations and FLSs in the northwest quadrant ▪ Undeveloped area of parcel 	<ul style="list-style-type: none"> ▪ Property acquisition or easement required. 	2
3	35649440009/ Counties - Park	<ul style="list-style-type: none"> ▪ Existing County parcel therefore no property acquisition costs ▪ Undeveloped area of parcel 	<ul style="list-style-type: none"> ▪ Additional force main will be required because it is not in line with the regional system and northwest quadrant. 	1
4	36560040008/ Counties – Golf Course	<ul style="list-style-type: none"> ▪ Existing County parcel therefore no property acquisition costs ▪ Undeveloped area of parcel 	<ul style="list-style-type: none"> ▪ Additional force main will be required because it is not in line with the regional system and northwest quadrant. This location would require the most additional length. ▪ Would have to reroute the force main along the road with the existing force main and may have conflicts for crossings. 	4

2.8 Conclusions and Next Steps

To update the 2021 Wastewater System Master Plan, new locations for the proposed FLS locations that are no longer available were identified. Table 5 presents the final recommendations for all FLSs within the wastewater service study area. If the property owner of the preferred site listed in Table 5 does not want to sell, is unwilling to negotiate a fair price for the property, or does not want an easement on their property, Jacobs recommends that the County pursue proposed alternatives listed in Table 3. Collier County should proceed with the property or easement acquisition as quickly as possible because there are limited vacant parcels remaining within Golden Gate City to use for future pump station sites.

The recommended sites were identified within the center of the subbasins to accommodate the slope needed for gravity mains to drain to the lift stations. If a preferred site cannot be obtained and an alternative site is purchased, the area for that subbasin may require adjustments to accommodate slopes for gravity mains. Therefore, if such future lift station site(s) become unavailable, the wastewater subbasins may need to be reevaluated and remodeled to accommodate the change. During the design phase, Jacobs

recommends that an analysis be performed based on the final site for the future lift station and survey data to determine the subbasin area that the lift station can accommodate.

The proposed force mains shown were rerouted to connect to the relocated future lift station sites, as shown on Figures 3 and 4. Jacobs recommends abandoning existing public lift stations within a future subbasin and rerouting their flows to the proposed future lift station within that subarea. This would prevent the County from having to maintain two lift station sites. If implemented, new gravity mains will have to be installed to accommodate this change. Because the 2021 Wastewater System Master Plan assumed private lift stations will remain private, an evaluation will be necessary during design if the County chooses to include them in the proposed network. Additionally, the County requested that all lift stations (public or private) can only discharge to force mains and cannot discharge to County-owned lift stations. This change shall be accommodated during the design stage.

Existing lift station number 104.29 was identified for replacement and is located within the ROW. If this lift station requires additional area to comply with current code, an assessment of property needs will be required.

Table 5. Recommended Future Lift Station Locations

FLS ID	Recommended Site Address	Recommended Parcel ID	Property Owner
FLS 1	5865 GOLDEN GATE PKWY	38166600002	Private
FLS 2	5407 27TH AVE SW	36323280005	Private
FLS 3	Vacant land/no legal address	38164120005	Private
FLS 4	2701 48TH TER SW	36443960001	Collier County School District (Golden Gate Middle School)
FLS 5	2636 TROPICANA BLVD	35985120009	Private
FLS 6	4701 GOLDEN GATE PKWY	36111520003	Collier County (Golden Gate Community Center)
FLS 7	1842 SANTA BARBARA BLVD	36230760003	Private (land trust)
FLS 8	5587 22ND PL SW	36303560004	Private
FLS 9	5436 GOLDEN GATE PKWY	36430320007	Private
FLS 10	3000 53RD ST SW	36439840009	St. John Neumann Catholic High School
FLS 11	2701 48TH TER SW	36443960001	Collier County School District (Golden Gate Middle School)
FLS 12	2965 44TH TER SW	36002520002	Collier County School District (Lavern Gaynor Elementary School)
FLS 13	2711 44TH TER SW	35998440006	Collier County School District (Golden Gate Terrace Elementary School)
FLS 14	4900 18TH CT SW	36124280000	Private
FLS 15	5305 18TH CT SW	36251080005	Collier County (Rita Eaton Park)

Table 5. Recommended Future Lift Station Locations

FLS ID	Recommended Site Address	Recommended Parcel ID	Property Owner
FLS 16	2059 51ST TER SW	36239960008	Private
FLS 17	2190 52ND LN SW	36377800004	Private
FLS 18	5236 24TH AVE SW	36307920006	Private
FLS 19	4760 32ND AVE SW	36010560009	Collier County School District (Vacant lot)
FLS 20	4900 21ST AVE SW	36121320002	Private
FLS 21	2600 52ND TER SW	36316680007	Private
FLS 22	2629 55TH TER SW	36325320002	Private (LLC)
FLS 23	4061 32ND AVE SW	36512280007	Collier County (Golf course property)
Regional In-Line Booster Pump Station	4401 23RD AVE SW	35649440009	Collier County (Aaron Lutz Park)

3. References

Collier County. 2024. "GIS Maps." Collier County Property Appraiser. January.
<https://maps.collierappraiser.com/map.aspx?560192286968232>.

Collier County. 2025. Utilities Standards Manual. Collier County. Accessed July 24, 2025.
<https://www.colliercountyfl.gov/home/showpublisheddocument/110254/638792908663530000>

Collier County. n.d. "Collier County Permitting Portal." Accessed January 9, 2025.
<https://cvportal.colliercountyfl.gov/cityviewweb>.

Tetra Tech. 2021. *Golden Gate Wastewater System Master Plan*. Prepared for Collier County Water and Sewer District. June.



Attachment A
Parcel Assessment Supporting Information

FLS 1

MAP SIZE: SMALL | MEDIUM | LARGE |

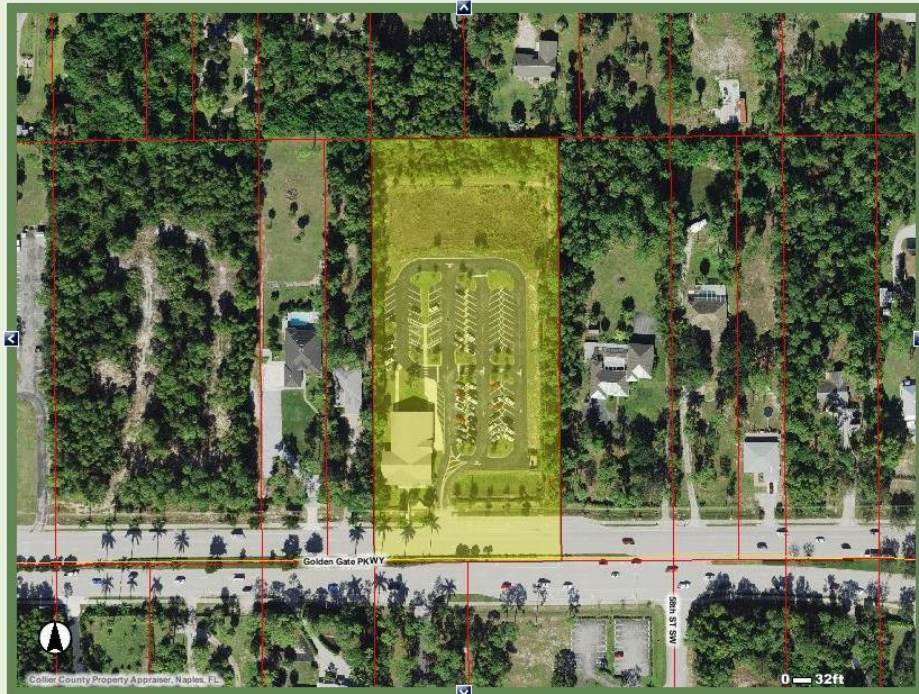


- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 3816660002
Name: NAPLES BRIDGE CENTER INC
Street# & Name: 5865 GOLDEN GATE PKWY
Build# / Unit#: 75 / 2

Map

- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | MEDIUM | LARGE |

Total: 61.34 ft Segment: 671.23 ft



- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 3816660002
Name: NAPLES BRIDGE CENTER INC
Street# & Name: 5865 GOLDEN GATE PKWY
Build# / Unit#: 75 / 2

Map


- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]


FLS 2

MAP SIZE: SMALL | **MEDIUM** | LARGE



Introduction
Search for Parcels by
Search Results
Parcel ID: 36323280005
Name: BARROSO, TERESITA
Street# & Name: 5407 27TH AVE SW
Build# / Unit#: 222 / 14
Map

Layers
Legend
Print



Collier County Property Appraiser, Naples, FL

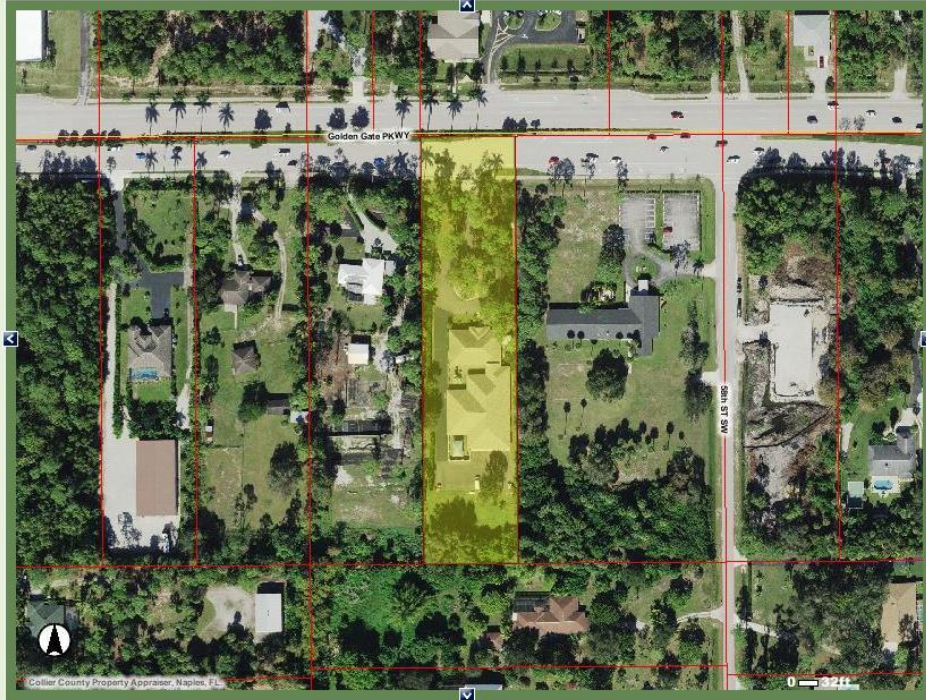
Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 3

MAP SIZE: SMALL | **MEDIUM** | LARGE



- Introduction
 - Search for Parcels by
 - Search Results
- Parcel ID: 38166640004
Name: ABLE ACADEMY INC
Street# & Name: 5860 GOLDEN GATE PKWY
Build# / Unit#: 76 / 0
- Map**
- Layers
 - Legend
 - Print



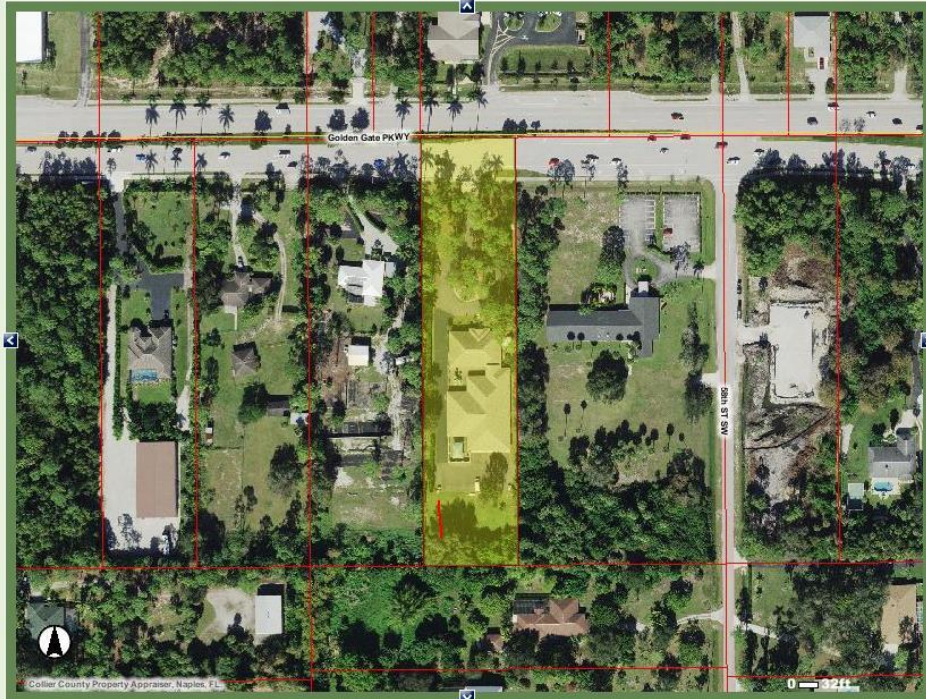
Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | **MEDIUM** | LARGE

Total: 59.56 ft Segment: 861.51 ft



- Introduction
 - Search for Parcels by
 - Search Results
- Parcel ID: 38166640004
Name: ABLE ACADEMY INC
Street# & Name: 5860 GOLDEN GATE PKWY
Build# / Unit#: 76 / 0
- Map**
- Layers
 - Legend
 - Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 5

MAP SIZE: SMALL | MEDIUM | LARGE |

Total: Segment:

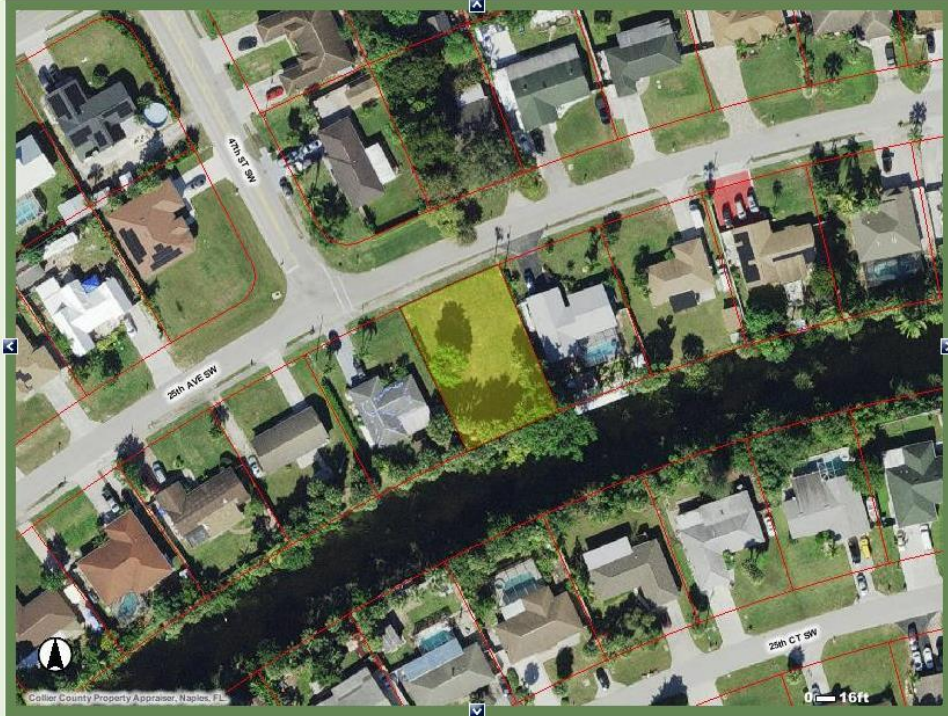


- Introduction
- Search for Parcels by
- Search Results

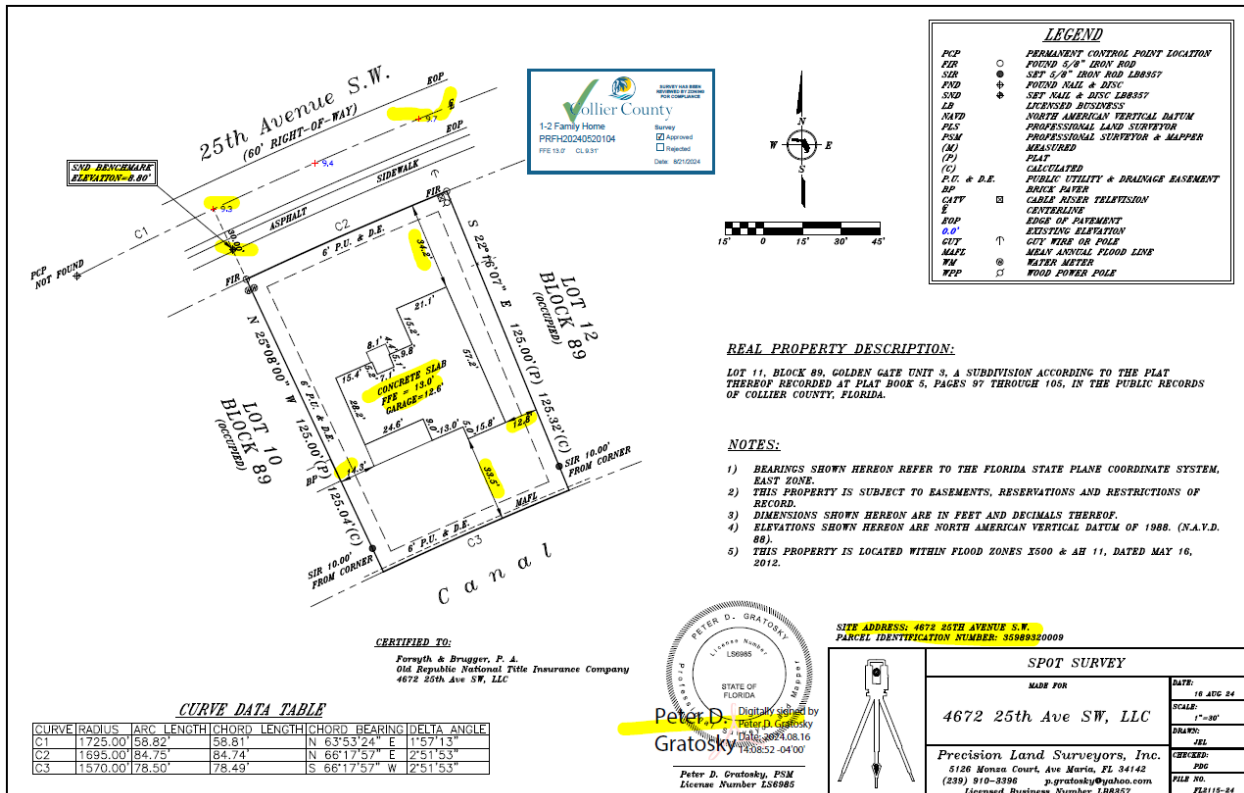
Parcel ID: 35989320009
 Name: 55THTR RENTAL LLC
 Street# & Name: 4672 25TH AVE SW
 Build# / Unit#: 89 / 11

[Map](#)

- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]



FLS 6

MAP SIZE: SMALL | **MEDIUM** | LARGE

Total: Segment:



- Introduction
 - Search for Parcels by
 - Search Results
- Parcel ID: 36111520003
Name: COLLIER CNTY
Street# & Name: 4701 GOLDEN GATE PKWY
Build# / Unit#: 118 / 1

- Layers
- Legend
- Print

Map



Aerial Photography: January - 2024 Urban [3IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 7

MAP SIZE: SMALL | **MEDIUM** | LARGE



- Introduction
 - Search for Parcels by
 - Search Results
- Parcel ID: 36232400002
Name: ANDES HOLDINGS LLC
Street# & Name: 1836 55TH TER SW
Build# / Unit#: 155 / 7
- Map**
- Layers
 - Legend
 - Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

Total: 60.74 ft Segment: 206.26 ft

MAP SIZE: SMALL | **MEDIUM** | LARGE



- Introduction
 - Search for Parcels by
 - Search Results
- Parcel ID: 36232400002
Name: ANDES HOLDINGS LLC
Street# & Name: 1836 55TH TER SW
Build# / Unit#: 155 / 7
- Map**
- Layers
 - Legend
 - Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 8 – County Owned Parcel

MAP SIZE: SMALL | **MEDIUM** | LARGE | Total: Segment:



Introduction

Search for Parcels by

Search Results

Parcel ID: 36379960007
 Name: COLLIER CNTY
 Street# & Name: 2308 55TH ST SW
 Build# / Unit#: 215 / 2

Map

Layers

Legend

Print



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 9

MAP SIZE: SMALL | **MEDIUM** | LARGE | Total: Segment:



Introduction

Search for Parcels by

Search Results

Parcel ID: 36431600001
 Name: DREAMED HOME BUILDERS LLC
 Street# & Name: 2972 54TH LN SW
 Build# / Unit#: 231 / 12

Map

Layers

Legend

Print



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | MEDIUM | LARGE

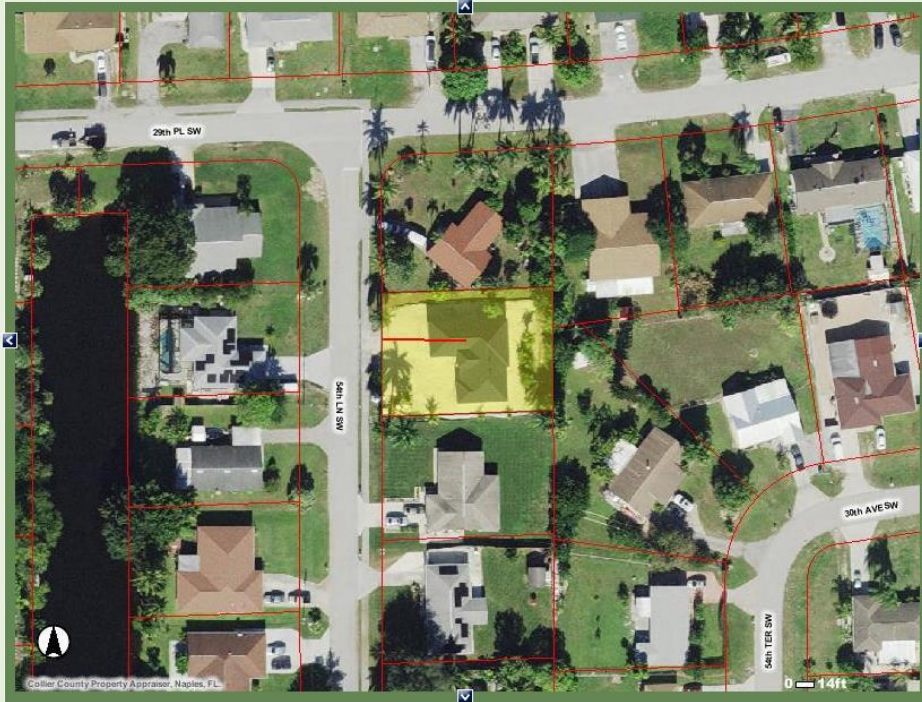
Total: 60.16 ft Segment: 328.84 ft



- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36431600001
 Name: DREAMED HOME BUILDERS LLC
 Street# & Name: 2972 54TH LN SW
 Build# / Unit#: 231 / 12

- Map
- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 10

MAP SIZE: SMALL | MEDIUM | LARGE

Total: Segment:



- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36439840009
 Name: ST JOHN NEUMANN CATHOLIC
 Street# & Name: 3000 53RD ST SW
 Build# / Unit#: 241 / 1

- Map
- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 11

MAP SIZE: SMALL | MEDIUM | LARGE | Total: Segment:



- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36443960001
Name: SCHOOL DISTRICT-GGM
Street# & Name: 2701 48TH TER SW
Build# / Unit#: 247 / 1

Map

- Layers
- Legend
- Print



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 12

MAP SIZE: SMALL | MEDIUM | LARGE | Total: Segment:



- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36002520002
Name: SCHOOL DISTRICT-GTI
Street# & Name: 2965 44TH TER SW
Build# / Unit#: 103 / 1

Map

- Layers
- Legend
- Print



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 13

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



Introduction
Search for Parcels by
Search Results

Parcel ID: 35998440006
Name: SCHOOL DISTRICT-GTE
Street# & Name: 2711 44TH TER SW
Build# / Unit#: 96 / 1

Map

Layers
Legend
Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 14

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



Introduction
Search for Parcels by
Search Results

Parcel ID: 36124280000
Name: PERRY, MARIE CAROLYN
Street# & Name: 4900 18TH CT SW
Build# / Unit#: 137 / 13

Map

Layers
Legend
Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 15

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



- Introduction
- **Search for Parcels by**
- Search Results

Parcel ID: 36251080005
Name: COLLIER CNTY
Street# & Name: 5305 18TH CT SW
Build# / Unit#: 179 / 1

Map

- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 16

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



- Introduction
- **Search for Parcels by**
- Search Results

Parcel ID: 36242200001
Name: SCHOOL DISTRICT-GGI
Street# & Name: 5055 20TH PL SW
Build# / Unit#: 168 / 1

Map

- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | MEDIUM | LARGE

Total: 60.77 ft Segment: 740.91 ft



- Introduction
- Search for Parcels by
- Search Results
- Parcel ID: 3624220001
- Name: SCHOOL DISTRICT-GGI
- Street# & Name: 5055 20TH PL SW
- Build# / Unit#: 168 / 1
- Map
- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 17

MAP SIZE: SMALL | MEDIUM | LARGE

Total: Segment:



- Introduction
- Search for Parcels by
- Search Results
- Parcel ID: 3637780004
- Name: WALKER, JUDITH
- Street# & Name: 2190 52ND LN SW
- Build# / Unit#: 211 / 7
- Map
- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 18

MAP SIZE: SMALL | **MEDIUM** | LARGE

Total: Segment:



- Introduction
- Search for Parcels by
- Search Results

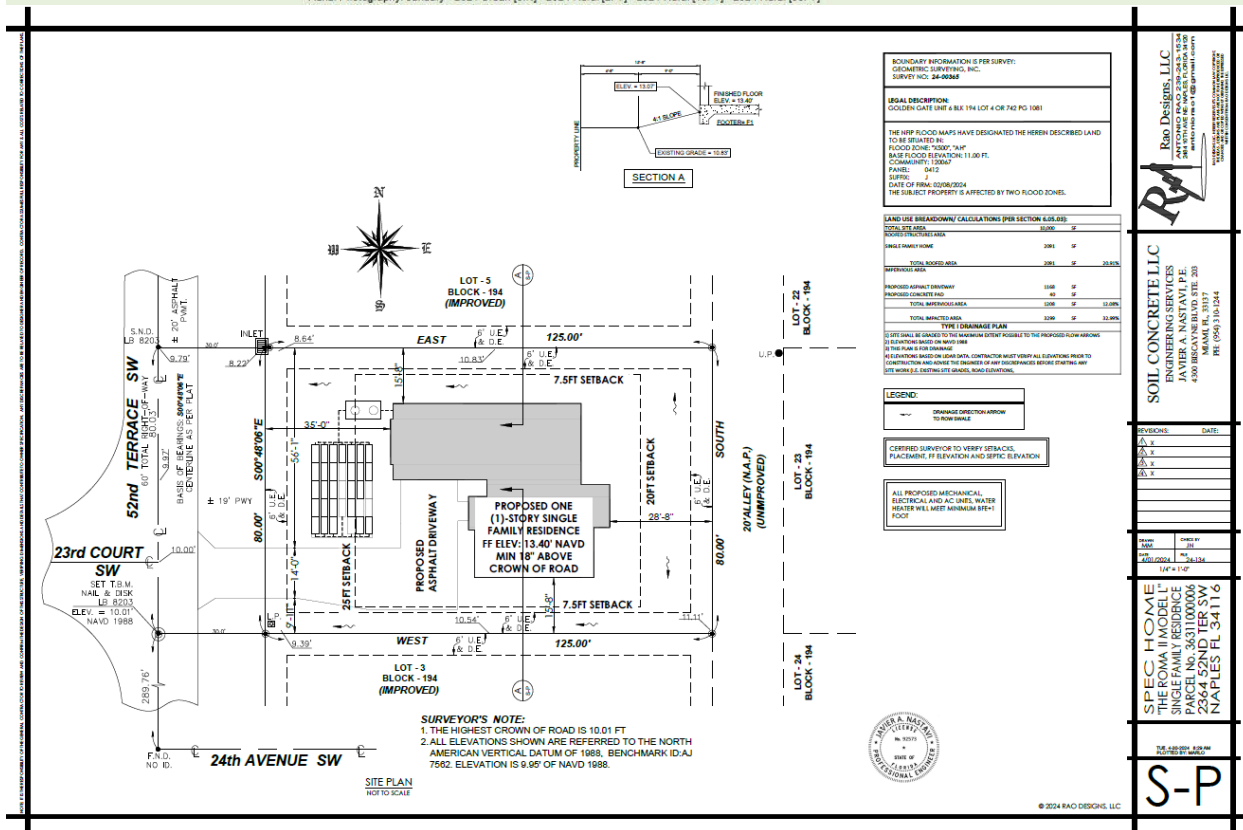
Parcel ID: 36311000006
 Name: ABOVE HOMES CORP
 Street# & Name: 2364 52ND TER SW
 Build# / Unit#: 194 / 4

Map

- Layers
- Legend
- Print



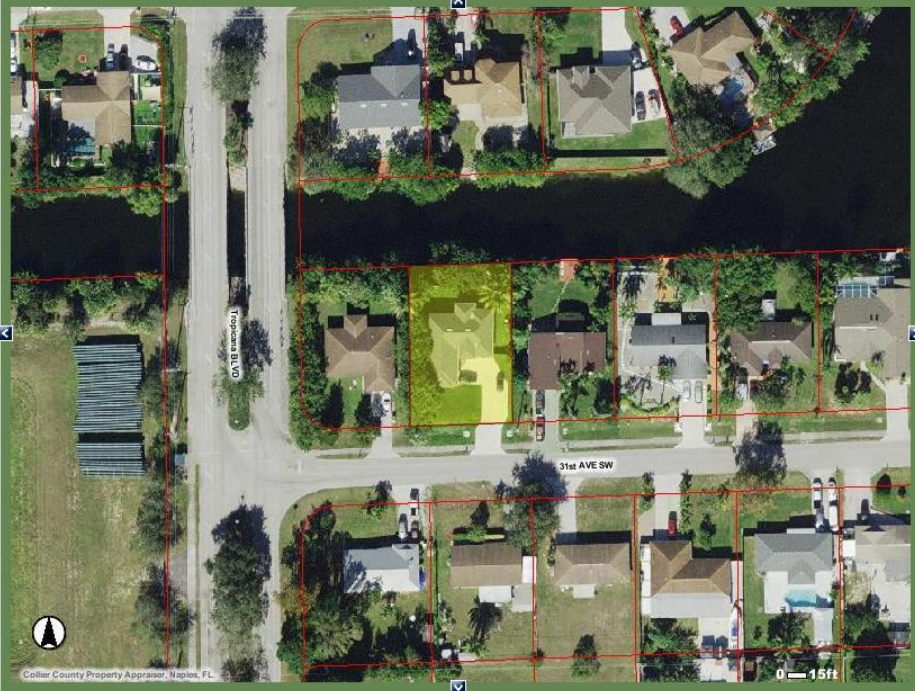
Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]



FLS 19

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 35992360001
Name: ELVE, GUYLENE
Street# & Name: 4779 31ST AVE SW
Build# / Unit#: 92 / 25

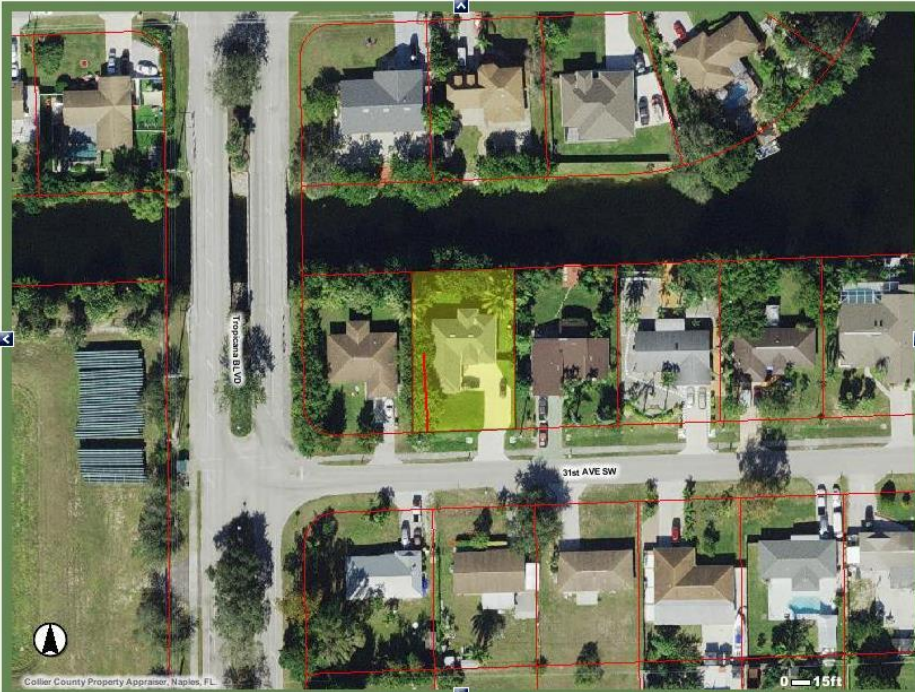
Map

- Layers
- Legend
- Print

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 35992360001
Name: ELVE, GUYLENE
Street# & Name: 4779 31ST AVE SW
Build# / Unit#: 92 / 25

Map

- Layers
- Legend
- Print

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 20

MAP SIZE: SMALL | **MEDIUM** | LARGE |

COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36122360003
Name: DERVIL, ELTA JEAN=& LUDNER
Street# & Name: 4868 20TH PL SW
Build# / Unit#: 135 / 7

Map

- Layers
- Legend
- Print

Total: Segment:



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | **MEDIUM** | LARGE |

COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results

Parcel ID: 36122360003
Name: DERVIL, ELTA JEAN=& LUDNER
Street# & Name: 4868 20TH PL SW
Build# / Unit#: 135 / 7

Map

- Layers
- Legend
- Print

Total: Segment:




Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 21

MAP SIZE: SMALL | MEDIUM | LARGE | Total: Segment:

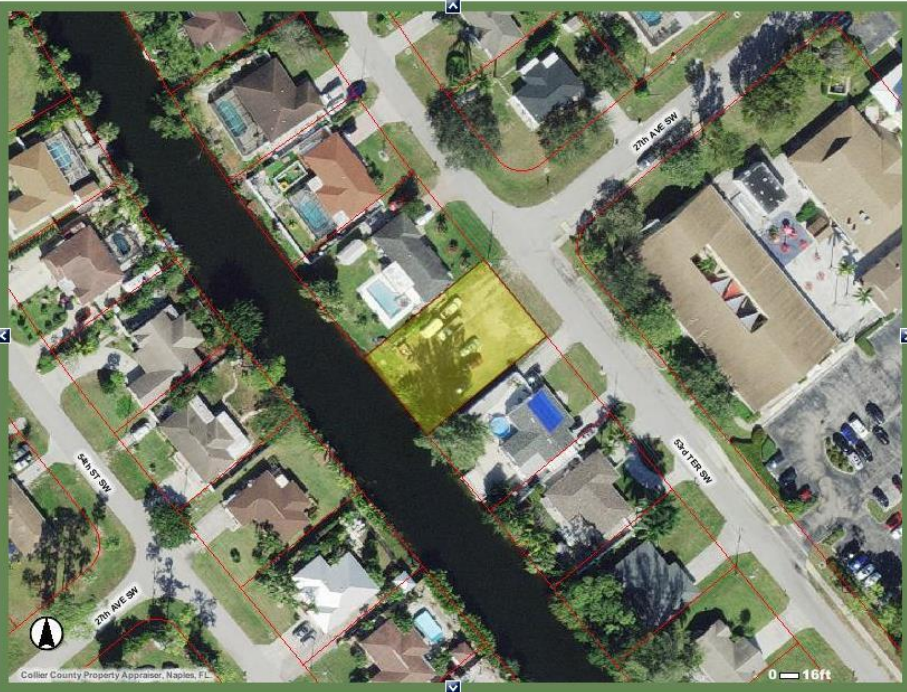


COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results
- Layers
- Legend
- Print

Parcel ID: 36374160006
Name: GARCIA, RAUL ENRIQUE
Street# & Name: 2701 53RD TER SW
Build# / Unit#: 207 / 12

[Map](#)




Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 22 – Previously Recommended Parcel

MAP SIZE: SMALL | **MEDIUM** | LARGE |

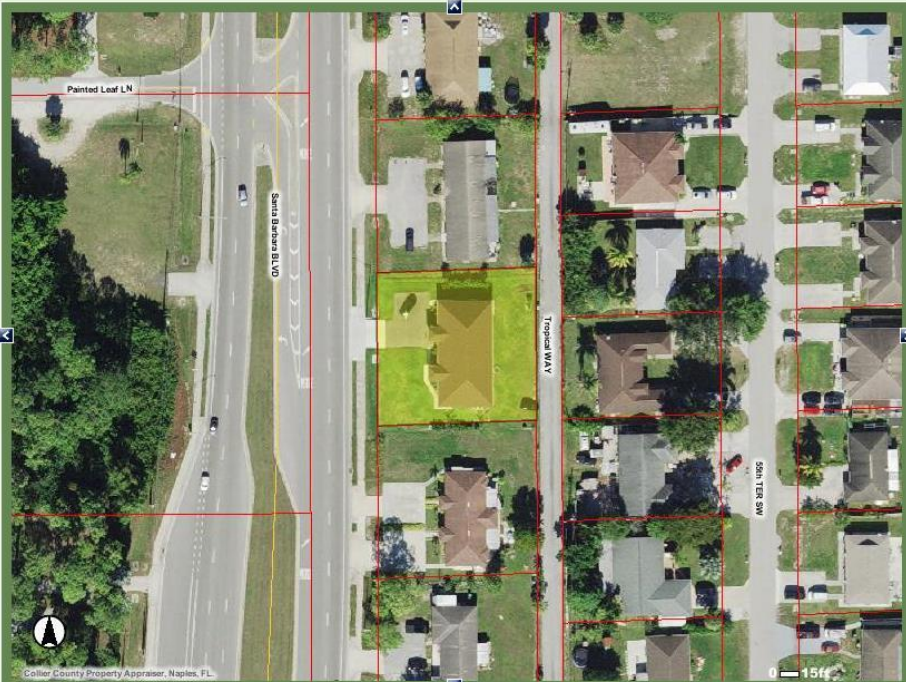
Total: Segment:



Introduction
Search for Parcels by
Search Results

Parcel ID: 36325080009
Name: MATO, CANDIDO SANTIAGO
Street# & Name: 2660 SANTA BARBARA BLVD
Build# / Unit#: 226 / 5
[Map](#)

Layers
Legend
Print




Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

MAP SIZE: SMALL | **MEDIUM** | LARGE |


Total: Segment:



Introduction
Search for Parcels by
Search Results

Parcel ID: 36325080009
Name: MATO, CANDIDO SANTIAGO
Street# & Name: 2660 SANTA BARBARA BLVD
Build# / Unit#: 226 / 5
[Map](#)

Layers
Legend
Print



Collier County Property Appraiser, Naples, FL

Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 22 – County Owned Parcel

MAP SIZE: SMALL | **MEDIUM** | LARGE | Total: Segment:



COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results
- Parcel ID: 36324760003
- Names: COLLIER CNTY
- Street# & Name: 2565 55TH TER SW
- Build# / Unit#: 225 / 23
- Map
- Layers
- Legend
- Print



Santa Barbara Blvd
Tropical Way
55th Ter SW
25th Pl SW

Collier County Property Appraiser, Naples, FL

0 — 14ft

Aerial Photography: January - 2024 Urban [6IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

FLS 23

MAP SIZE: SMALL | **MEDIUM** | LARGE |

Total: Segment:



COLLIER COUNTY
1923
FLORIDA

- Introduction
- Search for Parcels by
- Search Results


Parcel ID: 36560040008
Name: COLLIER CNTY
Street# & Name: 4150 GOLDEN GATE PKWY
Build# / Unit#: A / 1

[Map](#)

- Layers
- Legend
- Print



Aerial Photography: January - 2024 Urban [8IN] - 2024 Rural [2FT] - 2024 Rural [10FT] - 2024 Rural [50FT]

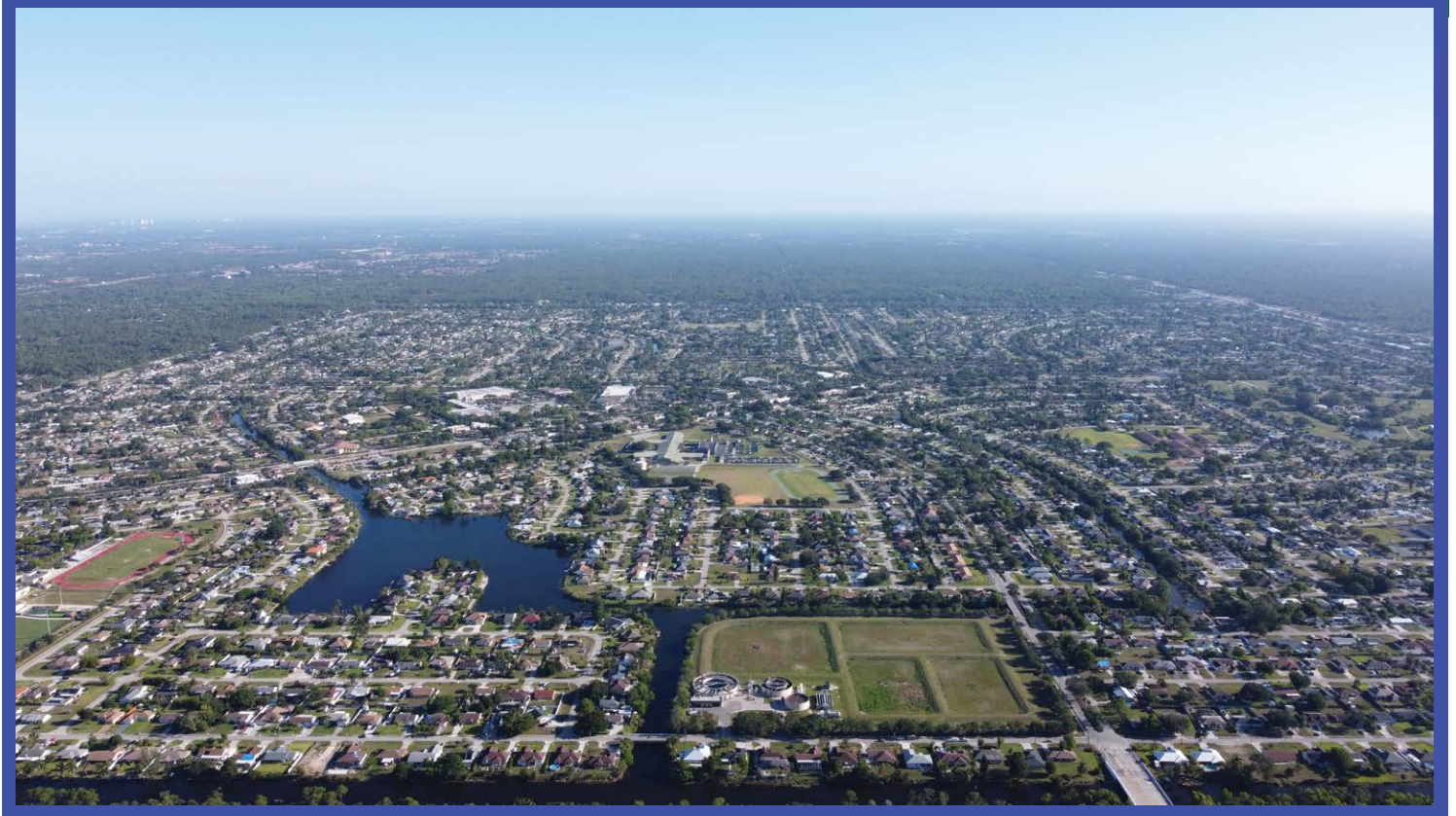


Appendix B
Water Distribution System Evaluation
Technical Memorandum

Golden Gate City Water Resource Protection - Restoration Master Plan

Water Distribution System Evaluation Technical Memorandum

January 2026



1. Introduction

Collier County (hereinafter, “the County”) was awarded a grant from the State of Florida Department of Environmental Protection for the Collier County Golden Gate City Water Resource Protection/Restoration Master Plan (hereinafter, the “Golden Gate City Master Plan [GGCMP]”). As part of the preliminary data collection and analysis, Jacobs reviewed the water distribution system within the Golden Gate City area and the information and recommendations provided in *Technical Memorandum 1 Golden Gate Area Pipeline Asset Management Program* (hereinafter, “the Golden Gate Area Pipeline Asset Management Program TM”) (Carollo 2020).

The purpose of this GGCMP is to develop an integrated master plan for the installation, repair, and replacement of existing infrastructure projects within the study area. The infrastructure projects include water distribution, wastewater collection and treatment, stormwater, sidewalks, bike paths, roadway improvements, landscaping, irrigation, lighting, and fiber. Figure 1 identifies the GGCMP study area.

The Golden Gate Area Pipeline Asset Management Program TM was evaluated for the same area as the GGCMP study area, which is an unincorporated area in western Collier County referred to as Golden Gate City, which is bounded to the north by Green Boulevard, to the east by Collier Boulevard, to the west by Santa Barbara Boulevard, and the south by the Golden Gate Main Canal.

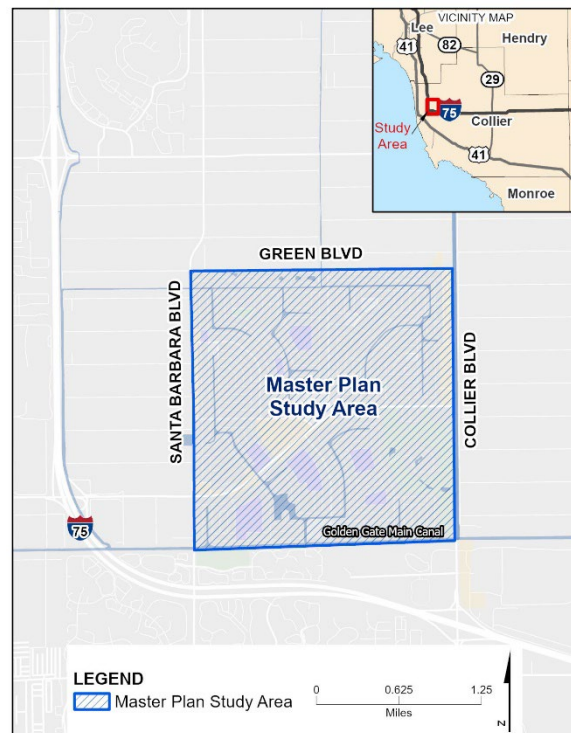
2. Water Distribution System Master Plan

The purpose of the Golden Gate Area Pipeline Asset Management Program TM was to evaluate the existing infrastructure, assist the County in prioritizing future replacement efforts, and develop a plan for serving the remainder of the area on private wells. According to the Golden Gate Area Pipeline Asset Management Program TM, approximately 53% of the population is served by Collier County potable water. The County has taken over utility service in the area with the ultimate goal of converting the area from private wells to the central water system.

Jacobs performed a review of the Water Distribution System Master Plan to verify recommendations for incorporation into the overall GGCMP for the area. A summary of the sections within the Golden Gate Area Pipeline Asset Management Program TM includes:

- **Section 1 - Introduction and Background.** This section provides background information about the Golden Gate area and the Collier County Water Sewer District. This section also covers the study purpose, scope, and assessment methodologies.
- **Section 2 - Existing Pipeline Analysis.** This section discusses data collection for the existing piping system, approach for existing water main risk assessment, and the assessment results.

Figure 1. Project Location Map



The methodology consisted of a review of pipe size, material, location, and installation date. Two important parameters were defined for each pipe within the existing network. These parameters are Likelihood of Failure (LoF) and Consequence of Failure (CoF). The overall risk was defined and calculated as:

$$\text{Risk} = \text{LoF} \times \text{CoF}$$

The consultant developed LoF criteria and matrix, CoF criteria and matrix, and risk categories and matrix for the water mains. The LoF, CoF, and risk results are provided in the Golden Gate Area Pipeline Asset Management Program TM.

- **Section 3 - Future Pipeline Analysis.** This section discusses future demand projection, pipe sizing criteria and layout as well as the hydraulic model development and results.
- **Section 4 – Overall Phasing Plan.** This section provides pipeline risk and replacement plan, the proposed phasing plan, cost estimates for the new pipe replacement components, and the study conclusions.

2.1 Data Sources

The Golden Gate Area Pipeline Asset Management Program TM data sources included the following:

- 2010 U.S. Census
- Monthly Operating Reports
- County's geographic information system (GIS) database
- Parcel Data - Parcel Use Description
- American Water Works Association
- Water Research Foundation (WRF)
- Collier County Property Appraiser's office - Parcel land use
- Ordinance 2019-24: Golden Gate City Sub-element, Land Development Code Amendment, and Overlay Map
- 10 States Standards – Recommended Standards for Wastewater Facilities
- Collier County's Fire Prevention and Protection Code
- Florida Bureau of Economic and Business Research
- The Association for the Advancement of Cost Engineering
- Florida Department of Transportation's 2018 Annual Statewide Average Costs
- 2018 Collier County Utilities Standard Manual
- 2021 Orange County Utilities Standards and Specifications Manual

2.2 Hydraulic Model

The potable water hydraulic models were used to evaluate and analyze existing systems, future scenarios and prioritize future capital improvement projects. Jacobs conducted an initial review of the hydraulic models of the Golden Gate City water distribution system provided by Carollo on August 15, 2024. A summary of Jacobs initial review included:

- The water hydraulic models were developed as a part of the *Golden Gate Area Pipeline Asset Management Program Study*, mainly used for evaluating piping capacities and ability to handle existing and future demands.
- Models were built in WaterGEMS software.

- There are two models with several scenarios; the hierarchy for these modes are as follows:
 1. *New 2024 Gold Gate WaterGEMS Model – (includes ONLY G.G. Future Distribution Pipes)*
 - High max day*
 - High Fire flow*
 2. *Potable Model 09302024 – (the Country's water model including G.G. area)*
 - 2021 Calibration*
 - Capri Calibration*
 - 2021 ADD*
 - 2021 MDD*
 - Future short term*
 - AAD*
 - MDD*
 - Future long term*
 - ADD*
 - MDD*
 - MDD + Fire*
- The model scenarios appear to have different demands and/or piping sets. Three separate demand estimates were considered for residential demand including:
 - A low-end estimate of 2.36 people per equivalent residential unit (ERU) times 100 gallons per capita per day (gpcd), using 2.36 people per household.
 - A mid-range estimate of 2.5 people per ERU times 100 gpcd, which is a common estimating method.
 - A high-end estimate of 300 gallons per day per ERU.
- The consultant estimated the residential daily demand range from 2.07 million gallons per day (mgd) to 2.63 mgd average annual daily flow, using the ERU-based demand estimates described.
- The estimated total average annual daily demand for residential and non-residential parcels is 3.263 mgd. Approximately two-thirds of the total demand is from residential use and one-third from non-residential use.
- There are three water supply connections from the County water distribution system to the Golden Gate City water distribution system.

2.3 Evaluation and Pipe Sizing

The Golden Gate Area Pipeline Asset Management Program TM evaluation resulted in an overall high risk for existing pipes. The new potable water distribution system recommendations were based on the replacement of the existing pipes and the future development needs to serve the entire Golden Gate City area including areas currently served by private wells. The proposed layout contains of 78.7 miles of water mains, 99.5% of which are 8 inches in diameter, with the remainder of the pipes being 12-inch or 16-inch-diameter pipe (Carollo 2020).

The overall phasing plan first prioritized the areas on the western and northern edges of Golden Gate City that connect Golden Gate City to the rest of the County's potable water distribution system. These areas became Phases 1A and 1B, respectively. The plan then prioritized areas in the northwest corner of Golden Gate City that are not currently served by the County as Phases 2 through 5. Once the new customers on wells are added to the system, the rest of the existing infrastructure was replaced in Phases 6 through 10.

The phasing plan prioritized areas as follows:

- Phase 1A: western edge of Golden Gate City
- Phase 1B: northern edge of Golden Gate City

- Phases 2–5: areas in the northwest corner of Golden Gate City that are not currently served by the County
- Phases 6–11: the remaining existing infrastructure

2.4 Conclusions

Jacobs review of the Golden Gate Area Pipeline Asset Management Program TM included an evaluation of the existing water main risk assessment approach, the hydraulic water model scenarios and results, and the capital improvement recommendations and phasing.

Jacobs performed the review with the assumption that the data used in the Golden Gate Area Pipeline Asset Management Program TM is correct including the existing piping data (diameters and material), the hydraulic model scenarios, water demand calculations, demands allocation, and cost estimate assumptions. After its high-level review, Jacobs has the following conclusions:

- The approach adopted to assess the existing pipelines risk is valid and fits the study purpose.
- The proposed new layout (77.3 miles of water main, 99.5% of which is 8 inches in diameter) is valid and meets the following system performance criteria:
 - minimum pressure is greater than or equal to 50 pounds per square inch (psi) at all junctions
 - velocity is less than or equal to 5 feet per second in all pipes
 - water demand projections provided in GIS by parcel match those identified in the report
- The hydraulic model scenarios including the fire flow scenario run adequately without errors.
- For the fire flow scenario, junctions were required to, and can supply, the following:
 - Fire flow for Residential: 750 gallons per minute (gpm) of fire flow at a residual pressure of 40 psi
 - Fire flow for Commercial: 3,000 gpm of fire flow at a residual pressure of 40 psi

County staff indicated in meetings that the asbestos pipe in the Golden Gate City service area has reached the end of its useful life. The phasing plan for replacement of existing pipeline that prioritizes first the areas on the western and northern borders of Golden Gate City is valid and realistic. First, Phases 1A and 1B connect Golden Gate City to the County's potable water distribution system. Next, the plan then prioritizes areas in the northwest quadrant of Golden Gate City that are not currently served by the County in Phases 2 through 5. Last, the remaining existing infrastructure is replaced (Phases 6 through 10).

Jacobs found a discrepancy between the model files and the Golden Gate Area Pipeline Asset Management Program TM on the total length of pipe for the proposed network. The Golden Gate Area Pipeline Asset Management Program TM identified a proposed network of approximately 76.7 miles, while the future model only shows 23.9 miles. This discrepancy was identified to Carollo who responded they would update their model and Golden Gate Area Pipeline Asset Management Program TM accordingly. Jacobs has received the updated model where the total updated length is 77.3 miles. Carollo provided the updated Golden Gate Area Pipeline Asset Management Program TM dated December 2024 and reported a proposed network with a total of 77.1 miles.

Another discrepancy found was the length of pipe along 27th Court SW. The existing pipeline along that road is approximately 716 feet and the proposed future pipe is only showing approximately 374 feet in the model and in the Golden Gate Area Pipeline Asset Management Program TM future exhibits. The length of pipe along this roadway needs to extend east to the start of the development (private property), as it is existing, in the future model (Figures 11, 12, and 13 in the Golden Gate Area Pipeline Asset Management Program TM), and the length of pipe updated in the quantities and cost estimate.

Additionally, Jacobs noted that the area west of the Golden Gate City study area was not included in the Golden Gate Area Pipeline Asset Management Program TM but was included in the wastewater model.

3. Boil Water Notices and Water Main Breaks

Jacobs evaluated boil water notices distributed to the Golden Gate City area within the last 5 years. Usually, a boil water notice is issued when an unexpected event has occurred and presents the possibility of contamination in the water distribution system, such as a break in the distribution system, low pressure, disinfection issues, etc.

Boil water notices for the last 5 years were provided by Collier County on February 26, 2025. Figure 2 shows the locations of boil water event locations and Table 1 summarizes the events in 2024. The data indicate a few boil water notices per year from sporadic maintenance or repair-related events. However, an increasing trend is noted, with 3 events each in 2020 and 2021, 5 in 2022, 6 in 2023, and 15 in 2024.

Figure 2. Boil Water Notice Locations
Source: Collier County

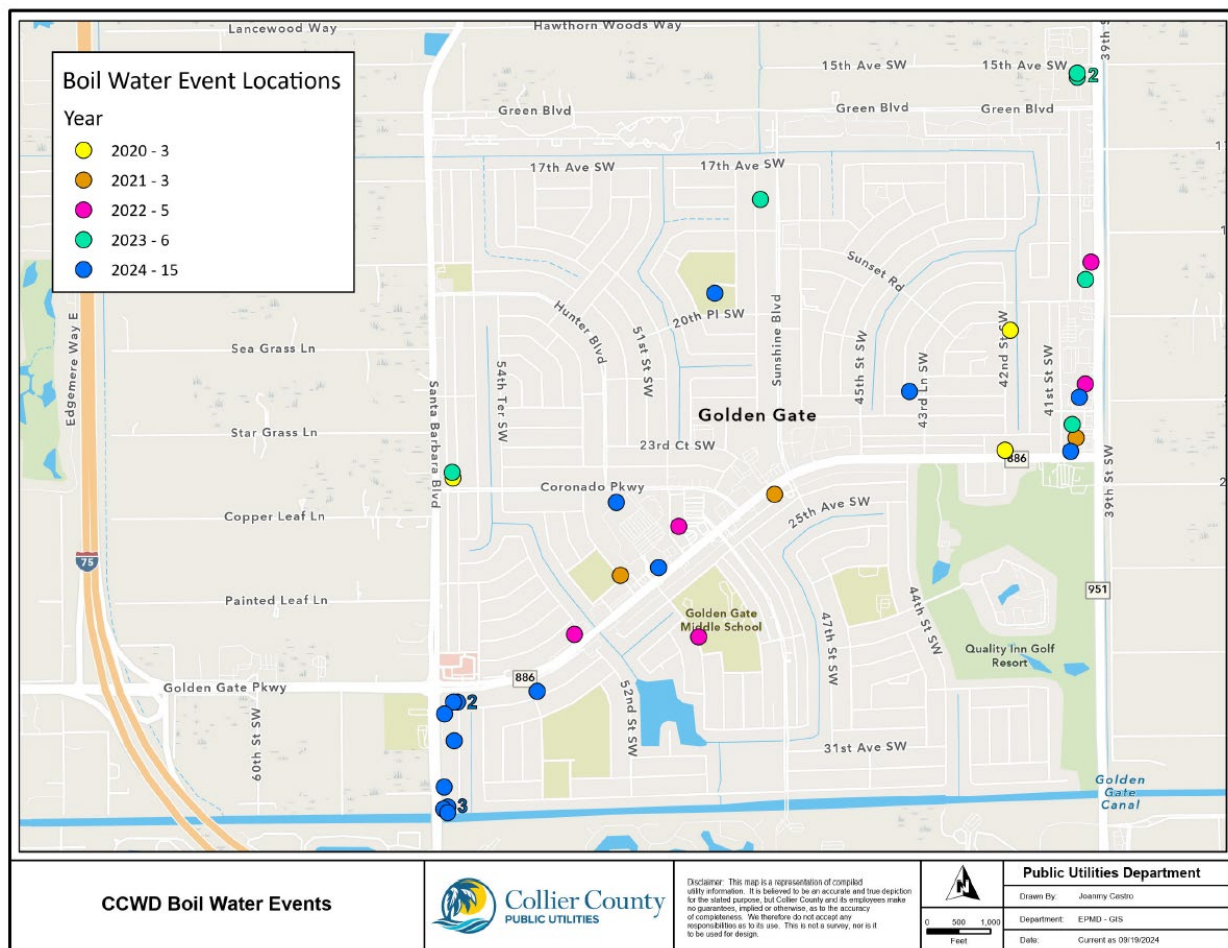


Table 1. Boil Water Notice Data

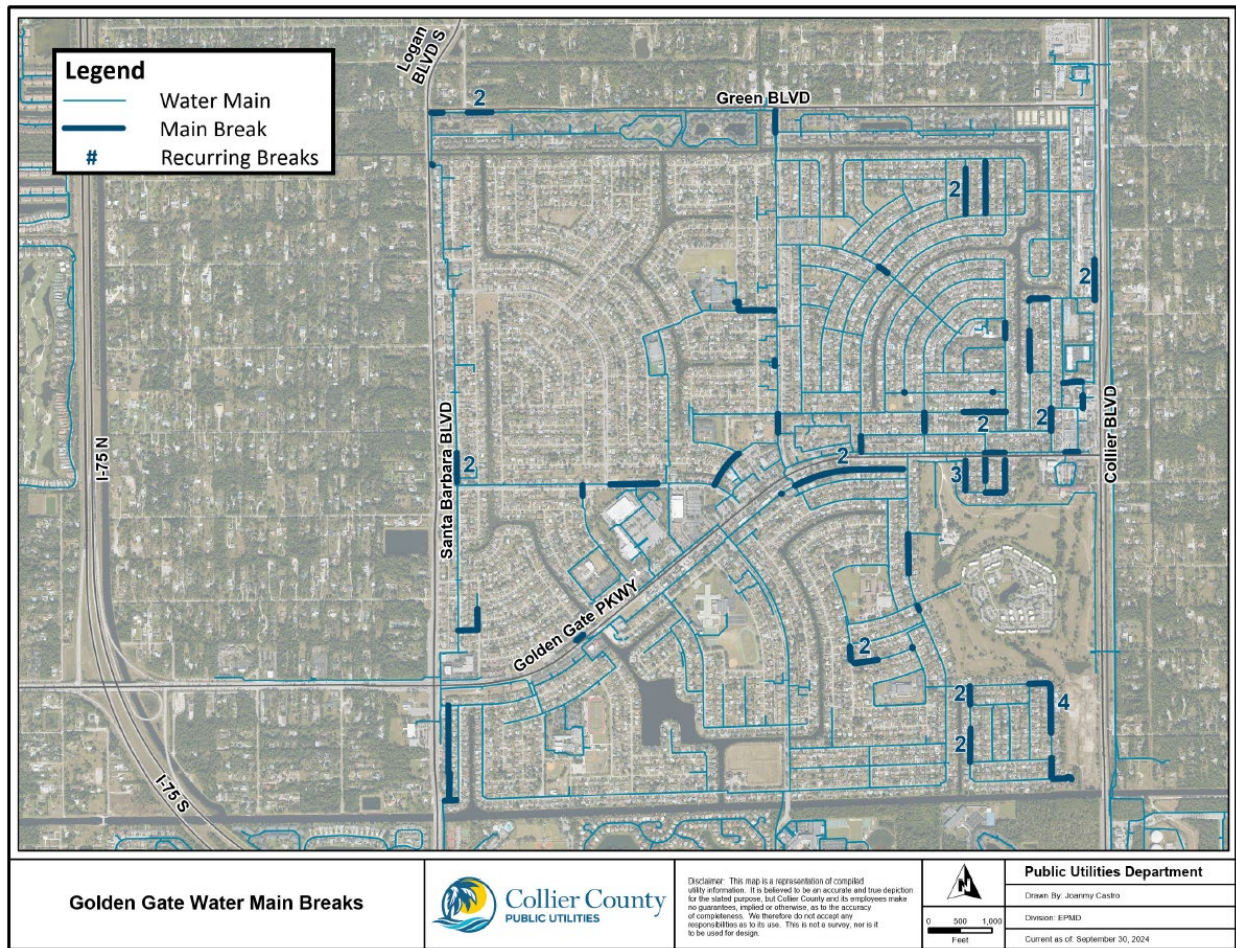
Date of Maintenance Work	Address	Subdivision	Statement of Event (Reason for Recheck)	Boil Water Event (Y/N)
2/8/2024	55th Terrace SW	Golden Gate	Valve Installation/Repair	Y
3/15/2024	5563 29th Place SW	Golden Gate	Relocation/Deflection	Y
6/18/2024	29th Place	Golden Gate	Contractor Error	Y
1/4/2024	5563 29th Place SW	Golden Gate City	Maintenance	Y
1/4/2024	2820 53rd Street SW	Golden Gate City	Maintenance	Y
1/24/2024	Golden Gate Pkwy.	Golden Gate City	Maintenance	Y
4/9/2024	4557 Golden Gate Pkwy. - Planet Fitness	Golden Gate City	Relocation/Deflection	Y
4/17/2024	Golden Gate Pkwy.	Golden Gate City	Relocation/Deflection	Y
4/23/2024	55th Terrace SW	Golden Gate City	Valve Installation/Repair	Y
4/25/2024	55th Terrace SW	Golden Gate City	Contractor Error	Y
8/24/2024	Toucan Alley & Golden Gate Pkwy.	Golden Gate City	Main Break	Y
9/5/2024	44 Street SW	Golden Gate City	Relocation/Deflection	Y
9/6/2024	Collier Blvd.	Golden Gate City	Main Break	Y
9/7/2024	Golden Gate Elem.	Golden Gate City	Main Break	Y
11/13/2024	Golden Gate Pkwy.	Golden Gate City	Main Break	Y

Source: Libby, pers. comm 2025.

