

AGENDA
REGULAR MEETING OF THE MAYOR AND COUNCIL
August 13, 2024
SEAFORD CITY HALL - 414 HIGH STREET

The meeting will be streamed via live feed.

To view a live meeting visit one of the links below:

- On our website: www.seafordde.com/meetinglivefeed
- On Facebook: www.Facebook.com/cityofseaford
- On YouTube:
<http://www.youtube.com/c/CityofSeafordDe19973>

To view this meeting agenda and supporting documentation visit our website:

www.seafordde.com/government/mayor_council/council_agendas_minutes

Comments and questions may be emailed to:

Councilinfo@seafordde.com

- 7:00 P.M.** - Mayor MacCoy calls the Regular Meeting to order.
- Invocation
 - Pledge of Allegiance to the Flag of the United States of America.
 - Changes to the agenda for this meeting.
 - Approval of minutes of the regular meeting on July 23, 2024.

ALL ITEMS ON THIS AGENDA MAY OR MAY NOT BE VOTED ON.

PUBLIC COMMENT:

- 1.

CORRESPONDENCE:

- 1.

7:05 PUBLIC HEARING:

1. Present the results of a feasibility analysis for the Norman Eskridge Highway and Front Street Intersection that would include the addition of an oval shaped roundabout.

AGENDA

REGULAR MEETING OF THE MAYOR AND COUNCIL

July 23, 2024

NEW BUSINESS:

1. Mr. Steve Mullins, Nanticoke Little League President requests approval to construct a 30' x 40' storage shed on the Williams Pond Park property.
2. Bids – Meter Site Analyzer.

OLD BUSINESS:

1. Present for a second reading of an ordinance to amend Chapter 8 of the Municipal Code by adding Article 10 – Curfew, that would prohibit juveniles from being out between the hours of 11:00 P.M. through 5:00 A.M. Monday – Sunday.

REMINDER OF MEETINGS & SETTING NEW MEETINGS:

1. Friday Night Live, August 16th, 5:00 p.m. at the grass lot behind City Hall.
2. First meeting of the Mayor and Council for September, has been moved to Wednesday night – September 11, 2024, at 7pm due to Council Chambers being used as a polling location for the State Primary Elections

LIAISON REPORTS:

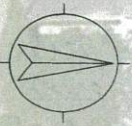
1. Public Works & WWTF – Councilwoman Stephanie Grassett
2. Police & Fire – Councilman Dan Henderson
3. Administration – Councilman Orlando Holland
4. Electric – Councilman Mike Bradley
5. Code, Parks and Recreation – Councilman Alan Quillen

Mayor MacCoy solicits a motion to adjourn the regular Council meeting.

NOTE: Agenda shall be subject to change to include or delete additional items (including executive session) which arise at the time of the meeting. (29 Del. C. S1004 (e) (3))

Date Posted: 08/05/2024 Revised Version: 08/13/2024

Posted by: BS

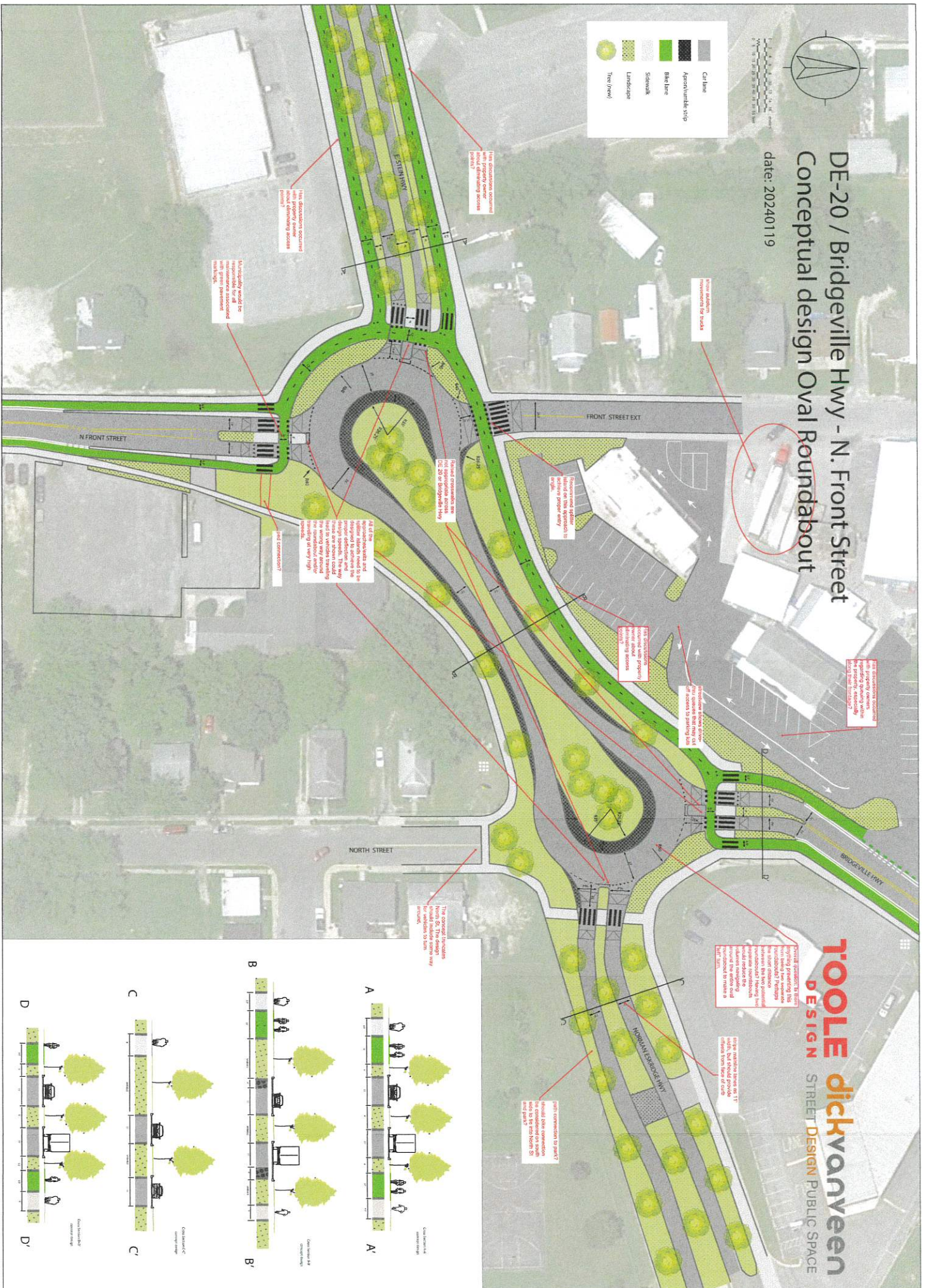


DE-20 / Bridgeville Hwy - N. Front Street

Conceptual design Oval Roundabout

date: 20240119

	Car lane
	Apex/turntable strip
	Blue line
	Sidewalk
	Landscaping
	Tree (new)



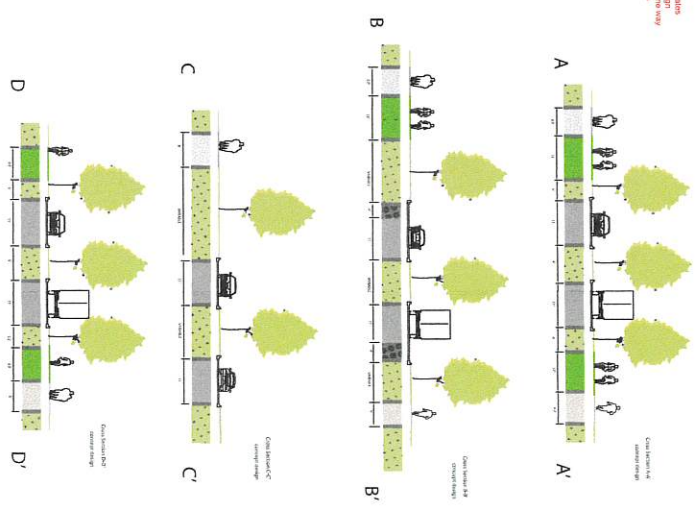
TOOLE dickvanveen
DESIGN STREET DESIGN PUBLIC SPACE

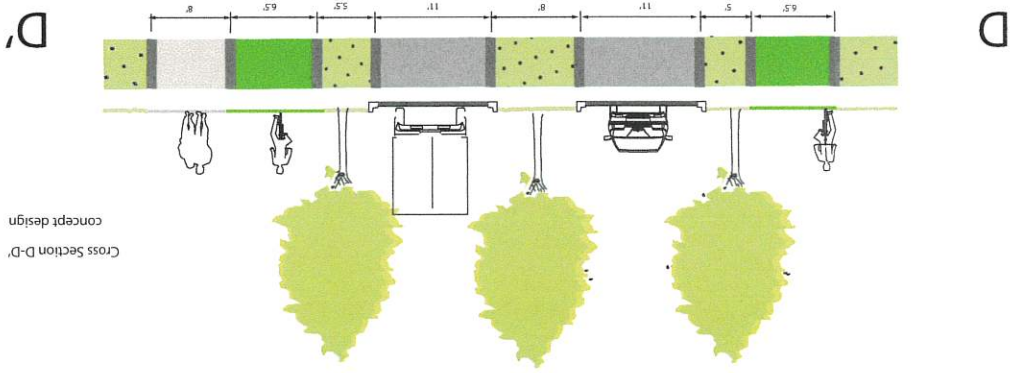
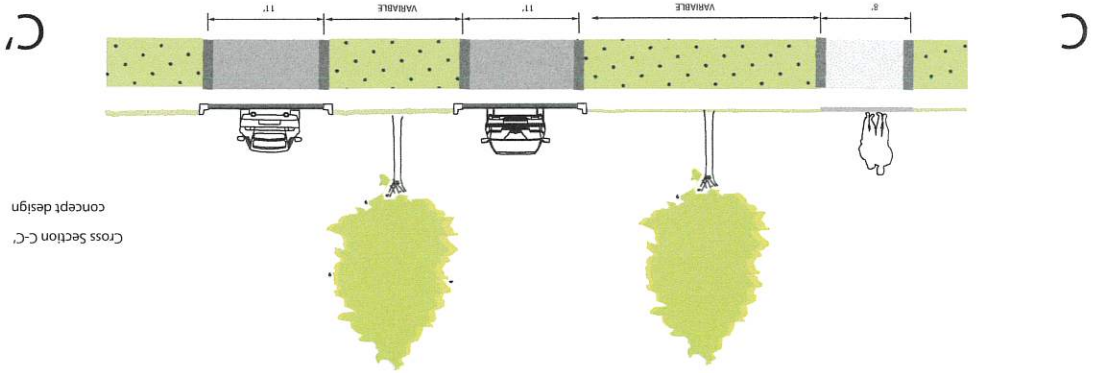
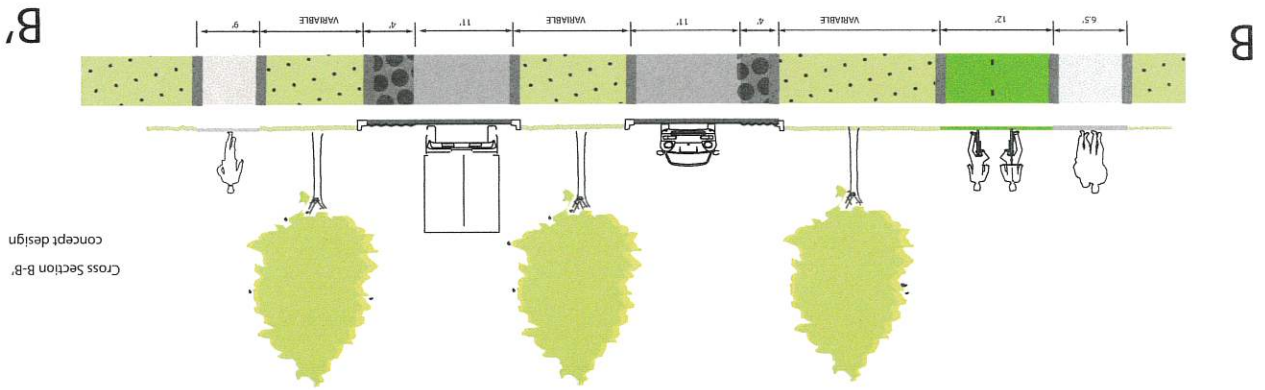
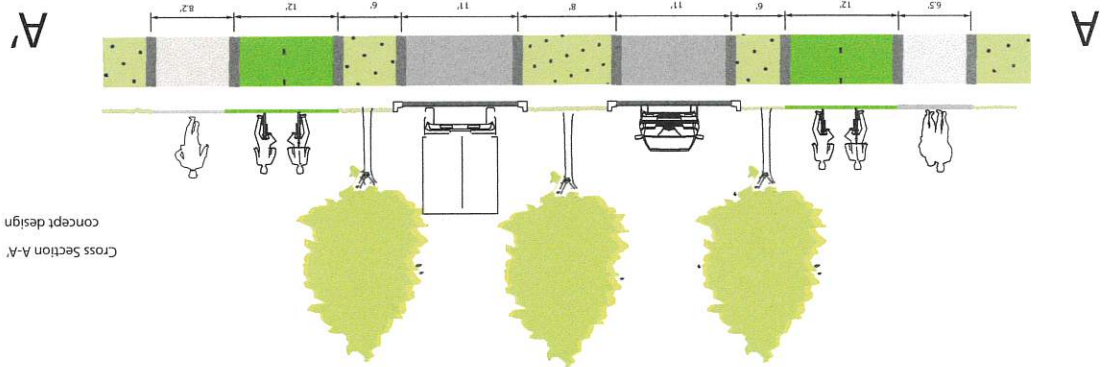
NOTE: The roundabout is designed to handle 1000 vehicles per hour. The roundabout is designed to handle 1000 vehicles per hour. The roundabout is designed to handle 1000 vehicles per hour.

