Exhibit 3

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Technical Memorandum

February 13, 2025 Project# 24846.005

To: Gail Payne, Susie Hufstader, Rochelle Wheeler
City of Alameda, CA

From: Kittelson & Associates, Inc.

RE: Stargell Avenue Complete Street Roundabout Performance Memo

INTRODUCTION

Kittelson is supporting the City of Alameda with the Stargell Avenue Complete Street project (project). This memo discusses intended project outcomes which were informed by community feedback and city priorities. This memo also provides the following for Stargell Avenue/Fifth Street, Stargell Avenue/Mariner Square Loop, and the roadway connecting the two:

- Analysis of traffic operations including comparison of alternatives
- Description of proposed pedestrian-bicyclist circulation improvements
- Discussion of community input and project goals

The memo is organized as follows:

PROJECT BACKGROUND AND INTENDED OUTCOMES

Background

The city has developed project concept designs for the Willie Stargell Avenue Complete Street project, which will construct safety improvements between Main Street and Mariner Square Loop. The concepts propose to improve school crossings, slow traffic, improve the safety of major intersections, green the street, and add new bus stops in conjunction with AC Transit's network realignment.

The project also includes roundabouts at the intersections with Fifth Street and Mariner Square Loop, which would be converted from their existing traffic signal control. Kittelson identified these intersections as good candidates for roundabouts as part of prior work conducting a citywide roundabout screening. The screening identified intersections along all City arterial and collector roadways and prioritized locations based on the following criteria:

- **Social equity:** in the City's most socially vulnerable areas.
- **Safety:** identified in the City's Vision Zero Action Plan.
- **Modal priority:** on existing, planned, or recommended bus, bike, and truck routes.
- **Sustainability:** most vulnerable to inundation in future sea level rise scenarios.
- **Implementation challenges:** not along Caltrans facilities.

Funding is being sought for all project elements.

Intended Outcomes

Intended project outcomes were developed based on review of existing conditions, City priorities, and community input (described in the section below).

Project intended outcomes have been identified as follows:

- Improve and prioritize safety for all road users. Promote safety by prioritizing the city's Vision Zero goal to reduce the number of fatal and serious injury crashes to zero within the study area by 2035.
- Provide mobility for all modes (including AC Transit buses and trucks).
- Improve bicycle and pedestrian access to/from nearby residential areas, Safeway and other businesses, Ruby Bridges Elementary School, College of Alameda, and the Oakland Alameda Access Project, among other destinations.
- Reduce speeds through roadway design changes.

- Improve transit service by increasing efficiency and providing bus stops.
- Comply with city plans & policies (including the General Plan Mobility Element, Vision Zero Action Plan, and the Active Transportation Plan).
- Provide flood reduction and landscaping opportunities.
- Reduce greenhouse gas emissions.

Roundabout Concept Development

Kittelson worked with the City to develop roundabout concept alternatives. In determining the size and placement of the roundabouts, the concepts balance two design goals: safety and mobility. Where they can provide adequate mobility, single-lane roundabouts are preferrable to multilane roundabouts because single-lane roundabouts reduce the complexity of the task for drivers and for people walking or biking by reducing conflict points. Single-lane roundabouts also typically force slower entry and circulating speeds (below 25 mph), reducing the likelihood and severity of crashes compared to other intersection control forms and to multilane roundabouts.

The concepts were also laid out to provide space for curb-separated facilities for pedestrians and bicyclists, either through dedicated lanes or shared-use paths, and to keep vehicle speeds at or below 25 mph while allowing space for truck and bus movements to be made in lane.

Kittelson conducted traffic operations analysis to compare performance between the roundabout concepts and the existing signal configuration. The comparison was tested under current and projected 2040 traffic volumes. This analysis showed that the roundabouts reduced average delay and had similar or shorter queue lengths compared to the existing signal configuration.

Another major motivation for adding roundabouts was to devote excess road space from the signalized intersections to landscaping and stormwater management, especially given that the area is prone to flooding, a risk which is increasing with sea level rise.

Community engagement and input also informed recommendations, including the finer details of the roundabout designs.

Concept designs can be found in Appendix A.

STUDY AREA COMMUNITY INPUT

The City collected input on the roundabout concept from community members via the following venues:

- Community Meeting and Open House on September 18, 2024
- Online community survey on project website[1]

Community input that relates to the roundabout concepts is listed below in three categories – concerns, desires, and general support. To address how the City has either addressed or reshaped the project based on community input, the memo provides a response for each listed item (whether a single comment or a thematic compilation of many comments).

Concerns

- **Excessive speeding and unsafe crossings:** Residents expressed concerns about constant speeding drivers who do not stop for pedestrians and children coming home from school, particularly between Fifth Street and Main Street. One community member described walking on Stargell Avenue as "harrowing." Others stated that right-turning cars frequently don't yield to them at the Fifth Street and Stargell Ave intersection.
- **Response:** Roundabout geometry will reduce vehicle speeds to 25 mph or less through the use of entry curvature and physical channelization. Reduced vehicle speeds improve driver yielding rates to pedestrians trying to cross. The roundabouts provide one lane of traffic to cross at a time, reducing crossing distances and exposure.

- **Lack of bike facilities:** Another resident shared that they don't feel safe riding their bike on the street, particularly between Fifth Street and Main Street.
- **Response:** Separated bike lanes and shared use paths at the roundabouts will provide an alternative to riding in a shared space with vehicle traffic. This approach is consistent with the rest of the Complete Streets project between Main Street and Mariner Square Loop.

- **Traffic delay and capacity:** One resident shared support for roundabouts in general but was concerned about congestion during high-traffic events like the Antiques Fair on the first Sunday of the month.

[1] Was posted until early 2025 at https://www.alamedaca.gov/Departments/Planning-Building-and-Transportation/Transportation/Willie-Stargell-Complete-Street-Project)

- **Response:** The roundabout provides sufficient capacity to serve the typical demand at this intersection. For infrequent high-traffic events, travel demand will be much higher, but other locations on the City's roadway network would also form traffic bottlenecks such as at the tubes. So although there would be higher traffic demand at the roundabouts, it would be limited by other congestion getting to and from these intersections.

- **Signal delay:** One resident brought up the existing issue of vehicle delays for drivers making eastbound left turns from Stargell Avenue to Fifth Street.
- **Response:** The traffic operations analysis in this memo shows that the roundabout reduces the queues and delays for this left-turn movement. This is because rather than getting a specific green phase at a traffic signal, drivers just proceed when they have a gap in traffic—so left-turn drivers have more opportunities to complete their movement compared to waiting for the green light.

- **Speeding on truck aprons:** One commenter expressed concern that drivers may use the truck apron to speed.
- **Response:** The truck aprons are designed with a vertical lip that is traversable but is not a desirable option surface for the general public. For commercial truck drivers, they use the truck apron for their back wheels but must make movements at roundabouts at slow speeds (lower than 25 mph).

- **Queueing into In-n-Out:** One resident expressed concern about traffic backing up at the In-n-Out on Stargell Ave, blocking through traffic in the proposed concept with just one lane.
- **Response:** The concept sketch currently allows for the right-turn lane into the In-N-Out to be maintained. Further design phases will account for this movement.

- **Midblock crossings:** A resident expressed concern about routine pedestrian crossings outside of marked crosswalks.
- **Response:** Non-engineering educational, outreach, or intervention efforts can attempt to change behavior, but the proposed concept would make that behavior less risky because there would be fewer lanes to cross at a time, and traffic speeds would be slower.

Desires

- **Improved wayfinding**: One resident said they wanted better signage and wayfinding for existing and proposed pedestrian and bike facilities, especially on the existing wide sidewalk on the south side of Stargell Avenue east of Fifth Street that can function as a shared-use path.
- **Response:** New pavement markings and signage will clearly direct people walking and biking to the proposed facilities and to other destinations and pedestrian/bike routes in the area.

- **Traffic calming:** Another resident expressed support for traffic calming on Stargell Avenue, including speed bumps, chicanes, and raised crosswalks.
- **Response:** Roundabout geometry (including horizontal deflection and roadway narrowing with splitter islands) will act as traffic calming and reduce vehicle speeds. The design will supplement this traffic calming effect as appropriate with raised crosswalks.

- **Flashing lights at crossings:** One resident requested flashing lights at pedestrian crossings at the proposed roundabouts.
- **Response:** There are a few common supplemental pedestrian treatments at roundabouts, and they are all most commonly applied at multilane roundabouts: rectangular rapid flashing beacons (RRFBs, or the flashing lights the resident noted); raised or table-top crossings, pedestrian hybrid beacons (PHBs), or signals. These treatments are commonly applied to increase yielding likelihood or to reduce pedestrian delay. Single-lane roundabouts like the ones proposed here have satisfactory yielding behavior and pedestrian delay without supplemental treatments. However, the City will incorporate a raised crosswalk on this project in response to community input on this and other projects. Raised crosswalks slow all traffic instead of only being activated with a push button.

- **Bicyclists using travel lanes:** Another resident wanted the option for people biking to use the roadway in case they want to avoid circuitous path around the roundabouts.
- **Response:** Cyclists always have the option to circulate with vehicle traffic, and the bike lane design will allow cyclists to make this merge.

General Support

In addition to specific concerns and desires from community input, the City received general support for the following aspects of the project:

- Addition of new roundabouts.
- Improved pedestrian-bike connection to the Oakland-Alameda Water Shuttle.

EXISTING CONDITIONS AND PLANNING CONTEXT

This section summarizes the existing conditions and planning context of the project site vicinity.

Pedestrian and Bicycle Facilities

Stargell Avenue and Fifth Street
The proposed roundabout would connect to pedestrian paths on each side of all four approach roadways. All of these pedestrian paths are sidewalks except for the shared-use paths on the north side of Stargell Avenue west of Fifth Street and on the south side of Stargell Avenue east of Fifth Street. All legs have marked crosswalks. On Stargell Avenue, existing striped bike lanes (Class II) are present on the east leg (westbound approach, eastbound departure) but not on the west leg; the west leg instead has sharrows. Striped bike lanes (Class II) are present on Fifth Street north and south of the intersection.

On Fifth Street, the Alameda Active Transportation Plan calls for buffered bike lanes north of Stargell Avenue and separated bike lanes south of Stargell Avenue. These proposed facilities will tie into the bicycle facilities included in the roundabout concept.

Stargell Avenue, Mariner Square Loop, and Campus Drive
The proposed roundabout would connect to the sidewalk along the north side of Stargell Avenue and the separated shared-use path along the south side of Stargell Avenue on both sides of the intersection. It would also connect to the sidewalks along the west side of Mariner Square Loop and Campus Drive. There are no sidewalks on the east side of Mariner Square Loop and Campus Drive. All legs have marked crosswalks. As for bike-specific facilities, there are striped bike lanes (Class II) on both sides of Stargell Avenue and Campus Drive but only sharrows on Mariner Square Loop to the north.

Transit Services

The study area serves two AC Transit routes (bus Lines 19 and 96). Currently, Line 19 only runs along Mariner Square Loop and Stargell Avenue east of Mariner Square Loop. However, the Realign project -- AC Transit's comprehensive assessment of all its bus lines in response to significant travel changes since the pandemic – reroutes Line 19 along Fifth Street and farther west along Stargell Avenue. Figure 1 provides a map of this reroute, in addition to AC Transit Line 20, which runs adjacent to the project area.

Within the study area, the following bus stop is present:

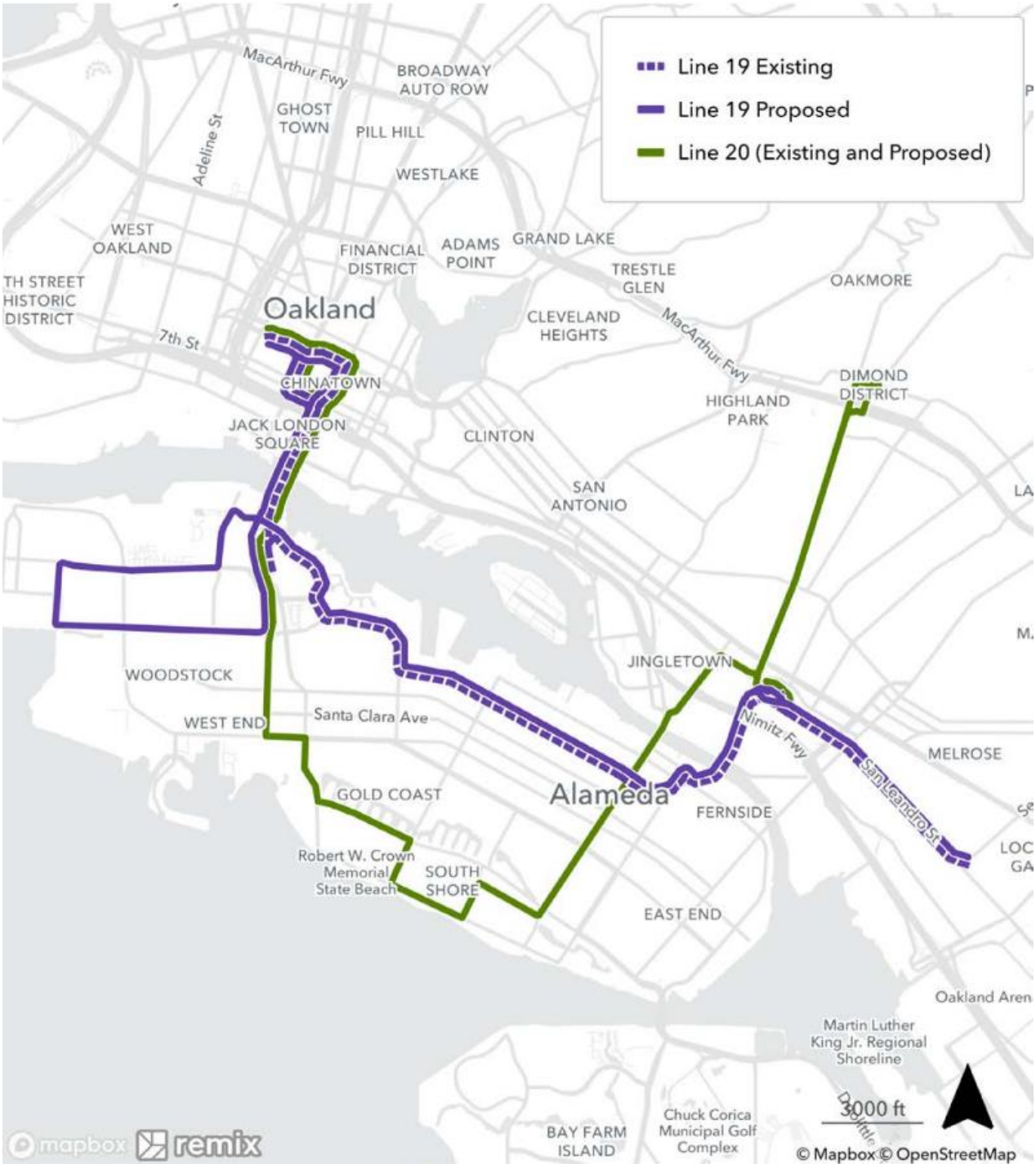
- Stargell Avenue & Mariner Square Loop: Lines 19 and 96, northbound

Additional eastbound and westbound stops for Lines 19 and 96 are proposed along Stargell Avenue at Mosley Avenue and Coral Sea Street.
Table 1 presents the existing and proposed bus frequencies by line. The AC Transit Realign does not include changes to bus frequencies for either of the lines running through the project area.