The water distribution model (WaterGEMS) includes water quality analysis tools that can be used to check water quality including water age and trace tolerance.

Water main breaks were provided by Collier County between April 2018 and September 2024 and are summarized in Attachment A. Figure 3 shows the locations and quantity of water main breaks resulting from crushed pipe, ground movement, age, corrosion, excessive bending, and other causes.

Figure 3. Water Main Break Locations
Source: Collier County



The boil water notice data identify notices issued during construction or maintenance activities, and the water main break data identify breaks primarily caused by pipe failure and age. Comprehensive data are needed to evaluate whether water quality conditions of the surface water (canals) and shallow aquifers should be evaluated, which Jacobs recommends evaluating as part of a separate project.

4. Potable Water Level of Service Criteria

The County provided Jacobs with potable water level of service (LOS) standards and performance criteria to evaluate whether the criteria will be met with the Golden Gate City Master Plan. A summary of the County’s LOS table is provided in Attachment B. Jacobs added the column ‘GGCMP Evaluation’ to identify whether the criteria were evaluated as part of this GGCMP study or if more data are needed to evaluate.

5. Future Demands

As part of a separate evaluation from the Golden Gate Area Pipeline Asset Management Program TM review, Jacobs reviewed the Golden Gate City future water demand projections provided by Carollo on November 6, 2024. The future demand projections were provided in a GIS file that calculated demands for low, medium, and high residential estimation categories (as defined in Section 2.2), as well as non-residential and zero demand parcels within Golden Gate City.

Table 2 summarizes Carollo’s basis of estimation. To calculate the future demand, Carollo analyzed parcel land use data from the Collier County Property Appraiser’s office website. A total of 5,330 parcels is included in the Golden Gate City area, which represents 8,763 ERUs. Approximately 78% of parcels within Golden Gate City are classified as single-family residential and approximately 12% are other residential. The GIS file contained only parcels within the GGCMP study area boundary identified in Figure 1.

Table 2. Demand Basis of Estimation

Source: Carollo 2020

Land use Type	Description	Basis of Estimation
Residential	Multi-Family Less Than 10 Units	Based on number of residential units
Residential	Vacant Residential	Assumed all are single-family for planning purposes
Residential	Boarding Homes (Institutional)	Based on number of units
Non-Residential	Public Schools	Estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)
Non-Residential	Warehouses and Distribution Centers	Estimate 100 gpd/1,000 ft ²
Non-Residential	Restaurants, Cafeterias	Assumed "Restaurant operating 16 hours or less per day, per seat", 40 gpd/unit * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)
Non-Residential	Cultural Organizations	Estimate 4 gpd/seat * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)
Non-Residential	Churches	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)
Non-Residential	Community Shopping Centers	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)
Non-Residential	Other Counties	Used "Office Building", 0.15 gpd per ft ² of space * 1.4 for potable (Collier standard)
Non-Residential	Orphanages	Treated like a school, estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)

The parcels can be classified as:

- 4,988 parcels with residential demands
- 130 parcels with non-residential demands
- 212 parcels with zero demands as follows:
 - 94 parcels with zero demands (streets, no values)
 - 47 parcels with zero demands (county parks, utilities, others)
 - 71 parcels are also marked as zero demands including hotel, multi-family, vacant commercial, school parcels

Jacobs performed a high-level review of the parcel demand projections and conducted spot checks for demand calculations for selected parcels using the assigned basis of estimation identified in Table 2. This analysis resulted in the following observations:

- The Golden Gate Area Pipeline Asset Management Program TM reported total residential high, average, and low demand (2.071, 2.194, and 2.633 mgd, respectively) that matched the GIS-provided total residential demands.
- The Golden Gate Area Pipeline Asset Management Program TM (Carollo Engineers 2020) estimated the total residential and non-residential to be 3.263 mgd average annual daily demand, which did not match the GIS-provided total demand scenarios. The GIS demand projections included:
 - 2.071 mgd for low residential + 2.003 mgd for non-residential = 4.074 mgd
 - 2.194 mgd for medium residential + 2.003 mgd for non-residential = 4.197 mgd
 - 2.633 mgd for high residential + 2.003 mgd for non-residential = 4.636 mgd

Note that these discrepancies between the Golden Gate Area Pipeline Asset Management Program TM and the GIS file demand projections were communicated to Carollo to address the gap in the non-residential demand data. Carollo provided a revised GIS file on November 12, 2024, with an updated total demand of 3.138 mgd (2.194 mgd for medium residential + 0.944 mgd non-residential demand).

5.1 Sample Calculation

To evaluate the gap in the non-residential demand projections, Jacobs reviewed Carollo's future demand estimates for the non-residential categories that use building areas and the number of seats as basis of estimation (such as schools, churches, and restaurants). Jacobs performed a sample review of future demands for the school parcels by measuring actual building areas from Google Earth aerial imagery and compared to the projections calculated by Carollo. Jacobs used the same formula as Carollo's basis of estimation using number of seats as basis of estimation to calculate the projection. Jacobs also performed a comparison to the updated calculations for the schools to actual demand data obtained by Collier County Public Utilities from November 2023 to December 2024. The analysis indicated that the estimated future demand by Carollo is over 15 % higher than expected and was using larger values for building square foot areas than Jacobs measured from aerial imagery. Using the sample review of schools for all of the parcel demand projections that were calculated using number of seats as the basis of estimation, the analysis indicates that the non-residential demands can be reduced by approximately 15% (0.807 mgd instead of 0.944 mgd reported by Carollo). Attachment C provides the breakdown of this review.

5.2 Zero Demand Parcels

In addition, Jacobs reviewed the 71 parcels that showed zero demands for parcels zoned as hotel, multi-family, vacant commercial, and schools. Because these demand projections are for the future build out scenario for the study area, the parcels should have a future demand assigned. This discrepancy was communicated to Carollo to solicit feedback about why no demand had been assigned to these parcels. Carollo provided an estimation demand for only one parcel (a hotel) on December 17, 2024. Because the remaining 70 parcels should also have a future demand assigned, Jacobs developed a future demand estimation for the 71 parcels that had zero demand.

The future demand estimation for these parcels was calculated to 0.186 mgd for residential and 0.062 mgd for non-residential (refer to Table 3). Attachment D provides a breakdown of this analysis with the parcels along with estimated demand and basis of estimation for each parcel.

Based on Jacobs' review, adding the projected demand for the 71 parcels that were assigned zero demand, the total future water demands is approximately 2.380 mgd for medium residential water demand and 0.869 mgd for non-residential water demand, for a total estimate of 3.249 mgd (refer to Table 3).

Table 3. Future Water Demand Summary

Number of Parcels	Parcel Use Description	Medium Residential Demand (mgd)	Non-Residential Demand (mgd)
4,988	Residential demands	2.194	0
130	Nonresidential demands (adjusted by about 85%)	0	0.807
94	Streets, no values (zero demands)	0	0
47	County parks, utilities, others (zero demands)	0	0
71	Hotels, multi-family, vacant commercials, schools (initially with zero demands)	0.186	0.062
Total		2.380	0.869

5.3 Conclusions

Carollo submitted an update to their Golden Gate Area Pipeline Asset Management Program TM dated December 2024 where they updated the total linear foot of proposed pipe. However, this updated memo did not update the projected demand for the build-out scenario provided from the GIS data and the memo reported a total future average annual daily demand of 3.263 mgd. On November 12, 2024, Carollo also submitted an update to the GIS file that revised the projected future demand to a total of 3.138 mgd. After reviewing the updated information, Jacobs calculated an update to the GIS file at an average of 3.249 mgd, which falls between the Golden Gate Area Pipeline Asset Management Program TM total and the updated GIS file’s total. The difference in the future demand projection is negligible and Jacobs confirms the recommendations from the Golden Gate Area Pipeline Asset Management Program TM for the proposed 8-inch and 12-inch-diameter pipes should be sufficient to meet the area’s future build out. Water demand should be verified during design.

6. References

Carollo Engineers, Inc. 2020. *Technical Memorandum 1 GOLDEN GATE AREA PIPELINE ASSET MANAGEMENT PROGRAM*. August.

Carollo Engineers, Inc. 2024. *Technical Memorandum 1 GOLDEN GATE AREA PIPELINE ASSET MANAGEMENT PROGRAM*. December.

Dragash, Kristiana, Carollo Engineers Inc. 2024a. Personal communication (email) with Felicia Kirby, Jacobs. August 29.

Dragash, Kristiana, Carollo Engineers Inc. 2024b. Personal communication along with updated GIS files (email) with Felicia Kirby, Jacobs. November 12.

Dragash, Kristiana, Carollo Engineers Inc. 2024c. Personal communication (email) with Baha Mirghani, Jacobs. December 17.

Drew, Cody, Collier County Public Utilities. 2025. Personal communication (email) with Felicia Kirby, Jacobs. July 14.

Stolts, Anthony, Collier County Public Utilities. 2025. Personal communication (email) with Felicia Kirby, Jacobs. March 4.

Libby, Pamela Manager, Distribution Water, Collier County. 2025. Personal communication (email) with Felicia Kirby, Jacobs. February 26.

Machin, Annia, Manager Utility Billing & Customer Service, Collier County. 2025. Personal communication (email) with Felicia Kirby, Jacobs. January 13.

Attachment A

Water Main Breaks



Table A-1. Water Main Breaks

Initiate Date	Actual Finish Date	Facility ID	Break Reason	Point X	Point Y
4/12/2018	4/12/2018	wMain_0067273	BROKEN PIPE_AGE	429149.80148159	674320.09136168
5/15/2018	5/15/2018	wMain_0060335	BROKEN PIPE_AGE	426043.61904567	672851.75243484
5/17/2018	5/16/2018	wMain_0060441	BROKEN PIPE_IMPROPER INSTALLATION	428943.90097475	674010.50142968
7/7/2018	7/7/2018	wMain_0069777	BROKEN PIPE_IMPROPER INSTALLATION	420727.88558267	672913.80808501
9/4/2018	9/4/2018	wMain_0060357	BROKEN PIPE_IMPROPER INSTALLATION	426980.94525500	670066.76358226
9/18/2018	9/18/2018	wMain_0062435	BROKEN PIPE_IMPROPER INSTALLATION	423882.40781692	672886.13983326
10/26/2018	10/26/2018	wMain_0060357	BROKEN PIPE_AGE	426980.94525500	670066.76358226
12/2/2018	12/2/2018	wMain_0060465	BROKEN PIPE_AGE	428723.88533867	672778.55802742
12/20/2018	12/20/2018	wMain_0060181	NULL	430554.07491975	674485.70520368
2/6/2019	2/6/2019	wMain_0060573	BROKEN PIPE_AGE	430100.06073592	668249.33184967
3/22/2019	3/22/2019	wMain_0060455	BROKEN PIPE_IMPROPER INSTALLATION	430071.97877109	674069.40255860
3/24/2019	3/24/2019	wMain_0060357	BROKEN PIPE_IMPROPER INSTALLATION	426980.94525500	670066.76358226
10/28/2019	10/29/2019	wMain_0061273	BROKEN PIPE_CONTRACTOR HIT	425733.60227725	678397.52283935
12/12/2019	12/12/2019	wMain_0060495	BROKEN PIPE_AGE	428728.44963400	677829.07679776
3/15/2020	3/15/2020	wMain_0083263	BROKEN PIPE_AGE	425724.21646925	674732.00326751
4/16/2020	4/16/2020	wMain_0077359	BROKEN PIPE_GROUND MOVEMENT	426906.94605917	670327.96155068
4/18/2020	4/18/2020	wMain_0076231	BROKEN PIPE_GROUND MOVEMENT	424777.39520017	672865.37937609
4/22/2020	4/22/2020	wMain_0074011	BROKEN PIPE_CONTRACTOR HIT	425737.93068067	678736.68521876
5/11/2020	5/11/2020	wMain_0060495	BROKEN PIPE_CONTRACTOR HIT	428728.44963400	677829.07679776

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Table A-1. Water Main Breaks

Initiate Date	Actual Finish Date	Facility ID	Break Reason	Point X	Point Y
5/22/2020	5/22/2020	wMain_0077359	BROKEN PIPE_IMPROPER INSTALLATION	426906.94605917	670327.96155068
6/15/2020	6/15/2020	wMain_0060281	BROKEN PIPE_GROUND MOVEMENT	420726.43447009	672974.98283143
7/31/2020	7/31/2020	wMain_0061747	SPLIT PIPE_EXCESSIVE BENDING	429347.43297609	675410.63478426
11/4/2020	11/5/2020	wMain_0060193	BROKEN PIPE_CRUSHED PIPE	427821.06398159	672096.81824917
12/17/2020	12/29/2020	wMain_0061891	SPLIT PIPE_EXCESSIVE BENDING	429081.01224909	673368.22843601
2/21/2021	2/21/2021	wMain_0089497	BROKEN PIPE_EXTERNAL LOADING	425827.65458259	672725.20872468
2/23/2021	2/23/2021	wMain_0089499	BROKEN PIPE_EXCESSIVE BENDING	427969.37142775	670965.50948817
3/24/2021	3/25/2021	wMain_0060497	PIPE FAILURE_CORROSION	429037.39816309	677935.32264826
4/29/2021	4/29/2021	wMain_0062101	PIPE FAILURE_CORROSION	428083.49291867	673705.24515043
6/6/2021	6/6/2021	wMain_0069375	SPLIT PIPE_CORROSION	428694.02844301	674007.44467726
7/10/2021	7/11/2021	wMain_0061237	BROKEN PIPE_GROUND MOVEMENT	430080.31536859	668581.22947984
7/15/2021	7/15/2021	wMain_0061691	BROKEN PIPE_IMPROPER INSTALLATION	428791.81400859	669705.24330793
7/19/2021	7/19/2021	wMain_0066189	BROKEN PIPE_CRUSHED PIPE	423541.70574242	672881.80060309
7/21/2021	7/27/2021	wMain_0060467	PIPE FAILURE_CORROSION	429728.08707042	669742.51127801
8/1/2021	8/1/2021	wMain_0061901	BROKEN PIPE_GROUND MOVEMENT	429346.30699409	673255.57118101
10/13/2021	10/13/2021	wMain_0095597	BROKEN PIPE_EXCESSIVE BENDING	427338.75950000	670121.38486409
12/3/2021	12/3/2021	wMain_0095939	BROKEN PIPE_GROUND MOVEMENT	426921.03592600	670129.98917759

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Table A-1. Water Main Breaks

Initiate Date	Actual Finish Date	Facility ID	Break Reason	Point X	Point Y
2/25/2022	2/26/2022	wMain_0065897	BROKEN PIPE_IMPROPER INSTALLATION	429724.34823275	675751.38574318
6/26/2022	6/22/2022	wMain_0060469	BROKEN PIPE_IMPROPER INSTALLATION	428805.53150084	669039.18394451
7/22/2022	7/27/2022	wMain_0077367	BROKEN PIPE_GROUND MOVEMENT	427889.75610142	670300.76672318
9/5/2022	9/6/2022	wMain_0060311	SPLIT PIPE_IMPROPER INSTALLATION	422607.02093200	670426.93805876
12/8/2022	12/8/2022	wMain_0061691	BROKEN PIPE_AGE	428791.81400859	669705.24330793
2/6/2023	2/6/2023	wMain_0076015	BROKEN PIPE_AGE	427078.90896984	673629.46347784
3/17/2023	3/17/2023	wMain_0060467	BROKEN PIPE_CRUSHED PIPE	429728.08707042	669742.51127801
3/31/2023	3/31/2023	wMain_0061251	BROKEN PIPE_AGE	421271.71356325	678716.02285851
4/22/2023	5/3/2023	wMain_0060467	BROKEN PIPE_GROUND MOVEMENT	429728.08707042	669742.51127801
4/23/2023	4/23/2023	wMain_0060281	BROKEN PIPE_GROUND MOVEMENT	420726.43447009	672974.98283143
5/17/2023	5/17/2023	wMain_0060375	BROKEN PIPE_AGE	430755.69000209	676402.49533334
7/30/2023	8/15/2023	wMain_0072053	BROKEN PIPE_AGE	429032.67638775	673367.65789909
8/15/2023	8/15/2023	wMain_0060517	BROKEN PIPE_AGE	429035.74134225	673253.61646051
8/23/2023	8/23/2023	wMain_0060441	BROKEN PIPE_AGE	428943.90097475	674010.50142968
9/1/2023	9/1/2023	wMain_0060335	NULL	426043.61904567	672851.75243484
10/11/2023	10/11/2023	wMain_0060465	NULL	428723.88533867	672778.55802742
12/27/2023	12/28/2023	wMain_0075239	BROKEN PIPE_AGE	427080.55529200	673383.93805026
1/4/2024	1/4/2024	wMain_0061247	BROKEN PIPE_GROUND MOVEMENT	420502.28301550	678706.66657801
2/23/2024	3/1/2024	wMain_0060375	BROKEN PIPE_AGE	430755.69000209	676402.49533334
4/2/2024	4/2/2024	wMain_0061949	BROKEN PIPE_EXCESSIVE BENDING	425772.30922084	673981.01165926

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Table A-1. Water Main Breaks

Initiate Date	Actual Finish Date	Facility ID	Break Reason	Point X	Point Y
4/4/2024	4/4/2024	wMain_0062197	BROKEN PIPE_CRUSHED PIPE	427357.88216517	676290.18486243
4/7/2024	4/7/2024	wMain_0061251	BROKEN PIPE_EXCESSIVE BENDING	421271.71356325	678716.02285851
4/16/2024	4/16/2024	wMain_0061797	BROKEN PIPE_AGE	429737.63888859	674651.54575126
4/26/2024	4/26/2024	wMain_0061775	NULL	420533.48439667	667900.36076284
8/6/2024	8/7/2024	wMain_0060467	BROKEN PIPE_AGE	429728.08707042	669742.51127801
8/12/2024	8/12/2024	wMain_0060357	BROKEN PIPE_EXTERNAL LOADING	426980.94525500	670066.76358226
8/16/2024	8/19/2024	wMain_0061881	BROKEN PIPE_GROUND MOVEMENT	430293.71126726	673378.95151167
8/25/2024	8/25/2024	wMain_0060469	BROKEN PIPE_GROUND MOVEMENT	428805.53150084	669039.18394451
9/6/2024	9/6/2024	wMain_0076157	BROKEN PIPE_AGE	430570.46825967	674070.50655901

Source: Drew, pers. comm. 2025.

Attachment B
County Potable Water
Level of Service Criteria



Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Capacity & Access	Annual average day per capita demand	130 LOS Standard	gpcd	Design	Historical Data Analysis	Jacobs verified that this criterion is met for future conditions.
Capacity & Access	Treatment plant process design basis	Max Day		Design	FAC 62-555.320 (6)	Jacobs does not currently have enough data to check this LOS performance criterion. Additional data would be required to verify if this criterion is met, including current WTP capacity and the maximum day demand for all areas served by the County (current and projected through planning horizon) for the entire Collier County service area.
Capacity & Access	Residential fire flow demand	1,000	gpm for duration of 1 hour	Design	Collier County Water Model Standard Protocol Draft Sec 6.2 Feb 2013 by Carollo	Jacobs verified that this criterion is met for future conditions.
Capacity & Access	Commercial fire flow demand	2,000	gpm for duration of 2 hours	Design	Potable Water Model for NESAs only/ FFPC 6th Ed: Minimum Required Fire Flow and Flow Duration for Buildings (18.4.5)	Jacobs verified that this criterion is met for future conditions.

Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Capacity & Access	Minimum annual average, max day and peak hour demand operating pressure	50	psi	Design	Collier County Water Model Standard Protocol Draft Sec 6.3 Feb 2013 by Carollo	Carollo developed and Jacobs verified projected annual average daily flows for the study area for future conditions. Jacobs scope of work for this master plan did not include updating the water distribution model. Additional data would be required to verify if this criterion is met.
Capacity & Access	Maximum annual average, max day and peak hour demand operating pressure	90	psi	Design	Collier County Water Model Standard Protocol Draft Sec 6.3 Feb 2013 by Carollo	Carollo developed and Jacobs verified projected annual average daily flows for the study area for future conditions. Jacobs scope of work for this master plan did not include updating the water distribution model. Additional data would be required to verify if this criterion is met.
Capacity & Access	Maximum day plus fire demand operating pressure	20	psi	Design	Collier County Water Model Standard Protocol Draft Sec 6.3 Feb 2013 by Carollo/ AWWA Computer Modeling of Water Distribution Systems 4th Ed	Jacobs verified that this criterion is met for future conditions.
Capacity & Access	Annual average, maximum day, maximum water velocity in pipe	7	fps	Design	Collier County Water Model Standard Protocol Draft Sec 6.1 Feb 2013 by Carollo	Jacobs scope of work for this master plan did not include updating the water distribution model. Additional data would be required to verify if this criterion is met.

Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Capacity & Access	Peak hour maximum water velocity in pipe	8	fps	Design	Collier County Water Model Standard Protocol Draft Sec 6.1 Feb 2017 by Carollo	Jacobs scope of work for this master plan did not include updating the water distribution model. Additional data would be required to verify if this criterion is met.
Health & Safety	Water quality complies with Federal and State of Florida Safe Drinking Water Act standards	Treatment plants and distribution system meet permit requirements for water quality	%	Regulatory	FDEP Rule Chapter 62-555 Drinking Water Standards, Monitoring, and Reporting.	The County will be supplying drinking water to Golden Gate City from their existing regional Water Treatment Plants (North and South Plants). Those facilities already have to comply with drinking water standards. Jacobs scope of work did not include collecting or analyzing additional water quality data as part of the GGCMF but anticipate this criterion is met.
Quality & Reliability	Meets treatment demands with one of the largest units out of service	Capacity with one of the largest units out of service		Reliability	2012 Recommended Standards for Water Works Sec 4.0 by The Great Lakes - Upper Mississippi River Board of State and Provincial Health and Environmental Managers	The County will be supplying drinking water to Golden Gate City from their existing regional Water Treatment Plants. Jacobs does not currently have enough data on the South WTP to check that this LOS performance criterion is met. The capacity of each unit at the South WTP and the total demand for the entire Collier County service area would be required to verify if this LOS criterion is met.

Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	% of additional supply requirement as reliable capacity from fresh groundwater source - Tamiami Wellfield	25	% of supply requirement	Reliability	The supply requirement is based upon the design capacity of the water treatment plants and the amount of raw water required to produce finished water	The County will be supplying drinking water to Golden Gate City from their existing regional Water Treatment Plants. The County holds a Water Use Permit (WUP) to withdraw water from different aquifers. The Water Use Permit for the Tamiami Wellfield would need to be reviewed against the total WTP capacity/Withdrawal and determined if adding the water demand for the Golden Gate City study area would violate the WUP.
Quality & Reliability	% of additional supply requirement as reliable capacity from brackish groundwater source - Hawthorne Wellfields	33	% of supply requirement	Reliability	The supply requirement is based upon the design capacity of the water treatment plants and the amount of raw water required to produce finished water	The County will be supplying drinking water to Golden Gate City from their existing regional Water Treatment Plants. The County holds Water Use Permits to draw water from different aquifers. Please provide the Water Use Permit for the Hawthorne Wellfields for Jacobs to review against the total WTP capacity and determine if adding the water demand for the Golden Gate City study area would violate the WUP.

Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Minimum reliable storage capacity is equal to average annual average daily demand plus fire requirements, plus meeting water quality standards	AADF + FF	MGD	Regulatory	2012 Recommended Standards for Water Works Sec 7.0.1 by The Great Lakes - Upper Mississippi River Board of State and Provincial Health and Environmental Managers	Jacobs is unable to confirm this LOS criterion as it involves Water Demand for all County Customers and storage facilities outside of the study area.
Quality & Reliability	Maximum allowable unaccounted-for water loss percentage	10%	%	Reliability, Environment	Basis of Review for Water Use Permit Applications Within the SFWMD Sec 2.6.1.C Water Conservation Plans July 21st, 2013	Jacobs scope of work did not include evaluating the Maximum allowable unaccounted-for water loss at the WTPs. This is outside of the study area.

Technical Memorandum

Attachment B. Potable Water Level of Service Standards/Performance Criteria Utilities for Master Plan

Asset Class: Water

Service Value	LOS/ Performance Criteria Statement	LOS/ Performance Criteria	Unit of Measure	Driver	Reference Material	GGCMP Evaluation
Quality & Reliability	Reliable capacity for deep injection well	Max Day Flow	MGD	Reliability	FDEP UIC Permits	Jacobs scope of work did not include evaluating the reliable capacity for deep injection well. This is outside of the study area.

Sources: (Stolts, pers. Comm. 2025).

Attachment C
Future Demand for Schools Calculated by
Jacobs and Carollo



Attachment C. Future Demand for Schools Calculated by Jacobs and Carollo

Parcel No.	Description/Name	Future Demand Calculated by Jacobs				Future Demand Calculated by Carollo			
		Parcel Area (acres)	Parcel Area (ft ²)	Building Area (ft ²)	Calculated Demands by Jacobs (gpd)	Parcel Area (acres)	Parcel Area (ft ²)	TOTLVGAREA (ft ²)	Calculated Demand by Carollo (gpd)
36439840009	St. John Neumann Catholic High School	19.01	828,076	73,829	68,907	21.02	915,460	124,679	131,754
36443960001	Golden Gate Middle School	26.94	1,173,506	138,642	129,399	28.80	1,254,628	110,804	117,092
36232040006	Grace Community School	1.81	78,844	6,055	5,651	1.79	78,179	6,055	6,399
36232160009	Grace Community School	0.46	20,038	2,861	2,670	0.46	19,925	2,861	3,023
46572000055	Grace Community School	0.46	20,038	8,492	7,926	0.46	19,928	8,492	8,974
36124760009	Golden Gate Elementary School	13.98	608,969	78,450	73,220	15.86	690,992	38,235	40,405
36242200001	Herbert Cambridge Elementary	2.98	129,809	72,082	67,277	3.69	160,921	136,368	144,107
36002520002	Lavern Gaynor Elementary	8.02	349,351	65,008	60,674	8.02	349,343	155,968	164,819
35753480007	Grace Place	4.29	186,872	14,678	13,699	3.97	172,995	8,578	9,065
36304680006	Parking Lot for Church	0.39	16,988	--	--	0.39	16,857	--	--
36010560009	CCPS Owned Vacant Parcel	0.23	10,019	--	--	0.23	10,000	--	--

Attachment C. Future Demand for Schools Calculated by Jacobs and Carollo

Parcel No.	Description/Name	Future Demand Calculated by Jacobs				Future Demand Calculated by Carollo			
		Parcel Area (acres)	Parcel Area (ft ²)	Building Area (ft ²)	Calculated Demands by Jacobs (gpd)	Parcel Area (acres)	Parcel Area (ft ²)	TOTLVGAREA (ft ²)	Calculated Demand by Carollo (gpd)
35998440006	Golden Terrace Elementary School	12.65	551,034	69,546	64,910	14.92	649,800	-	-
36317960001	St. Elizabeth Seton Catholic School	3.72	162,043	42,625	39,783	3.72	162,021	60,404	19,150
Total					534,117				644,787
Ratio									534,117/644,787 = 83%

The review shows that Jacobs numbers are approximately 15% lower than Carollo numbers. Therefore, overall Carollo non-residential numbers were reduced by approximately 15%.

Attachment D

Future Demand Estimation on Parcels with Zero Demand



Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
35640120001	HOTELS, MOTELS	--	405,735	Avg of 325 ft ² per room, 100 gpd/unit for wastewater * 1.4 for potable	174,778.15	0
35641440007	MULTI-FAMILY - FEWER THAN 10 UNITS	2	2,008	250 gpd per residential unit	500	0
35647680007	MULTI-FAMILY - FEWER THAN 10 UNITS	2	920	250 gpd per residential unit	500	0
35744840009	MULTI-FAMILY - FEWER THAN 10 UNITS	2	1,101	250 gpd per residential unit	500	0
35760320008	MULTI-FAMILY - FEWER THAN 10 UNITS	2	1,872	250 gpd per residential unit	500	0
35779760002	MULTI-FAMILY - FEWER THAN 10 UNITS	4	3,200	250 gpd per residential unit	1,000	0
35780960008	SINGLE FAMILY	1	1,598	250 gpd per residential unit	250	0
35980640005	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	2		250 gpd per residential unit	500	0
35980680007	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	2		250 gpd per residential unit	500	0
35980720006	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	2		250 gpd per residential unit	500	0
35984640001	MULTI-FAMILY - FEWER THAN 10 UNITS	2	1,586	250 gpd per residential unit	500	0

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36010560009	PUBLIC COUNTY SCHOOLS - INCLUDING ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	1		250 gpd per residential unit	250	0
36230880006	MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL COMBINATION	1	2,450	250 gpd per residential unit/Used "Office Building", 0.15 gpd per ft ² of space, * 1.4 for potable (Collier standard)	250	515
36231080009	OPEN STORAGE, NEW AND USED BUILDING SUPPLIES, JUNK YARDS, AUTO WRECKING, FUEL STORAGE, EQUIPMENT AND MATERIAL STORAGE	0		Assumed zero	0	0
36231120008	OPEN STORAGE, NEW AND USED BUILDING SUPPLIES, JUNK YARDS, AUTO WRECKING, FUEL STORAGE, EQUIPMENT AND MATERIAL STORAGE	0		Assumed zero	0	0
36231640009	MULTI-FAMILY - FEWER THAN 10 UNITS	3	2,548	250 gpd per residential unit	750	0
36308040008	MULTI-FAMILY - FEWER THAN 10 UNITS	4	1,701	250 gpd per residential unit	1000	0
36308560009	SINGLE FAMILY	1	1,124	250 gpd per residential unit	250	0
36315640006	MULTI-FAMILY - FEWER THAN 10 UNITS	4	3,912	250 gpd per residential unit	1000	0
36319960009	VACANT COMMERCIAL	2		250 gpd per residential unit	500	0

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36324760003	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	2		250 gpd per residential unit	500	0
36325120008	MULTI-FAMILY - FEWER THAN 10 UNITS	3	2,700	250 gpd per residential unit	750	0
36326680000	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36379960007	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	1		250 gpd per residential unit	250	0
36430040002	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36430080004	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36430120003	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36430160005	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36430200004	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36430240006	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36435200009	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	0		Assumed zero	0	0
36444080003	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36444120002	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36458920007	STATE, OTHER THAN MILITARY, FORESTS, PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	0		Assumed zero	0	0
36459160002	MULTI-FAMILY - FEWER THAN 10 UNITS	2	3,627	250 gpd per residential unit	500	0
35778480008	COMMUNITY SHOPPING CENTERS	0	6,000	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	840
36303800007	PRIVATE SCHOOLS AND COLLEGES	0	2,000	Estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)	0	1867

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36317920009	PRIVATE SCHOOLS AND COLLEGES	0		Treated like a school, estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)	0	4550
35998440006	PUBLIC COUNTY SCHOOLS - INCLUDING ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	0		Estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)	0	6930
36318560002	PUBLIC COUNTY SCHOOLS - INCLUDING ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	0	50,878	Estimate 10 gpd/seat (student) * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)	0	6300
35640160003	VACANT COMMERCIAL	0	2,000	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)	0	560
35640680004	VACANT COMMERCIAL	0	1,960	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	274

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
35640760005	VACANT COMMERCIAL	0	1,960	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	274
36303840009	PRIVATE SCHOOLS AND COLLEGES	0		Assumed zero	0	0
35640800004	VACANT COMMERCIAL	0	2,483	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	348
35777680003	VACANT COMMERCIAL	0	1,699	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	238
35777720002	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210
35777760004	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210
35777800003	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210
35777840005	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210
35777880007	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210
35777920006	VACANT COMMERCIAL	0	1,503	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	210

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36230640000	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36230680002	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36230720001	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304480002	CHURCHES	0		Assumed zero	0	0
36230760003	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36231160000	VACANT COMMERCIAL	0	457	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	64
36304680006	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36305040001	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36231200009	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36251080005	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36231240001	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36010440006	PUBLIC COUNTY SCHOOLS - INCLUDING ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	0		Assumed zero	0	0
36231280003	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
35984020003	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
36231320002	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36303560004	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36303600003	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36303640005	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36303960002	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
36304000000	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
35774000000	UTILITY, GAS AND ELECTRICITY, TELEPHONE AND TELEGRAPH, LOCALLY ASSESSED RAILROADS, WATER AND SEWER SERVICE, PIPELINES, CANALS, RADIO/TELEVISION COMMUNICATION	0		Assumed zero	0	0
35748320004	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36304040002	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
35649440009	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36304080004	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304120003	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304200004	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
35832120000	OPEN STORAGE, NEW AND USED BUILDING SUPPLIES, JUNK YARDS, AUTO WRECKING, FUEL STORAGE, EQUIPMENT AND MATERIAL STORAGE	0		Assumed zero	0	0
36304240006	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304280008	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304320007	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304520001	VACANT COMMERCIAL	0	915	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	128
36304600002	VACANT COMMERCIAL	0	1,111	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	156
36430280008	VACANT COMMERCIAL	0	2,352	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	329
36430320007	VACANT COMMERCIAL	0	2,483	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	348

Attachment D. Parcels with Zero Demand


Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
35779120008	UTILITY, GAS AND ELECTRICITY, TELEPHONE AND TELEGRAPH, LOCALLY ASSESSED RAILROADS, WATER AND SEWER SERVICE, PIPELINES, CANALS, RADIO/TELEVISION COMMUNICATION	0		Assumed zero	0	0
35779360004	UTILITY, GAS AND ELECTRICITY, TELEPHONE AND TELEGRAPH, LOCALLY ASSESSED RAILROADS, WATER AND SEWER SERVICE, PIPELINES, CANALS, RADIO/TELEVISION COMMUNICATION	0		Assumed zero	0	0
36430400008	VACANT COMMERCIAL	0	2,483	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	348
36430440000	VACANT COMMERCIAL	0	3,136	0.1 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	439
36453120006	VACANT COMMERCIAL	0	4,935/10,065	Assumed "Restaurant operating 16 hours or less per day, per seat", 40 gpd/unit * 1.4 for potable (Collier standard), seat = 1 seat per 15 ft ² (Orange County)//Used "Office Building", 0.15 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	20538

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
75180000120	VACANT COMMERCIAL	0	52,577	Used "Office Building", 0.15 gpd per ft ² of space, * 1.4 for potable (Collier standard)	0	11041
35930560009	CHURCHES	0		Assumed zero	0	0
35930600008	HOTELS, MOTELS	0		Assumed zero	0	0
36303680007	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	0	915	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)	0	256
36304360009	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	0	915	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)	0	256
36304400008	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	0	915	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)	0	256
35778740007	COMMUNITY SHOPPING CENTERS	0		Assumed zero	0	0
35778800002	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
35778840004	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
35779120105	VACANT COMMERCIAL	0		Assumed zero	0	0

Attachment D. Parcels with Zero Demand

Parcel ID	Parcel Use Descriptions	Number of Residential Units	Building (ft ²)	Estimation Basis	Medium Residential Demand (gpd)	Non-Residential Demand (gpd)
35779260007	VACANT COMMERCIAL	0		Assumed zero	0	0
35779400003	VACANT COMMERCIAL	0		Assumed zero	0	0
35930720001	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
35930760003	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
35931040007	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
35931120008	CHURCHES	0		Assumed zero	0	0
35931200009	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	0		Assumed zero	0	0
37920041002	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
38400160004	COUNTIES (OTHER THAN PUBLIC SCHOOLS, COLLEGES, HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	0		Assumed zero	0	0
36316520002	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	0	4,508	Estimate 3 gpd / seat (Collier standard) * 1.4 for potable, seat = 1 seat per 15 ft ² (Orange County)	0	1262
Total (gpd)					186,028	61,940



Appendix C
Stormwater System Technical Memorandum

Golden Gate City Water Resource Protection - Restoration Master Plan

Stormwater System Technical Memorandum

January 2026



1. Introduction

Collier County (hereinafter, “the County”) was awarded a grant from the State of Florida Department of Environmental Protection for the Collier County Golden Gate City Water Resource Protection/Restoration Master Plan (hereinafter, the “Golden Gate City Master Plan [GGCMP]”). As part of the preliminary data collection and analysis, Jacobs was tasked with interviewing key County staff from the Stormwater Management Department to compile a list of drainage projects underway within the study area and incorporate that information into work packages with other infrastructure projects. The other infrastructure projects in the GGCMP will include water distribution, wastewater collection and treatment, sidewalks, bike paths, roadway improvements, landscaping, irrigation, lighting, and fiber.

Figure 1 shows the overall GGCMP study area as well as the additional boundary used for the wastewater service area. The GGCMP study area is an unincorporated area within western Collier County referred to as Golden Gate City. The stormwater improvements will be evaluated for the Golden Gate City area, which includes for the 4 -square-mile area bounded on the north by Green Boulevard, on the east by Collier Boulevard, on the west by Santa Barbara Boulevard, and on the south by the Golden Gate Main Canal.

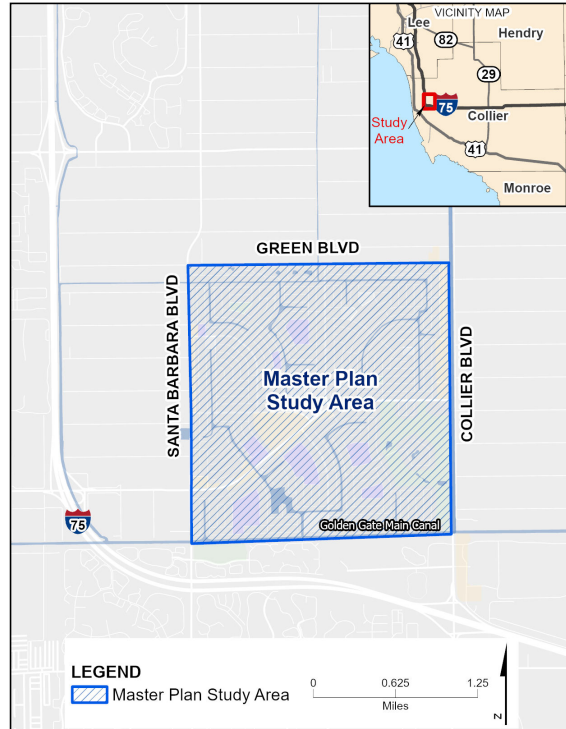


Figure 1. Master Plan Study Area

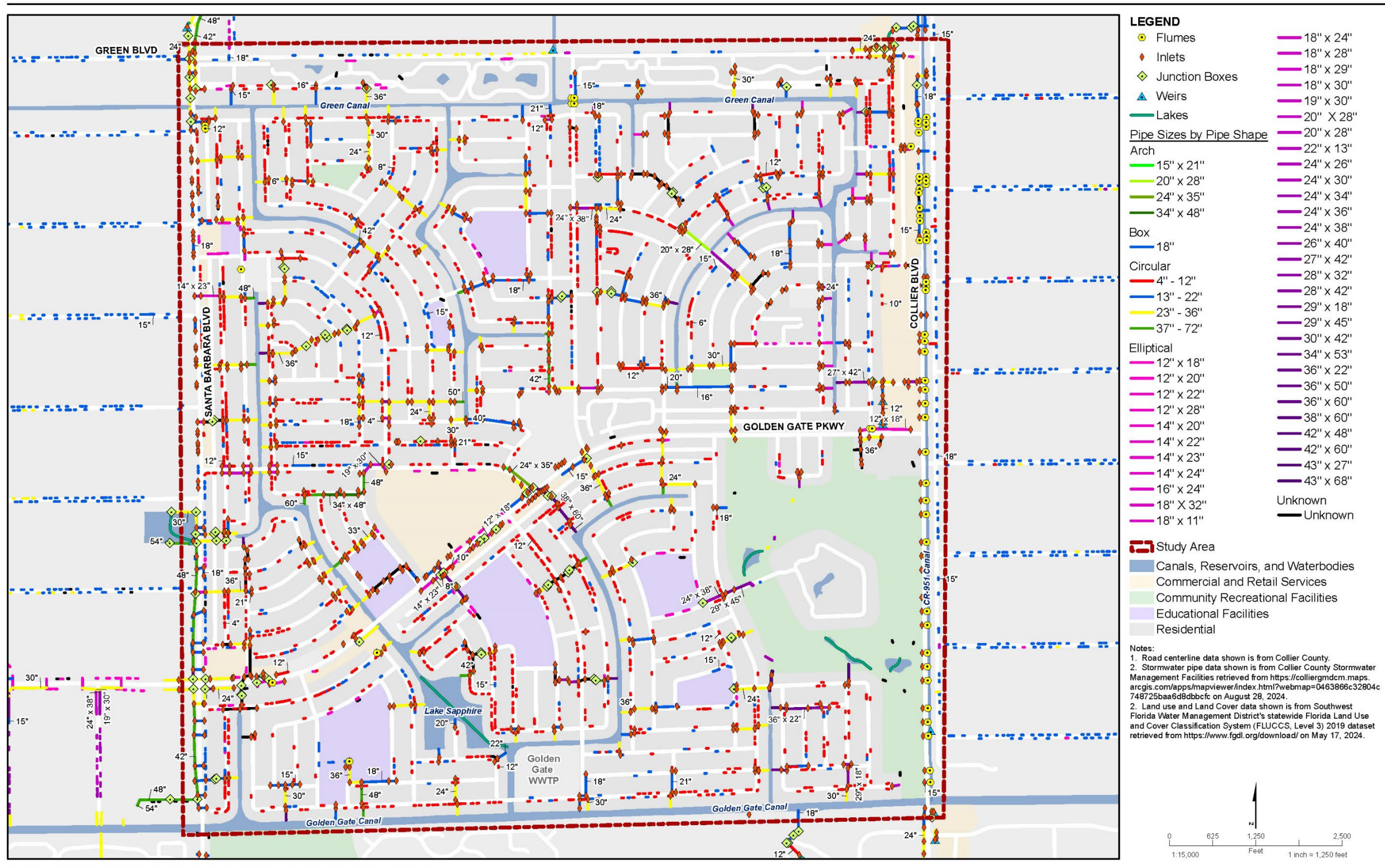
2. Data Collection

2.1 Stormwater Master Plan

The Golden Gate City Stormwater System Inventory and Master Plan (hereinafter, “the Stormwater Master Plan”) was developed for the study area in 2010 (GradyMinor 2010). This master plan developed an inventory of existing stormwater facilities, evaluated the condition of the existing infrastructure, and presented a plan for replacing the existing stormwater system. Geographic information system files of the County’s stormwater infrastructure have been kept updated by the County and were provided to Jacobs in June 2024 (Collier County 2024). Figure 2 shows a map that identifies existing stormwater infrastructure and interconnecting canal system.

According to the Stormwater Master Plan, the system has more than 780 stormwater structures, 17.9 miles of culvert piping, and 103 miles of roadside swales. At the time of that 2010 document, the majority of the system was 35 to 45 years old and was nearing the end of its useful life. Therefore, for the GGCMP, most of the system is approximately 50 to 60 years in age. The Stormwater Master Plan also noted the majority of the stormwater pipe is corrugated steel culverts that have severely deteriorated and, in some locations, have failed because of deformation and corrosion.

Figure 2. Existing Stormwater Management Pipe Size



\\DC1VSI\GIS\PROJ\COLLIERCOUNTY\GOLDEN_GATE_CITY\MAPFILES\GGC_MP_BASEMAP\GGC_MP_BASEMAP.APRX

The Stormwater Master Plan divided the Golden Gate City area into four quadrants (northeast, northwest, southeast, and southwest) and developed a recommended phasing plan. The recommendation was to replace the infrastructure in the order of original construction, as follows:

1. Northeast quadrant
2. Southeast quadrant
3. Northwest quadrant
4. Southwest quadrant

Each quadrant was further divided into subareas to phase projects within its respective quadrant with a construction cost range of approximately \$400,000 (in 2010 dollars).

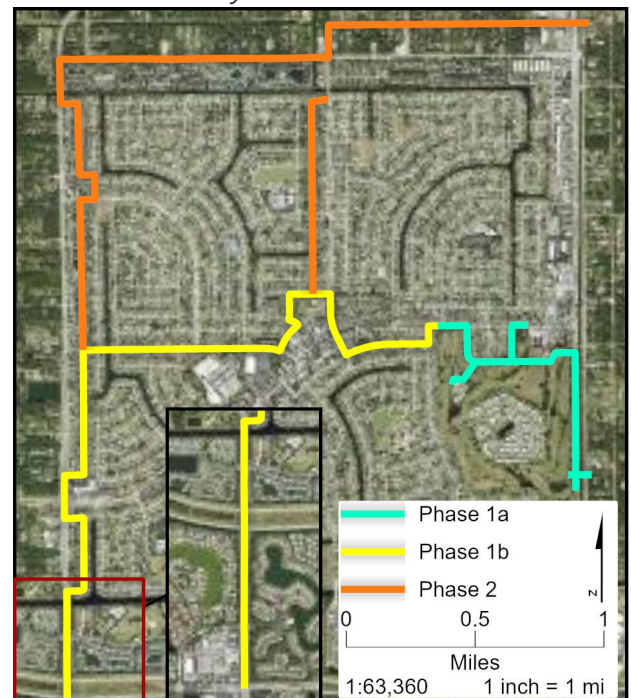
2.2 Recent Projects

A meeting was held on September 16, 2024, with County staff to discuss recent and planned stormwater projects within the study area. The following projects were identified as completed or in progress:

- **Golden Gate City Outfall Pipe Replacement Project** – This project includes replacement of 15 outfall pipes within the Golden Gate City area.
 - The County received approximately \$2.8 million in grant funding from the Florida Department of Environmental Protection to upgrade the outfalls. However, each outfall is anticipated to cost approximately \$1 million so the grant is not anticipated to cover the entire construction cost (Jacobs 2024).
 - The project is in the design stage. The design is being updated to include different trenching options and alternative methods for installation, as other County projects within the area have encountered shallow rock.
- **Golden Gate City Transmission Water Main Improvements** – This project includes water main improvements to serve the Golden Gate City area. The water main improvements project has three phases as shown in Figure 3. These improvements will also include stormwater management systems within the designated limits, with provisions for supplementary improvements as conditions require. The timeline for construction includes:
 - Phase 1a: The project is completed. It included water main, force main, and irrigation piping.
 - Phase 1b: The project is planned to be completed by mid-2025.
 - Phase 2: The project is planned to be completed by May 2025.

Figure 3. Water Main Improvements Phasing Map

Source: Collier County n.d.



2.3 Property Boundaries

The Golden Gate City area is platted with the road right-of-way primarily consisting of residential local roads at 60 feet wide, and the collector and major roads ranging from approximately 100 to 120 feet wide. Some areas include 10-foot-wide alleyways at the back of the properties. The subdivision plats

indicate a 6-foot-wide easement at the sides and rear of the properties for drainage and public utilities (GradyMinor 2010). The availability of these easements should be verified during design.

3. Conclusions and Recommendations

The Stormwater Master Plan recommended replacement of stormwater infrastructure in the following order:

1. Northeast quadrant
2. Southeast quadrant
3. Northwest quadrant
4. Southwest quadrant

Each quadrant was further divided into subareas that were grouped by construction cost, as identified in the Golden Gate City Stormwater Drainage Improvement Master Plan map (Collier County 2012). The map and the subareas are provided in Attachment A.

However, because all stormwater infrastructure in the study area needs replacing, and the phasing boundaries and sequence for stormwater improvements must align with the GGCMP, Jacobs does not recommend following the Stormwater Master Plan's order for replacement. Instead, the order of replacement should align with the overall area's GGCMP phasing.

Jacobs recommends keeping each individual stormwater subsystem's outfall piping and structures within the same phase of the GGCMP so that once improvements are made, the system can function properly. These subsystems are identified in the Project List tables and on the map in Attachment A. However, the improvements to swales and driveways for the subbasin do not necessarily need to be grouped into the same GGCMP phase.

In addition to the current outfall improvements project, the County plans to continue working on the remaining outfall projects in Golden Gate City as funding becomes available. When each GGCMP phase goes into design, coordination will be required to determine which outfall projects have been completed and which are still needed.

Jacobs recommends that a stormwater model be developed for the Golden Gate City area to determine water quality treatment, flood mitigation, and upgrades to the existing system. However, in a meeting on December 17, 2024, the County indicated that they do not anticipate a stormwater model being developed for the area and directed Jacobs to proceed with the GGCMP as an in-kind replacement. Therefore, Jacobs recommends that when each phase of the GGCMP goes into design, the drainage engineer should perform pipe sizing calculations for the area under design.

Pipe size calculations should be made to determine whether a different pipe diameter is required, as it is anticipated that the existing pipe diameters may require upsizing to meet current South Florida Water Management District design standards. A contingency with the cost estimates will be included to account for an anticipated increase in cost because of increasing pipe size.

Jacobs recommends removal and replacement of the existing pipes (vs. slip-lining) because the existing pipes are deteriorated, and slip-lining will reduce the capacity to the existing corrugated pipes. Additionally, when the areas move to the design stage, flood mitigation should be evaluated.

4. References

Collier County. 2012. *Golden Gate City Stormwater Drainage Improvement Master Plan* [map]. Prepared by Stormwater and Environmental Planning Section Land Development Services Department Growth Management Division. September 14.


Collier County. 2024. "GIS Maps." Collier County Property Appraiser. January.
<https://maps.collierappraiser.com/map.aspx?560192286968232>

Collier County. n.d. "Golden Gate City Transmission Water Main Improvements." Accessed January 8, 2025.
<https://ggcwatertransmission.com>

Jacobs. 2024. *Workshop 1 with Collier County PUD and Stormwater Meeting Minutes*. September 16.

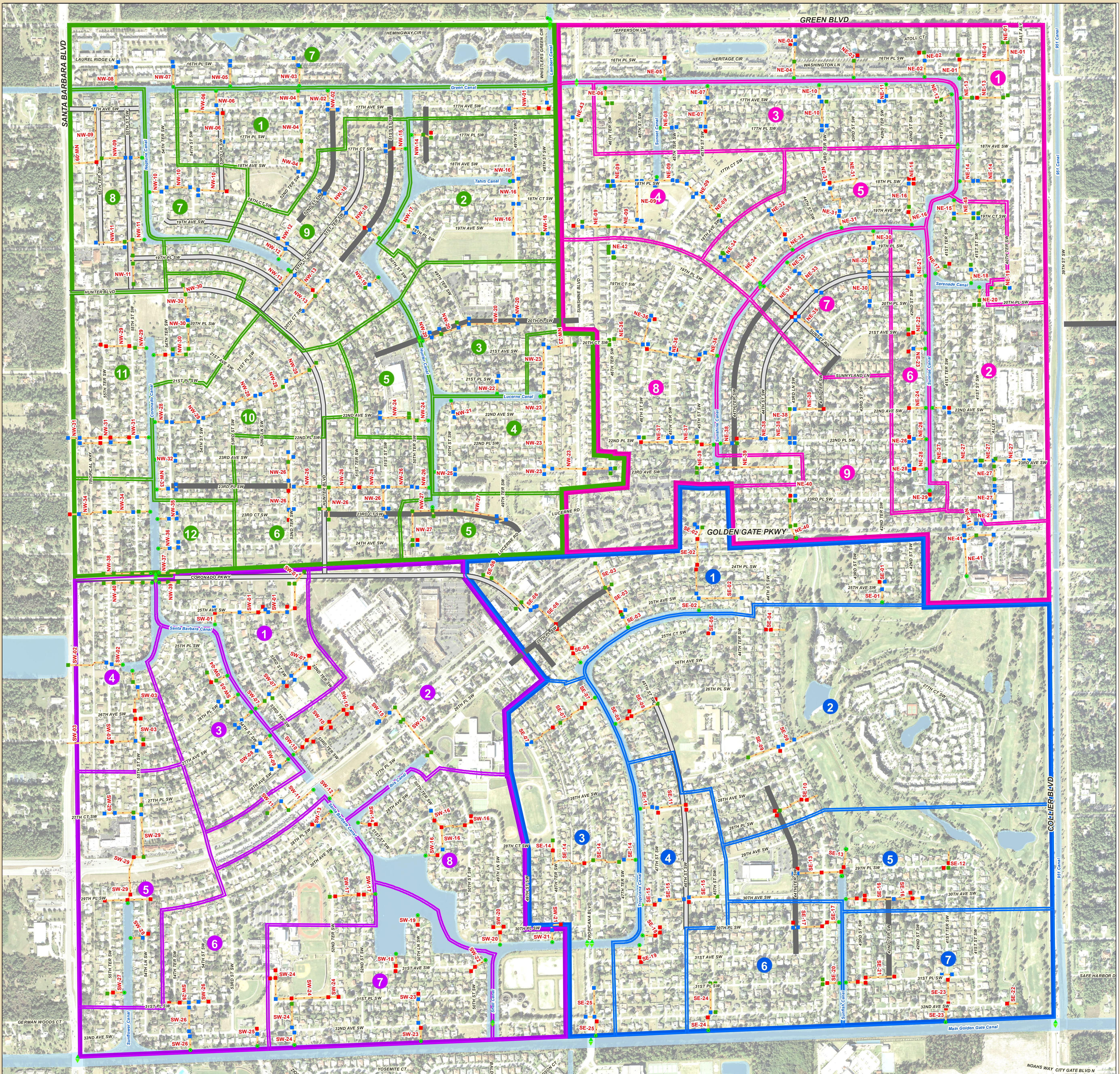
Q. Grady Minor & Associates, P.A. (GradyMinor). 2010. *Golden Gate City Stormwater System Inventory and Master Plan*. Prepared for Collier County Transportation Services Stormwater. January.

Tetra Tech. 2021. *Golden Gate Wastewater System Master Plan*. Prepared for Collier County Water and Sewer District. June.



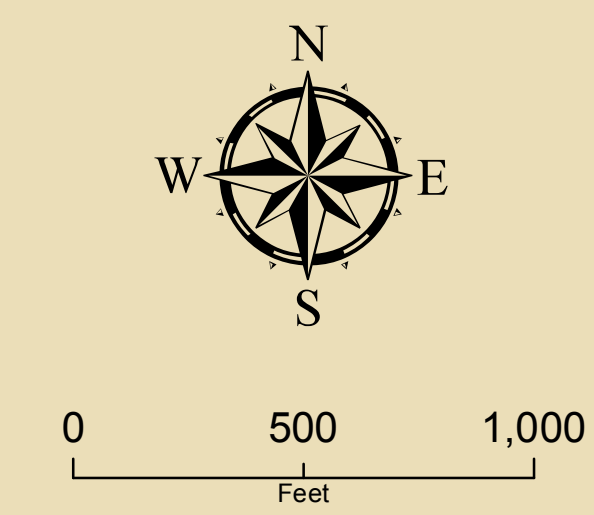
Attachment A
Stormwater Master Plan Map

Golden Gate City Stormwater Drainage Improvement Master Plan



Legend

- Outfall points (141)
- ◆ Bridges
- Structure**
- Good Condition (155)
- Fair Condition (370)
- Poor Condition (192)
- Pipes (Condition TBD)**
- Pipe and Culvert (91102.8 FT)
- Quadrant**
- NORTHEAST QUADRANT
- NORTHWEST QUADRANT
- SOUTHEAST QUADRANT
- SOUTHWEST QUADRANT
- Tentative With Road Maintenance Project**
- Roadways Overlaid in 2012
- Roadways Targeted For Overlay in 2013
- NW-XX - Stormwater System I.D (Quadrant- Pipe Run)



Prepared by:
Stormwater and Environmental Planning Section
Land Development Services Department
Growth Management Division

NORTHWEST QUADRANT

PROJECT NO	SUBSYSTEM
1	NW 01, 02, 04, 06
2	NW 14, 16, 17
3	NW 20, 22
4	NW 21, 23, 25
5	NW 24, 27
6	NW 26
7	NW 03, 05, 07, 08, 10
8	NW 09, 11
9	NW 12, 13, 15, 18, 19
10	NW 28, 32, 33
11	NW 29, 30, 31
12	NW 34, 35, 36, 37, 38, 39, 40


SOUTHWEST QUADRANT

PROJECT NO	SUBSYSTEM
1	SW 01, 07
2	SW 10, 11, 15
3	SW 04, 05, 06, 08, 09
4	SW 02, 03
5	SW 27, 29
6	SW 12, 13, 17, 25, 26, 28
7	SW 18, 19, 22, 23, 24
8	SW 14, 16, 20, 21

Project List

NORTHEAST QUADRANT	
PROJECT NO	SUBSYSTEM
1	NE 01, 02, 03, 04, 05, 13, 14, 19
2	NE 15, 17, 18, 20, 25, 27
3	NE 6, 7, 8, 10, 11, 12
4	NE 9, 43
5	NE 16, 31, 32, 34
6	NE 21, 22, 23, 24, 26, 28, 29
7	NE 30, 33, 35
8	NE 36, 37, 39
9	38, 40, 41

SOUTHEAST QUADRANT	
PROJECT NO	SUBSYSTEM
1	SE 01, 02, 03, 06
2	SE 04, 05, 08, 09, 10
3	SE 07, 14, 25
4	SE 11, 15, 18, 19
5	SE 12, 13, 16
6	SE 17, 20, 24
7	SE 21, 22, 23



Appendix D
Sidewalks, Bike Lanes, Transit, and Landscaping
Technical Memorandum

August 27, 2025

MEMORANDUM

Subject: Golden Gate Sidewalks**Introduction:**

This memo outlines the sidewalk, bus stop, and beautification improvement plan for Golden Gate City, integrating findings from the Golden Gate City Walkable Community Study with updated GIS analysis to prioritize sidewalk construction. By leveraging the study's recommendations and GIS mapping, the GIS analysis identified priority areas for improving pedestrian safety, connectivity, and mobility.