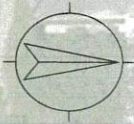
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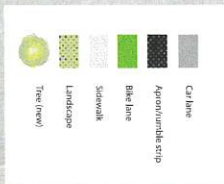




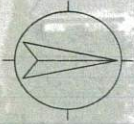
Scale: 1" = 20'

DE-20 / Bridgeville Hwy - N. Front Street Conceptual design Oval Roundabout

date: 20240119



TOOLE **dick** **vanveen**
DESIGN STREET DESIGN PUBLIC SPACE



Scale: 1" = 40'

DE-20 / Bridgeville Hwy - N. Front Street Conceptual design Oval Roundabout

date: 20240119



TOOLE **dickvanyeen**
DESIGN STREET DESIGN PUBLIC SPACE

MEMORANDUM

April 25, 2024

To: Katie Hickey

Organization: City of Seaford, Delaware

From: Megan McCarty Graham, PE; Toole Design

Barbara Mosier, PE, PTOE; Toole Design

Dick Van Veen; Dickvanveen

Project: Norman Eskridge Highway and Front Street – Feasibility Analysis

Re: DRAFT Summary Memorandum

Introduction

The purpose of this evaluation is to investigate the feasibility of implementing a roundabout design at the intersection of Norman Eskridge Highway/N Front Street/North Street in Seaford, Delaware. This memorandum includes a discussion of existing conditions, traffic analysis, and the design decisions leading to the roundabout concept provided.

The complicated six-way signalized intersection of Norman Eskridge Hwy / East Stein Hwy with Bridgeville Hwy / N Front Street, with Front Street ex and with North Street currently is a major bottleneck in the traffic safety and traffic flow for pedestrians and cyclists in Seaford. Even though the traffic volumes on these streets are relatively low, the amount of infrastructure is on a scale which is not in balance with the town directly around it anymore; the highways have become urban arterials with neighborhoods and commercial parks on the north side of it.

The concept outlined in the memorandum seeks to provide safer and more balanced access for all modes through the intersection by creating an oval shaped roundabout.

Existing and Historical Conditions

The intersection of SR-20 (Norman Eskridge Highway/E. Stein Highway), N. Front Street, and Bridgeville Highway is a complicated junction in the heart of Seaford, DE. SR-20 is an east-west arterial connecting to US-13, and is designated as a bike route, but does not have any designated bike facilities.

Stein Highway, which is the name of SR-20 on the west side of the intersection, is marked at 30 miles per hour, with an ADT of approximately 17,000 vehicles per day. To the east of the intersection, SR-20 becomes Norman Eskridge Highway, and the posted speed limit increases to 35 mph. Norman Eskridge Highway carries approximately 13,000 vehicles per day. Bridgeville Highway is a collector, which has a posted speed limit of 25 mph, and an ADT of 13,700 cars per day. It is a 2-lane roadway with on-street parking and is designated as part

of the primary bicycle network but has no dedicated facilities. North Front Street is a 20-mph collector which primarily serves local traffic, with an ADT of approximately 6000 vehicles per day.

The existing geometry of the intersection is very straight, with multiple sweeping and oblique turns which encourage high vehicular speeds. Though pedestrian crossings are limited and uncomfortable, these roadways provide important access to schools and local business that attract people seeking to travel by foot and bicycle. This intersection is located on the northern edge of the original town grid of Seaford (Figure 1), with the downtown core and many residences located to the south of SR-20, while three of the town's schools as well as other public amenities and businesses are now located to the north as shown in Figure 2.



Figure 1 Historical Seaford Grid Compared to Existing Intersection Location

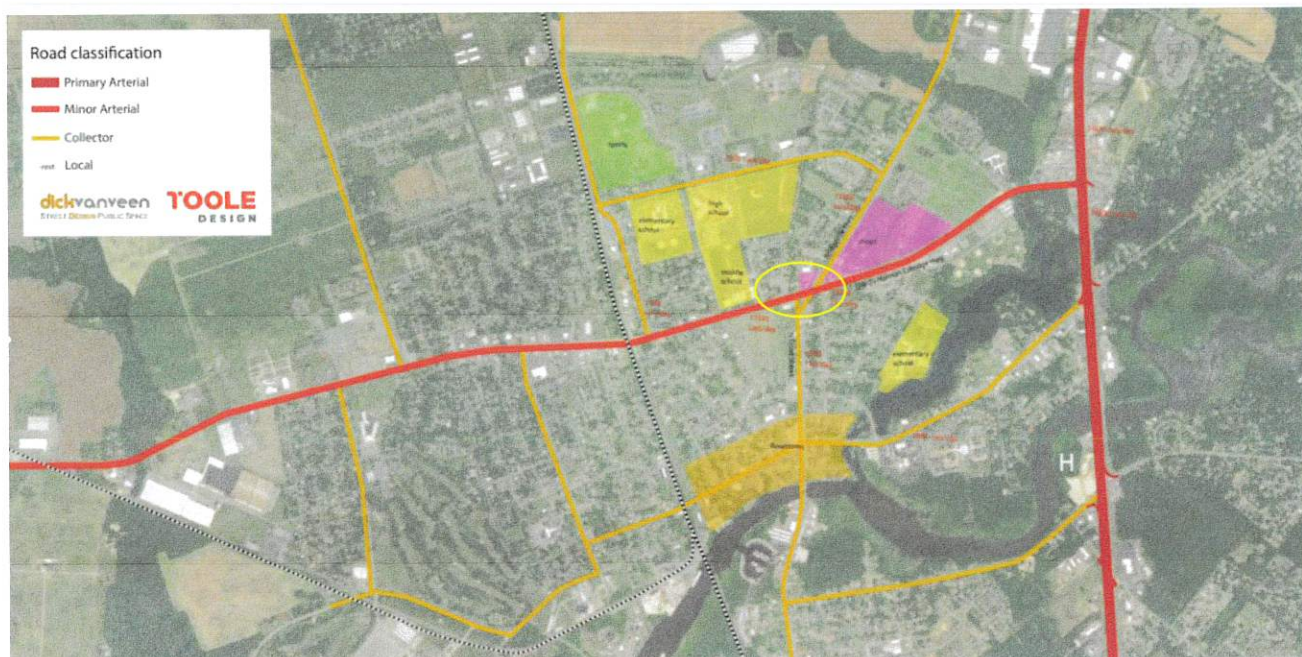


Figure 2 Roadway Classification and Surrounding Land Use

Data Collection and Existing Vehicular Analysis

Turning movement data collection was conducted at the intersection during the AM and PM weekday peak periods on May 25, 2023. Turning movement count data is summarized below and included in full in the Attachments. Existing signal timing data was provided by DeIDOT.

The existing turning movement volumes and signal timing data were used to develop an existing conditions Synchro model to reflect existing vehicular operations with the signalized intersection control existing today. Please note that due to the unusual geometry at this location, the Synchro analysis, which uses Highway Capacity Manual methodologies to determine Level of Service (LOS) and Delay for vehicular movements, cannot provide an overall intersection result, and also does not accurately reflect some of the movements, such as the unsignalized middle Dunkin driveway which was omitted from the model, though the volumes were assigned to Front Street Ext to maintain turning movement volumes.

As summarized in the figures below, the central signalized intersection currently operates at LOS C during the AM and PM peak hours. Based on the Synchro output results in the memo attachments, the unsignalized approaches generally operate at LOS B in both peak hours. Individual approaches operate at LOS C or better during the AM peak hour and D or better during the PM peak hour. From a strictly capacity point of view, the existing intersection is operating at acceptable LOS and likely has substantial excess capacity during time periods outside of the PM peak hour, leading to higher higher vehicular speeds.



Figure 3 AM Peak Hour Volumes and Level of Service



Figure 4 PM Peak Hour Volumes and Level of Service

Concept Design Selection

The concept design envisions the replacement of the complex signalized intersection with a roundabout. To accommodate for the more than usual connections, and to address spatial challenges, this roundabout comprises of two connected roundabouts, leading to an oval shaped circular road. Spatial optimization is achieved by pinching this oval in the middle resulting in a **peanut shaped circulating roadway**. Cars slow down upon entering the roundabout, continue through it at a moderate pace (target speed is approximately 20 mph). At entry and exit locations this speed is lower, allowing for cyclists and pedestrians to cross unsignalized, with right of way, on a raised crossing. This roundabout improves traffic safety, encourages continuous traffic flow at moderate speed and allows for removal of existing asphalt to provide green space for landscaping and stormwater management. **The roundabout becomes a landmark for Seaford; the gateway into town.**

The concept design is shown below for reference, but is attached to this memo in larger format.



Figure 5 Proposed Conceptual Design for Roundabout

Evaluation of Lanes Required

During initial design development, planning level thresholds for roundabouts as found in the NCHRP 672, Roundabouts: An Informational Guide were compared to existing volumes at the study intersection. The assumed entering ADT for this intersection based on daily volumes of the surrounding roadway is approximately 24,000-

25,000, which is near the upper edge of capacity for a single lane roundabout and indicates that additional analysis is needed (see yellow highlighted area of Figure 4). In order to provide a more detailed analysis, SIDRA, an analysis software package which specializes in roundabout analysis based on Highway Capacity Manual methodologies, was used to test the capacity of the proposed roundabout based on the existing volume conditions with a single circulating lane and single lane approaches.

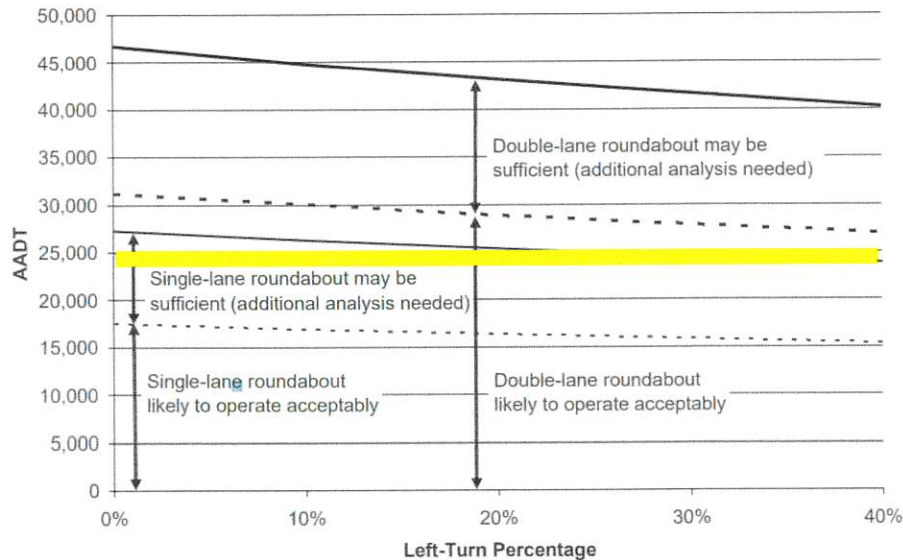


Figure 6 - Planning level daily intersection volumes for a four-leg roundabout
Source: NCHRP 672 - Exhibit 3-12

Based on the results of the SIDRA analysis, the overall intersection with a single circulating lane and single approach lanes would operate with acceptable level of service and delay overall and at each approach. The overall roundabout is forecast to operate at LOS B during the AM peak hour and LOS D during the PM peak hour. Each approach is forecast to operate at LOS B or better during the AM peak hour, and LOS D or better during the PM peak hour. SIDRA outputs are included in the Attachments and are summarized below.



Figure 7 SIDRA AM and PM Peak Hour Analysis Summary

Please note during review of the SIDRA analysis outputs, that the software is not a design software and does not take in account the unique geometry of the circulating roadway. The simple circular roundabout shown in the outputs is a schematic of the lane assignments and volumes only.

Design Summary

Vehicle Infrastructure and Access

Vehicle infrastructure on all approaches is reduced to a single lane per direction. Because the roundabout replaces the signalized intersection, there is no need for separated turning lanes in each direction.

