W Bay to Bay Blvd from S Manhattan Ave to S Church Ave Lane Repurposing Study

Report type: Lane Repurposing Feasibility Report

Location: South Tampa, Hillsborough County, Florida

Prepared for: City of Tampa, Transportation and Stormwater Services, Traffic Management Center

Prepared by: Bala Consulting Services, LLC

Date: September 26, 2026

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Certification

Agency: Traffic Management Center, Transportation and Stormwater Services, City of Tampa, 1104 East Twiggs Street, Suite 200, Tampa, Florida 33602

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Bala Consulting Services, LLC, authorized to operate as an engineering business (Certificate of Authorization No. 31398), and that I have reviewed or approved the calculations, findings, opinions, conclusions, or technical advice hereby reported for:

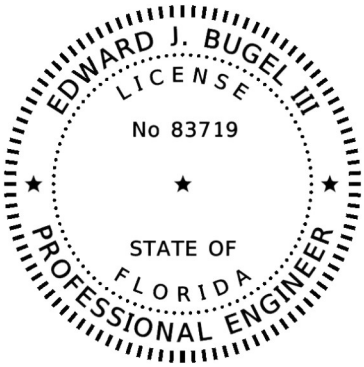
Project: W Bay to Bay Blvd from S Manhattan Ave to S Church Ave, South Tampa, Hillsborough County, Florida

Report: Lane Repurposing Feasibility Report

I acknowledge that the procedures and references used to develop the information contained in this report are standard to the professional practices of civil engineering as applied through professional judgment and experience.

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Executive Summary

Bala Consulting Services, LLC (BCS) evaluated the feasibility of repurposing Bay to Bay Blvd between S Manhattan Ave and S Church Ave from four vehicular lanes to one lane in each direction with buffered bicycle lanes. Based on Synchro traffic analysis, AM and PM field observations, crash history, and engineering judgment, the study found the proposed configuration is feasible.

The corridor can operate with single eastbound and westbound vehicular lanes and buffered bicycle lanes without reducing overall corridor level of service.

The proposed repurposing is not expected to disrupt traffic flow or create significant safety concerns. Existing volumes support one lane in each direction, and the addition of speed humps, narrowed lanes, vertical separators, and buffered bicycle lanes is expected to reduce speeds and improve corridor safety. The five-year crash review identified 54 crashes, including one fatal crash, reflecting a low to moderate crash rate.

At S Manhattan Ave, the eastbound Bay to Bay Blvd approach remains the corridor's controlling movement. It operates at LOS D under current AM and PM conditions and remains LOS D with the proposed configuration; with 10 years of growth, it is projected to operate at LOS E.

At S Church Ave, the eastbound approach is projected to decline from LOS B to LOS C in the PM peak with 10-year growth. The primary concern is westbound queueing from Dale Mabry Hwy toward Church Ave; therefore, the proposed westbound merge lane should be replaced with a westbound right-turn drop lane at Church Ave. **Although roadway performance is slightly reduced, the proposed configuration is adequate for current and future traffic needs.**

Recommendations

- At the Lois Ave intersection, trim back the bushes on the southeast corner to reduce sight obstruction.

- At the Church Ave intersection, trim back the oak tree that overhangs the mast arm supporting the signal heads for the eastbound movement to make the signal heads more visible.

- Provide retroreflective backplates to the signal heads at Church Ave.

Concept Plan Recommendation

- Revise the westbound Bay to Bay Blvd merge lane from Dale Mabry Hwy to Church Ave to be a right-turn drop lane at Church Ave. This will help reduce the westbound queue on Bay to Bay Blvd approaching Church Ave from Dale Mabry Hwy.

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Abbreviations and Terms

This report uses the following abbreviations and technical terms.

- **AADT:** Annual average daily traffic, the average number of vehicles using a road per day over a year.
- **AM peak and PM peak:** The busiest one-hour period of traffic in the morning and in the afternoon.
- **BCS:** Bala Consulting Services, LLC.
- **CDMS:** Crash Data Management System.
- **EB, WB, NB, SB:** Eastbound, westbound, northbound, and southbound.
- **Existing and Proposed:** The current four-lane road layout and the planned one-lane-each-direction layout with buffered bicycle lanes.
- **LOS (level of service):** A letter grade from A (best, little delay) to F (worst, failing) that describes how well an intersection or approach operates.
- **NBLT and SBLT:** Northbound left turn and southbound left turn.
- **PDO:** Property damage only, a crash with no injuries.
- **TMC:** Turning movement count, a traffic count of every movement at an intersection.
- **TWLT lane:** Two-way left-turn lane.
- **V/C (volume-to-capacity) ratio:** Traffic volume divided by the road's capacity. A value of 1.0 or less is the target.
- **VPH:** Vehicles per hour.
- **Year 0 and Year 10:** Current traffic volumes, and volumes projected 10 years into the future.

- **95th percentile queue:** The length of vehicle backup that is not exceeded 95 percent of the time.