Background:

The **Golden Gate City Walkable Community Study** highlighted critical gaps in sidewalk coverage, including:

- Only **36%** of road miles having some sidewalk coverage.
- **4.3 miles** of sidewalks existing on both sides of the road and **22.9 miles** on one side. The study also provided a tiered prioritization of sidewalk projects based on factors such as proximity to schools, parks, and high-crash areas.

Using GIS, the data was updated to reflect current conditions, identify gaps, and prioritize sidewalks for construction. GIS mapping visually represents where Tier 1, Tier 2, and Tier 3 sidewalks should be constructed to align with community needs. The tier map (Exhibit A) was updated to reflect any projects that have been completed since the Golden Gate Walkable Study was completed.

Methodology:

The methodology for identifying and prioritizing sidewalk, bus stops, and beautification improvements in Golden Gate City combined findings from the Golden Gate Walkable Community Study with updated GIS analysis, coordination with Collier County, reviewing CAT's Transit Development Plan (TDP), and reviewing the beautification master plan. The following steps were undertaken:

1. Data Collection:

- Existing sidewalk data was extracted from the Golden Gate Walkable Community Study, which identified current coverage, gaps, and priorities based on Tier 1, Tier 2, and Tier 3 classifications. This data was then compared to existing conditions and updated completed projects since the completion of the Golden Gate Walkable Community Study. A sidewalk verification map (Exhibit B) was then produced to show the status of completed sidewalks and non-completed sidewalks in the Golden Gate City community.
- A meeting with Collier County's Public Transit & Neighborhood Enhancement (PTNE) Division was conducted to discuss the agency's future plans in the Golden Gate Community. PTNE provided existing bus stops locations and recommended improvements as shown in Exhibit C. The CAT's TDP was reviewed to gather information on the agency's long-term goal for the Golden Gate Community.
- Coordination with staff from Collier County's PTNE Division was conducted to gather information on the beautification plan for the Golden Gate Community. County PTNE staff provided the Beautification Master Plan, which was reviewed and a list of recommended projects was gathered from this list. A summary of these projects is presented in Exhibit D.

2. GIS Mapping:

- The data was imported into GIS to map out the existing sidewalk network and visualize gaps.

- GIS was used to compare the sidewalks in the Walkable study with existing conditions.
- GIS was used to Map out the existing bus stops location in the Golden Gate Community. The existing bus stops can be viewed in Exhibit E.
- GIS was used to map out the recommended projects listed in the Beautification Master Plan. The recommended projects map can be viewed in Exhibit F.

3. Prioritization:

- According to the Golden Gate Walkable Community Study, sidewalk projects were assigned to three tiers:
 - **Tier 1:** High-priority projects near schools, parks, and high-crash areas. Tier 1 is shown as red in Exhibit A.
 - **Tier 2:** Medium-priority projects that enhance connectivity and access to less critical destinations. Tier 2 is shown as blue in Exhibit A.
 - **Tier 3:** Long-term projects that complete the network and improve overall walkability. Tier 3 is shown as green in Exhibit A.
- The GIS tier map from the Golden Gate Walkable Community Study was updated to reflect completed projects.
- Along with addressing Tier 1 sidewalks, priority needs to be given to bus stops that don't meet ADA standards.

4. Shared Use Path-Bike Path-Roadway Improvements

- In coordination with the Collier MPO, Capital reviewed programmed pedestrian facilities, including sidewalks and shared-use paths (SUPs), within and near the Golden Gate City study area. This review included verifying a shared-use path along Collier Boulevard and sidewalk segments from the FY 2019-2029 Transportation Improvement Program. These improvements are funded projects set to move forward into construction in the future. They are highlighted in cyan and can be found in Exhibit B.
- As identified in the Collier MPO 2045 Long Range Transportation Plan (LRTP), bicycle facility improvements were reviewed within and near the Golden Gate City study area. These improvements were planned along corridors such as Golden Gate Parkway and Green Boulevard, where dedicated bike lanes and shared-use facilities were prioritized. The projects were identified to support multimodal access, improve safety, and encourage bicycle use throughout the community. Funding was allocated, and implementation was scheduled within the LRTP's planning horizon (*Collier MPO 2045 LRTP, Table ES-4, ES-5; pp. ES-23 to ES-26*).
- Roadway and intersection improvement projects located within and around the Golden Gate City study area were identified and prioritized through the Collier MPO 2045 Long Range Transportation Plan (LRTP). Improvements such as the intersection enhancements at Golden Gate Parkway at Collier Boulevard and the widening of Green Boulevard from Santa Barbara Boulevard to Sunshine Boulevard were included. These projects were developed to address congestion, improve operational efficiency, and enhance safety for all users. Funding was secured, and the projects were programmed for future construction under the LRTP (*Collier MPO 2045 LRTP, Table ES-2; pp. ES-9 to ES-11*).

5. PTNE Bus Stops:

A stakeholder meeting was held with Collier County's PTNE Division on October 30th, 2024. During this call, staff from Collier County's PTNE Division outlined potential upgrades to the Collier County transit system, particularly focusing on ADA improvements and shelter installations in the Golden Gate community. A summary of these recommended

improvements can be viewed in Exhibit C. Per follow-up email correspondence with staff from Collier County's PTNE Division in March 2025, it was clarified that bus stop improvements typically do not have a set implementation timeline unless tied to a specific project or funding source. High-ridership stops are prioritized, and improvements are often determined by grant eligibility or coordination with roadway projects, such as those led by FDOT. For example, ADA pad installations are sometimes implemented where FDOT projects intersect transit needs. As of the correspondence, 36 stops in Golden Gate were either under design or construction. PTNE also noted that they are close to completing the Immokalee Transfer Hub, which had significant overlap with previous coordination.

Additionally, CAT's **2021–2030 Transit Development Plan (TDP)** was reviewed, and coordination was conducted with them to ensure alignment with their transit goals and infrastructure improvements for Golden Gate City. Based on the TDP, the following plans have been established for the Golden Gate City community.

- Collier Area Transit (CAT) is implementing significant improvements to its bus routes and infrastructure to enhance accessibility and connectivity in Golden Gate City. The plan includes splitting Route 25 into distinct east-west and north-south segments along Golden Gate Parkway and Goodlette-Frank Road, respectively, to provide better transit options. Route 27 will also be adjusted, incorporating a deviation to the Golden Gate Community Center on Golden Gate Parkway to enhance accessibility for residents. Additionally, CAT will introduce a Mobility-on-Demand (MOD) service by 2029, allowing for flexible, app-based ride booking within the community.
- Key infrastructure improvements include new transit shelters and ADA-compliant bus stop upgrades along Golden Gate Parkway, Collier Boulevard, and Santa Barbara Boulevard to improve rider experience and accessibility. High-priority stops include Golden Gate Community Center, Golden Gate Parkway & Collier Boulevard, Santa Barbara Boulevard at Coronado Parkway, and Golden Gate Parkway at Sunshine Boulevard. CAT is also increasing the frequency of Route 20/26 and extending the operating hours of Route 24 to 10:00 PM by 2027, ensuring improved transit availability.
- The primary goal of CAT's plan is to enhance mobility, reduce transit gaps, and improve accessibility for residents by optimizing routes and adding key transit amenities. These improvements aim to better serve high-traffic areas, including schools, parks, and commercial centers. By restructuring routes and integrating new bus stops, CAT is working toward a more efficient and rider-friendly transit system in Golden Gate City.

6. Landscaping

Coordination was conducted with the Municipal Service Taxing Unit (MSTU) to discuss the agency's plan regarding landscaping (beautification) for the Golden Gate Community. The Golden Gate Beautification MSTU was established in 1983 to fund and maintain beautification improvements within Golden Gate City. Overseen by Collier County and advised by a resident committee, the MSTU is responsible for enhancing major corridors through projects such as median landscaping, irrigation, pedestrian-scale lighting, sidewalks, bike lanes, and decorative features. These improvements aim to elevate community aesthetics, improve safety, and support economic development, as outlined in the 2011 Golden Gate Beautification Master Plan. Priority corridors include Golden Gate Parkway, Collier Blvd, Green Blvd, Hunter Blvd, Coronado Parkway, and Santa Barbara Blvd.

The MSTU is funded through ad valorem property taxes levied within its district. While annual budgets vary, the MSTU has historically contributed significant funding to corridor improvements—for example, \$213,000 toward Collier Blvd landscaping in FY 1997–1998.

In addition to coordinating with MSTU staff, the Golden Gate Community Roadways Beautification Master Plan was reviewed to determine what the agency has planned for the community in terms of landscaping/beautification. Below is a summary of the Golden Gate Beautification Master Plan:

- Per the Golden Gate Beautification Master Plan (2011), strategic enhancements are targeted for key roadways spanning approximately 12 miles within the community. These corridors include Golden Gate Parkway (East), Collier Blvd., Coronado Parkway, Hunter Blvd., Green Blvd., Santa Barbara Boulevard (North section), and other crucial arteries (Golden Gate Beautification Master

Plan, 2011, Figures 2 through 11 (pp. 3-5 to 3-23)). The plan emphasizes the planting of native, drought-tolerant vegetation and improvements to pedestrian and bicycle infrastructures, complemented by consistent and aesthetically pleasing street furniture to create a unified and appealing streetscape. The objectives are to foster community pride, enhance public safety, elevate property values, and attract commercial investments (Golden Gate Beautification Master Plan, 2011, pp. 1-1 to 1-4, 2-1 to 2-3, and 3-5 to 3-23).

- The Master Plan proposes a phased funding strategy primarily supported by the Golden Gate Beautification MSTU, supplemented by potential state and federal grants and public-private partnerships. Recommendations include prioritizing projects with the greatest community impact, securing long-term maintenance commitments from Collier County to sustain the enhancements, expanding funding sources to include state and federal grants and public-private partnerships, and engaging the community through outreach and participatory initiatives. These steps are essential to maximize the positive impacts of the beautification efforts and ensure sustainable development (Golden Gate Beautification Master Plan, 2011, pp. 7-1 to 7-4). The recommended projects are shown in Exhibit D. Exhibit D displays the recommended project that the Golden Gate Beautification Master Plan identified. Per Exhibit D, some of the recommended projects have been completed.
- By adhering to the guidelines of the Golden Gate Beautification Master Plan, the envisioned improvements aim to transform the community's major roadways into exciting, attractive, and safe environments that support economic growth and significantly enhance the quality of life for all residents (Golden Gate Beautification Master Plan, 2011, pp. 1-1 to 1-4, 2-1 to 2-3).
- All landscape recommendations shall adhere to utility protection guidelines, including the use of root barriers where appropriate and maintaining adequate horizontal and vertical separation between plantings and underground utilities per PUD criteria. Coordination with utility owners will be conducted during final design to ensure compliance.

7. Bike Paths and Roadway Improvements

Recommendations:

1. Construct Tier 1 Sidewalks First:

- Prioritize areas near schools, parks, and high-crash locations, as identified by GIS analysis. After Tier 1 sidewalks have been addressed, Tier 2 and Tier 3 should be addressed on an as-needed basis, depending on funding availability.

2. Collier PTNE Division to work closely with other Collier County Divisions:

- PTNE should work closely with other Collier County divisions and relevant agencies to identify opportunities for implementing bus stop improvements, particularly where future development or infrastructure projects are planned. Emphasis should be placed on incorporating ADA upgrades at stops that do not currently meet standards.

3. Beautification Coordination

- Since many proposed sidewalk and transit improvements overlap with MSTU priority corridors, the County's PTNE division should coordinate with the County's MSTU to align design efforts and secure funding support where possible.

4. Bike Path and Roadway Coordination

- It is recommended that the Collier County Transportation Department coordinate with other County departments to secure funding and complete the Green Blvd and Golden Gate Pkwy intersection improvement project.

5. Use GIS for Ongoing Monitoring:

- Using GIS to monitor progress, evaluate the impact of completed projects, and refine future plans. This will allow relevant stakeholders and the community to view the progress that has been made in the community.

6. Engage the Community:

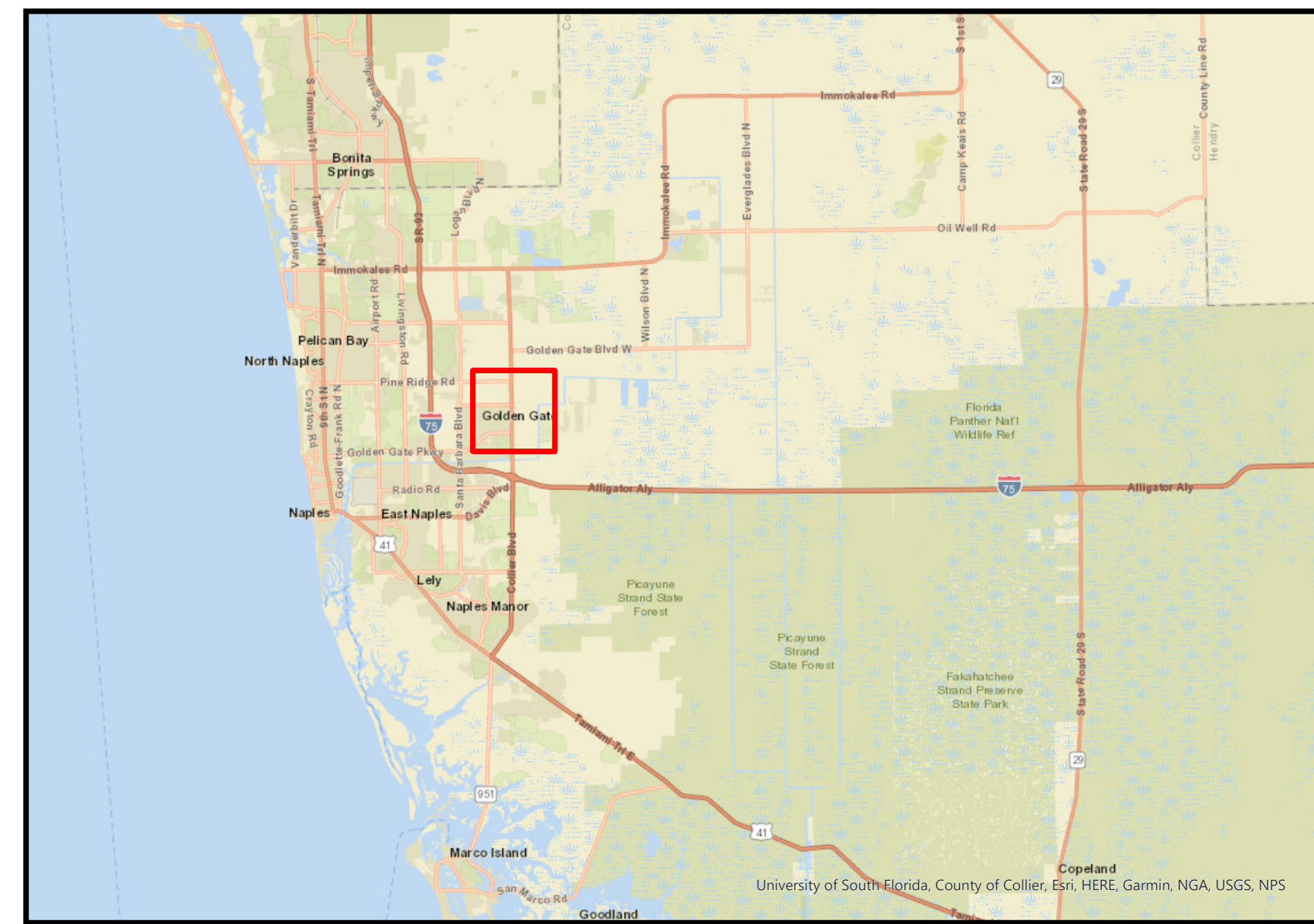
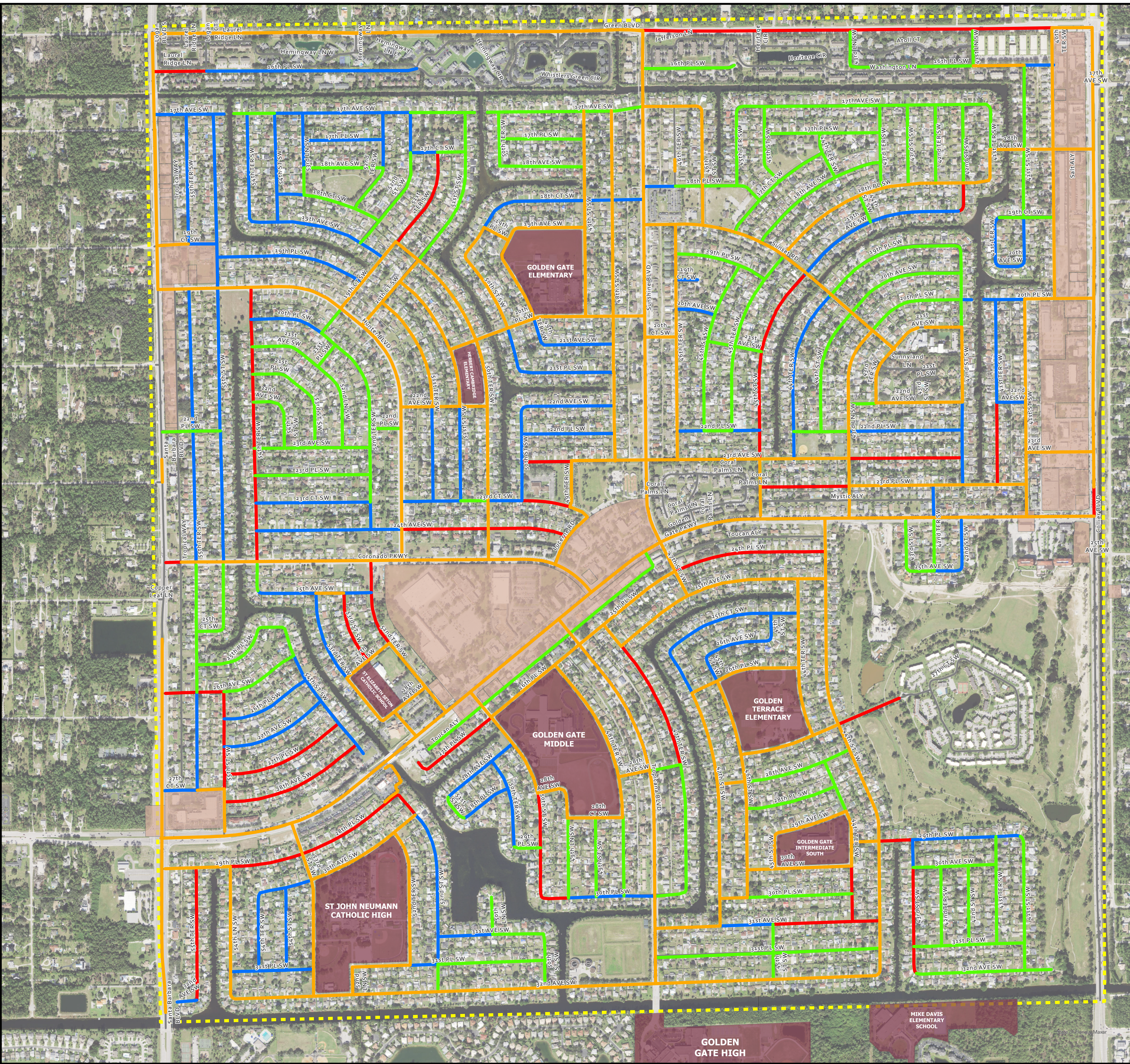
- Share GIS maps and project plans with the community to gather feedback and ensure alignment with local needs.

Conclusion:

By conducting stakeholder meetings, reviewing master plans, and using GIS, a data-driven approach has been developed to identify and prioritize sidewalks, bus stops, and beautification improvements in Golden Gate City. This plan ensures that critical gaps are addressed, pedestrian safety is addressed, and connectivity is enhanced. Exhibit A, Exhibit C, and Exhibit D provide a summary of prioritization for constructing sidewalks, bus stops, and beautification improvements in the Golden Gate Community.

References:

- Collier MPO 2045 Long Range Transportation Plan, December 2020
- Golden Gate City Walkable Community Study
- Golden Gate Community Roadways Beautification Master Plan, March 2011
- Collier Area Transit Ten Year Transit Development Plan 2021-2023, December 2020



LEGEND

Completed (YES/NO), Tier

- NO, Tier 1
- NO, Tier 2
- NO, Tier 3
- YES
- Roads Centerline
- School Parcels
- Commercial Zones
- Project Boundary

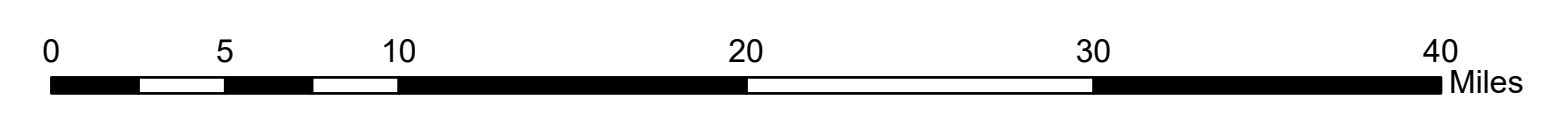
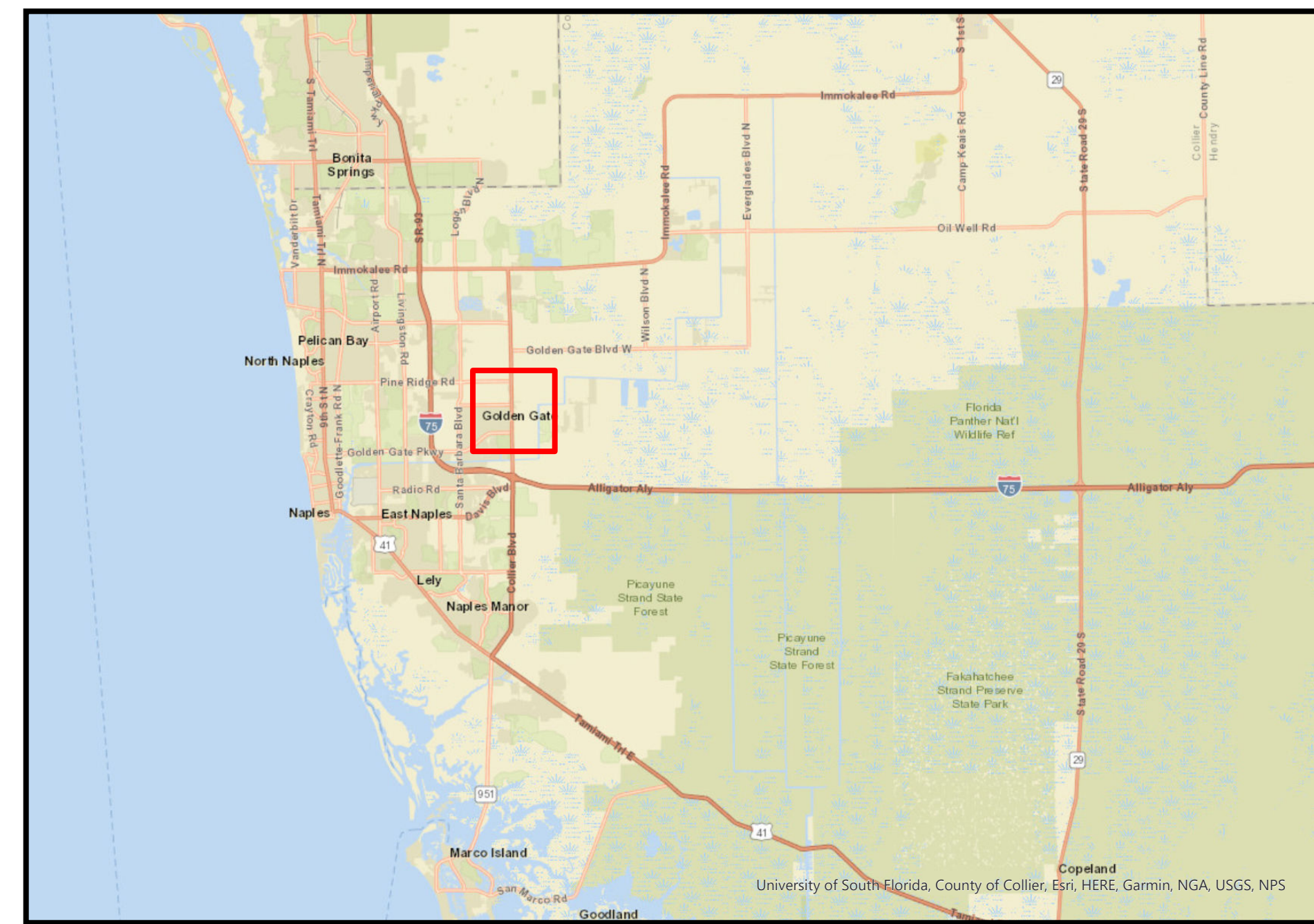
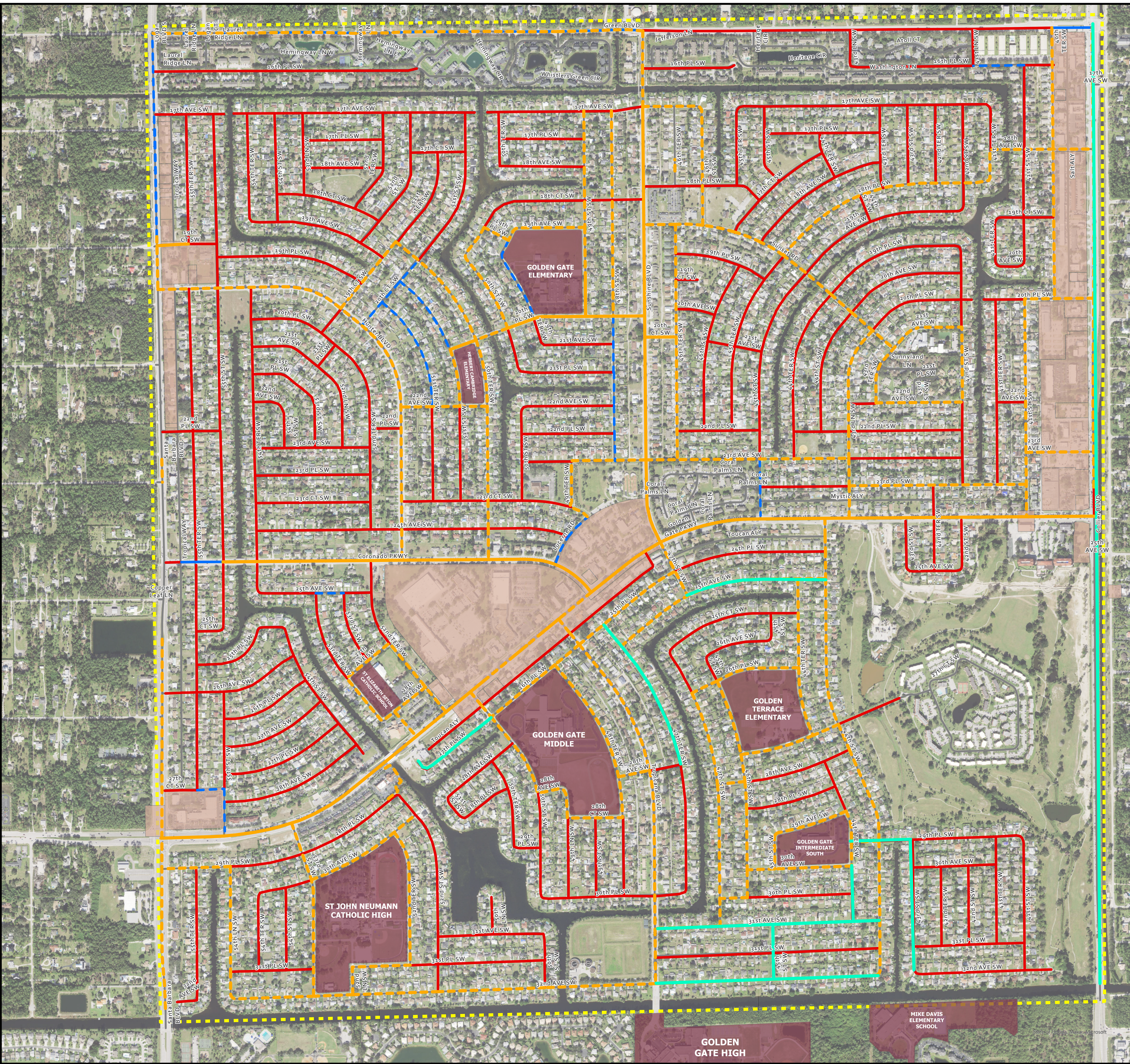


EXHIBIT A

Sidewalk Tiers
Golden Gate City Masterplan
Collier County, Florida





LEGEND

- SW Existing**
 - Sidewalk Both Sides
 - Sidewalk One Side
- SW Completed (YES/NO)**
 - NO
 - YES, Both Sides
 - YES, One Side
- Golden Gate Programmed PED Facilities TIP FY 25-29
- Roads Centerline
- School Parcels
- Commercial Zones
- - - Project Boundary

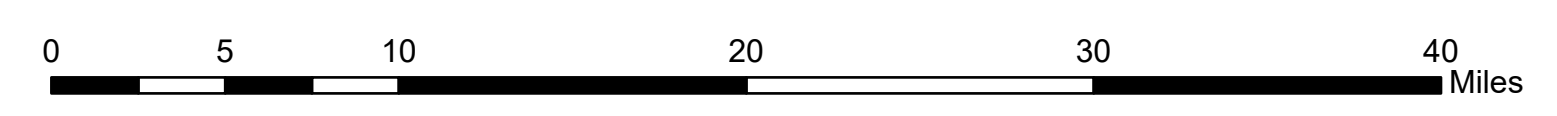
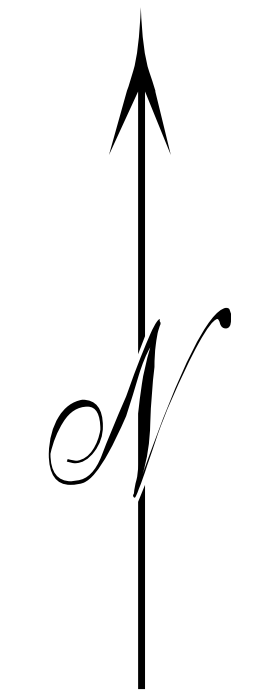


EXHIBIT B

Sidewalk Verification
 Golden Gate City Masterplan
 Collier County, Florida



EXHIBIT C
Golden Gate City
PTNE BUS STOPS

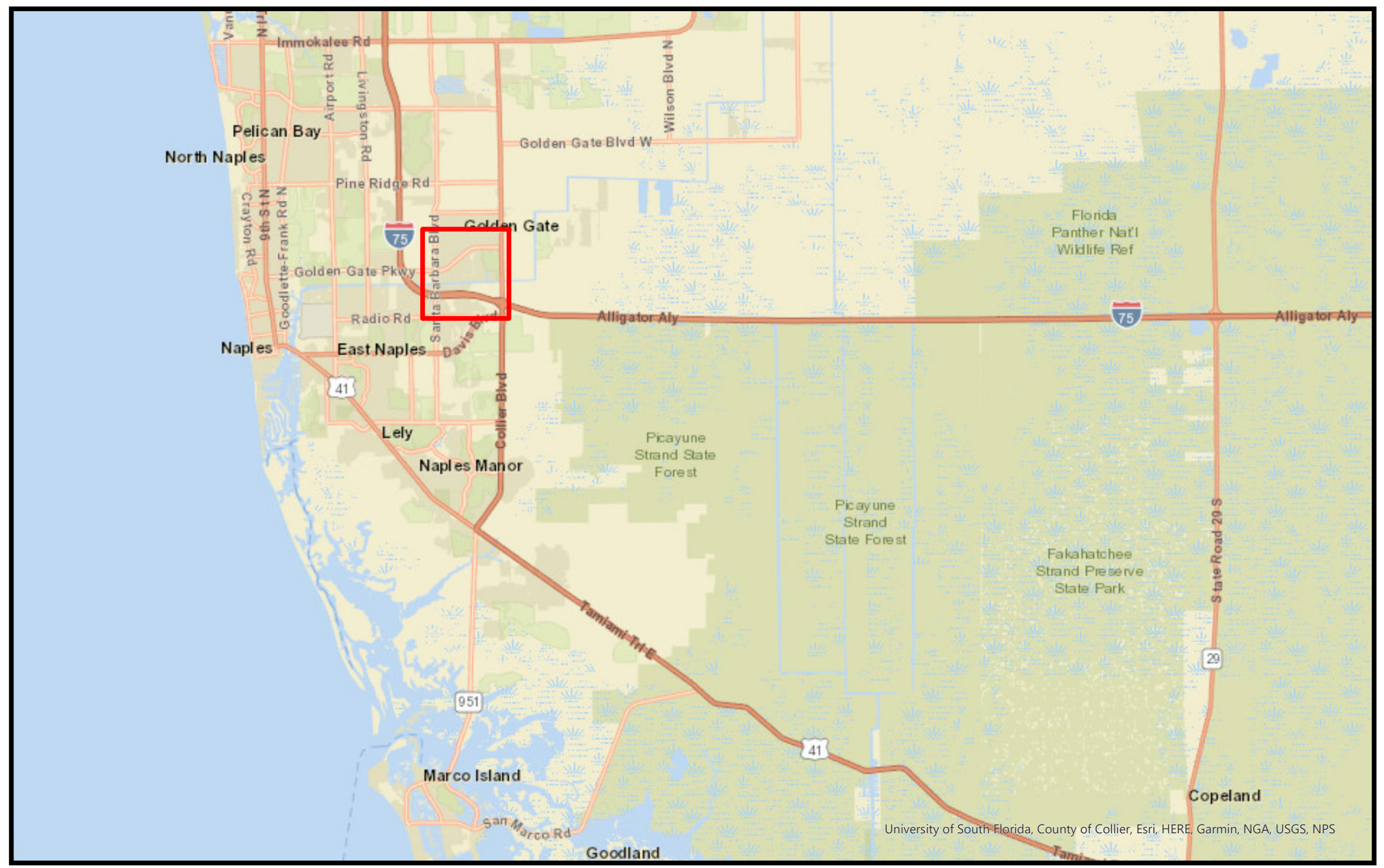
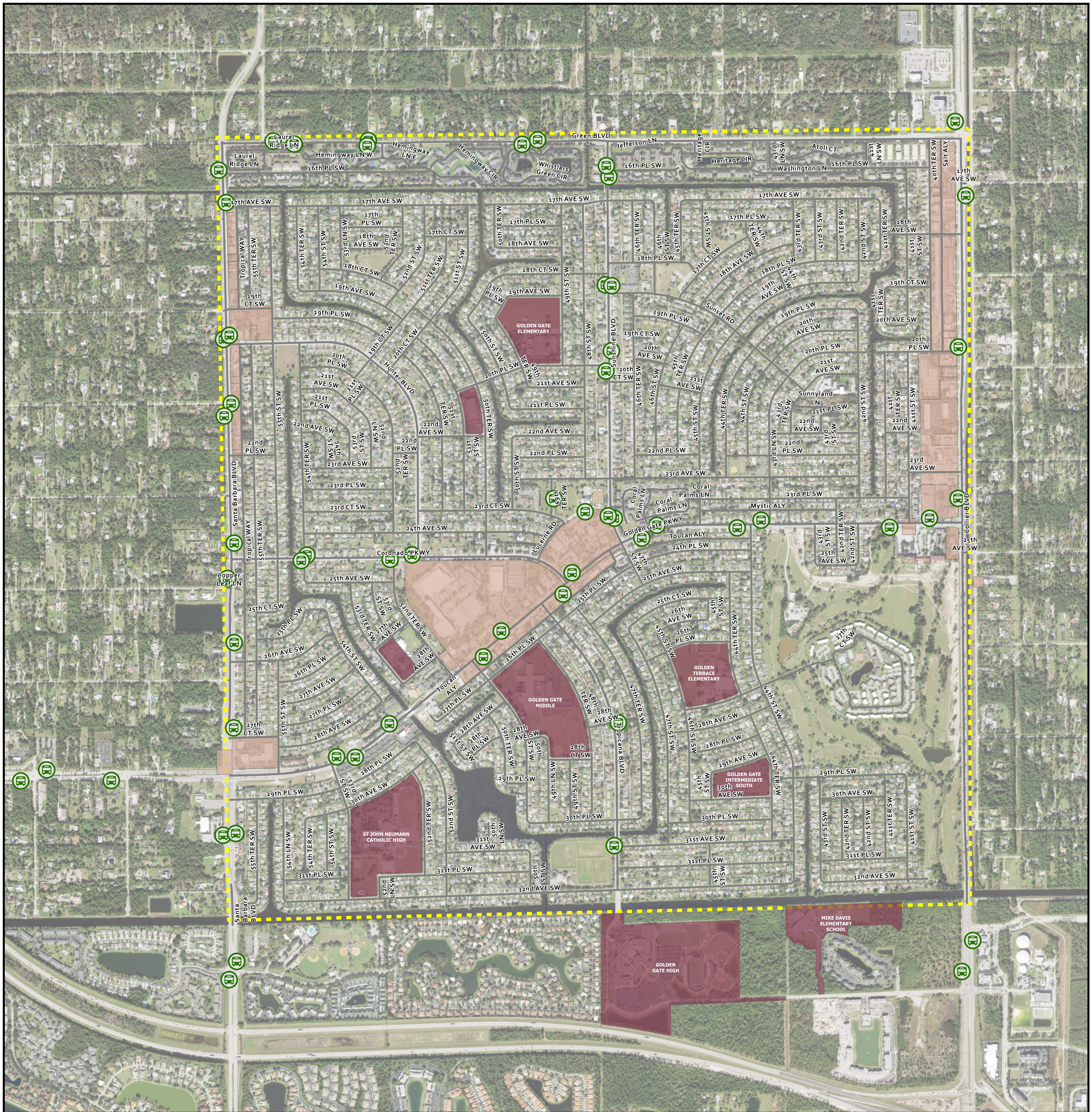
ID	Street	Route Ahead	Routes	Type	Bench	Bikerack	Trash Can	Lighting	Shelter	Recommended Improvement	Improvement Status
664	COLLIER BLVD	GREEN BLVD	19, 22, 27	Bus Shelter	1	1	1	Shelter Solar	1		ADA Improvements completed on 08/21/21
657	49TH TER SW	SUNSHINE BLVD	20, 25, 27 as needed	Bus Stop	0	0	0		0		
564	LUCERNE RD	23RD CT SW	20, 25, 27	Bus Stop	0	0	0	Street	0	Shelter	
543	CORONADO PKWY	HUNTER BLVD	20	Bus Stop	0	0	0	None	0	Sign and Post	
542	CORONADO PKWY	52ND TER SW	20, 15, 16	Bus Stop	0	0	0	None	0	Sign and Post	
541	CORONADO PKWY	54TH TER SW	20	Bus Stop	0	0	0	None	0	Sign and Post	
540	CORONADO PKWY	54TH TER SW	20	Bus Stop	0	0	0	None	0	Sign and Post	
315	GOLDEN GATE PKWY	42ND ST SW	25, 27	Bus Shelter	1	1	1	shelter solar	1		ADA Improvements completed on 09/06/22
314	GOLDEN GATE PKWY	44TH ST SW	25, 27	Bus Stop	0	0	0	None	0	ADA Pad	
313	GOLDEN GATE PKWY	SUNSHINE BLVD	25, 27	Bus Stop	0	0	0	None	0	ADA Pad	
310	GOLDEN GATE PKWY	CORAL PALMS LN	25, 27	Bus Stop	0	0	0	None	0		ADA Improvements completed on 9/06/22
309	GOLDEN GATE PKWY	43RD LN SW	25, 27	Bus Stop	0	0	0	None	0	ADA Pad	
308	GOLDEN GATE PKWY	41ST ST SW	25, 27	Bus Stop	0	0	0	Street	0	Bench	Funded
296	COLLIER BLVD	GOLDEN GATE PKWY	19, 22, 27	Bus Shelter	1	1	1	Shelter solar	1		
295	COLLIER BLVD	20TH PL SW	19, 22, 27	Bus Stop	0	0	0	Street	0		
276	COLLIER BLVD	17TH AVE SW	19, 22, 27	Bus Stop	0	0	0	None	0	Shelter	Funded
218	SANTA BARBARA BLVD	COPPER LEAF LN	16, 20, 25	Bus Stop	0	0	0	None	0	ADA Pad	
217	SANTA BARBARA BLVD	SEA GRASS LN	16, 20	Bus Stop	0	0	0	None	0	Sign and Post	
216	SANTA BARBARA BLVD	HUNTER BLVD	16, 20	Bus Stop	0	0	0	None	0	ADA Pad	
215	SANTA BARBARA BLVD	16TH PL SW	16, 20	Bus Stop	0	0	0	None	0	ADA Pad	
214	GREEN BLVD	LOGAN CT	16	Bus Stop	0	0	0	None	0	ADA Pad	
213	GREEN BLVD	HEMINGWAY LN	16	Bus Stop	0	0	0	None	0	Sign and Post	
212	GREEN BLVD	WHISTLERS GREEN CIR	16	Bus Stop	0	0	0	None	0	Sign and Post	
211	SUNSHINE BLVD	16TH PL SW	16	Bus Shelter	1	1	1	Shelter	1		Shelter installed on 6/11/18
210	SUNSHINE BLVD	SUNSET RD	16	Bus Stop	0	0	0	None	0	Bench	
209	SUNSHINE BLVD	20TH PL SW	16	Bus Stop	0	0	0	None	0	ADA Pad	
208	SUNSHINE BLVD	GOLDEN GATE PKWY	16	Bus Stop	0	0	0	None	0	Shelter	
207	GOLDEN GATE PKWY	CORONADO PKWY	16, 25	Bus Stop	0	0	0	None	0	Bench	
206	GOLDEN GATE PKWY	50TH ST SW	16, 25	Bus Shelter	1	1	1	None	1		
205	GOLDEN GATE PKWY	53RD ST SW	16, 25	Bus Stop	0	0	0	Street	0	Sign and Post	
202	SANTA BARBARA BLVD	GOLDEN GATE PKWY	15, 16, 20	Bus Stop	0	0	0	None	0	Sign and Post	
201	SANTA BARBARA BLVD	GOLDEN GATE PKWY	15, 20	Bus Stop	0	0	0	None	0	Sign and Post	
200	SANTA BARBARA BLVD	26TH AVE SW	15, 20	Bus Stop	0	0	0	None	0	Sign and Post	
199	SANTA BARBARA BLVD	CORONADO PKWY	15, 20	Bus Stop	0	0	0	None	0	Bench	
198	SANTA BARBARA BLVD	SEA GRASS LN	15, 20	Bus Stop	0	0	0	None	0	Sign and Post	
197	SANTA BARBARA BLVD	HUNTER BLVD	15, 20	Bus Stop	1	0	0	None	0	Bench	
196	SANTA BARBARA BLVD	17TH AVE SW	15, 20	Bus Stop	0	0	0	None	0	Bench	

195	GREEN BLVD	SANTA BARBARA BLVD	15	Bus Stop	0	0	0	None	0	ADA Pad	
194	GREEN BLVD	HEMINGWAY LN	15	Bus Shelter	1	1	1	None	1		ADA Improvements completed on 3/17/22
193	GREEN BLVD	WHISTLERS GREEN CIR	15	Bus Shelter	1	1	1	CAT Pole	1		
192	SUNSHINE BLVD	17TH AVE SW	15	Bus Stop	0	0	0	None	0	Bench	Funded
191	SUNSHINE BLVD	18TH CT SW	15	Bus Stop	0	0	0	None	0	Bench	Funded
190	SUNSHINE BLVD	20TH PL SW	15	Bus Stop	0	0	0	None	0	ADA Pad	
189	SUNSHINE BLVD	GOLDEN GATE PKWY	15	Bus Shelter	1	1	1	CAT Pole	1		
188	GOLDEN GATE PKWY	CORONADO PKWY	15, 25, 27	Bus Stop	0	0	0	None	0	Bench	
187	GOLDEN GATE PKWY	50TH ST SW	15, 25	Bus Shelter	1	1	1	CAT Pole	1		
186	GOLDEN GATE PKWY	55TH ST SW	15, 25	Bus Shelter	1	1	1	Shelter Solar	1		ADA Improvements completed on 3/17/22
185	GOLDEN GATE PKWY	53RD ST SW	15, 25	Bus Stop	0	0	0	None	0		ADA Improvements completed on 3/17/22
184	SANTA BARBARA BLVD	GOLDEN GATE PKWY	15, 16, 20	Bus Stop	0	0	0	None	0	Bench	






EXHIBIT D

GOLDEN GATE BEAUTIFICATION MASTER PLAN RECOMMENDED PROJECTS

Project Name	Description	Location	Timeline	Cost	Funding Source	References
Coronado Parkway	Median landscaping, irrigation, roadway lighting, sidewalks, bike paths, and pedestrian amenities.	Coronado Parkway (Golden Gate Parkway to Santa Barbara Blvd.)	Ongoing/As funding available	TBD	Golden Gate M.S.T.U.	Pages 3-5 to 3-6 (Figure 2)
Collier Blvd. (C.R. 951), South - Part A	Median landscaping and irrigation improvements; curbed medians with vertical curbing; intersection improvements.	Golden Gate Canal to Golden Gate Parkway	Completed (maintenance ongoing)	TBD	Golden Gate M.S.T.U. & Collier County	Pages 3-7 to 3-9, (Figure 3)
Collier Blvd. (C.R. 951), South - Part B	Median landscaping, irrigation, continuous street lighting, sidewalks.	Golden Gate Parkway to Green Blvd.	Completed (maintenance ongoing)	TBD	Golden Gate M.S.T.U. & Collier County	Pages 3-7 to 3-10, (Figure 4)
Golden Gate Parkway, East	Median landscaping, irrigation, roadway lighting, sidewalks, bike paths, and additional roadway enhancements.	Golden Gate Parkway, from C.R. 951 to Santa Barbara Blvd., North	Completed (maintenance ongoing)	TBD	Golden Gate M.S.T.U. & Collier County	Pages 3-11 to 3-12, (Figure 5)
Green Boulevard	Median landscaping, irrigation, sidewalks, bike paths, and signage improvements.	Collier Blvd. (C.R. 951) to Logan Blvd. & Santa Barbara Blvd. intersection	Future project (as funding available)	TBD	Golden Gate M.S.T.U.	Pages 3-13 to 3-15, (Figures 6 & 7)
Hunter Boulevard	Median landscaping, irrigation, sidewalks, bike lanes, and general beautification.	Coronado Parkway to Santa Barbara Blvd., North	Future project (as funding available)	TBD	Golden Gate M.S.T.U.	Pages 3-16 to 3-17, (Figure 8)
Santa Barbara Boulevard, North	Median landscaping, irrigation, curbing, sidewalks, and bike lanes; awaiting final roadway improvements.	Golden Gate Canal to Green Blvd.	Pending roadway improvements	TBD		Pages 3-18 to 3-19, (Figure 9)
Sunshine Boulevard	Median landscaping, irrigation, pedestrian and roadway lighting, sidewalks, and traffic calming at pedestrian crossings.	Golden Gate Parkway to Green Blvd.	Completed (2007)	TBD	Golden Gate M.S.T.U.	Pages 3-20 to 3-21, (Figure 10)
Tropicana Boulevard	Median landscaping, irrigation, lighting improvements, sidewalks, and designated bike lanes.	Golden Gate Parkway, East to 32nd Ave. SW.	Completed 2002	TBD	Golden Gate M.S.T.U.	Pages 3-22 to 3-23, (Figure 11)



LEGEND

-  GGC CAT Bus Stop Locations
-  Roads Centerline
-  School Parcels
-  Commercial Zones
-  Project Boundary

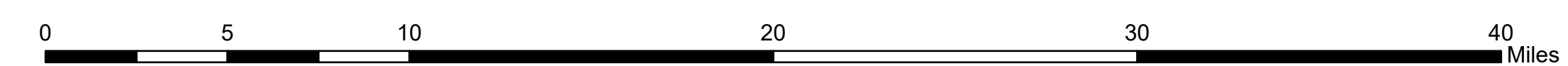
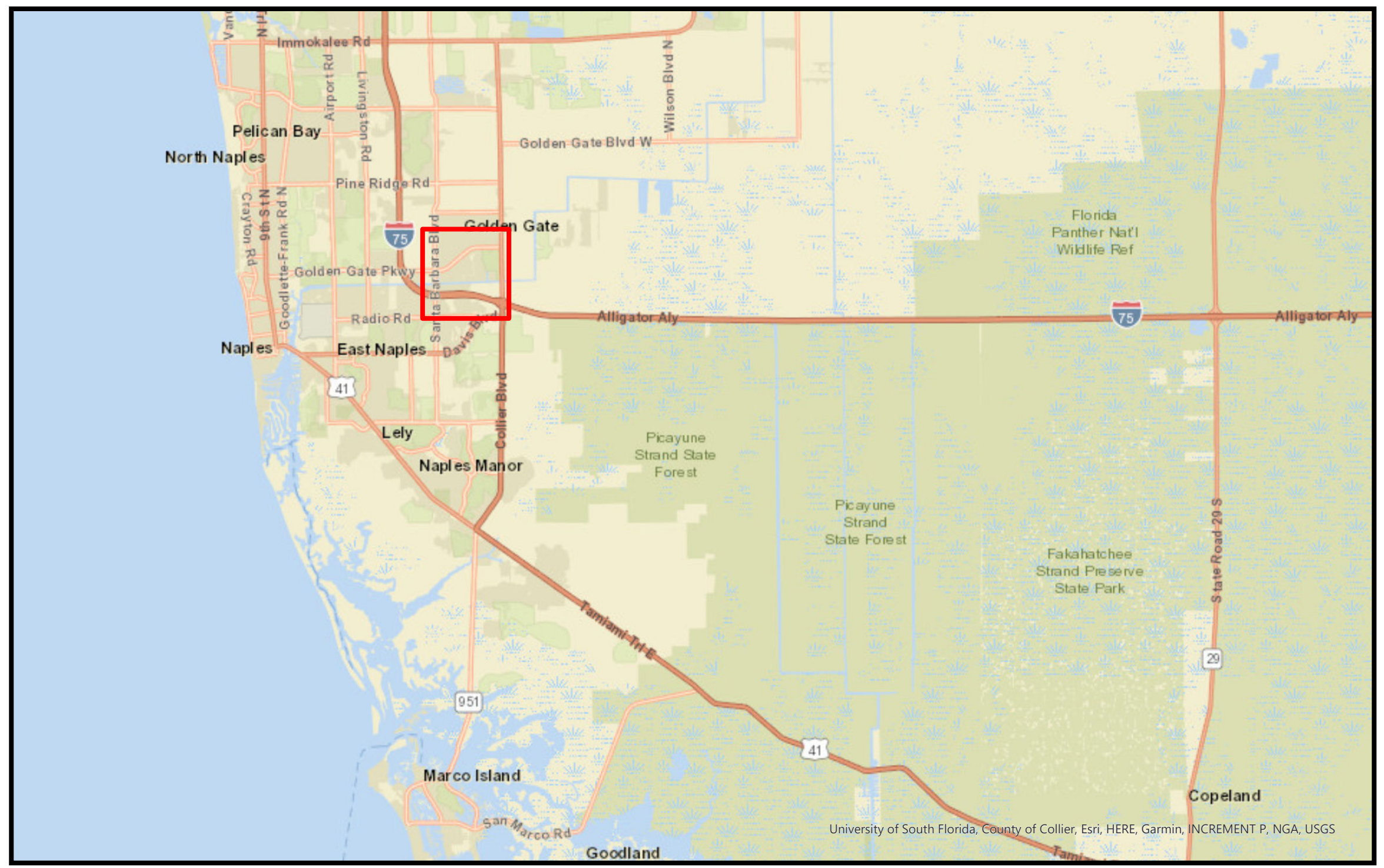
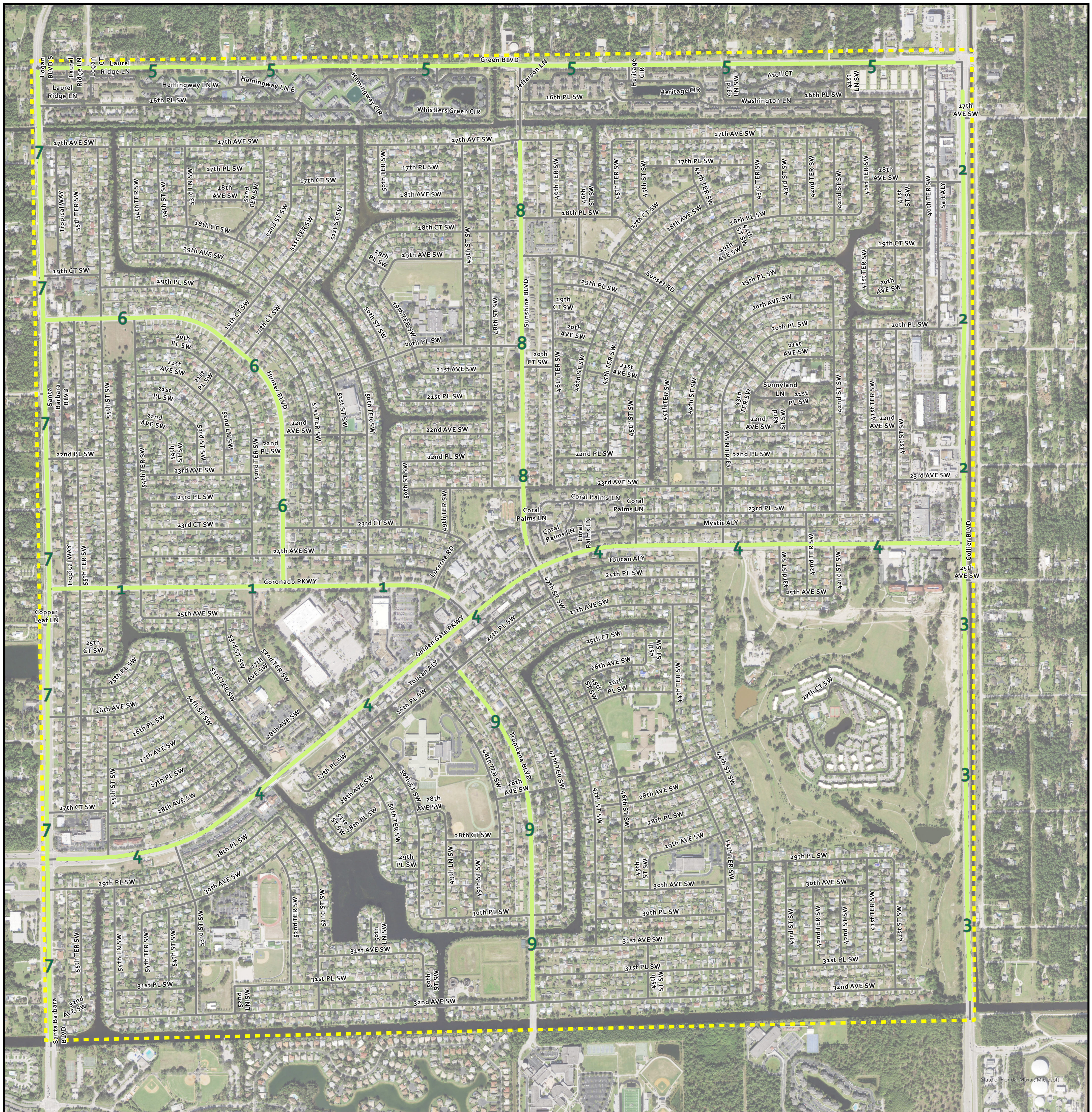


EXHIBIT E

Bus Stop Locations
 Golden Gate City Masterplan
 Collier County, Florida





LEGEND

- GGC Landscaped Medians
- Roads Centerline
- Project Boundary

Id	Facility Name	From	To	Description	Length (mi)
1	Coronado Pkwy	Santa Barbara Blvd	Golden Gate Pkwy	Landscaped Roadway Median	0.86
2	Collier Blvd	Green Blvd	Golden Gate Blvd	Landscaped Roadway Median	0.98
3	Collier Blvd	Golden Gate Blvd	Golden Gate Canal	Landscaped Roadway Median	0.99
4	Golden Gate Pkwy	Santa Barbara Blvd	Collier Blvd	Landscaped Roadway Median	2.16
5	Green Blvd	Santa Barbara Blvd	Collier Blvd	Landscaped Roadway Median	1.97
6	Hunter Blvd	Santa Barbara Blvd	Coronado Pkwy	Landscaped Roadway Median	0.97
7	Santa Barbara Blvd	Golden Gate Canal	Green Blvd	Landscaped Roadway Median	2.1
8	Sunshine Blvd	Golden Gate Pkwy	17th Ave SW	Landscaped Roadway Median	0.87
9	Tropicana Blvd	25th PL SW	32nd Ave SW	Landscaped Roadway Median	0.75

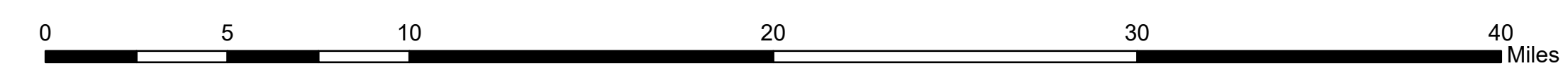


EXHIBIT F

Landscaped Roadway Medians
Golden Gate City Masterplan
Collier County, Florida





Appendix E
Pavement Evaluations Technical Memorandum

Golden Gate City Water Resource Protection - Restoration Master Plan

Pavement Evaluations Technical Memorandum

February 2025



1. Background and Purpose

The purpose of the Golden Gate City Water Resource Protection/Restoration Master Plan (hereinafter, the "Master Plan") is to develop an integrated master plan for the unincorporated area of Golden Gate City for Collier County's existing infrastructure repair needs for wastewater, potable water, stormwater, roadways, sidewalks, bike paths, irrigation, lighting, and fiber. The Master Plan will provide a database and list of prioritized projects needed.

Golden Gate City is located in Collier County, Florida, and is bordered by Collier Boulevard to the east, Santa Barbara Boulevard to the west, Green Boulevard to the north, and the Golden Gate Canal to the south. The area encompasses 4 square miles and includes approximately 78 miles of roadway, most of which are local residential roads.

As part of the Master Plan, the roadway's pavement conditions were evaluated to determine roadway improvement needs, with the exception of private roadways. Roadways were determined to be public or private using the GIS maps on the Collier County Property Appraiser's web site (Collier County n.d.). Right-of-ways within the area are generally 60 feet wide, with some of the larger roadways having up to 120 feet. Additionally, the Golden Gate Area also has some County-owned alleyways located at rear lot lines, which were also included in this evaluation.

1.1 Pavement Evaluation Criteria and Methodology

The asphalt pavement conditions were evaluated using numerical grading criteria based on the following 11 types of pavement distress:

- 1) Transverse Cracking
- 2) Longitudinal Cracking
- 3) Alligator Cracking
- 4) Utility Cuts/Mechanical Cut (Patching)
- 5) Depressions/Bumps/Rutting
- 6) Corrugation (Ripples)
- 7) Raveling, Edge of Pavement Damage
- 8) Shoving or Pushing
- 9) Potholes
- 10) Asphalt Bleeding
- 11) Polished Aggregate

Each distress type was scored based on its level of severity between 0 and 10 for distresses 1 through 9. For distress types 10 and 11, a rating between 0 and 5 was used. A rating of 0 indicates the distress was not observed, with higher numbers indicating more severe or extreme the defect. The overall pavement condition score was calculated taking the sum of all the distress subtracted from 100. Therefore, the lower the ranking score, the worse the pavement condition.

Asphalt Pavement Rating Form			Surveyed on:	86
Site ID	CG-4503			
Street	40TH ST NE			
Segment	64TH AVE NE TO 66TH AVE NE			
Length (ft)	1316.84			
Pavement Type				
Milling Required	No			
DISTRESS				
(Note: A rating of "0" indicates distress does not occur)				
1. Transverse Cracks	0-10	1		
2. Longitudinal Cracks	0-10	2		
3. Alligator Cracks	0-10	1		
4. Utility/Mechanical Cut(Patching)	0-10	1		
5. Depressions/Bump/Rutting	0-10	2		
6. Corrugations(Ripple)	0-10	2		
7. Raveling, Edge of pavement damage	0-10	1		
8. Shoving or Pushing	0-10	1		
9. Pot Holes	0-10	1		
10. Asphalt Bleeding	0-5	1		
11. Polished Aggregate	0-5	1		
Sum of Defects =		14		
Condition Rating = 100- Sum of Defects				
Overall Condition Rating		86		
Condition of Striping	0-5	0		
Condition of Curb	0-5	4		
Inspected By:				

Figure 1. Asphalt Rating Criteria

In addition to grading the quality of the asphalt, the quality of roadway striping and curb conditions for each segment were evaluated, when applicable. However, striping and curb condition were not incorporated into the final rating. Figure 1 shows an example of the pavement rating form used in each of the evaluations. A separate form was completed for each roadway segment to assign each an individual

rating. The pavement evaluation ratings were performed through the ArcGIS Collector application so that scores and accompanying geotagged photos could be collected and tagged with their corresponding locations on a map.