The roundabout size allows for larger trucks to move through at moderate pace. For exceptionally large trucks (semi-trailers, double trailers) mountable aprons are provided in corners where they are needed. The use of mountable aprons prevents lanes from becoming exceptionally wide, which would increase driving speeds for smaller vehicles, while allowing for large vehicle movements.

To ease traffic on the roundabout, clarify circulation and to enhance the safety, several conflicts are eliminated:

- North Street would be closed off on the north side. This provides more space for a well-designed, clear exit from the roundabout to N. Eskridge Hwy. It also eliminates a cut through-route through the neighborhood. Traffic with an origin or destination in the neighborhood can use N. Front Street, which is better suited for slightly larger traffic volumes than a residential street like North Street
- The middle driveway to Dunkin Donuts, which is currently in the middle of the signalized intersection without being signalized itself, would be closed off. The driveway of the business on Front Street Ext remains, while the driveway on Bridgeville Hwy is moved to the north and combined with the entry to the Harbor House. The drive-through remains, with an exit on Front Street Ext.
- The driveway access to the Church and its parking location along N. Front Street is limited to two driveways of 20 feet each. With this change, bicycle and pedestrian facilities along N. Front street are safer as the conflict locations are reduced to two points. A wider buffer reduces proximity of the Church building to the road.

Bicycle and Pedestrian Infrastructure

The roundabout allows for safe crossings with right of way for cyclists and pedestrians at locations where traffic is driving the slowest: the entry and exit locations. The bicycle path and sidewalk are separated from car infrastructure by a landscaped buffer. The bicycle path runs bidirectional along the west and north side of the roundabout, while the sidewalk also runs along its current locations on the south side, connecting N. Front Street to North Street.

At the roads leading up to the roundabout (pedestrian and) cycling infrastructure is provided. These connections align with the desired cycling network. Buffered bike lanes are envisioned on N. Front street and on Bridgeville Hwy which will connect to curb separated paths when nearing the roundabout. On Stein Hwy the bicycle path and sidewalk are separated by a landscaped buffer. The bicycle paths are bidirectional on both sides for the road, to increase connectivity and reduce the need for additional crossing. Along N. Eskridge Hwy no bicycle facilities are foreseen, though there is space for them, if desired. Front Street Ext is a low volume residential street which does not need additional bicycle infrastructure since with low volumes and speeds it can operate comfortably as a shared space.

Landscaping

The reduced need for vehicular lanes frees up space for landscaping. This can be planted with greenery – grass, shrubs and even trees. In the concept design these elements are included as placeholders; the trees locations are not checked for underground utilities. It is desirable however, to place trees or higher shrubs in the roundabout center to break the line of sight along the roundabout to decrease travel speed. Linear lines of trees along the east-west roadways will reduce speed as vertical elements enclose the field of vision.

Stormwater management will require additional engineering to incorporate into this conceptual design. The roundabout as shown encroaches on the green space to the west of N. Front street, which currently has a role in the stormwater management of this location. However, the increase in green space has the potential for additional climate resilient storm water management features which can be developed in the next design phase.

Conclusion

Based on the conceptual design developed for the project, as well as the analysis of existing and future conditions, the proposed roundabout appears to be feasible at this location without major right-of-way impacts or a significant impact to vehicular congestion. The roundabout will provide a gateway feature, reduce vehicular speeds, improve safety for all modes and provide space for additional bicycle facilities, pedestrian facilities and green space.

Additional engineering development would be required to confirm ROW availability with survey, determine storm water management impacts, and confirm circulating geometrics with fastest path evaluation and truck turning details for the design and control vehicles.

ATTACHMENTS



Location: N Front St/Bridgeville Hwy -- E Stein Hwy/Norman Eskridge Hwy
Date: 5/25/2023
Site Code: 1.6E+07

Start Time	Dunkin Dwy Southbound				Bridgeville Hwy Southwestbound				Norman Eskridge Hwy Westbound				North St Northwestbound			
	Right to Front St Ext	Right to Norman Eskridge Hwy	Thru to N Front St	Left to Norman Eskridge Hwy	Left to Bridgeville Hwy	U-Turn	Right to Dunkin Dwy	Right to Front St Ext	Right to Norman Eskridge Hwy	Left to N Front St	Left to Norman Eskridge Hwy	U-Turn	Right to Bridgeville Hwy	Right to Dunkin Dwy	Right to Front St Ext	Thru to Norman Eskridge Hwy
07:00 AM	1	6	0	0	0	0	0	0	0	23	18	0	0	5	1	82
07:15 AM	0	6	0	0	0	0	0	0	0	36	21	0	0	9	4	114
07:30 AM	2	6	0	0	0	0	0	0	2	37	34	0	0	5	5	109
07:45 AM	0	5	0	0	0	0	0	0	0	38	35	0	0	4	2	10
08:00 AM	0	5	0	0	0	0	0	0	0	31	28	0	0	7	1	88
08:15 AM	0	0	0	0	0	0	0	0	0	32	38	0	0	6	2	91
08:30 AM	1	3	1	0	0	0	0	0	0	44	29	0	0	3	2	95
08:45 AM	2	4	0	0	0	0	0	0	3	46	46	0	0	7	1	95
Total	6	35	1	0	0	0	0	0	6	287	247	0	0	46	17	759

Peak Hour: 7:15 AM - 8:15 AM
Peak 15: 7:30 AM - 7:45 AM
PHF: 0.89855

Location: N Front St/Bridgeville Hwy -- E Stein Hwy/Norman Eskridge Hwy

Date: 5/25/2023
Site Code: 16225002

Start Time	Dunkin Dwy Southbound				Bridgeville Hwy Southwestbound				Norman Eskridge Hwy Westbound				North St Northwestbound			
	Right to Front St Ext	Right to Norman Eskridge Hwy	Thru to N Front St	Left to Norman Eskridge Hwy	Left to Bridgeville Hwy	U-Turn	Right to Dunkin Dwy	Right to Front St Ext	Right to Norman Eskridge Hwy	Left to N Front St	Left to Norman Eskridge Hwy	U-Turn	Right to Bridgeville Hwy	Right to Dunkin Dwy	Right to Front St Ext	Thru to Norman Eskridge Hwy
04:00 PM	0	1	0	0	0	0	0	0	0	51	50	0	0	10	1	142
04:15 PM	0	0	0	0	0	0	0	0	1	62	70	0	0	6	3	122
04:30 PM	0	0	0	0	0	0	0	0	0	68	48	0	0	4	4	130
04:45 PM	0	0	0	0	0	0	0	0	0	59	42	0	0	5	1	126
05:00 PM	0	0	0	0	0	0	0	0	0	71	53	0	0	5	1	131
05:15 PM	0	2	0	0	0	0	0	0	0	61	70	0	0	5	0	157
05:30 PM	0	1	0	0	0	0	0	0	0	45	37	0	0	5	5	139
05:45 PM	0	2	0	0	0	0	0	0	0	45	32	0	0	10	2	133
Total	0	6	0	0	0	0	0	0	1	462	402	0	0	52	17	1080

Peak Hour: 4:00 PM - 5:00 PM
Peak 15: 4:00 PM - 4:15 PM
PHF: 0.978316



Location: N Front St/Bridgeville Hwy – E Stein Hwy/Norman Eskridge Hwy
Date: 5/25/2023
Site Code: 16226001

Start Time	N Front St Northbound				Norman Eskridge Hwy Eastbound				Front St Ext Southeastbound			
	Left to Norman Eskridge Hwy	Left to N Front St	U-Turn	Right to North St	Right to Norman Eskridge Hwy	Right to Bridgeville Hwy	Thru to Dunkin Dwy	Left to Front St Ext	Left to Norman Eskridge Hwy	Right to North St	Right to Norman Eskridge Hwy	Thru to North St
07:00 AM	0	0	0	0	14	29	10	1	13	0	0	0
07:15 AM	0	0	0	0	1	31	7	2	10	0	16	0
07:30 AM	0	0	0	0	10	44	2	2	24	0	14	0
07:45 AM	0	0	0	0	0	11	40	3	7	0	19	0
08:00 AM	0	0	0	0	0	12	43	3	6	0	11	0
08:15 AM	0	0	0	0	13	28	3	1	11	0	15	0
08:30 AM	0	0	0	0	8	39	7	1	11	0	14	0
08:45 AM	0	0	0	0	1	42	3	3	9	0	15	0
Total	0	0	0	0	92	256	40	10	91	0	122	0
F	0	0	0	0	1	158	17	4	47	0	60	0

Location: N Front St/Bridgeville Hwy – E Stein Hwy/Norman Eskridge Hwy
Date: 5/25/2023
Site Code: 16226002

Start Time	N Front St Northbound				Norman Eskridge Hwy Eastbound				Front St Ext Southeastbound			
	Left to Norman Eskridge Hwy	Left to N Front St	U-Turn	Right to North St	Right to Norman Eskridge Hwy	Right to Bridgeville Hwy	Thru to Dunkin Dwy	Left to Front St Ext	Left to Norman Eskridge Hwy	Right to North St	Right to Norman Eskridge Hwy	Thru to North St
04:00 PM	0	0	0	0	12	53	1	0	11	0	4	0
04:15 PM	0	0	0	0	10	47	0	1	7	0	15	0
04:30 PM	0	0	0	0	18	51	2	0	10	0	11	0
04:45 PM	0	0	0	0	1	46	3	0	11	0	11	0
05:00 PM	0	0	0	0	20	38	0	0	8	0	10	0
05:15 PM	0	0	0	0	19	30	1	0	9	0	6	0
05:30 PM	0	0	0	0	14	38	2	0	9	0	11	0
05:45 PM	0	0	0	0	1	42	2	0	8	0	11	0
Total	0	0	0	0	121	345	11	1	73	0	79	0
peak hour	0	0	0	0	1	197	6	1	39	0	41	0
F	0	0	0	0	1	54	23	2	826	0	826	0

HCM Signalized Intersection Capacity Analysis

3: N Front St & Bridgeville Hwy

04/25/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	190	481	0	31	425	25	68	158	40	27	118	146
Future Volume (vph)	190	481	0	31	425	25	68	158	40	27	118	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.88	0.95	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	3539		1770	3539	1583	1770	1393	1504	1770	1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	1770	3539		1770	3539	1583	1770	1393	1504	1770	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	523	0	34	462	27	74	172	43	29	128	159
RTOR Reduction (vph)	0	0	0	0	0	20	0	139	31	0	0	124
Lane Group Flow (vph)	207	523	0	34	462	7	74	37	8	29	128	35
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	Perm	Prot	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	16.0	29.0		9.0	22.0	22.0	8.0	19.0	19.0	9.0	20.0	20.0
Effective Green, g (s)	16.0	29.0		9.0	22.0	22.0	8.0	19.0	19.0	9.0	20.0	20.0
Actuated g/C Ratio	0.18	0.32		0.10	0.24	0.24	0.09	0.21	0.21	0.10	0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	314	1140		177	865	386	157	294	317	177	393	351
v/s Ratio Prot	c0.12	0.15		0.02	c0.13		c0.04	0.03		0.02	c0.07	
v/s Ratio Perm						0.00			0.01			0.02
v/c Ratio	0.66	0.46		0.19	0.53	0.02	0.47	0.13	0.03	0.16	0.33	0.10
Uniform Delay, d1	34.5	24.3		37.2	29.5	25.8	39.0	28.8	28.2	37.1	29.3	27.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.4	1.3		2.4	2.4	0.1	9.8	0.9	0.2	2.0	2.2	0.6
Delay (s)	44.8	25.6		39.6	31.9	25.9	48.8	29.7	28.3	39.0	31.5	28.4
Level of Service	D	C		D	C	C	D	C	C	D	C	C
Approach Delay (s)		31.1			32.1		34.4				30.7	
Approach LOS		C			C		C				C	
Intersection Summary												
HCM 2000 Control Delay		31.8										
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		90.0										
Intersection Capacity Utilization		53.0%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 3: N Front St & Bridgeville Hwy

04/25/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	214	526	0	76	529	27	46	197	55	29	210	241
Future Volume (vph)	214	526	0	76	529	27	46	197	55	29	210	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.88	0.95	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	3539		1770	3539	1583	1770	1393	1504	1770	1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	1770	3539		1770	3539	1583	1770	1393	1504	1770	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	572	0	83	575	29	50	214	60	32	228	262
RTOR Reduction (vph)	0	0	0	0	0	22	0	174	43	0	0	204
Lane Group Flow (vph)	233	572	0	83	575	7	50	46	11	32	228	58
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	Perm	Prot	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	16.0	29.0		9.0	22.0	22.0	8.0	19.0	19.0	9.0	20.0	20.0
Effective Green, g (s)	16.0	29.0		9.0	22.0	22.0	8.0	19.0	19.0	9.0	20.0	20.0
Actuated g/C Ratio	0.18	0.32		0.10	0.24	0.24	0.09	0.21	0.21	0.10	0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	314	1140		177	865	386	157	294	317	177	393	351
v/s Ratio Prot	c0.13	0.16		0.05	c0.16		c0.03	0.03		0.02	c0.13	
v/s Ratio Perm						0.00			0.01			0.04
v/c Ratio	0.74	0.50		0.47	0.66	0.02	0.32	0.16	0.04	0.18	0.58	0.17
Uniform Delay, d1	35.0	24.7		38.2	30.7	25.8	38.4	29.0	28.2	37.1	31.3	28.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.6	1.6		8.7	4.0	0.1	5.3	1.1	0.2	2.2	6.1	1.0
Delay (s)	49.7	26.2		46.9	34.7	25.9	43.7	30.1	28.4	39.4	37.4	29.3
Level of Service	D	C		D	C	C	D	C	C	D	D	C
Approach Delay (s)		33.0			35.8		31.9				33.4	
Approach LOS		C			D		C				C	
Intersection Summary												
HCM 2000 Control Delay		33.8										
HCM 2000 Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		90.0							24.0			
Intersection Capacity Utilization		62.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
6: Norman Eskridge Hwy & Front St Ext