1. Introduction

Recent City of Tampa initiatives developed by Complete Streets, Vision Zero, and other strategic programs have focused on revitalizing the existing infrastructure, expanding multimodal networks, creating safer streets, supporting efficient transit, and managing congestion. A recent pursuit has been the revisioning of Bay to Bay Blvd in South Tampa. Aiming to maximize the available right of way within this historic residential area, the City identified the four through lanes on Bay to Bay Blvd as being underutilized and having a surplus of capacity. Preliminary design plans, shown in **Appendix A**, were developed to determine the constructability of converting Bay to Bay Blvd from four vehicular through lanes into two vehicular through lanes with bicycle lanes in both the eastbound and westbound directions between S Manhattan Ave and S Church Ave. As part of the City's assessment to fully understand the benefits, impacts, and effects of this proposed project, Bala Consulting Services, LLC (BCS) was tasked to perform a Traffic Analysis Study. This study will inform the City of any adverse impacts of the proposed Bay to Bay Blvd repurposing project, especially connected to traffic impacts and overall safety.

This study analyzes six intersections along this ¾-mile stretch of Bay to Bay Blvd. Of the six intersections, only the two controlling signalized intersections on the west and east ends, S Manhattan Ave and S Church Ave respectively, were analyzed with Synchro traffic signal modeling software, as they have the greatest demand along the corridor and function as the major inlets and outlets to the Bay to Bay corridor. If the traffic analysis proves acceptable at these two intersections, the smaller intersections in between with lower volumes would also be acceptable. Both major intersections were evaluated for level of service, delay, queue length, and volume-to-capacity (V/C) ratio. These metrics were recorded for the following four conditions for the AM and PM peaks:

1. Existing conditions with current volumes (Existing, Year 0).
2. Existing conditions with a 10-year growth factor applied (Existing, Year 10).
3. Proposed conditions with current volumes (Proposed, Year 0).

4. Proposed conditions with the 10-year growth factor applied (Proposed, Year 10).

The existing conditions were then compared to the proposed conditions to determine any changes, and to what extent these differences would impact traffic along eastbound and westbound Bay to Bay Blvd. A growth rate of 2.5% per year was assumed for this project, which compounds to a factor of 1.28 after 10 years (1.025 raised to the 10th power equals 1.28). **Figure 1** shows the site location map.