Table 1: Bus Frequency Summary

Route	Weekday	Weekend
Line 19	1 hour	1 hour
Line 96	30 minutes	30 minutes

Figure 1: AC Transit Bus Route Map for Lines 19 and 20



Speed

Current speed limits within the study area roadways are as follows:

- **Stargell Avenue, Fifth Street, Mariner Square Loop:** 25 mph
- **Campus Drive:** 15 mph

The City provided Kittelson with a speed study completed along Stargell Avenue, between Mosley Avenue and Coral Sea Street for one week in May of 2024. This study showed the following:

- **Eastbound direction:** Median speed is 34.1 mph, 85th percentile speed is 39.4 mph
- **Westbound direction:** Median speed is 34.9 mph, 85th percentile speed is 40.3 mph
- 85th percentile speeds exceed the posted speed limit by 15 mph and the median speeds exceed the posted speed limit by 10 mph.

Traffic Operations Analysis

Vehicular, bicycle, and pedestrian AM Peak and PM Peak turning movement counts were collected on Thursday, May 9, 2024, at the following intersections:

- Stargell Avenue/Fifth Street
- Stargell Avenue/Mariner Square Loop/Campus Drive

Appendix B presents these turning movement counts.

Kittelson used PTV Vistro software to model the two intersections with their existing signal configurations and with the proposed roundabout configurations for both the AM and PM peak periods. This was used to compare traffic operations between the two alternatives with existing traffic volumes. Kittelson also conducted this analysis with projected 2040 traffic volumes. Appendix C provides Vistro reports of these results.

Cardinal directions for the study intersections were assumed as follows:

- Stargell Avenue: east/west
- Fifth Street: north/south
- Mariner Square Loop/Campus Drive: north/south

Intersection delay is one key measure from the Vistro analysis. Table 2 and Table 3 show a comparison of intersection delay under all the different scenarios for the two intersections.

Table 2: Stargell Avenue and Fifth Street - Intersection Delays

	Weekday AM				Weekday PM			
	Signal		Roundabout		Signal		Roundabout	
	Average Delay (s)	V/C	Average Delay (s)	V/C	Average Delay (s)	V/C	Average Delay (s)	V/C
Existing	17.2	0.63	7.9	0.47	17.9	0.53	10	0.57
2040	17.4	0.64	7.9	0.47	19.8	0.64	12.2	0.70

Table 3: Stargell Avenue and Mariner Square Loop - Intersection Delays

	Weekday AM				Weekday PM			
	Signal		Roundabout		Signal		Roundabout	
	Average Delay (s)	V/C	Average Delay (s)	V/C	Average Delay (s)	V/C	Average Delay (s)	V/C
Existing	10	0.52	10.1	0.66	27	0.88	17.9	0.84
2040	16.3	0.6	14.7	0.82	66.2	1.17	56	1.1

Another key measure from the Vistro analysis are queue lengths. Table 4 through Table 7 show 95th percentile queue lengths under all the different scenarios for the two intersections. These values represent conditions for the worst five percent of the weekday peak hour. Queue lengths that exceed the storage length for that movement are highlighted in orange.

As shown in Table 4 through Table 7, the only existing movement for which the 95th percentile queues exceed capacity is the signalized southbound left at Mariner Square Loop. That queue also exceeds capacity in 2040. The only additional 95th percentile queue that exceeds capacity in 2040 is the signalized eastbound left at Fifth street. No roundabout alternative queues exceed capacity under current or 2040 traffic volumes

Table 4: Stargell Avenue and Fifth Street – Existing 95th Percentile Queue Lengths

		Northbound			Southbound			Eastbound			Westbound		
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Existing Storage	**200**	**1,800**		**100**	**325**	**100**	**65**	**600**		**800**	**800**	**225**
Existing Weekday AM	Signal	10	80		30	30	25	30	155		25	175	20
	Roundabout	30			30			55			65		
Existing Weekday PM	Signal	5	65		40	50	25	65	135		70	155	40
	Roundabout	25			60			70			100		

Table 5: Stargell Avenue and Fifth Street – 2040 95th Percentile Queue Lengths

		Northbound			Southbound			Eastbound			Westbound		
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Existing Storage	**200**	**1,800**		**100**	**325**	**100**	**65**	**600**		**800**	**800**	**225**
2040 Weekday AM	Signal	9	85		35	30	30	35	150		20	180	20
	Roundabout	30			30			55			65		
2040 Weekday PM	Signal	5	70		70	50	45	75	135		80	170	75
	Roundabout	25			65			75			150		

Table 6: Stargell Avenue and Mariner Square Loop – Existing 95th Percentile Queue Lengths

		Northbound			Southbound			Eastbound			Westbound		
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Existing Storage	**1,000**			**225**	**1,375**		**125**	**800**	**800**	**100**	**700**	**350**
Existing Weekday AM	Signal	10			25	5		15	50	50	25	50	40
	Roundabout	5			20			70			135		
Existing Weekday PM	Signal	25			405	15		40	85	85	30	125	205
	Roundabout	15			135			105			285		

Table 7: Stargell Avenue and Mariner Square Loop – 2040 95th Percentile Queue Lengths

		Northbound			Southbound			Eastbound			Westbound		
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Existing Storage	**1,000**			**225**	**1,375**		**125**	**800**	**800**	**100**	**700**	**350**
2040 Weekday AM	Signal	20			125	10		35	70	70	40	80	130
	Roundabout	5			35			90			250		
2040 Weekday PM	Signal	25			1,180	50		75	75	75	30	145	300
	Roundabout	15			540			165			595		

Figure 2 and Figure 3 show simplified diagrams of the queue lengths reported in Table 4 through Table 7.

Figure 2: Stargell Avenue and Fifth Street - Queue Length Diagrams

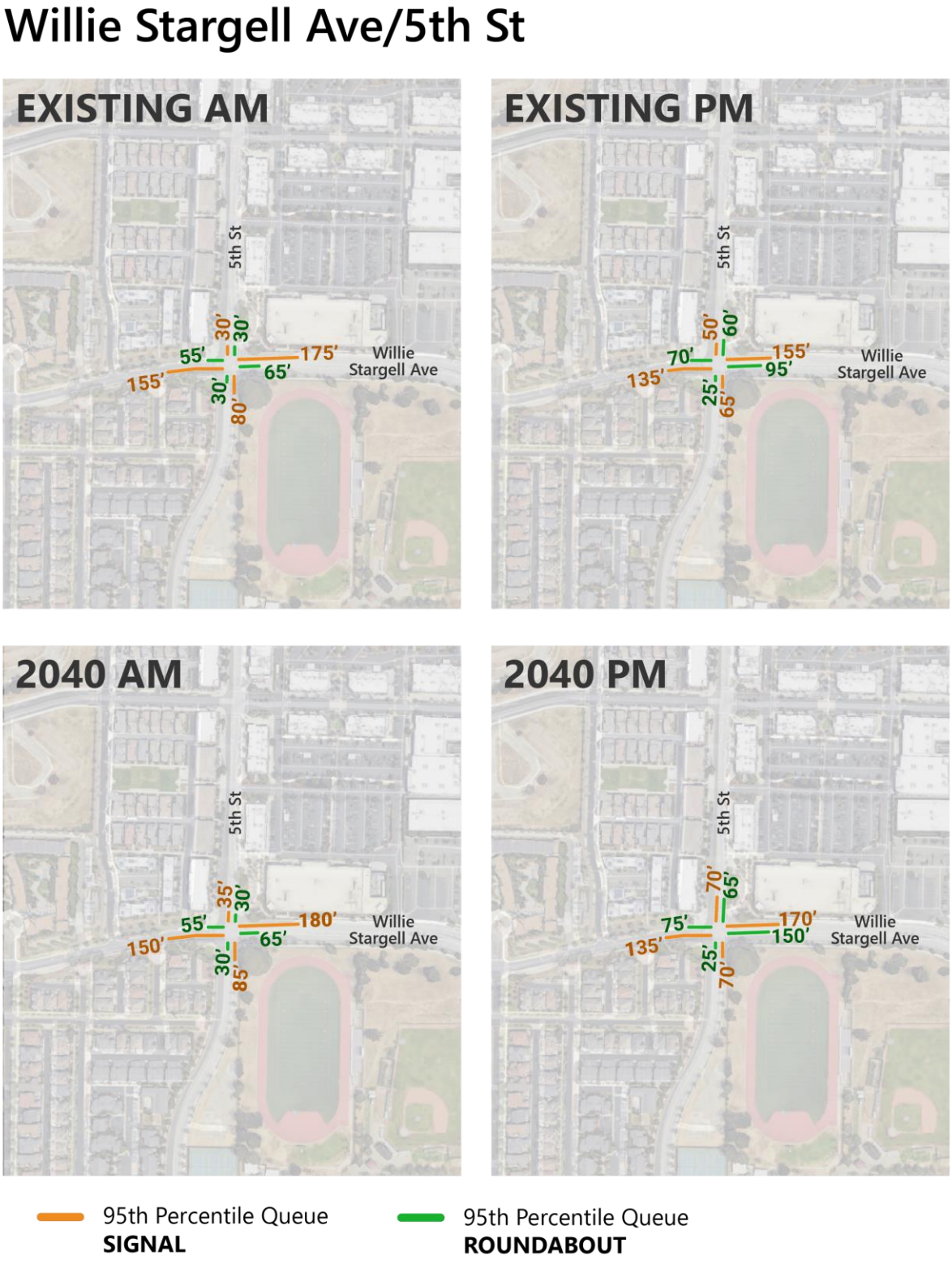
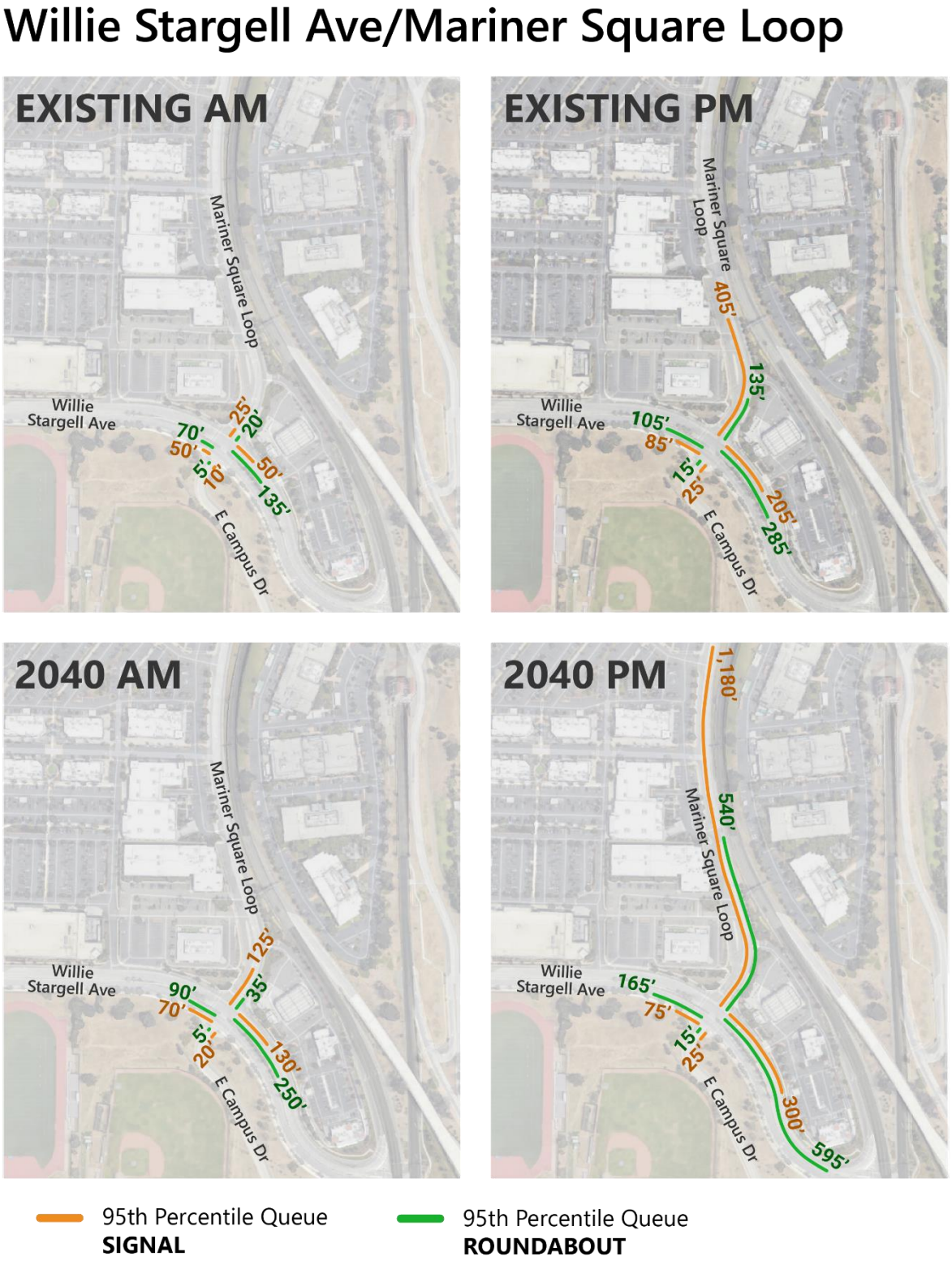