04/25/2024

Intersection										
Int Delay, s/veh	0.6									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations	↑↑↑			↑↑			↑			
Traffic Vol, veh/h	0	671	85	0	597	42	0	82	0	0
Future Vol, veh/h	0	671	85	0	597	42	0	82	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	None	-	-
Storage Length	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	729	92	0	649	46	0	89	0	0

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	0	-	-	0	-	348		
Stage 1	-	-	-	-	-	-	-	-		
Stage 2	-	-	-	-	-	-	-	-		
Critical Hdwy	-	-	-	-	-	-	-	6.94		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-		
Follow-up Hdwy	-	-	-	-	-	-	-	3.32		
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	648		
Stage 1	0	-	-	0	-	-	0	-		
Stage 2	0	-	-	0	-	-	0	-		
Platoon blocked, %	-	-	-	-	-	-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	648		
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-		
Stage 1	-	-	-	-	-	-	-	-		
Stage 2	-	-	-	-	-	-	-	-		

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	648
HCM Lane V/C Ratio	-	-	-	-	0.138
HCM Control Delay (s)	-	-	-	-	11.4
HCM Lane LOS	-	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0.5

HCM 6th TWSC
8: North St & Norman Eskridge Hwy

04/25/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑		↑
Traffic Vol, veh/h	540	9	0	481	0	6
Future Vol, veh/h	540	9	0	481	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	587	10	0	523	0	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 299
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.94
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.32
Pot Cap-1 Maneuver	-	-	0 - 0 697
Stage 1	-	-	0 - 0 -
Stage 2	-	-	0 - 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - - 697
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	697	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	10.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

HCM 6th TWSC
6: Norman Eskridge Hwy & Front St Ext

04/25/2024

Intersection										
Int Delay, s/veh	0.3									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations	↑↑↑			↑↑			↑			
Traffic Vol, veh/h	0	740	85	0	799	17	0	42	0	0
Future Vol, veh/h	0	740	85	0	799	17	0	42	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	None	-	-
Storage Length	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	804	92	0	868	18	0	46	0	0

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	0	-	-	0	-	443		
Stage 1	-	-	-	-	-	-	-	-		
Stage 2	-	-	-	-	-	-	-	-		
Critical Hdwy	-	-	-	-	-	-	-	6.94		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-		
Follow-up Hdwy	-	-	-	-	-	-	-	3.32		
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	562		
Stage 1	0	-	-	0	-	-	0	-		
Stage 2	0	-	-	0	-	-	0	-		
Platoon blocked, %	-	-	-	-	-	-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	562		
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-		
Stage 1	-	-	-	-	-	-	-	-		
Stage 2	-	-	-	-	-	-	-	-		

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12
HCM LOS			B

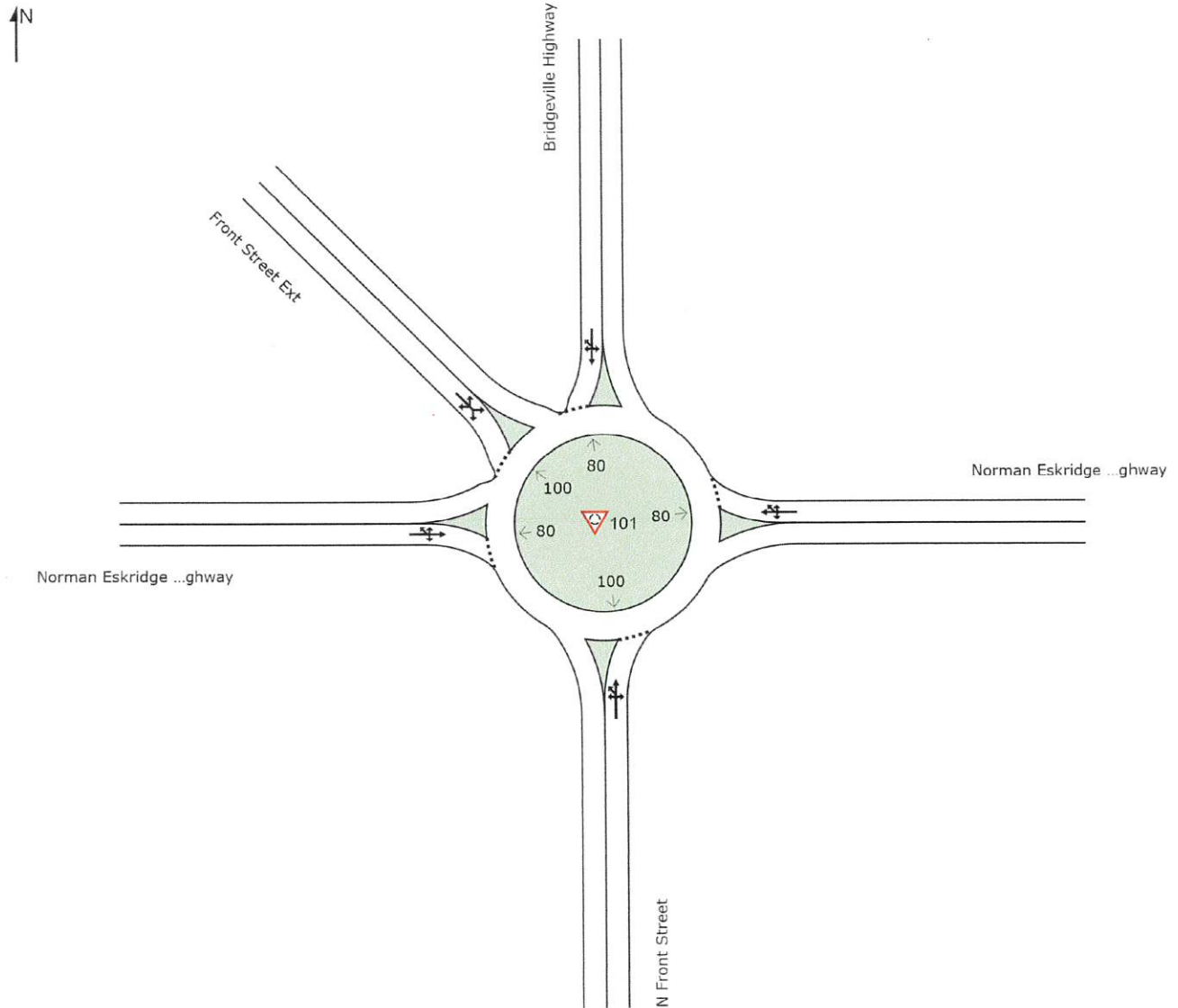
Minor Lane/Major Mvmt	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	562
HCM Lane V/C Ratio	-	-	-	-	0.081
HCM Control Delay (s)	-	-	-	-	12
HCM Lane LOS	-	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0.3

SITE LAYOUT

 **Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

 Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: N Front Street														
3	L2	68	2.0	74	2.0	0.483	13.6	LOS B	2.9	72.6	0.75	0.87	1.10	30.3
3a	L1	1	3.0	1	3.0	0.483	13.7	LOS B	2.9	72.6	0.75	0.87	1.10	30.0
8	T1	158	2.0	172	2.0	0.483	13.6	LOS B	2.9	72.6	0.75	0.87	1.10	30.3
18	R2	46	2.0	50	2.0	0.483	13.6	LOS B	2.9	72.6	0.75	0.87	1.10	29.7
Approach		273	2.0	297	2.0	0.483	13.6	LOS B	2.9	72.6	0.75	0.87	1.10	30.2
East: Norman Eskridge Highway														
1	L2	31	2.0	34	2.0	0.573	12.8	LOS B	5.0	127.0	0.74	0.88	1.13	31.0
6	T1	408	2.0	443	2.0	0.573	12.8	LOS B	5.0	127.0	0.74	0.88	1.13	31.0
16a	R1	1	3.0	1	3.0	0.573	12.8	LOS B	5.0	127.0	0.74	0.88	1.13	30.7
16	R2	1	2.0	1	2.0	0.573	12.8	LOS B	5.0	127.0	0.74	0.88	1.13	30.2
Approach		441	2.0	479	2.0	0.573	12.8	LOS B	5.0	127.0	0.74	0.88	1.13	31.0
North: Bridgeville Highway														
7	L2	27	2.0	29	2.0	0.418	10.2	LOS B	2.4	60.0	0.68	0.74	0.83	32.1
4	T1	118	2.0	128	2.0	0.418	10.2	LOS B	2.4	60.0	0.68	0.74	0.83	32.0
14	R2	146	2.0	159	2.0	0.418	10.2	LOS B	2.4	60.0	0.68	0.74	0.83	31.3
14b	R3	1	3.0	1	3.0	0.418	10.2	LOS B	2.4	60.0	0.68	0.74	0.83	30.9
Approach		292	2.0	317	2.0	0.418	10.2	LOS B	2.4	60.0	0.68	0.74	0.83	31.7
NorthWest: Front Street Ext														
7bx	L3	1	3.0	1	3.0	0.054	7.3	LOSA	0.2	5.0	0.63	0.61	0.63	33.8
7ax	L1	1	3.0	1	3.0	0.054	7.3	LOSA	0.2	5.0	0.63	0.61	0.63	33.2
14ax	R1	1	3.0	1	3.0	0.054	7.3	LOSA	0.2	5.0	0.63	0.61	0.63	33.2
14bx	R3	24	3.0	26	3.0	0.054	7.3	LOSA	0.2	5.0	0.63	0.61	0.63	32.3
Approach		27	3.0	29	3.0	0.054	7.3	LOSA	0.2	5.0	0.63	0.61	0.63	32.4
West: Norman Eskridge Highway														
5b	L3	1	3.0	1	3.0	0.659	12.6	LOS B	7.7	196.3	0.68	0.57	0.82	30.9
5	L2	190	2.0	207	2.0	0.659	12.6	LOS B	7.7	196.3	0.68	0.57	0.82	30.6
2	T1	478	2.0	520	2.0	0.659	12.6	LOS B	7.7	196.3	0.68	0.57	0.82	30.7
12	R2	1	2.0	1	2.0	0.659	12.6	LOS B	7.7	196.3	0.68	0.57	0.82	29.9
Approach		670	2.0	728	2.0	0.659	12.6	LOS B	7.7	196.3	0.68	0.57	0.82	30.7
All Vehicles		1703	2.0	1851	2.0	0.659	12.3	LOS B	7.7	196.3	0.71	0.73	0.94	30.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Lane Use and Performance												
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist]		ft	% %
South: N Front Street												
Lane 1 ^d	297	2.0	614	0.483	100	13.6	LOS B	2.9	72.6	Full	1600	0.0 0.0
Approach	297	2.0		0.483		13.6	LOS B	2.9	72.6			
East: Norman Eskridge Highway												
Lane 1 ^d	479	2.0	836	0.573	100	12.8	LOS B	5.0	127.0	Full	1600	0.0 0.0
Approach	479	2.0		0.573		12.8	LOS B	5.0	127.0			
North: Bridgeville Highway												
Lane 1 ^d	317	2.0	760	0.418	100	10.2	LOS B	2.4	60.0	Full	1600	0.0 0.0
Approach	317	2.0		0.418		10.2	LOS B	2.4	60.0			
NorthWest: Front Street Ext												
Lane 1 ^d	29	3.0	543	0.054	100	7.3	LOS A	0.2	5.0	Full	1600	0.0 0.0
Approach	29	3.0		0.054		7.3	LOS A	0.2	5.0			
West: Norman Eskridge Highway												
Lane 1 ^d	728	2.0	1105	0.659	100	12.6	LOS B	7.7	196.3	Full	1600	0.0 0.0
Approach	728	2.0		0.659		12.6	LOS B	7.7	196.3			
Intersection	1851	2.0		0.659		12.3	LOS B	7.7	196.3			

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)												
South: N Front Street												
Mov.	L2	L1	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S To Exit:	W	NW	N	E			veh/h	v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	74	1	172	50	297	2.0	614	0.483	100	NA	NA	
Approach	74	1	172	50	297	2.0		0.483				
East: Norman Eskridge Highway												
Mov.	L2	T1	R1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E							veh/h	v/c	Util. %	SL Ov. %	Lane No.	