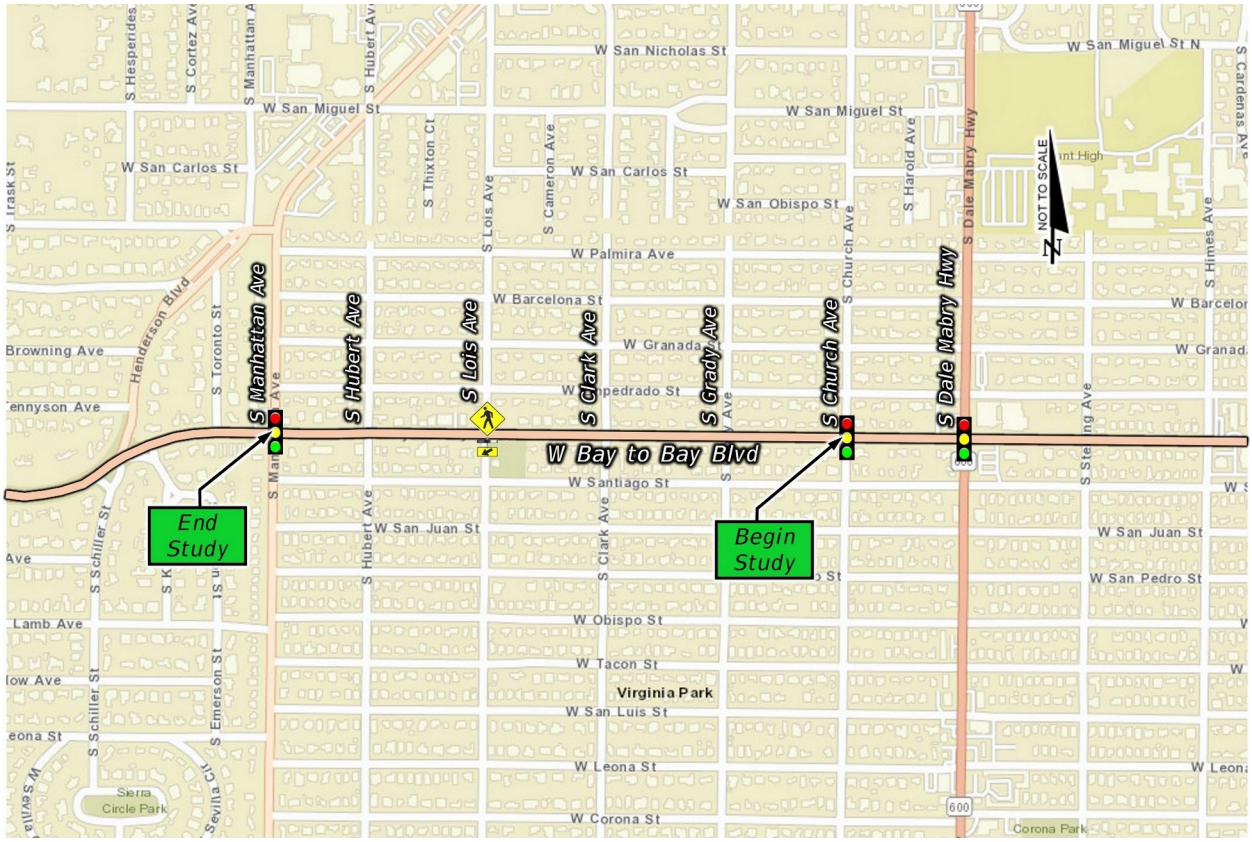


Figure 1: Site Location Map

Description of Figure 1: The map shows W Bay to Bay Blvd as a highlighted east-west corridor through a grid of residential streets in South Tampa. The study begins at the signalized intersection with S Church Ave (east end) and ends at the signalized intersection with S Manhattan Ave (west end). Between them, from west to east, are the unsignalized cross streets S Hubert Ave, S Lois Ave (marked with a pedestrian crossing sign), S Clark Ave, and S Grady Ave. S Dale Mabry Hwy, a signalized major north-south highway, crosses Bay to Bay Blvd just east of Church Ave, outside the study limits. North is toward the top of the map, and the map is not to scale.

2. Existing Conditions Traffic Analysis

Bay to Bay Blvd is an east-west collector roadway in a well-established residential area of South Tampa. Bay to Bay Blvd connects to Westshore Blvd to the west and extends two miles to the east, where it terminates at Bayshore Blvd, connecting large residential areas and service-based businesses to major highways such as Dale Mabry Hwy and the Selmon Expressway. It is a residential four-lane collector roadway with a two-way left-turn (TWLT) lane. The speed limit on Bay to Bay Blvd is 30 MPH. Turning movement counts (TMC) along Bay to Bay Blvd south of Church Ave show approximately 10,000 annual average daily traffic (AADT). The TMC at Bay to Bay Blvd and Lois Ave revealed approximately 8,500 AADT, and west of Manhattan Ave showed approximately 7,500 AADT. The TMCs for Bay to Bay Blvd at Church Ave, Lois Ave, and Manhattan Ave can be found in **Appendix B**. Bay to Bay Blvd has two through lanes in both the eastbound and westbound directions with no median divider. There are left-turn lanes only at Manhattan Ave. On-street parking is not permitted throughout the study limits of Bay to Bay Blvd. There is sidewalk along both sides of the road, and there are no bike lanes.

Each of the two evaluated intersections was modeled using Cubic Synchro Studio, version 12. The baseline Synchro files were provided by the City of Tampa Smart Mobility Department from its overall network model. Lane configurations and signal timings were confirmed with the latest signal timing sheets and with observations of each intersection. Turning movement counts were provided by the City of Tampa. The peak hours for the morning and afternoon peak periods were used as inputs to the Synchro models. All existing and proposed Synchro reports can be found in **Appendix C**. The Synchro file timings were also verified against the existing signal timing sheets for the Manhattan Ave and Bay to Bay Blvd intersection and the Church Ave and Bay to Bay Blvd intersection. These timing sheets can be found in **Appendix D**.

The greatest eastbound and westbound volumes on Bay to Bay Blvd for both the AM and PM peak were at Church Ave, ranging between 440 and 588 vehicles in the AM peak, and between 528 and 533 vehicles during the PM peak hour. The AM peak hour volumes at Manhattan Ave were between 307 and 375 vehicles per hour (VPH), and

between 359 and 388 VPH in the PM peak. For reference, Federal Highway guidelines suggest that an 11-foot-wide urban roadway in a residential setting with a 30 MPH speed limit can carry between 400 and 800 VPH per lane, depending on various conditions. With the volumes on Bay to Bay Blvd at or below 600 VPH, a single eastbound and westbound lane is sufficient to handle current demands. Corridor volumes are shown in **Table 1**.

Table 1: Bay to Bay Blvd Corridor Current Day Volumes

Intersection	Count Date	Peak Hour	EB	WB	NB	SB	Total
Manhattan Ave (signalized)	9/24/2025	AM	307	375	1098	628	2408
Manhattan Ave (signalized)	9/24/2025	PM	359	388	1110	1058	2915
Lois Ave (pedestrian crossing)	1/11/2022	AM	474	394	53	75	996
Lois Ave (pedestrian crossing)	1/11/2022	PM	411	541	80	137	1169
Church Ave (signalized)	1/22/2026	AM	588	440	169	133	1330
Church Ave (signalized)	1/22/2026	PM	528	533	217	236	1514

Note: Volumes are peak-hour vehicle counts by approach direction (EB, WB, NB, SB). Hubert Ave, Clark Ave, and Grady Ave have no turning movement count data (not applicable) and are not listed.

Of the two intersections in this study that were analyzed with Synchro, only the eastbound approach of Manhattan Ave showed an existing level of service of D for current-year volumes. The 10-year growth factor for the existing intersection configuration showed a level of service E for the same eastbound approach, and LOS F for the overall intersection. Church Ave had a level of service of B or better for the eastbound and westbound approaches, with an overall intersection LOS of C in the existing PM peak for both current and 10-year growth volumes.

Delay analysis showed the greatest amount of existing delay to be 53.8 seconds at the eastbound approach at Manhattan Ave in the AM peak. The eastbound delay at Manhattan Ave increases to 67.7 seconds in the 10-year growth scenario. The westbound approach at Church Ave had the worst existing delay at 11.6 seconds in the PM peak, which is projected to increase to 15.3 seconds in 10 years.