Figure 3: Stargell Avenue and Mariner Square Loop - Queue Length Diagrams

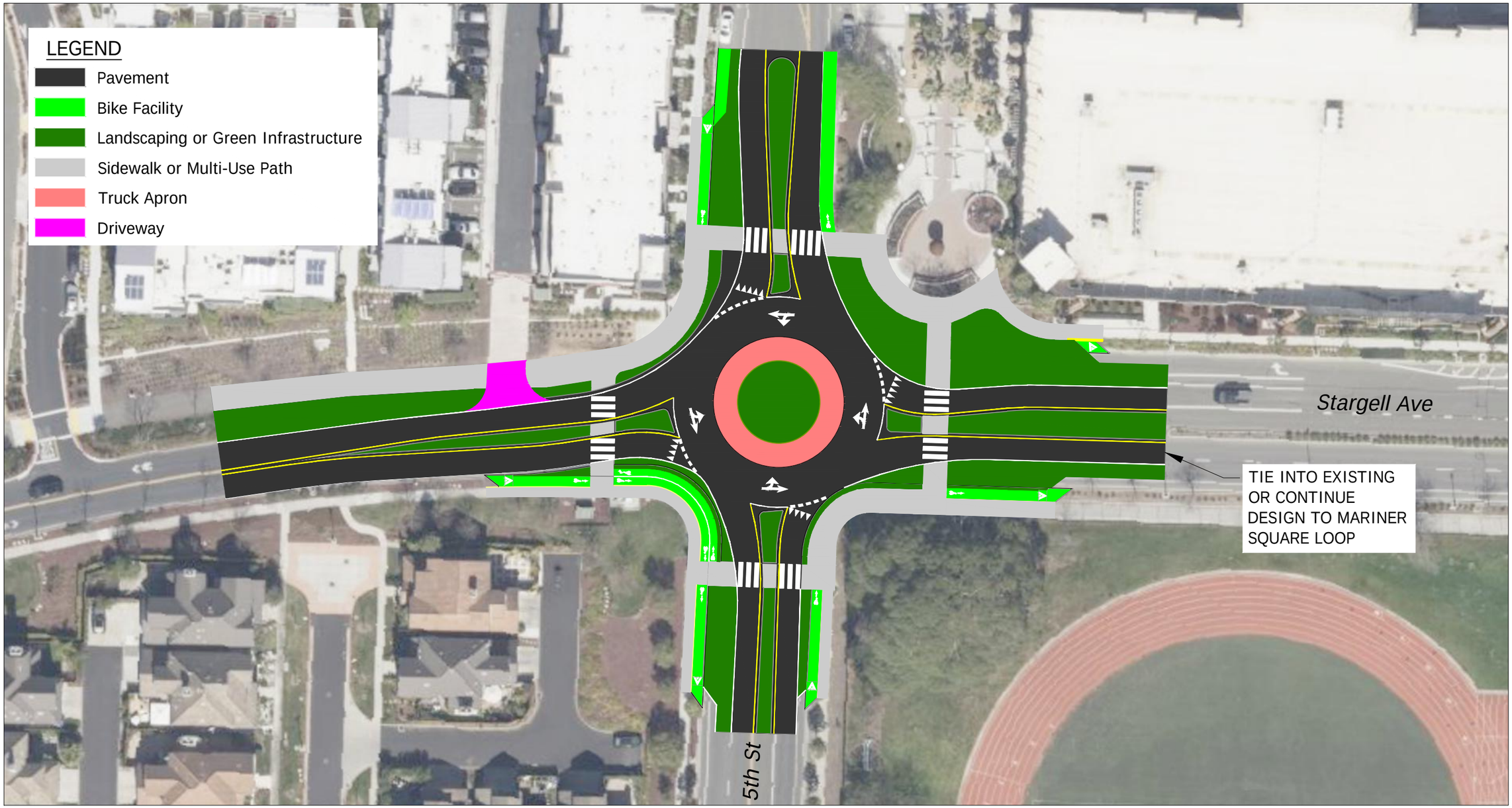


ANALYSIS RESULTS

The operations analysis and queue length analysis show:

- Both roundabout alternatives have an average delay that is the same or better than the signal alternatives under all scenarios, existing and future. Additionally, no roundabout queue lengths exceed their capacity whereas the signal has 1 queue length in existing and 2 queue lengths in the future that exceed capacity.
  - At Fifth Street, the signal has longer 95th percentile queue lengths than the roundabout in almost all movements in all scenarios.
  - At Mariner Square Loop, there is more variability in which alternative has the longer queue lengths. However, the outlier southbound queue lengths during the PM peak hour for the signal alternative are less than half as long for the roundabout alternative, existing and future.
- In conclusion, both roundabouts provide moderate to significant traffic operation benefits now and in the future as compared to the existing signals.

Appendix A Concept Designs



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Scale: 1" = 50'

50 25 0 50

Willie Stargell Ave and 5th St
Alameda, CA

Figure
1

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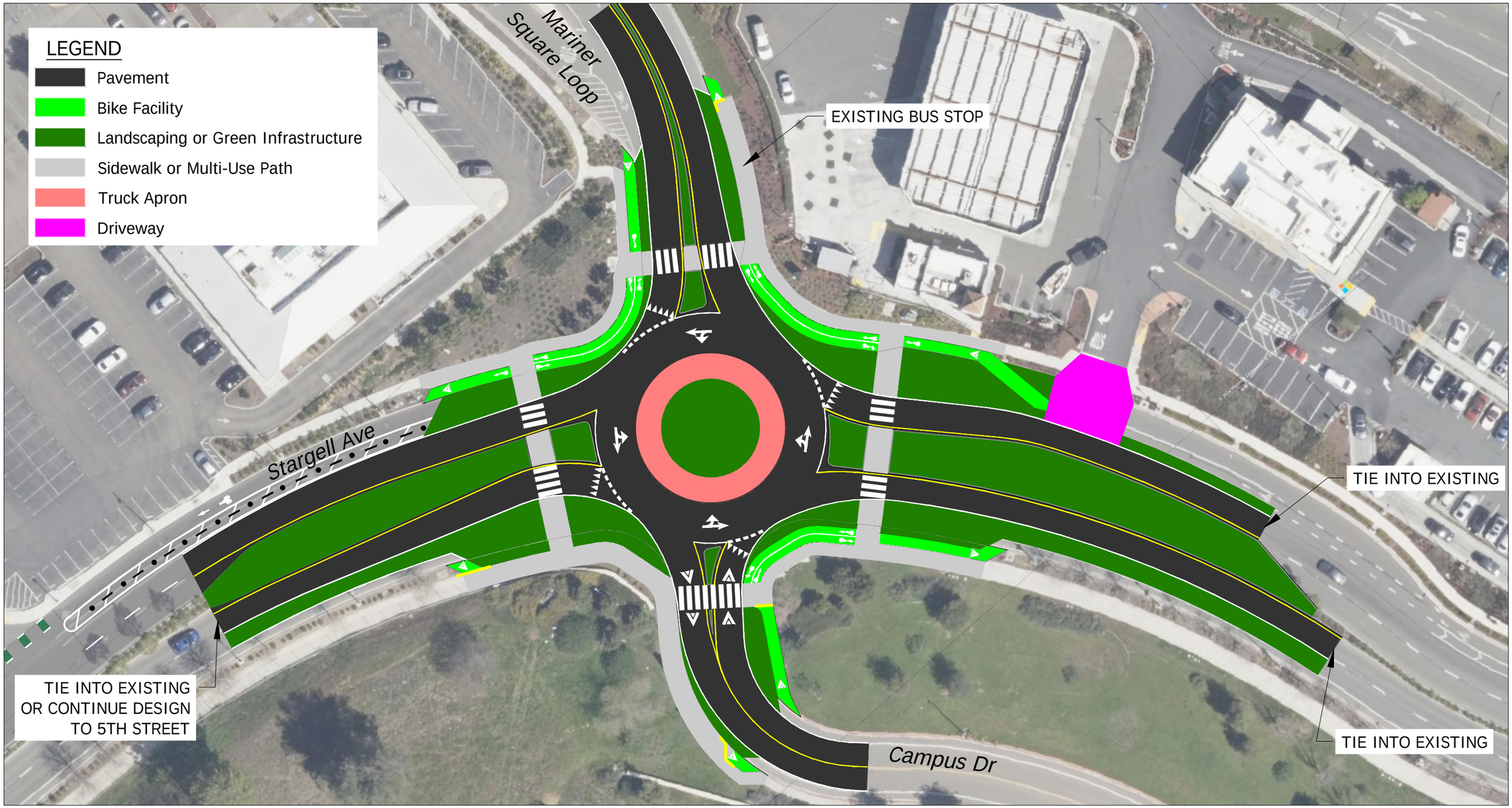

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Scale: 1" = 50'

50 25 0 50

Willie Stargell Ave and Mariner Square Loop/Campus Dr
Alameda, CA

Figure
2

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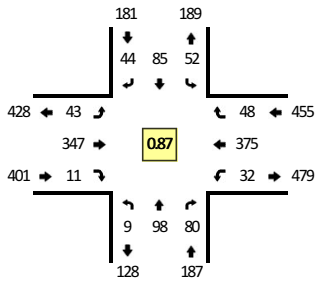
Appendix B Turning Movement Counts

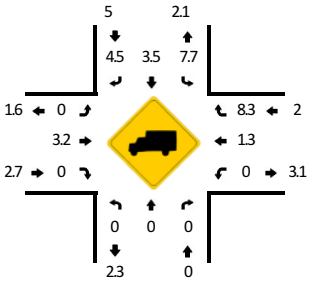
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

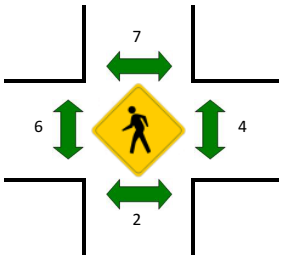
LOCATION: 5th St -- Willie Stargell Ave | **QC JOB #:** 16603801
CITY/STATE: Alameda, CA | **DATE:** Thu, May 9 2024

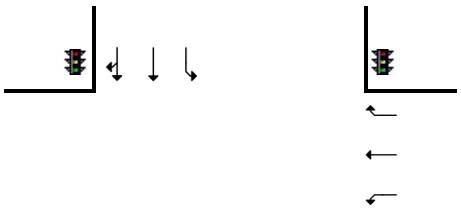
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

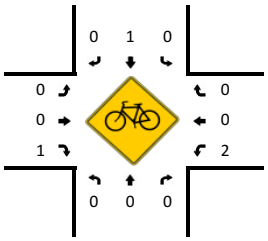


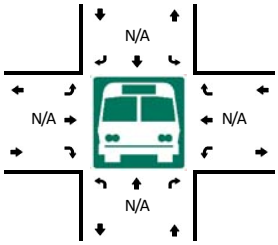
TRUE DATA TO IMPROVE MOBILITY

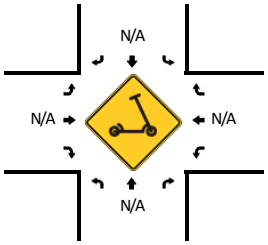












5-Min Count Period Beginning At	5th St (Northbound)				5th St (Southbound)				Willie Stargell Ave (Eastbound)				Willie Stargell Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	4	2	0	0	0	1	0	1	14	0	0	3	23	3	0	51	
7:05 AM	0	5	2	0	2	4	1	0	0	19	0	0	1	18	1	0	53	
7:10 AM	0	4	2	0	4	7	3	0	1	12	1	0	0	8	5	0	47	
7:15 AM	0	3	5	0	4	3	1	0	1	12	0	0	0	21	4	0	54	
7:20 AM	1	3	3	0	2	5	1	0	1	11	1	0	2	20	7	0	57	
7:25 AM	0	1	3	0	2	5	4	0	2	18	0	0	0	29	5	0	69	
7:30 AM	0	0	3	0	7	4	4	0	3	19	1	0	1	10	2	0	54	
7:35 AM	0	1	4	0	7	0	2	0	1	26	1	0	2	27	2	0	73	
7:40 AM	0	2	3	0	5	7	2	0	1	22	1	0	3	21	5	0	72	
7:45 AM	0	6	2	0	7	4	2	0	1	30	1	0	3	31	4	0	91	
7:50 AM	0	7	1	0	7	7	4	0	1	32	1	0	1	32	4	0	97	
7:55 AM	0	3	5	0	5	7	4	0	2	31	1	0	2	40	2	0	102	820
8:00 AM	3	5	9	0	5	5	6	0	3	24	0	0	1	30	4	0	95	864
8:05 AM	1	5	8	0	5	11	2	0	3	24	2	0	2	31	1	0	95	906
8:10 AM	2	4	4	0	6	9	4	0	3	37	3	0	1	22	6	0	101	960
8:15 AM	1	5	6	0	3	9	6	0	6	32	1	0	5	42	3	0	119	1025
8:20 AM	0	11	8	0	2	10	7	0	3	34	0	0	3	33	7	0	118	1086
8:25 AM	1	11	6	0	1	5	2	0	4	35	1	0	8	33	6	0	113	1130
8:30 AM	0	17	12	0	4	9	2	0	7	34	0	0	2	20	4	0	111	1187
8:35 AM	0	16	9	0	3	5	1	0	5	21	0	0	2	29	3	0	94	1208
8:40 AM	1	8	10	0	4	4	4	0	5	13	1	0	2	32	4	0	88	1224
8:45 AM	0	8	7	0	2	5	4	0	1	16	0	0	5	20	6	0	74	1207
8:50 AM	0	6	9	0	2	11	5	0	2	14	0	0	4	19	4	0	76	1186
8:55 AM	2	12	9	0	6	6	2	0	3	17	1	0	1	31	4	0	94	1178