1.2 Distress Ratings

A description of each pavement distress evaluated is included in this section.

Transverse Cracking

Transverse cracking is a fracture in the roadway that occurs perpendicular to the roadway (across the road). Transverse cracking is graded on the severity and quantity of fractures. A high-severity crack includes numerous cracks and cracks greater than ½-inch wide. Figure 2 provides an example of transverse cracking. This distress affected 42 of the 304 total roadway segments.

Longitudinal Cracking

Longitudinal cracking is a fracture in the roadway running down the length of the roadway along the driving path. This type of defect was the most common in the study area, affecting 168 of the total 304 roadway segments evaluated. Figure 3 provides an example of longitudinal cracking.



Figure 3. Longitudinal Cracking

Photo location: Intersection of 17th Ct SW and 44th Terrace SW

Alligator Cracking

Alligator cracking consists of small scale-like patches that resemble the back of an alligator, as shown on Figure 4. Alligator cracking generally begins as longitudinal cracking that over time becomes interconnected to create a scale-like pattern. Alligator cracking is graded on the amount and severity of the cracking along the road. This distress is generally located along the wheel path of vehicles. A total of 33 of the total 304 roadway segments displayed alligator cracking.



Figure 2. Transverse Cracking

Photo location: Intersection of 18th Pl SW and 41st Terrace SW

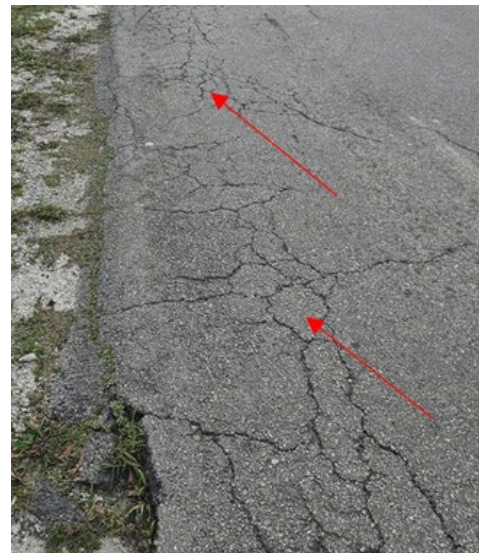


Figure 4. Alligator Cracking

Photo location: 23rd Ave SW from 46th Terrace SW to 45th St SW

Utility Cuts and Patching

Utility cuts are created when subsurface utility work is required, and a section of asphalt and subbase is removed to perform the work beneath the roadway. Patches are created when filling depressions or potholes. Though from different causes, both utility cuts and patching generally lead to some unevenness, which can create bumps in the road. The quantity and severity of these defects contribute to the grade that the road segment receives. This type of defect was the third most common in the study area, affecting 87 of the total 304 roadway segments. Figure 5 shows an example of a utility patch.

Depression, Bumps, and Rutting

Depression, bumps, and rutting are deformities in the road that lower the roadway surface in a localized area. Rutting includes longitudinal depressions developed in the wheel paths from vehicles. These conditions are primarily graded on the 'ride quality' of a road segment, as some depressions, bumps, and rutting can be difficult to see but can be felt while driving the roadway segment. This category of distress was the second most common in the study area, affecting 166 of the total 304 roadway segments. Figures 6 and 7 show examples of bumps and depression, respectively, in a roadway.



Figure 5. Utility Patch

Photo location: Intersection of 25th Ave SW and 44th Terrace SW



Figure 6. Bumps in Roadway

Photo location: 28th Ave SW between 46th St SW and 44th Terrace SW



Figure 7. Depression

Photo location: Intersection of 41st St SW and 22nd Ave SW

Corrugation (Ripples)

Corrugations are fluctuations in the asphalt surface causing undulations perpendicular to the direction of travel. This causes a rolling or 'rippling' effect to the surface. This was not a prevalent type of distress observed.

Edge of Pavement Damage and Raveling

Edge of pavement damage includes damage to the asphalt beginning at the edge of the pavement and working its way inward. Raveling is when the aggregate particles separate over time and wear away from the surface or from the edge of pavement inwards. The rating is based on the severity of the damage and the amount of loose aggregate on the surface. This type of distress was the fourth most common observed, affecting 63 out of 304 roadway segments. Figure 8 shows an example of raveling.



Figure 8. Raveling

Photo location: 21st Ave SW between Sunset Rd and 42nd St SW



Figure 9. Pothole

Photo location: Intersection of 46th St SW and 26th Ave SW

Shoving or Pushing

Shoving or pushing is categorized as an irregular bulging in the asphalt. This distress is noticed by ripples or waves where there is lateral displacement in the asphalt surface. This was not a prevalent type of distress observed.

Potholes

Potholes are holes in the pavement caused by severe distress. Potholes vary in size and are graded based on the impact to the ride quality. However, an emphasis is also placed on the risk of potholes to cars. Potholes were the fifth most observed distress type, affecting 47 of 304 roadway segments. Figure 9 provides an example of a pothole within the study area.

Asphalt Bleeding

Asphalt bleeding is classified as a shiny liquid or oily appearance on the asphalt surface. Asphalt bleeding was not a prevalent type of distress observed.

Polished Aggregate

Polished aggregate occurs when the asphalt surface becomes smooth. The aggregate on the surface crushes from vehicular traffic and creates a smooth surface. This was not a prevalent type of distress observed.

2. Pavement Evaluation Results and Recommendations

The asphalt pavement rating for each roadway segment was scored by summing the severity of distresses observed and subtracting from 100. Attachment A summarizes the roadway segments individual and overall distress ratings, and Figure 10 shows a GIS map with the overall rankings. Of the 304 roadway segments evaluated, 270 segments scored an overall rating of 80 or higher, with the lowest rating in the area at 68.

Overall, the pavement conditions within the study area were in good to fair condition. The most common distresses observed included longitudinal cracking, depression/bumps, and utility patches. The least common distresses observed were polished aggregate, asphalt bleeding, shoving or pushing, and corrugations.

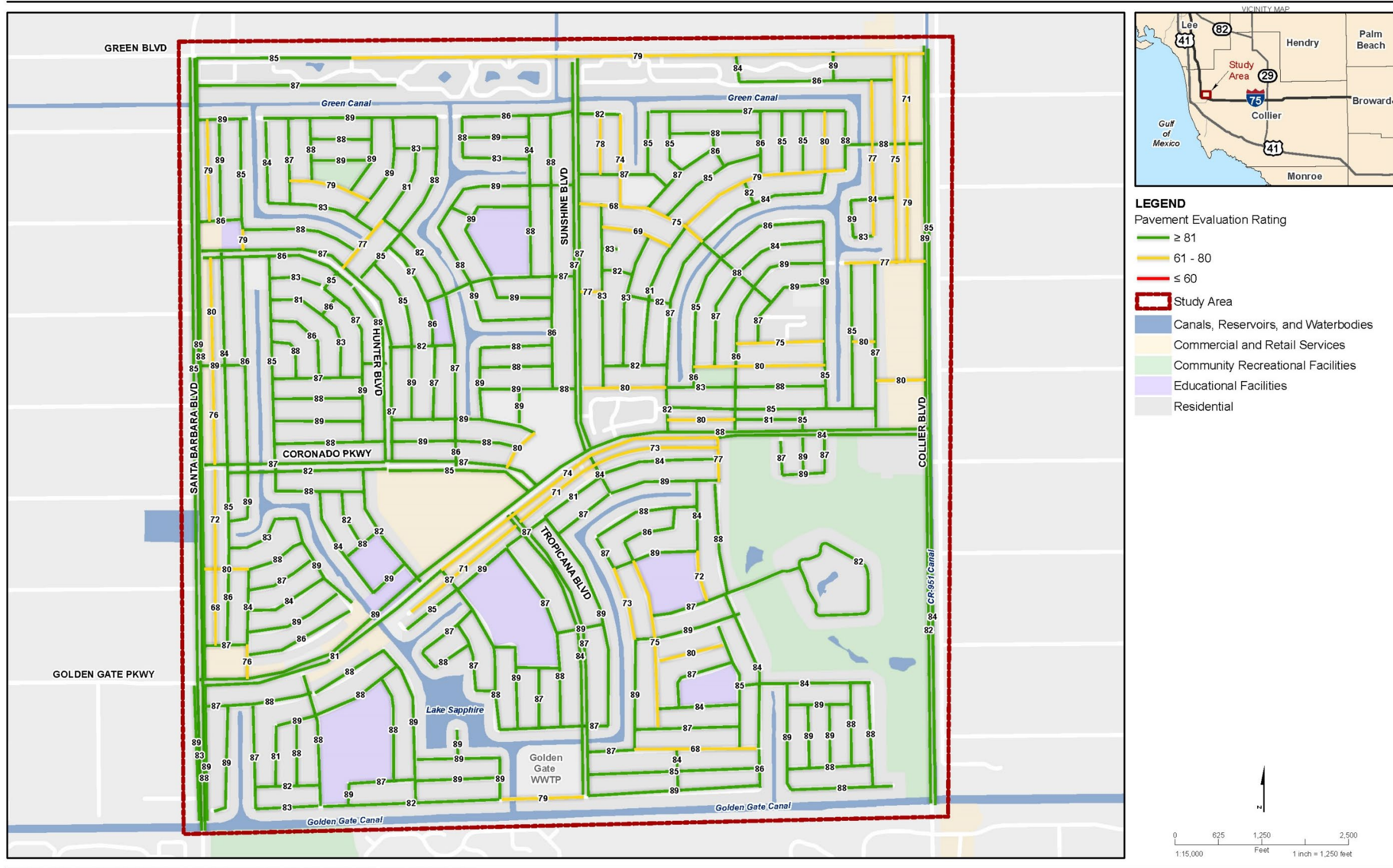
The sections of roadway that ranked the lowest included:

- 28th Avenue from 47th Street to 44th Street (Score 68) – cracking, utility patches, and depressions/bumps were observed.
- 17th Court from Sunset Road to 44th Terrace (Score 68) –longitudinal cracking, utility patches, and potholes were observed.
- Tropical Way from 27th Ct SW to 26th Ave SW (Score 68) –cracking, potholes, and edge of pavement damage were observed.
- 45th Street from Sunset Road to 23rd Avenue (Score 69) –alligator cracking and depressions/bumps were observed.
- Toucan Alley from 47th Street SW to End (Score 71) –cracking, depressions/bumps, raveling, and potholes were observed.
- Salt Alley from Green Blvd to 18th Ave SW (Score 71) –cracking, depressions/bumps, and flooding were observed.

Additionally, as part of the pavement evaluations, the conditions of curb and striping along each roadway was rated but not included in the final score. Overall, all roadway segments with curb were in good condition. The following segments were observed to have striping in poor condition:

- 20th Place SW from 50th Street SW to 48th Street SW
- 27th Avenue SW from 53rd Terrace SW to 52nd Terrace SW
- 55th Street SW from 26th Ave SW to 27th Court SW
- 16th Place SW from 43rd Lane SW to 40th Terrace SW
- 41st Terrace SW from 17th Avenue SW to 18th Place SW
- 46th Street SW from 17th Avenue SW to 18th Place SW
- 23rd Avenue SW from 41st Street SW to Collier Boulevard

Figure 10. Pavement Evaluations Results



Jacobs recommends that Collier County Road Maintenance perform repairs to the following road segments with potholes:

- Toucan Alley from 44th Street SW to End
- 18th Place SW from Sunshine Boulevard to 17th Court SW
- 46th Street SW from 26th Avenue SW to 26th Place SW
- 20th Court SW from Sunshine Boulevard to 26th Terrace SW
- 23rd Avenue SW from Sunshine Boulevard to 45th Street SW
- Green Boulevard from Hemingway Lane to Sunshine Boulevard

Because there are no significant distresses with the roadway segments, the repairs and resurfacing will be addressed with the Collier County Road Maintenance regular schedule for repairs.


When the Master Plan phasing areas go into design, the roadway's pavement condition ratings should be reevaluated and updated to determine roadway improvements needed. Additionally, if the proposed improvements with the Master Plan will result in numerous utility cuts along the roadway, the entire roadway segment should be evaluated for resurfacing. Restriping the roadway segments should also be evaluated during design. Costs for resurfacing utility cuts will be included in the construction estimates for pipe installation.

3. References

Collier County. n.d. "GIS Maps." Collier County Property Appraiser. Accessed July 29, 2024. <https://www.collierappraiser.com/index.html>

Minnesota Asphalt Pavement Association. 2012. *A Pavement Rating System for Asphalt Pavement*. June 5.

Pavement Tools Consortium. n.d. Pavement Interactive. n.d. "Pavement Distresses." Pavement Interactive. Accessed July 19, 2024. <https://pavementinteractive.org/reference-desk/pavement-management/pavement-distresses/>



Attachment A
Pavement Evaluation Results

Pavement Evaluation Results

Segment Name	Transverse Cracking	Longitudinal Cracking	Alligator Cracking	Utility/Mechanical Cut (Patching)	Depressions, Bumps, or Rutting	Raveling, Edge of Pavement Damage	Potholes	Polished Aggregate	Shoving or Pushing	Asphalt Bleeding	Corrugations (Ripple)	Sum of Defects	Condition of Stripping	Condition of Curb	Overall Rating
28th Ave SW from 47th St SW to 44th St SW	3	3	3	5	6	2	3	2	3	1	1	32	1	1	88
17th Ct SW From Sunset Rd to 44th Terrace SW	4	7	3	5	3	1	4	1	1	1	1	32	1	1	88
Tropical Way from 27th Ct SW to 26th Ave SW	5	5	5	1	6	4	1	2	1	1	1	32	1	1	88
45th St SW from Sunset Rd to 23rd Ave SW	3	4	7	3	6	3	1	1	1	1	1	31	1	1	89
Toucan Aly from 47th St SW to Tropicana Blvd	2	3	2	1	3	4	6	1	1	1	1	29	1	1	71
Toucan Aly from Tropicana Blvd to 50th St SW	2	3	6	1	3	4	6	1	1	1	1	29	1	1	71
Toucan Aly from 50th St SW to End	2	3	6	1	3	4	6	1	1	1	1	29	1	1	71
Salt Alley from Green Blvd to 18th Ave SW	5	7	3	1	5	3	1	1	1	1	1	29	1	1	71
46th St SW from 26th Ave SW to 26th Pl SW	3	4	5	1	3	3	5	1	1	1	1	28	1	1	72
Tropical Way from 26th Ave SW to Coronado Pkwy	3	4	4	3	5	3	2	1	1	1	1	28	1	1	72
46th St SW from 26th Pl SW to 30th Pl SW	3	4	2	5	5	3	1	1	1	1	1	27	1	1	73
Toucan Aly from 44th St SW to 47th St SW	2	3	6	1	4	6	1	1	1	1	1	27	1	1	73
20th Ct SW from Sunshine Blvd to 46th Terrace SW	3	3	1	3	5	1	5	2	1	1	1	26	3	1	74
18th Ave SW from 41st Terrace SW to Collier Blvd	1	4	4	5	6	1	1	1	1	1	1	26	1	1	74
27th Ct SW from 46th St SW to 44th St SW	1	6	1	5	5	1	2	1	1	1	1	25	2	1	75
41st St SW from 20th Pl SW to Golden Gate Pkwy	1	4	1	5	4	3	3	1	1	1	1	25	2	1	75
18th Pl SW from Sunshine Blvd to 17th Ct SW	1	1	4	4	4	1	6	1	1	1	1	25	1	1	75
21st Ave SW from Sunset Rd to 42nd St SW	3	5	1	3	5	3	1	1	1	1	1	25	3	1	75
55th St SW from Golden Gate Pkwy to 27th Ct SW	3	5	5	3	1	2	1	1	1	1	1	24	4	1	76
Tropical Way from Coronado Pkwy to 22nd Pl SW	1	3	5	1	3	2	2	1	3	2	1	24	1	1	76
19th Ct SW from Hunter Blvd to 50th Terrace SW	1	5	2	1	3	2	4	1	1	1	1	23	1	1	77
47th St SW from Golden Gate Pkwy to 25th Ave SW	2	2	1	5	4	1	4	1	1	1	1	23	1	1	77
40th Terrace SW from Green Blvd to 20th Pl SW	1	2	1	5	4	3	3	1	1	1	1	23	4	1	77
23rd Ave SW from Sunshine Blvd to 45th St SW	2	3	4	1	3	1	5	1	1	1	1	23	2	1	77
41st Terrace SW from 20th Pl SW to 23rd Pl SW	2	4	1	5	4	2	1	1	4	1	1	23	3	1	77
46th St SW from 17th Ave SW to Sunset Rd	4	4	1	6	1	1	1	1	1	1	1	22	5	1	78
18th Ct SW from 54th St SW to 52nd St SW	1	4	1	2	4	4	1	1	1	1	1	21	1	1	79
32nd Ave SW from 50th St SW to Tropicana Blvd	1	3	1	3	3	3	3	1	1	1	1	21	1	1	79
41st Terrace SW from 17th Ave SW to 18th Pl SW	3	5	1	3	1	1	3	1	1	1	1	21	5	1	79
55th St SW from Hunter Blvd to 19th Pl SW	3	3	3	3	1	1	1	1	1	1	3	21	1	1	79
Tropical Way from 19th Ct SW to 17th Ave SW	1	3	1	3	5	3	1	1	1	1	1	21	1	1	79
Green Blvd from Hemingway Ln to Sunshine Blvd	1	5	1	1	1	3	5	1	1	1	1	21	1	1	79
Green Blvd from Sunshine Blvd to Collier Blvd	1	5	1	1	1	3	1	1	1	1	1	21	1	1	79
Salt Alley from 18th Ave SW to 20th Pl SW	3	3	3	1	3	3	1	1	1	1	1	21	1	1	79
Lucerne Rd from 23rd Ct SW to Coronado Pkwy	1	3	1	3	4	3	1	1	1	1	1	21	1	1	80
26th Ave SW from Santa Barbara Blvd to 55th St SW	4	1	1	1	5	1	3	1	1	1	1	20	3	1	80
30th Ave SW from 46th St SW to 44th Terrace SW	1	2	1	5	1	1	4	1	1	1	1	20	3	1	80
42nd Terrace SW from 17th Ave SW to 18th Pl SW	1	5	1	1	4	2	2	1	1	1	1	20	4	1	80
22nd Pl SW from 46th Terrace SW to 45th St SW	1	2	1	3	1	3	1	1	1	1	1	20	1	1	80
44th St SW from Sunset Rd to 22nd Pl SW	2	4	1	1	5	1	4	1	2	1	1	20	1	1	80
23rd Ave SW from 43rd Ln SW to 42nd St SW	2	5	1	2	1	1	1	1	1	1	1	20	3	1	80
22nd Ave SW from 41st Terrace SW to 41st St SW	1	4	1	3	3	1	1	1	1	1	1	20	4	1	80
Tropical Way from 22nd Pl SW to Hunter Blvd	1	3	3	1	5	1	1	1	1	2	1	20	1	1	80
Mystic Aly from 43rd Ln SW to 45th St SW	2	2	5	1	1	1	3	1	1	2	1	20	1	1	80
51st Terrace SW from 17th Ct SW to 50th Terrace SW	1	3	1	2	3	2	3	1	1	1	1	19	1	1	81
21st Ave SW from 54th Terrace SW to 21st Pl SW	1	3	1	3	5	1	1	1	1	1	1	19	1	1	81
54th Terrace SW from 31st Pl SW to 30th Ave SW	2	2	1	3	1	2	4	1	1	1	1	19	1	1	81
47th Terrace SW from 25th Pl SW to 30th Pl SW	3	2	1	3	4	1	1	1	1	1	1	19	3	1	81
19th Ave SW from Sunset Rd to 18th Pl SW	1	2	1	4	3	1	3	1	1	1	1	19	3	1	81
23rd Ave SW from 45th St SW to 43rd Ln SW	2	3	1	3	4	1	1	1	1	1	1	19	3	1	81
Mystic Aly from 42nd Terrace SW to 43rd Ln SW	2	2	5	1	1	2	1	1	1	2	1	19	1	1	81
50th Terrace SW from 51st Terrace SW to 20st Pl SW	1	2	1	2	3	2	2	1	1	1	1	18	1	1	82
22nd Ave SW from Hunter Blvd to 50th Terrace SW	1	3	1	1	4	1	3	1	1	1	1	18	4	1	82
52nd Terrace SW From Coronado Pkwy to Golden Gate Pkwy	1	1	1	3	5	1	1	1	1	1	1	18	3	1	82
53rd St SW from 25th Ave SW to 27th Ave SW	3	1	1	1	4	3	1	1	1	1	1	18	1	1	82
Coronado Pkwy Eastbound from 55th Terrace SW to Hunter Blvd	1	4	1	1	3	1	1	1	1	1	1	18	1	1	82
31st Pl SW from 54th Ln SW to 53rd St SW	1	4	1	1	3	1	3	1	1	1	1	18	1	1	82
32nd Ave SW from 52nd Ln SW to 50th St SW	1	1	1	5	4	1	1	1	1	1	1	18	1	1	82
46th St SW from 19th Pl SW to 22nd Pl SW	1	3	1	4	3	1	1	1	1	1	1	18	2	1	82
46th Terrace SW from 17th Ave SW to 18th Pl SW	1	2	6	1	1	1	1	1	1	1	1	18	1	1	82
27th Ct SW from 44th St SW to Golf Course	1	3	2	2	3	2	1	1	1	1	1	18	1	1	82
23rd Pl SW from 45th St SW to 41st St SW	2	3	1	1	4	2	1	1	1	1	1	18	4	1	82
27th Ct SW from 44th Ct to End	2	2	5	2	1	1	1	1	1	1	1	18	1	1	82
21st Ave SW from 46th St SW to 45th St SW	2	3	1	1	3	1	2	1	1	2	1	18	1	1	82
20th Ave SW from 46th Terrace SW to 46th St SW	2	3	3	1	3	1	1	1	1	1	1	18	1	1	82
44th St from 18th Pl SW to 19th Ave SW	1	3	3	1	4	1	1	1	1	1	1	18	1	1	82
19th Ave SW from 54th Terrace SW to 51st Terrace SW	1	2	1	1	1	3	2	1	2	1	1	17	1	1	83
17th Ct SW from 52nd St SW to 51st St SW	1	2	1	3	2	1	3	1	1	1	1	17	1	1	83
18th Ave SW from 50th Terrace SW to 49th St SW	1	2	1	1	1	2	1	2	1	1	1	17	3	1	83
20th Pl SW from 54th Terrace SW to 19th Ct SW	1	3	1	1	5	1	1	1	1	1	1	17	1	1	83
52nd Ln SW from 21st Pl SW to 23rd Ave SW	2	3	1	4	1	1	1	1	1	1	1	17	1	1	83
25th Pl SW from 55th Terrace SW to 54th St SW	1	3	1	1	4	1	2	1	1	1	1	17	1	1	83
32nd Ave SW from 54th Ln SW to 53rd St SW	1	1	1	5	3	1	1	1	1	1	1	17	1	1	83
41st St SW from 16th Pl SW to 20th Ave SW	1	4	1	1	2	1	1	1	1	1	1	17	1	1	83
19th Pl SW from 46th Terrace SW to 45th Terrace SW	2	4	1	1	3	1	1	1	1	1	1	17	3	1	83
46th Terrace SW from Sunset Rd to 23rd Ave SW	2	2	1	1	3	1	3	1	1	1	1	17	1	1	83
43rd Ln SW from 22nd Ave SW to Golden Gate Pkwy	1	2	1	3	4	1	1	1	1	1	1	17	2	1	83
49th Terrace SW from 23rd Ave SW to 23rd Ct SW	1	3	1	1	3	1	2	1	1	1	1	17	1	1	83
19th Ct SW from 46th Terrace SW to End	3	3	1	1	3	1	1	1	1	1	1	17	1	1	83
54th Terrace SW from 17th Ave SW to 19th Ave SW	1	2	2	1	3	2	1	1	1	1	1	16	1	1	84
49th St SW from 17th Ave SW to 18th Ct SW	1	3	1	1	3	1	2	1	1	1	1	16	1	1	84

Pavement Evaluation Results

Segment Name	Transverse Cracking	Longitudinal Cracking	Alligator Cracking	Utility/Mechanical Cut (Patching)	Depressions, Bumps, or Rutting	Raveling, Edge of Pavement Damage	Potholes	Polished Aggregate	Shoving or Pushing	Asphalt Bleeding	Corrugations (Ripple)	Sum of Defects	Condition of Striping	Condition of Curb	Overall Rating
55th Terrace SW from Hunter Blvd to Coronado Pkwy	1	3	1	2	3	1	1	1	1	1	1	16	1	1	84
53rd Terrace SW from 25th Ave SW to 28th Ave SW	1	1	1	4	3	1	1	1	1	1	1	16	2	1	84
55th St SW from 26th Ave SW to 27th Ct SW	1	3	1	1	4	1	1	1	1	1	1	16	5	1	84
27th Ave SW from 55th St SW to 54th St SW	1	4	1	1	2	2	1	1	1	1	1	16	3	1	84
28th Ave SW from 48th Terrace SW to 47th Terrace SW	1	1	2	1	3	1	1	1	1	1	1	16	1	1	84
25th Ave SW from 47th St SW to 44th St SW	1	1	1	3	1	1	4	1	1	1	1	16	1	1	84
24th Pl SW from 47th St SW to 44th St SW	1	3	1	2	3	1	1	1	1	1	1	16	2	1	84
31st Ave SW from 47th St SW to 44th St SW	1	2	1	3	3	1	1	1	1	1	1	16	1	1	84
31st Pl SW from Tropicana to 44th St SW	1	2	1	1	4	2	1	1	1	1	1	16	1	1	84
30th Pl SW from 47th St SW to 44th Terrace SW	1	2	1	1	5	1	1	1	1	1	1	16	1	1	84
Tropicana Northbound	1	1	1	2	3	3	1	1	1	1	1	16	2	1	84
Tropicana Southbound	1	2	1	3	3	1	1	1	1	1	1	16	2	1	84
41st Terrace SW from 19th Ct SW to 20th Ave SW	1	2	1	3	3	1	1	1	1	1	1	16	1	1	84
16th Pl SW from 43rd Ln SW to 40th Terrace SW	1	3	1	3	2	1	1	1	1	1	1	16	5	1	84
Sunset Rd from 17th Ct SW to 19th Ave SW	1	1	1	4	3	1	1	1	1	1	1	16	3	1	84
Collier Blvd Southbound from Green Blvd to Golden Gate Pkwy	1	2	1	2	3	1	2	1	1	1	1	16	1	1	84
Golden Gate Pkwy Eastbound from 44th St SW to Collier Blvd	1	3	1	2	3	1	1	1	1	1	1	16	1	1	84
42nd St SW from 21st Ave SW to 19th Pl SW	1	3	1	2	3	1	1	1	1	1	1	16	1	1	84
55th St SW from 17th Ave SW to 19th Pl SW	1	2	1	1	3	2	1	1	1	1	1	15	1	1	85
51st Terrace SW from 20th Ct SW to 22nd Ave SW	1	2	1	1	2	3	1	1	1	1	1	15	1	1	85
20th Ct SW from Hunter Blvd to 50th Terrace SW	1	3	1	1	3	1	1	1	1	1	1	15	1	1	85
54th Terrace SW from Hunter Blvd to Coronado Pkwy	1	2	1	1	4	1	1	1	1	1	1	15	3	1	85
55th Terrace SW from Coronado Pkwy to 25th Pl SW	1	3	1	1	3	1	1	1	1	1	1	15	1	1	85
Coronado Pkwy Eastbound from Hunter Blvd to Golden Gate Pkwy	1	1	1	4	2	1	1	1	1	1	1	15	1	1	85
50th St SW from 26th Pl SW to 28th Ave SW	1	1	1	1	3	1	3	1	1	1	1	15	1	1	85
44th St SW from 27th Ct SW to 31st Ave SW	1	1	1	3	3	1	1	1	1	1	1	15	1	1	85
32nd Ave SW from Tropicana Blvd to 44th St SW	1	1	1	1	5	1	1	1	1	1	1	15	1	1	85
17th Ave SW from 45th Terrace SW to 41st Terrace SW	1	2	1	3	2	1	1	1	1	1	1	15	3	1	85
45th Terrace SW from 17th Ave SW from 18th Pl SW	1	1	1	1	3	1	3	1	1	1	1	15	3	1	85
43rd Terrace SW from 17th Ave SW to 18th Pl SW	1	3	1	2	1	2	1	1	1	1	1	15	3	1	85
43rd St SW from 17th Ave SW to 18th Pl SW	1	3	1	2	1	2	1	1	1	1	1	15	1	1	85
18th Pl SW from Sunset Rd to 41st Terrace SW	1	1	1	3	2	1	2	1	1	1	1	15	1	1	85
Golden Gate Pkwy Westbound from Coronado Pkwy to Collier Blvd	1	2	1	1	4	1	1	1	1	1	1	15	1	1	85
20th Pl SW from Sunset Rd to 42nd St SW	1	3	1	2	2	1	1	1	1	1	1	15	1	1	85
22nd Pl SW from 44th Terrace SW to 42nd St SW	1	2	1	1	2	1	3	1	1	1	1	15	1	1	85
20th Pl SW from 41st Terrace SW to Collier Blvd	1	2	1	2	3	1	1	1	1	1	1	15	1	1	85
Golden Gate Pkwy Eastbound from Santa Barbara Blvd to 50th St SW	1	2	1	2	2	1	2	1	1	1	1	15	1	1	85
20th Pl SW from 48th St SW to Sunshine Blvd	1	1	1	3	3	1	1	1	1	1	1	15	1	1	85
Green Blvd from Santa Barbara Blvd to Hemingway Ln	1	3	1	3	3	1	3	1	1	1	1	15	1	1	85
42nd Terrace SW from Golden Gate Pkwy to 23rd Pl SW	1	5	1	1	1	1	1	1	1	1	1	15	1	1	85
42nd St SW from 23rd Pl SW to 22nd Ave SW	2	3	1	1	1	2	1	1	1	1	1	15	1	1	85
19th Ct SW from Santa Barbara Blvd to 55th St SW	1	3	1	1	1	2	1	1	1	1	1	14	1	1	86
17th Ave SW from 50th Terrace SW to 48th St SW	1	2	1	1	2	2	1	1	1	1	1	14	1	1	86
48th St SW from 20th Pl SW to 23rd Ave SW	1	2	1	1	2	1	1	1	1	1	1	14	1	1	86
51st St SW from 20th Pl SW to 22nd Ave SW	1	2	1	1	2	2	1	1	1	1	1	14	3	1	86
50th Terrace SW from 24th Ave SW to Coronado Pkwy	1	1	1	1	4	1	1	1	1	1	1	14	1	1	86
21st Pl SW/53rd St SW from 54th Terrace SW to 23rd Ave SW	1	3	1	1	2	1	1	1	1	1	1	14	3	1	86
55th St SW from Hunter Blvd to Coronado Pkwy	1	2	1	3	1	1	1	1	1	1	1	14	1	1	86
28th Ave SW from 55th St SW to 54th St SW	1	3	1	1	2	1	1	1	1	1	1	14	4	1	86
56th Terrace SW from 25th Pl SW to 27th Ct SW	1	2	1	3	1	1	1	1	1	1	1	14	3	1	86
Hunter Blvd Southbound from Santa Barbara Blvd to 20th Ct SW	1	2	1	3	1	1	1	1	1	1	1	14	1	1	86
25th Ct SW to 47th St SW to 44th Terrace SW	1	3	1	1	2	1	1	1	1	1	1	14	2	1	86
45th St SW/26th Ave SW from 25th Ct SW to 46th St SW	1	2	1	1	2	1	2	1	1	1	1	14	1	1	86
44th Terrace SW from 28th Ave SW to 31st Ave SW	1	1	1	3	2	1	1	1	1	1	1	14	1	1	86
19th Ct SW from 41st Terrace SW to 40th Terrace SW	1	3	1	1	2	1	1	1	1	1	1	14	1	1	86
45th St SW from 17th Ave SW to 17th Ct SW	1	2	1	3	1	1	1	1	1	1	1	14	2	1	86
Sunset Rd from Sunshine Blvd to 17th Ct SW	1	2	1	1	3	1	1	1	1	1	1	14	1	1	86
42nd St SW from 21st Ave SW to 22nd Ave SW	1	3	1	1	2	1	1	1	1	1	1	14	1	1	86
43rd Terrace SW from Sunset Rd to 22nd Ave SW	1	1	1	3	2	1	1	1	1	1	1	14	1	1	86
23rd Ave SW from 41st St SW to Collier Blvd	1	1	1	1	2	1	3	1	1	1	1	14	5	1	86
21st Pl from 21st Ave SW to 52nd Terrace SW	1	2	2	1	1	2	1	1	1	1	1	14	1	1	86
44th Terrace SW from 23rd Ave SW to 22nd Pl SW	1	3	1	1	2	1	1	1	1	1	1	14	1	1	86
16th Pl SW from Santa Barbara Blvd to End	1	2	1	1	1	1	2	1	1	1	1	13	1	1	87
54th St SW from 17th Ave SW to 19th Ave SW	1	1	1	3	1	1	1	1	1	1	1	13	1	1	87
51st St SW from 20th Ct SW to 20th Pl SW	1	2	1	2	1	1	1	1	1	1	1	13	1	1	87
51st St SW from 22nd Ave SW to 23rd Ct SW	1	2	1	2	1	1	1	1	1	1	1	13	1	1	87
50th Terrace SW from 20th Pl SW to 24th Ave SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
52nd Terrace SW from 19th Ct SW to 22nd Pl SW	1	1	1	1	3	1	1	1	1	1	1	13	1	1	87
23rd Ave SW from 54th Terrace SW to 52nd Terrace SW	1	3	1	1	1	1	1	1	1	1	1	13	3	1	87
27th Ct SW from Santa Barbara Blvd to 55th St SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
26th Pl SW from 55th St SW to 54th St SW	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
Hunter Blvd Northbound from Coronado Pkwy to 22nd Ave SW	1	2	1	1	1	2	1	1	1	1	1	13	1	1	87
Coronado Pkwy Westbound from Hunter Blvd to Santa Barbara Blvd SW	1	2	1	1	1	2	1	1	1	1	1	13	1	1	87
Hunter Blvd from 22nd Ave SW to Santa Barbara	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
Sunshine Blvd Southbound from Green Blvd to Golden Gate Pkwy	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
Coronado Pkwy Westbound from Hunter Blvd to Golden Gate Pkwy	1	2	1	1	1	2	1	1	1	1	1	13	1	1	87
54th Ln SW from 29th Pl SW to 32nd Ave SW	1	1	1	1	3	1	1	1	1	1	1	13	2	1	87
31st Pl SW from 52nd Ln SW to 52nd St SW	1	1	1	1	3	1	1	1	1	1	1	13	1	1	87
29th Pl SW from 50th Terrace SW to 50th St SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
50th Terrace SW from 28th Ave SW to 29th Pl SW	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
28th Ave SW from 51st St SW to 50th St SW	1	1	1	1	3	1	1	1	1	1	1	13	1	1	87

Pavement Evaluation Results

Segment Name	Transverse Cracking	Longitudinal Cracking	Alligator Cracking	Utility/Mechanical Cut (Patching)	Depressions, Bumps, or Rutting	Raveling, Edge of Pavement Damage	Potholes	Polished Aggregate	Shoving or Pushing	Asphalt Bleeding	Corrugations (Ripple)	Sum of Defects	Condition of Stripping	Condition of Curb	Overall Rating
49th St SW from 28th Ct SW to 30th Pl SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
27th Pl SW from 50th St SW to End	1	1	1	1	3	1	1	1	1	1	1	13	1	1	87
28th Ct SW from 49th Ln SW to 48th Terrace SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
26th Pl SW from 50th St SW to 48th Terrace SW	1	1	1	1	2	2	1	1	1	1	1	13	2	1	87
25th Pl SW from 47th Terrace SW to 47th St SW	3	1	1	1	1	1	1	1	1	1	1	13	1	1	87
25th Ave SW from 47th Terrace SW to 47th St SW	1	2	1	1	2	1	1	1	1	1	1	13	2	1	87
26th Pl SW from 47th St SW to 44th Terrace SW	1	2	1	1	2	1	1	1	1	1	1	13	4	1	87
44th St SW from 25th Ave SW to 27th Ct SW	1	2	1	1	1	1	2	1	1	1	1	13	1	1	87
45th St SW from 31st Ave SW to 32nd Ave SW	1	1	1	1	3	1	1	1	1	1	1	13	1	1	87
28th Pl SW from 46th St SW to 44th Terrace SW	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
47th St SW from 28th Ave SW to 31st Ave SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
31st Ave SW from Tropicana Blvd to 47th St SW	1	2	1	1	2	1	1	1	1	1	1	13	2	1	87
43rd St SW from 29th Pl SW to 32nd Ave SW	1	1	1	3	1	1	1	1	1	1	1	13	1	1	87
25th Ave SW from 43rd St SW to 42nd St SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
42nd Terrace SW from Golden Gate Pkwy to 25th Ave SW	1	3	1	1	1	1	1	1	1	1	1	13	2	1	87
41st Ln SW from Green Blvd to 16th Pl SW	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
17th Pl SW from 45th St SW to 43rd Terrace SW	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
44th Terrace SW from 17th Pl SW to 18th Ave SW	1	1	1	2	2	1	1	1	1	1	1	13	1	1	87
45th Terrace SW from Sunset Rd to 22nd Pl SW	1	2	1	1	1	1	2	1	1	1	1	13	1	1	87
Collier Blvd Northbound from bridge to Golden Gate Pkwy	1	2	1	1	2	1	1	1	1	1	1	13	1	1	87
22nd Ave SW from 43rd Ln SW to 42nd St SW	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
20th Ave SW from Sunset Rd to 42nd St SW	1	1	1	2	2	1	1	1	1	1	1	13	1	1	87
Golden Gate Pkwy Eastbound from 50th St SW to 44th St SW	1	1	2	1	1	1	1	1	1	1	1	13	1	1	87
29th Pl SW from Santa Barbara Blvd to 55th Terrace	1	3	1	1	1	1	1	1	1	1	1	13	1	1	87
19th Pl SW from 55th St SW to 19th Ct SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
53rd Ln SW from 17th Ave SW to 18th Ct SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
17th Pl SW from 53rd Ln SW to 52nd Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
51st St SW from 17th Ave SW to 50th Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
48th St SW from 17th Ave SW to 18th Ct SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
50th Terrace SW from 17th Ave SW to 18th Ave SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
50th St SW from 19th Pl SW to 20th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
48th St SW from 18th Ct SW to 20th Pl SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
49th St SW from 18th Ct SW to 20th Pl SW	1	1	1	2	1	1	1	1	1	1	1	12	2	1	88
22nd Ave SW from 50th St SW to 48th St SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
22nd Pl SW from 50th St SW to 48th St SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
20th Pl SW from 51st St SW to 50th St SW	1	1	1	1	1	1	1	1	1	1	1	12	1	1	88
24th Ave SW from 50th Terrace SW to Lueme Rd	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
22nd Ave SW/54th St SW from 54th Terrace SW to 23rd Ave SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
24th Ave SW from 54th Terrace SW to 52nd Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	2	1	88
23rd Pl SW from 54th Terrace SW to 52nd Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
26th Ave SW/54th Terrace SW from Coronado Pkwy to 52nd Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	4	1	88
27th Ave SW from 53rd Terrace SW to 52nd Terrace SW	1	1	1	1	2	1	1	1	1	1	1	12	5	1	88
26th Ave SW from 55th St SW to 54th St SW	1	1	1	1	2	1	1	1	1	1	1	12	4	1	88
Hunter Blvd Southbound from 20th Ct SW to Coronado Pkwy	1	1	1	1	1	2	1	1	1	1	1	12	1	1	88
53rd St SW from Golden Gate Pkwy to 32nd Ave SW	1	1	1	1	2	1	1	1	1	1	1	12	2	1	88
29th Pl SW from Santa Barbara Blvd to 53rd St SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
54th St SW from 31st Pl SW to 30th Ave SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
28th Pl SW from 53rd St SW to 52nd St SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
52nd Terrace SW from 30th Ave SW to 31st Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
30th Ave SW from 53rd St SW to 52nd St SW	1	1	1	1	2	1	1	1	1	1	1	12	2	1	88
30th Pl SW from 50th St SW to Tropicana Blvd	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
51st St SW from 28th Ave SW to 28th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
28th Pl SW from 51st St SW to 50th Terrace SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
50th St SW from 29th Pl SW to 30th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
48th Terrace SW from 28th Ct SW to 30th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
50th St SW from 28th Ave SW to 29th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
50th St SW from Golden Gate Pkwy to 26th Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
47th St SW from 25th Ct SW to 26th Pl SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
44th Terrace SW from 26th Pl SW to 27th Ct SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
29th Pl SW from 44th Terrace SW to 41st St SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
41st St SW from 29th Pl SW to 32nd Ave SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
32nd Ave SW from 43rd St SW to 41st St SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
31st Pl SW from 43rd St SW to 41st St SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
42nd St SW from 17th Ave SW to 18th Pl SW	1	2	1	1	1	1	1	1	1	1	1	12	2	1	88
18th Ave SW from Sunset Rd to 43rd Terrace SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
Collier Blvd Southbound from Golden Gate Pkwy to bridge	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
Sunshine Blvd Northbound from Golden Gate Pkwy to Green Blvd	1	1	1	2	1	1	1	1	1	1	1	12	2	1	88
44th Terrace SW from Sunset Rd to 22nd Pl SW	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
45th St SW from 23rd Ave SW to Golden Gate Pkwy	1	2	1	1	1	1	1	1	1	1	1	12	2	1	88
Santa Barbara Southbound from Green Blvd to Golden Gate Pkwy	1	1	1	1	2	1	1	1	1	1	1	12	1	1	88
Santa Barbara Northbound from Golden Gate Pkwy to Green Blvd	1	1	1	1	1	1	1	1	1	1	1	12	1	1	88
17th Ave SW from 48th St SW to Sunshine Blvd	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
23rd Ave SW from 48th St SW to Sunshine Blvd	1	1	1	1	1	2	1	1	1	1	1	12	1	1	88
24th Ave SW from 52nd Terrace SW to Hunter Blvd	1	1	1	1	1	2	1	1	1	1	1	12	1	1	88
50th St SW from 29th Pl SW to 28th Ave SW	1	2	1	1	1	1	1	1	1	1	1	12	1	1	88
55th Terrace SW from 17th Ave SW to 19th Ct SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
17th Ave SW from Santa Barbara Blvd to Canal	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
17th Ave SW from 54th Terrace SW to 51st St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
52nd St SW from 17th Ave SW to 19th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
52nd Terrace SW from 17th Ave SW to 19th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
18th Ave SW from 53rd Ln SW to 52nd Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89

Pavement Evaluation Results

Segment Name	Transverse Cracking	Longitudinal Cracking	Alligator Cracking	Utility/Mechanical Cut (Patching)	Depressions, Bumps, or Rutting	Raveling, Edge of Pavement Damage	Potholes	Polished Aggregate	Shoving or Pushing	Asphalt Bleeding	Corrugations (Ripple)	Sum of Defects	Condition of Striping	Condition of Curb	Overall Rating
17th Pl SW from 50th Terrace SW to 49th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
18th Ct SW from 19th Pl SW to 48th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
20th Pl SW from 50th St SW to 48th St SW	1	1	1	1	1	1	1	1	1	1	1	11	5	1	89
49th Terrace SW from 19th Pl SW to 20th Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
19th Pl SW from 50th St SW to 49th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
19th Ave SW from 19th Pl SW to 49th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
23rd Ave SW from 50th St SW to 48th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
50th St SW from 22nd Ave SW to 23rd Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
21st Pl SW from 50th St SW to 48th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
50th St SW from 20th Pl SW to 21st Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
21st Ave SW from 20th Pl SW to 48th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
51st Terrace SW from 22nd Ave SW to 23rd Ct SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
24th Ave SW from Hunter Blvd to 50th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
23rd Ct SW from Hunter Blvd to 50th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
23rd Ct SW from 50th Terrace SW to Lucerne Rd	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
22nd Pl SW from 52nd Terrace SW from Hunter Blvd	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
52nd Terrace SW from 22nd Pl SW to 24th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	3	1	89
23rd Ct SW from 54th Terrace SW to 52nd Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
22nd Pl SW from Santa Barbara Blvd to 55th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
28th Ave SW from 53rd Terrace SW to 52nd Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	2	1	89
27th Pl SW from 55th St SW to 54th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
54th St SW from 25th Pl SW to 28th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
55th St SW from Coronado Pkwy to 25th Ct SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
25th Ct SW from 55th St SW to 55th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
Golden Gate Pkwy Westbound from Santa Barbara Blvd to Coronado Pkwy	1	1	1	1	1	1	1	1	1	1	1	11	2	1	89
55th Terrace SW from 29th Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
30th Ave SW from 54th Terrace SW to 53rd St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
52nd St SW from 28th Pl SW to 32nd Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
50th St SW from 31st Ave SW to 32nd Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
31st Ave SW from 52nd St SW to 50th St SW	1	1	1	1	1	1	1	1	1	1	1	11	4	1	89
31st Pl SW from 52nd St SW to 50th St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
52nd Ln SW from 32nd Ave SW to 31st Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
49th Ln SW/28th Ave SW from 50th St SW to 30th Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	2	1	89
48th Terrace SW from 26th Pl SW to 28th Ct SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
30th Pl SW from Tropicana to 47th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
26th/25th Pl SW from 48th Terrace SW to 47th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
44th St SW from Golden Gate Pkwy to 25th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
44th Terrace SW from 25th Ave SW to 26th Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
47th St SW from 26th Pl SW to 28th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
44th St SW from 31st Ave SW to 32nd Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
45th St SW/29th Ave SW from 30th Ave SW to 44th Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
41st Terrace SW from 29th Pl SW to 31st Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
42nd St SW from 30th Ave SW to 31st Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
42nd Terrace SW from 30th Ave SW to 31st Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
30th Ave SW from 43rd St SW from 41st Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
43rd St SW from Golden Gate Pkwy to 25th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	2	1	89
42nd St SW from Golden Gate Pkwy to 25th Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
20th Ave SW from 41st Terrace SW to 41st St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
43rd Ln SW Green Blvd to 16th Pl SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
17th Ave SW from Sunshine Blvd to 46th St SW	1	1	1	1	1	1	1	1	1	1	1	11	3	1	89
Collier Blvd Northbound from Golden Gate Pkwy to Green Blvd	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
Sunset Rd from 45th St SW to 43rd Terrace SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
43rd Ln SW from Sunset Rd to 22nd Ave SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
19th Pl SW from Sunset Rd to 42nd St SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
55th St SW from 27th Ct SW to Golden Gate Pkwy	1	1	1	1	1	1	1	1	1	1	1	11	3	1	89
19th Ct SW from 52nd Terrace SW to Hunter Blvd	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
50th St SW from 23rd Ave SW to 23rd Ct SW	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
Santa Barbara Southbound from Golden Gate Pkwy to bridge	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
Santa Barbara Northbound from Golden Gate Pkwy to bridge	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
18th Ct SW from 48th St SW to Sunshine Blvd	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89
50th Ln SW from 31st Ave SW to End	1	1	1	1	1	1	1	1	1	1	1	11	1	1	89

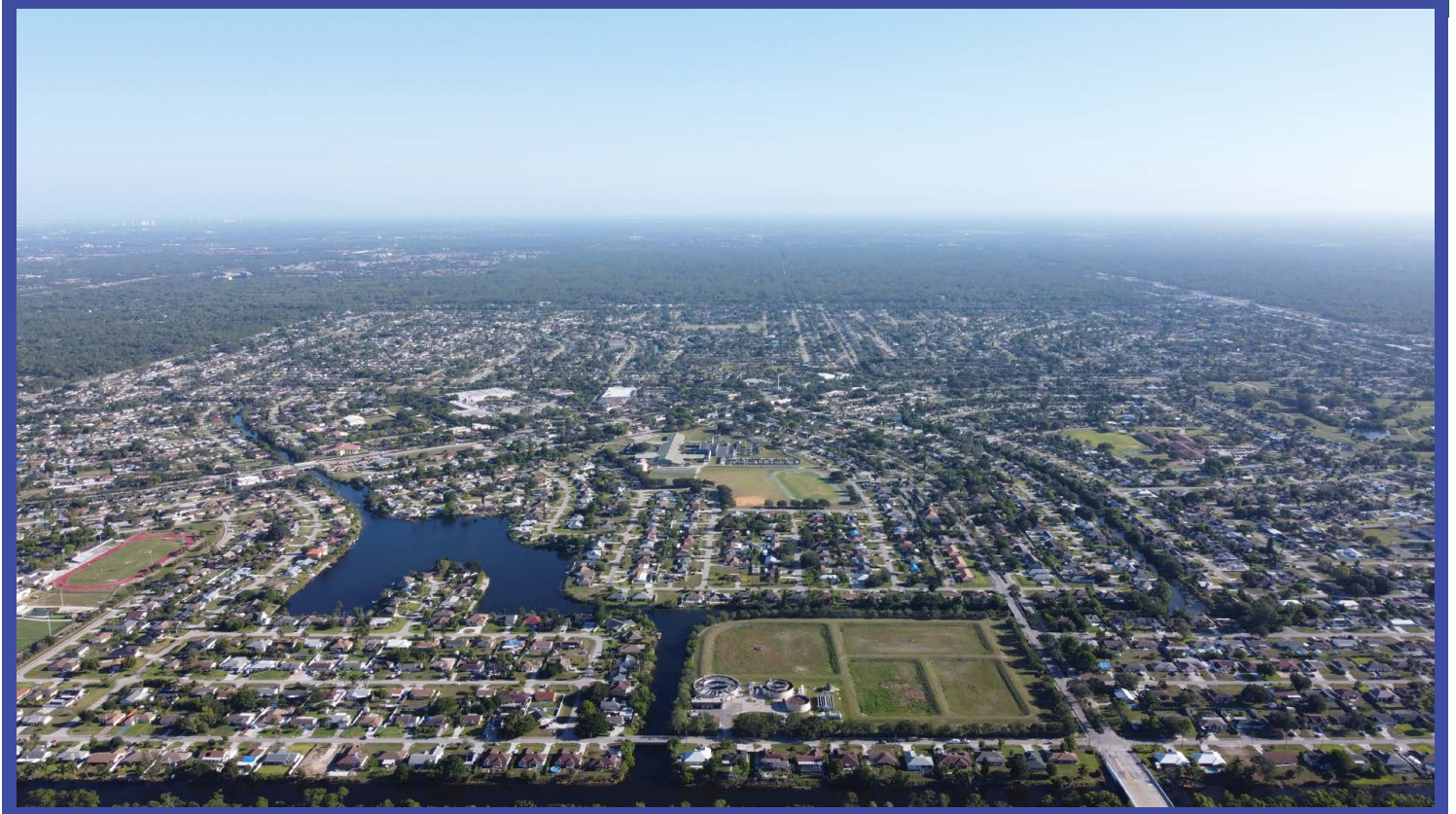


Appendix F
Lighting Study Analysis Report

Golden Gate City Water Resource Protection - Restoration Master Plan

Lighting Study Analysis Report

July 2025



1. Introduction

Collier County (hereinafter, “the County”) was awarded a grant from the State of Florida Department of Environmental Protection for the Collier County Golden Gate City Water Resource Protection/ Restoration Master Plan (hereinafter, the “Golden Gate City Master Plan [GGCMP]”). The study area for the GGCMP includes the unincorporated area in western Collier County referred to as Golden Gate City, which is bounded to the north by Green Boulevard, to the east by Collier Boulevard, to the west by Santa Barbara Boulevard, and the south by the Golden Gate Main Canal.

The purpose of this Lighting Analysis Report is to perform a preliminary lighting study for the area to consider roadway lighting and pedestrian lighting needs for the community. This lighting study is based on typical street sections for the following roadway classification types: local, collector, arterial, and service roads. The study evaluated lighting improvements on County-owned roadways to meet current lighting design requirements per the lighting criteria as defined in the 2025 Florida Department of Transportation (FDOT) Design Manual (FDM) Chapter 231 Lighting, and guidelines identified in the Collier County Lighting Standards (Collier County 2017a).

2. Existing Conditions

The existing lighting within the Golden Gate City study area includes a variety of luminaires and light poles, such as luminaires installed on the existing Florida Power and Light (FPL) utility poles and/or standalone concrete poles, aluminum poles, or decorative poles along the roadway. The existing layout is not considered a “continuous” lighting system because the luminaires do not cover the full area required, which would include the entire length of roadway as well as any sidewalks or bike lanes.

Collier County and FPL have lighting agreements in place for the luminaires mounted on the existing FPL utility poles. According to the lighting agreements, luminaires mounted on existing utility poles include high-pressure sodium (HPS) “cobra-head” style and light-emitting diode (LED) luminaires. Otherwise, lighting is provided on a standalone light pole with an estimated 6-foot-long arm bracket (single and double). Luminaire wattage is estimated for the following street classifications: 100 watts (W) for HPS and 40-W for LEDs for local streets, 200-W HPS and 76-W LEDs for collector streets, and 400-W HPS and 182-W LEDs for arterial streets. The mounting height is estimated at 20 to 25 feet for local and collector streets and 30 to 35 feet for arterial roads.

Some local streets within the study area have existing concrete poles with luminaires. At these locations, the lighting distribution is from an electrical underground system. Sunshine Boulevard and Tropicana Boulevard include existing decorative poles with “bell-shape” luminaires at specific locations. The decorative poles are installed within the median and the luminaire is aligned over the pedestrian crosswalk, as shown on Figure 1. Arterial roads include double-arm luminaires mounted on concrete poles along the median, as shown on Figure 2.

Figure 1. Decorative Street Light on Sunshine Blvd



Figure 2. Double-Arm Luminaires on Concrete Pole



The Golden Gate Beautification Municipal Service Taxing Unit (MSTU) was developed to serve the project area. The MSTU committee makes recommendations for roadway landscaping improvements. A Streetscape Master Plan was developed for Collier County in 1997 and in 2011, the *Golden Gate Community Roadways Beautification Master Plan* was developed, providing recommendations on roadway median landscaping (McGee & Associates 2011). The recommendations in the Beautification Master Plan included two types of lighting for the major intersections: median ends and pedestrian crosswalks. These recommendations were identified as:

1. For the 'Special Overlay District,' the pole and fixture recommended was the Collier County Traffic Operations "East Trail Street Light Assembly" (Lumec 250-watt metal halide, DMS30 LMS11684A, Type A), Drawing No. CCTO 03-204.
2. For the MSTU roadways, the pole was identified as a green-toned, exposed aggregate round pole anchor-based or embedded, topped with a single- or double- 6-foot fixture arm and forest green in color. The fixture was identified as Lumec Helios series H.B.M., forest green color, or approved equal (McGee & Associates 2011).

Decorative pedestrian light poles were identified as Lumec AM6U-16-GN6-TX 16-foot-high pole with base cover or approved equal, the arm as VR 302-1A-GN6-TX, and the fixture as Lumec #175SMH-DMS50-SG3-LD-QTA240 or approved equal (McGee & Associates 2011). Table 1 provides the lighting recommendations in the Beautification Master Plan.

Table 1. Beautification Master Plan Lighting Recommendations

Roadway Name	Lighting Recommendation
Coronado Pkwy.	Pedestrian fixtures at main intersections or pedestrian crossings. Install twin-headed decorative streetlight fixture within the medians on ±200-foot centers.
Collier Blvd. (A - Golden Gate Canal to Golden Gate Pkwy.)	Pedestrian fixtures at main intersections or pedestrian crossings. Install decorative streetlight fixture on both sides of the roadway spaced triangularly on ±200-foot centers.
Collier Blvd. (B - Golden Gate Pkwy. to Green Blvd.)	Pedestrian fixtures at main intersections or pedestrian crossings. Replace existing streetlight fixtures with decorative poles and fixtures.

Technical Memorandum

Table 1. Beautification Master Plan Lighting Recommendations

Roadway Name	Lighting Recommendation
Golden Gate Pkwy., East	Pedestrian fixtures at main intersections or pedestrian crossings. Install decorative streetlight fixture on both sides of the roadway spaced triangularly on ± 200 -foot centers.
Green Blvd.	Pedestrian fixtures at main intersections or pedestrian crossings. Decorative twin-headed streetlight fixtures within the medians on the eastern half and along the southern edge of pavement on the western half spaced ± 200 feet on center.
Hunter Blvd.	Pedestrian fixtures at main intersections or pedestrian crossings. Decorative twin-headed fixtures as specified in the Master Plan within the medians spaced ± 200 feet on center.
Santa Barbara Blvd., North	Pedestrian fixtures at main intersections or pedestrian crossings. Install decorative streetlight fixture on both sides of the roadway spaced triangularly on ± 200 -foot centers.
Sunshine Blvd.	Pedestrian fixtures at main intersections or pedestrian crossings. Decorative twin-headed fixtures within the medians spaced ± 200 feet on center. Pedestrian fixtures at median ends completed.
Tropicana Blvd.	Pedestrian fixtures at main intersections or pedestrian crossings. Decorative twin-headed fixtures within the medians spaced ± 200 feet on center. Pedestrian fixtures at median ends completed.

Source: *Golden Gate Community Roadways Beautification Master Plan* (McGee & Associates 2011)

Figure 3 shows the location of existing lighting within the study area as well as the roadway classifications. The existing data were collected from a desktop review using 2024 Collier County aerial imagery and field verification.

Figure 3. Existing Roadway Lighting



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Sources: Collier County Property Appraiser, Collier County GIS Hub.

3. Electrical Analysis

The loading data of the luminaire is included in the cut sheet information for reference in Attachment A. FPL will perform the analysis for any future improvements where they provide the lighting.

4. Photometric Analysis

4.1 Lighting Analysis Approach

The lighting analysis evaluated pedestrian lighting safety along the roadway, intersections, and pedestrian crosswalks within the study area. The photometric criterion used in this consideration was based on Chapter 231 Lighting in the FDM.

Existing conditions and design constraints evaluated included:

- Right-of-way limits
- Geometry of existing roadway, intersections, sidewalks, driveways, and so forth
- Locations of overhead and underground utilities, drainage, or other roadside features
- Existing sidewalks
- Clear zone requirements - No closer than 4 feet from face of curb or clear zone per FDM Chapter 215 Table 215.2.2 Minimum Lateral Offset Criteria

Using these conditions and constraints, an estimated photometric analysis was conducted using the Roadway Optimizer Tool from the AGi32 software. The analysis included a typical section for the roadway classifications of local, collector, and arterial roads. Luminaire data used in the typical section analysis was based on the luminaires used under the existing agreements between Collier County and FPL (Eastley 2024).

The analysis provides an estimated light pole spacing for each roadway classification that will meet the current FDOT lighting criteria. Because the scope of work for the GGCMP does not include any design or surveying, an intersection and vertical analysis could not be simulated with the Roadway Optimizer Tool and, therefore, was not included in this Lighting Analysis Report.

4.2 Photometric Criteria

The photometric criteria used for this analysis is based on FDOT FDM Table 231.2.1 for corridor lighting (refer to Table 2). For the horizontal and vertical illuminance calculations, the values for "Other Roadways" shown in Table 2 were used for local, collector, and service road type classifications.

Roadway Classification	Illumination Level Average Foot Candle		Illumination Uniformity Ratios		Veiling Luminance Ratio
	Horizontal (H.F.C.)	Vertical (V.F.C.)	Avg./Min.	Max./Min.	$L_{V(MAX)}/L_{AVG}$
Or Project Type	Horizontal (H.F.C.)	Vertical (V.F.C.)	Avg./Min.	Max./Min.	$L_{V(MAX)}/L_{AVG}$
Corridor Lighting					
Limited Access Facilities	1.5	N/A	4:1 or Less	10:1 or Less	0.3:1 or Less
Major Arterials	1.5				
Other Roadways	1.0				
Signalized Intersection and Roundabout Lighting					

Technical Memorandum

New or Reconstruction	3.0 Std. 1.5 Min.	1.5 Std. 1.2 Min.	4:1 or Less	10:1 or Less	N/A
Lighting Retrofit	1.5 Std. 1.0 Min.	1.5 Std. 1.0 Min.			
Unsignalized Intersection Lighting					
All Project Types	1.0 to 1.5	1.5 Std. 1.0 Min.	4:1 or Less	10:1 or Less	N/A

Note: Local, collector, and service roads are considered "Other Roadways" for design criteria.

Source: FDM (2024)

4.3 Luminaire Options

Luminaires used as the basis for this lighting analysis were based on the information in the existing agreements between FPL and Collier County (Eastley 2024). The luminaire data are also included in the FPL LED Lighting Catalog and are described in Table 3. The Illumination Engineering Society (IES) data provides information regarding the light distribution pattern of the luminaire. The backlight, uplight, and glare (BUG) rating describes the measure of emitting light in unwanted directions.