The volume-to-capacity (V/C) ratio is low to moderate for the Church Ave intersection, with the V/C ratio never going beyond 0.53, which is the expected ratio for the eastbound approach in 10 years. Manhattan Ave had a high V/C ratio of 0.95 for the eastbound approach in the PM peak for the 10-year future volume condition. With 1.0 being the ideal ratio to maximize the volume through the available capacity, the two lanes in both the eastbound and westbound directions of Bay to Bay Blvd absorb roughly half of the demand on average.

Finally, the observed 95th percentile queues during both the AM and PM peak periods for Manhattan Ave were quite long in the existing condition, ranging from 257 feet to 464 feet. The westbound approach had less queueing due to lower volumes, ranging from 108 to 175 feet. There was little to no change in the proposed condition, since the lane configuration will remain the same for the Manhattan Ave and Bay to Bay Blvd intersection in both the eastbound and westbound approaches. For the existing condition at the Church Ave intersection, 95th percentile queue lengths in the eastbound direction ranged between 115 feet in the current AM peak and 181 feet in the AM peak 10 years from now. The westbound Church Ave existing condition had a 95th percentile queue length ranging between 75 feet in the current AM peak and 151 feet in the 10-year PM peak. **Tables 2a and 2b** show the intersection performance metrics along Bay to Bay Blvd for the existing conditions.

Table 2a: Bay to Bay Blvd Intersection Level of Service and Delay, Existing Conditions

Intersection	Peak Hour, Condition, and Year	EB LOS	WB LOS	Overall LOS	EB Delay (sec)	WB Delay (sec)	Overall Delay (sec)
Manhattan Ave	AM Existing Year 0	D	B	B	47.3	18.4	21.3
Manhattan Ave	AM Existing Year 10	E	C	C	53.8	28	31.5
Manhattan Ave	PM Existing Year 0	D	B	C	52.2	28.6	24.8
Manhattan Ave	PM Existing Year 10	E	C	F	67.7	45.6	47.1
Church Ave	AM Existing Year 0	A	A	B	7.7	6.3	16.2
Church Ave	AM Existing Year 10	B	A	B	10.8	8.7	19
Church Ave	PM Existing Year 0	B	B	C	11.6	10.1	20.4
Church Ave	PM Existing Year 10	B	B	C	15.3	13.3	28

Note: Only the two signalized intersections, Manhattan Ave and Church Ave, were analyzed in Synchro. Hubert Ave, Lois Ave, Clark Ave, and Grady Ave were not analyzed (all values not applicable) and are not listed. Level of service (LOS) is graded from A (best, little delay) to F (worst, failing). Delay is average seconds per vehicle.

Table 2b: Bay to Bay Blvd Intersection Queue Length and Volume-to-Capacity Ratio, Existing Conditions

Intersection	Peak Hour, Condition, and Year	EB Avg Queue (ft)	EB 95th Pct Queue (ft)	WB Avg Queue (ft)	WB 95th Pct Queue (ft)	EB V/C	WB V/C	Overall Max V/C
Manhattan Ave	AM Existing Year 0	172	257	71	113	0.64	0.39	0.78
Manhattan Ave	AM Existing Year 10	224	377	87	141	0.87	0.54	1.19 (SBLT)
Manhattan Ave	PM Existing Year 0	106	304	65	108	0.83	0.55	0.83
Manhattan Ave	PM Existing Year 10	268	464	84	175	0.95	0.79	1.68 (NBLT)
Church Ave	AM Existing Year 0	63	115	38	75	0.32	0.24	0.76
Church Ave	AM Existing Year 10	101	181	62	117	0.46	0.34	0.86
Church Ave	PM Existing Year 0	76	122	66	110	0.35	0.34	0.89
Church Ave	PM Existing Year 10	117	166	104	151	0.53	0.49	1.02 (SB)

Note: Only Manhattan Ave and Church Ave were analyzed; the other intersections are not listed (all values not applicable). Queue lengths are in feet. The volume-to-capacity (V/C) target is 1.0 or less. Where the overall maximum V/C is above 1.0, the controlling movement is shown in parentheses: SBLT is the southbound left turn, NBLT is the northbound left turn, and SB is the southbound approach.

3. Crash Analysis

Crash data was analyzed for five years, from 2021 through 2025. Both the Crash Data Management System (CDMS) and Signal 4 Analytics crash data were reviewed to ensure that all crashes were accounted for in the analysis. There were fifty-four (54) crashes along the Bay to Bay Blvd corridor between the east leg stop line at Manhattan Ave and approximately 300 feet east of the Church Ave intersection (approximately 2/3 of a mile) during the five-year period. There were nine (9) angle crashes, one (1) rear-end crash, and zero (0) pedestrian or bicycle crashes. There was one (1) fatal, one (1) incapacitating, seven (7) non-incapacitating, eleven (11) possible injury, and thirty-four (34) property damage only crashes.

The lone fatal crash was an angle crash that occurred at the intersection of Lois Ave and Bay to Bay Blvd on December 10, 2021, at 12:55 PM, when the front of an eastbound motorcycle collided with the driver's side of a northbound sport utility vehicle. Both the driver and passenger of the motorcycle died from their injuries.