To Exit:	S	W	NW	N								
Lane 1	34	443	1	1	479	2.0	836	0.573	100	NA	NA	
Approach	34	443	1	1	479	2.0		0.573				
North: Bridgeville Highway												
Mov.	L2	T1	R2	R3	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N							Cap.	Satn	Util.	SL Ov.	Lane	
To Exit:	E	S	W	NW			veh/h	v/c	%	%	No.	
Lane 1	29	128	159	1	317	2.0	760	0.418	100	NA	NA	
Approach	29	128	159	1	317	2.0		0.418				
NorthWest: Front Street Ext												
Mov.	L3	L1	R1	R3	Total	%HV		Deg.	Lane	Prob.	Ov.	
From NW							Cap.	Satn	Util.	SL Ov.	Lane	
To Exit:	N	E	S	W			veh/h	v/c	%	%	No.	
Lane 1	1	1	1	26	29	3.0	543	0.054	100	NA	NA	
Approach	1	1	1	26	29	3.0		0.054				
West: Norman Eskridge Highway												
Mov.	L3	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Cap.	Satn	Util.	SL Ov.	Lane	
To Exit:	NW	N	E	S			veh/h	v/c	%	%	No.	
Lane 1	1	207	520	1	728	2.0	1105	0.659	100	NA	NA	
Approach	1	207	520	1	728	2.0		0.659				
Total %HV Deg.Satn (v/c)												
Intersection	1851	2.0						0.659				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: N Front Street												
Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Norman Eskridge Highway												
Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Bridgeville Highway												
Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Front Street Ext												
Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Norman Eskridge Highway												
Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.

QUEUE ANALYSIS

 Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start Cycle of Green (ft)		Average Queue (ft)		Queue Storage Ratio		Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%			
South: N Front Street															
Lane 1		0.483	1.000	6.8	29.2	72.6	NA	NA	28.5	51.8	0.02	0.05	0.0	NA	NA
Approach		0.483			29.2	72.6	NA	NA	28.5	51.8	0.02	0.05			
East: Norman Eskridge Highway															
Lane 1		0.573	1.000	13.4	51.1	127.0	NA	NA	43.3	78.5	0.03	0.08	0.0	NA	NA
Approach		0.573			51.1	127.0	NA	NA	43.3	78.5	0.03	0.08			
North: Bridgeville Highway															
Lane 1		0.418	1.000	3.2	24.1	60.0	NA	NA	22.8	41.4	0.02	0.04	0.0	NA	NA
Approach		0.418			24.1	60.0	NA	NA	22.8	41.4	0.02	0.04			
NorthWest: Front Street Ext															
Lane 1		0.054	1.000	0.0	2.0	5.0	NA	NA	1.5	2.8	0.00	0.00	0.0	NA	NA
Approach		0.054			2.0	5.0	NA	NA	1.5	2.8	0.00	0.00			
West: Norman Eskridge Highway															
Lane 1		0.659	1.000	11.8	79.0	196.3	NA	NA	64.8	117.6	0.05	0.12	0.0	NA	NA
Approach		0.659			79.0	196.3	NA	NA	64.8	117.6	0.05	0.12			
Intersection		0.659			79.0	196.3	NA	NA	64.8	117.6	0.05	0.12			

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Green (veh)		Cycle Average Queue (veh)		Queue Storage Ratio		Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%			
South: N Front Street															
Lane 1		0.483	1.000	0.3	1.1	2.9	NA	NA	1.1	2.0	0.02	0.05	0.0	NA	NA
Approach		0.483			1.1	2.9	NA	NA	1.1	2.0	0.02	0.05			
East: Norman Eskridge Highway															
Lane 1		0.573	1.000	0.5	2.0	5.0	NA	NA	1.7	3.1	0.03	0.08	0.0	NA	NA
Approach		0.573			2.0	5.0	NA	NA	1.7	3.1	0.03	0.08			
North: Bridgeville Highway															
Lane 1		0.418	1.000	0.1	0.9	2.4	NA	NA	0.9	1.6	0.02	0.04	0.0	NA	NA
Approach		0.418			0.9	2.4	NA	NA	0.9	1.6	0.02	0.04			
NorthWest: Front Street Ext															
Lane 1		0.054	1.000	0.0	0.1	0.2	NA	NA	0.1	0.1	0.00	0.00	0.0	NA	NA

Approach	0.054			0.1	0.2	NA	NA	0.1	0.1	0.00	0.00			
West: Norman Eskridge Highway														
Lane 1	0.659	1.000	0.5	3.1	7.7	NA	NA	2.6	4.6	0.05	0.12	0.0	NA	NA
Approach	0.659			3.1	7.7	NA	NA	2.6	4.6	0.05	0.12			
Intersection	0.659			3.1	7.7	NA	NA	2.6	4.6	0.05	0.12			

Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.

Continuous Lane Performance														
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy	Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)		
	v/c	mph	sec	sec	ft	ft	sec	sec	%	%	veh/mi	pc/mi		
South: N Front Street														
This approach does not have any continuous lanes														
East: Norman Eskridge Highway														
This approach does not have any continuous lanes														
North: Bridgeville Highway														
This approach does not have any continuous lanes														
NorthWest: Front Street Ext														
This approach does not have any continuous lanes														
West: Norman Eskridge Highway														
This approach does not have any continuous lanes														

Midblock Effective Detection Zone Length = 7 ft

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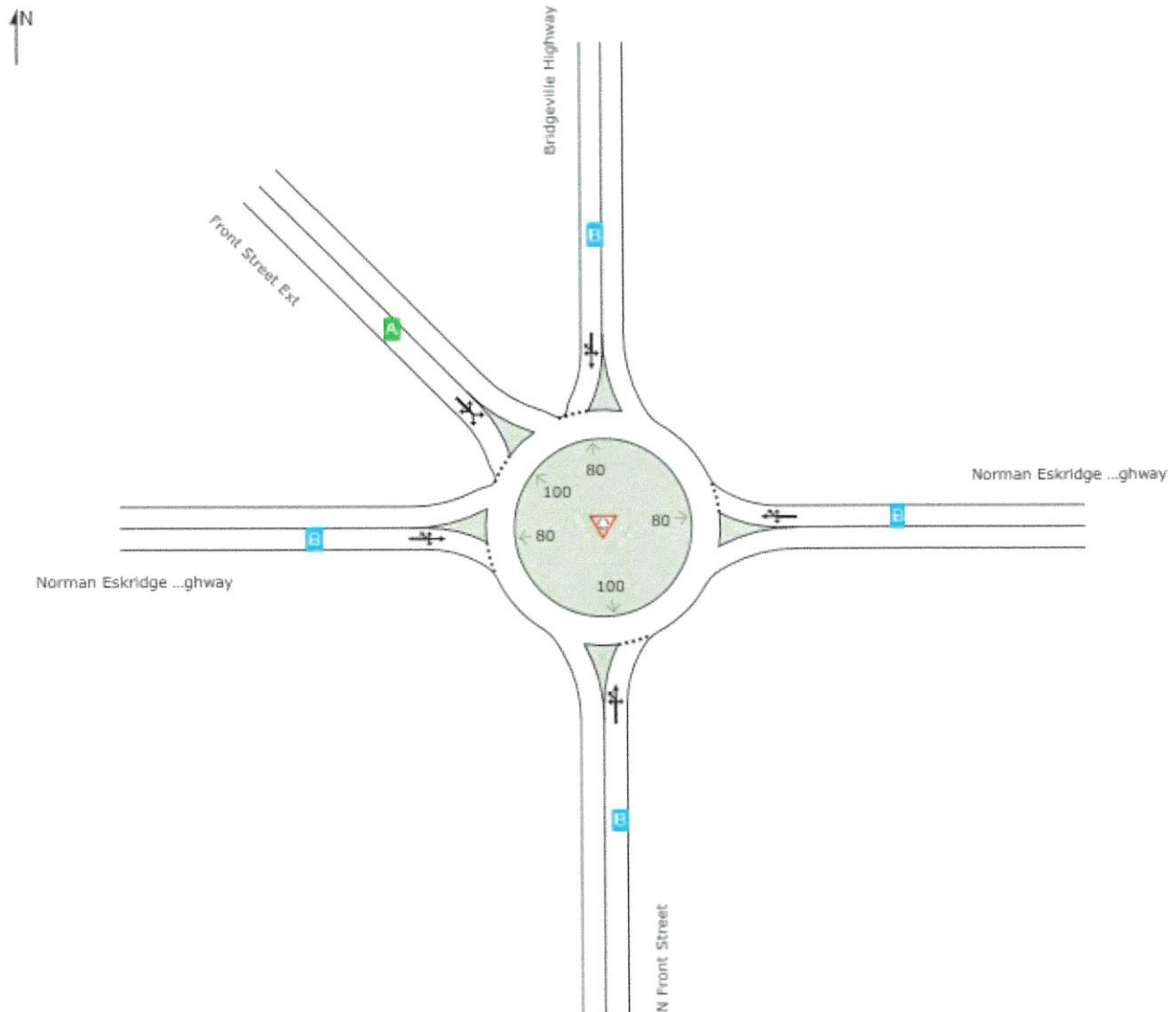
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

	Approaches					Intersection
	South	East	North	Northwest	West	
LOS	B	B	B	A	B	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: HCM Delay Formula (Geometric Delay is not included).

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DEGREE OF SATURATION

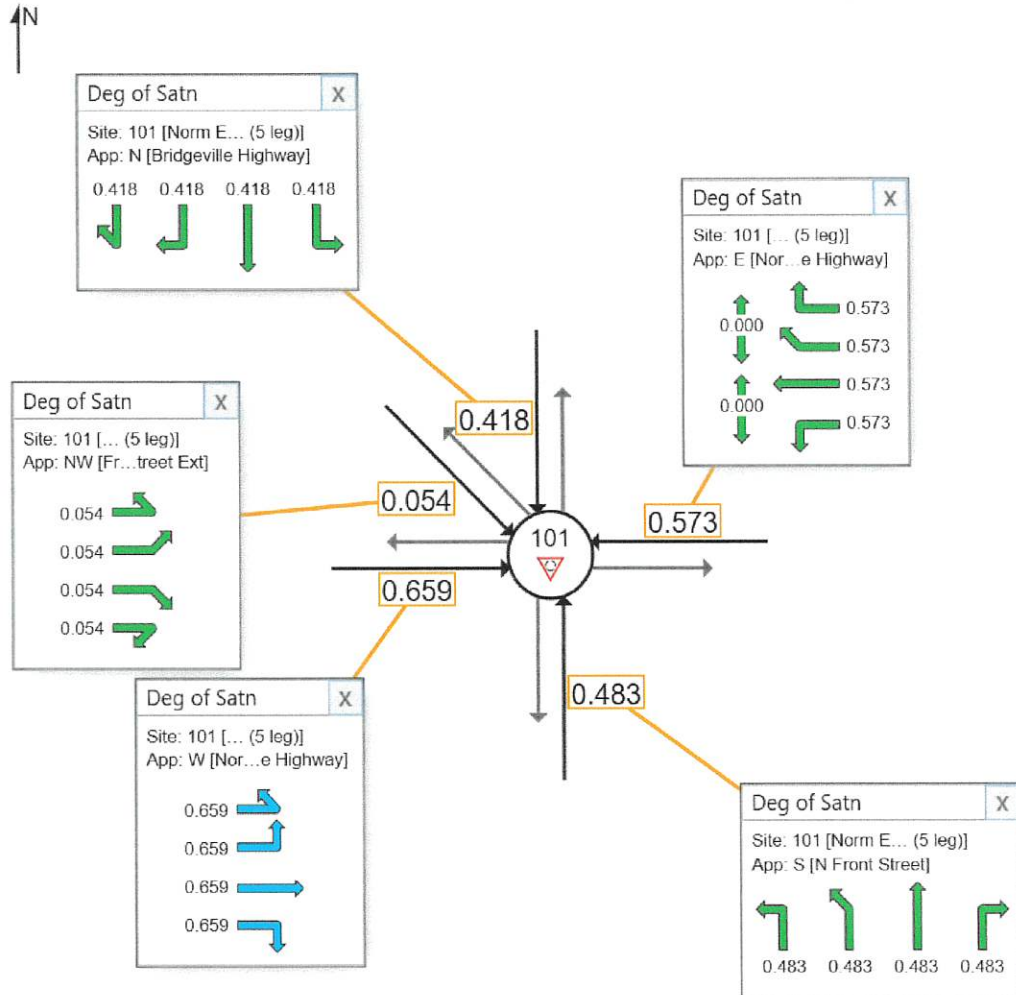
Ratio of Demand Volume to Capacity, v/c ratio per movement

 **Site: 101 [Norm Esk Hwy - AM (5 leg)] (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

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Click and drag popup boxes to move to preferred positions.