Table 3. Luminaire Schedule

Fixture Manufacturer	Luminaire IES Number	Luminaire Watts	Luminaire Lumens	IES Class	BUG Rating
Cree RSW	RSW-3ME-5L-40K7	40	5000	Type III	B1-U0-G1
AEL ATBS & ATBM	ATBS-I-XXXX-R2 ATBM-E-XXXX-R3	80/120	8653/ 15453	Type II/ Type III	B2-U0-G2 B2-U0-G3
Cooper Verdeon M	VERD-M-A03-E-U-T3-AP	180	22236	Type III	B3-U0-G3

Source: FPL LED Lighting Catalog (FPL 2024)

4.4 Roadway Lighting Analysis

The roadway calculations and analysis include horizontal pavement illuminance along the roadway. This analysis was performed using the AGi32 Roadway Optimizing Tool. This tool estimates the light pole spacing based on a roadway typical section where the program creates a calculation zone and performs a horizontal lighting analysis based on the input parameters.

Intersection calculations include both horizontal pavement illuminance and vertical illuminance at pedestrian crosswalks. Because the GGCMF scope does not include obtaining survey data, an estimate on the required lighting levels for an intersection using the Optimizer tool could not be performed. Similarly, without that data, the vertical lighting analysis for pedestrian crossings at the intersections could not be performed. These analyses should be performed during project design.

Table 4 provides a summary of the lighting analysis on each typical roadway section and Table 5 includes a summary of estimated light pole spacing based on the analysis.

Attachment B provides the AGi32 roadway analysis layouts and calculation results.

Table 4. Roadway (Typical Streets) - Calculation Summary

Road Classification	Luminaire Data	Illumination			Veiling Luminance
		Avg (F.C.)	Avg/Min	Max/Min	LvMax/LvAvg
		Horizontal Calculations			
Local	40W LED Luminaire	1.01	1.58	2.00	0.17
	70W LED Luminaire	1.10	3.14	7.83	0.28
Collector	120W LED Luminaire	1.25	2.08	4.40	0.29
	(More than 1 typical)	1.11	2.92	6.95	0.28
		1.18	2.23	4.94	0.30
		1.10	2.82	6.62	0.29
Arterial	180W LED Luminaire	1.80	3.83	7.79	0.24
	(More than 1 typical)	1.70	3.86	7.93	0.25
		1.73	1.66	3.46	0.30
Service	70W LED Luminaire	1.34	3.62	9.89	0.28
Calculation Targets		1.0 HFC - 1.5 HFC	≤4	≤10	≤0.3

Local/Collector/Service Street: Target FC value: 1.00FC. Arterial Street: Target FC value: 1.50 FC.

Table 5. Roadway (Typical Streets) - Light Pole Spacing

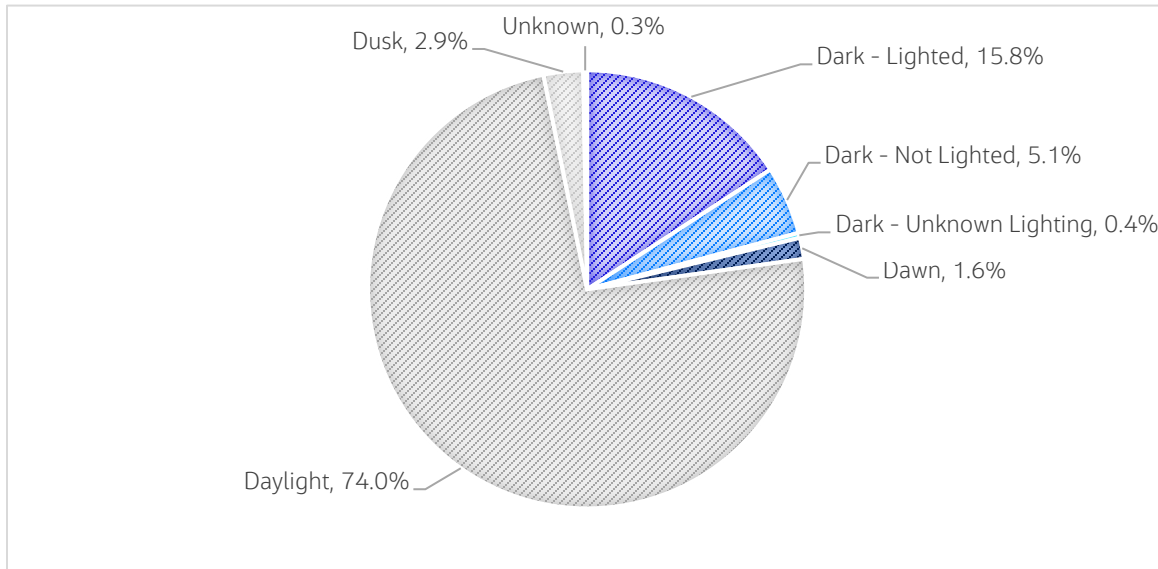
Road Classification	Luminaire Data	Light Pole Spacing (Estimate in feet)	Placement Configuration	Number of Arms and Luminaires
Local	40W LED Luminaire	165	Staggered	Single
	70W LED Luminaire	350/175	Staggered	Single
Collector	120W LED Luminaire	180	Median	Double
	(More than 1 typical)	210	Median	Double
		190	Median	Double
		210	Median	Double
Arterial	180W LED Luminaire	236	Staggered	Single
	(More than 1 typical)	214	One side	Single
		175	Opposite	Single
Service	70W LED Luminaire	160	One side	Single

Notes: Staggered refers to the light poles placed on opposite sides of the road offset from each other.

5. Crash Data Analysis

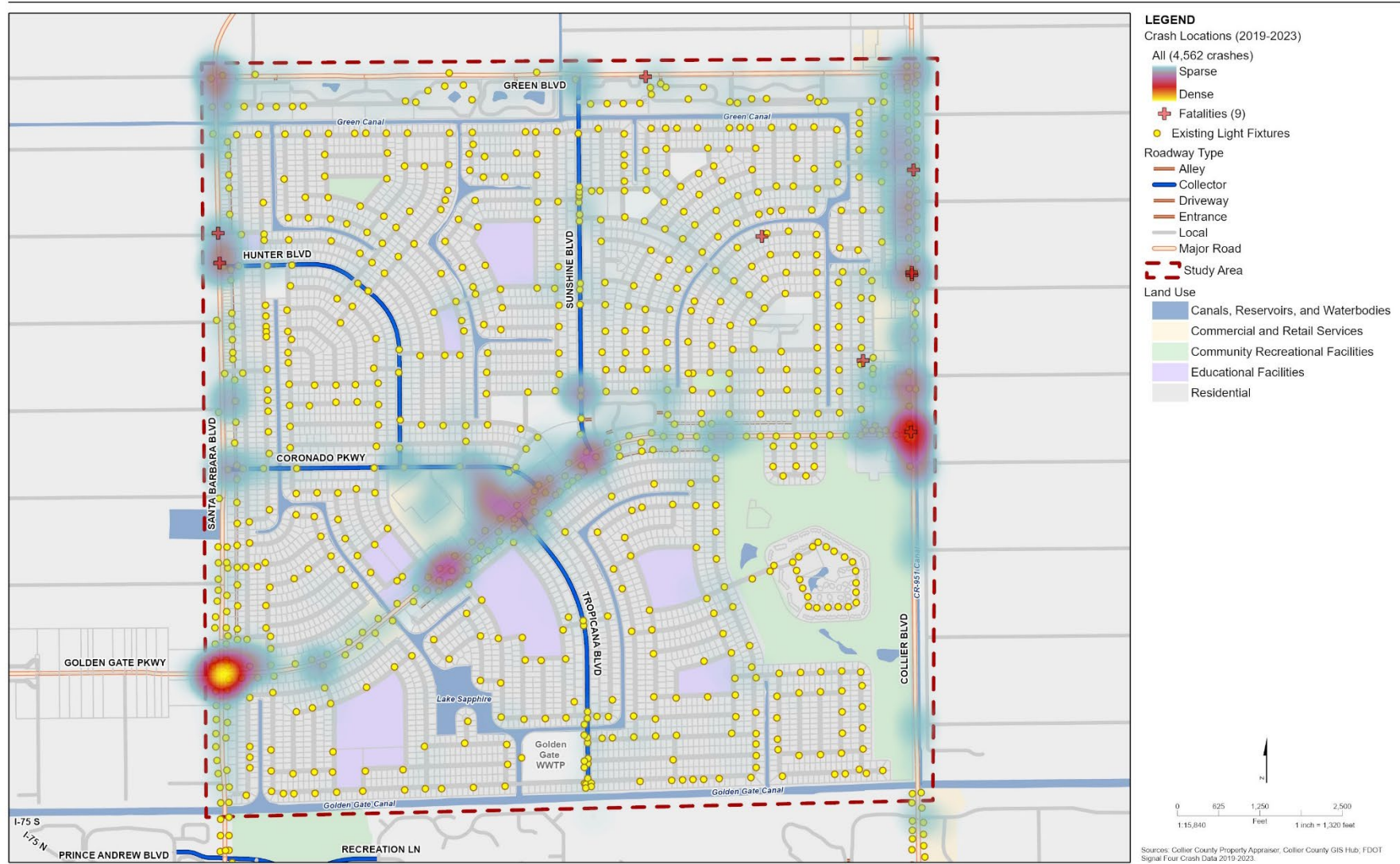
Traffic crash data were obtained from FDOT's Signal Four crash data for the 5-year period from December 2019 to December 2023 (Signal Four Analytics n.d.). A total of 4,562 crashes occurred within the Golden GGCM study area. Figure 4 summarizes the total crashes based on lighting condition and Figure 5 provides a heat map of total crashes in Golden Gate City.

Figure 4. Golden Gate City Crash Data by Lighting Condition



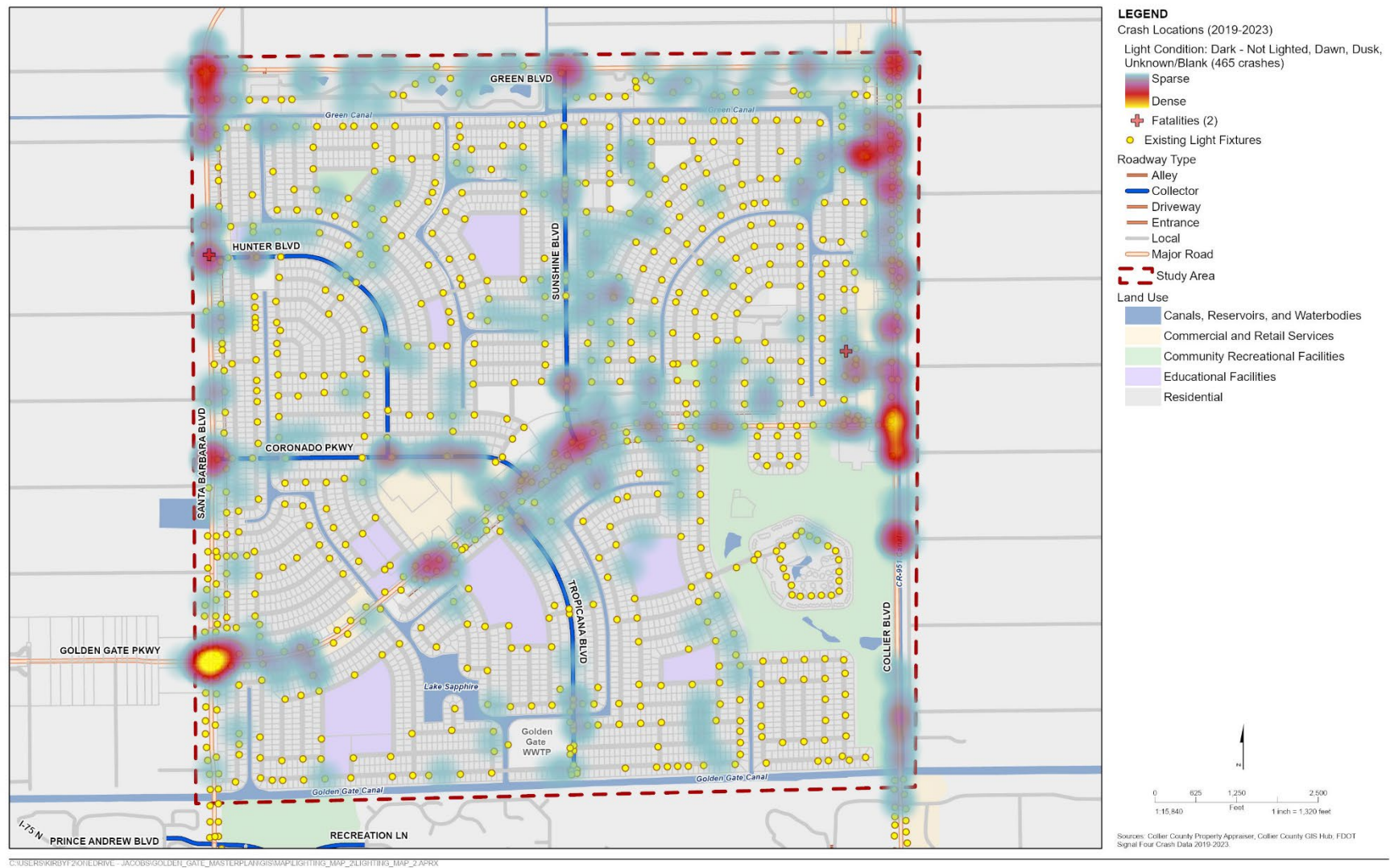
Of the total 4,562 crashes, 465 crashes occurred outside of daylight or dark-lighted conditions. These crashes were labeled as either low light (dawn or dusk), dark – not lighted, dark - unknown lighting, or unknown/blank. Figure 6 provides a heat map of these 465 crashes.

Figure 5. Crash Locations Heat Map (December 2019 to December 2023)



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Figure 6. Crash Locations Heat Map for Crashes That Occurred Outside of Daylight or Dark-Lighted Conditions (December 2019 to December 2023)



The 465 crashes that occurred outside of daylight or lighted conditions can be summarized as follows:

- 11 crashes involved pedestrians, 17 involved bicyclists
- 2 crashes resulted in fatalities: 1 involved a pedestrian fatality and 1 involved a bicyclist fatality
- The number of crashes occurring based on intersection type was identified as:
 - 100 crashes at four-way intersections
 - 294 crashes were not at an intersections
 - 60 crashes were at a T-intersections
 - 11 crashes were labeled as other
- The crashes based on type of impact were identified as:
 - 86 as angle crashes
 - 11 as front-to-front crashes
 - 119 as front-to-rear crashes
 - 4 as rear-to-rear crashes
 - 10 as rear-to- side crashes
 - 17 as sideswipe, opposite direction crashes
 - 36 as sideswipe, same direction crashes
 - 31 labeled as unknown, other, or marked blank

6. Recommendations

This analysis used the AGi Roadway Optimizer Tool to estimate the required light pole spacing on each roadway section to meet the minimum FDOT lighting design criteria. However, an analysis can also be performed using other agency lighting design criteria, such as County, Illuminating Engineering Society of North America, American Association of State Highway and Transportation Officials, and so forth. The County has identified a lack of funding for lighting improvements within Golden Gate City. Most existing lighting appears to be installed based on the *Golden Gate Community Roadways Beautification Master Plan* and funded through the MSTU budget. The majority of the existing lighting is placed to accommodate pedestrian and bicyclists at intersections.

Based on the required spacing in Table 5, the majority of the existing roadway lighting on the local, collector, arterial, and service roads in the study area does not meet these spacing requirements. However, some sections of the corridors within the study area may meet the required spacing based on existing luminaires and will need to be evaluated. A calculation zone analysis should be performed for each section after obtaining survey and illumination data to determine whether illumination requirements are met. For lighting that was installed outside of the agreements between FPL and Collier County, the luminaire data will need to be obtained, and light pole spacing recalculated. Note that Collier Boulevard will undergo lighting improvements as part of the widening project from City Gate Boulevard North to Green Boulevard.

Because the existing lighting along the majority of the corridors is not continuous, it does not meet the FDOT lighting criteria for street lighting. The required spacing data for each roadway section can be reviewed to evaluate additional light poles to meet FDOT requirements. The unsignalized and signalized intersections will need to be evaluated once luminaire mounting height is determined. Lighting at intersections will also be required to meet current FDOT lighting design criteria for intersections with pedestrian crosswalks. Lighting along sidewalks and roadways used by students walking home from school and after-school activities should be prioritized to improve safety and visibility.

Lighting shall also follow the recommended practice included in the Collier County Lighting Standards (Collier County 2017a) and the Lighting Standards Special Considerations (Collier County 2017b) documents. These guidelines include recommendations for outdoor and roadway lighting within County facilities such as warranting conditions, location criteria, and level of illumination. Some recommendations include the use of full cutoff luminaires to avoid light spillage, the use of a shield to control backlight, orientation of the luminaires toward the road, and so forth. Special consideration should be given to avoid

or minimize any light distribution into private properties. This can be achieved by using “house-side” shielding option on the luminaire and controlling the arm bracket and height of light pole.

A desktop analysis indicates that additional lighting is needed to meet current lighting criteria. However, because lighting is an unfunded improvement for installation and maintenance, Jacobs recommends continued use of existing FPL poles to affix light fixtures along major arterials and collectors. Any additional luminaires on existing FPL poles can be accommodated through an additional service agreement between the County and FPL or through modifications to the current agreements within the study area. It is recommended to prioritize the installation of additional lighting in the areas with high pedestrian traffic (for example, around schools, commercial areas, parks, and so forth) and at intersections with pedestrian crossings, then make improvements to the local/collector streets. Additionally, Jacobs recommends evaluating areas with higher crash densities shown in Figure 6 for lighting improvements.

The required spacing and lighting levels for improvements will need to be evaluated when each project goes into the design stage, survey is obtained, and budget is determined. Additionally, when each project goes into design, a plan should be developed with the MSTU to coordinate lighting and landscaping improvements. This coordination should aim to enhance visibility and safety for all road users, particularly pedestrians and bicyclists.

7. References

Collier County. 2017a. *Lighting Standards*. Issued By: County-Wide Lighting Team. Issued January 6.

Collier County. 2017b. *Lighting Standards Special Considerations*. Issued By: County-Wide Lighting Team. Issued January 6.

Eastley, Katherine/Collier County. 2024. Personal communication (email) to Diana Francois/Jacobs and Felicia Kirby/Jacobs. October 28.

Florida Department of Transportation (FDOT). 2024. *2025 FDOT Design Manual*. FDOT Roadway Design Office. Topic No: 625-000-002. Effective January 1, 2025. December 3.

Florida Power & Light. 2024. *LED Lighting Solutions*. August 13.

McGee & Associates. 2011. *Golden Gate Community Roadways Beautification Master Plan*. Prepared for Collier County Board of County Commissioners and Golden Gate Beautification Municipal Services Taxing Unit, M.S.T.U. Advisory Committee. March.

Signal Four Analytics. n.d. “Florida Traffic Safety Dashboard.” Accessed February 14, 2025.
<https://signal4analytics.com/>



Attachment A
Manufacturer's Data Sheets

RSW Series

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Rev. Date: V9 10/30/2024

Product Description

The RSW Series, utilizing WaveMax® Technology, will transform the way utilities and municipalities light their residential streets, interchanges, and expressways. With the first viable LED streetlight at warm CCT, the RSW Series delivers up to 144 LPW, enhanced visual comfort with reduced glare and high color contrast leading to improved overall illumination using less energy. The RSW Series provides warm, inviting dark sky friendly lighting that makes good economic sense.

Applications: Residential roads, collector roads, multi-lane freeways, express ways, major roads, parking lots, and general area spaces

Performance Summary

WaveMax® Technology

Assembled in the USA by Cree Lighting from US and imported parts

Initial Delivered Lumens: 3,000 - 32,000

Input Power: 25 - 248W

Efficacy: Up to 144 LPW

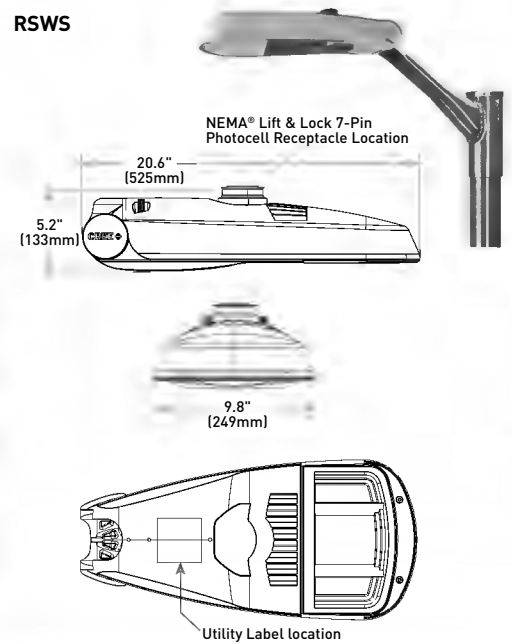
CRI: Minimum 70 CRI (3000K, 4000K & 5000K); 80 CRI (2700K, 3000K & 4000K; 3L/5L/9L lumen packages only)

CCT: 2700K, 3000K, 4000K, 5000K

Limited Warranty*: 10 years for luminaire; up to 5 years for Synapse® accessories; 1 year for luminaire accessories

* See <https://www.creeighting.com/resources/warranties/> for warranty terms. For Synapse accessories, consult Synapse spec sheets for details on warranty terms.

RSWS



Luminaire	Weight*
RSWS	9.4 lbs. (4.3kg)

* RSW-BLSS, RSW-CLSS, or RSW-FLSS Accessories: add 0.4 lbs. (0.2kg)

RSWM/RSWL/RSWX Luminaire - See page 14 for photos & dimensions

Ordering Information

Example: RSW-B-HT-2ME-3L-27K8-UL-GY-N

Luminaire										
RSW	B	HT							N	
Family	Size	Series	Mounting*	Optic	Lumen Package***	CCT/CRI	Voltage	Finish	Utility Label/Receptacle	Options
RSW	S Small	B	HT Horizontal Tenon	2LG** Type II Long	Small 3L 3,000 Lumens	27K8 2700K, 80 CRI - Available only with 3L, 5L, or 9L lumen packages	UL Universal 120-277V	BK Black	N Utility Label and NEMA® Lift & Lock 7-Pin Photocell Receptacle	4BLT Four Bolt Mounting - Mounts to 1.25" (32mm) IP, 1.66" (42mm) O.D. or 2" (51mm) IP, 2.375" (60mm) O.D. horizontal tenon - Available only with large or extra large lumen packages
	M Medium			2ME** Type II Medium	5L 5,000 Lumens	30K7 3000K, 70 CRI	UH Universal 347-480V	GY Grey	- External utility label per ANSI C136.15-2020 - 7-pin receptacle per ANSI C136.41 - Factory connected 0-10V dim leads - Requires photocell or shorting cap by others	20KV 20kV/10kA Surge Suppression - Replaces standard 10kV/5kA surge protection
	L Large			3ME** Type III Medium	7L 7,000 Lumens	30K8 3000K, 80 CRI				PP Pallet Packaging - Available only with small and medium luminaires
	X Extra Large				9L 9,000 Lumens	- Available only with 3L, 5L, or 9L lumen packages				- Multiple luminaires (up to 26 maximum per pallet for small; up to 22 maximum per pallet for medium)
					Large 14L 14,000 Lumens	40K7 4000K, 70CRI				Q9/Q8/Q7/Q6/Q5/Q4/Q3/Q2/Q1 Field Adjustable Lumen Output - Must select Q4, Q3, Q2, or Q1 for small lumen package - Must select Q8, Q7, Q6, Q5, Q4, Q3, Q2, or Q1 for medium lumen package - Must select Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, or Q1 for large or extra large lumen packages
					Extra Large 24L 24,000 Lumens	40K8 4000K, 80 CRI				- Offers full range lumen adjustability - Includes wattage label for setting selected - Refer to pages 7-13 for power and lumen values - Luminaire may also be dimmed through 7-Pin receptacle with use of dimming control by others
					32L 32,000 Lumens	50K7 5000K, 70CRI				SS Stainless Steel Bolts
						- Available only with 3L, 5L, or 9L lumen packages				X8/X7/X6/X5/X4/X3/X2/X1 Locked Lumen Output - Must select X3, X2, or X1 for small lumen packages - Must select X7, X6, X5, X4, X3, X2, or X1 for medium lumen package - Must select X8, X7, X6, X5, X4, X3, X2, or X1 for large or extra large lumen packages
										- Lumen output is permanently locked to the setting selected - Includes wattage label for setting selected - Refer to pages 7-13 for power and lumen values - Dimming is only available through 7-Pin receptacle with use of dimming control by others

* Reference EPA and pole configuration suitability data on page 6

** Available with Backlight Shield when ordered with field-installed accessory (see table on page 2)

*** Lumen Package codes identify approximate light output only. Actual lumen output levels vary depending on CCT and optic selection. Refer to Initial Delivered Lumen tables for specific lumen values



Website: creeighting.com
US: (800) 236-6800 Canada: (800) 473-1234

Product Specifications

WAVEMAX® TECHNOLOGY

Featuring up to 90% optical efficiency and precise control, WaveMax® Technology provides unmatched comfort and decreased LED source luminance by smoothly spreading brightness over a broader area. When integrated with luminous surfaces made of a polymer medium engineered with DiamondFacet™ optical elements, extremely high efficacy luminaires are the result – ultimately creating more visually comfortable and appealing environments while exceeding illumination performance.

CONSTRUCTION & MATERIALS

- Housing constructed of high strength, lightweight bulk molding compound for long weathering and durability
- UV stabilized polymeric door with handle pocket for tool-less entry
- Straight in wiring to terminal block for power input (#6-#14 AWG)
- Optic box and driver enclosure inside optic box meet IP66 requirements
- Mounts on 1.25" [32mm] IP, 1.66" [42mm] O.D. or 2" [51mm] IP, 2.375" [60mm] O.D. horizontal tenon (minimum 8" [203mm] in length) and is adjustable +/- 5° in 2.5° increments to allow for fixture leveling (two axis T-level included)
- Luminaire secures with two grade 5 steel mounting bolts w/clear zinc clad finish standard; optional 316 stainless steel mounting bolts available with SS option. Optional four bolt mounting is also available with large and extra large luminaires
- Comes standard with Utility Label per ANSI C136.15-2020 and 7-pin NEMA® Lift & Lock Photocell Receptacle per ANSI C136.41

Luminaire	Weight	Adder for Shielding		
		BLS	CLS	FLS
RSWS	9.4 lbs. [4.3kg]	0.4 lbs. [0.2kg]	0.4 lbs. [0.2kg]	0.4 lbs. [0.2kg]
RSWM	15.6 lbs. [7.1kg]	0.4 lbs. [0.2kg]	0.6 lbs. [0.3kg]	0.6 lbs. [0.3kg]
RSWL	20.2 lbs. [9.2kg]	0.6 lbs. [0.3kg]	1.0 lb. [0.5kg]	N/A
RSWX	28.8 lbs. [13.1kg]	0.8 lbs. [0.4kg]	N/A	N/A

* RSW-BLSS, RSW-CLSS, or RSW-FLSS Accessories: add 0.4 lbs. [0.2kg]; RSW-BLSM Accessory: add 0.4 lbs. [0.2kg]; RSW-CLSM or RSW-FLSM Accessories: add 0.6 lbs. [0.3kg]; RSW-BLSL Accessory: add 0.6 lbs. [0.3kg]; RSW-CLSL Accessory: add 1.0 lb. [0.5kg]

- Includes QR code on inside sidewall of housing which provides access to: Online installation instructions, Luminaire information (Part number, Serial number, Build date, and Warranty end date), and Warranty claim submission form
- Duplicate 1" and 2" QR code labels are included. 1" labels can be affixed inside pole bases, next to fixtures, on site plans, or in maintenance records. 2" labels can be scanned from the ground when placed at an appropriate height

ELECTRICAL SYSTEM

- Input Voltage:** 120-277V or 347-480V (available only with medium, large or extra large lumen packages), 50/60Hz
- Power Factor:** > 0.9 at full load
- Total Harmonic Distortion:** < 20% at full load
- Integral 10kV/5kA surge suppression protection standard; 20kV/10kA surge suppression protection optional
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- 10V Source Current:** 0.15mA
- Operating Temperature Range:** -40°C - +50°C (-40°F - +122°F) for RSWS, RSWM, RSWL-14L with Q/X1-Q/X5, and RSWX-24L with Q/X1-Q/X3; -40°C - +40°C (-40°F - +104°F) for other RSWL and RSWX settings

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- Meets CALTrans 611 Vibration testing
- ANSI C136.2 10kV/5kA (standard) and 20kV/10kA (optional) surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Assembled in the USA by Cree Lighting from US and imported parts
- Meets the requirements for Buy American Act (BAA) because it qualifies as a commercially-available off-the-shelf (COTS) item. Please refer to www.creelighting.com/BAA-BABA
- RoHS compliant. Consult factory for additional details
- DarkSky Approved when ordered with 27K7 or 30K7 CCTs. Please refer to <https://darksky.org/what-we-do/darksky-approved/products-companies/#/> ~ /search/keyword=cree for most current information
- DLC and DLC Premium qualified versions available. Please refer to <https://qpl.designlights.org/solid-state-lighting> for most current information
- CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

Accessories

Field-Installed	
Backlight Control Shields RSW-BLSS (for use with small lumen packages only) RSW-BLSM (for use with medium lumen packages only) RSW-BLSL (for use with large lumen packages only) RSW-BLSX (for use with extra large lumen packages only) - Provides 1 mounting height cutoff - 0.5" [13mm] 301 stainless steel construction - Refer to initial delivered lumen tables for lumen output	Cul-De-Sac Shields RSW-CLSS (for use with small lumen packages only) RSW-CLSM (for use with medium lumen packages only) RSW-CLSL (for use with large lumen packages only) - Provides backlight and sidelight control - 0.5" [13mm] 301 stainless steel construction - Lumen multiplier from standard optic: 0.77 [S/M]; 0.75 [L] Front Light Shields RSW-FLSS (for use with small lumen packages only) RSW-FLSM (for use with medium lumen packages only) - Provides front light control - 0.5" [13mm] 301 stainless steel construction - Lumen multiplier from standard optic: 0.87
Bird Guards RSW-BRDGRDS (for use with small lumen packages only) RSW-BRDGRDM (for use with medium lumen packages only) - 5052-H32 aluminum construction	Shorting Cap XA-XLSHRT

Product Specifications

SYNAPSE® SIMPLYSNAP INTELLIGENT CONTROL

FOR NON-STREET LIGHTING APPLICATIONS ONLY

The RSW Series is compatible with the Synapse® SimplySNAP platform. A highly intuitive connected lighting solution for Site and Area applications only. The system features a reliable and robust self-healing mesh network with a browser-based interface that runs on smartphones, tablets, and PCs.

Using a Twist-Lock Lighting Controller and Site Controller, SimplySnap provides: energy productivity, code compliance and a better light experience for non-street lighting installations. SimplySNAP is optimized to create and manage networks for campus wide Area and Site applications which differs from networking requirements for street lighting applications. Controller (TL7-B2) and Site Controller (SS450-002) take the RSW Series to a new performance plateau, providing extreme energy productivity, code compliance and a better light experience.

Synapse Wireless Control Accessories	
Twist-Lock Lighting Controller TL7-HVG - Suitable for 120-480V (UL and UH) voltage - Requires NEMA/ANSI C136.41 7-Pin Dimming Receptacle - Provides On/Off switching, dimming, power metering, digital sensor input, and status monitoring of luminaire - Refer to TL7-HVG spec sheet for details	SimplySNAP On-Site Controller SS450-002 - Verizon® LTE-enabled - Designed for indoor applications - Refer to SS450-002 spec sheet for details Building Management System (BMS) Gateway BMS-GW-002 - Required for BACnet integration - Refer to BMS-GW-002 spec sheet for details
SimplySNAP Central Base Station CBSW-450-002 - Includes On-Site Controller (SS450-002) and 5-button switch - Indoor and Outdoor rated - Refer to CBSW-450-002 spec sheet for details	Outdoor Antennas (Optional, for increased range, 8dB gain) KIT-ANT405M - Kit includes antenna, 20' cable and bracket KIT-ANT360 - Kit includes antenna, 30' cable and bracket KIT-ANT400 - Kit includes antenna, 50' cable and bracket - Refer to Outdoor antenna spec sheet for details
Synapse Wireless Sensor WSN-DPM - Motion and light sensor - Control multiple zones - Refer to WSN-DPM spec sheet for details	

Electrical Data*									
Lumen Package	CCT/CRI	System Watts 120-480V**	Utility Wattage Label†	Total Current (A)					
				120V	208V	240V	277V	347V	480V
3L	27K8	29	30	0.25	0.14	0.13	0.11	N/A	N/A
	30K7	27	30	0.23	0.13	0.12	0.10	N/A	N/A
	30K8	29	30	0.25	0.14	0.13	0.11	N/A	N/A
	40K7	25	30	0.21	0.12	0.11	0.09	N/A	N/A
	40K8	27	30	0.23	0.13	0.12	0.10	N/A	N/A
5L	50K7	25	30	0.21	0.12	0.11	0.09	N/A	N/A
	27K8	45	50	0.38	0.22	0.19	0.16	N/A	N/A
	30K7	42	40	0.36	0.20	0.18	0.15	N/A	N/A
	30K8	45	50	0.38	0.22	0.19	0.16	N/A	N/A
	40K7	40	40	0.34	0.20	0.17	0.15	N/A	N/A
7L	40K8	45	50	0.38	0.22	0.19	0.16	N/A	N/A
	50K7	40	40	0.34	0.20	0.17	0.15	N/A	N/A
	30K7	51	50	0.43	0.25	0.21	0.19	N/A	N/A
	40K7	50	50	0.42	0.24	0.21	0.18	N/A	N/A
	50K7	50	50	0.42	0.24	0.21	0.18	N/A	N/A
9L	27K8	76	80	0.64	0.37	0.32	0.28	0.22	0.16
	30K7	73	70	0.62	0.36	0.31	0.27	0.21	0.16
	30K8	76	80	0.64	0.37	0.32	0.28	0.22	0.16
	40K7	64	60	0.54	0.31	0.27	0.24	0.19	0.14
	40K8	76	80	0.64	0.37	0.32	0.28	0.22	0.16
14L	50K7	64	60	0.54	0.31	0.27	0.24	0.19	0.14
	30K7	108	110	0.91	0.52	0.46	0.40	0.31	0.23
	40K7	111	110	0.94	0.54	0.47	0.41	0.32	0.23
24L	50K7	111	110	0.94	0.54	0.47	0.41	0.32	0.23
	30K7	194	190	1.66	0.94	0.81	0.71	0.57	0.41
	40K7	167	170	1.42	0.81	0.70	0.61	0.49	0.35
32L	50K7	167	170	1.42	0.81	0.70	0.61	0.49	0.35
	30K7	248	250	2.10	1.21	1.05	0.92	0.72	0.52
	40K7	248	250	2.10	1.21	1.05	0.92	0.72	0.52
	50K7	248	250	2.10	1.21	1.05	0.92	0.72	0.52

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V or 347-480V +/- 10%.
** 3L, 5L and 7L are available with UL voltage only.
† Refer to Field Adjustable Output tables beginning on page 7 for utility label lumen values.

RSW-B Series Ambient Adjusted Lumen Maintenance ¹						
Ambient	Initial LMF	25K hr Reported ² LMF	50K hr Reported ² LMF	75K hr Reported ² LMF	100K hr Reported ² LMF	
5°C (41°F)	1.03	1.02	1.01	1.00	0.99	0.99
10°C (50°F)	1.02	1.01	1.00	0.99	0.99	0.98
15°C (59°F)	1.02	1.01	1.00	0.99	0.99	0.98
20°C (68°F)	1.01	1.00	0.99	0.98	0.98	0.97
25°C (77°F)	1.00	0.99	0.98	0.97	0.97	0.96

¹ Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaires testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors. Please refer to the [Temperature Zone Reference Document](#) for outdoor average nighttime ambient conditions.
² In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.

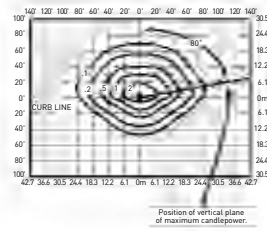
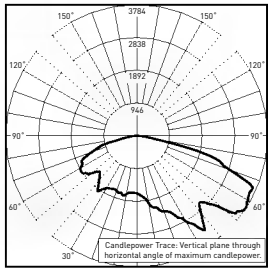
RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult:

<https://www.creeighting.com/products/outdoor/street-and-roadway/rsw-series>

2LG



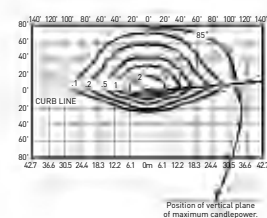
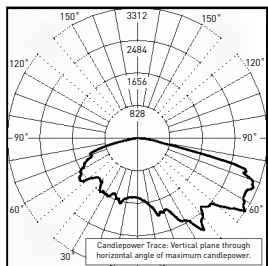
RESL Test Report #: PL15985-001A
RSWM-B--2LG-9L-40K7-UL-**-N**
Initial Delivered Lumens: 8,575

RSWM-B--2LG-9L-40K7-UL-**-N**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 9,000
Initial FC at grade

Type II Long Distribution													
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)		
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	
3L	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	
5L	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	
7L	N/A	N/A	6,700	B2 U0 G2	N/A	N/A	7,000	B2 U0 G2	N/A	N/A	7,000	B2 U0 G2	
9L	8,200	B2 U0 G2	9,000	B2 U0 G2	8,700	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2	
14L	N/A	N/A	14,500	B3 U0 G3	N/A	N/A	14,500	B3 U0 G3	N/A	N/A	14,500	B3 U0 G3	
24L	N/A	N/A	24,000	B3 U0 G3	N/A	N/A	24,000	B3 U0 G3	N/A	N/A	24,000	B3 U0 G3	
32L	N/A	N/A	29,000	B3 U0 G3	N/A	N/A	32,000	B4 U0 G4	N/A	N/A	32,000	B4 U0 G4	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens

** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt



RESL Test Report #: PL16167-001A
RSWS-B--2LG-7L-40K7-UL-**-N w/RSW-BLSM**
Initial Delivered Lumens: 6,379

RSWM-B--2LG-9L-40K7-UL-**-N w/RSW-BLSM**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 8,250
Initial FC at grade

Type II Long Distribution w/BLS													
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)		
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	
3L	3,040	B1 U0 G1	3,040	B1 U0 G1	3,040	B1 U0 G1	3,040	B1 U0 G1	3,040	B1 U0 G1	3,040	B1 U0 G1	
5L	4,610	B1 U0 G1	4,610	B1 U0 G1	4,610	B1 U0 G1	4,610	B1 U0 G1	4,610	B1 U0 G1	4,610	B1 U0 G1	
7L	N/A	N/A	6,175	B1 U0 G2	N/A	N/A	6,450	B1 U0 G2	N/A	N/A	6,450	B1 U0 G2	
9L	7,525	B1 U0 G2	8,250	B1 U0 G2	7,975	B1 U0 G2	8,250	B1 U0 G2	8,250	B1 U0 G2	8,250	B1 U0 G2	
14L	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3	
24L	N/A	N/A	22,100	B3 U0 G5	N/A	N/A	22,100	B3 U0 G5	N/A	N/A	22,100	B3 U0 G5	
32L	N/A	N/A	26,700	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5	

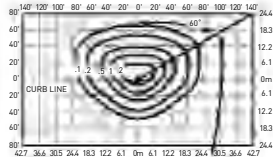
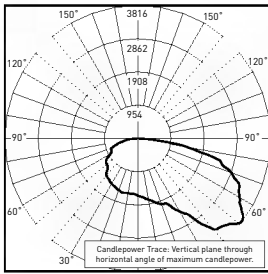
* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens

** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

Photometry

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2ME

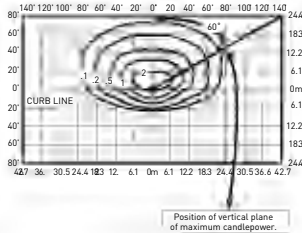
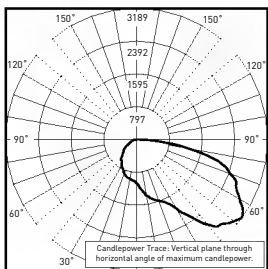


RESTL Test Report #: PL16070-001A
RSWM-B-2ME-9L-40K7-UL**-N**
Initial Delivered Lumens: 9,166

RSWM-B-2ME-9L-40K7-UL**-N**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 9,000
Initial FC at grade

Type II Medium Distribution													
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)		
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	
3L	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	
5L	5,000	B1 U0 G2	5,000	B1 U0 G2	5,000	B1 U0 G2	5,000	B1 U0 G2	5,000	B1 U0 G2	5,000	B1 U0 G2	
7L	N/A	N/A	6,700	B2 U0 G2	N/A	N/A	7,000	B2 U0 G2	N/A	N/A	7,000	B2 U0 G2	
9L	8,200	B2 U0 G2	9,000	B2 U0 G2	8,700	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2	
14L	N/A	N/A	14,500	B3 U0 G3	N/A	N/A	14,500	B3 U0 G3	N/A	N/A	14,500	B3 U0 G3	
24L	N/A	N/A	24,000	B3 U0 G4	N/A	N/A	24,000	B3 U0 G4	N/A	N/A	24,000	B3 U0 G4	
32L	N/A	N/A	29,000	B3 U0 G4	N/A	N/A	32,000	B4 U0 G4	N/A	N/A	32,000	B4 U0 G4	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
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RESTL Test Report #: PL16447-001A
RSW-B-2ME-7L-40K7-UL**-N w/ RSW-BLSM**
Initial Delivered Lumens: 6,648

RSW-B-2ME-7L-40K7-UL**-N w/ RSW-BLSM**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 8,250
Initial FC at grade

Type II Medium Distribution w/BLS													
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)		
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	
3L	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	
5L	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	
7L	N/A	N/A	6,175	B1 U0 G3	N/A	N/A	6,450	B1 U0 G3	N/A	N/A	6,450	B1 U0 G3	
9L	7,525	B1 U0 G3	8,250	B1 U0 G3	7,975	B1 U0 G3	8,250	B1 U0 G3	8,250	B1 U0 G3	8,250	B1 U0 G3	
14L	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3	
24L	N/A	N/A	22,100	B3 U0 G5	N/A	N/A	22,100	B3 U0 G5	N/A	N/A	22,100	B3 U0 G5	
32L	N/A	N/A	26,700	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5	

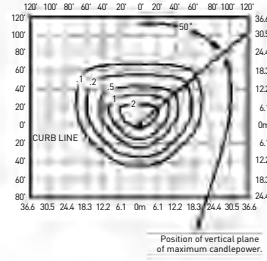
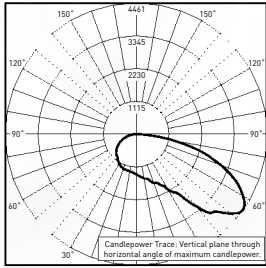
* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
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RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Photometry

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3ME

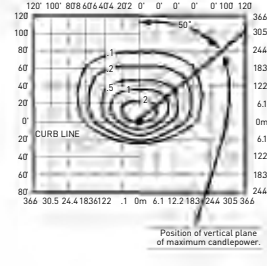
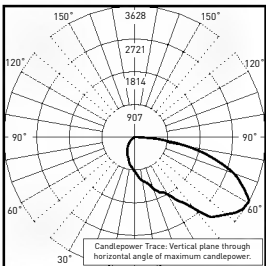


RESTL Test Report #: PL15958-001A
RSWM-B--3ME-9L-40K7-UL-**-N**
Initial Delivered Lumens: 8,705

RSWM-B--3ME-9L-40K7-UL-**-N**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 9,000
 Initial FC at grade

Type III Medium Distribution												
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)	
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20
3L	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1	3,300	B1 U0 G1
5L	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1	5,000	B1 U0 G1
7L	N/A	N/A	6,700	B1 U0 G2	N/A	N/A	7,000	B1 U0 G2	N/A	N/A	7,000	B1 U0 G2
9L	8,200	B2 U0 G2	9,000	B2 U0 G2	8,700	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2	9,000	B2 U0 G2
14L	N/A	N/A	14,500	B2 U0 G3	N/A	N/A	14,500	B2 U0 G3	N/A	N/A	14,500	B2 U0 G3
24L	N/A	N/A	24,000	B3 U0 G3	N/A	N/A	24,000	B3 U0 G3	N/A	N/A	24,000	B3 U0 G3
32L	N/A	N/A	29,000	B3 U0 G4	N/A	N/A	32,000	B3 U0 G4	N/A	N/A	32,000	B3 U0 G4

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
 ** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt



RESTL Test Report # PL16166-001A
RSWS-B--3ME-7L-40K7-UL-**-N w/ RSW-BLSS**
Initial Delivered Lumens: 6,603

RSWM-B--3ME-9L-40K7-UL-**-N w/RSW-BLSM**
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 8,250
 Initial FC at grade

Type III Medium Distribution w/BLS												
Lumen Package	27K (80 CRI)		3000K (70 CRI)		3000K (80 CRI)		4000K (70 CRI)		4000K (80 CRI)		5000K (70 CRI)	
	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20	Initial Delivered Lumens*	BUG Ratings** per TM-15-20
3L	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2	3,040	B1 U0 G2
5L	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2	4,610	B1 U0 G2
7L	N/A	N/A	6,175	B1 U0 G3	N/A	N/A	6,450	B1 U0 G3	N/A	N/A	6,450	B1 U0 G3
9L	7,525	B1 U0 G3	8,250	B1 U0 G3	7,975	B1 U0 G3	8,250	B1 U0 G3	8,250	B1 U0 G3	8,250	B1 U0 G3
14L	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3	N/A	N/A	12,800	B2 U0 G3
24L	N/A	N/A	22,100	B3 U0 G4	N/A	N/A	22,100	B3 U0 G4	N/A	N/A	22,100	B3 U0 G4
32L	N/A	N/A	26,700	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5	N/A	N/A	29,400	B3 U0 G5

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
 ** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Luminaire EPA

Horizontal Tenon Mount – RSWS Weight: 9.4 lbs. (4.3kg); RSW-BLSS, RSW-CLSS, or RSW-FLSS Accessories: add 0.4 lbs. (0.2kg); RSWM Weight: 15.6 lbs. (7.1kg); RSW-BLSM Accessory: add 0.4 lbs. (0.2kg); RSW-CLSM or RSW-FLSM Accessories: add 0.6 lbs. (0.3kg); RSWL Weight: 20.2 lbs. (9.2kg); RSW-BLSL Accessory: add 0.6 lbs. (0.3kg); RSW-CLSL Accessory: add 1.0 lb. (0.5kg); RSWX Weight: 28.8 lbs. (13.1kg); RSW-BLSX Accessory: add 0.8 lbs. (0.4kg)

	Single	2 @ 90°	2 @ 180°	3 @ 90°	4 @ 90°
	Tenon Configuration [0° - 80° Tilt]; If used with Cree Lighting tenons, please add tenon EPA with Luminaire EPA				
Luminaire					
	PD-1H4; PT-1H	PD-2H4(90); PT-2H(90)	PD-2H4(180); PT-2H(180)	PD-3H4(90); PT-3H(90)	PD-4H4(90); PT-4H(90)
RSWS	0.61	0.89	1.22	1.50	1.78
RSWM	0.86	1.24	1.71	2.10	2.49
RSWL	1.00	1.55	2.00	2.55	3.10
RSWX	1.17	1.93	2.33	3.09	3.85
RSWS Luminaire w/RSW-BLSS, RSW-CLSS or RSW-FLSS Accessory	0.61	1.25	1.22	1.85	2.49
RSWM Luminaire w/RSW-BLSM, RSW-CLSM or RSW-FLSM Accessory	0.86	1.59	1.71	2.45	3.19
RSWL Luminaire w/RSW-BLSL or RSW-CLSL Accessory	1.01	2.16	2.01	3.17	4.33
RSWX Luminaire w/RSW-BLSX Accessory	1.18	2.85	2.35	4.02	5.70

Tenon EPA

Part Number	EPA
PD Series Tenons	0.09
PT Series Tenons	0.10
WM-2L	0.13
XA-TMDA8	0.19

Tenons and Brackets* (must specify color)

Square Internal Mount Horizontal Tenons (Aluminum)
 - Mounts to 4" (102mm) square aluminum or steel poles
 PD-1H4 - Single PD-3H4(90) - 90° Triple
 PD-2H4(90) - 90° Twin PD-4H4(90) - 90° Quad
 PD-2H4(180) - 180° Twin

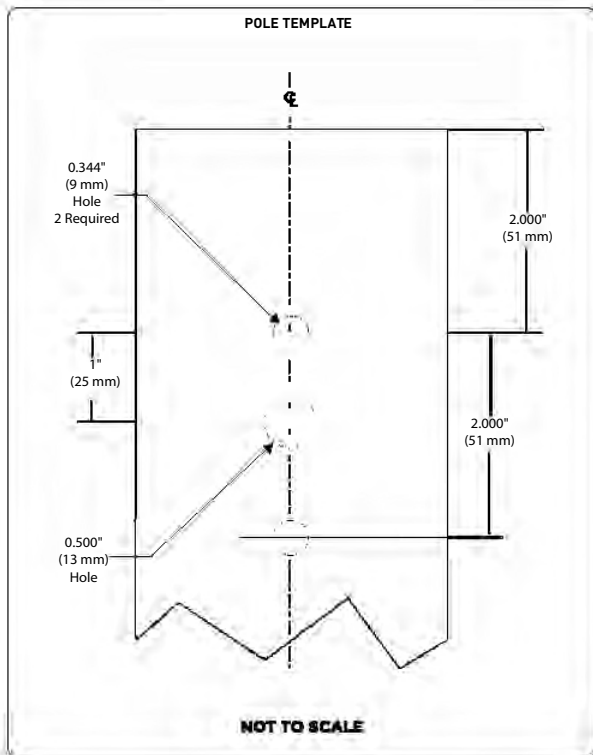
Round External Mount Horizontal Tenons (Aluminum)
 - Mounts to 2.375"-3" (60-76mm) O.D. round aluminum or steel poles or tenons
 PT-1H - Single PT-3H(90) - 90° Triple
 PT-2H(90) - 90° Twin PT-4H(90) - 90° Quad
 PT-2H(180) - 180° Twin

Wall Mount Brackets
 - Mounts to wall or roof
 WM-2L - Extended Horizontal

Direct Arm Pole Adaptor Bracket
 - Mounts to 3-6" (76-152mm) round or square aluminum or steel poles
 XA-TMDA8

* Refer to the Bracket and Tenons spec sheet for more details

Fixture Mounting Drill Pattern for XA-TMDA8



Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 3L

Q Setting	X Setting	CCT/CRI	System Watts †	Lumen Values		Utility Label		Optics Qualified on DLC QPL	
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Standard	DLC Premium
Q4 (Full Power)	N/A (Full Power)	27K8	29	3,300	3,040	30	3000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	27			30			2LG, 2ME, 3ME
		30K8	29			30			2LG, 2ME, 3ME
		40K7	25			30			2LG, 2ME, 3ME
		40K8	27			30			2LG, 2ME, 3ME
		50K7	25			30			2LG, 2ME, 3ME
Q3	X3	27K8	24	2,730	2,520	20	3000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	22			20			2LG, 2ME, 3ME
		30K8	24			20			2LG, 2ME, 3ME
		40K7	21			20			2LG, 2ME, 3ME
		40K8	22			20			2LG, 2ME, 3ME
		50K7	21			20			2LG, 2ME, 3ME
Q2	X2	27K8	19	2,230	2,060	20	2000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	18			20			2LG, 2ME, 3ME
		30K8	19			20			2LG, 2ME, 3ME
		40K7	17			20			2LG, 2ME, 3ME
		40K8	18			20			2LG, 2ME, 3ME
		50K7	17			20			2LG, 2ME, 3ME
Q1	X1	27K8	15	1,730	1,600	20	2000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	14			10			2LG, 2ME, 3ME
		30K8	15			20			2LG, 2ME, 3ME
		40K7	13			10			2LG, 2ME, 3ME
		40K8	14			10			2LG, 2ME, 3ME
		50K7	13			10			2LG, 2ME, 3ME

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 5L

Q Setting	X Setting	CCT/CRI	System Watts †	Lumen Values		Utility Label		Optics Qualified on DLC QPL	
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Standard	DLC Premium
Q4 (Full Power)	N/A (Full Power)	27K8	45	5,000	4,610	50	5000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	42			40			
		30K8	45			50			
		40K7	40			40			
		40K8	45			50			
		50K7	40			40			
Q3	X3	27K8	40	4,610	4,250	40	5000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	38			40			
		30K8	40			40			
		40K7	36			40			
		40K8	40			40			
		50K7	36			40			
Q2	X2	27K8	36	4,180	3,850	40	4000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	34			30			
		30K8	36			40			
		40K7	33			30			
		40K8	36			40			
		50K7	33			30			
Q1	X1	27K8	32	3,720	3,430	30	4000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	30			30			
		30K8	32			30			
		40K7	29			30			
		40K8	32			30			
		50K7	29			30			

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 7L

Q Setting	X Setting	CCT/CRI	System Watts [†]	Lumen Values		Utility Label		Optics Qualified on DLC QPL
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Premium
Q4 (Full Power)	N/A (Full Power)	30K7	51	6,700	6,175	50	7000 L	2LG, 2ME, 3ME
		40K7	50	7,000	6,450	50		2LG, 2ME, 3ME
		50K7	50	7,000	6,450	50		2LG, 2ME, 3ME
Q3	X3	30K7	45	6,125	5,650	50	6000 L	2LG, 2ME, 3ME
		40K7	45	6,400	5,900	50		2LG, 2ME, 3ME
		50K7	45	6,400	5,900	50		2LG, 2ME, 3ME
Q2	X2	30K7	40	5,475	5,050	40	5000 L	2LG, 2ME, 3ME
		40K7	39	5,700	5,260	40	6000 L	2LG, 2ME, 3ME
		50K7	39	5,700	5,260	40		2LG, 2ME, 3ME
Q1	X1	30K7	35	4,850	4,470	40	5000 L	2LG, 2ME, 3ME
		40K7	35	5,075	4,680	40		2LG, 2ME, 3ME
		50K7	35	5,075	4,680	40		2LG, 2ME, 3ME

[†] Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 9L

Q Setting	X Setting	CCT/CRI	System Watts †	Lumen Values		Utility Label		Optics Qualified on DLC QPL	
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Standard	DLC Premium
Q8 [Full Power]	N/A [Full Power]	27K8	76	8,200	7,525	80	9000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	73	9,000	8,250	70			
		30K8	76	8,700	7,975	80			
		40K7	64	9,000	8,250	60			
		40K8	76			80			
		50K7	64			60			
Q7	X7	27K8	73	7,925	7,275	70	8000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	70	8,700	7,975	70	9000 L		
		30K8	73	8,400	7,700	70	8000 L		
		40K7	61	8,700	7,975	60	9000 L		
		40K8	73			70			
		50K7	61			60			
Q6	X6	27K8	69	7,575	6,950	70	8000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	66	8,275	7,600	70			
		30K8	69	8,025	7,375	70			
		40K7	58	8,275	7,600	60			
		40K8	69			70			
		50K7	58			60			
Q5	X5	27K8	63	7,050	6,475	60	7000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	61	7,725	7,100	60	8000 L		
		30K8	63	7,475	6,850	60	7000 L		
		40K7	53	7,725	7,100	50	8000 L		
		40K8	63			60			
		50K7	53			50			
Q4	X4	27K8	61	6,850	6,275	60	7000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	59	7,500	6,875	60	8000 L		
		30K8	61	7,275	6,675	60	7000 L		
		40K7	52	7,500	6,875	50	8000 L		
		40K8	61			60			
		50K7	52			50			
Q3	X3	27K8	58	6,500	5,975	60	7000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	56	7,100	6,525	60			
		30K8	58	6,900	6,325	60			
		40K7	49	7,100	6,525	50			
		40K8	58			60			
		50K7	49			50			
Q2	X2	27K8	56	6,300	5,775	60	6000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	54	6,875	6,300	50	7000 L		
		30K8	56	6,675	6,125	60			
		40K7	47	6,875	6,300	50			
		40K8	56			60			
		50K7	47			50			
Q1	X1	27K8	49	5,625	5,175	50	6000 L	2LG, 2ME, 3ME	2LG, 2ME, 3ME
		30K7	47	6,125	5,625	50			
		30K8	49	5,975	5,475	50			
		40K7	42	6,125	5,625	40			
		40K8	49			50			
		50K7	42			40			

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V or 347-480V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 14L

Q Setting	X Setting	CCT/CRI	System Watts †	Lumen Values		Utility Label		Optics Qualified on DLC QPL
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Premium
Q9 (Full Power)	N/A (Full Power)	30K7	108	14,500	12,800	110	15000 L	2LG, 2ME, 3ME
		40K7	111			110		2LG, 2ME, 3ME
		50K7	111			110		2LG, 2ME, 3ME
Q8	X8	30K7	103	14,025	12,400	100	14000 L	2LG, 2ME, 3ME
		40K7	105			110		2LG, 2ME, 3ME
		50K7	105			110		2LG, 2ME, 3ME
Q7	X7	30K7	97	13,400	11,825	100	13000 L	2LG, 2ME, 3ME
		40K7	99			100		2LG, 2ME, 3ME
		50K7	99			100		2LG, 2ME, 3ME
Q6	X6	30K7	93	12,950	11,450	90	13000 L	2LG, 2ME, 3ME
		40K7	95			100		2LG, 2ME, 3ME
		50K7	95			100		2LG, 2ME, 3ME
Q5	X5	30K7	85	11,950	10,550	90	12000 L	2LG, 2ME, 3ME
		40K7	86			90		2LG, 2ME, 3ME
		50K7	86			90		2LG, 2ME, 3ME
Q4	X4	30K7	79	11,175	9,875	80	11000 L	2LG, 2ME, 3ME
		40K7	80			80		2LG, 2ME, 3ME
		50K7	80			80		2LG, 2ME, 3ME
Q3	X3	30K7	70	10,175	9,000	70	10000 L	2LG, 2ME, 3ME
		40K7	71			70		2LG, 2ME, 3ME
		50K7	71			70		2LG, 2ME, 3ME
Q2	X2	30K7	63	9,225	8,150	60	9000 L	2LG, 2ME, 3ME
		40K7	64			60		2LG, 2ME, 3ME
		50K7	64			60		2LG, 2ME, 3ME
Q1	X1	30K7	57	8,425	7,450	60	8000 L	2LG, 2ME, 3ME
		40K7	57			60		2LG, 2ME, 3ME
		50K7	57			60		2LG, 2ME, 3ME

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V or 347-480V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output (rounded to nearest 1000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 24L

Q Setting	X Setting	CCT/CRI	System Watts †	Lumen Values		Utility Label		Optics Qualified on DLC QPL
			120-277V	2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Premium
Q9 (Full Power)	N/A (Full Power)	30K7	194	24,000	22,100	190	24000 L	2LG, 2ME, 3ME
		40K7	167			170		2LG, 2ME, 3ME
		50K7	167			170		2LG, 2ME, 3ME
Q8	X8	30K7	185	23,200	21,300	190	23000 L	2LG, 2ME, 3ME
		40K7	160			160		2LG, 2ME, 3ME
		50K7	160			160		2LG, 2ME, 3ME
Q7	X7	30K7	174	22,100	20,300	170	22000 L	2LG, 2ME, 3ME
		40K7	151			150		2LG, 2ME, 3ME
		50K7	151			150		2LG, 2ME, 3ME
Q6	X6	30K7	167	21,300	19,600	170	21000 L	2LG, 2ME, 3ME
		40K7	145			150		2LG, 2ME, 3ME
		50K7	145			150		2LG, 2ME, 3ME
Q5	X5	30K7	152	19,600	18,000	150	20000 L	2LG, 2ME, 3ME
		40K7	132			130		2LG, 2ME, 3ME
		50K7	132			130		2LG, 2ME, 3ME
Q4	X4	30K7	140	18,300	16,800	140	18000 L	2LG, 2ME, 3ME
		40K7	122			120		2LG, 2ME, 3ME
		50K7	122			120		2LG, 2ME, 3ME
Q3	X3	30K7	125	16,600	15,300	130	17000 L	2LG, 2ME, 3ME
		40K7	108			110		2LG, 2ME, 3ME
		50K7	108			110		2LG, 2ME, 3ME
Q2	X2	30K7	111	15,000	13,775	110	15000 L	2LG, 2ME, 3ME
		40K7	97			100		2LG, 2ME, 3ME
		50K7	97			100		2LG, 2ME, 3ME
Q1	X1	30K7	100	13,700	12,600	100	14000 L	2LG, 2ME, 3ME
		40K7	87			90		2LG, 2ME, 3ME
		50K7	87			90		2LG, 2ME, 3ME

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V or 347-480V +/-10%

RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

Field Adjustable Output (Q4/Q3/Q2/Q1) Option Description:

The Field Adjustable Output option enables the street and area luminaire within the RSW Series on this page to be tuned to the exact needs of a particular application through multiple levels of adjustment. When ordered with the Q option, the luminaire will be shipped from the factory at the selected lumen output, will be fully adjustable between the outputs, and will include an ANSI C136.15-2020 utility label that indicates the wattage (rounded to nearest 10W), the lumen output ($\leq 24,000$ lumens rounded to nearest 1000 lumens, > 24,001 lumens rounded to the nearest 2000 lumens), and the CCT of the luminaire at the selected lumen output. Additional dimming functionality is available when a dimming control (by others) is used in the 7-Pin receptacle.