Ten (10) of the fifty-four (54) crashes occurred at Lois Ave, with seven (7) being angle crashes, six (6) of which involved the westbound through movement. These are likely due to the sight obstruction of northbound vehicles from the wrought-iron fence with bushes behind it at the park on the southeast corner, as shown in **Figure 3**.

Twenty-nine (29) of the fifty-four (54) crashes occurred at Church Ave, with eighteen (18) angle crashes, all of which involved the eastbound through movement running the red light. There were also six (6) left-turn crashes, four (4) rear-end crashes, and one (1) single-vehicle crash. A large oak tree overhangs the mast arm that supports the signal heads for the eastbound movement, as shown in **Figure 4**, which is likely contributing to the red-light running.

A corridor crash summary is shown in **Tables 3a through 3d**, and a corridor collision diagram is shown in **Figure 2**.

Table 3a: Corridor Crash Summary by Severity, 2021 to 2025

Severity	2021	2022	2023	2024	2025	Total	Mean	Percent
Fatal	1	0	0	0	0	1	0.2	1.9%
Incapacitating injury	0	1	0	0	0	1	0.2	1.9%
Non-incapacitating injury	1	3	1	1	1	7	1.4	13.0%
Possible injury	1	2	4	0	4	11	2.2	20.4%
Property damage only (PDO)	5	7	10	5	7	34	6.8	63.0%
Total	8	13	15	6	12	54	10.8	100.0%

Note: Mean is the average number of crashes per year. Percent is the share of all 54 crashes.

Table 3b: Corridor Crash Summary by Crash Type, 2021 to 2025

Crash Type	2021	2022	2023	2024	2025	Total	Mean	Percent
Angle	5	7	7	1	6	26	5.2	48.1%
Head on	0	0	1	0	0	1	0.2	1.9%
Left turn	0	0	2	1	3	6	1.2	11.1%
Rear end	1	1	3	2	2	9	1.8	16.7%
Sideswipe	0	0	0	2	0	2	0.4	3.7%
Hit fixed object	0	2	1	0	1	4	0.8	7.4%
Pedestrian	0	1	0	0	0	1	0.2	1.9%
Single vehicle	2	2	1	0	0	5	1.0	9.3%
Total	8	13	15	6	12	54	10.8	100.0%

Table 3c: Corridor Crash Summary by Lighting Condition, 2021 to 2025

Lighting Condition	2021	2022	2023	2024	2025	Total	Mean	Percent
Daylight	5	10	12	6	12	45	9.0	83.3%
Dark, lighted	3	3	2	0	0	8	1.6	14.8%
Dark, not lighted	0	0	1	0	0	1	0.2	1.9%
Total	8	13	15	6	12	54	10.8	100.0%

Table 3d: Corridor Crash Summary by Road Surface, 2021 to 2025

Road Surface	2021	2022	2023	2024	2025	Total	Mean	Percent
Dry	7	13	15	6	11	52	10.4	96.3%
Wet	1	0	0	0	1	2	0.4	3.7%
Total	8	13	15	6	12	54	10.8	100.0%



Figure 2: Corridor Collision Diagram

Description of Figure 2: The diagram is an aerial photograph of the corridor split into three panels joined at match lines A and B, with crash locations marked by symbols. The first panel runs from S Manhattan Ave to S Lois Ave. Crash analysis begins at the Manhattan Ave stop line. Callouts identify 3 hit-fixed-object crashes between Manhattan Ave and

Hubert Ave (1 moderate injury and 2 property damage only), and 5 sideswipe or parking crashes between Hubert Ave and Lois Ave. At Lois Ave, a callout lists 7 angle crashes, including 1 fatal crash, with 6 involving westbound vehicles, plus 1 pedestrian, 1 head-on, and 1 rear-end crash. The second panel runs from Lois Ave past S Clark Ave and S Grady Ave and shows a few scattered crashes. The third panel runs from Grady Ave to S Dale Mabry Hwy. At the signalized S Church Ave intersection, a callout lists 18 angle crashes caused by eastbound vehicles running the red light, 6 left-turn crashes, 4 rear-end crashes, and 1 single-vehicle crash. Crash analysis ends east of Church Ave, before Dale Mabry Hwy.



Figure 3: Eastbound Bay to Bay Blvd Approaching Lois Ave, Showing Sight Obstruction on the Southeast Corner



Figure 4: Eastbound Bay to Bay Blvd at Church Ave, Showing Oak Tree Over the Eastbound Signal Mast Arm

4. Proposed Conditions Traffic Analysis

The proposed conditions modeled in Synchro Studio version 12 reflect the concept drawings shown in **Appendix A** of this report. No growth factor was applied to the current volumes on Bay to Bay Blvd to analyze the proposed condition, since this South Tampa area is already well established and built out. Further, with greater emphasis on multimodal travel facilities within the South Tampa network, pedestrian and bicycle travel spaces play an important role in improving safety and protecting vulnerable users.