Close All Popups



Colour code based on Degree of Saturation



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QUEUE DISTANCE (AVERAGE)

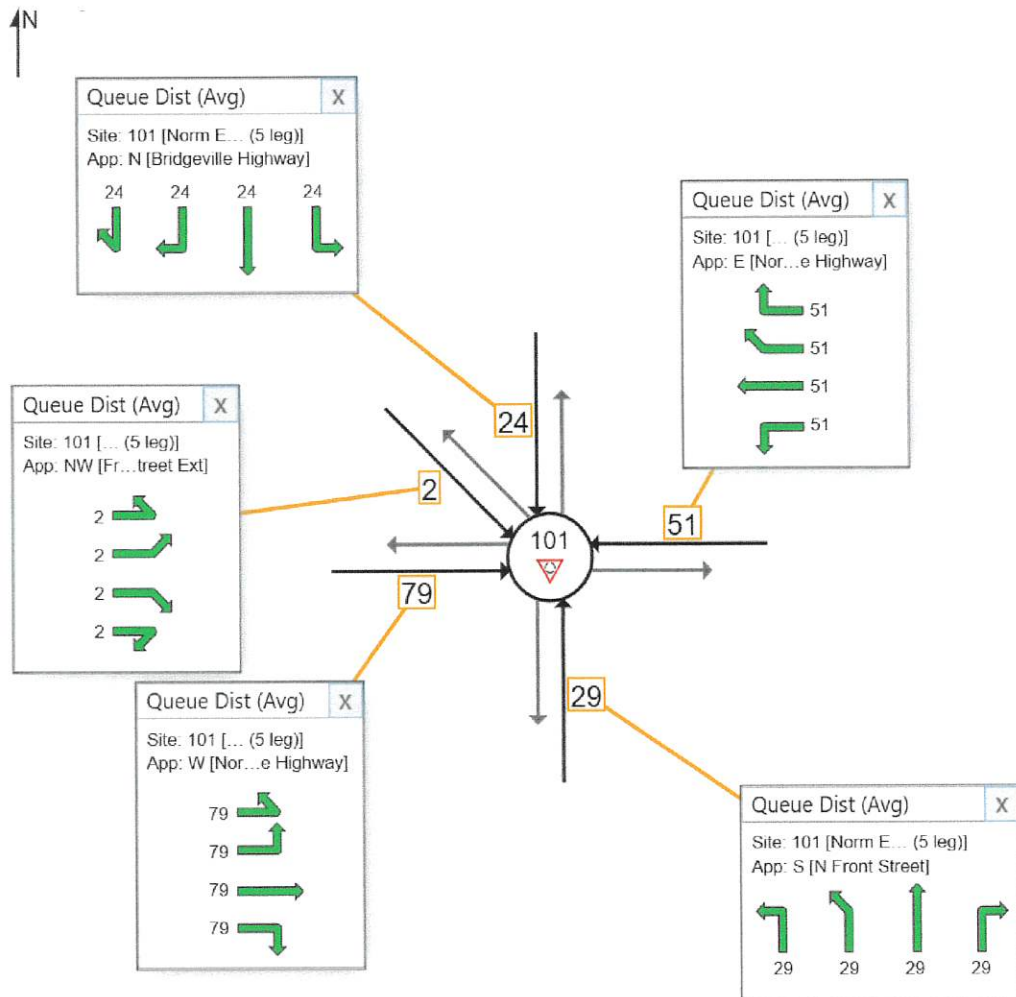
Largest Average Back of Queue Distance for any lane used by the vehicle movement (feet)

 **Site: 101 [Norm Esk Hwy - AM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

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Click and drag popup boxes to move to preferred positions.

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Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

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QUEUE DISTANCE (PERCENTILE)

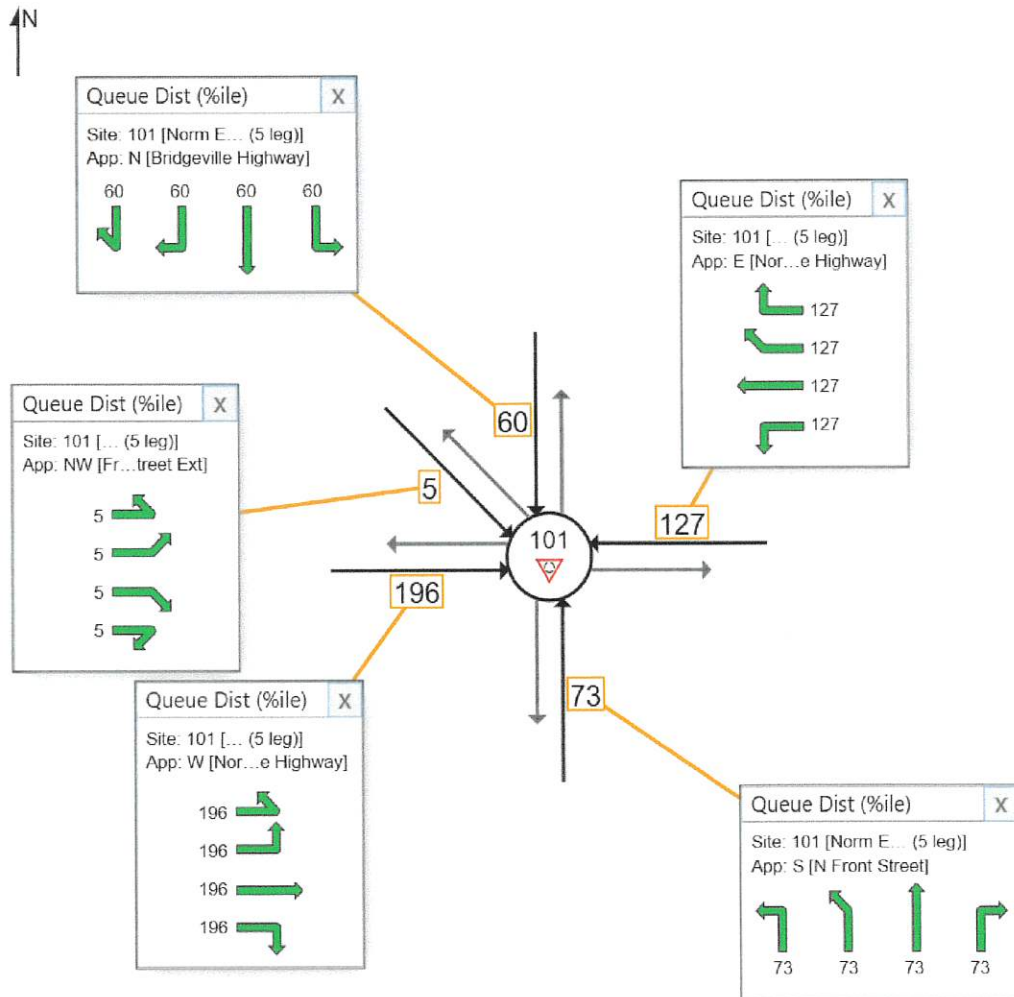
Largest 95% Back of Queue Distance for any lane used by the vehicle movement (feet)

 Site: 101 [Norm Esk Hwy - AM (5 leg)] (Site Folder: General)

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

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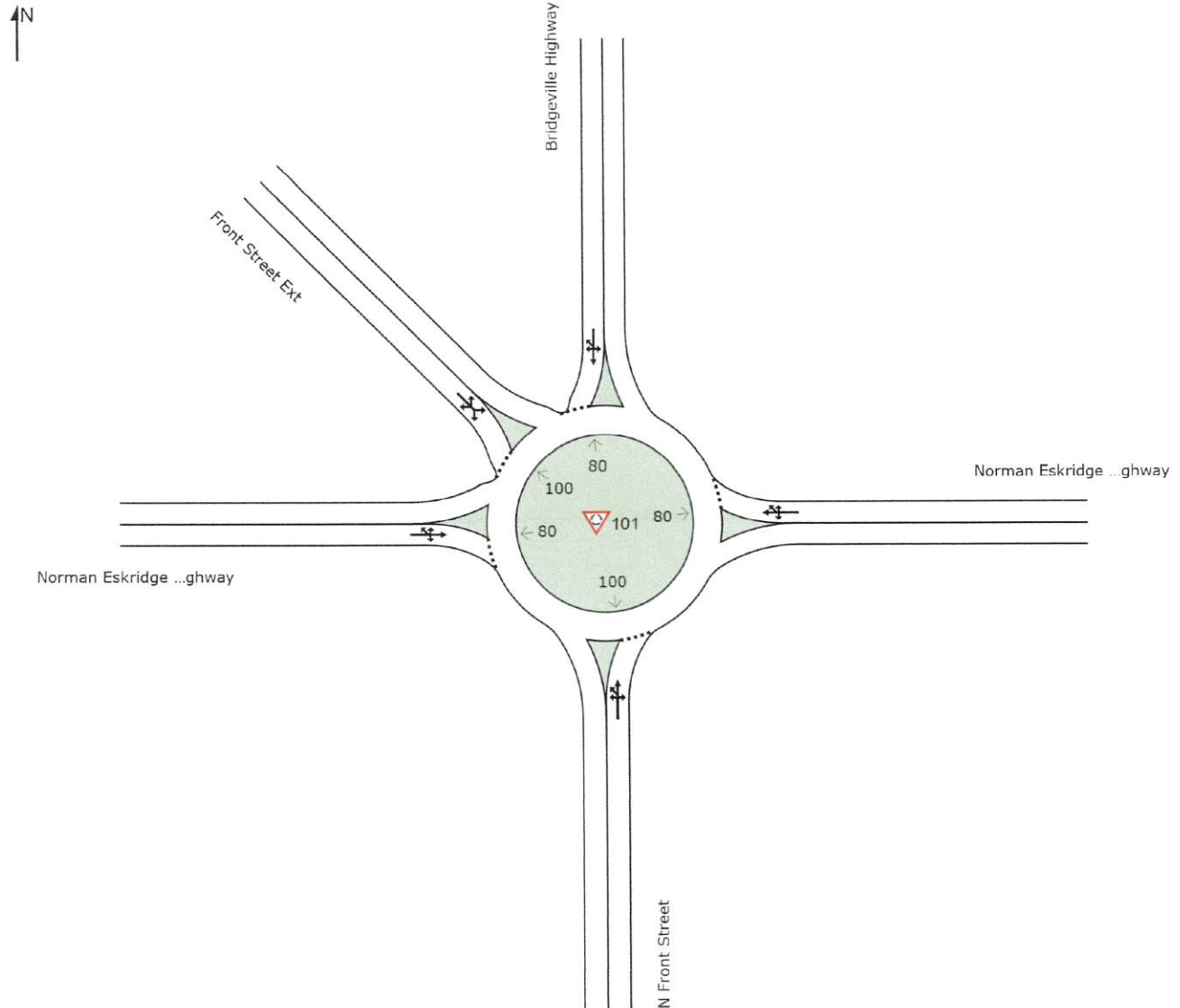
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SITE LAYOUT

 **Site: 101 [Norm Esk Hwy - PM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Elliptical shape restrictions apply to this Roundabout.

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MOVEMENT SUMMARY

 Site: 101 [Norm Esk Hwy - PM (5 leg) (Site Folder: General)]

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: N Front Street														
3	L2	46	2.0	50	2.0	0.619	19.3	LOS C	4.4	111.9	0.82	1.02	1.45	28.4
3a	L1	1	3.0	1	3.0	0.619	19.3	LOS C	4.4	111.9	0.82	1.02	1.45	28.1
8	T1	197	2.0	214	2.0	0.619	19.3	LOS C	4.4	111.9	0.82	1.02	1.45	28.4
18	R2	78	2.0	85	2.0	0.619	19.3	LOS C	4.4	111.9	0.82	1.02	1.45	27.8
Approach		322	2.0	350	2.0	0.619	19.3	LOS C	4.4	111.9	0.82	1.02	1.45	28.2
East: Norman Eskridge Highway														
1	L2	76	2.0	83	2.0	0.827	26.2	LOS D	14.4	366.8	0.97	1.46	2.29	26.1
6	T1	529	2.0	575	2.0	0.827	26.2	LOS D	14.4	366.8	0.97	1.46	2.29	26.1
16a	R1	1	3.0	1	3.0	0.827	26.2	LOS D	14.4	366.8	0.97	1.46	2.29	25.9
16	R2	1	2.0	1	2.0	0.827	26.2	LOS D	14.4	366.8	0.97	1.46	2.29	25.5
Approach		607	2.0	660	2.0	0.827	26.2	LOS D	14.4	366.8	0.97	1.46	2.29	26.1
North: Bridgeville Highway														
7	L2	29	2.0	32	2.0	0.810	29.0	LOS D	10.1	257.6	0.93	1.36	2.24	25.4
4	T1	210	2.0	228	2.0	0.810	29.0	LOS D	10.1	257.6	0.93	1.36	2.24	25.3
14	R2	241	2.0	262	2.0	0.810	29.0	LOS D	10.1	257.6	0.93	1.36	2.24	24.8
14b	R3	1	3.0	1	3.0	0.810	29.0	LOS D	10.1	257.6	0.93	1.36	2.24	24.6
Approach		481	2.0	523	2.0	0.810	29.0	LOS D	10.1	257.6	0.93	1.36	2.24	25.1
NorthWest: Front Street Ext														
7bx	L3	1	3.0	1	3.0	0.012	9.8	LOSA	0.0	1.0	0.72	0.66	0.72	31.7
7ax	L1	1	3.0	1	3.0	0.012	9.8	LOSA	0.0	1.0	0.72	0.66	0.72	31.1
14ax	R1	1	3.0	1	3.0	0.012	9.8	LOSA	0.0	1.0	0.72	0.66	0.72	31.1
14bx	R3	1	3.0	1	3.0	0.012	9.8	LOSA	0.0	1.0	0.72	0.66	0.72	30.3
Approach		4	3.0	4	3.0	0.012	9.8	LOSA	0.0	1.0	0.72	0.66	0.72	31.0
West: Norman Eskridge Highway														
5b	L3	1	3.0	1	3.0	0.854	25.7	LOS D	21.8	554.2	1.00	1.50	2.32	26.2
5	L2	214	2.0	233	2.0	0.854	25.7	LOS D	21.8	554.2	1.00	1.50	2.32	26.1
2	T1	526	2.0	572	2.0	0.854	25.7	LOS D	21.8	554.2	1.00	1.50	2.32	26.1
12	R2	1	3.0	1	3.0	0.854	25.7	LOS D	21.8	554.2	1.00	1.50	2.32	25.5
Approach		742	2.0	807	2.0	0.854	25.7	LOS D	21.8	554.2	1.00	1.50	2.32	26.1
All Vehicles		2156	2.0	2343	2.0	0.854	25.6	LOS D	21.8	554.2	0.95	1.38	2.16	26.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