Locked Lumen Output (X3/X2/X1) Option Description:

The Locked Lumen Output option on this page permanently locks the lumen output on the RSW Series street and area luminaire to the setting selected. When ordered with the X option, the luminaire will be shipped from the factory at the lumen output setting selected, and will include a utility label that indicates the wattage, lumen output, and CCT of the setting selected. When this option is selected, the luminaire output is not able to be adjusted in the field except if a dimming control (by others) is used in the 7-Pin receptacle.

Q & X Option Power & Lumen Data – 32L

Q Setting	X Setting	CCT/CRI	System Watts †		Lumen Values		Utility Label		Optics Qualified on DLC QPL
			120-277V		2LG, 2ME, 3ME	w/BLS	Wattage	Lumens	DLC Premium
Q9 (Full Power)	N/A (Full Power)	30K7	248		29,000	26,700	250	30000 L	2LG, 2ME, 3ME
		40K7	248		32,000	29,400	250	32000 L	2LG, 2ME, 3ME
		50K7	248				250		2LG, 2ME, 3ME
Q8	X8	30K7	237		28,000	25,700	240	28000 L	2LG, 2ME, 3ME
		40K7	237		30,900	28,400	240	30000 L	2LG, 2ME, 3ME
		50K7	237				240		2LG, 2ME, 3ME
Q7	X7	30K7	223		26,800	24,600	220	26000 L	2LG, 2ME, 3ME
		40K7	223		29,600	27,200	220	30000 L	2LG, 2ME, 3ME
		50K7	223				220		2LG, 2ME, 3ME
Q6	X6	30K7	213		25,900	23,800	210	26000 L	2LG, 2ME, 3ME
		40K7	213		28,600	26,300	210	28000 L	2LG, 2ME, 3ME
		50K7	213				210		2LG, 2ME, 3ME
Q5	X5	30K7	193		23,900	22,000	190	24000 L	2LG, 2ME, 3ME
		40K7	193		26,400	24,300	190	26000 L	2LG, 2ME, 3ME
		50K7	193				190		2LG, 2ME, 3ME
Q4	X4	30K7	178		22,400	20,600	180	22000 L	2LG, 2ME, 3ME
		40K7	178		24,700	22,700	180	24000 L	2LG, 2ME, 3ME
		50K7	178				180		2LG, 2ME, 3ME
Q3	X3	30K7	159		20,300	18,700	160	20000 L	2LG, 2ME, 3ME
		40K7	159		22,400	20,600	160	22000 L	2LG, 2ME, 3ME
		50K7	159				160		2LG, 2ME, 3ME
Q2	X2	30K7	142		18,500	17,000	140	19000 L	2LG, 2ME, 3ME
		40K7	142		20,400	18,700	140	20000 L	2LG, 2ME, 3ME
		50K7	142				140		2LG, 2ME, 3ME
Q1	X1	30K7	127		16,900	15,500	130	17000 L	2LG, 2ME, 3ME
		40K7	127		18,700	17,200	130	19000 L	2LG, 2ME, 3ME
		50K7	127				130		2LG, 2ME, 3ME

† Electrical and lumen data at 25°C (77°F). Actual wattage and lumen output may differ by +/-10% when operating between 120-277V or 347-480V +/-10%

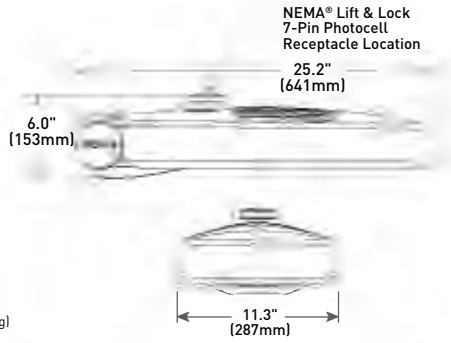
RSW™ LED Street Luminaire – Small, Medium, Large & Extra Large

RSWM



Weight*
15.6 lbs. (7.1kg)

*RSW-BLSM Accessory: add 0.4 lbs. (0.2kg);
RSW-CLSM or RSW-FLSM Accessories: add 0.6 lbs. (0.3kg)



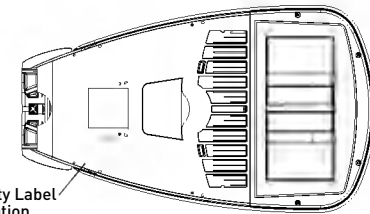
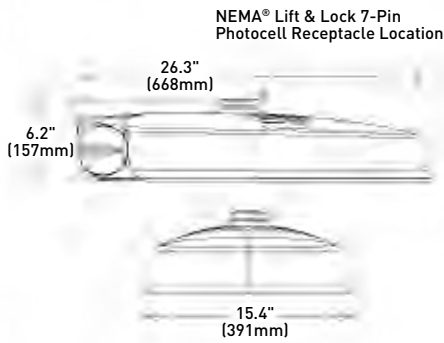
Utility Label Location

RSWL



Weight*
20.2 lbs. (9.2kg)

*RSW-BLSL Accessory: add 0.6 lbs. (0.3kg);
RSW-CLSL Accessory: add 1.0 lb. (0.5kg)



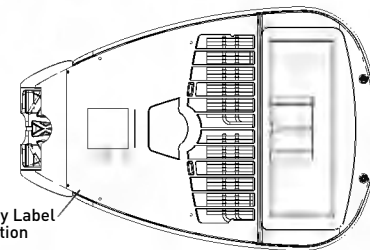
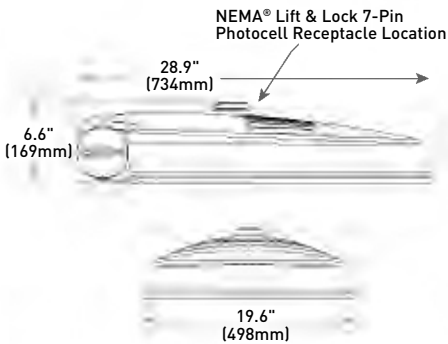
Utility Label Location

RSWX



Weight*
28.8 lbs. (13.1kg)

*RSW-BLSX Accessory: add 0.8 lbs. (0.4kg)



Utility Label Location

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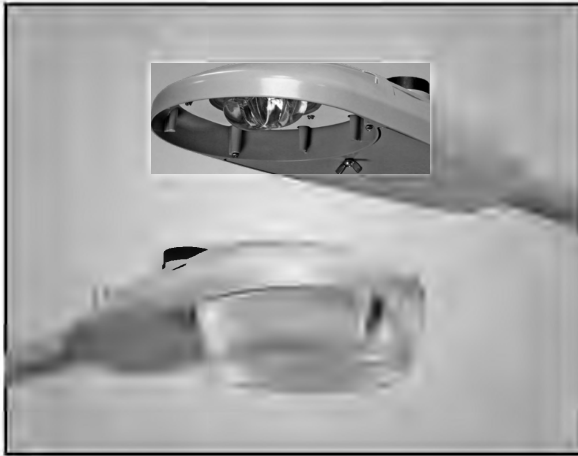


Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction



Autobahn Series ATBS Roadway & Security Lighting

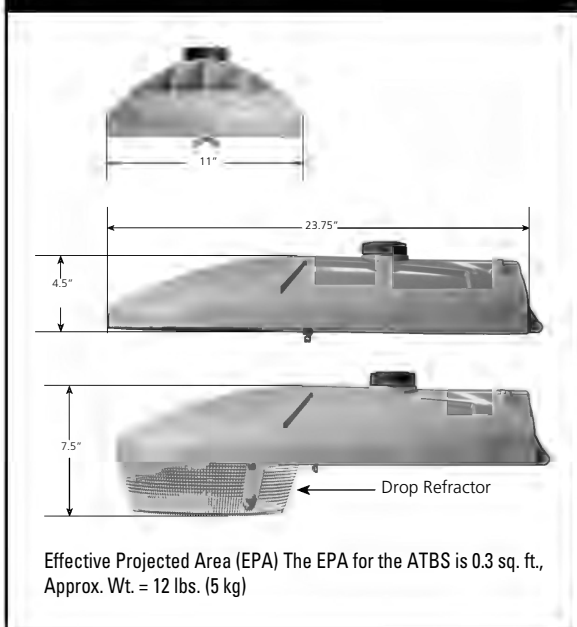
PRODUCT OVERVIEW



Applications:

Residential streets
Parking lots
General security lighting

DIMENSIONS



STANDARDS

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of $\leq 3000\text{K}$ must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

GOVERNMENT PROCUREMENT — BAA – Buy America(n) Act: Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.

BABA – Build America Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Build America, Buy America Act.

Please refer to www.acuitybrands.com/buy-american for additional information.

Note: Actual performance may differ as a result of end-user environment and application. Specifications subject to change without notice.

Features:

OPTICAL

Same Light: Performance is comparable to 100W – 200W HPS and up to 175W Mercury Vapor roadway and security lighting luminaires.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, and V roadway distributions. When used with the optional acrylic refractor the unit provides approximately 10% uplight and increased vertical foot-candles

ELECTRICAL

Expected Life: LED light engines are rated $>100,000$ hours at 25°C , L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40–60% over comparable HID luminaires.

Standard surge protection is 20kV/10kA “Extreme Level” per ANSI C136.2. An optional MOV pack provides 10kV/5kA “Enhanced Level”.

Luminaire ships with a 0–10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt clamping mechanism provides 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life)

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Autobahn Series ATBS

Roadway & Security Lighting

ORDERING INFORMATION

Series	Performance Packages	Voltage	Optics
ATBS Autobahn LED Roadway & Security	P10 5,500 lumens P20 6,800 lumens P30 8,300 lumens P40 9,400 lumens P50 10,800 lumens P60 ⁴ 11,850 lumens	MVOLT Multi-volt, 120-277V 347 347V 480 480V	R2 Roadway Type II R3 Roadway Type III R5 Roadway Type V D3 Type III, Drop Refractor included D5 Type V, Drop Refractor included
Options			

Color Temperature (CCT)
(Blank) 4000K CCT, 70 CRI Min.
27K² 2700K CCT, 70 CRI Min.
3K 3000K CCT, 70 CRI Min.
5K 5000K CCT, 70 CRI Min.

Paint
Blank Gray (Standard)
BK Black
WH White
BZ Bronze

Surge Protection
Blank Standard 20kV/10kA SPD
MP MOV Pack 10kV/5kA

Misc.
HS House Side Shield
NL NEMA Label
XL Not CSA Certified
VR³ Visual Comfort Optic
BAA Buy America(n) Act and/or Build America Buy America Qualified

Controls
(Blank) 3 Pin NEMA Photocontrol Receptacle
NR¹ No Photocontrol Receptacle
P7 7 Pin Photocontrol Receptacle (dimmmable driver included)
PCSS^{1,4} DTL DSS Photocontrol
PCL1¹ DTL DLL Photocontrol 120-277V
AO Field Adjustable Output
SH Shorting Cap

Packages
(Blank) Standard Pack
JP Job Pack (54/pallet)

Install Packages
PKGS DTL DSS Photocontrol
PKGL DTL DLL Photocontrol
 Packages ship with selected photocontrol, 24", 1 1/4" diameter arm, 5' of prewire and mounting hardware

Accessories
ATBSREF Drop Refractor for field installation
ATBSHSS House Side Shield for field installation
ATBSLTS Light Trespass Shield for field installation
ATBS LOUVER KIT Louver Kit for field installation
ATBSVR-XX Visual Comfort Refractor and painted skirt for field installation

Universal Arms (steel)
UMR XX 8" Horizontal Arm for Round Pole, Painted to match Fixture (XX - Paint Color)
UMS XX 8" Horizontal Arm for Square Pole, Painted to match Fixture (XX - Paint Color)
UMR GALV 8" Horizontal Arm for Round Pole, Galvanized
UMS GALV 8" Horizontal Arm for Square Pole, Galvanized

- Notes**
- Not available with Install Packages.
 - Requires RFD.
 - Not available with D3 or D5 option.
 - Not available with 347V and 480V supply voltage options.

Autobahn Series ATBS

Roadway & Security Lighting

PERFORMANCE PACKAGE

ATBS

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P10	R2	40	5,360	134	1	0	2	5,577	139	1	0	2	0.92	0.89	0.85
	R3		5,287	132	1	0	1	5,524	138	1	0	1			
	R5		5,576	139	3	0	1	5,758	144	3	0	1			
	D3		4,963	124	1	3	3	5,163	129	1	3	3			
P20	R2	50	5,372	134	2	3	3	5,590	140	2	3	3	0.92	0.89	0.85
	R3		6,707	134	1	0	2	6,809	136	1	0	2			
	R5		6,687	134	2	0	2	6,760	135	2	0	2			
	D3		6,926	139	3	0	1	7,108	142	3	0	1			
P30	R2	60	6,496	130	2	3	4	6,244	125	1	3	4	0.92	0.89	0.85
	R3		7,032	141	3	4	4	7,317	146	3	4	4			
	R5		8,092	135	2	0	2	8,067	134	1	0	1			
	D3		7,971	133	2	0	2	8,328	139	2	0	2			
P40	R2	70	8,470	141	3	0	2	8,760	146	3	0	2	0.92	0.89	0.85
	R3		7,491	125	2	3	4	7,795	130	2	3	4			
	R5		8,110	135	3	4	4	8,438	141	3	4	4			
	D3		9,138	131	2	0	2	9,533	136	2	0	2			
P50	R2	82	9,136	131	2	0	2	9,355	134	2	0	2	0.92	0.89	0.85
	R3		9,868	141	3	0	2	9,710	139	3	0	2			
	R5		8,460	121	2	3	4	8,802	126	2	3	5			
	D3		9,158	131	3	4	5	9,529	136	3	4	5			
P60	R2	92	10,628	130	2	0	3	10,829	132	2	0	3	0.92	0.89	0.85
	R3		10,624	130	2	0	2	10,826	132	2	0	2			
	R5		11,450	140	4	0	2	11,181	136	4	0	2			
	D3		10,143	124	2	4	5	10,553	129	2	4	5			
P60	R2	92	10,651	130	3	4	5	11,082	135	3	4	5	0.92	0.89	0.85
	R3		11,050	120	2	0	3	11,848	129	2	0	3			
	R5		10,911	119	2	0	2	11,862	129	2	0	2			
	D3		12,199	133	4	0	2	12,756	139	4	0	2			
P60	R2	92	10,230	111	2	4	5	10,644	116	2	4	5	0.92	0.89	0.85
	D5		11,074	120	3	4	5	11,523	125	3	4	5			

ATBS with VR

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P10	R2 with VR	40	4,450	111	1	0	1	4,561	114	1	0	1	0.92	0.89	0.85
	R3 with VR		4,273	107	1	0	1	4,605	115	1	0	1			
	R5 with VR		4,539	113	2	0	1	4,679	117	2	0	1			
P20	R2 with VR	50	5,491	110	1	0	1	5,550	111	1	0	1	0.92	0.89	0.85
	R3 with VR		5,379	108	1	0	1	5,582	112	2	0	1			
	R5 with VR		5,647	113	2	0	1	5,692	114	2	0	1			
P30	R2 with VR	60	6,479	108	2	0	1	6,530	109	2	0	1	0.92	0.89	0.85
	R3 with VR		6,400	107	2	0	1	6,564	109	2	0	1			
	R5 with VR		6,703	112	3	0	1	6,693	112	2	0	1			
P40	R2 with VR	70	7,307	104	2	0	1	7,561	108	2	0	1	0.92	0.89	0.85
	R3 with VR		7,347	105	2	0	1	7,638	109	2	0	1			
	R5 with VR		7,693	110	3	0	1	7,749	111	3	0	1			
P50	R2 with VR	82	8,552	104	2	0	2	8,711	106	2	0	2	0.92	0.89	0.85
	R3 with VR		8,494	104	2	0	1	8,814	107	2	0	1			
	R5 with VR		8,895	108	3	0	1	8,911	109	3	0	1			
P60	R2 with VR	92	8,989	98	2	0	2	9,815	107	2	0	2	0.92	0.89	0.85
	R3 with VR		8,899	97	2	0	1	9,857	107	2	0	2			
	R5 with VR		9,309	101	3	0	1	10,256	111	3	0	1			

Note: Individual fixture performance may vary. Specifications subject to change without notice.



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 Email: TechSupport-Lighting@AcuityBrands.com

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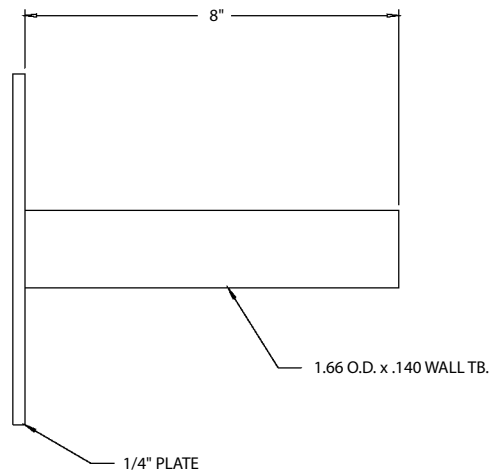
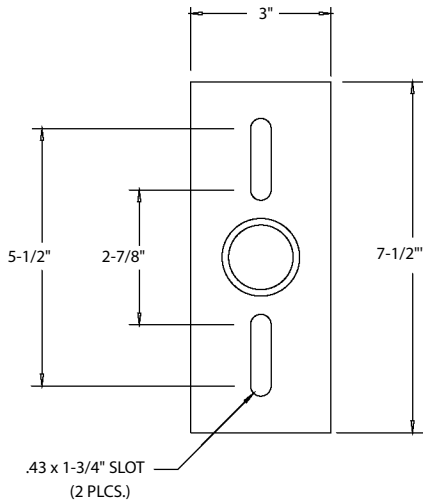
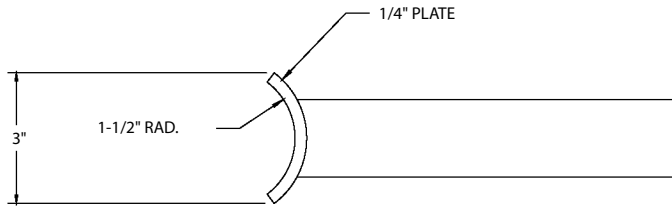
Warranty Five-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

UMR POLE ADAPTOR

RECOMMENDED FOR USE WITH POLES OF 4" DIAMETER OR SMALLER



UMS POLE ADAPTOR



Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction

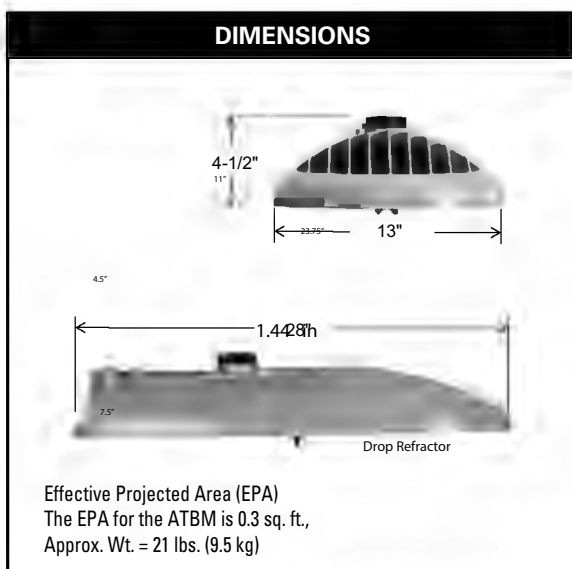


PRODUCT OVERVIEW



Applications:

- Residential streets
- Parking lots
- High speed roadways



STANDARDS

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of $\leq 3000\text{K}$ must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

GOVERNMENT PROCUREMENT — BAA – Buy America(n) Act: Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.

BABA – Build America Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Build America, Buy America Act.

Please refer to www.acuitybrands.com/buy-american for additional information.

Features:

OPTICAL

Same Light: Performance is comparable to 150W – 250W HPS

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, IV, & V roadway distributions.

DualOptix™ visual comfort option is also available for all distributions.

ELECTRICAL

Expected Life: LED light engines are rated $>100,000$ hours at 25°C , L70.

Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2. An optional MOV pack provides 10kV/5kA "Enhanced Level."

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt and optional 4 bolt clamping mechanism provide 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life).

Extreme long life solid state locking-style photocontrol with on demand remote on/off control - PCCC (15 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Autobahn Series ATBM

Roadway

ORDERING INFORMATION

Series	Lumen Package	Voltage	Optics	Mounting
ATBM Autobahn LED Roadway	P05 9,700 Lumens P10 11,000 Lumens P20 12,800 Lumens P30 15,500 Lumens P40 17,400 Lumens P50 18,700 Lumens P60 20,000 Lumens P70 21,500 Lumens	MVOLT Multi-volt, 120-277V 347 347V 480 480V	R2 Roadway Type II R3 Roadway Type III R4 Roadway Type IV R5 Roadway Type V	(Blank) 2 Bolt Mounting 4B 4 Bolt Mounting

Options

Color Temperature (CCT)

- (Blank)** 4000K CCT, 70 CRI Min.
- 27K²** 2700K CCT, 70 CRI Min.
- 3K** 3000K CCT, 70 CRI Min.
- 5K** 5000K CCT, 70 CRI Min.

Paint

- (Blank)** Gray
- BK** Black
- BZ** Bronze
- DDB** Dark Bronze
- GI** Graphite
- WH** White

Surge Protector

- (Blank)** Standard 20kV/10kA SPD
- MP** MOV Pack

Miscellaneous Options

- HSS** House Side Shield
- NL** NEMA Label Indicating Wattage
- XL** Not CSA Certified – No Terminal Block Cover
- VR²** Dual Optix visual comfort
- BAA** Buy America(n) Act and/or Build America Buy America Qualified

Controls Options

- (Blank)** 3 Pin NEMA Photocontrol Receptacle
- P7** 7 Pin Photocontrol Receptacle (dimnable driver included)¹
- NR** No Photocontrol Receptacle
- AO** Field Adjustable Output
- PCSS** Solid-State Lighting Photocontrol³
- PCLL** Solid-State Long Life Photocontrol
- PCCC** Solid-State Long Life Photocontrol with remote control on/off³
- SH** Shorting Cap

Packages

- (Blank)** Standard Pack
- JP** Job Pack (36/pallet)

Accessories

- ATBMHSS** House Side Shield
- ATBMLTS** Light Trespass Shield
- RKATBMMVOLTSPD** ATBM Acuity SPD, MVOLT
- RKATBMHVSPD** ATBM Acuity SPD, 347/480V
- RKATBMMVOLTMP** ATBM MOV Pack, MVOLT
- RKATBMHVMP** ATBM MOV Pack, 347/480V

Universal Arms (steel)

- UMR-XX** 8" Horizontal Arm for Square Pole, Painted to match Fixture
- UMS-XX** 8" Horizontal Arm for Round Pole, Galvanized
- UMR-GALV** 8" Horizontal Arm for Round Pole, Galvanized
- UMS-GALV** 8" Horizontal Arm for Square Pole, Galvanized

Notes:

- 1 Dimmable drive included.
- 2 This option requires RFD
- 3 MVOLT only



Autobahn Series ATBM Roadway

P E R F O R M A N C E P A C K A G E

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	25k Hours	75k Hours	100k Hours
P05	R2	68	9,396	138	1	0	2	9,718	143	1	0	2	0.93	0.86	0.83
	R3		9,366	138	1	0	3	9,688	142	1	0	3			
	R4		9,030	133	1	0	3	9,340	137	1	0	3			
	R5		10,334	152	3	0	2	10,689	157	3	0	2			
P10	R2	81	10,635	131	2	0	3	11,299	139	2	0	3	0.93	0.86	0.83
	R3		10,675	132	2	0	3	11,302	140	2	0	3			
	R4		10,391	128	2	0	4	10,994	136	2	0	4			
	R5		11,504	142	3	0	2	12,086	149	3	0	2			
P20	R2	94	12,073	128	2	0	3	12,874	137	2	0	3	0.93	0.86	0.83
	R3		12,065	128	2	0	3	12,818	136	2	0	3			
	R4		11,946	127	2	0	4	12,525	133	2	0	4			
	R5		13,085	139	4	0	2	13,776	147	4	0	2			
P30	R2	118	14,637	124	2	0	3	15,514	131	2	0	3	0.93	0.86	0.83
	R3		14,631	124	2	0	3	15,452	131	2	0	3			
	R4		14,317	121	2	0	4	15,151	128	2	0	5			
	R5		15,775	134	4	0	2	16,685	141	4	0	2			
P40	R2	135	16,233	120	2	0	3	17,493	130	2	0	3	0.93	0.86	0.83
	R3		16,402	121	2	0	3	17,367	129	2	0	3			
	R4		15,911	118	2	0	5	17,008	126	2	0	5			
	R5		17,507	130	4	0	2	18,595	138	4	0	2			
P50	R2	152	17,541	115	2	0	3	18,748	123	2	0	3	0.93	0.86	0.83
	R3		17,677	116	2	0	4	18,712	123	2	0	4			
	R4		17,154	113	2	0	5	18,246	120	2	0	5			
	R5		19,008	125	4	0	2	20,088	132	4	0	2			
P60	R2	168	18,770	112	2	0	3	20,095	120	3	0	3	0.93	0.86	0.83
	R3		18,830	112	2	0	4	20,094	120	3	0	4			
	R4		18,369	109	2	0	5	19,648	117	2	0	5			
	R5		20,350	121	4	0	2	21,505	128	4	0	2			
P70	R2	190	20,190	106	3	0	3	21,565	114	3	0	3	0.93	0.86	0.83
	R3		20,142	106	3	0	4	21,504	113	3	0	4			
	R4		19,660	103	2	0	5	21,024	111	3	0	5			
	R5		21,988	116	4	0	2	23,076	121	4	0	2			

Note: Individual fixture performance may vary. Specifications subject to change without notice.



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Warranty Five-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

Autobahn Series ATBM Roadway

P E R F O R M A N C E P A C K A G E

ATBM with DualOptix	Distribution	Input Watts	3000K					4000K/5000K					LDD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P05	R2 with VR	68	8,323	122	2	3	3	8,609	127	2	3	3	0.93	0.86	0.83
	R3 with VR		8,296	122	2	3	3	8,581	126	2	3	3			
	R4 with VR		7,998	118	2	3	4	8,273	122	2	3	4			
	R5 with VR		9,154	135	3	3	3	9,468	139	3	3	3			
P10	R2 with VR	81	9,421	116	2	3	3	10,009	124	2	3	3	0.93	0.86	0.83
	R3 with VR		9,456	117	2	3	4	10,012	124	2	3	4			
	R4 with VR		9,204	114	2	3	4	9,738	120	2	3	4			
	R5 with VR		10,191	126	3	3	3	10,706	132	3	3	3			
P20	R2 with VR	94	10,694	114	2	3	4	11,404	121	2	3	4	0.93	0.86	0.83
	R3 with VR		10,687	114	2	3	4	11,354	121	2	3	4			
	R4 with VR		10,581	113	2	3	5	11,094	118	2	3	5			
	R5 with VR		11,591	123	3	3	3	12,203	130	3	3	3			
P30	R2 with VR	118	12,966	110	2	3	4	13,742	116	2	3	4	0.93	0.86	0.83
	R3 with VR		12,960	110	2	3	4	13,687	116	2	3	5			
	R4 with VR		12,681	107	2	3	5	13,420	114	2	3	5			
	R5 with VR		13,974	118	3	3	3	14,780	125	3	3	3			
P40	R2 with VR	135	14,379	107	2	3	4	15,495	115	3	3	5	0.93	0.86	0.83
	R3 with VR		14,529	108	2	3	5	15,384	114	3	3	5			
	R4 with VR		14,093	104	2	3	5	15,066	112	3	3	5			
	R5 with VR		15,508	115	3	3	3	16,471	122	4	3	3			
P50	R2 with VR	152	15,538	102	3	3	5	16,607	109	3	3	5	0.93	0.86	0.83
	R3 with VR		15,658	103	3	3	5	16,575	109	3	3	5			
	R4 with VR		15,195	100	3	3	5	16,162	106	3	3	5			
	R5 with VR		16,837	111	4	3	3	17,794	117	4	3	4			
P60	R2 with VR	168	16,626	99	3	3	5	17,800	106	3	3	5	0.93	0.86	0.83
	R3 with VR		16,679	99	3	3	5	17,799	106	3	3	5			
	R4 with VR		16,271	97	3	3	5	17,404	104	3	3	5			
	R5 with VR		18,026	107	4	3	4	19,049	113	4	3	4			
P70	R2 with VR	190	17,884	94	3	3	5	19,102	101	3	3	5	0.93	0.86	0.83
	R3 with VR		17,842	94	3	3	5	19,048	100	3	3	5			
	R4 with VR		17,415	92	3	3	5	18,623	98	3	3	5			
	R5 with VR		19,477	103	4	3	4	20,440	108	4	3	4			



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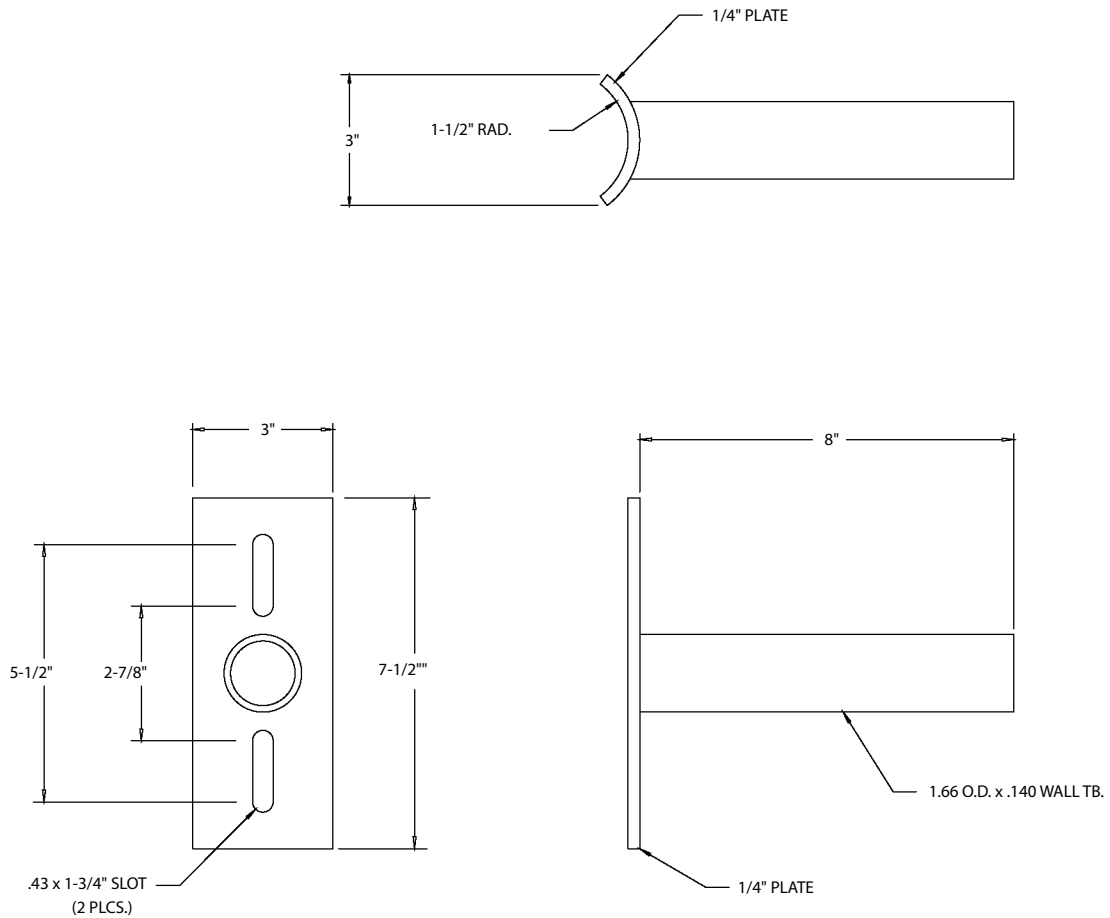
Warranty Five-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

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UMR POLE ADAPTOR

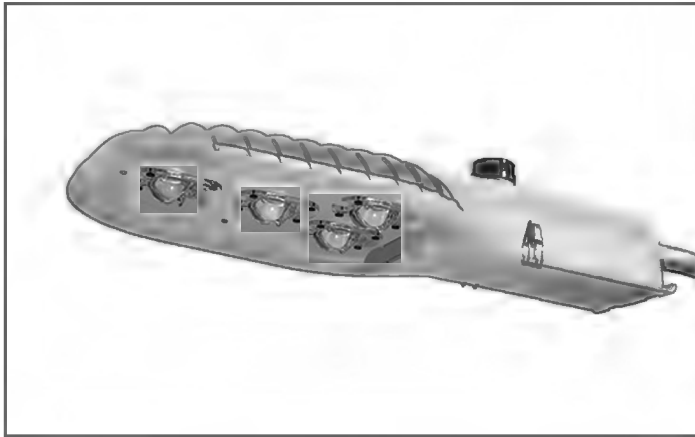
RECOMMENDED FOR USE WITH POLES OF 4" DIAMETER OR SMALLER



UMS POLE ADAPTOR



Project		Catalog #		Type	
Prepared by		Notes		Date	



Streetworks

VERD-M VERDEON

Roadway Luminaire

Product Features



Product Certifications



Interactive Menu

- Order Information [page 2](#)
- Product Specifications [page 2](#)
- Energy & Performance Data [page 3](#)
- Control Options [page 4](#)

Quick Facts

- Ideal replacement for 50W - 250W+ HPS luminaires
- UL/cUL listed for wet locations
- Optional IP66 enclosure rating available
- Tool-less removable power door for easy maintenance
- Series or parallel surge protection available (10kV or 20kV)
- 3G vibration rated

Connected Systems

- WaveLinx Lite

Dimensional Details

VERD-M



NOTES:
 1. Visit <https://www.designlights.org/search/> to confirm qualification. Not all product variations are DLC qualified.
 2. IDA Certified for 3000K CCT and warmer with Fixed mount only.

Ordering Information

SAMPLE NUMBER: **VERD-M-CA3-180-740-U-T2-AP-10K-PR7**

Product Family ^{1,2}	Configuration	Wattage Bucket	Color Temperature	Voltage	Distribution	Mounting	Color
VERD-M=Verdeon Maximus BAA-VERD-M=Verdeon Maximus Buy American Act Compliant ¹² TAA-VERD-M=Verdeon Maximus Trade Agreements Act Compliant ¹²	CA3=3 COB Light Engine CA4=4 COB Light Engine	150=150W 160=160W 170=170W 180=180W 190=190W 200=200W 210=210W 220=220W 230=230W 240=240W 250=250W	740=70CRI, 4000K 727=70CRI, 2700K 722=70CRI, 2200K 730=70CRI, 3000K 750=70CRI, 5000K	U=Universal (120-277V) 8=480V⁴ 9=347V HV=High Voltage Driver (347V - 480V)	T1=Type I T2=Type II T3=Type III T4=Type IV T5=Type V	[Blank]=None A15=15" Straight Mast Arm ⁶ ASJS15=Adjustable Slipfitter (Factory set at 15° degrees) ASJS25=Adjustable Slipfitter (Factory set at 25° degrees) ASJS45=Adjustable Slipfitter (Factory set at 45° degrees)	AP=Grey BZ=Bronze BK=Black DP=Dark Platinum GM=Graphite Metallic WH=White

Options (Add as Suffix)	Controls	Accessories (Order Separately) ¹³
10MSP=Parallel 10kV MOV Surge Protective Device 20MSP=Parallel 20kV MOV Surge Protective Device 10K=Series 10kV UL 1449 Surge Protective Device 20K=Series 20kV UL 1449 Surge Protective Device 20KI=Series 20kV UL 1449 Surge Protective Device with light indicator K=Level Indicator 4B=Four-bolt, Two-clamp mounting HA=50°C High Ambient Temperature HSS=Factory Install House Side Shield IP66=IP66 Rated Housing FADC=Field Adjustable Dimming Controller ¹¹ DXXXX=Department of Transportation - Customer specific details ¹⁴ UXXXX=Utility - Customer specific details ¹⁴	PSC=Photocontrol Shorting Cap NPC=NEMA Photocontrol - Multi-Tap LLPC=Longlife Photocontrol Included PR=NEMA 3-PIN Twistlock Photocontrol Receptacle PR7=NEMA 7-PIN Twistlock Photocontrol Receptacle MS/DIM-L08=Motion Sensor for Dimming Operation, Maximum 8' Mounting Height ⁵ MS/DIM-L20=Motion Sensor for Dimming Operation, Maximum 9' - 20' Mounting Height ⁵ MS/DIM-L40=Motion Sensor for Dimming Operation, Maximum 21' - 40' Mounting Height ⁵ 5LTD=DALI SPB1=Dimming Occupancy Sensor with Bluetooth Interface, <8' Mounting SPB2=Dimming Occupancy Sensor with Bluetooth Interface, 8'-20' Mounting SPB4=Dimming Occupancy Sensor with Bluetooth Interface, 21'-40' Mounting	OA1223=10kV UL 1449 Surge Module Replacement OA/RA1013=Photocontrol Shorting Cap OA/RA1014=NEMA Photocontrol - 120V OA/RA1016=NEMA Photocontrol - Multi-Tap OA/RA1027=NEMA Photocontrol - 480V OA/RA1201=NEMA Photocontrol - 347V FSIR-100=Wireless Configuration Tool for Motion Sensor ⁷ HS/VERD=Verdeon House Side Shield ⁹ VGS-F/B=Vertical Glare Shield, Front/Back ⁸ VGS-SIDE=Vertical Glare Shield, Side ASJS15-XX=Adjustable slipfitter (Factory set at 15 degrees) ¹⁰ ASJS25-XX=Adjustable slipfitter (Factory set at 25 degrees) ¹⁰ ASJS45-XX=Adjustable slipfitter (Factory set at 45 degrees) ¹⁰

NOTES:

- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
- DesignLights Consortium® Qualified. Refer to www.designlights.org qualified products list under family model details.
- Reserved.
- Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
- The FSIR-100 accessory is required to adjust parameters.
- Round pole adapter and mounting hardware included. "M" drill pattern.
- This tool enables adjustment of parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Cooper Lighting Solutions for more information.
- VGS-F/B not compatible with T1 or T5 distribution.
- Option will come factory-installed. Must order one per optic as an accessory. House Side Shield not suitable for T5 distribution.
- Replace XX with color selection.
- Cannot be used with PR7 or other motion response control options.
- Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC.PREFERENCES website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.
- Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.
- Customer specific specifications utilizes standard products with small adjustments to meet unique requirements such as packaging, labels, wattage adjustments, etc.

Product Specifications

Construction

- Heavy-duty die-cast aluminum housing and door
- Tool-less entry hinged removable door for easy maintenance
- 3G vibration rated

Optics

- Optics are precisely designed to shape the distribution maximizing efficiency and fixture spacing
- Offered in 2200K, 2700K, 3000K, 4000K, and 5000K CCTs; 70CRI
- IDA Certified for 3000K CCT and warmer with Fixed mount only

Electrical

- 120-277V 50/60Hz, 347V 60Hz or 480V 60Hz operation

- Parallel and series surge protection available (10kV or 20kV)
- Thermal management transfers heat away from the LED source for optimal efficiency, light output, and lumen maintenance
- Operates in ambient temperatures from -40°C to 40°C. 50°C HA (high ambient) option available
- Standard three-position tunnel type terminal block
- LED modules are IP66 rated

Mounting

- Four-bolt slipfitter with cast-in pipe stop and 2.5" leveling steps
- Fixed in-place bird guard seals around 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) mounting arms
- Optional 15" pole mount arm available with round pole adapter and mounting hardware included

Finish

- Housing and cast parts finished in five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear
- Consult your lighting representative at Cooper Lighting Solutions for a complete selection of standard colors

Warranty

- Standard five-year warranty
- Optional ten-year warranty, please see your Cooper Lighting Solutions Streetworks sales representative

Energy and Performance Data

[View VERD-M IES files](#)

Power and Lumens - VERD-M

Light Engine	CA3				CA4							
Power (Watts)	153	163	173	183	193	202	214	223	233	242	252	
Wattage Label	150	160	170	180	190	200	210	220	230	240	250	
Current (A) @ 120V	1.28	1.36	1.44	1.53	1.61	1.68	1.78	1.86	1.95	2.02	2.10	
Current (A) @ 277V	0.56	0.59	0.63	0.66	0.73	0.76	0.80	0.83	0.87	0.90	0.93	
Power (Watts)	162	173	183	194	206	216	223	232	244	254	264	
Wattage Label	160	170	180	190	210	220	220	230	240	250	260	
Current (A) @ 347V	0.47	0.50	0.53	0.56	0.60	0.63	0.65	0.68	0.72	0.74	0.77	
Current (A) @ 480V	0.34	0.36	0.39	0.41	0.44	0.46	0.47	0.49	0.52	0.53	0.56	
Optics												
Type I	4000K	23,480	24,742	25,924	27,037	29,335	30,522	31,948	33,103	34,384	35,483	36,673
	BUG Rating	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3
	3000K	23,055	24,294	25,454	26,583	28,804	29,970	31,370	32,503	33,762	34,840	36,009
	BUG Rating	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3
	2700K	19,883	20,951	21,952	22,925	24,841	25,846	27,054	28,031	29,117	30,047	31,055
	BUG Rating	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3
Type II	4000K	22,129	23,318	24,432	25,515	27,647	28,766	30,110	31,198	32,406	33,441	34,563
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
	3000K	21,728	22,896	23,990	25,053	27,146	28,245	29,565	30,633	31,819	32,836	33,937
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
	2700K	18,739	19,746	20,689	21,606	23,411	24,359	25,497	26,418	27,441	28,318	29,268
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
Type III	4000K	22,178	23,370	24,486	25,571	27,708	28,830	30,177	31,267	32,478	33,515	34,640
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
	3000K	21,776	22,947	24,043	25,109	27,207	28,308	29,630	30,701	31,890	32,908	34,012
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
	2700K	18,780	19,789	20,735	21,654	23,463	24,413	25,554	26,477	27,502	28,380	29,333
	BUG Rating	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
Type III	4000K (70 CRI)	22,095	23,282	24,394	25,476	27,605	28,722	30,064	31,150	32,356	33,390	34,510
	BUG Rating	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	3000K	21,695	22,861	23,953	25,015	27,105	28,202	29,519	30,586	31,770	32,785	33,885
	BUG Rating	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	2700K	18,710	19,715	20,657	21,573	23,375	24,322	25,458	26,378	27,399	28,274	29,223
	BUG Rating	B2-U0-G4	B2-U0-G4	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
Type V	4000K	22,787	24,011	25,158	26,274	28,469	29,621	31,005	32,126	33,370	34,435	35,591
	BUG Rating	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	3000K	22,374	23,577	24,703	25,798	27,954	29,085	30,444	31,544	32,765	33,812	34,946
	BUG Rating	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	2700K	19,296	20,333	21,304	22,248	24,108	25,083	26,255	27,204	28,257	29,160	30,138
	BUG Rating	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5

NOTE: Lumen output for AP Grey fixture color, 120-277V.

Energy and Performance Data

Energy Data

Electronic LED Driver
0.9 Power Factor
< 20% Total Harmonic Distortion
120-277V/50 and 60Hz,
347V/60Hz, 480V/60Hz
-40°C Minimum Temperature Rating
+40°C Ambient Temperature Rating

Lumen Maintenance

Ambient Temperature	TM-21 Lumen Maintenance (60,000 hours)	Theoretical L70 (Hours)
40°C	> 85%	> 140,000

EPA

Effective Projected Area (Sq. Ft.)
0.8

Shipping Data

Approximate Net Weight
35 lbs (15.9 kgs.)

FADC Settings

FADC Position	Percent of Typical Lumen Output
1	25%
2	46%
3	55%
4	62%
5	72%
6	77%
7	82%
8	85%
9	90%
10	100%

Note: +/-5% typical value

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

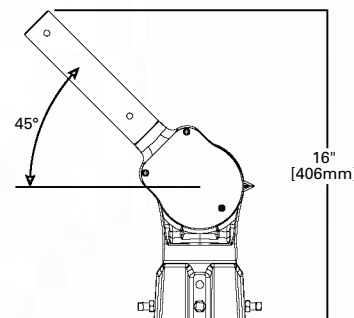
Mounting Details

Optional Arms

15" STRAIGHT ARM

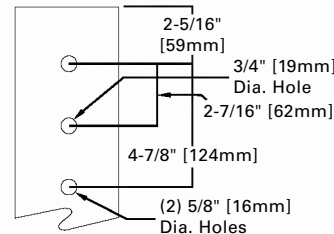


ADJUSTABLE SLIPFITTER OFFSET ARM



Arm Drilling

TYPE "M"



Control Options

Photocontrol (PR and PR7)

Photocontrol (PR and PR7) Photocontrol receptacles (PR and PR7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with ANSI C136.41 7-pin standards can be utilized with the PR7 receptacle.

Dimming Occupancy Sensor (MS/DIM-LXX)

These sensors are factory installed in the luminaire housing. When the MS/DIM-LXX sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MS/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes. These occupancy sensors include an integral photocell that can be activated with the FSIR-100 accessory for "dusk-to-dawn" control or daylight harvesting - the factory preset is OFF. The FSIR-100 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters. A variety of sensor lens are available to optimize the coverage pattern for mounting heights from 8' - 40'.

Dimming Occupancy Sensor (SPB)

These passive infrared (PIR) sensors are factory installed in the luminaire housing. When the SPB sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when no motion is detected. After a period of time, the luminaire turns off, and when motion is detected, the luminaire returns to full light output. The SPB sensor default parameters are listed in the table below, and can be configured utilizing the Sensor Configuration mobile application for iOS and Android devices. An integral photocontrol can be activated with the app for "dusk-to-dawn" control or daylight harvesting - the factory default is off. Three sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'. Four sensor colors are available; Bronze, Black, Gray and White, and are automatically selected based on the luminaire finish as indicated by the table below.

SPB sensor finish matched to luminaire finish		
Luminaire Finish		SPB Sensor Finish
WH	White	White
BK	Black	Black
GM	Graphite Metallic	Black
BZ	Bronze	Bronze
AP	Gray	Gray
DP	Dark Platinum	Gray



LED Lighting Solutions



Roadway Lighting | Area Lighting | Pendant Lighting | Post Top Lighting | Brackets and Poles

Safer. Smarter. More Vibrant Spaces.



FPL

LED Lighting Solutions

Roadway Lighting

Feel Safe, Drive Safe



Shield facing coastal line

Cree – RSW Large Turtle-friendly Amber



Cree – RSW



Cree – XSP1



AEL – ATBS



AEL – ATBM and ATBL



Available in black, bronze, or gray

AEL – ATB2





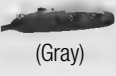
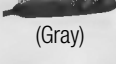
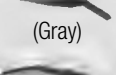
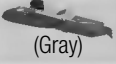



Cooper – Verdeon M



Cooper – Verdeon M

ROADWAY LIGHTING

Manufacturer	Style	Fixture	Pole Options	Bracket Options	Light Pattern	Line Watts/ NEMA Label	Color Temp	Lumens	Glare Rating (BUG)	.ies File	Billing Tier
Cree Local	RSW Large Turtle-friendly Amber	 (Gray) shield facing coastal line	6, 7	1	3	92/90	594nM (Amber)	3,715	B3-U0-G3	PL 14092-001A RSWL - TRL AID FnRpt.ies	F5
	RSW	 (Gray)	6, 7	1	3	28/30	3000K	3,300	B1-U0-G1	RSWS-3ME-3L-30K7.ies	B2
			6, 7	1	3	26/30	4000K	3,300	B1-U0-G1	RSWS-3ME-3L-40K7 CONFIGURED.ies	B2
			6, 7	1	3	45/50	3000K	5,000	B1-U0-G1	RSWS-3ME-5L-30K7 CONFIGURED.ies	C2
			6, 7	1	3	41/40	4000K	5,000	B1-U0-G1	RSWS-3ME-5L-40K7 CONFIGURED.ies	C2
XSP2	 (Gray)	6, 7	1	3	102/100	4000K	10,882	B2-U0-G3	BXSP-C-HT-3ME-A-40K-UL-XX-N-Q4 CONFIGURED.ies	G3	
AEL Collector	ATBS	 (Gray)	6, 7	1	2	40/40	4000K	4,770	B1-U0-G1	ATBS_E_XXXXX_R2.ies	C2
			6, 7	1	2	47/50	4000K	5,392	B1-U0-G1	ATBS_F_XXXXX_R2.ies	C2
			6, 7	1	2	76/80	4000K	8,653	B2-U0-G2	ATBS_I_XXXXX_R2.ies	E2
	ATBM	 (Gray)	6, 7	1	3	118/120	4000K	15,453	B2-U0-G3	ATBM_E_XXXXX_R3_XXXX.ies	G2
	ATBL	 (Gray)	6, 7	1	3	259/260	4000K	28,091	B3-U0-G5	ATBL_F_XXXXX_R3.ies	O4
	ATB2	 (Gray)	6, 7	1	4	133/130	4000K	16,593	B2-U0-G3	ATB2_40BLEDE10_XXXXX_R4.ies	H3
			6, 7	1	4	268/270	4000K	32,329	B3-U0-G5	ATB2_80BLEDE10_XXXXX_R4.ies	O5
			6, 7	Hybrid only	4	133/130	4000K	16,593	B2-U0-G3	ATB2_40BLEDE10_XXXXX_R4.ies	H3
			6, 7	Hybrid only	4	268/270	4000K	32,329	B3-U0-G5	ATB2_80BLEDE10_XXXXX_R4.ies	O5
			4, 6, 7	2	4	133/130	4000K	16,593	B2-U0-G3	ATB2_40BLEDE10_XXXXX_R4.ies	H3
4, 6, 7	2	4	268/270	4000K	32,329	B3-U0-G5	ATB2_80BLEDE10_XXXXX_R4.ies	O5			
Verdeon M	 (Gray)	6, 7	1	3	182/180	4000K	22,236	B3-U0-G3	VERD-M-A03-E-U-T3-AP.ies	K4	
Verdeon M	 (Gray)	6, 7	1	3	247/250	4000K	29,537	B3-U0-G4	VERD-M-A04-E-U-T3-AP.ies	N4	

Note: All roadway fixtures are grey unless otherwise noted



FPL

Area Lighting

Inspiring Illumination

Available in black,
or gray or bronze



Cooper - Galleon



Cooper - UFLD





Cooper - UFLD



Cooper - UFLD

AREA LIGHTING

Manufacturer	Style	Fixture	Pole Options	Bracket Options	Light Pattern	Line Watts/ NEMA Label	Color Temp	Lumens	Glare Rating (BUG)	.ies File	Billing Tier
Cooper	Galleon		1*	5	4	113/110	4000K	12,336	B2-U0-G3	GAP-AF-02-LED-U-T4W.ies	G3
		(Black)	1*	5	4	225/230	4000K	23,844	B3-U0-G4	GAN-AF-04-LED-U-T4W.ies	M4
			1*	5	4	445/450	4000K	47,372	B4-U0-G5	GAN-AF-08-LED-U-T4W.ies	Y6
		(Gray)	1*	5	4	558/560	4000K	58,506	B4-U0-G5	GAN-AF-10-LED-U-T4W.ies	EE7
Cooper	UFLD		6, 7	24" stand-off (2DS)	6x6	51/50	4000K	5,976	B2-U0-G1	UFLD-S-C15-X-U-66.ies	D3
			6, 7	24" stand-off (2DS)	6x6	85/90	4000K	10,530	B3-U0-G1	UFLD-C25-X-U-66.ies	F3
			6, 7	24" stand-off (2DS)	6x6	184/180	4000K	23,797	B4-U0-G2	UFLD-C70-X-U-66.ies	K4
			6, 7	24" stand-off (2DS)	6x6	371/370	4000K	48,028	B5-U0-G3	UFLD-L-C175-X-U-66.ies	U5

* = 20' (13' MH) Standard concrete pole for 113W only.
 = 35' (27'6" MH) Standard concrete pole applicable to all.

Note: Glare (BUG) Ratings for UFLD are measured at 0° tilt.



FPL

Pendant Lighting

Functional Can Be Beautiful

Black



Holophane - Bern



Holophane - Domus (Memphis)







Holophane - Teardrop (Memphis)

Turtle-friendly amber



Holophane - Bern

PENDANT LIGHTING

Manufacturer	Style	Fixture	Pole Options	Bracket Options	Light Pattern	Line Watts/ NEMA Label	Color Temp	Lumens	Glare Rating (BUG)	.ies File	Billing Tier
Holophane	Bern	 (Black)	3, 4	3	3	58/60	4000K	6,808	B1-U0-G2	1SF3145IP5 GBLF2 P20 40K XX X X L3.ies	D11
		 (Turtle-friendly amber)	3, 4	3	3	56/60	Amber	1,934	B1-U0-G0	Upon Request	D11
	Domus (Memphis)	 (Black)	3, 4	3	3	144/140	4000K	15,098	B3-U0-G3	LTL29277P14 ES2 P35S 40K XX SG 3 DS.ies	I11
		Teardrop (Memphis)	 (Black)	3, 4	3	3	144/140	4000K	15,375	B2-U3-G4	LTL29193P14 ES2 P35S 40K XX TG 3.ies



FPL

Post Top Lighting

Making a Great First Impression



AEL – Traditional Carriage
(American Revolution)



AEL – Contemporary
(Contempo)



Cooper – Mesa



GE – EPTC



Black/Black

Holophane – Granville



Clear/Black

Holophane – Granville



Green/Green









Holophane – Granville



Silver/Clear

Holophane – Granville

POST TOP LIGHTING

Manufacturer	Style	Fixture	Pole Options	Bracket Options	Light Pattern	Line Watts/ NEMA Label	Color Temp	Lumens	Glare Rating (BUG)	.ies File	Billing Tier
AEL	Traditional Carriage (American Revolution)	 (Black)	1 (20'), 2, 8	NA	3	39/40	3000K	3,292	B1-U3-G2	247L_10LEDE10_XXXX_3K_R3_AY.ies	C2
			1 (20'), 2, 8	NA	3	74/70	3000K	6,195	B2-U3-G2	247L_20LEDE10_XXXX_3K_R3_AY.ies	E2
			1 (20'), 2, 8	NA	3	39/40	4000K	3,584	B1-U3-G2	247L_10LEDE10_XXXX_4K_R3_AY.ies	C2
			1 (20'), 2, 8	NA	3	74/70	4000K	6,746	B2-U3-G2	247L_20LEDE10_XXXX_4K_R3_AY.ies	E2
	Contemporary (Contempo)	 (Grey)	1 (20'), 2, 8	NA	3	38/40	3000K	2,970	B1-U3-G1	245L_10LEDE10_XXXX_3K_R3_RNA.ies	C2
			1 (20'), 2, 8	NA	3	72/70	3000K	5,565	B2-U3-G2	245L_20LEDE10_XXXX_3K_R3_RNA.ies	E2
			1 (20'), 2, 8	NA	3	38/40	4000K	3,188	B1-U3-G1	245L_10LEDE10_XXXX_4K_R3_RNA.ies	C2
			1 (20'), 2, 8	NA	3	72/70	4000K	5,977	B2-U3-G2	245L_20LEDE10_XXXX_4K_R3_RNA.ies	E2
Cooper	Mesa	 (Black)	1 (20'), 2, 5, 8	NA	3	75/80	4000K	7,456	B2-U0-G2	PMM-E03-LED-E-U-T3.ies	E5
			1 (20'), 2, 5, 8	NA	3	150/150	4000K	14,911	B3-U0-G3	PMM-E06-LED-E-U-TE.ies	I6
GE	EPTC	 (Black)	1 (20'), 2, 8	NA	5	65/70	4000K	7,300	B3-U0-G1	eptc02_07A40____.ies	D4
Holophane	Granville	 Black/Black	1, 5, 8*	NA or 4	3	39/40	3000K	4,644	B2-U3-G4	ISF 32566P8 GVD2 P20 30K AS 3 NF.ies	C5
			1, 5, 8*	NA or 4	3	39/40	5000K	4,888	B2-U3-G4	ISF 32566P12 GVD2 P20 50K AS 3 NF.ies	C5
			1, 5, 8*	NA or 4	3	60/60	3000K	6,586	B2-U4-G5	ISF 32566P14 GVD2 P30 30K AS 3 NF.ies	D5
			1, 5, 8*	NA or 4	3	60/60	5000K	6,932	B2-U4-G5	ISF 32566P17 GVD2 P30 50K AS 3 NF.ies	D5
	Granville	 Clear/Black	1, 5, 8*	NA or 4	3	60/60	5000K	7,440	B2-U5-G4	ISF 30151P5 GVD2 P30 50K AS 3 N.ies	D5
	Granville	 Green/Green	1, 5	NA	3	39/40	3000K	4,644	B2-U3-G4	ISF 32566P8 GVD2 P20 30K AS 3 NF.ies	C5
			1, 5	NA	3	39/40	5000K	4,888	B2-U3-G4	ISF 32566P12 GVD2 P20 50K AS 3 NF.ies	C5
			1, 5	NA	3	60/60	3000K	6,586	B2-U4-G5	ISF 32566P14 GVD2 P30 30K AS 3 NF.ies	D5
			1, 5	NA	3	60/60	5000K	6,932	B2-U4-G5	ISF 32566P17 GVD2 P30 50K AS 3 NF.ies	D5
	Granville w/Lunar Optics	 Silver/Clear	1, 5	NA	3	39/40	3000K	2,103	B1-U3-G1	ISF 30152P15 GVD2 P20 30K AS 6 N.ies	C5
			1, 5	NA	3	39/40	5000K	2,211	B1-U3-G1	ISF 30152P2 GVD2 P20 50K AS 6 N.ies	C5
			1, 5	NA	3	60/60	3000K	2,982	B1-U3-G2	ISF 30152P3 GVD2 P30 30K AS 6 N.ies	D5
			1, 5	NA	3	60/60	5000K	3,136	B1-U3-G2	ISF 30152P5 GVD2 P30 50K AS 6 N.ies	D5

*Also available in double bracket configuration



FPL®

Brackets and Poles

Discover a New Road to Efficiency

BRACKETS



1

Style

Standard
2', 6', 8', 12'
Side Mounted

Color

Silver



2

Style

Standard
8'
Side Mounted Arm
or Standard 6', 8'
Tenon Mounted Arm

Color

Black



3

Style

Decorative
6' Tenon Mounted Arm
or Decorative 48"
Pedestrian Side
Mounted Arm

Color

Black



4

Style

Decorative
Double Bracket
Tenon Mounted Arm

Color

Black
Green



5

Style

Single or
Double Bracket
Tenon Mounted
for Galleon

Color

Black
Gray
Bronze

POLES

Standard Concrete



1

Tenon Mount
20' (13' MH)
35' (27'6" MH)

Standard Black Fiberglass



2

Tenon Mount
13' (10' MH)
20' (15'6" MH)

Black Columbia Concrete



3

Tenon Mount
20' (15'9" MH)

Black Octagonal Concrete



4

Tenon Mount
37' (30' MH)

Black or Green Washington Concrete



5

Tenon Mount
18.5' (14'6" MH)

Standard Wood



6

Arm Mount
35' (29' MH)
40' (33'6" MH)
45' (38" MH)

Standard Concrete



7

Arm Mount
30' (22'6" MH)
35' (27'6" MH)
40' (30" MH)
45' (35' MH)

Black Tapered Concrete



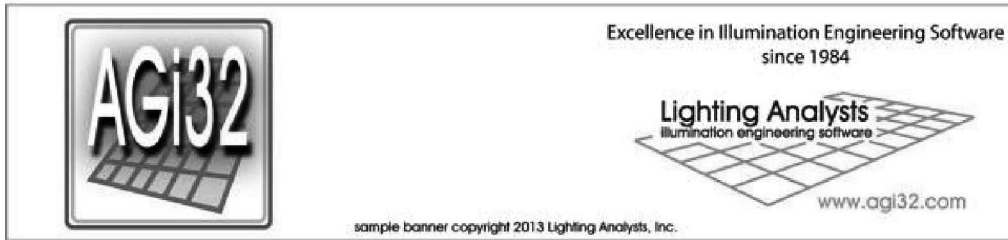
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Tenon Mount
14'6" (10' MH)
21'6" (15'6" MH)

*MH = Approximate Mounting Height



Attachment B
Agi32 Lighting Analysis and Layout



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Local Street (Typical)

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Staggered; 2R_STG
 Roadway Width: 21 ft
 Lanes In Direction Of Travel: 1
 Driver's Side Of Roadway: Right

Luminaire Information:

RSWS-B-HT-3ME-5L-40K7-UL-xx-N
 Description: RSWS-B-HT-3ME-5L-40K7-UL-xx-N CONFIGURED
 File Name: RSWS-B-HT-3ME-5L-40K7-UL-xx-N_CONFIGURED.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 5000
 Luminaire Watts: 40
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 165
 Spacing - Row 2: 165

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
RSWS-B-HT-3ME-5L-40...	495	-12	25	90	0	0
RSWS-B-HT-3ME-5L-40...	330	-12	25	90	0	0
RSWS-B-HT-3ME-5L-40...	165	-12	25	90	0	0
RSWS-B-HT-3ME-5L-40...	0	-12	25	90	0	0
RSWS-B-HT-3ME-5L-40...	-165	-12	25	90	0	0

Roadway Optimizer - Layout 1 - Cont.