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	108	80	0	24	96	60	0	52	404	8	0	64	432	64	0	1400
Heavy Trucks	0	0	0		0	0	4		0	8	0		0	12	4		28
Buses																	
Pedestrians		8				0				0				8			16
Bicycles	0	0	0		0	0	0		0	0	0		4	0	0		4
Scooters																	

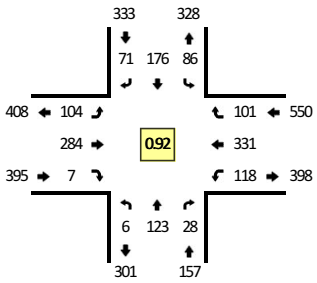
Comments:

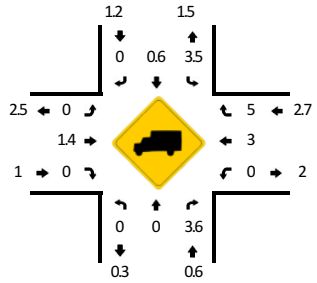
Report generated on 5/24/2024 3:57 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

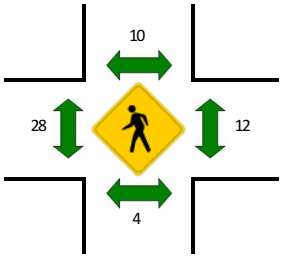
LOCATION: 5th St -- Willie Stargell Ave | **QC JOB #:** 16603802
CITY/STATE: Alameda, CA | **DATE:** Thu, May 9 2024

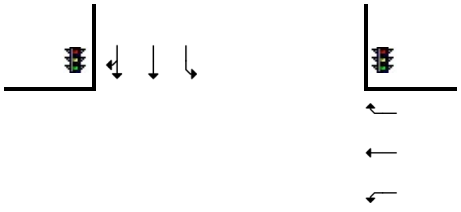
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

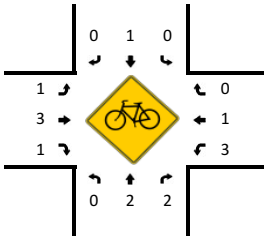


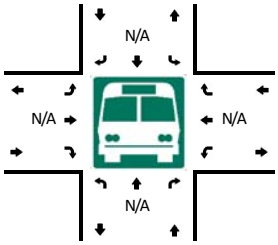


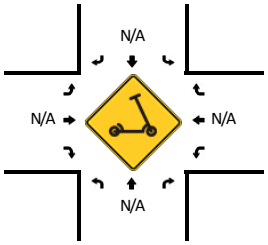
TRUE DATA TO IMPROVE MOBILITY











5-Min Count Period Beginning At	5th St (Northbound)				5th St (Southbound)				Willie Stargell Ave (Eastbound)				Willie Stargell Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	11	3	0	13	7	4	0	11	27	0	0	6	15	6	0	103	
4:05 PM	1	10	3	0	11	11	8	0	5	32	3	0	3	26	10	0	123	
4:10 PM	0	11	6	0	10	10	2	0	7	29	0	0	3	25	8	0	111	
4:15 PM	0	12	6	0	10	18	7	0	5	21	0	0	6	25	14	0	124	
4:20 PM	0	7	3	0	9	9	4	0	5	22	0	0	7	25	9	0	100	
4:25 PM	0	8	5	0	3	11	5	0	5	23	0	0	8	26	3	0	97	
4:30 PM	0	10	4	0	8	16	5	0	4	21	1	0	5	22	15	0	111	
4:35 PM	0	12	7	0	2	11	5	0	4	31	0	0	9	23	10	0	114	
4:40 PM	0	5	1	0	8	10	4	0	6	31	0	0	12	34	9	0	120	
4:45 PM	0	9	7	0	10	15	8	0	5	24	2	0	12	13	10	0	115	
4:50 PM	0	6	1	0	9	10	5	0	7	30	1	0	11	26	10	0	116	
4:55 PM	0	7	1	0	10	10	4	0	10	27	0	0	7	24	11	0	111	1345
5:00 PM	1	11	3	0	7	13	5	0	11	26	0	0	13	23	8	0	121	1363
5:05 PM	0	12	2	0	6	22	5	0	4	28	1	0	4	32	8	0	124	1364
5:10 PM	1	15	0	0	5	16	8	0	18	23	1	0	10	28	13	0	138	1391
5:15 PM	1	12	2	0	7	16	6	0	10	25	0	0	13	32	5	0	129	1396
5:20 PM	1	9	2	0	5	16	6	0	8	17	0	0	7	29	4	0	104	1400
5:25 PM	1	12	2	0	6	18	9	0	5	12	0	0	9	26	10	0	110	1413
5:30 PM	1	11	3	0	5	17	3	0	11	22	0	0	11	26	7	0	117	1419
5:35 PM	0	14	4	0	8	13	8	0	9	19	2	0	9	38	6	0	130	1435
5:40 PM	0	12	4	0	4	13	6	0	11	16	2	0	7	33	6	0	114	1429
5:45 PM	1	12	2	0	8	16	10	0	9	22	1	0	6	25	8	0	120	1434
5:50 PM	0	9	1	0	8	14	3	0	7	18	1	0	12	25	7	0	105	1423
5:55 PM	1	12	2	0	12	13	10	0	6	20	0	0	4	32	7	0	119	1431

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	156	16	0	72	216	76	0	128	304	8	0	108	368	104	0	1564
Heavy Trucks	0	0	0		4	4	0		0	8	0		0	20	4		40
Buses																	
Pedestrians		4				8				24				12			48
Bicycles	0	0	8		0	0	0		4	0	0		0	4	0		16
Scooters																	

Comments:

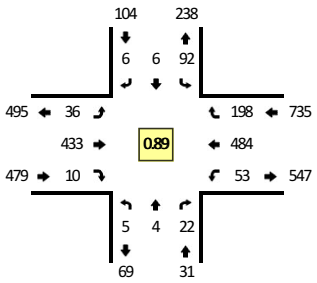
Report generated on 5/24/2024 3:57 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

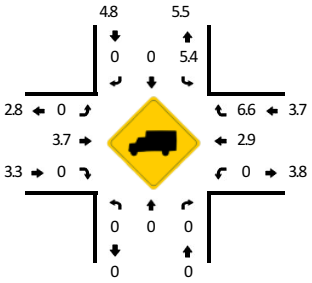
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: Mariner Square Loop/E Campus Dr -- Willie Stargell Ave
CITY/STATE: Alameda, CA

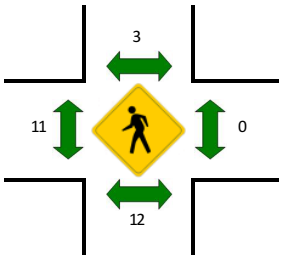
QC JOB #: 16603803
DATE: Thu, May 9 2024

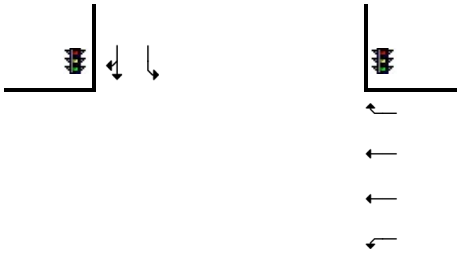
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:10 AM -- 8:25 AM

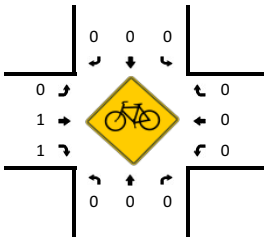


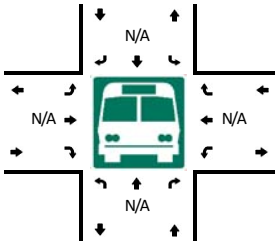


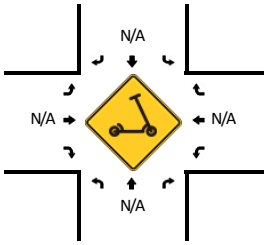
TRUE DATA TO IMPROVE MOBILITY











5-Min Count Period Beginning At	Mariner Square Loop/E Campus Dr (Northbound)				Mariner Square Loop/E Campus Dr (Southbound)				Willie Stargell Ave (Eastbound)				Willie Stargell Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	10	0	1	0	2	12	0	0	0	30	14	0	69	
7:05 AM	0	0	0	0	8	0	0	0	0	25	0	0	0	15	12	0	60	
7:10 AM	0	0	0	0	11	1	1	0	2	13	1	0	1	27	2	0	59	
7:15 AM	0	0	0	0	5	0	1	0	1	20	1	0	1	26	6	0	61	
7:20 AM	0	0	0	0	10	0	0	0	3	13	0	0	0	28	11	0	65	
7:25 AM	0	0	0	0	6	0	0	0	0	23	0	0	1	35	13	0	78	
7:30 AM	0	0	2	0	5	0	1	0	2	28	0	0	1	14	12	0	65	
7:35 AM	0	0	1	0	6	0	1	0	2	35	0	0	1	34	8	0	88	
7:40 AM	0	0	1	0	7	0	0	0	1	25	0	0	2	39	15	0	90	
7:45 AM	0	0	0	0	7	0	0	0	2	33	2	0	1	38	18	0	101	
7:50 AM	3	0	0	0	8	1	0	0	1	39	1	0	3	35	19	0	110	
7:55 AM	0	0	0	0	2	1	0	0	5	36	0	0	3	45	7	0	99	945
8:00 AM	0	0	1	0	13	1	3	0	2	31	0	0	3	37	13	0	104	980
8:05 AM	0	0	1	0	12	1	0	0	4	36	1	0	2	35	16	0	108	1028
8:10 AM	1	1	1	0	6	0	1	0	3	47	2	0	11	42	15	0	130	1099
8:15 AM	1	0	1	0	8	1	1	0	2	32	4	0	9	45	20	0	124	1162
8:20 AM	0	0	4	0	5	0	0	0	3	41	0	0	7	49	17	0	126	1223
8:25 AM	0	2	2	0	5	1	0	0	3	41	0	0	3	46	15	0	118	1263
8:30 AM	0	0	8	0	6	0	0	0	3	45	0	0	4	35	24	0	125	1323
8:35 AM	0	1	2	0	12	0	1	0	2	31	0	0	3	40	14	0	106	1341
8:40 AM	0	0	2	0	8	0	0	0	6	21	0	0	4	37	20	0	98	1349
8:45 AM	0	2	2	0	8	0	0	0	6	20	0	0	5	34	23	0	100	1348
8:50 AM	1	1	2	0	8	0	2	0	2	24	0	0	7	32	24	0	103	1341
8:55 AM	0	1	2	0	8	0	1	0	2	28	0	0	2	40	22	0	106	1348

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	4	24	0	76	4	8	0	32	480	24	0	108	544	208	0	1520
Heavy Trucks	0	0	0		0	0	0		0	24	0		0	16	12		52
Buses																	
Pedestrians		16				4				12				0			32
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/24/2024 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

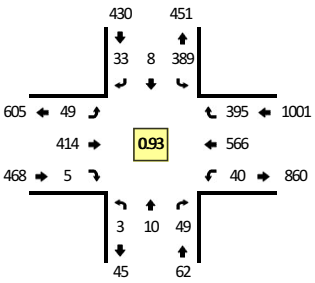
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

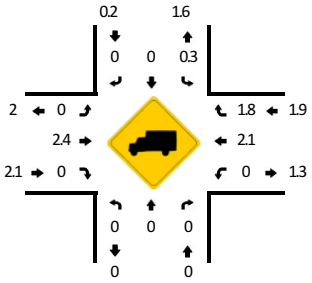
LOCATION: Mariner Square Loop/E Campus Dr -- Willie Stargell Ave
CITY/STATE: Alameda, CA

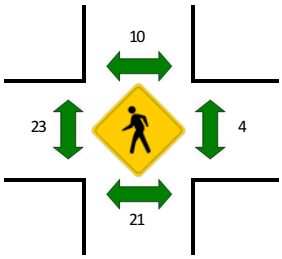
QC JOB #: 16603804
DATE: Thu, May 9 2024

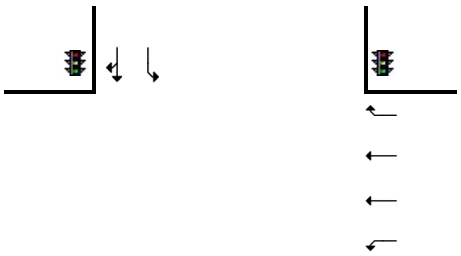
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:35 PM -- 4:50 PM

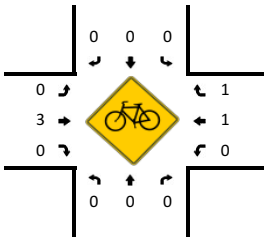


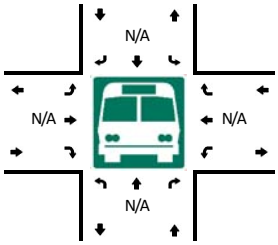
TRUE DATA TO IMPROVE MOBILITY

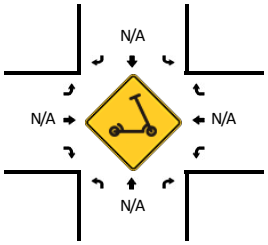












5-Min Count Period Beginning At	Mariner Square Loop/E Campus Dr (Northbound)				Mariner Square Loop/E Campus Dr (Southbound)				Willie Stargell Ave (Eastbound)				Willie Stargell Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	1	5	0	30	2	4	0	1	40	0	0	2	41	38	2	167	
4:05 PM	0	1	7	0	42	0	1	0	3	42	0	0	5	42	24	0	167	
4:10 PM	0	1	2	0	29	2	1	0	10	39	0	0	0	36	35	0	155	
4:15 PM	0	0	5	0	34	0	2	0	3	35	2	1	3	69	30	0	184	
4:20 PM	0	3	4	0	26	0	1	0	2	22	1	1	1	43	39	0	143	
4:25 PM	0	1	1	0	26	1	3	0	3	33	0	0	1	50	38	0	157	
4:30 PM	0	0	2	0	23	0	1	0	4	32	1	0	3	57	29	1	153	
4:35 PM	0	1	5	0	36	0	2	0	4	33	0	0	4	44	39	1	169	
4:40 PM	2	2	6	0	42	0	2	0	7	33	0	0	5	48	38	0	185	
4:45 PM	0	0	5	0	35	2	6	0	3	36	1	1	3	43	37	2	174	
4:50 PM	0	0	4	0	33	0	5	0	3	34	0	0	3	42	25	2	151	
4:55 PM	0	0	3	0	33	1	5	0	3	35	0	0	2	51	23	0	156	1961
5:00 PM	0	2	1	0	18	1	5	0	9	24	3	0	4	48	44	0	159	1953
5:05 PM	1	0	0	0	17	1	6	0	8	22	0	0	4	72	27	0	158	1944
5:10 PM	0	0	0	0	12	3	6	0	6	25	1	1	2	58	40	0	154	1943
5:15 PM	2	0	2	0	26	1	10	0	10	26	0	1	8	46	23	0	155	1914
5:20 PM	4	0	2	0	39	0	3	0	6	23	1	0	7	46	30	0	161	1932
5:25 PM	0	0	0	0	27	2	5	0	2	15	1	1	3	57	32	0	145	1920
5:30 PM	0	0	1	0	35	1	5	0	5	17	1	0	10	47	26	1	149	1916
5:35 PM	1	0	2	0	27	1	2	0	4	33	1	1	9	55	29	0	165	1912
5:40 PM	0	1	2	0	32	0	1	0	6	14	1	0	8	46	32	0	143	1870
5:45 PM	0	0	5	0	29	2	6	0	3	28	0	2	15	62	32	0	184	1880
5:50 PM	2	4	1	0	36	0	4	0	3	23	1	0	1	40	37	0	152	1881
5:55 PM	0	1	0	0	25	1	6	0	4	28	0	1	5	69	34	1	175	1900