 **Site: 101 [Norm Esk Hwy - PM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist]		ft	%	%
South: N Front Street													
Lane 1 ^d	350	2.0	565	0.619	100	19.3	LOS C	4.4	111.9	Full	1600	0.0	0.0
Approach	350	2.0		0.619		19.3	LOS C	4.4	111.9				
East: Norman Eskridge Highway													
Lane 1 ^d	660	2.0	798	0.827	100	26.2	LOS D	14.4	366.8	Full	1600	0.0	0.0
Approach	660	2.0		0.827		26.2	LOS D	14.4	366.8				
North: Bridgeville Highway													
Lane 1 ^d	523	2.0	646	0.810	100	29.0	LOS D	10.1	257.6	Full	1600	0.0	0.0
Approach	523	2.0		0.810		29.0	LOS D	10.1	257.6				
NorthWest: Front Street Ext													
Lane 1 ^d	4	3.0	373	0.012	100	9.8	LOS A	0.0	1.0	Full	1600	0.0	0.0
Approach	4	3.0		0.012		9.8	LOS A	0.0	1.0				
West: Norman Eskridge Highway													
Lane 1 ^d	807	2.0	944	0.854	100	25.7	LOS D	21.8	554.2	Full	1600	0.0	0.0
Approach	807	2.0		0.854		25.7	LOS D	21.8	554.2				
Intersection	2343	2.0		0.854		25.6	LOS D	21.8	554.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)													
South: N Front Street													
Mov.	L2	L1	T1	R2	Total	%HV							
From S To Exit:	W	NW	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
Lane 1	50	1	214	85	350	2.0	565	0.619	100	NA	NA		
Approach	50	1	214	85	350	2.0		0.619					
East: Norman Eskridge Highway													
Mov.	L2	T1	R1	R2	Total	%HV							
From E							Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		

To Exit:	S	W	NW	N							
Lane 1	83	575	1	1	660	2.0	798	0.827	100	NA	NA
Approach	83	575	1	1	660	2.0	0.827				
North: Bridgeville Highway											
Mov.	L2	T1	R2	R3	Total	%HV		Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL	SL
To Exit:	E	S	W	NW			veh/h	v/c	%	%	Lane No.
Lane 1	32	228	262	1	523	2.0	646	0.810	100	NA	NA
Approach	32	228	262	1	523	2.0	0.810				
NorthWest: Front Street Ext											
Mov.	L3	L1	R1	R3	Total	%HV		Deg.	Lane	Prob.	Ov.
From NW							Cap.	Satn	Util.	SL	SL
To Exit:	N	E	S	W			veh/h	v/c	%	%	Lane No.
Lane 1	1	1	1	1	4	3.0	373	0.012	100	NA	NA
Approach	1	1	1	1	4	3.0	0.012				
West: Norman Eskridge Highway											
Mov.	L3	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL	SL
To Exit:	NW	N	E	S			veh/h	v/c	%	%	Lane No.
Lane 1	1	233	572	1	807	2.0	944	0.854	100	NA	NA
Approach	1	233	572	1	807	2.0	0.854				
Total %HV Deg. Satn (v/c)											
Intersection	2343	2.0	0.854								

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: N Front Street Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Norman Eskridge Highway Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Bridgeville Highway Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
NorthWest Exit: Front Street Ext Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Norman Eskridge Highway Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

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QUEUE ANALYSIS

 **Site: 101 [Norm Esk Hwy - PM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start of Green (ft)		Cycle Average Queue (ft)		Queue Storage Ratio		Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%			
South: N Front Street															
Lane 1		0.619	1.000	15.0	45.0	111.9	NA	NA	47.6	86.3	0.03	0.07	0.0	NA	NA
Approach		0.619			45.0	111.9	NA	NA	47.6	86.3	0.03	0.07			
East: Norman Eskridge Highway															
Lane 1		0.827	1.000	64.2	147.6	366.8	NA	NA	122.0	221.2	0.09	0.23	0.0	NA	NA
Approach		0.827			147.6	366.8	NA	NA	122.0	221.2	0.09	0.23			
North: Bridgeville Highway															
Lane 1		0.810	1.000	47.3	103.7	257.6	NA	NA	106.9	193.9	0.06	0.16	0.0	NA	NA
Approach		0.810			103.7	257.6	NA	NA	106.9	193.9	0.06	0.16			
NorthWest: Front Street Ext															
Lane 1		0.012	1.000	0.0	0.4	1.0	NA	NA	0.3	0.6	0.00	0.00	0.0	NA	NA
Approach		0.012			0.4	1.0	NA	NA	0.3	0.6	0.00	0.00			
West: Norman Eskridge Highway															
Lane 1		0.854	1.000	91.9	223.0	554.2	NA	NA	146.2	265.2	0.14	0.35	0.0	NA	NA
Approach		0.854			223.0	554.2	NA	NA	146.2	265.2	0.14	0.35			
Intersection		0.854			223.0	554.2	NA	NA	146.2	265.2	0.14	0.35			

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Green (veh)		Cycle Average Queue (veh)		Queue Storage Ratio		Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%			
South: N Front Street															
Lane 1		0.619	1.000	0.6	1.8	4.4	NA	NA	1.9	3.4	0.03	0.07	0.0	NA	NA
Approach		0.619			1.8	4.4	NA	NA	1.9	3.4	0.03	0.07			
East: Norman Eskridge Highway															
Lane 1		0.827	1.000	2.5	5.8	14.4	NA	NA	4.8	8.7	0.09	0.23	0.0	NA	NA
Approach		0.827			5.8	14.4	NA	NA	4.8	8.7	0.09	0.23			
North: Bridgeville Highway															
Lane 1		0.810	1.000	1.9	4.1	10.1	NA	NA	4.2	7.6	0.06	0.16	0.0	NA	NA
Approach		0.810			4.1	10.1	NA	NA	4.2	7.6	0.06	0.16			
NorthWest: Front Street Ext															
Lane 1		0.012	1.000	0.0	0.0	0.0	NA	NA	0.0	0.0	0.00	0.00	0.0	NA	NA

Approach	0.012			0.0	0.0	NA	NA	0.0	0.0	0.00	0.00			
West: Norman Eskridge Highway														
Lane 1	0.854	1.000	3.6	8.8	21.8	NA	NA	5.8	10.4	0.14	0.35	0.0	NA	NA
Approach	0.854			8.8	21.8	NA	NA	5.8	10.4	0.14	0.35			
Intersection	0.854			8.8	21.8	NA	NA	5.8	10.4	0.14	0.35			

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	
South: N Front Street												
This approach does not have any continuous lanes												
East: Norman Eskridge Highway												
This approach does not have any continuous lanes												
North: Bridgeville Highway												
This approach does not have any continuous lanes												
NorthWest: Front Street Ext												
This approach does not have any continuous lanes												
West: Norman Eskridge Highway												
This approach does not have any continuous lanes												

Midblock Effective Detection Zone Length = 7 ft

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 Organisation: TOOLE DESIGN GROUP | Licence: PLUS / 1PC | Processed: Tuesday, June 20, 2023 11:31:18 AM
 Project: H:\50000\00DCA.00254.00_P_Norman Eskridge Hwy & N Front St\02 Previous Studies and existing Conditions Review\SIDRA\SIDRA Norman Eskridge & N Front St - US units.sip9

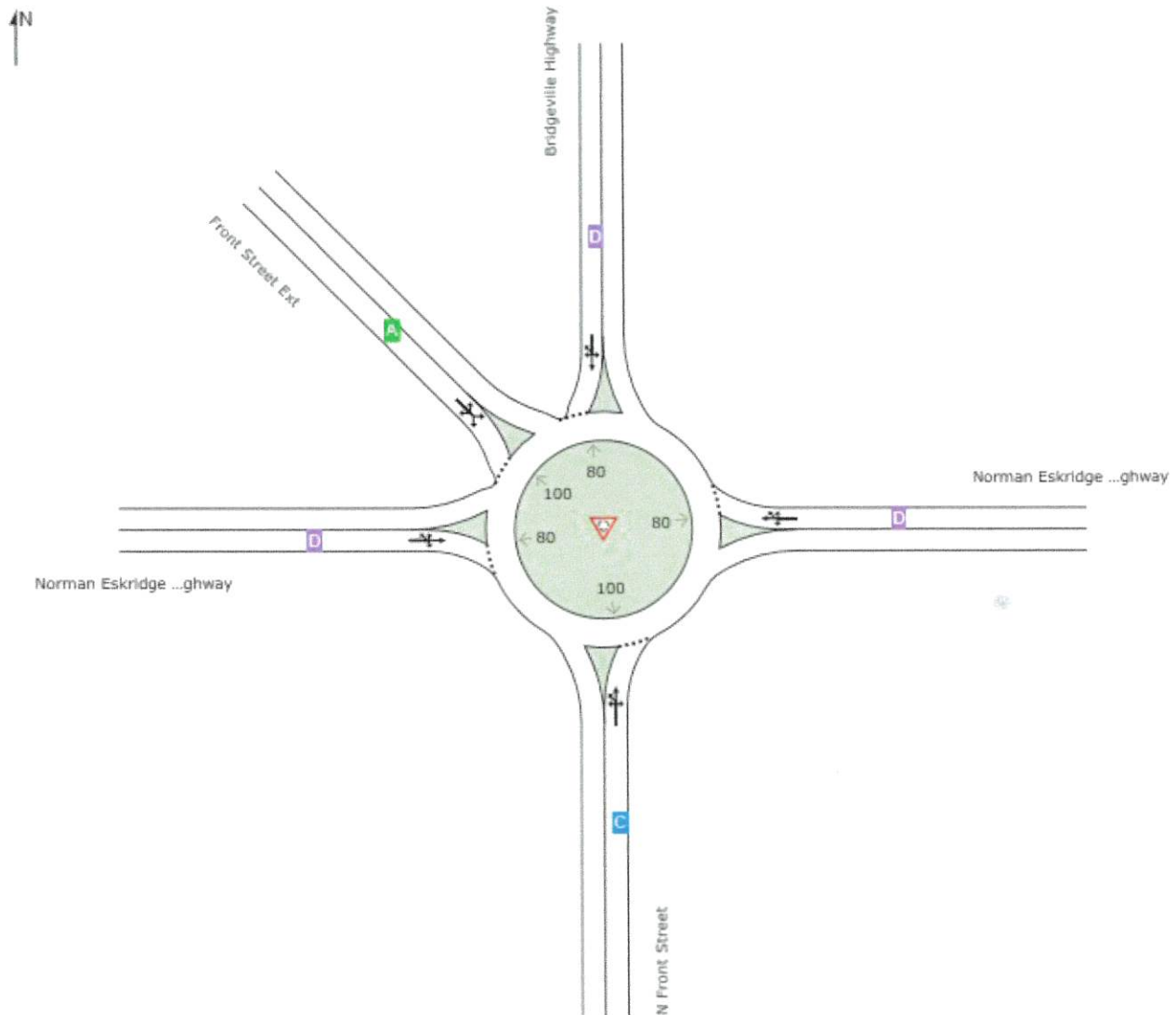
LANE LEVEL OF SERVICE

Lane Level of Service

 **Site: 101 [Norm Esk Hwy - PM (5 leg) (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

	Approaches					Intersection
	South	East	North	Northwest	West	
LOS	C	D	D	A	D	D



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: HCM Delay Formula (Geometric Delay is not included).