Luminaire Location Summary:

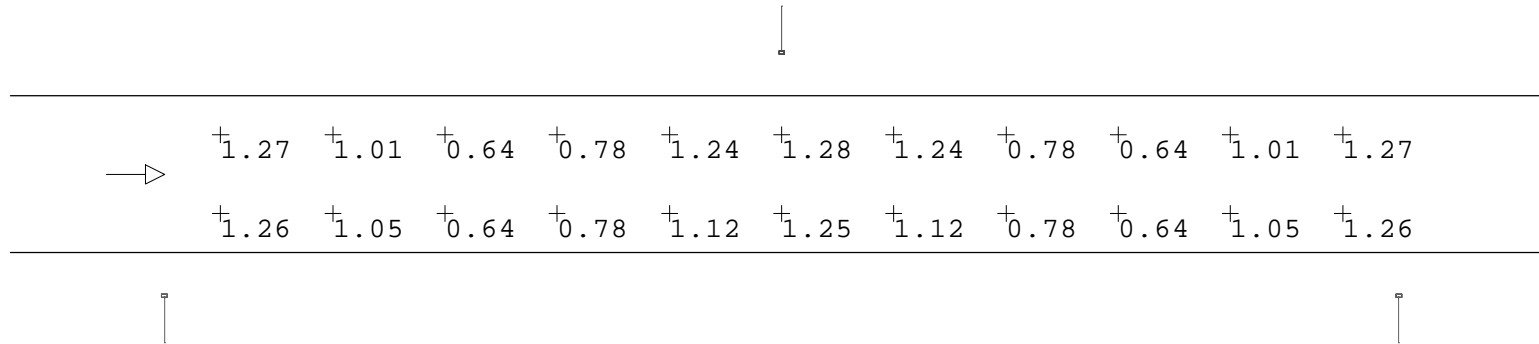
Coordinates in ft

RSWS-B-HT-3ME-5L-40...	-330	-12	25	90	0	0
RSWS-B-HT-3ME-5L-40...	577.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	412.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	247.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	82.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	-82.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	-247.5	33	25	270	0	0
RSWS-B-HT-3ME-5L-40...	-412.5	33	25	270	0	0

Total Number of locations: 13

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.01

Maximum = 1.28

Minimum = 0.64

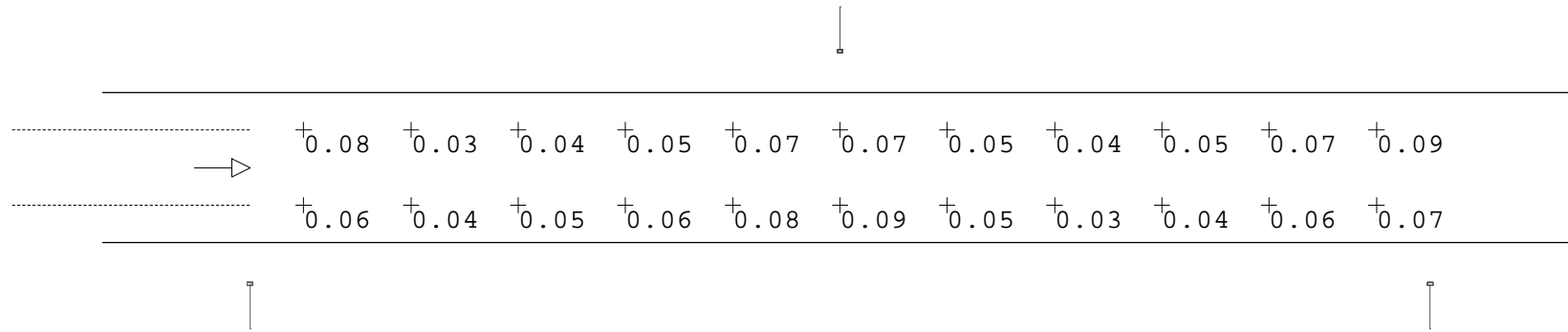
Avg/Min Ratio = 1.58

Max/Min Ratio = 2

Max/Avg Ratio = 1.27

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.06

Maximum = 0.09

Minimum = 0.03

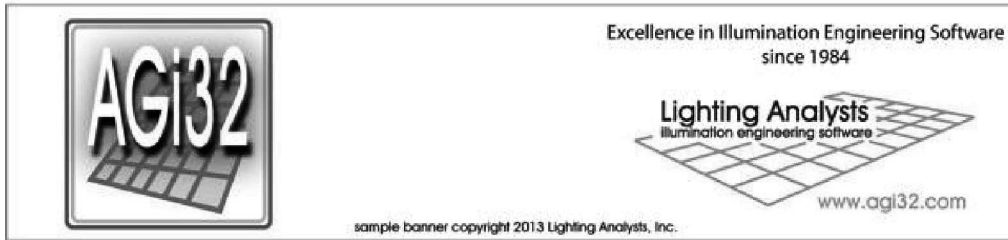
Avg/Min Ratio = 2

Max/Min Ratio = 3

Max/Avg Ratio = 1.5

MaxLv Ratio = 0.17

Threshold Increment (TI) = 9.72



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Local Street (Typical)

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Staggered; 2R_STG
 Roadway Width: 21 ft
 Lanes In Direction Of Travel: 1
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBS P40 XXXXX R2 4K 5K
 Description: ATBS P40 XXXXX R2 4K_5K
 File Name: ATBS P40 XXXXX R2 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 9535
 Luminaire Watts: 70
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 350
 Spacing - Row 2: 350

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBS P40 XXXXX R2 4...	1050	-12	30	90	0	0
ATBS P40 XXXXX R2 4...	700	-12	30	90	0	0
ATBS P40 XXXXX R2 4...	350	-12	30	90	0	0
ATBS P40 XXXXX R2 4...	0	-12	30	90	0	0
ATBS P40 XXXXX R2 4...	-350	-12	30	90	0	0

Roadway Optimizer - Layout 1 - Cont.

Luminaire Location Summary:

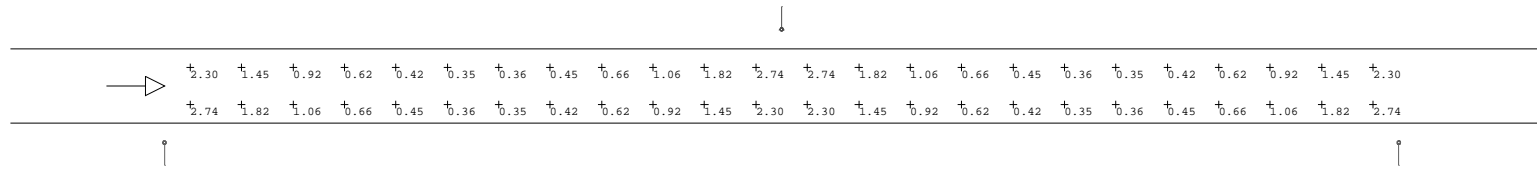
Coordinates in ft

ATBS P40 XXXXX R2 4...	875	33	30	270	0	0
ATBS P40 XXXXX R2 4...	525	33	30	270	0	0
ATBS P40 XXXXX R2 4...	175	33	30	270	0	0
ATBS P40 XXXXX R2 4...	-175	33	30	270	0	0
ATBS P40 XXXXX R2 4...	-525	33	30	270	0	0

Total Number of locations: 10

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.1

Maximum = 2.74

Minimum = 0.35

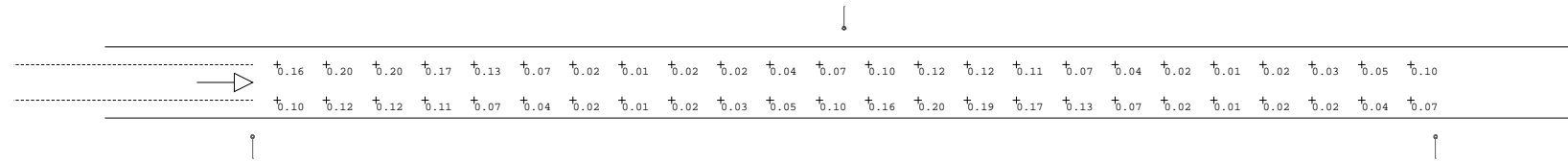
Avg/Min Ratio = 3.14

Max/Min Ratio = 7.83

Max/Avg Ratio = 2.49

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.08

Maximum = 0.20

Minimum = 0.01

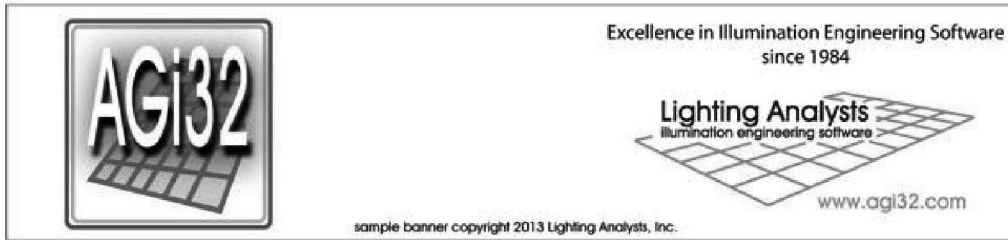
Avg/Min Ratio = 8

Max/Min Ratio = 20

Max/Avg Ratio = 2.5

MaxLv Ratio = 0.28

Threshold Increment (TI) = 17.10



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Col-Coronado-Worst Case-actual dist is 1178ft

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Opposite, Median Mounted; 2R_OPP_MM
 Roadway Width: 31 ft
 Median Width: 17 ft
 Lanes In Direction Of Travel: 3
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBM P30 XXXXX R3 4K_5K
 Description: ATBM P30 XXXXX R3 4K_5K
 File Name: ATBM P30 XXXXX R3 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 15452
 Luminaire Watts: 118
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 180
 Spacing - Row 2: 180

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBM P30 XXXXX R3 4...	720	39.5	35	270	0	0
ATBM P30 XXXXX R3 4...	540	39.5	35	270	0	0
ATBM P30 XXXXX R3 4...	360	39.5	35	270	0	0
ATBM P30 XXXXX R3 4...	180	39.5	35	270	0	0

Roadway Optimizer - Layout 1 - Cont.

Luminaire Location Summary:

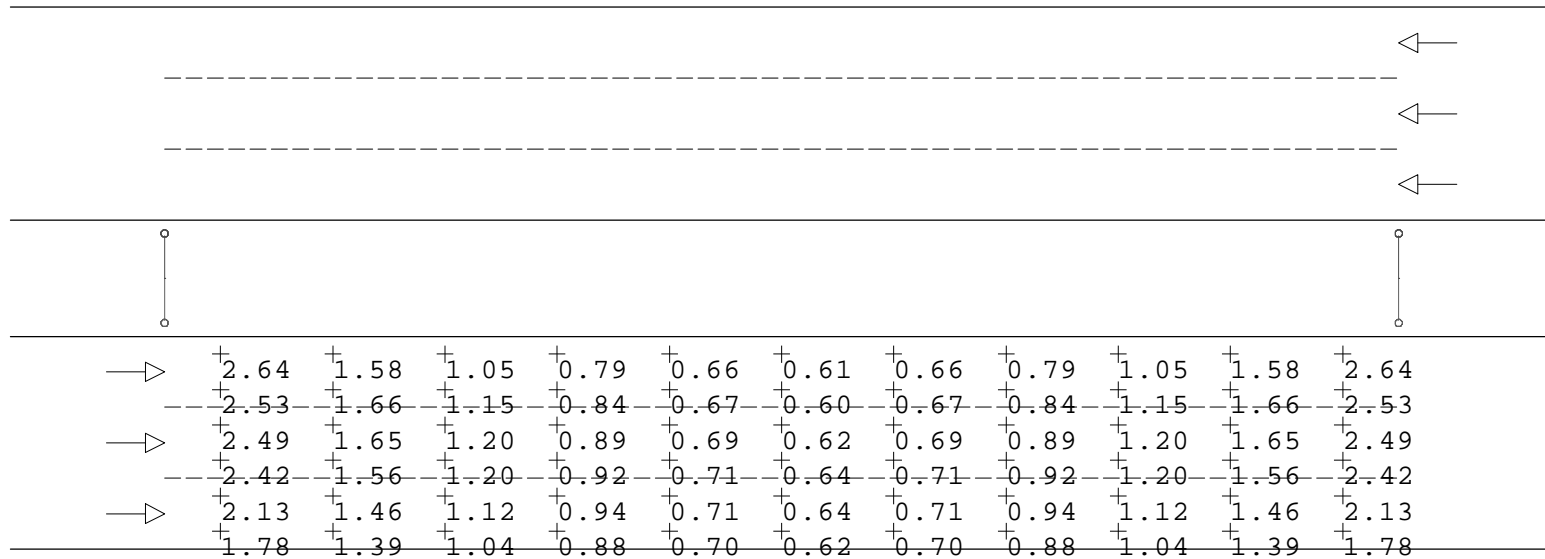
Coordinates in ft

ATBM P30	XXXXXX	R3	4...	0	39.5	35	270	0	0
ATBM P30	XXXXXX	R3	4...	-180	39.5	35	270	0	0
ATBM P30	XXXXXX	R3	4...	-360	39.5	35	270	0	0
ATBM P30	XXXXXX	R3	4...	720	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	540	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	360	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	180	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	0	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	-180	39.5	35	90	0	0
ATBM P30	XXXXXX	R3	4...	-360	39.5	35	90	0	0

Total Number of locations: 14

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.25

Maximum = 2.64

Minimum = 0.60

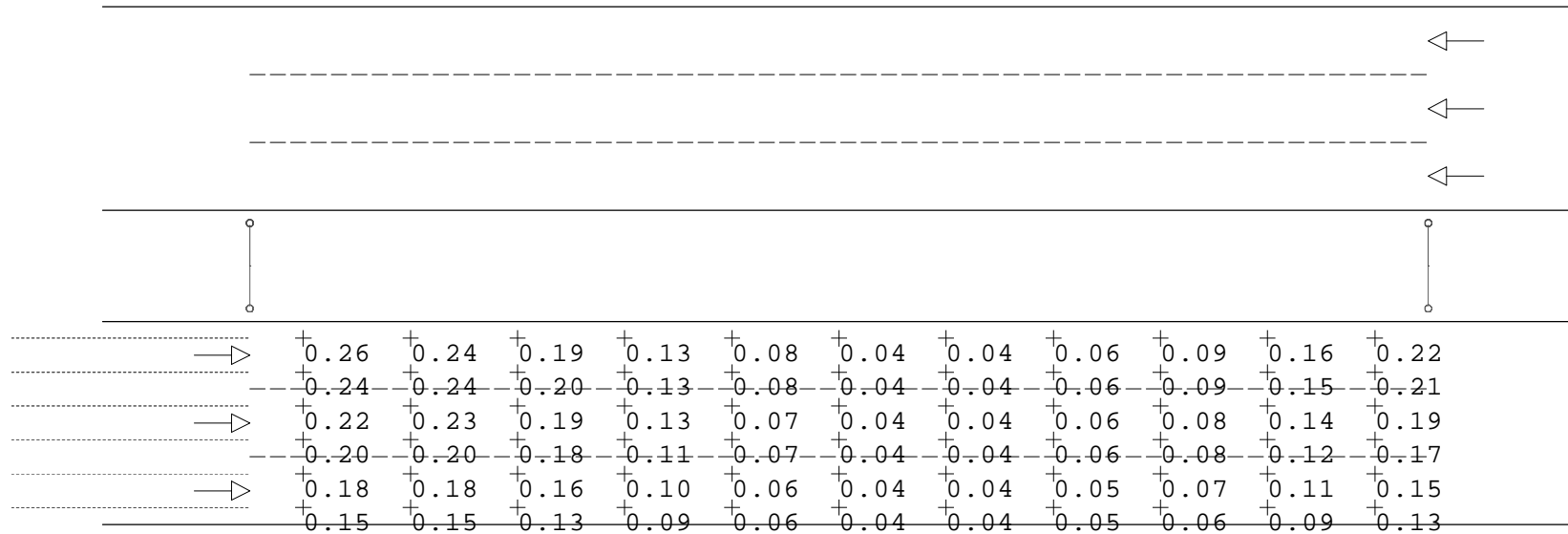
Avg/Min Ratio = 2.08

Max/Min Ratio = 4.4

Max/Avg Ratio = 2.11

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.12

Maximum = 0.26

Minimum = 0.04

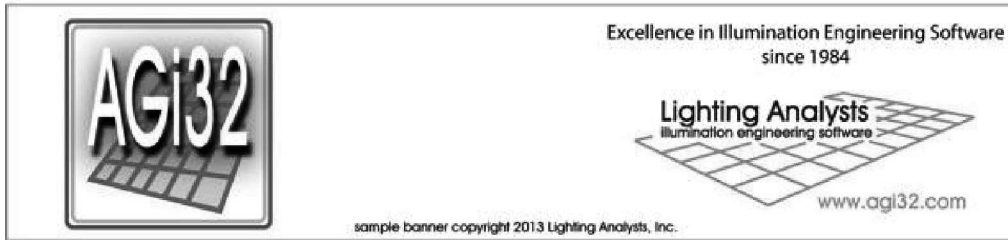
Avg/Min Ratio = 3

Max/Min Ratio = 6.5

Max/Avg Ratio = 2.17

MaxLv Ratio = 0.29

Threshold Increment (TI) = 18.55



Roadway Optimizer - Layout 2

General:

GoldenGateCityMP-Col-Coronado-Worst Case-actual dist is 1178ft

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Opposite, Median Mounted; 2R_OPP_MM
 Roadway Width: 21 ft
 Median Width: 17 ft
 Lanes In Direction Of Travel: 2
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBM P30 XXXXX R3 4K_5K

Description: ATBM P30 XXXXX R3 4K_5K
 File Name: ATBM P30 XXXXX R3 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 15452
 Luminaire Watts: 118
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 210
 Spacing - Row 2: 210

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBM P30 XXXXX R3 4...	-420	29.5	35	270	0	0
ATBM P30 XXXXX R3 4...	-210	29.5	35	270	0	0
ATBM P30 XXXXX R3 4...	0	29.5	35	270	0	0
ATBM P30 XXXXX R3 4...	210	29.5	35	270	0	0

Roadway Optimizer - Layout 2 - Cont.

Luminaire Location Summary:

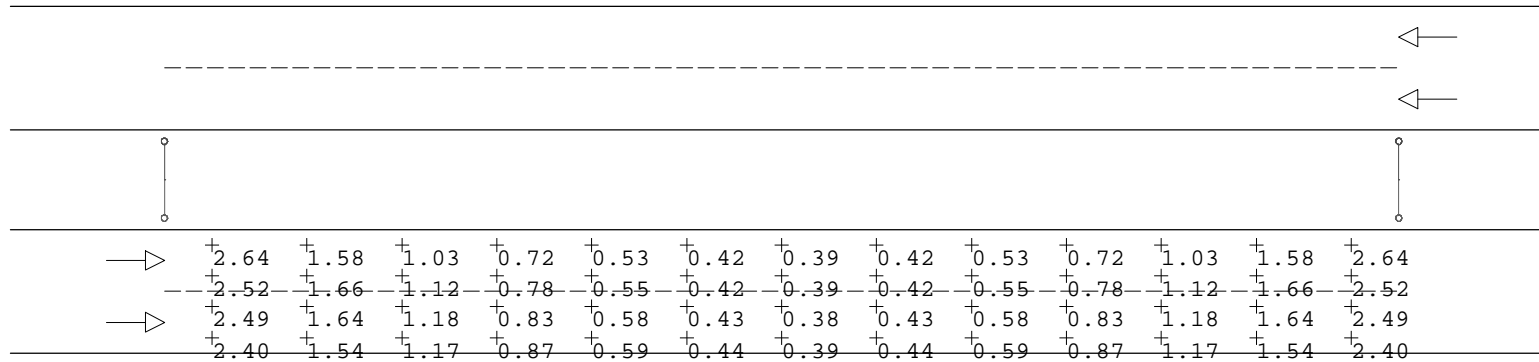
Coordinates in ft

ATBM P30 XXXXX R3 4...	420	29.5	35	270	0	0
ATBM P30 XXXXX R3 4...	630	29.5	35	270	0	0
ATBM P30 XXXXX R3 4...	-420	29.5	35	90	0	0
ATBM P30 XXXXX R3 4...	-210	29.5	35	90	0	0
ATBM P30 XXXXX R3 4...	0	29.5	35	90	0	0
ATBM P30 XXXXX R3 4...	210	29.5	35	90	0	0
ATBM P30 XXXXX R3 4...	420	29.5	35	90	0	0
ATBM P30 XXXXX R3 4...	630	29.5	35	90	0	0

Total Number of locations: 12

Roadway Optimizer - Layout 2

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.11

Maximum = 2.64

Minimum = 0.38

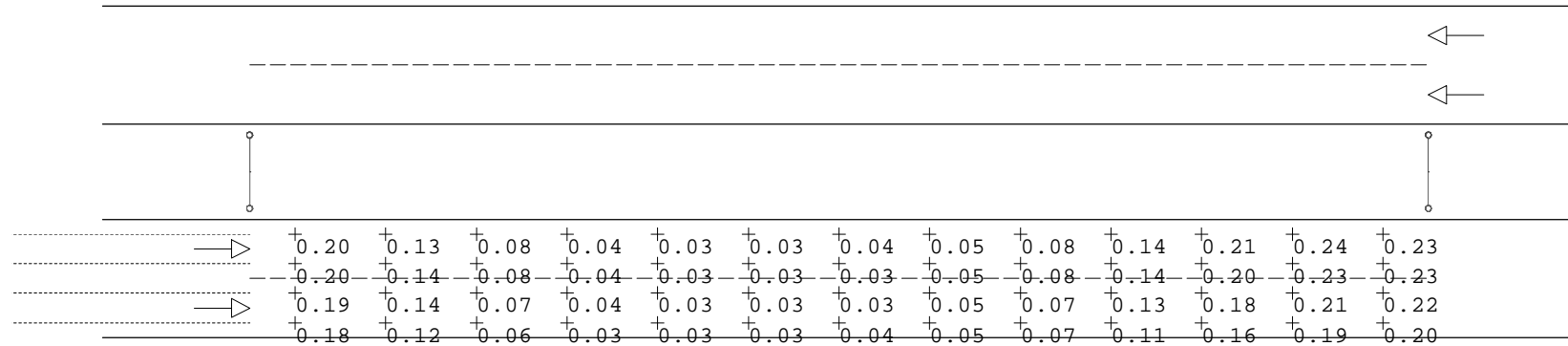
Avg/Min Ratio = 2.92

Max/Min Ratio = 6.95

Max/Avg Ratio = 2.38

Roadway Optimizer - Layout 2

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.11

Maximum = 0.24

Minimum = 0.03

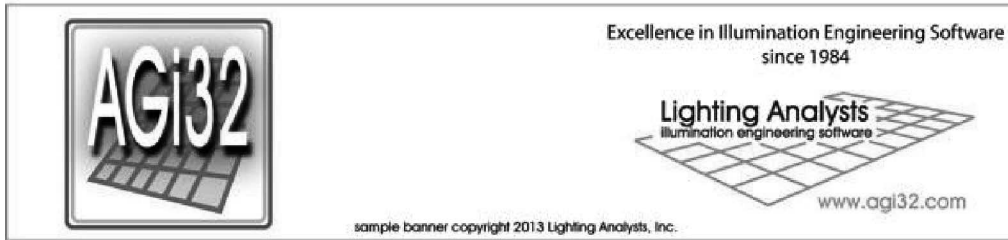
Avg/Min Ratio = 3.67

Max/Min Ratio = 8

Max/Avg Ratio = 2.18

MaxLv Ratio = 0.28

Threshold Increment (TI) = 17.60



Roadway Optimizer - Layout 3

General:

GoldenGateCityMP-Col-Sunshine-Worst Case, actual length is 1295

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Opposite, Median Mounted; 2R_OPP_MM
 Roadway Width: 31 ft
 Median Width: 18 ft
 Lanes In Direction Of Travel: 3
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBM P30 XXXXX R3 4K_5K

Description: ATBM P30 XXXXX R3 4K_5K
 File Name: ATBM P30 XXXXX R3 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 15452
 Luminaire Watts: 118
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 190
 Spacing - Row 2: 190

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBM P30 XXXXX R3 4...	760	40	35	270	0	0
ATBM P30 XXXXX R3 4...	570	40	35	270	0	0
ATBM P30 XXXXX R3 4...	380	40	35	270	0	0
ATBM P30 XXXXX R3 4...	190	40	35	270	0	0

Roadway Optimizer - Layout 3 - Cont.

Luminaire Location Summary:

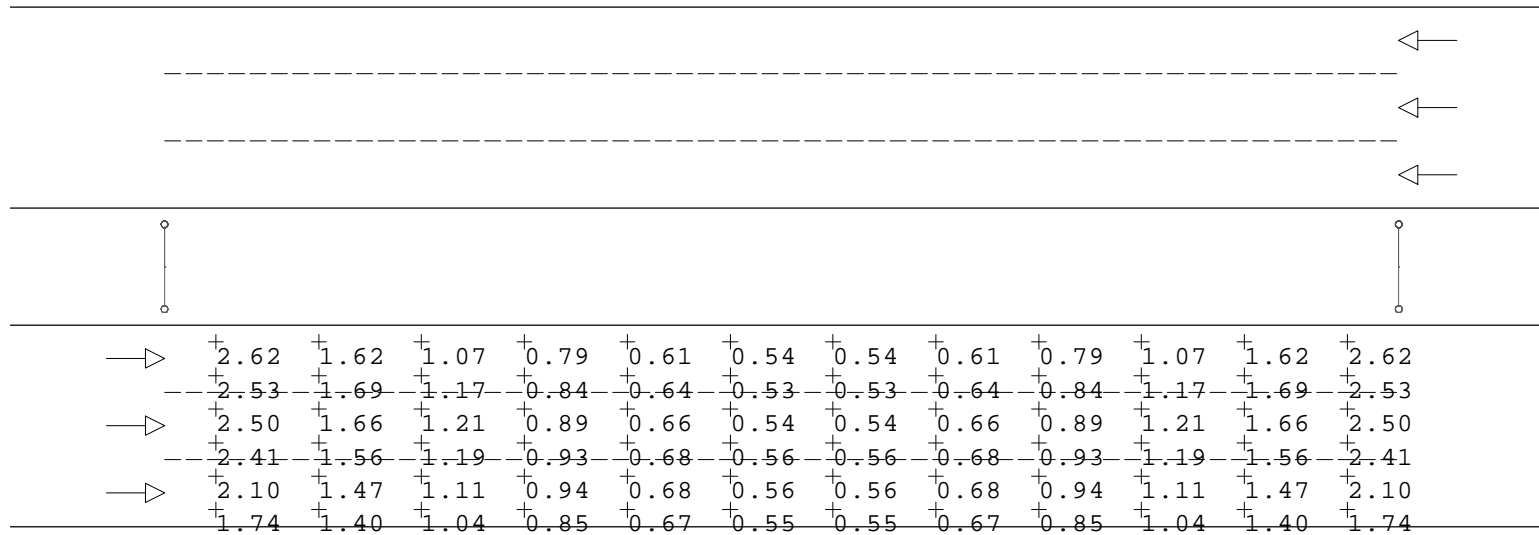
Coordinates in ft

ATBM P30	XXXXX	R3	4...	0	40	35	270	0	0
ATBM P30	XXXXX	R3	4...	-190	40	35	270	0	0
ATBM P30	XXXXX	R3	4...	-380	40	35	270	0	0
ATBM P30	XXXXX	R3	4...	760	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	570	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	380	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	190	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	0	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	-190	40	35	90	0	0
ATBM P30	XXXXX	R3	4...	-380	40	35	90	0	0

Total Number of locations: 14

Roadway Optimizer - Layout 3

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.18

Maximum = 2.62

Minimum = 0.53

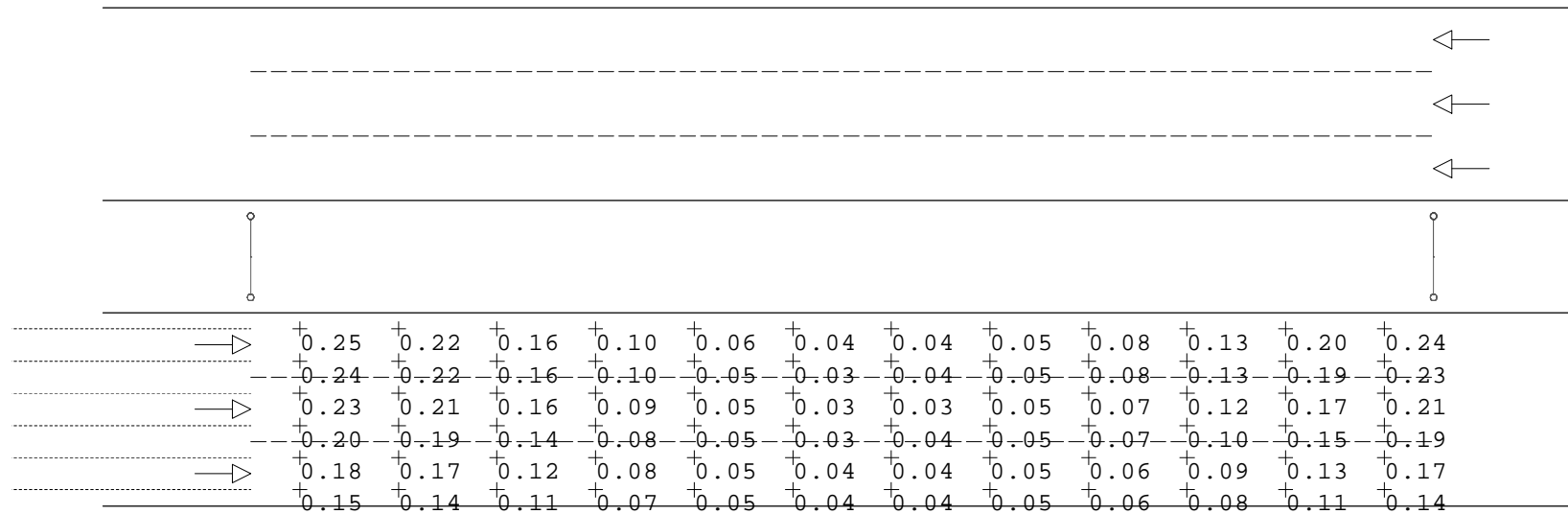
Avg/Min Ratio = 2.23

Max/Min Ratio = 4.94

Max/Avg Ratio = 2.22

Roadway Optimizer - Layout 3

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.11

Maximum = 0.25

Minimum = 0.03

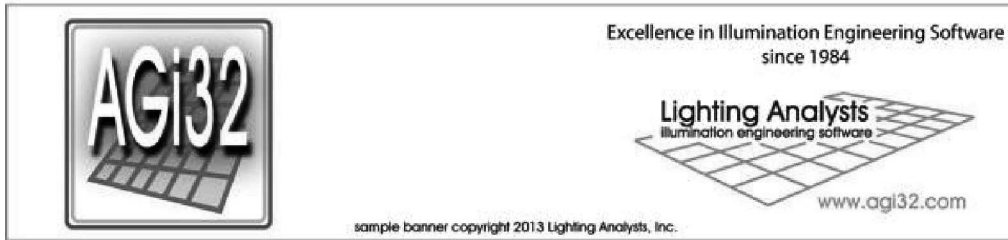
Avg/Min Ratio = 3.67

Max/Min Ratio = 8.33

Max/Avg Ratio = 2.27

MaxLv Ratio = 0.30

Threshold Increment (TI) = 18.86



Roadway Optimizer - Layout 4

General:

GoldenGateCityMP-Col-Sunshine-Worst Case, actual length is 1295

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Opposite, Median Mounted; 2R_OPP_MM
 Roadway Width: 24 ft
 Median Width: 18 ft
 Lanes In Direction Of Travel: 2
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBM P30 XXXXX R3 4K_5K

Description: ATBM P30 XXXXX R3 4K_5K
 File Name: ATBM P30 XXXXX R3 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 15452
 Luminaire Watts: 118
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 210
 Spacing - Row 2: 210

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBM P30 XXXXX R3 4...	630	33	35	270	0	0
ATBM P30 XXXXX R3 4...	420	33	35	270	0	0
ATBM P30 XXXXX R3 4...	210	33	35	270	0	0
ATBM P30 XXXXX R3 4...	0	33	35	270	0	0

Roadway Optimizer - Layout 4 - Cont.

Luminaire Location Summary:

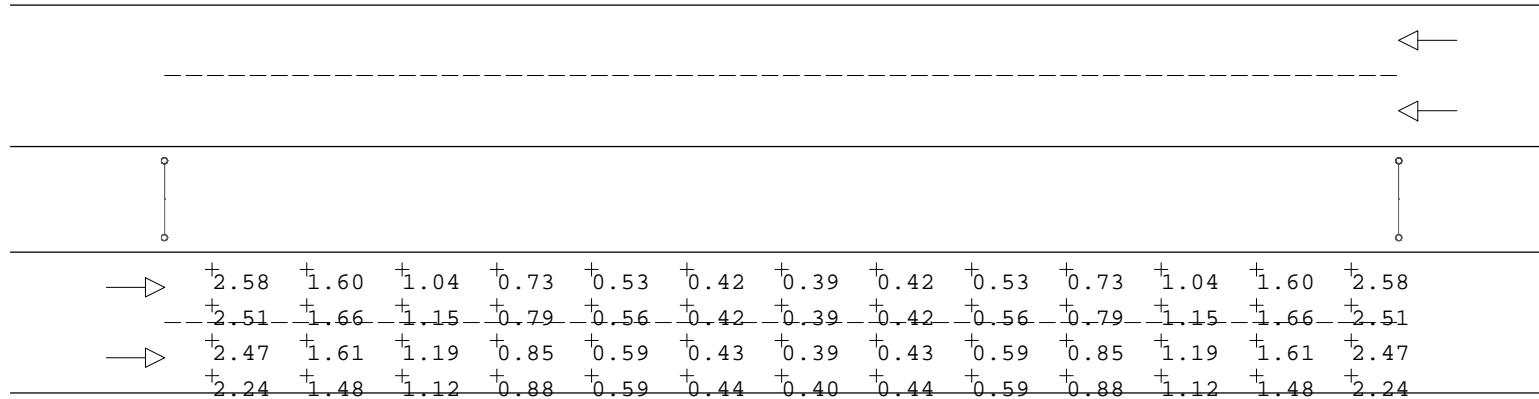
Coordinates in ft

ATBM P30	XXXXXX	R3	4...	-210	33	35	270	0	0
ATBM P30	XXXXXX	R3	4...	-420	33	35	270	0	0
ATBM P30	XXXXXX	R3	4...	630	33	35	90	0	0
ATBM P30	XXXXXX	R3	4...	420	33	35	90	0	0
ATBM P30	XXXXXX	R3	4...	210	33	35	90	0	0
ATBM P30	XXXXXX	R3	4...	0	33	35	90	0	0
ATBM P30	XXXXXX	R3	4...	-210	33	35	90	0	0
ATBM P30	XXXXXX	R3	4...	-420	33	35	90	0	0

Total Number of locations: 12

Roadway Optimizer - Layout 4

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.1

Maximum = 2.58

Minimum = 0.39

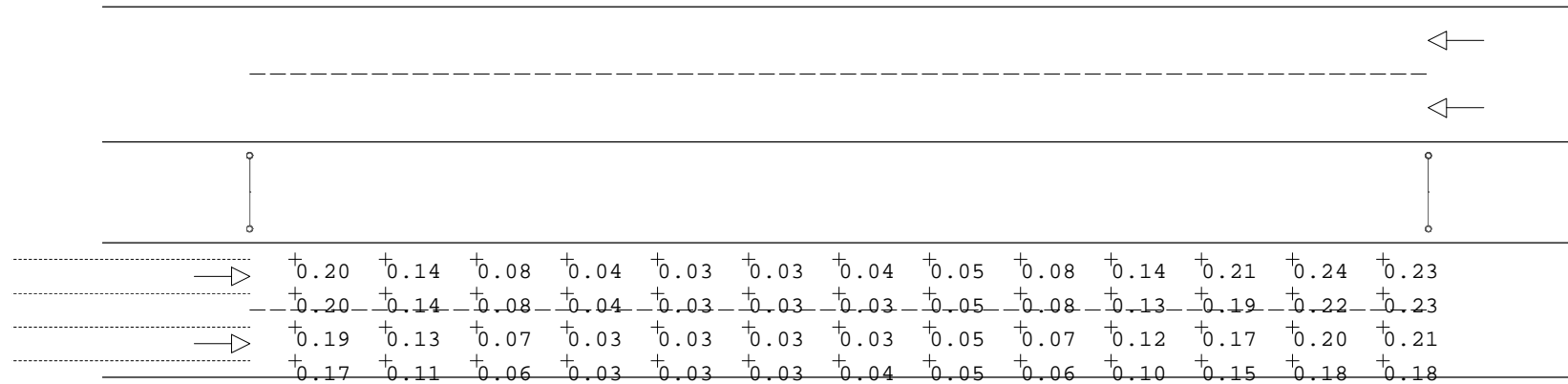
Avg/Min Ratio = 2.82

Max/Min Ratio = 6.62

Max/Avg Ratio = 2.35

Roadway Optimizer - Layout 4

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.11

Maximum = 0.24

Minimum = 0.03

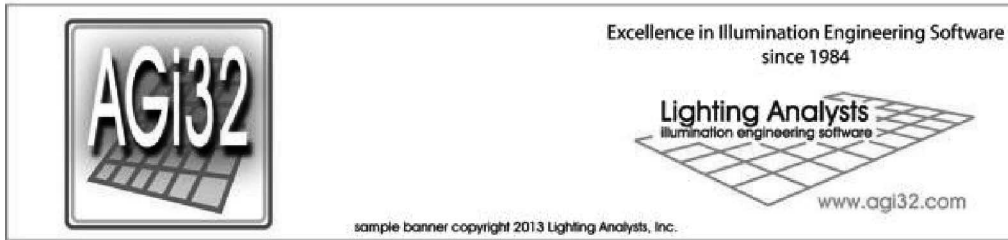
Avg/Min Ratio = 3.67

Max/Min Ratio = 8

Max/Avg Ratio = 2.18

MaxLv Ratio = 0.29

Threshold Increment (TI) = 18.28



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Art-GoldenGate-Worst Case

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, Staggered, With Median; 2R_STG_w/M
 Roadway Width: 22 ft
 Median Width: 40 ft
 Lanes In Direction Of Travel: 2
 Driver's Side Of Roadway: Right

Luminaire Information:

VERD-M-CA3-170-740-U-T3

Description: VERD-M-CA3-170-740-U-T3
 File Name: VERD-M-CA3-170-740-U-T3.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 3
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 24486
 Luminaire Watts: 172.8
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 236
 Spacing - Row 2: 236

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
VERD-M-CA3-170-740-...	708	-10	35	90	0	0
VERD-M-CA3-170-740-...	472	-10	35	90	0	0
VERD-M-CA3-170-740-...	236	-10	35	90	0	0
VERD-M-CA3-170-740-...	0	-10	35	90	0	0

Roadway Optimizer - Layout 1 - Cont.

Luminaire Location Summary:

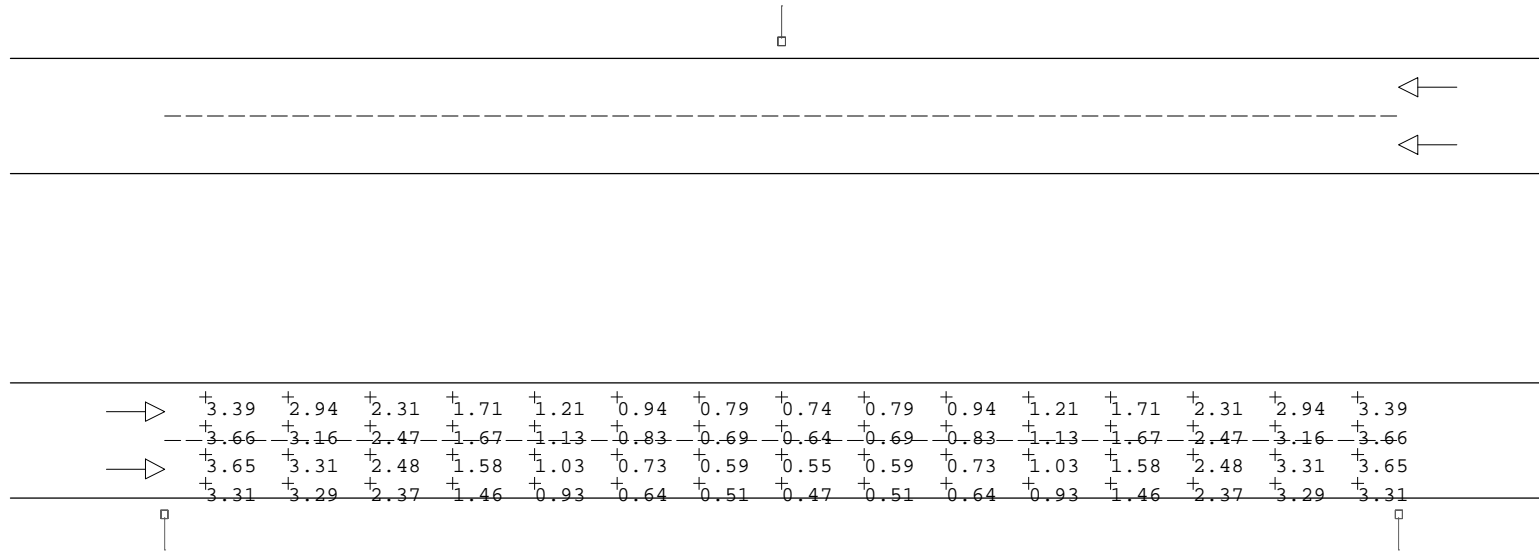
Coordinates in ft

VERD-M-CA3-170-740-...	-236	-10	35	90	0	0
VERD-M-CA3-170-740-...	-472	-10	35	90	0	0
VERD-M-CA3-170-740-...	826	94	35	270	0	0
VERD-M-CA3-170-740-...	590	94	35	270	0	0
VERD-M-CA3-170-740-...	354	94	35	270	0	0
VERD-M-CA3-170-740-...	118	94	35	270	0	0
VERD-M-CA3-170-740-...	-118	94	35	270	0	0
VERD-M-CA3-170-740-...	-354	94	35	270	0	0

Total Number of locations: 12

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.8

Maximum = 3.66

Minimum = 0.47

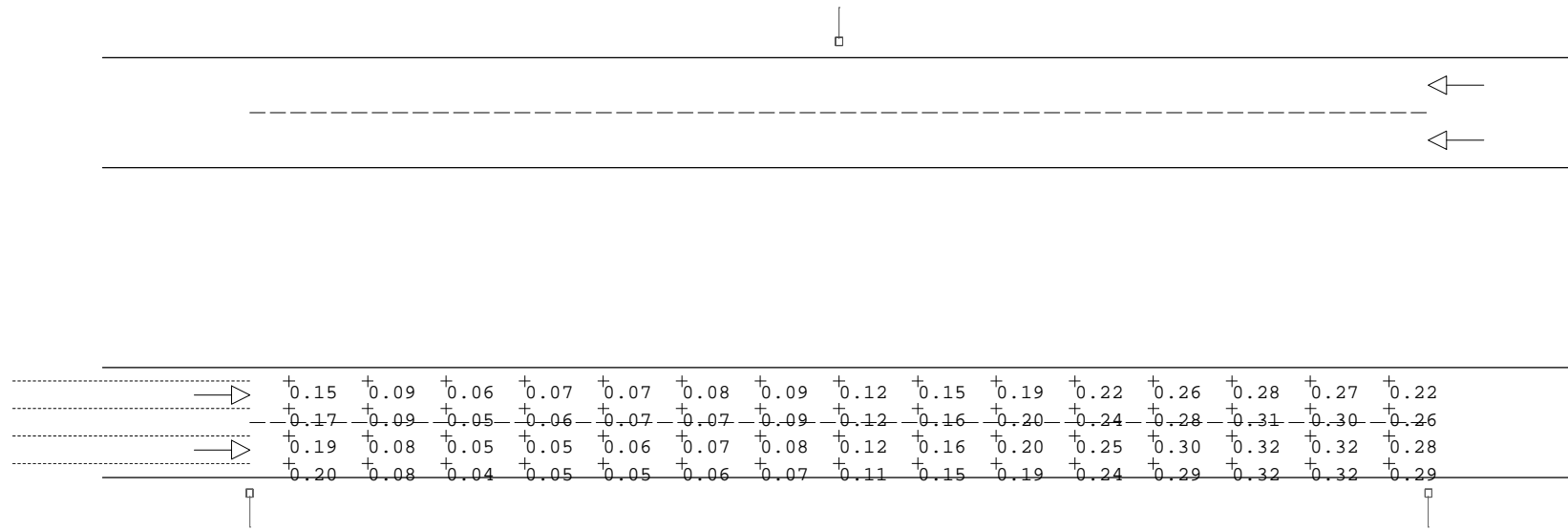
Avg/Min Ratio = 3.83

Max/Min Ratio = 7.79

Max/Avg Ratio = 2.03

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.16

Maximum = 0.32

Minimum = 0.04

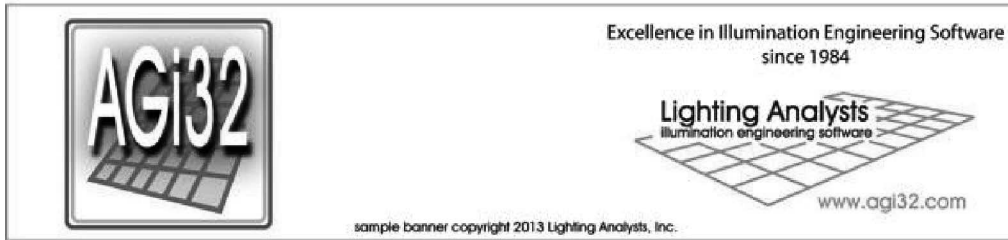
Avg/Min Ratio = 4

Max/Min Ratio = 8

Max/Avg Ratio = 2

MaxLv Ratio = 0.24

Threshold Increment (TI) = 16.26



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Arterial-SantaBarbara, layout 1, 1509ft

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Near Side, With Median; 1RNS_W/M
 Roadway Width: 22 ft
 Median Width: 20 ft
 Lanes In Direction Of Travel: 2
 Driver's Side Of Roadway: Right

Luminaire Information:

VERD-M-CA3-170-740-U-T3

Description: VERD-M-CA3-170-740-U-T3
 File Name: VERD-M-CA3-170-740-U-T3.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 3
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 24486
 Luminaire Watts: 172.8
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 214

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
VERD-M-CA3-170-740-...	-428	-12	35	90	0	0
VERD-M-CA3-170-740-...	642	-12	35	90	0	0
VERD-M-CA3-170-740-...	428	-12	35	90	0	0
VERD-M-CA3-170-740-...	214	-12	35	90	0	0
VERD-M-CA3-170-740-...	0	-12	35	90	0	0

Roadway Optimizer - Layout 1 - Cont.

Luminaire Location Summary:

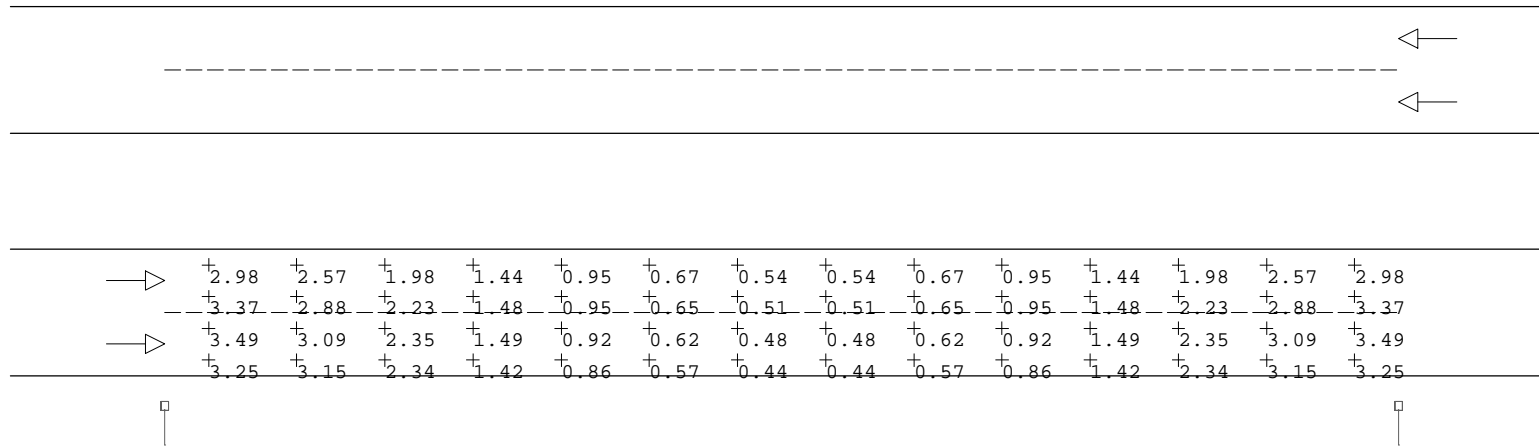
Coordinates in ft

VERD-M-CA3-170-740-...	-214	-12	35	90	0	0
------------------------	------	-----	----	----	---	---

Total Number of locations: 6

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.7

Maximum = 3.49

Minimum = 0.44

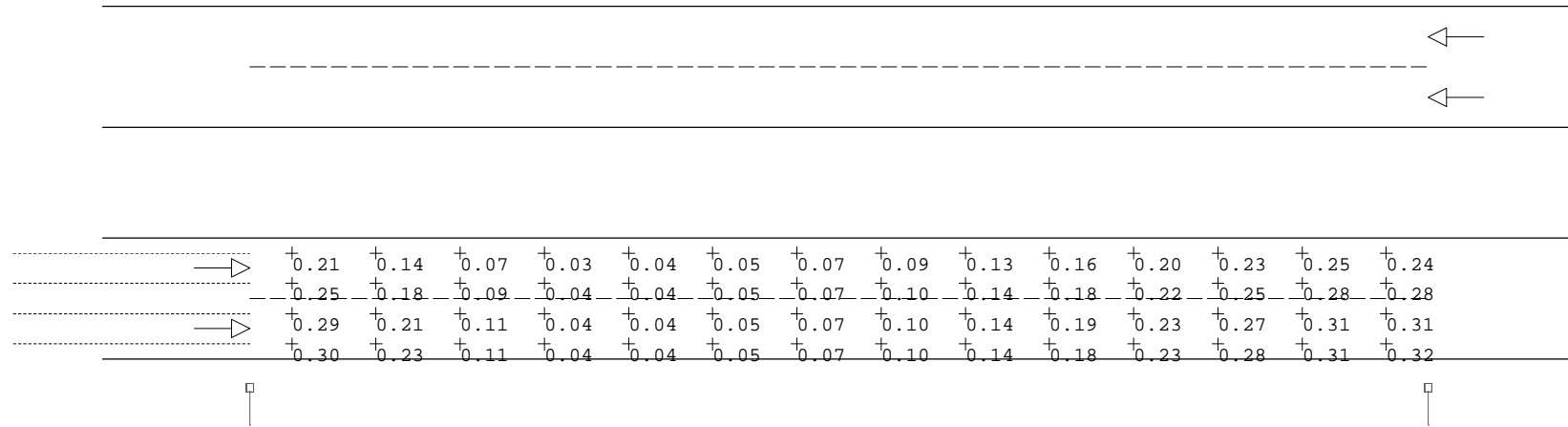
Avg/Min Ratio = 3.86

Max/Min Ratio = 7.93

Max/Avg Ratio = 2.05

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.16

Maximum = 0.32

Minimum = 0.03

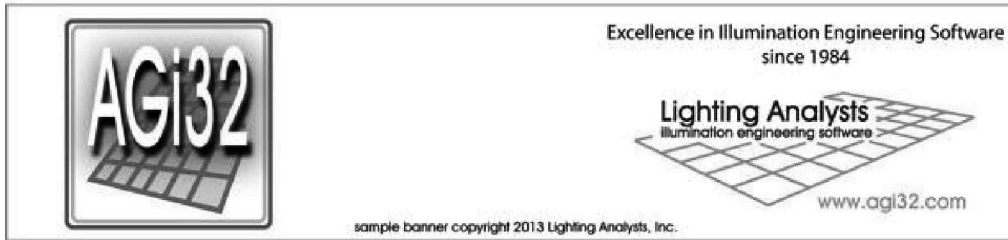
Avg/Min Ratio = 5.33

Max/Min Ratio = 10.67

Max/Avg Ratio = 2

MaxLv Ratio = 0.25

Threshold Increment (TI) = 17.29



Roadway Optimizer - Layout 3

General:

GoldenGateCityMP-Arterial-SantaBarbara, layout 2

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: Two Rows, **Opposite**, With Median; 2R_OPP_w/M
 Roadway Width: 43 ft
 Median Width: 13 ft
 Lanes In Direction Of Travel: 3
 Driver's Side Of Roadway: Right

Luminaire Information:

VERD-M-CA3-170-740-U-T3

Description: VERD-M-CA3-170-740-U-T3
 File Name: VERD-M-CA3-170-740-U-T3.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 3
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 24486
 Luminaire Watts: 172.8
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 175
Spacing - Row 2: 175

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
VERD-M-CA3-170-740-...	-350	-19	35	90	0	0
VERD-M-CA3-170-740-...	-175	-19	35	90	0	0
VERD-M-CA3-170-740-...	0	-19	35	90	0	0
VERD-M-CA3-170-740-...	175	-19	35	90	0	0

Roadway Optimizer - Layout 3 - Cont.

Luminaire Location Summary:

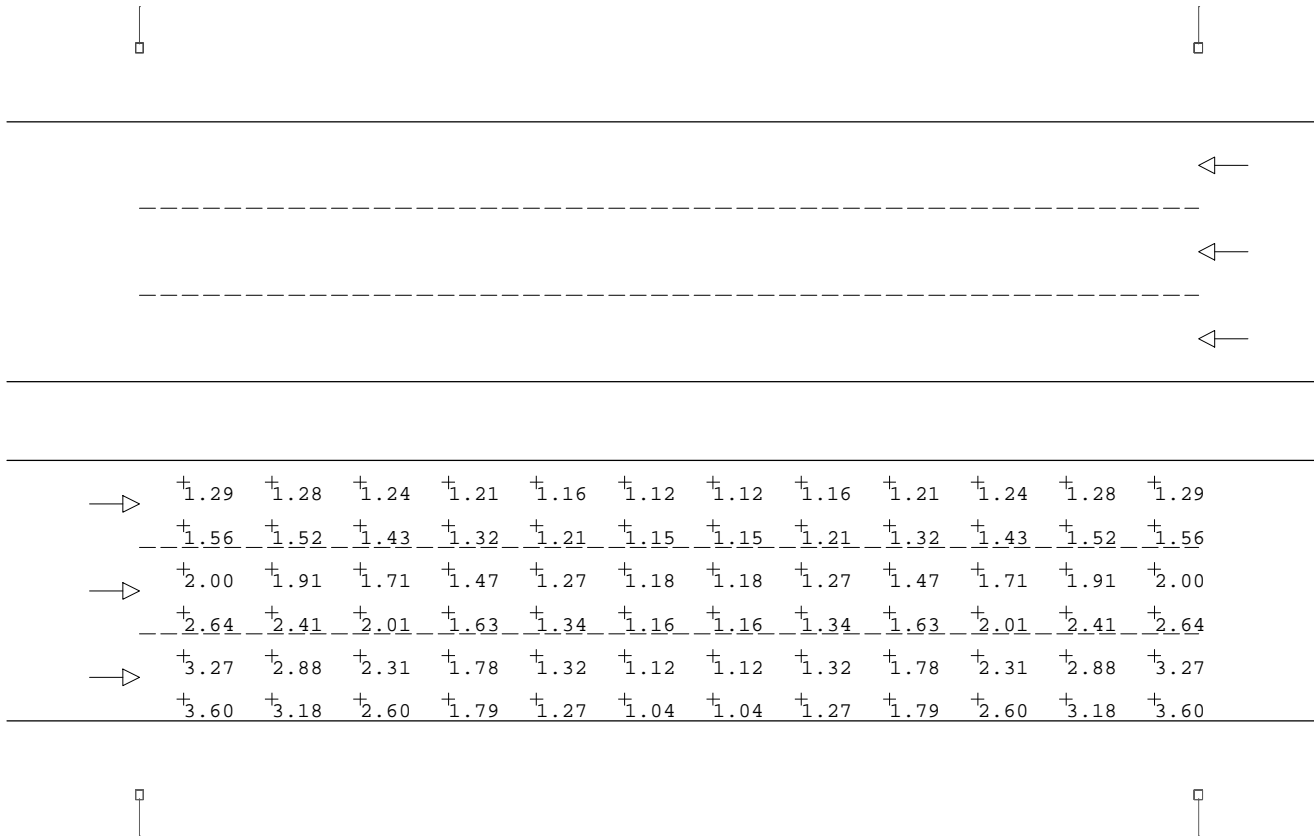
Coordinates in ft

VERD-M-CA3-170-740-...	350	-19	35	90	0	0
VERD-M-CA3-170-740-...	525	-19	35	90	0	0
VERD-M-CA3-170-740-...	700	-19	35	90	0	0
VERD-M-CA3-170-740-...	-350	118	35	270	0	0
VERD-M-CA3-170-740-...	-175	118	35	270	0	0
VERD-M-CA3-170-740-...	0	118	35	270	0	0
VERD-M-CA3-170-740-...	175	118	35	270	0	0
VERD-M-CA3-170-740-...	350	118	35	270	0	0
VERD-M-CA3-170-740-...	525	118	35	270	0	0
VERD-M-CA3-170-740-...	700	118	35	270	0	0

Total Number of locations: 14

Roadway Optimizer - Layout 3

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.73

Maximum = 3.60

Minimum = 1.04

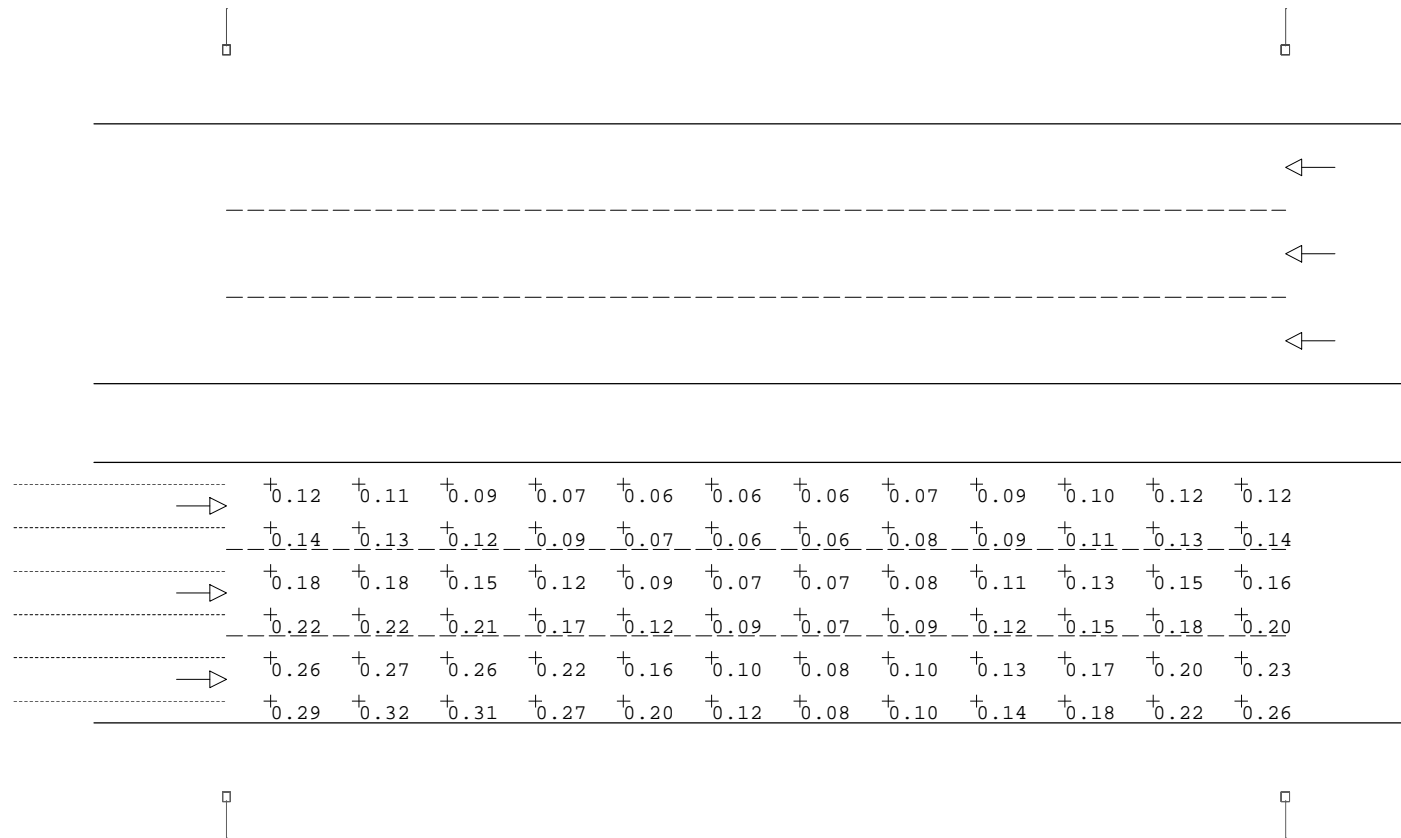
Avg/Min Ratio = 1.66

Max/Min Ratio = 3.46

Max/Avg Ratio = 2.08

Roadway Optimizer - Layout 3

RoadOpt_1_Veil_Lum



Veiling Luminance (Cd/SqM)

Average = 0.14

Maximum = 0.32

Minimum = 0.06

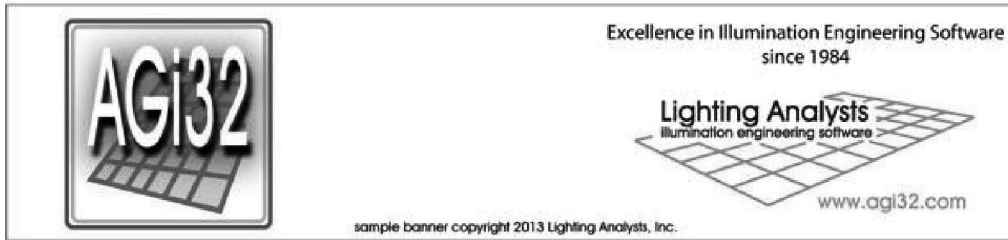
Avg/Min Ratio = 2.33

Max/Min Ratio = 5.33

Max/Avg Ratio = 2.29

MaxLv Ratio = 0.30

Threshold Increment (TI) = 19.70



Roadway Optimizer - Layout 1

General:

GoldenGateCityMP-Service

Roadway Standard: ANSI-IES RP-8-18 Roadway
 R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Near Side; LRNS
 Roadway Width: 18 ft
 Lanes In Direction Of Travel: 1
 Driver's Side Of Roadway: Right

Luminaire Information:

ATBS P40 XXXXX R2 4K_5K

Description: ATBS P40 XXXXX R2 4K_5K
 File Name: ATBS P40 XXXXX R2 4K_5K.ies
 Lumens Per Lamp: N.A.
 Number Of Lamps: 1
 Total Lamp Lumens: N.A.
 Luminaire Lumens: 9535
 Luminaire Watts: 70
 Efficiency (%): N.A.
 S/P Ratio: 1.00
 Total Light Loss Factor: 1.000
 Luminaire Arrangement: Single
 Arm Length: 6 ft
 Offset: 0 ft

Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 160

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ATBS P40 XXXXX R2 4...	-320	-1	25	90	0	0
ATBS P40 XXXXX R2 4...	-160	-1	25	90	0	0
ATBS P40 XXXXX R2 4...	0	-1	25	90	0	0
ATBS P40 XXXXX R2 4...	160	-1	25	90	0	0
ATBS P40 XXXXX R2 4...	320	-1	25	90	0	0
ATBS P40 XXXXX R2 4...	480	-1	25	90	0	0

Roadway Optimizer - Layout 1 - Cont.