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	12	64	0	452	8	40	0	56	408	4	4	48	540	456	12	2112
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	16	12		32
Buses																	
Pedestrians		24				4				32				0			60
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

Comments:

Report generated on 5/24/2024 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix C Vistro Traffic Operations Results

Vistro File: H:\...\248460.005_Stargell ops_2024-10-15 - BZD.vistro
Report File: H:\..._Stargell 2024 AM Existing.pdf

Scenario 5 Signalized Weekday AM Existing
1/8/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Signalized	HCM 7th Edition	NB Left	0.630	17.2	B
6	Stargell/Mariner Square/Campus	Signalized	HCM 7th Edition	EB Left	0.515	10.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Signalized	Delay (sec / veh):	17.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	65.00	100.00	100.00	1000.00	100.00	225.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	9	98	80	44	85	52	43	347	11	32	375	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	4.00	4.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	98	80	44	85	52	43	347	11	32	375	48
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	28	23	13	24	15	12	100	3	9	108	14
Total Analysis Volume [veh/h]	10	113	92	51	98	60	49	399	13	37	431	55
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3			0			0			4		
v_di, Inbound Pedestrian Volume crossing m	4			0			0			3		
v_co, Outbound Pedestrian Volume crossing	3			1			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	3			0			3			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	8	22	0	10	22	0	8	30	0	18	38	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	10	0	0	8	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	20	0	0	12	0	0	14	0	0	20	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		Yes	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	L	C	L	C	R
C, Cycle Length [s]	46	46	46	46	46	46	46	46	46	46
L, Total Lost Time per Cycle [s]	4.00	4.60	4.00	4.60	4.60	4.00	4.60	4.00	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.60	2.00	2.60	2.60	2.00	2.60	2.00	2.60	2.60
g_i, Effective Green Time [s]	1	10	2	12	12	2	14	2	13	13
g / C, Green / Cycle	0.01	0.22	0.05	0.26	0.26	0.05	0.31	0.04	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.01	0.12	0.03	0.04	0.05	0.03	0.22	0.02	0.23	0.04
s, saturation flow rate [veh/h]	1781	1725	1767	1855	1631	1781	1859	1752	1840	1561
c, Capacity [veh/h]	24	386	93	488	429	92	569	73	545	463
d1, Uniform Delay [s]	22.41	15.66	21.14	13.00	13.04	21.18	14.16	21.47	14.80	11.74
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.37	1.14	4.89	0.16	0.20	4.79	1.77	5.31	2.62	0.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.53	0.55	0.17	0.18	0.54	0.72	0.51	0.79	0.12
d, Delay for Lane Group [s/veh]	33.78	16.80	26.03	13.15	13.24	25.97	15.93	26.78	17.41	11.86
Lane Group LOS	C	B	C	B	B	C	B	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.17	1.74	0.61	0.57	0.55	0.58	3.41	0.46	3.80	0.36
50th-Percentile Queue Length [ft/ln]	4.30	43.53	15.16	14.22	13.64	14.57	85.37	11.46	94.98	8.98
95th-Percentile Queue Length [veh/ln]	0.31	3.13	1.09	1.02	0.98	1.05	6.15	0.82	6.84	0.65
95th-Percentile Queue Length [ft/ln]	7.74	78.35	27.28	25.60	24.55	26.22	153.67	20.62	170.96	16.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.78	16.80	16.80	26.03	13.17	13.24	25.97	15.93	15.93	26.78	17.41	11.86
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.59			16.33			17.00			17.49		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.17											
Intersection LOS	B											
Intersection V/C	0.630											

Emissions

Vehicle Miles Traveled [mph]	0.46	9.34	3.30	5.24	4.97	3.48	29.26	6.19	72.10	9.20
Stops [stops/h]	13.56	137.31	47.81	44.86	43.02	45.95	269.31	36.14	299.62	28.33
Fuel consumption [US gal/h]	0.16	1.84	0.67	0.68	0.65	0.66	4.03	0.66	6.15	0.67
CO [g/h]	11.35	128.87	46.84	47.56	45.43	45.86	281.59	45.87	429.97	46.70
NOx [g/h]	2.21	25.07	9.11	9.25	8.84	8.92	54.79	8.92	83.66	9.09
VOC [g/h]	2.63	29.87	10.85	11.02	10.53	10.63	65.26	10.63	99.65	10.82

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	14.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	4134.90	24021.85	0.00	3330.51
d_p, Pedestrian Delay [s]	10.97	10.97	12.40	10.97
l_p,int, Pedestrian LOS Score for Intersectio	2.173	2.188	2.211	2.461
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	964	964	1314	1665
d_b, Bicycle Delay [s]	6.13	6.13	2.68	0.64
l_b,int, Bicycle LOS Score for Intersection	1.914	1.732	2.320	2.423
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.515

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	225.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	350.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	5	4	22	92	6	6	36	433	10	53	484	198
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	8.00	8.00	8.00	3.00	3.00	3.00	5.00	5.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	4	22	92	6	6	36	433	10	53	484	198
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	6	26	2	2	10	122	3	15	136	56
Total Analysis Volume [veh/h]	6	4	25	103	7	7	40	487	11	60	544	222
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	5	20	0	5	20	0	15	35	0	15	35	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.2	0.0	1.0	1.2	0.0
Walk [s]	0	9	0	0	9	0	0	9	0	0	6	0
Pedestrian Clearance [s]	0	26	0	0	22	0	0	22	0	0	14	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.8	0.0	2.0	2.8	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	32	32	32	32	32	32	32	32	32
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.00	4.80	4.80	4.00	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.00	2.80	2.80	2.00	2.80	2.80
g_i, Effective Green Time [s]	7	7	7	2	10	10	2	10	10
g / C, Green / Cycle	0.21	0.21	0.21	0.05	0.31	0.31	0.07	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.01	0.02	0.13	0.13	0.03	0.16	0.14
s, saturation flow rate [veh/h]	1625	1314	1636	1767	1855	1841	1738	3475	1551
c, Capacity [veh/h]	467	273	338	87	574	570	117	1139	508
d1, Uniform Delay [s]	10.34	11.42	10.21	14.88	8.86	8.86	14.50	8.62	8.49
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.86	0.05	3.77	0.52	0.53	3.46	0.31	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.38	0.04	0.46	0.43	0.44	0.51	0.48	0.44
d, Delay for Lane Group [s/veh]	10.41	12.28	10.26	18.65	9.38	9.39	17.95	8.93	9.08
Lane Group LOS	B	B	B	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.16	0.55	0.06	0.32	1.02	1.02	0.45	1.05	0.88
50th-Percentile Queue Length [ft/ln]	3.96	13.77	1.59	7.98	25.53	25.40	11.22	26.15	22.11
95th-Percentile Queue Length [veh/ln]	0.28	0.99	0.11	0.57	1.84	1.83	0.81	1.88	1.59
95th-Percentile Queue Length [ft/ln]	7.12	24.79	2.87	14.37	45.96	45.72	20.20	47.07	39.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.41	10.41	10.41	12.28	10.26	10.26	18.65	9.39	9.39	17.95	8.93	9.08
Movement LOS	B	B	B	B	B	B	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	10.41			12.03			10.07			9.63		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	9.99											
Intersection LOS	A											
Intersection V/C	0.515											

Emissions

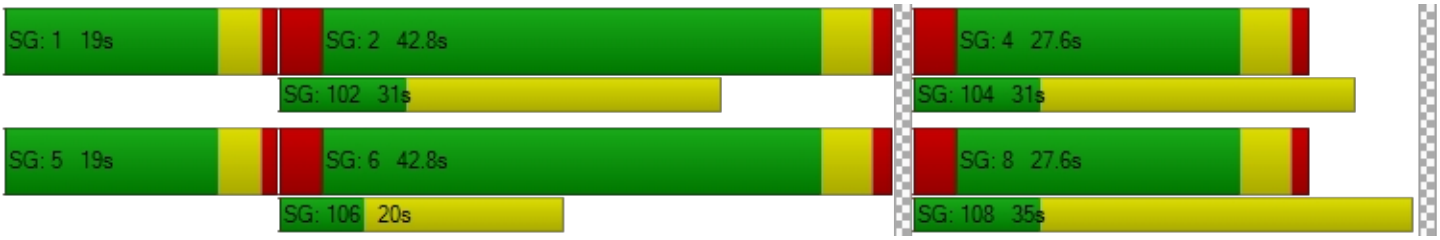
Vehicle Miles Traveled [mph]	0.87	8.74	1.19	6.69	41.79	41.53	4.76	43.18	17.62
Stops [stops/h]	17.80	61.97	7.17	35.91	114.87	114.27	50.49	235.30	99.45
Fuel consumption [US gal/h]	0.21	0.96	0.12	0.63	2.83	2.82	0.69	4.07	1.69
CO [g/h]	14.55	67.07	8.23	43.74	197.95	196.78	48.53	284.27	117.79
NOx [g/h]	2.83	13.05	1.60	8.51	38.51	38.29	9.44	55.31	22.92
VOC [g/h]	3.37	15.54	1.91	10.14	45.88	45.61	11.25	65.88	27.30

Other Modes

g_Walk,mi, Effective Walk Time [s]	13.0	10.0	13.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	5.64	7.57	5.64	5.64
l_p,int, Pedestrian LOS Score for Intersectio	1.697	2.003	2.449	2.760
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1250	1250	2187	2187
d_b, Bicycle Delay [s]	2.25	2.25	0.14	0.14
l_b,int, Bicycle LOS Score for Intersection	1.617	1.753	2.003	2.241
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Report File: H:\..._Stargell 2024 AM Existing.pdf

Scenario 5 Signalized Weekday AM Existing
1/8/2025

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Stargell/5th	9	98	80	44	85	52	43	347	11	32	375	48	1224

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6	Stargell/Mariner Square/Campus	5	4	22	92	6	6	36	433	10	53	484	198	1349

Vistro File: H:\...\248460.005_Stargell ops_2024-10-15 - BZD.vistro
Report File: H:\..._Stargell 2024 AM Existing.pdf

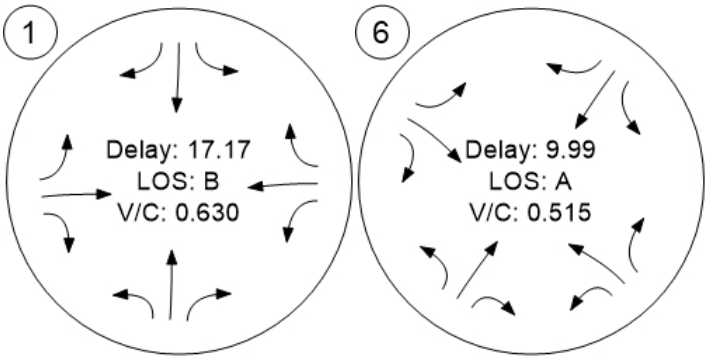
Scenario 5 Signalized Weekday AM Existing
1/8/2025

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Stargell/5th	Final Base	9	98	80	44	85	52	43	347	11	32	375	48	1224
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**9**	**98**	**80**	**44**	**85**	**52**	**43**	**347**	**11**	**32**	**375**	**48**	**1224**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6	Stargell/Mariner Square/Campus	Final Base	5	4	22	92	6	6	36	433	10	53	484	198	1349
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**5**	**4**	**22**	**92**	**6**	**6**	**36**	**433**	**10**	**53**	**484**	**198**	**1349**

Traffic Conditions



Vistro File: H:\...\248460.005_Stargell ops_2024-10-15 - BZD.vistro
Report File: H:\..._Stargell Vistro Reports - Roundabout 2024 AM.pdf

Scenario 1 Weekday AM Existing

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Roundabout	HCM 7th Edition	WB Thru		7.9	A
6	Stargell/Mariner Square/Campus	Roundabout	HCM 7th Edition	WB Thru		10.1	B
9	Stargell/Main	Roundabout	HCM 7th Edition	WB Thru		5.7	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Roundabout	Delay (sec / veh):	7.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	9	98	80	44	85	52	43	347	11	32	375	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	4.00	4.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	98	80	44	85	52	43	347	11	32	375	48
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	28	23	13	24	15	12	100	3	9	108	14
Total Analysis Volume [veh/h]	10	113	92	51	98	60	49	399	13	37	431	55
Pedestrian Volume [ped/h]	6			1			3			7		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	509			497			192			175		
Exiting Flow Rate [veh/h]	153			222			520			553		
Demand Flow Rate [veh/h]	9	98	80	44	85	52	43	347	11	32	375	48
Adjusted Demand Flow Rate [veh/h]	10	113	92	51	98	60	49	399	13	37	431	55