The proposed project will convert the existing east-west four-lane typical section on Bay to Bay Blvd into a two-lane typical section with a two-way left-turn lane and 5- to 6-foot bicycle lanes with a 2- to 5-foot buffer. Intersections will transition from having two eastbound and two westbound approach lanes with limited or no left-turn lanes to a single approach lane in each direction with a two-way left-turn lane. The proposed condition also includes the transition of the two westbound lanes between Dale Mabry Hwy and Church Ave into a merge from two lanes into one, so that the proposed condition at westbound Church Ave is a single through lane with a left-turn lane. This change would pose the greatest potential issue for motorists if queues on westbound Bay to Bay Blvd approaching Church Ave were to spill back to Dale Mabry Hwy, which is approximately 575 feet east of Church Ave.

Table 4 shows the 10-year growth volumes, and **Tables 5a and 5b** show the intersection performance metrics along Bay to Bay Blvd for the proposed conditions, considering both current Year 0 volumes and potential 10-year growth volumes. For the proposed condition, the Church Ave intersection PM peak 95th percentile queue length in the westbound direction was 478 feet in the Synchro model, leaving about 130 feet of space before queues would spill back to Dale Mabry Hwy. For the eastbound and westbound approaches at Church Ave, the AM and PM peak levels of service remained B or better, with the 10-year volumes degrading the eastbound and westbound approaches to LOS C in the PM peak. The Manhattan Ave intersection approach lanes will remain the same as the current condition, with a left-turn lane, a through lane, and a right-turn lane. As such, the Manhattan Ave intersection maintained LOS D in the eastbound approach for the current volumes and LOS E for the 10-year volumes. The

westbound approach showed LOS B in the AM peak and degraded from B to C in the westbound PM peak.

Table 4: Bay to Bay Blvd Corridor Projected 10-Year Volumes

Intersection	Count Date	Peak Hour	EB	WB	NB	SB	Total
Manhattan Ave (signalized)	9/24/2025	AM	393	480	1405	804	3082
Manhattan Ave (signalized)	9/24/2025	PM	460	497	1421	1354	3731
Lois Ave (pedestrian crossing)	1/11/2022	AM	607	504	68	96	1275
Lois Ave (pedestrian crossing)	1/11/2022	PM	526	692	102	175	1496
Church Ave (signalized)	1/22/2026	AM	753	563	216	170	1702
Church Ave (signalized)	1/22/2026	PM	676	682	278	302	1938

Note: Projected volumes are current peak-hour counts multiplied by the 10-year growth factor of 1.28. Hubert Ave, Clark Ave, and Grady Ave have no count data (not applicable) and are not listed.

Table 5a: Bay to Bay Blvd Intersection Level of Service and Delay, Proposed Conditions

Intersection	Peak Hour, Condition, and Year	EB LOS	WB LOS	Overall LOS	EB Delay (sec)	WB Delay (sec)	Overall Delay (sec)
Manhattan Ave	AM Proposed Year 0	D	C	C	49.1	25.8	21.3
Manhattan Ave	AM Proposed Year 10	E	C	C	53.8	28	31.5
Manhattan Ave	PM Proposed Year 0	D	B	C	52.2	28.6	24.8
Manhattan Ave	PM Proposed Year 10	E	C	F	67.7	45.3	47.1
Church Ave	AM Proposed Year 0	B	A	B	10.7	8.8	18
Church Ave	AM Proposed Year 10	B	B	C	17.9	13	22.9
Church Ave	PM Proposed Year 0	B	B	C	15.4	15.6	23.2
Church Ave	PM Proposed Year 10	C	C	D	24.9	27.7	35.2

Note: Only the two signalized intersections, Manhattan Ave and Church Ave, were analyzed in Synchro. Hubert Ave, Lois Ave, Clark Ave, and Grady Ave were not analyzed (all values not applicable) and are not listed. Level of service (LOS) is graded from A (best, little delay) to F (worst, failing). Delay is average seconds per vehicle.

Table 5b: Bay to Bay Blvd Intersection Queue Length and Volume-to-Capacity Ratio, Proposed Conditions

Intersection	Peak Hour, Condition, and Year	EB Avg Queue (ft)	EB 95th Pct Queue (ft)	WB Avg Queue (ft)	WB 95th Pct Queue (ft)	EB V/C	WB V/C	Overall Max V/C
Manhattan Ave	AM Proposed Year 0	172	257	71	113	0.78	0.40	0.78
Manhattan Ave	AM Proposed Year 10	224	377	87	141	0.87	0.54	1.19 (SBLT)
Manhattan Ave	PM Proposed Year 0	196	304	65	108	0.83	0.55	0.83
Manhattan Ave	PM Proposed Year 10	268	464	84	175	0.95	0.79	1.68 (NBLT)
Church Ave	AM Proposed Year 0	133	269	87	183	0.52	0.41	0.76
Church Ave	AM Proposed Year 10	227	517	145	298	0.71	0.56	0.86
Church Ave	PM Proposed Year 0	157	273	162	287	0.55	0.59	0.89
Church Ave	PM Proposed Year 10	250	419	264	478	0.79	0.84	1.02 (SB)

Note: Only Manhattan Ave and Church Ave were analyzed; the other intersections are not listed (all values not applicable). Queue lengths are in feet. The volume-to-capacity (V/C) target is 1.0 or less. Where the overall maximum V/C is above 1.0, the controlling movement is shown in parentheses: SBLT is the southbound left turn, NBLT is the northbound left turn, and SB is the southbound approach.