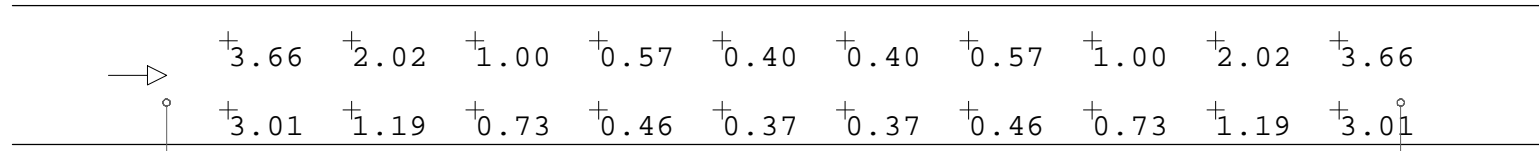
Luminaire Location Summary:

Coordinates in ft

Total Number of locations: 6

Roadway Optimizer - Layout 1

RoadOpt_1_Illum



Illuminance (Fc)

Average = 1.34

Maximum = 3.66

Minimum = 0.37

Avg/Min Ratio = 3.62

Max/Min Ratio = 9.89

Max/Avg Ratio = 2.73

Roadway Optimizer - Layout 1

RoadOpt_1_Veil_Lum

→	†0.05	†0.12	†0.25	†0.32	†0.28	†0.19	†0.06	†0.02	†0.02	†0.02
○	†0.05	†0.10	†0.26	†0.34	†0.25	†0.14	†0.05	†0.02	†0.02	†0.02

Veiling Luminance (Cd/SqM)

Average = 0.13

Maximum = 0.34

Minimum = 0.02

Avg/Min Ratio = 6.5

Max/Min Ratio = 17

Max/Avg Ratio = 2.62

MaxLv Ratio = 0.28

Threshold Increment (TI) = 18.97

Table 231.2.1 Lighting Initial Values

Roadway Classification Or Project Type	Illumination Level Average Foot Candle		Illumination Uniformity Ratios		Veiling Luminance Ratio
	Horizontal (H.F.C.)	Vertical (V.F.C.)	Avg./Min.	Max./Min.	$L_{V(MAX)}/L_{AVG}$
Corridor Lighting					
Limited Access Facilities	1.5	N/A	4:1 or Less	10:1 or Less	0.3:1 or Less
Major Arterials	1.5				
Other Roadways	1.0				
High Mast Lighting					
All Roadway Classifications	0.8 to 1.0	N/A	3:1 or Less	10:1 or Less	N/A
Signalized Intersection and Roundabout Lighting					
New or Reconstruction	3.0 Std. 1.5 Min.	1.5 Std. 1.2 Min.	4:1 or Less	10:1 or Less	N/A
Lighting Retrofit	1.5 Std. 1.0 Min.	1.5 Std. 1.0 Min.			
Unsignalized Intersection Lighting					
All Project Types	1.0 to 1.5	1.5 Std. 1.0 Min.	4:1 or Less	10:1 or Less	N/A
Midblock Crosswalk Lighting					
Low Ambient Luminance	N/A	1.5	N/A	N/A	N/A
Medium & High Ambient Luminance		2.3			
Sidewalks and Shared Use Paths					
Facilities Separated from the Roadway	2.5	N/A	4:1 or Less	10:1 or Less	N/A
Sign Lighting					
Low Ambient Luminance	15-20	N/A	N/A	6:1	N/A
Medium & High Ambient Luminance	25-35				
Rest Area Lighting					
All Roadways and Parking Areas	1.5	N/A	4:1 or Less	10:1 or Less	N/A

Source: Florida Department of Transportation (FDOT). 2024. 2025 FDOT Design Manual. FDOT Roadway Design Office. Topic No: 625-000-002. Effective January 1, 2025. December 3.

**Table 231.2.2 Minimum Mounting Heights
Based on Maximum Candela**

Minimum Mounting Height (ft.)	Maximum Candela of Luminaire		
	Long Distribution	Medium Distribution	Short Distribution
20 or Less	5,000	10,000	15,000
25	10,000	15,000	20,000
30	15,000	20,000	25,000
35	20,000	25,000	30,000
40	25,000	30,000	35,000
45	30,000	35,000	40,000
50	35,000	40,000	45,000
<p>(1) Note: “Distribution” refers to the longitudinal distribution of the luminaire output per the Illuminating Engineering Society of North America (IESNA).</p> <p>(2) “Maximum Candela” is generally provided with the manufacturer’s luminaire specific “IES” file for AGI32® or similar design software.</p>			

Source: Florida Department of Transportation (FDOT). 2024. 2025 FDOT Design Manual. FDOT Roadway Design Office. Topic No: 625-000-002. Effective January 1, 2025. December 3.



Appendix G
Proposed Fiber Optic Cable Infrastructure
Technical Memorandum

August 27, 2025

MEMORANDUM

Subject: Golden Gate City Proposed Fiber Infrastructure for
Public Lift Stations & Future Lift Station Expansion

Introduction

As part of ongoing efforts to modernize infrastructure in Golden Gate City, the integration of fiber optic connectivity into the public lift station network is a critical step toward improving operational efficiency and long-term sustainability. This initiative will strengthen wastewater management by enhancing real-time monitoring, system resilience, and overall performance. Beyond these immediate benefits, the installation of fiber will also lay the groundwork for future technological advancements, including expanded high-speed internet access and smart city applications.

Methodology:

Exhibit A shows fiber in the Golden Gate community, Key components included in Exhibit A include the following:

- **Existing Fiber Lines** – Highlighting areas (Orange dash) that already have established fiber connectivity. The existing fiber is traffic and IT. The existing fiber data were provided by Collier County on 12/10/24.
- **Proposed Fiber Routes** –To determine where to map out the fiber, coordination was done with Collier County Public Utilities. From the direction of Collier County, the proposed fiber is connected to public lift stations. The public lift stations include existing and proposed lift stations. This can be viewed in Exhibit A (Orange solid). Additionally, an IT fiber connection is being proposed to the existing WWTP.
- **Lift Stations** – Per Exhibit A The fiber network connects to existing public and 23 future public lift stations. Per Exhibit A, fiber going to future lift stations is orange, and fiber going to existing lift stations is light orange.

Enhancing Lift Station Infrastructure

Upgrading lift stations with fiber optic connectivity will bring several key operational improvements:

- **Real-Time Monitoring & Control:** Fiber will provide a faster, more reliable communication link between lift stations and central management systems. This will enable remote monitoring, allowing quicker identification and response to system anomalies, reducing downtime, and improving service reliability.
- **Improved System Resilience:** A dedicated fiber network enhances system redundancy, allowing for more coordinated responses to failures and minimizing potential disruptions.
- **Cost Savings & Efficiency:** Fiber connectivity supports predictive maintenance by enabling advanced data analytics. By identifying potential issues before they escalate, costly emergency repairs and unplanned service interruptions can be significantly reduced.

Long-Term Benefits & Future Expansion

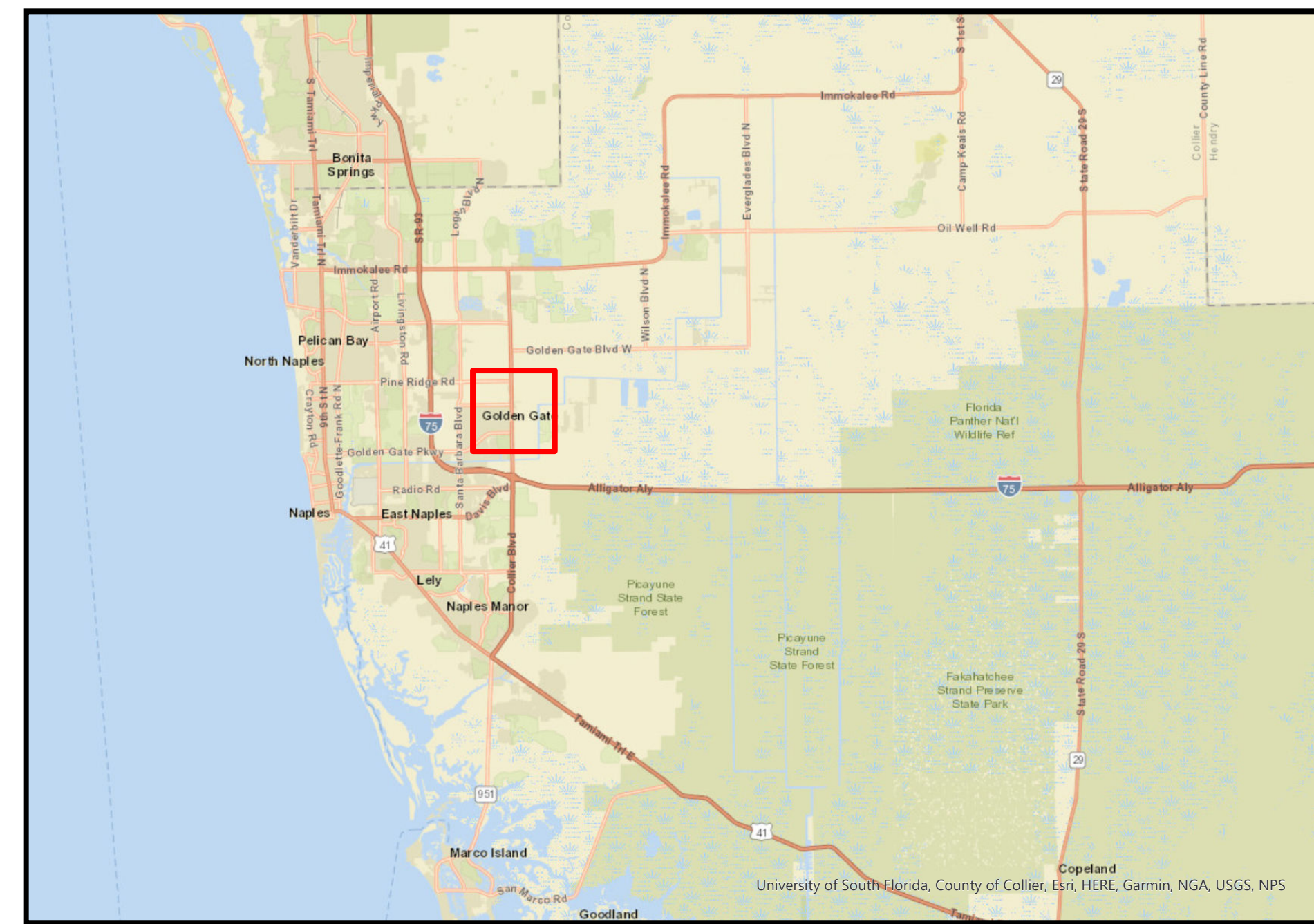
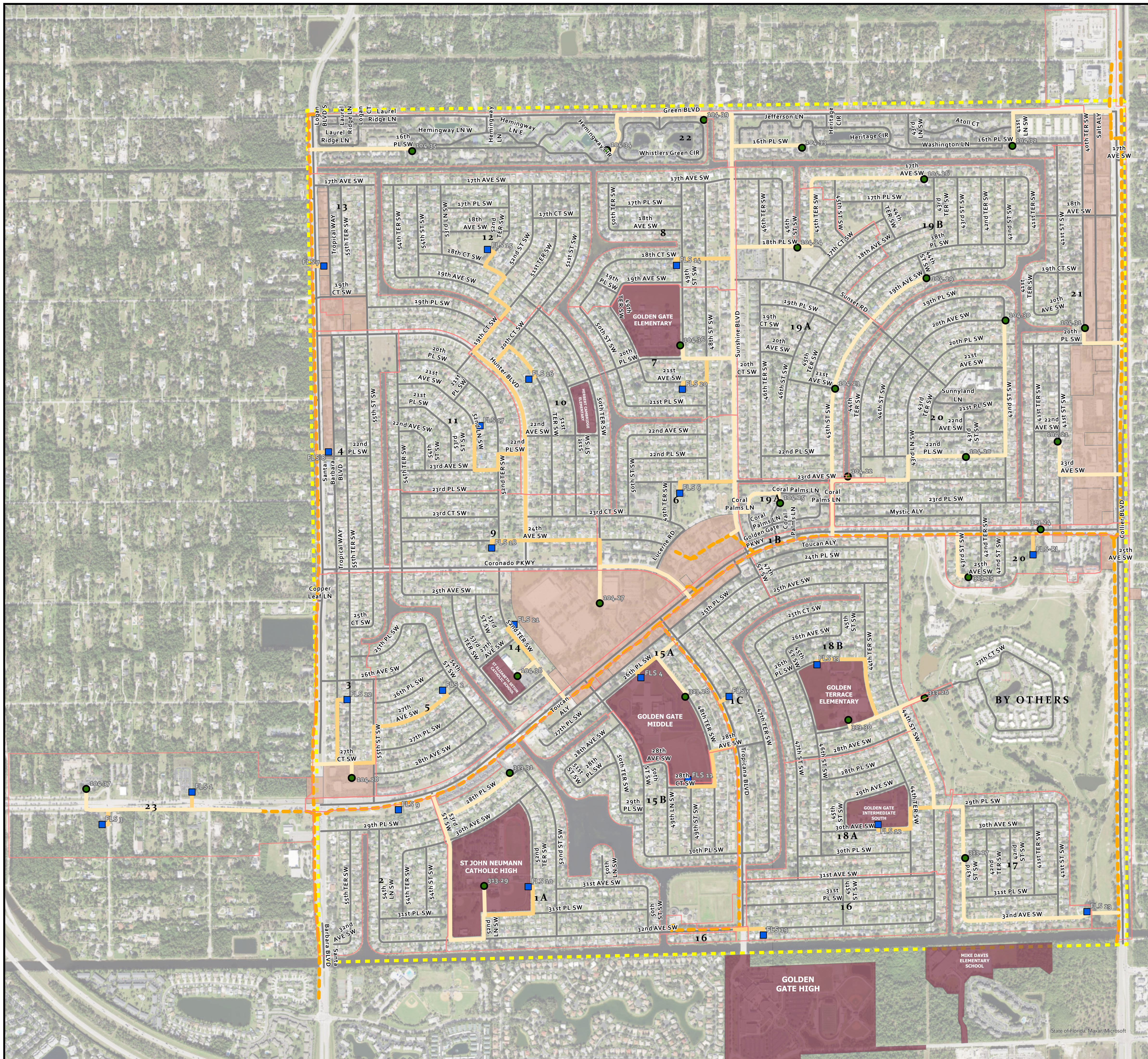
While the immediate focus is on improving lift station operations, the fiber installation also presents broader benefits for the community:

- **Expanding High-Speed Internet Access:** The new fiber infrastructure provides a scalable foundation for extending broadband connectivity to residential and commercial areas, fostering economic growth and improving digital access for the community.
- **Smart City Integration:** A high-speed fiber network supports future smart city applications, such as intelligent traffic management, enhanced public safety communication, and optimized emergency response systems.

- **Economic & Community Growth:** Reliable broadband infrastructure is a key factor in attracting businesses, supporting modern workplaces, and improving the overall quality of life for residents.

Conclusion:

In conclusion, the proposed fiber infrastructure for Golden Gate City's public lift stations represents a significant step toward modernizing wastewater management while paving the way for future technological advancements. By integrating fiber optic connectivity, the project will enhance real-time monitoring, improve system resilience, and drive operational efficiency, ultimately reducing costs and service disruptions. Additionally, this initiative lays the groundwork for expanded high-speed internet access, smart city applications, and long-term economic growth. As the project progresses, the benefits will extend beyond lift station operations, contributing to a more connected, efficient, and future-ready community.



- LEGEND**
- Proposed Fiber, Future LS Connection
 - Proposed Fiber, Public LS Connection
 - Existing Fiber
 - Public Lift Station (Existing)
 - Future Lift Stations
 - School Parcels
 - Commercial Zones
 - Project Boundary
 - Phase Boundaries

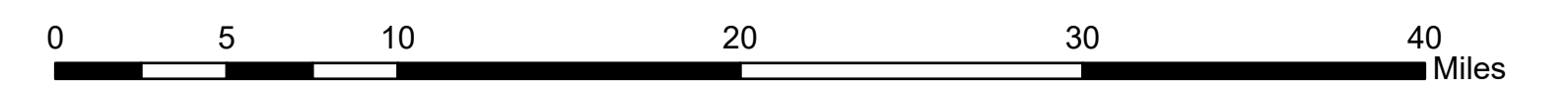


EXHIBIT A

Fiber
Golden Gate City Masterplan
Collier County, Florida





Appendix H
Proposed Irrigation Improvements
Technical Memorandum

August 27, 2025

Subject: Irrigation Quality (IQ) Water System within Golden Gate City**MEMORANDUM****Introduction:**

Golden Gate City, a four-square-mile community in Collier County, is home to approximately 12,755 residents. Much of the area's infrastructure, including its water, wastewater, and stormwater systems, was developed in the 1960s. Over time, these systems have deteriorated and no longer meet the needs of the growing population.

This memo outlines the analysis and rationale for implementing an Irrigation Quality (IQ) Water System within Golden Gate, FL. The purpose of this system is to provide non-potable water for irrigation to reduce the demand for potable water resources and promote sustainable water use practices. The source of the irrigation quality water will be from the Golden Gate Wastewater Treatment Plant (GGWWTP). Currently, irrigation in the Golden Gate community is either potable water or water from wells, per Collier County.

Methodology:

The following methods were used in this analysis:

- **GIS Mapping:** Identified high-water-use sites within the study area. This can be seen in Exhibit A.
- **Collier County Coordination:** A Coordination meeting was conducted with Collier County staff to review and discuss the proposed irrigation layout for the Golden Gate Master Plan. The purpose of the meeting was to gather input on reclaimed water service needs for county-owned facilities, parks, medians, and potential expansion into dual-piped residential communities south of the Golden Gate Canal. County staff emphasized the importance of aligning the proposed network with future service priorities and considering right-of-way constraints when planning pipe alignments. Following the meeting, the irrigation map was revised, and Exhibit A was updated to reflect future connection points to both the regional irrigation quality (IQ) system and dual-piped communities. Notes and labels were added to Exhibit A to identify proposed residential irrigation alignments and ensure consistency with long-term utility planning goals.
- **Analysis:** Reviewed landscaping and irrigation needs of schools, parks, residential communities, and commercial properties. For this analysis, the South Florida Water Management District's 2022 Lower West Coast Water Supply Plan Update (LWCWSP) was used to determine the demand for schools, golf courses, parks, and residential. Exhibit A shows the demand rates for categories such as schools, median, and golf courses.

Potential High-Water Users:

The Golden Gate community has many homes, schools, parks, religious institutions, and commercial centers. Collier County has stated that the county will provide IQ water for county facilities such as parks, roadway medians, and the golf course. For creating a network that will address future needs, this memo discusses schools, parks, and commercial centers as users. These users can be seen in Exhibit A.

Schools (Potential Customers for Collier County)

Schools in Golden Gate are among the largest irrigated areas due to sports fields, playgrounds, and landscaped grounds. These institutions represent a significant demand for IQ water.

- **Golden Gate Elementary School** – Landscaping, sports fields, and playground areas.
- **Golden Gate Middle School** – Includes sports fields and garden areas.
- **Golden Terrace Elementary School** – Extensive grounds with open fields.

- **Golden Gate Elementary Intermediate School**– Landscaping, sports fields, and playground areas.
- **Golden Terrace Elementary South School.** – Landscaping, sports fields, and playground areas.
- **Lavern Gaynor Elementary School** – Grounds with multiple irrigated green spaces.
- **St. John Neumann Catholic High School** – High irrigation needs for sports fields and landscaping.
- **St. Elizabeth Seaton Catholic School**– Grounds with multiple irrigated green spaces

Parks and Recreation Areas

Parks require substantial irrigation to maintain green spaces, playgrounds, and community recreational areas.

- **Rita Eaton Park** – A community park with open green spaces and landscaped areas.
- **Other Green Spaces** – Smaller community parks or green areas within Golden Gate.

Religious Institutions (Potential Customers for the County)

Churches and community organizations often maintain landscaped grounds that require regular irrigation.

- **Evangelical Free Methodist Church** – Landscaped areas around the property.
- **Grace Place for Children and Families** – Gardens and community landscaping.
- **The Church of Jesus Christ of Latter-Day Saints** – Landscaped grounds around the facility.
- **Saint Elizabeth Seton Catholic Church** – Grounds and entryway landscaping.

Commercial Centers (Potential Customers for the County)

Commercial properties have landscaped areas around buildings and parking lots that need regular watering.

- **Sungate Center** – Shopping center with landscaped areas.
- **Golden Gate Farmers Market Area** – Landscaped greens and gardens around the market.

Road Medians and Public Right-of-Ways

Several roads in the study area feature landscaped medians requiring irrigation, which could benefit from IQ water.

- **Golden Gate Parkway** – Major roadway with landscaped medians.
- **Green Boulevard**- Major roadway with landscaped median. The roadway will be widened to four lanes from Santa Barbara to Sunshine Boulevard.
- **Santa Barbara Boulevard**- Major roadway with landscaped median.
- **Collier Boulevard**- Major roadway with landscaped median. Collier Blvd will be getting irrigation sleeves with the widening project.
- **Sunshine Boulevard** – Landscaped right-of-way areas.
- **Coronado Parkway**- Roadway Medians
- **Hunter Blvd**- Roadway Medians
- **Tropicana Blvd**- Roadway Medians

Country Club (Golden Gate Country Club)

The country club represents a substantial irrigation need due to its expansive green spaces, golf course, and landscaped areas. This user is expected to be one of the highest-demand locations for the IQ water system, significantly influencing the design and pipe sizing requirements in the surrounding area.

Residential (Potential Customers for the County)

The Golden Gate Community has a population of 12,755 residents. Providing access to IQ will allow residents to use sustainable methods of watering their green spaces. Additionally, other benefits include water conservation and economic benefits for residents. It is recommended that the county look at adding irrigation-quality water as an option for residents.

Rationale for Pipe Sizes:

The pipe sizes selected in the cost estimate are designed to meet the specific irrigation needs of high-water-use sites in Golden Gate, FL, while ensuring efficient and sustainable distribution across the study area.

12-inch PVC Pipe (Main Distribution Lines)

- **Purpose:** The 12-inch pipes serve as primary distribution lines, carrying large volumes of IQ water to major users like schools, parks, commercial centers, and the country club. These distribution lines will be along major corridors such as Golden Gate Parkway (Refer to Exhibit A for other corridors with 12 in lines).
- **Rationale:** This size supports substantial water flow with minimal pressure loss over long distances, essential for meeting peak irrigation demand across multiple large sites, including the high-demand country club.

10-inch PVC Pipe (Secondary Distribution Lines)

- **Purpose:** 10-inch pipes branch off from the main distribution lines to serve clusters of high-demand users, including schools, parks, residential areas, and sections of the country club as it can be seen in Exhibit A.
- **Rationale:** The 10-inch size balances adequate flow capacity and cost-effectiveness, allowing efficient distribution to localized areas, including various zones within the country club, while maintaining stable system pressure.

Existing Irrigation in Golden Gate:

Collier County provided a map (**Exhibit A-1**) identifying the locations of existing potable irrigation meters within the Golden Gate study area. These meters vary in size and are generally located along major corridors such as Golden Gate Parkway, Santa Barbara Boulevard, and Collier Boulevard.

While the meter locations are confirmed, the alignments of associated irrigation lines are not shown due to unavailable records and lack of field verification. It is anticipated that these meters may be associated with existing irrigated areas such as landscaped medians or public frontages; however, this has not been verified. For planning purposes, these meter locations should be considered in future irrigation system design and utility coordination.

Livingston Road Regional Irrigation Quality Connection:

The proposed Golden Gate Irrigation Quality water will be connected to the planned Livingston Road Regional Irrigation Quality Connection. This connection is anticipated to enhance the efficiency and reliability of water distribution for irrigation purposes across Golden Gate.

Integrating the local IQ system with the broader regional infrastructure is expected to provide a more stable and consistent supply of irrigation-quality water, particularly to high-demand areas such as schools, parks, and the golf course. This strategic link should leverage regional water treatment capabilities, permitting the growing irrigation demands of Golden Gate to be met without straining the local water resources.

The planned connection is designed to alleviate some operational burden from the GGWWTP by allowing it to distribute its treated effluent more effectively during peak demand times and enhance system resilience against fluctuations in water demand or treatment capacity. This initiative is critical for supporting the sustainable growth and development of Golden Gate, serving as a foundation for future expansions of the irrigation network.

Phased Capacity and System Planning:

As part of the County's infrastructure planning, the GGWWTP is scheduled for expansion to increase reclaimed water capacity. The first phase will provide up to 4 MGD of irrigation-quality (IQ) water, with an ultimate build-out capacity of 8 MGD. These phased improvements will support both immediate and long-term demand from parks, medians, schools, commercial users, and future residential connections.

During coordination meetings, County staff emphasized the importance of planning IQ mains to reflect this phased capacity, prioritizing early service to high-demand users such as the golf course, county facilities, and key roadway medians. As the network expands beyond the initial Golden Gate Master Plan boundaries, future tie-ins to dual-piped communities and regional connections, such as along Santa Barbara Boulevard and Davis Boulevard, should be considered to optimize long-term reuse distribution.

The system layout, as reflected in Exhibit A, is designed to align with this phased expansion by identifying initial service corridors and reserving capacity for future connections that support regional reuse planning goals.

Golden Gate Wastewater Treatment Plant:

The GGWWTP has been evaluated for its potential to reuse treated effluent as Irrigation Quality (IQ) water, ensuring compliance with Florida Administrative Code Chapter 62-610 and Collier County's IQ Water Level of Service (LOS) standards.

As outlined in Exhibit B, the current effluent treatment processes at GGWWTP achieve Class I reliability and high-level disinfection standards necessary for public-access reuse. Effluent quality parameters, specifically detailed in Exhibit B, include a cBOD₅ limit of 20 mg/L, TSS limit of 5 mg/L, chlorine residual \geq 1.0 mg/L, and non-detectable fecal coliform in 75% of daily samples. While the existing deep well injection system does not have a regulatory nitrogen limit, future regulatory changes may require nitrogen concentrations below 6 mg/L and phosphorus below 1.0 mg/L.

The compliance analysis provided in Exhibit B identifies strong alignment with county criteria, while also highlighting specific areas that require further investigation, such as detailed hydraulic modeling to verify distribution system pressures and velocities, as well as consideration of supplemental groundwater supply.

Recommended actions include enhanced nitrogen and phosphorus monitoring, continued strict adherence to high-level disinfection requirements, and conducting hydraulic verification analyses. With these measures implemented, the GGWWTP's current treatment design and operational flexibility position it effectively to meet current and anticipated regulatory standards.

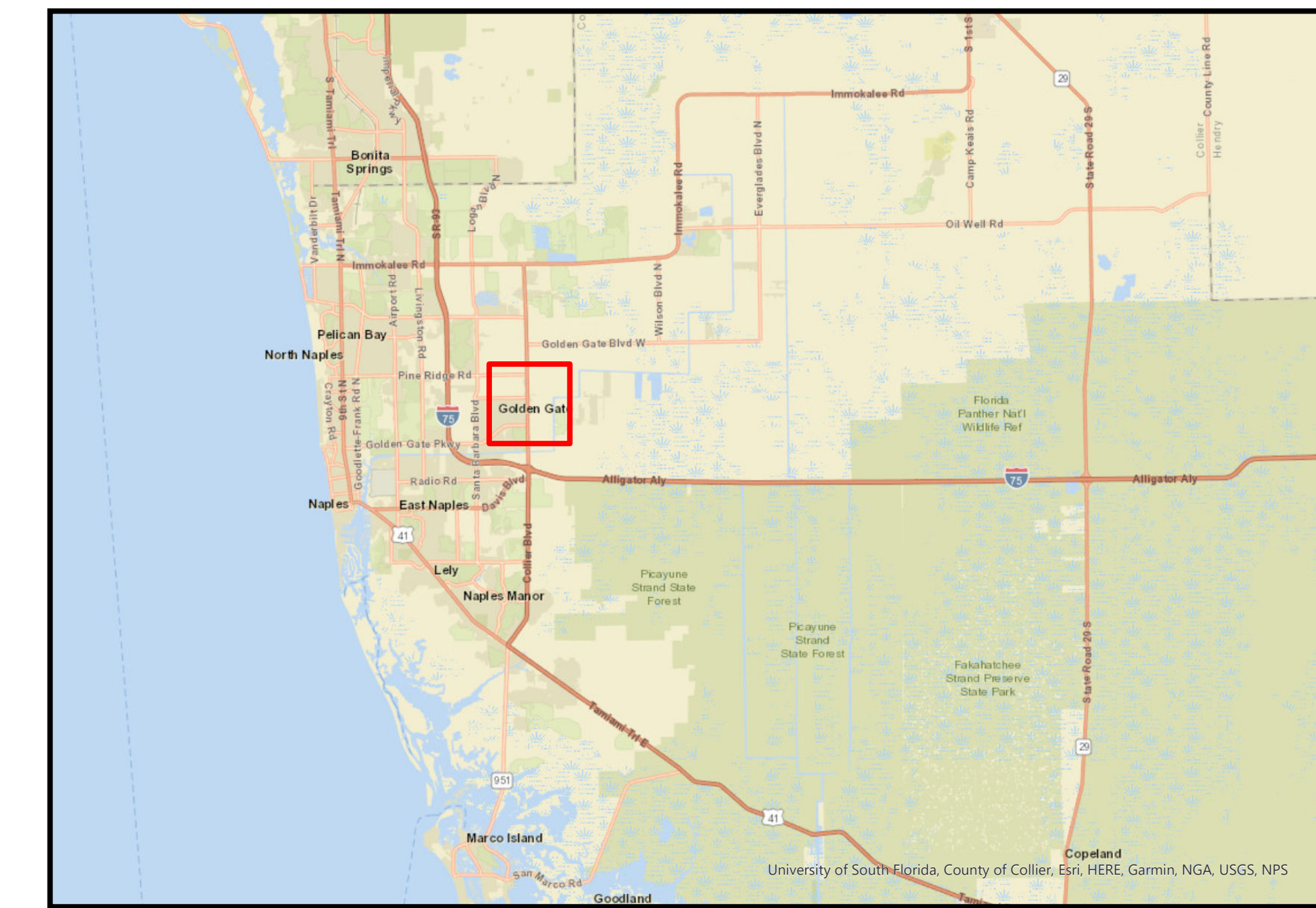
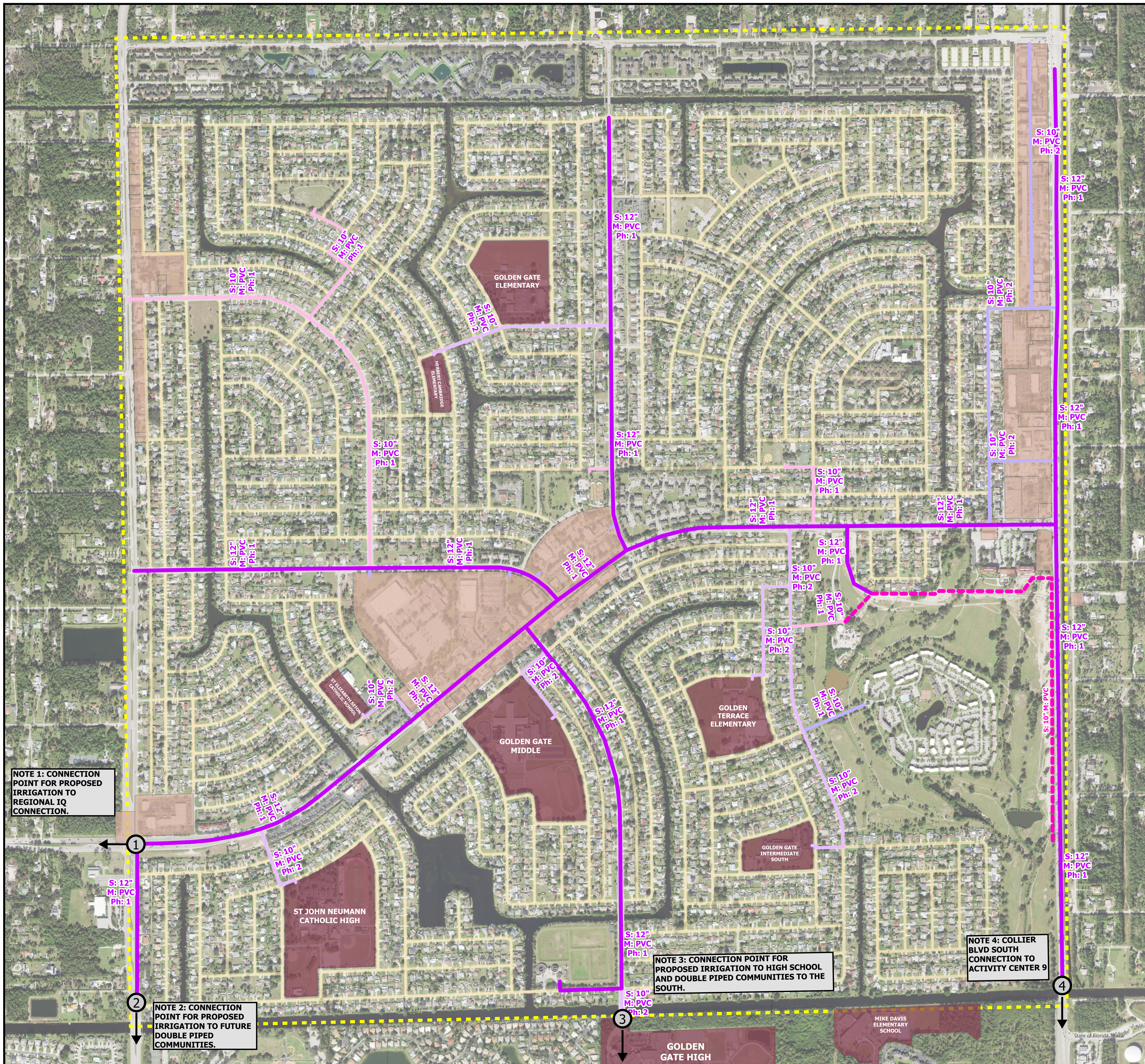
This assessment confirms that, upon implementation of the outlined recommendations, GGWWTP effluent will be suitable for public-access irrigation reuse (Exhibit B).

Conclusion:

Collier County's identified irrigation quality users include the golf course, roadway medians, and public parks. Collier County will be connecting the proposed IQ to the planned Livingston Road Regional Irrigation Quality Connection. Potential bulk consumers for IQ include schools, commercial, and residential communities. The selected pipe sizes (12-inch for main lines and 10-inch for secondary lines) ensure efficient and reliable distribution, tailored to meet the irrigation needs of both high-demand sites like the country club and roadway medians. This approach aligns with the area's overall irrigation requirements and environmental goals. Finalizing user commitment and refining the system layout will support the successful implementation of the IQ water system for sustainable irrigation practices in Golden Gate.

Note: The size of the pipes is conceptual, and no model was performed for this study.

Note: No detailed engineering design or hydraulic modeling was performed as part of this study.



- LEGEND**
- Existing Irrigation
 - School Parcels
 - Commercial Zones
 - Project Boundary
 - Proposed Residential Irrigation
 - 10", County
 - 10", Private
 - 10", School District
 - 12", County

Use Category	Estimated IQ Area (ac)	Demand Rate (MGD/ac)	Estimated Demand (MGD)	Acreage Assumption/Source
Roadway Medians	32.22	0.018	0.58	Based on ~11.63 miles of landscaped roadway medians multiplied by their respective average widths
Schools	96.00	0.022	2.11	Derived from school parcel shapefiles provided by the Collier County Property Appraiser
Public Parks	18.73	0.027	0.51	Acreage calculated using GIS-measured public park parcels
Golf Course	165.00	0.058	9.57	Parcel measurement based on Collier County Property Appraiser data
Residential	172.85	0.04	6.914	Based on ~57.04 miles of roadway with adjacent housing; assumes a 25-foot irrigated depth into residential parcels
TOTAL DEMAND (MGD)			19.68	

Note: Demand rates sourced from SFWMD

NOTE 1: CONNECTION POINT FOR PROPOSED IRRIGATION TO REGIONAL IQ CONNECTION.

1

2

NOTE 2: CONNECTION POINT FOR PROPOSED IRRIGATION TO FUTURE DOUBLE PIPED COMMUNITIES.

NOTE 3: CONNECTION POINT FOR PROPOSED IRRIGATION TO HIGH SCHOOL AND DOUBLE PIPED COMMUNITIES TO THE SOUTH.

3

NOTE 4: COLLIER BLVD SOUTH CONNECTION TO ACTIVITY CENTER 9

4

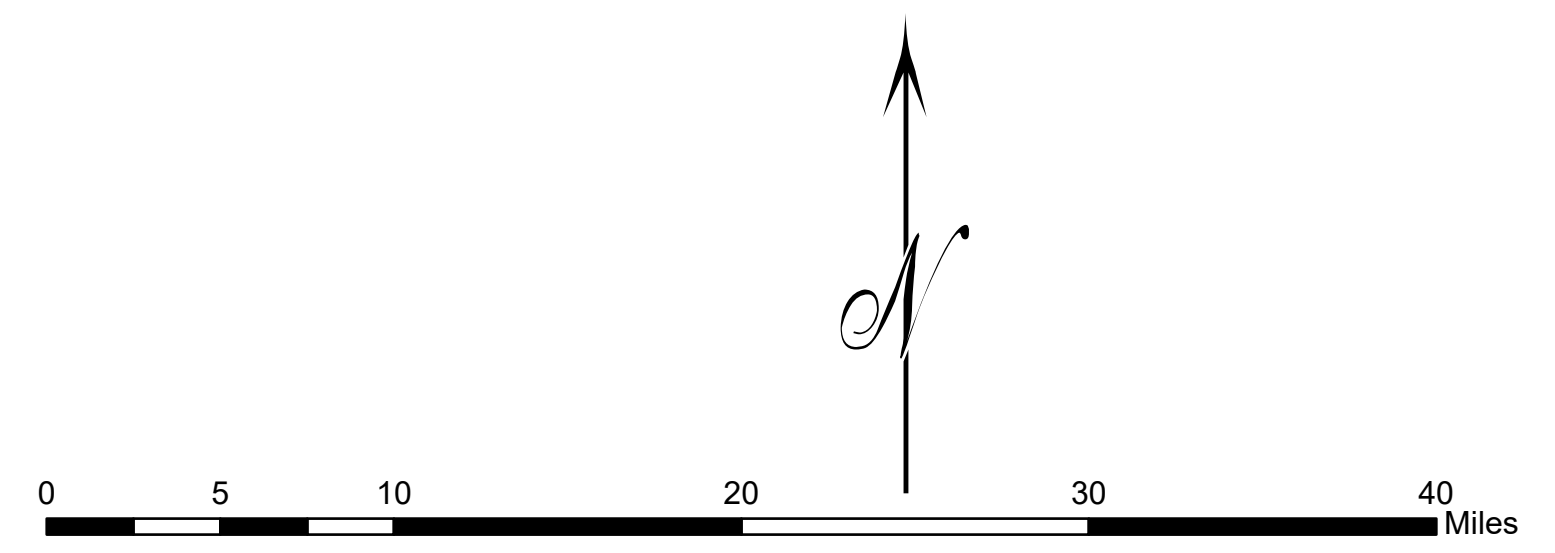


EXHIBIT A

Irrigation
Golden Gate City Masterplan
Collier County, Florida



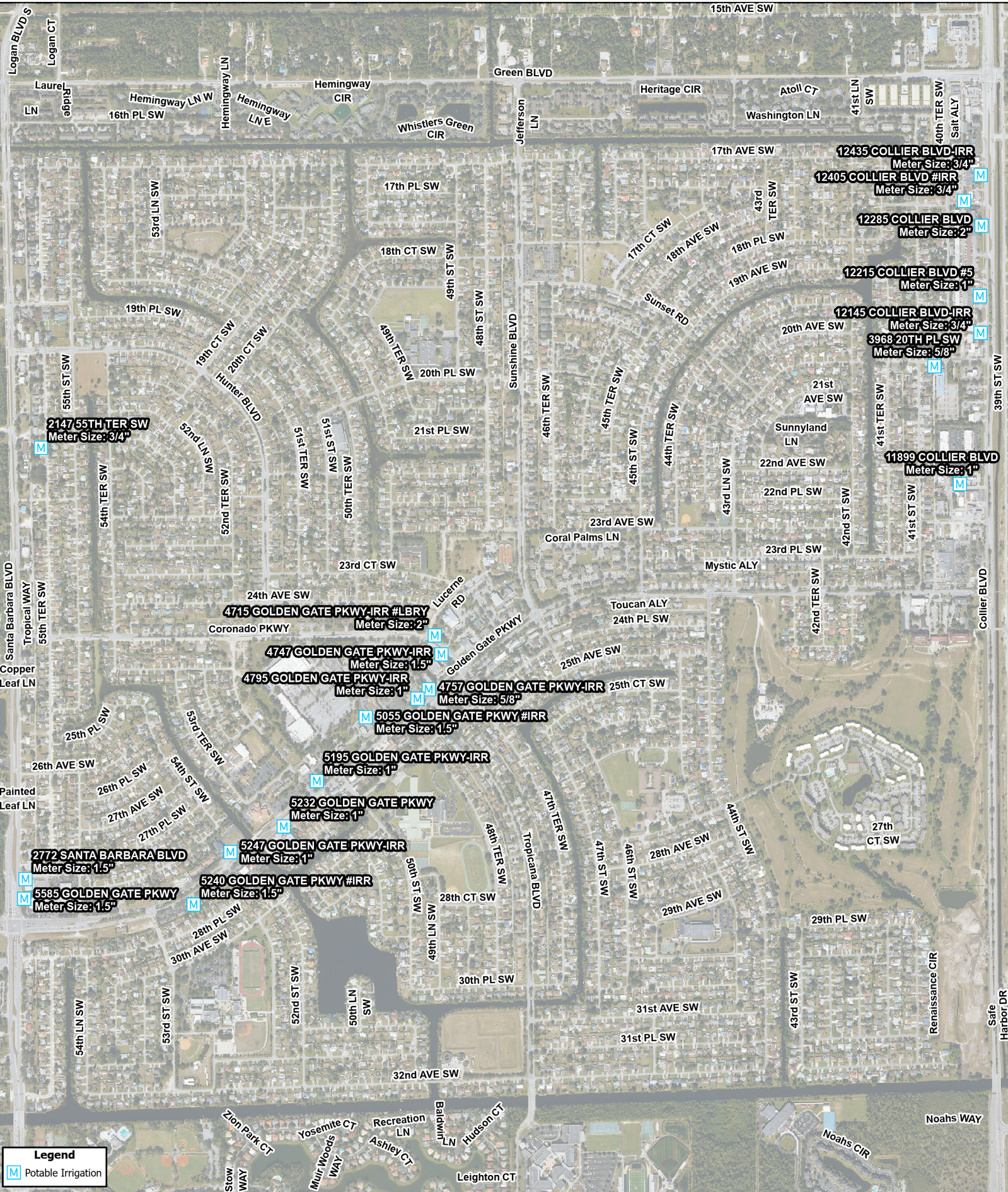
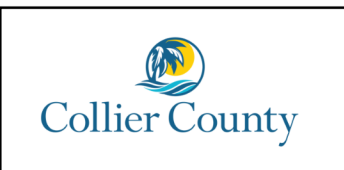
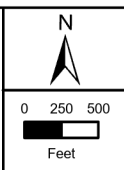


EXHIBIT A-1
Potable Irrigation Golden Gate



Disclaimer: This map is a representation of compiled utility information. It is believed to be an accurate and true depiction for the stated purpose, but Collier County and its employees make no guarantees, implied or otherwise, as to the accuracy of completeness. We therefore do not accept any responsibilities as to its use. This is not a survey, nor is it to be used for design.



Public Utilities Department	
Division: EPMD	
Drawn By: Chris McGovern	
Current as of: June 18, 2025	

April 1, 2025

Subject: Evaluation and Recommendation on Effluent Quality for Reuse as Irrigation Quality (IQ) Water Golden Gate Wastewater Treatment Plant (GGWWTP)

Introduction:

This memo provides an evaluation of the effluent quality at the Golden Gate Wastewater Treatment Plant (GGWWTP) in relation to its potential use as Irrigation Quality (IQ) water for irrigation purposes. This memo includes a review of effluent parameters from the GGWWTP Preliminary Design Report and recommendations for ensuring that the treated effluent meets the necessary standards for reuse in public-access areas, as outlined in Florida Administrative Code (FAC) Chapter 62-610.

Existing Effluent Quality and Treatment Standards:

According to the GGWWTP Preliminary Design Report, the current effluent disposal system at the facility involves deep well injection and rapid infiltration basins (RIBs). The effluent is treated to meet Class I reliability standards, ensuring that the plant can provide high-level disinfection for potential future reuse applications. Parameters listed in **Table 1** (Table listed below) of the report detail the standards that the GGWWTP must meet for reuse in public-access areas. These include:

- **cBOD₅ (Carbonaceous Biochemical Oxygen Demand):** 20 mg/L (Annual Average)
- **TSS (Total Suspended Solids):** 5 mg/L (Single Sample)
- **Fecal Coliform:** Non-detectable in 75% of daily samples, max 25 CFU/100 mL in any single sample
- **pH:** 6.0-8.5
- **Chlorine Residual:** Minimum of 1.0 mg/L for high-level disinfection

Table 1: Effluent Limits and Reliability Requirement for Public Access Reuse

	Units	Min/Max	Limit	Statistical Basis
cBOD ₅	mg/L	Max	20	Annual Average
			30	Monthly Average
			45	Weekly Average
			60	Single Sample
TSS	mg/L	max	5	Single Sample
Fecal Coliform	#/100mL percent	Max '-	25	Single Sample
			Non-detectable in 75% of daily samples	Monthly Total
pH	s.u.	Min Max	6.0	Single Sample
			8.5	Single Sample
Disinfection Level	'--	'--	High Level	'--
Minimum Chlorine Residual	mg/L	Min	1.0 mg/L	Single Sample
Reliability Required	'--	'--	Class I**	'--

**As defined by EPA MCD-05

These parameters are requirements for effluent disposal and public-access reclaimed water systems, as stipulated by the Florida Department of Environmental Protection (FDEP) in FAC Chapter 62-610.

Potential for IQ Water Reuse:

The report indicates that the GGWWTP is designed to allow future disposal of treated effluent via spray irrigation in public-access areas. However, to achieve this, the effluent must consistently meet the standards outlined above for reclaimed water.

One key aspect to consider for future effluent quality is nitrogen levels. While there are currently no regulatory nitrogen limits for the existing deep well injection, the facility is designed for partial nitrogen removal to maintain effluent nitrogen levels below 10 mg/L. Given potential future regulatory tightening, particularly for nitrogen and phosphorous, it is recommended that the GGWWTP prepare for more stringent effluent criteria, such as maintaining nitrogen levels below 6 mg/L and phosphorous below 1.0 mg/L, to ensure long-term compliance.

Compliance with Collier County IQ Water Level of Service (LOS) Criteria

A desktop compliance analysis against Collier County’s IQ Water LOS criteria (Exhibit B-1) was performed, cross-referencing the GGWWTP Preliminary Design Report (August 2024). The results, summarized in **Table 2** below, indicate current design compliance and identify areas requiring further verification or potential modifications.

Table 2: GGWWTP Compliance with Collier County IQ Water LOS Criteria

#	Criteria	Standard	GGWWTP Design Status	Compliance
1	IQ water supply for irrigable areas	1 inch/acre/week	Designed for future reclaimed water system connection.	Planned
2	Percent beneficial reuse of WRF effluent	100% reuse	Future reuse design is explicitly included.	Planned
3	Limit new major customer agreements to available supply	100% compliance	Future capacity allows new reuse agreements.	Planned
4	Minimum pressure upstream of customer meter	45 psi minimum	Robust pump station planned, verification required.	Likely
5	Maximum pressure upstream of customer meter	90 psi maximum	Robust pump station planned, verification required.	Likely
6	Annual average, max day velocity in pipe	≤ 7 fps	Requires hydraulic model verification (not yet conducted).	Likely
7	Peak hour max water velocity in pipe	≤ 8 fps	Requires hydraulic model verification (not yet conducted).	Likely
8	WRF effluent water quality compliance	100% compliance	Meets FAC limits for public reuse.	Yes
9	Additional reliable groundwater supply	25% from groundwater	Not included; no groundwater supplementation planned.	No
10	Seasonal minimum month reliable capacity from WRF effluent	≥ 95% reliable	Class I Reliability and redundancy explicitly included.	Yes
11	Reliable IQ water supply (95% availability)	≥ 95% availability	Highly redundant systems provided, clearly compliant.	Yes

Key Findings from LOS Analysis (Table 2):

- **Confirmed Compliance:**
 - Criteria #1, #2, #3, #8, #10, #11 are either fully compliant or explicitly planned for compliance in the current design of the GGWWTP.
- **Further Verification Needed:**
 - Distribution system pressures and velocities (criteria #4, #5, #6, #7) are **likely** compliant, but explicit hydraulic modeling is recommended for final verification.
- **Identified Non-compliance:**
 - Criterion #9 (groundwater supplementation) is currently not met, and consideration for alternative compliance or explicit groundwater supplementation planning may be necessary.

Recommendations for IQ Water Use:

Based on the design, operational capabilities, and desktop compliance analysis against Collier County IQ Water Level of Service (LOS) criteria (Table 3), the effluent from the GGWWTP is suitable for reuse as IQ water, provided the following recommendations are implemented:

1. Monitoring and Optimization of Nutrient Levels

- Implement regular monitoring and optimization procedures to consistently meet or exceed the Proposed Design Effluent Quality Design Criteria outlined in Table 3, specifically focusing on:
 - Maintaining $\text{cBOD}_5 \leq 20 \text{ mg/L}$, $\text{TSS} \leq 5 \text{ mg/L}$, and Total Nitrogen $\leq 10 \text{ mg/L}$.
 - Preparing the facility for potentially stricter future nutrient limits (e.g., Total Nitrogen $< 6 \text{ mg/L}$ and Total Phosphorus $< 1 \text{ mg/L}$) by evaluating chemical polishing or additional anoxic zones as discussed earlier.

Table 3 Proposed Design Effluent Quality Design Criteria

Parameter	Design Criteria
cBOD ₅ (mg/L)	20
TSS (mg/L)	5
TN (mg/L)	10*
TP (mg/L)	NA**
pH	6.0-8.5
Chlorine Residual (Minimum)	1.0 mg/L

* treatment goal, not a regulatory requirement.

2. High-Level Disinfection

- Ensure strict adherence to the high-level disinfection standards ($\text{CT} \geq 25 \text{ min-mg/L}$ and chlorine residual $\geq 1.0 \text{ mg/L}$), as specified in the effluent criteria (Table 3), to achieve consistent compliance required for public-access reuse.

3. Hydraulic Verification for IQ LOS Criteria Compliance

- Conduct detailed hydraulic modeling of the reclaimed water distribution system, as highlighted in Table 2 (Criteria #4, #5, #6, #7), to verify explicitly:
 - Minimum and maximum distribution pressures (45-90 psi).
 - Maximum velocities (≤ 7 fps annual average/max day; ≤ 8 fps peak hour).
- Use the results from hydraulic modeling to confirm or adjust the current design to ensure compliance with Collier County's LOS criteria.

4. Groundwater Supplementation

- Clarify and address compliance with the groundwater supplementation criterion (Table 2, Criterion #9):
 - Confirm whether this requirement (25% reliable capacity from fresh groundwater) is mandatory.
 - If required, plan and implement infrastructure for supplemental groundwater sourcing, or document justification for a potential waiver based on robust reclaimed water reliability and redundancy.

5. Facility Design Flexibility and Future Regulatory Readiness

- Ensure continued flexibility in facility design and operation to promptly respond to regulatory changes. Emphasis should be placed on nutrient removal processes and adaptability to stricter effluent criteria, as reflected in the existing and potential future design standards (Table 3).

By proactively implementing these recommendations and consistently referencing the established design effluent quality criteria (Table 3) and the comprehensive IQ LOS compliance analysis (Table 2), GGWWTP will achieve robust and sustainable reuse of IQ water, meeting both current and anticipated regulatory and community expectations.

Conclusion:

The GGWWTP is well-positioned to produce effluent suitable for reuse as IQ water. Based on the preliminary design and compliance analysis presented herein, the facility is designed explicitly to meet the stringent effluent standards required for public-access reuse as outlined in FAC Chapter 62-610 (**Table 3**).

However, to ensure complete and robust compliance with Collier County's IQ Level of Service criteria (**Table 2**), additional actions are recommended. Specifically, detailed hydraulic modeling should be performed to verify pressures and velocities within the reclaimed water distribution system. Additionally, addressing the groundwater supplementation criterion—either through explicit planning or by documenting justification for exemption—is recommended. By proactively addressing these recommendations, GGWWTP will ensure sustainable reuse of treated effluent, enhancing environmental protection, resource efficiency, and community benefit in alignment with both current and anticipated regulatory requirements.

References:

- GGWWTP Preliminary Design Report, August 2024
 - Section 3.2 "Effluent Limits and Reliability Requirements" (Pages 11-14)
 - Table 3-2 "Effluent Limits and Reliability Requirements for Public Access Reuse" (Pages 12-13)
 - Section 3.4.5 "Disinfection" (Page 27)
 - Section 3.2.1 "Potential Future Regulatory Considerations" (Page 14)
- Florida Administrative Code (FAC) Chapter 62-610 and Chapter 62-600

EXHIBIT B-1

Table 5-2 IQ Water Level of Service/Performance Criteria Utilized for Master Plan

Asset Class	Service Value	LOS/Performance Criteria Statement	Recommended LOS/Performance Criteria	Unit of Measure	Driver	Reference Material
Irrigation	Capacity & Access	IQ water supply for irrigable areas	1 inch / acre / week LOS Standard	inch / acre / week	Regulatory	Collier County Code of Ordinances Chapter 134 Utilities - Article II - Collier County Water-Sewer District IQ Water Ordinance Sec 134-29
Irrigation		Percent beneficial reuse of WRF Effluent as defined by SFWMD which equals providing an average annual reuse equal to the lowest consecutive three months of wastewater flows	100	%	Aspirational	County Aspirational Goal
Irrigation	Capacity & Access	Limit the addition of new major customer agreements as supply becomes available	100	% of time	Reliability	Collier County Water-Sewer District: Irrigation Quality (IQ) Water Policy - Future Service Prioritization June 11, 2013
Irrigation	Capacity & Access	Minimum pressure upstream of customer meter	45	psi	Design	Collier County IQ Water Model Standard Protocol Draft July 2013 Sec 6.1 by Carollo
Irrigation	Capacity & Access	Maximum pressure upstream of customer meter	90	psi	Design	Collier County IQ Water Model Standard Protocol Draft July 2013 Sec 6.1 by Carollo
Irrigation	Capacity & Access	Annual average, max day, max water velocity in pipe	7	fps	Design	Collier County IQ Water Model Standard Protocol Draft July 2013 Sec 6.1 by Carollo

Irrigation	Capacity & Access	Peak hour max water velocity in pipe	8	fps	Design	Collier County IQ Water Model Standard Protocol Draft July 2013 Sec 6.1 by Carollo
Irrigation	Health & Safety	Water reclamation facility effluent water quality complies with regulatory and permitting requirements	100	% of time	Regulatory	FDEP Permit # FL0141399 (NCWRF) and FL0141356 (SCWRF)
Irrigation	Quality & Reliability	% of additional supply requirement as reliable capacity from fresh groundwater source	25	%	Reliability	Collier County Government Public Utilities Division Reliability Guidelines 2006
Irrigation	Quality & Reliability	Seasonal minimum month AADF * 95% as reliable capacity from WRF effluent (for IQ water supply)	Seasonal Min Month PF * 95%	MGD	Reliability	Population and Flow Projections
Irrigation	Quality & Reliability	Reliable IQ water supply is equal to 95% of the Total IQ water available which is the sum of reliable reclaimed water and reliable wellfield supply	Reliable IQ water supply = Total IQ water available * 95%	MGD	Reliability	Population and Flow Projections

Note: IQ water application rate is a LOS Standard. Remaining items are performance criteria.

Reliability goals are identified above and are utilized to establish levels of capacity for supply, treatment and distribution systems to mitigate concerns regarding potential service interruption. These goals are based upon Collier County Government Public Utilities Division Reliability Guidelines and EPA guidelines.

The Level of Service Standards, Performance Criteria and goals outlined above and utilized in this master plan will be used as criteria to evaluate the IQ water system. The criteria will be used to determine demand, the availability of IQ water, and a basis to measure the overall performance of the IQ water service provided. System deficiencies over the planning period will be identified and a prioritized list of these improvements in conjunction with water quality goals, treatment requirements and available water resources will then form the basis for a Capital Improvement Program.