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.97	0.98	0.96
Entry Flow Rate [veh/h]	220	216	471	544
Capacity of Entry and Bypass Lanes [veh/h]	821	832	1135	1154
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	804	807	1112	1109
X, volume / capacity	0.27	0.26	0.41	0.47

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	1.08	1.03	2.07	2.59
95th-Percentile Queue Length [ft]	26.98	25.86	51.80	64.71
Approach Delay [s/veh]	7.44	7.31	7.58	8.47
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.85			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Roundabout	Delay (sec / veh):	10.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	5	4	22	92	6	6	36	433	10	53	484	198
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	8.00	8.00	8.00	3.00	3.00	3.00	5.00	5.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	4	22	92	6	6	36	433	10	53	484	198
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	6	26	2	2	10	122	3	15	136	56
Total Analysis Volume [veh/h]	6	4	25	103	7	7	40	487	11	60	544	222
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	654			640			182			51		
Exiting Flow Rate [veh/h]	82			278			585			638		
Demand Flow Rate [veh/h]	5	4	22	92	6	6	36	433	10	53	484	198
Adjusted Demand Flow Rate [veh/h]	6	4	25	103	7	7	40	487	11	60	544	222

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	1.00	0.93	0.97	0.95
Entry Flow Rate [veh/h]	35	127	555	868
Capacity of Entry and Bypass Lanes [veh/h]	709	719	1147	1310
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	709	666	1114	1248
X, volume / capacity	0.05	0.18	0.48	0.66

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	B
95th-Percentile Queue Length [veh]	0.16	0.63	2.70	5.34
95th-Percentile Queue Length [ft]	3.89	15.86	67.62	133.48
Approach Delay [s/veh]	5.59	7.44	8.64	11.66
Approach LOS	A	A	A	B
Intersection Delay [s/veh]	10.12			
Intersection LOS	B			

Intersection Level Of Service Report
Intersection 9: Stargell/Main

Control Type:	Roundabout	Delay (sec / veh):	5.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Main Street			Main Street			Midway Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Main Street			Main Street			Midway Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	42	89	92	43	66	6	3	100	43	71	177	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	5.00	5.00	7.00	7.00	7.00	4.00	4.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	89	92	43	66	6	3	100	43	71	177	81
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	26	27	13	19	2	1	29	13	21	51	24
Total Analysis Volume [veh/h]	49	103	107	50	77	7	3	116	50	83	206	94
Pedestrian Volume [ped/h]	2			1			4			5		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	180			351			220			158		
Exiting Flow Rate [veh/h]	221			206			272			286		
Demand Flow Rate [veh/h]	42	89	92	43	66	6	3	100	43	71	177	81
Adjusted Demand Flow Rate [veh/h]	49	103	107	50	77	7	3	116	50	83	206	94

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.95	0.93	0.96
Entry Flow Rate [veh/h]	265	141	181	399
Capacity of Entry and Bypass Lanes [veh/h]	1149	966	1103	1175
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1126	920	1031	1129
X, volume / capacity	0.23	0.15	0.16	0.34

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.89	0.51	0.59	1.52
95th-Percentile Queue Length [ft]	22.23	12.74	14.64	37.92
Approach Delay [s/veh]	5.30	5.31	5.00	6.52
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	5.74			
Intersection LOS	A			

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Report File: H:\..._Stargell Vistro Reports - Signalized 2024 PM.pdf

Scenario 6 Signalized Weekday PM Existing

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Signalized	HCM 7th Edition	EB Left	0.533	17.9	B
6	Stargell/Mariner Square/Campus	Signalized	HCM 7th Edition	SB Left	0.871	27.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Signalized	Delay (sec / veh):	17.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	65.00	100.00	100.00	1000.00	100.00	225.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	6	123	28	86	176	71	104	284	7	118	331	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	4.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00	3.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	123	28	86	176	71	104	284	7	118	331	101
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	33	8	23	48	19	28	77	2	32	90	27
Total Analysis Volume [veh/h]	7	134	30	93	191	77	113	309	8	128	360	110
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3			0			0			4		
v_di, Inbound Pedestrian Volume crossing m	4			0			0			3		
v_co, Outbound Pedestrian Volume crossing	3			1			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	3			0			3			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	8	22	0	10	22	0	8	30	0	18	38	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	10	0	0	8	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	20	0	0	12	0	0	20	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		Yes	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C	R	L	C	L	C	R
C, Cycle Length [s]	47	47	47	47	47	47	47	47	47	47
L, Total Lost Time per Cycle [s]	4.00	4.60	4.60	4.60	4.60	4.00	4.60	4.00	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.60	0.00	2.60	2.60	2.00	2.60	2.00	2.60	2.60
g_i, Effective Green Time [s]	0	10	20	14	14	4	11	5	12	12
g / C, Green / Cycle	0.01	0.21	0.42	0.29	0.29	0.08	0.24	0.10	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.01	0.09	0.10	0.08	0.05	0.06	0.17	0.07	0.19	0.07
s, saturation flow rate [veh/h]	1211	1837	1398	1885	1615	1810	1876	1810	1855	1548
c, Capacity [veh/h]	152	383	834	544	466	150	455	174	475	396
d1, Uniform Delay [s]	23.36	16.27	9.11	12.98	12.59	21.24	16.34	20.81	16.26	14.11
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.76	0.09	0.26	0.17	7.45	1.94	5.92	2.51	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.43	0.17	0.27	0.17	0.75	0.70	0.74	0.76	0.28
d, Delay for Lane Group [s/veh]	23.48	17.03	9.20	13.24	12.75	28.69	18.28	26.72	18.78	14.48
Lane Group LOS	C	B	A	B	B	C	B	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.08	1.43	0.81	1.05	0.54	1.41	2.93	1.52	3.40	0.86
50th-Percentile Queue Length [ft/ln]	1.91	35.74	20.13	26.31	13.56	35.31	73.36	38.05	85.12	21.40
95th-Percentile Queue Length [veh/ln]	0.14	2.57	1.45	1.89	0.98	2.54	5.28	2.74	6.13	1.54
95th-Percentile Queue Length [ft/ln]	3.44	64.33	36.24	47.35	24.41	63.56	132.06	68.49	153.21	38.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.48	17.03	17.03	9.20	12.27	12.75	28.69	18.28	18.28	26.72	18.78	14.48
Movement LOS	C	B	B	A	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.30			11.58			21.01			19.69		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	17.91											
Intersection LOS	B											
Intersection V/C	0.533											

Emissions

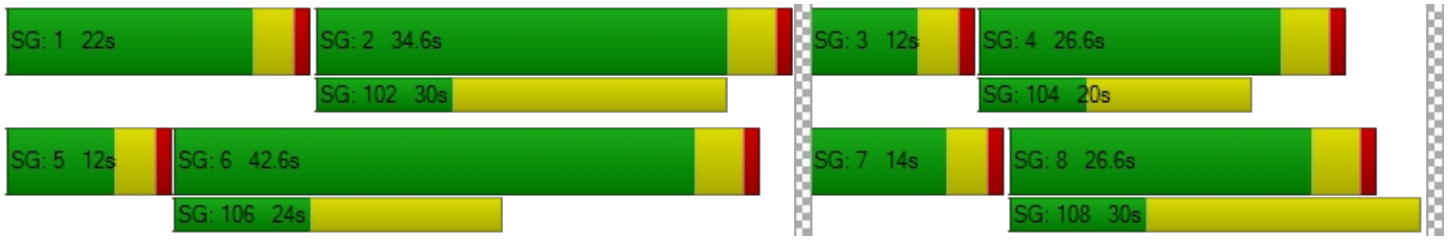
Vehicle Miles Traveled [mph]	0.32	7.47	8.98	9.37	4.98	8.03	22.52	21.41	60.23	18.40
Stops [stops/h]	5.82	109.04	61.42	80.26	41.38	107.73	223.83	116.08	259.69	65.29
Fuel consumption [US gal/h]	0.08	1.48	0.97	1.22	0.63	1.59	3.34	2.22	5.29	1.44
CO [g/h]	5.51	103.34	67.75	85.30	44.27	110.81	233.65	155.11	369.75	100.83
NOx [g/h]	1.07	20.11	13.18	16.60	8.61	21.56	45.46	30.18	71.94	19.62
VOC [g/h]	1.28	23.95	15.70	19.77	10.26	25.68	54.15	35.95	85.69	23.37

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	14.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	4013.48	22158.54	0.00	3054.47
d_p, Pedestrian Delay [s]	11.68	11.68	13.12	11.68
l_p,int, Pedestrian LOS Score for Intersectio	2.208	2.262	2.195	2.628
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	932	932	1271	1610
d_b, Bicycle Delay [s]	6.73	6.73	3.13	0.90
l_b,int, Bicycle LOS Score for Intersection	1.842	1.857	2.269	2.546
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.871

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	225.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	350.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	3	10	49	389	8	33	49	414	5	40	566	395
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	4.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00	3.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	10	49	389	8	33	49	414	5	40	566	395
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	13	105	2	9	13	111	1	11	152	106
Total Analysis Volume [veh/h]	3	11	53	418	9	35	53	445	5	43	609	425
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	5	20	0	5	20	0	15	35	0	15	35	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.2	0.0	1.0	1.2	0.0
Walk [s]	0	9	0	0	9	0	0	9	0	0	6	0
Pedestrian Clearance [s]	0	26	0	0	22	0	0	22	0	0	14	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.8	0.0	2.0	2.8	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	55	55	55	55	55	55	55	55	55
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.00	4.80	4.80	4.00	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.00	2.80	2.80	2.00	2.80	2.80
g_i, Effective Green Time [s]	20	20	20	3	19	19	2	19	19
g / C, Green / Cycle	0.36	0.36	0.36	0.05	0.35	0.35	0.04	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.04	0.32	0.03	0.03	0.12	0.12	0.02	0.17	0.27
s, saturation flow rate [veh/h]	1662	1327	1653	1810	1885	1878	1810	3532	1551
c, Capacity [veh/h]	666	397	594	92	666	663	80	1224	538
d1, Uniform Delay [s]	11.78	20.37	11.62	25.58	13.09	13.09	25.80	14.22	16.21
k, delay calibration	0.11	0.32	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	51.01	0.05	5.59	0.30	0.30	5.53	0.31	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	1.05	0.07	0.58	0.34	0.34	0.54	0.50	0.79
d, Delay for Lane Group [s/veh]	11.85	71.38	11.67	31.18	13.39	13.39	31.33	14.53	18.86
Lane Group LOS	B	F	B	C	B	B	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.50	10.33	0.32	0.78	1.86	1.85	0.64	2.68	4.58
50th-Percentile Queue Length [ft/ln]	12.38	258.29	8.04	19.51	46.43	46.30	16.04	67.04	114.44
95th-Percentile Queue Length [veh/ln]	0.89	16.11	0.58	1.40	3.34	3.33	1.15	4.83	8.09
95th-Percentile Queue Length [ft/ln]	22.29	402.76	14.47	35.12	83.57	83.34	28.87	120.67	202.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.85	11.85	11.85	71.38	11.67	11.67	31.18	13.39	13.39	31.33	14.53	18.86
Movement LOS	B	B	B	F	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	11.85			65.70			15.27			16.91		
Approach LOS	B			E			B			B		
d_I, Intersection Delay [s/veh]	27.04											
Intersection LOS	C											
Intersection V/C	0.871											

Emissions

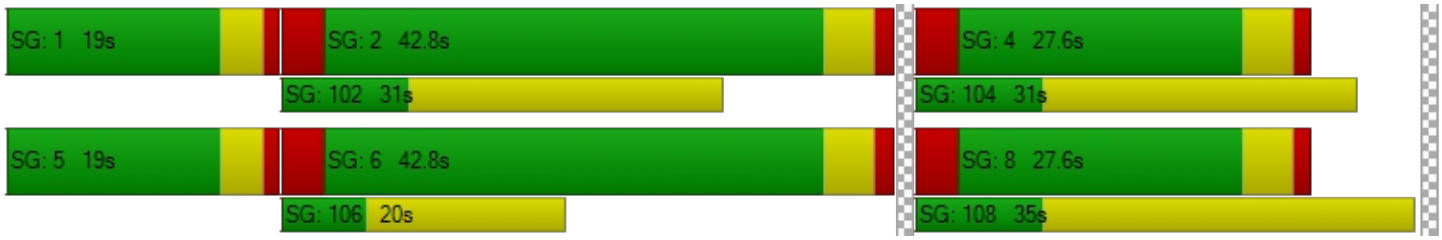
Vehicle Miles Traveled [mph]	1.66	35.47	3.73	8.87	37.70	37.59	3.41	48.34	33.74
Stops [stops/h]	32.30	673.65	20.97	50.89	121.09	120.76	41.83	349.69	298.47
Fuel consumption [US gal/h]	0.41	11.25	0.37	0.98	2.84	2.83	0.65	5.72	4.67
CO [g/h]	28.54	786.64	26.15	68.67	198.17	197.60	45.14	400.06	326.37
NOx [g/h]	5.55	153.05	5.09	13.36	38.56	38.45	8.78	77.84	63.50
VOC [g/h]	6.61	182.31	6.06	15.92	45.93	45.80	10.46	92.72	75.64

Other Modes

g_Walk,mi, Effective Walk Time [s]	13.0	10.0	13.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	16.14	18.51	16.14	16.14
l_p,int, Pedestrian LOS Score for Intersectio	1.744	2.224	2.497	3.340
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	724	724	1268	1268
d_b, Bicycle Delay [s]	11.23	11.23	3.70	3.70
l_b,int, Bicycle LOS Score for Intersection	1.670	2.322	1.975	2.448
Bicycle LOS	A	B	A	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 2 Weekday PM Existing

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Roundabout	HCM 7th Edition	WB Thru		10.0	A
6	Stargell/Mariner Square/Campus	Roundabout	HCM 7th Edition	WB Thru		17.9	C
9	Stargell/Main	Roundabout	HCM 7th Edition	SB Thru		6.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Roundabout	Delay (sec / veh):	10.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	6	123	28	86	176	71	104	284	7	118	331	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	123	28	86	176	71	104	284	7	118	331	101
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	33	8	23	48	19	28	77	2	32	90	27
Total Analysis Volume [veh/h]	7	134	30	93	191	77	113	309	8	128	360	110
Pedestrian Volume [ped/h]	12			16			7			28		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	520			500			416			257		
Exiting Flow Rate [veh/h]	330			361			448			436		
Demand Flow Rate [veh/h]	6	123	28	86	176	71	104	284	7	118	331	101
Adjusted Demand Flow Rate [veh/h]	7	134	30	93	191	77	113	309	8	128	360	110