5. Comparisons, Conclusions, and Recommendations

When comparing the existing conditions traffic analysis with the proposed conditions traffic analysis, repurposing the four-lane section to a two-lane section with a two-way left-turn lane and buffered bicycle lanes on Bay to Bay Blvd will not adversely affect traffic flow or lead to problematic safety issues. The proposed condition has no level of service worse than D, except the eastbound approach at Manhattan Ave, which degrades to LOS E with the 10-year growth factor. The LOS E is the same for both the existing and proposed lane configurations. The Church Ave intersection maintained LOS B or better for all conditions, except the PM peak proposed condition with the 10-year growth factor applied, which falls to LOS C. Traffic analysis metrics are compared in **Tables 6a and 6b**.

Delay at the Manhattan Ave intersection increases by approximately 13 seconds between current volumes and 10-year growth volumes. While delay increased by almost 21 seconds in the worst-case scenario (westbound existing condition in the AM peak for Year 0 volumes compared with the proposed condition in the AM peak for Year 10 volumes), the overall delay of 27.7 seconds is still quite low. Overall delay on Bay to Bay Blvd remained at or below 67.7 seconds for the Manhattan Ave intersection and was no greater than 27.7 seconds for the Church Ave intersection, showing that overall delay at each end of the corridor is relatively low in the proposed condition.

The queue length for the Manhattan Ave intersection remained almost identical in the proposed condition compared with the existing condition, while the Church Ave intersection 95th percentile queue length increased from 115 to 517 feet in the westbound direction when considering the 10-year growth factor. **This is the most problematic metric in this report, showing that westbound queues at Church Ave will back up to within about 130 feet of the Dale Mabry Hwy intersection.**

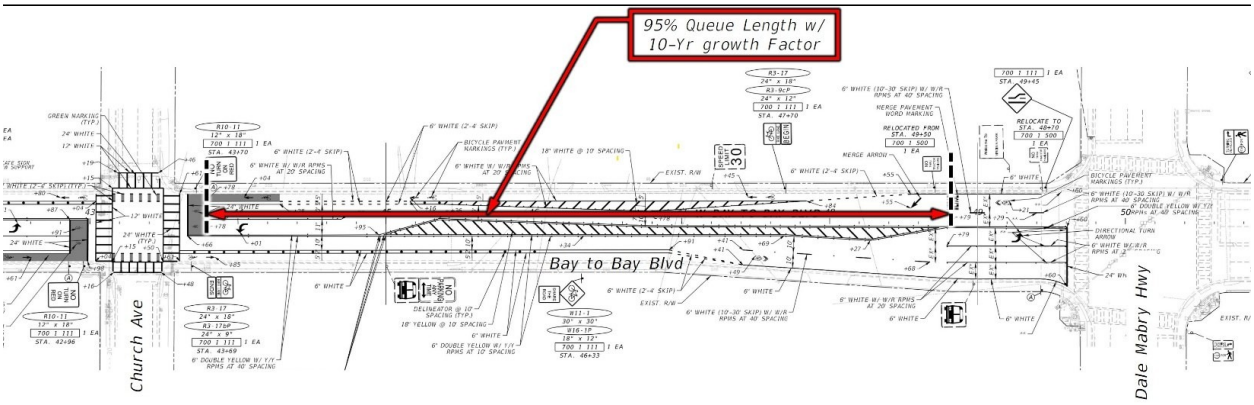


Figure 5: Westbound Bay to Bay Blvd Queue Length at Church Ave

Description of Figure 5: The figure is an excerpt of the proposed signing and pavement marking concept plan for Bay to Bay Blvd between S Church Ave on the left and S Dale Mabry Hwy on the right. A red double-headed arrow, labeled “95% Queue Length with 10-Year Growth Factor,” extends from the westbound stop bar at Church Ave most of the way to Dale Mabry Hwy. It shows that the projected westbound queue would reach within about 130 feet of the Dale Mabry Hwy intersection. The plan also shows the proposed westbound merge from two lanes to one, the buffered bicycle lanes, and the related signs and pavement markings.

The greatest V/C ratio at the Manhattan Ave intersection was 0.95 for the PM peak proposed condition for the eastbound approach in the 10-year future scenario. The largest V/C ratio for the Church Ave intersection was 0.84 for the PM peak at the westbound approach for the proposed condition considering 10-year growth along Bay to Bay Blvd. Overall V/C ratios remained below 1.0, indicating that a reduction in the number of lanes from two to one in either the eastbound or westbound direction will not adversely affect traffic flow.

In summary, reducing Bay to Bay Blvd from two lanes to one in each direction will not negatively impact the overall level of service, delay, or queueing, nor will it introduce significant safety concerns, other than the westbound queue length approaching Church Ave 10 years from now. This is largely because the current traffic volumes align more closely with those of a one-lane street than a two-lane street as presently configured.

The overall crash level on the corridor was low to moderate for a ¾-mile segment of a four-lane road, with fifty-four (54) crashes total over five (5) years. This averages approximately 10 or 11 crashes each year. The reduction in lanes and the addition of speed humps and buffered bicycle lanes will reduce travel speeds, promote multimodal activity, and cause motorists to be more cautious or take alternate routes, improving the overall safety of the corridor.

Due to the fatal angle crash at Lois Ave and the concentration of crashes at Church Ave, the following maintenance recommendations should be considered.