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.99	0.99	0.99	0.99
Entry Flow Rate [veh/h]	173	365	435	604
Capacity of Entry and Bypass Lanes [veh/h]	812	829	903	1063
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	803	819	893	1048
X, volume / capacity	0.21	0.44	0.48	0.57

Movement, Approach, & Intersection Results

Lane LOS	A	B	B	B
95th-Percentile Queue Length [veh]	0.80	2.28	2.66	3.74
95th-Percentile Queue Length [ft]	20.11	56.89	66.60	93.51
Approach Delay [s/veh]	6.76	10.02	10.13	10.76
Approach LOS	A	B	B	B
Intersection Delay [s/veh]	9.97			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Roundabout	Delay (sec / veh):	17.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	3	10	49	389	8	33	49	414	5	40	566	395
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	10	49	389	8	33	49	414	5	40	566	395
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	13	105	2	9	13	111	1	11	152	106
Total Analysis Volume [veh/h]	3	11	53	418	9	35	53	445	5	43	609	425
Pedestrian Volume [ped/h]	9			14			24			1		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1			
Circulating Flow Rate [veh/h]	934			662			483			68			
Exiting Flow Rate [veh/h]	58			494			654			933			
Demand Flow Rate [veh/h]	3	10	49	389	8	33	49	414	5	40	566	395	
Adjusted Demand Flow Rate [veh/h]	3	11	53	418	9	35	53	445	5	43	609	425	

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	1.00	0.97	0.99	0.99
Entry Flow Rate [veh/h]	67	476	509	1088
Capacity of Entry and Bypass Lanes [veh/h]	533	703	843	1289
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	533	682	832	1276
X, volume / capacity	0.13	0.68	0.60	0.84

Movement, Approach, & Intersection Results

Lane LOS	A	C	B	C
95th-Percentile Queue Length [veh]	0.43	5.30	4.17	11.22
95th-Percentile Queue Length [ft]	10.72	132.53	104.15	280.49
Approach Delay [s/veh]	8.36	19.08	13.74	19.99
Approach LOS	A	C	B	C
Intersection Delay [s/veh]	17.93			
Intersection LOS	C			

Intersection Level Of Service Report
Intersection 9: Stargell/Main

Control Type:	Roundabout	Delay (sec / veh):	6.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Main Street			Main Street			Midway Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Main Street			Main Street			Midway Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	37	115	43	104	137	10	9	166	46	52	193	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	2.00	2.00	2.00	0.00	0.00	0.00	1.00	1.00	1.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	115	43	104	137	10	9	166	46	52	193	58
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	31	12	28	37	3	2	45	13	14	52	16
Total Analysis Volume [veh/h]	40	125	47	113	149	11	10	180	50	57	210	63
Pedestrian Volume [ped/h]	1			5			4			16		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	305			311			325			180		
Exiting Flow Rate [veh/h]	260			202			265			344		
Demand Flow Rate [veh/h]	37	115	43	104	137	10	9	166	46	52	193	58
Adjusted Demand Flow Rate [veh/h]	40	125	47	113	149	11	10	180	50	57	210	63

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.97	0.98	1.00	0.99
Entry Flow Rate [veh/h]	219	279	240	334
Capacity of Entry and Bypass Lanes [veh/h]	1011	1006	991	1149
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	982	985	991	1135
X, volume / capacity	0.22	0.28	0.24	0.29

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.82	1.14	0.95	1.22
95th-Percentile Queue Length [ft]	20.50	28.41	23.75	30.39
Approach Delay [s/veh]	5.76	6.44	6.01	5.92
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	6.04			
Intersection LOS	A			

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Report File: H:\..._Stargell Vistro Reports - Signalized 2040 AM.pdf

Scenario 7 Signalized Weekday AM 2040

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Signalized	HCM 7th Edition	NB Left	0.642	17.4	B
6	Stargell/Mariner Square/Campus	Signalized	HCM 7th Edition	SB Left	0.603	16.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	65.00	100.00	100.00	1000.00	100.00	225.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	10	107	73	51	87	53	50	338	11	28	380	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	4.00	4.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	107	73	51	87	53	50	338	11	28	380	47
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	31	21	15	25	15	14	97	3	8	109	14
Total Analysis Volume [veh/h]	11	123	84	59	100	61	57	389	13	32	437	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3			0			0			4		
v_di, Inbound Pedestrian Volume crossing m	4			0			0			3		
v_co, Outbound Pedestrian Volume crossing	3			1			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	3			0			3			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	8	22	0	10	22	0	8	30	0	18	38	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	10	0	0	8	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	20	0	0	12	0	0	14	0	0	20	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		Yes	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	L	C	L	C	R
C, Cycle Length [s]	47	47	47	47	47	47	47	47	47	47
L, Total Lost Time per Cycle [s]	4.00	4.60	4.00	4.60	4.60	4.00	4.60	4.00	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.60	2.00	2.60	2.60	2.00	2.60	2.00	2.60	2.60
g_i, Effective Green Time [s]	1	10	3	12	12	3	15	2	14	14
g / C, Green / Cycle	0.01	0.22	0.06	0.26	0.26	0.06	0.32	0.04	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.01	0.12	0.03	0.04	0.05	0.03	0.22	0.02	0.24	0.03
s, saturation flow rate [veh/h]	1781	1738	1767	1855	1631	1781	1859	1752	1840	1561
c, Capacity [veh/h]	26	382	102	489	430	101	591	65	549	466
d1, Uniform Delay [s]	22.90	16.18	21.51	13.30	13.35	21.54	13.91	22.13	15.13	11.95
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.63	1.19	5.04	0.16	0.20	4.89	1.39	5.68	2.69	0.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.54	0.58	0.17	0.18	0.57	0.68	0.49	0.80	0.12
d, Delay for Lane Group [s/veh]	33.52	17.37	26.55	13.46	13.55	26.44	15.30	27.81	17.82	12.06
Lane Group LOS	C	B	C	B	B	C	B	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.19	1.83	0.71	0.60	0.57	0.69	3.29	0.42	3.98	0.36
50th-Percentile Queue Length [ft/ln]	4.65	45.70	17.84	14.99	14.34	17.21	82.36	10.40	99.56	9.07
95th-Percentile Queue Length [veh/ln]	0.34	3.29	1.28	1.08	1.03	1.24	5.93	0.75	7.17	0.65
95th-Percentile Queue Length [ft/ln]	8.38	82.25	32.12	26.98	25.81	30.98	148.25	18.72	179.22	16.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.52	17.37	17.37	26.55	13.48	13.55	26.44	15.30	15.30	27.81	17.82	12.06
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	18.19			17.00			16.68			17.84		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.39											
Intersection LOS	B											
Intersection V/C	0.642											

Emissions

Vehicle Miles Traveled [mph]	0.50	9.43	3.81	5.34	5.06	4.05	28.55	5.35	73.11	9.03
Stops [stops/h]	14.34	140.80	54.98	46.19	44.18	53.04	253.78	32.05	306.79	27.95
Fuel consumption [US gal/h]	0.17	1.90	0.78	0.70	0.67	0.77	3.83	0.58	6.29	0.66
CO [g/h]	12.23	132.66	54.49	49.04	46.74	53.57	267.67	40.44	439.64	46.05
NOx [g/h]	2.38	25.81	10.60	9.54	9.09	10.42	52.08	7.87	85.54	8.96
VOC [g/h]	2.83	30.75	12.63	11.37	10.83	12.42	62.03	9.37	101.89	10.67

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	14.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	4037.91	23458.93	0.00	3268.99
d_p, Pedestrian Delay [s]	11.46	11.46	12.91	11.46
l_p,int, Pedestrian LOS Score for Intersectio	2.175	2.197	2.215	2.461
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	942	942	1284	1626
d_b, Bicycle Delay [s]	6.54	6.54	3.00	0.82
l_b,int, Bicycle LOS Score for Intersection	1.919	1.741	2.317	2.423
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	225.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	350.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	5	6	22	156	12	10	56	429	11	64	494	332
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	8.00	8.00	8.00	3.00	3.00	3.00	5.00	5.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	6	22	156	12	10	56	429	11	64	494	332
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	2	6	44	3	3	16	121	3	18	139	93
Total Analysis Volume [veh/h]	6	7	25	175	13	11	63	482	12	72	555	373
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	5	20	0	5	20	0	15	35	0	15	35	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.2	0.0	1.0	1.2	0.0
Walk [s]	0	9	0	0	9	0	0	9	0	0	6	0
Pedestrian Clearance [s]	0	26	0	0	22	0	0	22	0	0	14	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.8	0.0	2.0	2.8	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		No		No	No		No	No		No	No	
Pedestrian Recall		No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	43	43	43	43	43	43	43	43	43
L, Total Lost Time per Cycle [s]	4.60	4.00	4.60	4.00	4.80	4.80	4.00	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.00	2.60	2.00	2.80	2.80	2.00	2.80	2.80
g_i, Effective Green Time [s]	4	5	13	3	14	14	3	14	14
g / C, Green / Cycle	0.09	0.12	0.29	0.06	0.33	0.33	0.07	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.10	0.01	0.04	0.13	0.13	0.04	0.16	0.24
s, saturation flow rate [veh/h]	1123	1695	1647	1767	1855	1839	1738	3475	1551
c, Capacity [veh/h]	162	196	485	110	608	603	118	1159	517
d1, Uniform Delay [s]	18.49	18.86	10.93	19.72	11.27	11.27	19.60	11.43	12.64
k, delay calibration	0.11	0.22	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.74	22.56	0.04	4.63	0.44	0.44	5.03	0.31	1.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.89	0.05	0.57	0.41	0.41	0.61	0.48	0.72
d, Delay for Lane Group [s/veh]	19.22	41.42	10.97	24.35	11.71	11.72	24.63	11.74	14.56
Lane Group LOS	B	D	B	C	B	B	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.35	2.73	0.14	0.69	1.55	1.54	0.79	1.74	2.78
50th-Percentile Queue Length [ft/ln]	8.67	68.31	3.53	17.18	38.86	38.62	19.68	43.41	69.58
95th-Percentile Queue Length [veh/ln]	0.62	4.92	0.25	1.24	2.80	2.78	1.42	3.13	5.01
95th-Percentile Queue Length [ft/ln]	15.60	122.95	6.36	30.92	69.95	69.51	35.42	78.14	125.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.22	19.22	19.22	41.42	10.97	10.97	24.35	11.71	11.72	24.63	11.74	14.56
Movement LOS	B	B	B	D	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	19.22			37.75			13.14			13.72		
Approach LOS	B			D			B			B		
d_I, Intersection Delay [s/veh]	16.32											
Intersection LOS	B											
Intersection V/C	0.603											

Emissions

Vehicle Miles Traveled [mph]	0.94	14.85	2.04	10.54	41.47	41.18	5.72	44.06	29.61
Stops [stops/h]	28.94	228.04	11.79	57.35	129.75	128.93	65.70	289.84	232.28
Fuel consumption [US gal/h]	0.35	3.35	0.20	1.06	3.01	2.99	0.96	4.74	3.61
CO [g/h]	24.28	233.91	14.16	74.30	210.72	209.31	67.05	331.39	252.15
NOx [g/h]	4.72	45.51	2.76	14.46	41.00	40.72	13.04	64.48	49.06
VOC [g/h]	5.63	54.21	3.28	17.22	48.84	48.51	15.54	76.80	58.44

Other Modes

g_Walk,mi, Effective Walk Time [s]	13.0	10.0	13.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	10.53	12.73	10.53	10.53
l_p,int, Pedestrian LOS Score for Intersectio	1.732	2.108	2.480	2.678
Crosswalk LOS	A	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	927	927	1623	1623
d_b, Bicycle Delay [s]	6.20	6.20	0.77	0.77
l_b,int, Bicycle LOS Score for Intersection	1.622	1.888	2.019	2.385
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Vistro File: H:\...\248460.005_Stargell ops_2024-05-28.vistro
Report File: H:\...\2040 Stargell Vistro Reports AM.pdf

Scenario 3 Weekday AM 2040
8/30/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Roundabout	HCM 7th Edition	WB Thru		7.9	A
6	Stargell/Mariner Square/Campus	Roundabout	HCM 7th Edition	WB Thru		14.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Roundabout	Delay (sec / veh):	7.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	10	107	73	51	87	53	50	338	11	28	380	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	8.00	4.00	5.00	0.00	3.00	0.00	0.00	1.00	8.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	107	73	51	87	53	50	338	11	28	380	47
Peak Hour Factor	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700	0.8700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	31	21	15	25	15	14	97	3	8	109	14
Total Analysis Volume [veh/h]	11	123	84	59	100	61	57	389	13	32	437	54
Pedestrian Volume [ped/h]	2			7			6			4		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	521			484			200			191		
Exiting Flow Rate [veh/h]	149			238			516			548		
Demand Flow Rate [veh/h]	10	107	73	51	87	53	50	338	11	28	380	47
Adjusted Demand Flow Rate [veh/h]	11	123	84	59	100	61	57	389	13	32	437	54

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	1.00	0.95	0.98	0.98
Entry Flow Rate [veh/h]	218	232	471	532
Capacity of Entry and Bypass Lanes [veh/h]	811	843	1126	1136
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	811	799	1097	1118
X, volume / capacity	0.27	0.28	0.42	0.47

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	1.09	1.12	2.10	2.55
95th-Percentile Queue Length [ft]	27.19	28.08	52.57	63.84
Approach Delay [s/veh]	7.41	7.59	7.71	8.37
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.89			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Roundabout	Delay (sec / veh):	14.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	5	6	22	156	12	10	56	429	11	64	494	332
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	5.00	0.00	0.00	0.00	4.00	0.00	0.00	3.00	7.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	6	22	156	12	10	56	429	11	64	494	332
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	2	6	44	3	3	16	121	3	18	139	93
Total Analysis Volume [veh/h]	6	7	25	175	13	11	63	482	12	72	555	373
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	748			650			269			76		
Exiting Flow Rate [veh/h]	97			469			589			710		
Demand Flow Rate [veh/h]	5	6	22	156	12	10	56	429	11	64	494	332
Adjusted Demand Flow Rate [veh/h]	6	7	25	175	13	11	63	482	12	72	555	373