Maintenance Recommendations

- At the Lois Ave intersection, trim back the bushes on the southeast corner to reduce sight obstruction.
- At the Church Ave intersection, trim back the oak tree that overhangs the mast arm supporting the signal heads for the eastbound movement to make the signal heads more visible.
- Provide retroreflective backplates to the signal heads at Church Ave.

Due to the westbound queueing at Church Ave in the proposed condition considering a 10-year growth factor, the following recommendation should be considered for the proposed condition concept plans.

Concept Plan Recommendation

- Revise the westbound Bay to Bay Blvd merge lane from Dale Mabry Hwy to Church Ave to be a right-turn drop lane at Church Ave. This will help reduce the westbound queue on Bay to Bay Blvd approaching Church Ave from Dale Mabry Hwy.

Table 6a: Bay to Bay Blvd Traffic Analysis Comparison, Level of Service and Delay, Existing Versus Proposed

Intersection	Peak Hour, Condition, and Year	EB LOS	WB LOS	Overall LOS	EB Delay (sec)	WB Delay (sec)	Overall Delay (sec)
Manhattan Ave	AM Existing Year 0	D	B	B	47.3	18.4	21.3
Manhattan Ave	AM Existing Year 10	E	C	C	53.8	28	31.5
Manhattan Ave	AM Proposed Year 0	D	C	C	49.1	25.8	21.3
Manhattan Ave	AM Proposed Year 10	E	C	C	53.8	28	31.5
Manhattan Ave	PM Existing Year 0	D	B	C	52.2	28.6	24.8
Manhattan Ave	PM Existing Year 10	E	C	F	67.7	45.6	47.1
Manhattan Ave	PM Proposed Year 0	D	B	C	52.2	28.6	24.8
Manhattan Ave	PM Proposed Year 10	E	C	F	67.7	45.3	47.1
Church Ave	AM Existing Year 0	A	A	B	7.7	6.3	16.2
Church Ave	AM Existing Year 10	B	A	B	10.8	8.7	19
Church Ave	AM Proposed Year 0	B	A	B	10.7	8.8	18
Church Ave	AM Proposed Year 10	B	B	C	17.9	13	22.9
Church Ave	PM Existing Year 0	B	B	C	11.6	10.1	20.4
Church Ave	PM Existing Year 10	B	B	C	15.3	13.3	28
Church Ave	PM Proposed Year 0	B	B	C	15.4	15.6	23.2
Church Ave	PM Proposed Year 10	C	C	D	24.9	27.7	35.2

Note: Only the two signalized intersections, Manhattan Ave and Church Ave, were analyzed in Synchro. Hubert Ave, Lois Ave, Clark Ave, and Grady Ave were not analyzed (all values not applicable) and are not listed. Level of service (LOS) is graded from A (best, little delay) to F (worst, failing). Delay is average seconds per vehicle.

Table 6b: Bay to Bay Blvd Traffic Analysis Comparison, Queue Length and Volume-to-Capacity Ratio, Existing Versus Proposed

Intersection	Peak Hour, Condition, and Year	EB Avg Queue (ft)	EB 95th Pct Queue (ft)	WB Avg Queue (ft)	WB 95th Pct Queue (ft)	EB V/C	WB V/C	Overall Max V/C
Manhattan Ave	AM Existing Year 0	172	257	71	113	0.64	0.39	0.78
Manhattan Ave	AM Existing Year 10	224	377	87	141	0.87	0.54	1.19 (SBLT)
Manhattan Ave	AM Proposed Year 0	172	257	71	113	0.78	0.40	0.78
Manhattan Ave	AM Proposed Year 10	224	377	87	141	0.87	0.54	1.19 (SBLT)
Manhattan Ave	PM Existing Year 0	106	304	65	108	0.83	0.55	0.83
Manhattan Ave	PM Existing Year 10	268	464	84	175	0.95	0.79	1.68 (NBLT)
Manhattan Ave	PM Proposed Year 0	196	304	65	108	0.83	0.55	0.83
Manhattan Ave	PM Proposed Year 10	268	464	84	175	0.95	0.79	1.68 (NBLT)
Church Ave	AM Existing Year 0	63	115	38	75	0.32	0.24	0.76
Church Ave	AM Existing Year 10	101	181	62	117	0.46	0.34	0.86
Church Ave	AM Proposed Year 0	133	269	87	183	0.52	0.41	0.76
Church Ave	AM Proposed Year 10	227	517	145	298	0.71	0.56	0.86
Church Ave	PM Existing Year 0	76	122	66	110	0.35	0.34	0.89
Church Ave	PM Existing Year 10	117	166	104	151	0.53	0.49	1.02 (SB)
Church Ave	PM Proposed Year 0	157	273	162	287	0.55	0.59	0.89
Church Ave	PM Proposed Year 10	250	419	264	478	0.79	0.84	1.02 (SB)

Note: Only Manhattan Ave and Church Ave were analyzed; the other intersections are not listed (all values not applicable). Queue lengths are in feet. The volume-to-capacity (V/C) target is 1.0 or less. Where the overall maximum V/C is above 1.0, the controlling movement is shown in parentheses: SBLT is the southbound left turn, NBLT is the northbound left turn, and SB is the southbound approach.