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	1.00	0.96	0.97	0.96
Entry Flow Rate [veh/h]	38	208	577	1043
Capacity of Entry and Bypass Lanes [veh/h]	644	712	1050	1278
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	644	682	1015	1226
X, volume / capacity	0.06	0.29	0.55	0.82

Movement, Approach, & Intersection Results

Lane LOS	A	A	B	C
95th-Percentile Queue Length [veh]	0.19	1.21	3.45	9.86
95th-Percentile Queue Length [ft]	4.70	30.31	86.17	246.58
Approach Delay [s/veh]	6.24	8.90	10.53	18.48
Approach LOS	A	A	B	C
Intersection Delay [s/veh]	14.69			
Intersection LOS	B			

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Report File: H:\..._Stargell Vistro Reports - Signalized 2040 PM.pdf

Scenario 8 Signalized Weekday PM 2040

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Signalized	HCM 7th Edition	NB Left	0.638	19.8	B
6	Stargell/Mariner Square/Campus	Signalized	HCM 7th Edition	SB Left	1.169	66.2	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Signalized	Delay (sec / veh):	19.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	65.00	100.00	100.00	1000.00	100.00	225.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	4	127	25	108	169	64	118	283	5	133	350	168
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	4.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00	3.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	127	25	108	169	64	118	283	5	133	350	168
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	35	7	29	46	17	32	77	1	36	95	46
Total Analysis Volume [veh/h]	4	138	27	117	184	70	128	308	5	145	380	183
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3			0			0			4		
v_di, Inbound Pedestrian Volume crossing m	4			0			0			3		
v_co, Outbound Pedestrian Volume crossing	3			1			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	3			0			3			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	8	22	0	10	22	0	8	30	0	18	38	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	10	0	0	8	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	20	0	0	12	0	0	14	0	0	20	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		Yes	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	L	C	L	C	R
C, Cycle Length [s]	49	49	49	49	49	49	49	49	49	49
L, Total Lost Time per Cycle [s]	4.00	4.60	4.00	4.60	4.60	4.00	4.60	4.00	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.60	2.00	2.60	2.60	2.00	2.60	2.00	2.60	2.60
g_i, Effective Green Time [s]	0	10	4	14	14	5	13	5	13	13
g / C, Green / Cycle	0.01	0.20	0.09	0.28	0.28	0.09	0.25	0.11	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.00	0.09	0.07	0.07	0.07	0.07	0.17	0.08	0.20	0.12
s, saturation flow rate [veh/h]	1810	1843	1767	1885	1713	1810	1879	1810	1855	1548
c, Capacity [veh/h]	10	373	154	536	487	169	479	197	501	418
d1, Uniform Delay [s]	24.60	17.34	22.15	13.67	13.70	21.95	16.54	21.43	16.63	14.99
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	23.07	0.82	7.42	0.23	0.27	6.69	1.52	5.27	2.38	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.39	0.44	0.76	0.24	0.25	0.76	0.65	0.74	0.76	0.44
d, Delay for Lane Group [s/veh]	47.67	18.16	29.57	13.90	13.97	28.64	18.05	26.70	19.02	15.71
Lane Group LOS	D	B	C	B	B	C	B	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.11	1.55	1.53	1.01	0.96	1.63	2.96	1.76	3.75	1.57
50th-Percentile Queue Length [ft/ln]	2.70	38.66	38.20	25.29	23.97	40.82	74.09	44.10	93.67	39.16
95th-Percentile Queue Length [veh/ln]	0.19	2.78	2.75	1.82	1.73	2.94	5.33	3.18	6.74	2.82
95th-Percentile Queue Length [ft/ln]	4.87	69.60	68.75	45.52	43.15	73.48	133.37	79.38	168.61	70.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.67	18.16	18.16	29.57	13.92	13.97	28.64	18.05	18.05	26.70	19.02	15.71
Movement LOS	D	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	18.86			18.87			21.13			19.74		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.82											
Intersection LOS	B											
Intersection V/C	0.638											

Emissions

Vehicle Miles Traveled [mph]	0.18	7.51	7.56	8.45	7.96	9.09	22.23	24.26	63.57	30.62
Stops [stops/h]	7.87	112.64	111.27	73.67	69.83	118.92	215.84	128.47	272.88	114.08
Fuel consumption [US gal/h]	0.09	1.54	1.63	1.13	1.06	1.78	3.26	2.50	5.60	2.48
CO [g/h]	6.28	107.75	113.94	78.65	74.37	124.23	227.71	174.50	391.11	173.07
NOx [g/h]	1.22	20.96	22.17	15.30	14.47	24.17	44.30	33.95	76.10	33.67
VOC [g/h]	1.46	24.97	26.41	18.23	17.23	28.79	52.77	40.44	90.64	40.11

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	14.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	3840.35	19682.31	0.00	3374.59
d_p, Pedestrian Delay [s]	12.70	12.70	14.17	12.70
l_p,int, Pedestrian LOS Score for Intersectio	2.213	2.290	2.195	2.485
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	890	890	1214	1537
d_b, Bicycle Delay [s]	7.61	7.61	3.82	1.32
l_b,int, Bicycle LOS Score for Intersection	1.838	1.866	2.287	2.728
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Signalized	Delay (sec / veh):	66.2
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.169

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	225.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	350.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	3	13	34	591	14	79	83	375	5	31	616	512
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	4.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00	3.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	13	34	591	14	79	83	375	5	31	616	512
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	9	159	4	21	22	101	1	8	166	138
Total Analysis Volume [veh/h]	3	14	37	635	15	85	89	403	5	33	662	551
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	5	20	0	5	20	0	15	35	0	15	35	0
Amber [s]	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.2	0.0	1.0	1.2	0.0
Walk [s]	0	9	0	0	9	0	0	9	0	0	6	0
Pedestrian Clearance [s]	0	26	0	0	22	0	0	22	0	0	14	0
Delayed Vehicle Green [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.6	0.0	2.0	2.6	0.0	2.0	2.8	0.0	2.0	2.8	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	0	9	14	0	9	14	0	9	14	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	64	64	64	64	64	64	64	64	64
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.00	4.80	4.80	4.00	4.80	4.80
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.00	2.80	2.80	2.00	2.80	2.80
g_i, Effective Green Time [s]	20	20	20	4	29	29	2	27	27
g / C, Green / Cycle	0.31	0.31	0.31	0.07	0.44	0.44	0.04	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.03	0.47	0.06	0.05	0.11	0.11	0.02	0.19	0.36
s, saturation flow rate [veh/h]	1686	1343	1639	1810	1885	1877	1810	3532	1551
c, Capacity [veh/h]	584	457	510	119	839	835	64	1464	643
d1, Uniform Delay [s]	15.75	23.13	16.24	29.50	11.10	11.10	30.46	13.55	17.08
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.19
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	188.33	0.19	9.01	0.15	0.15	6.30	0.22	5.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	1.39	0.20	0.75	0.24	0.24	0.52	0.45	0.86
d, Delay for Lane Group [s/veh]	15.82	211.46	16.42	38.51	11.25	11.25	36.76	13.77	22.90
Lane Group LOS	B	F	B	D	B	B	D	B	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.53	30.44	1.03	1.59	1.64	1.64	0.59	3.12	7.50
50th-Percentile Queue Length [ft/ln]	13.36	761.04	25.64	39.67	41.08	40.95	14.83	78.08	187.46
95th-Percentile Queue Length [veh/ln]	0.96	47.07	1.85	2.86	2.96	2.95	1.07	5.62	11.99
95th-Percentile Queue Length [ft/ln]	24.05	1176.63	46.15	71.41	73.94	73.72	26.69	140.55	299.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.82	15.82	15.82	211.46	16.42	16.42	38.51	11.25	11.25	36.76	13.77	22.90
Movement LOS	B	B	B	F	B	B	D	B	B	D	B	C
d_A, Approach Delay [s/veh]	15.82			184.93			16.13			18.42		
Approach LOS	B			F			B			B		
d_I, Intersection Delay [s/veh]	66.25											
Intersection LOS	E											
Intersection V/C	1.169											

Emissions

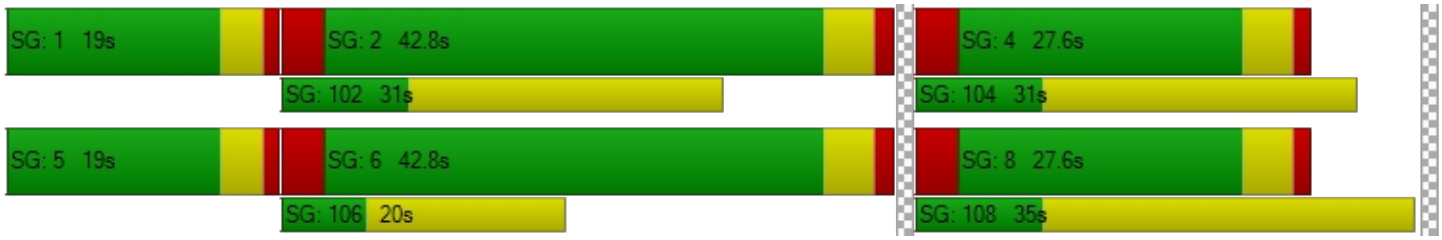
Vehicle Miles Traveled [mph]	1.34	53.89	8.49	14.89	34.18	34.07	2.62	52.55	43.74
Stops [stops/h]	29.98	1708.01	57.54	89.04	92.20	91.91	33.28	350.49	420.71
Fuel consumption [US gal/h]	0.39	38.98	1.00	1.80	2.38	2.38	0.54	5.96	6.69
CO [g/h]	27.58	2724.46	70.01	125.98	166.68	166.15	37.65	416.28	467.83
NOx [g/h]	5.37	530.08	13.62	24.51	32.43	32.33	7.32	80.99	91.02
VOC [g/h]	6.39	631.42	16.22	29.20	38.63	38.51	8.72	96.48	108.42

Other Modes

g_Walk,mi, Effective Walk Time [s]	13.0	10.0	13.0	13.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.40	22.86	20.40	20.40
l_p,int, Pedestrian LOS Score for Intersectio	1.745	2.374	2.526	3.712
Crosswalk LOS	A	B	B	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	623	623	1091	1091
d_b, Bicycle Delay [s]	15.20	15.20	6.63	6.63
l_b,int, Bicycle LOS Score for Intersection	1.649	2.772	1.970	2.588
Bicycle LOS	A	C	A	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: H:\...\248460.005_Stargell ops_2024-10-15 - BZD.vistro
Report File: H:\..._Stargell Vistro Reports - Roundabout 2040 PM.pdf

Scenario 4 Weekday PM 2040

1/9/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Stargell/5th	Roundabout	HCM 7th Edition	WB Thru		12.2	B
6	Stargell/Mariner Square/Campus	Roundabout	HCM 7th Edition	SB Left		56.0	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Stargell/5th

Control Type:	Roundabout	Delay (sec / veh):	12.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	5th Street			5th Street			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	4	127	25	108	169	64	118	283	5	133	350	168
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	4.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00	3.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	127	25	108	169	64	118	283	5	133	350	168
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	35	7	29	46	17	32	77	1	36	95	46
Total Analysis Volume [veh/h]	4	138	27	117	184	70	128	308	5	145	380	183
Pedestrian Volume [ped/h]	4			10			28			12		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	560			540			451			270		
Exiting Flow Rate [veh/h]	336			458			465			460		
Demand Flow Rate [veh/h]	4	127	25	108	169	64	118	283	5	133	350	168
Adjusted Demand Flow Rate [veh/h]	4	138	27	117	184	70	128	308	5	145	380	183

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.99	0.99	0.99	0.97
Entry Flow Rate [veh/h]	171	377	445	729
Capacity of Entry and Bypass Lanes [veh/h]	780	796	871	1048
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	775	783	862	1017
X, volume / capacity	0.22	0.47	0.51	0.70

Movement, Approach, & Intersection Results

Lane LOS	A	B	B	B
95th-Percentile Queue Length [veh]	0.83	2.57	2.98	5.96
95th-Percentile Queue Length [ft]	20.70	64.33	74.44	148.95
Approach Delay [s/veh]	7.03	11.04	11.04	14.71
Approach LOS	A	B	B	B
Intersection Delay [s/veh]	12.17			
Intersection LOS	B			

Intersection Level Of Service Report
Intersection 6: Stargell/Mariner Square/Campus

Control Type:	Roundabout	Delay (sec / veh):	56.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	E Campus Drive			Mariner Square Loop			Willie Stargell Avenue			Willie Stargell Avenue		
Base Volume Input [veh/h]	3	13	34	591	14	79	83	375	5	31	616	512
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	13	34	591	14	79	83	375	5	31	616	512
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	9	159	4	21	22	101	1	8	166	138
Total Analysis Volume [veh/h]	3	14	37	635	15	85	89	403	5	33	662	551
Pedestrian Volume [ped/h]	9			14			24			1		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	1135			711			683			106		
Exiting Flow Rate [veh/h]	53			665			763			1083		
Demand Flow Rate [veh/h]	3	13	34	591	14	79	83	375	5	31	616	512
Adjusted Demand Flow Rate [veh/h]	3	14	37	635	15	85	89	403	5	33	662	551

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	1.00	1.00	0.98	0.98
Entry Flow Rate [veh/h]	54	735	506	1271
Capacity of Entry and Bypass Lanes [veh/h]	434	669	688	1239
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	434	667	675	1215
X, volume / capacity	0.12	1.10	0.74	1.03

Movement, Approach, & Intersection Results

Lane LOS	B	F	C	F
95th-Percentile Queue Length [veh]	0.42	21.40	6.50	23.66
95th-Percentile Queue Length [ft]	10.58	535.12	162.47	591.39
Approach Delay [s/veh]	10.10	90.06	22.45	51.18
Approach LOS	B	F	C	F
Intersection Delay [s/veh]	55.95			
Intersection LOS	F			