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Project: H:\500000\00DCA.00254.00_P_Norman Eskridge Hwy & N Front St\02 Previous Studies and existing Conditions Review\SIDRA\SIDRA Norman Eskridge & N Front St - US units.sip9

DEGREE OF SATURATION

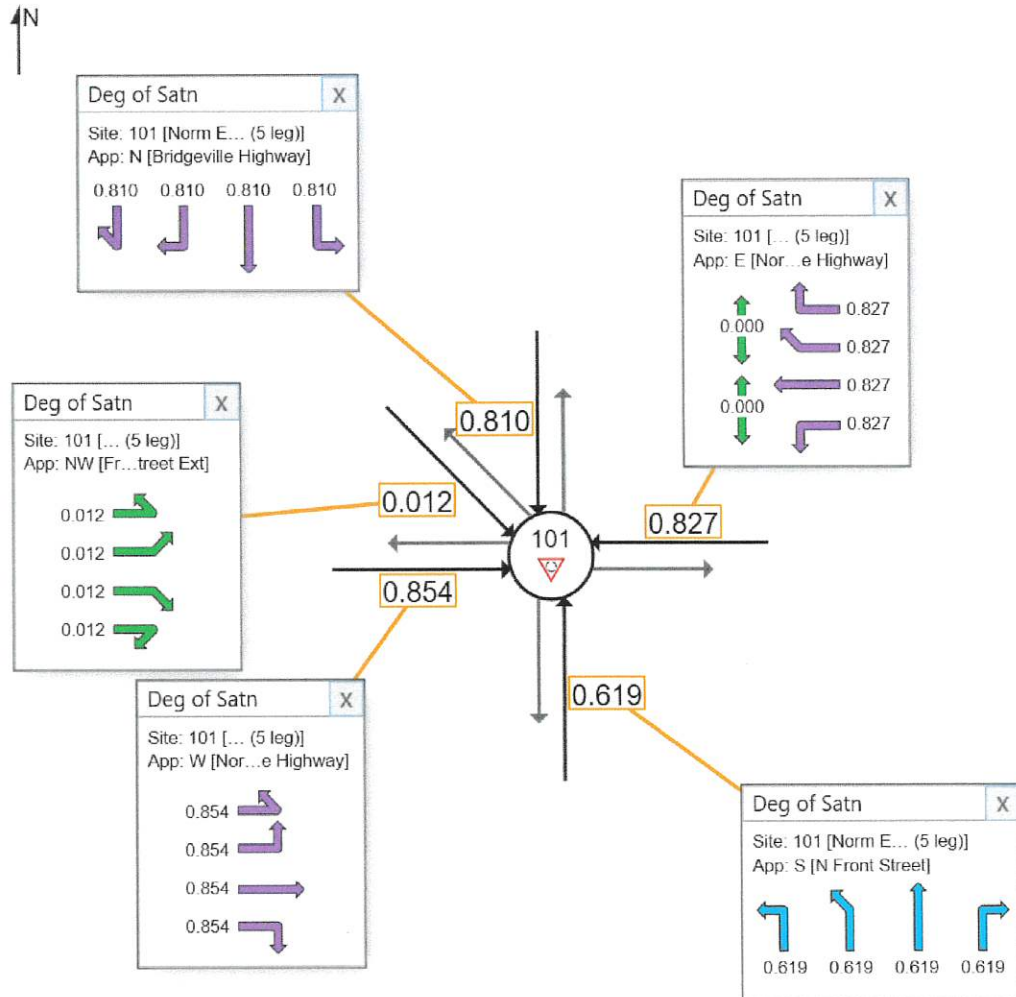
Ratio of Demand Volume to Capacity, v/c ratio per movement

 **Site: 101 [Norm Esk Hwy - PM (5 leg)] (Site Folder: General)]**

Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Colour code based on Degree of Saturation



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Project: H:\50000\00DCA.00254.00_P_Norman Eskridge Hwy & N Front St\02 Previous Studies and existing Conditions Review\SIDRA\SIDRA Norman Eskridge & N Front St - US units.sip9

QUEUE DISTANCE (AVERAGE)

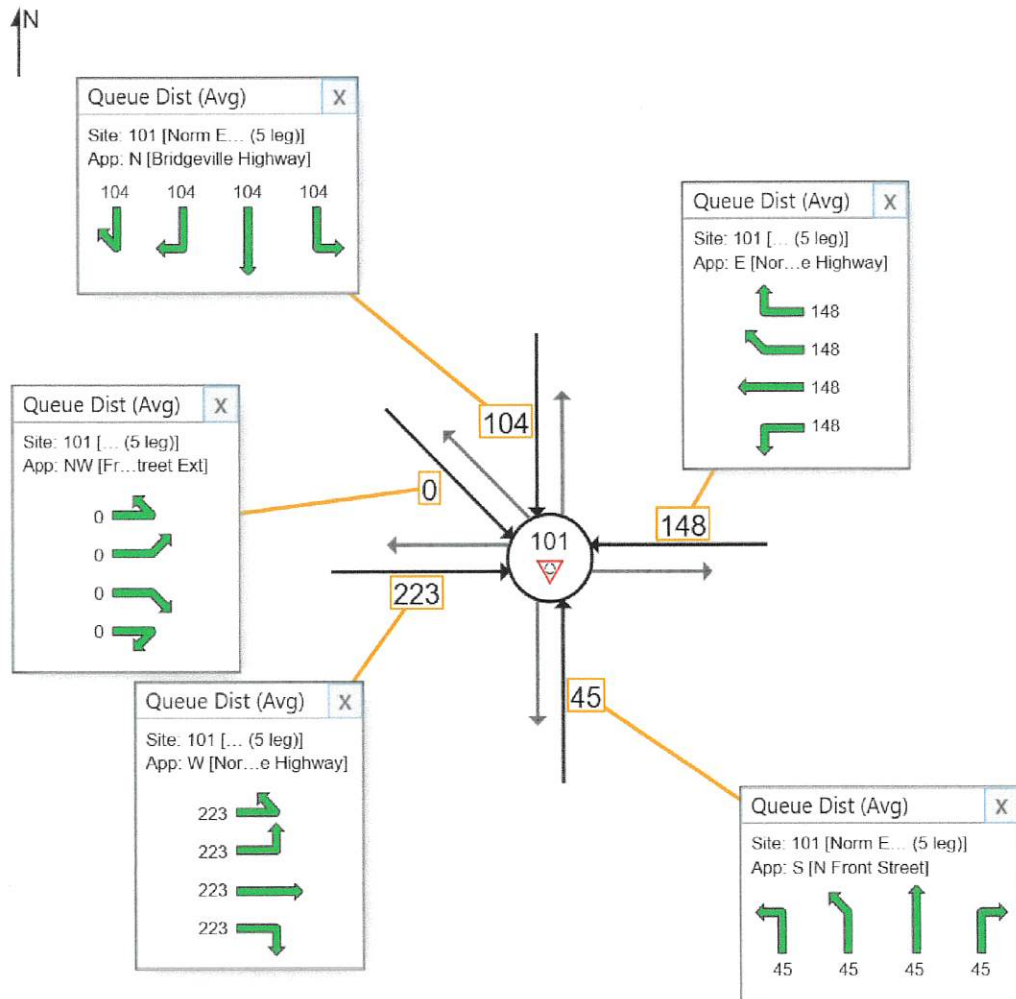
Largest Average Back of Queue Distance for any lane used by the vehicle movement (feet)

 Site: 101 [Norm Esk Hwy - PM (5 leg)] (Site Folder: General)]

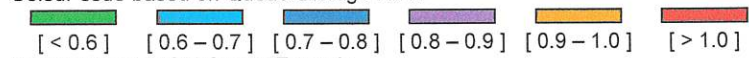
Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

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Project: H:\500000\00DCA.00254.00_P_Norman Eskridge Hwy & N Front St\02 Previous Studies and existing Conditions Review\SIDRA\SIDRA Norman Eskridge & N Front St - US units.sip9

QUEUE DISTANCE (PERCENTILE)

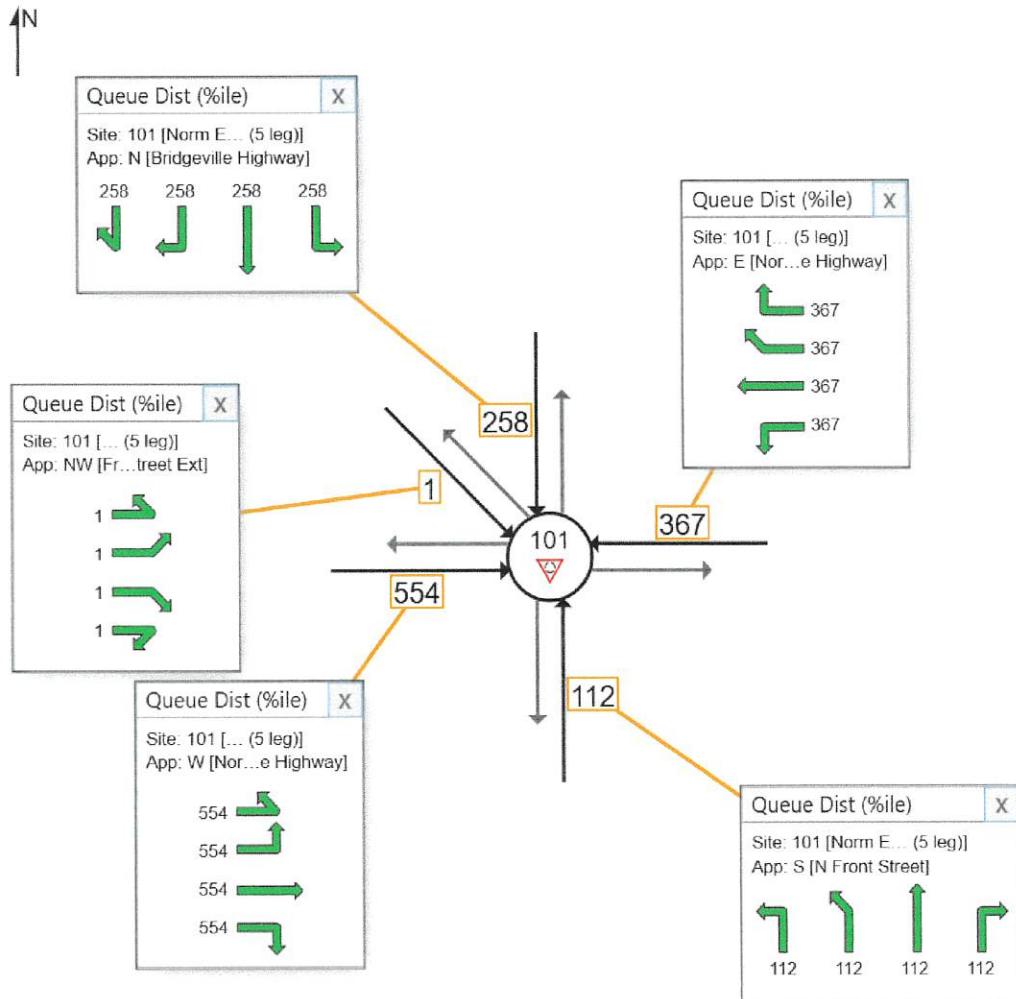
Largest 95% Back of Queue Distance for any lane used by the vehicle movement (feet)

 Site: 101 [Norm Esk Hwy - PM (5 leg)] (Site Folder: General)]

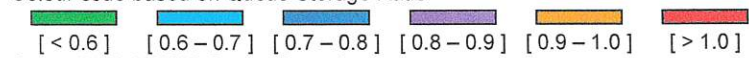
Norman Eskridge & N Front St
Site Category: Future Conditions 1
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Colour code based on Queue Storage Ratio

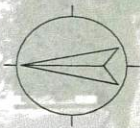


Queue Model: HCM Queue Formula.

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Project: H:\50000\00DCA.00254.00_P_Norman Eskridge Hwy & N Front St\02 Previous Studies and existing Conditions Review\SIDRA\SIDRA Norman Eskridge & N Front St - US units.sip9

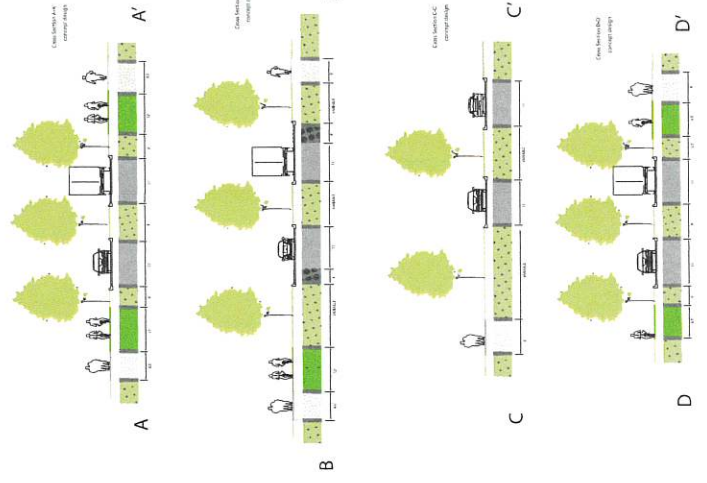


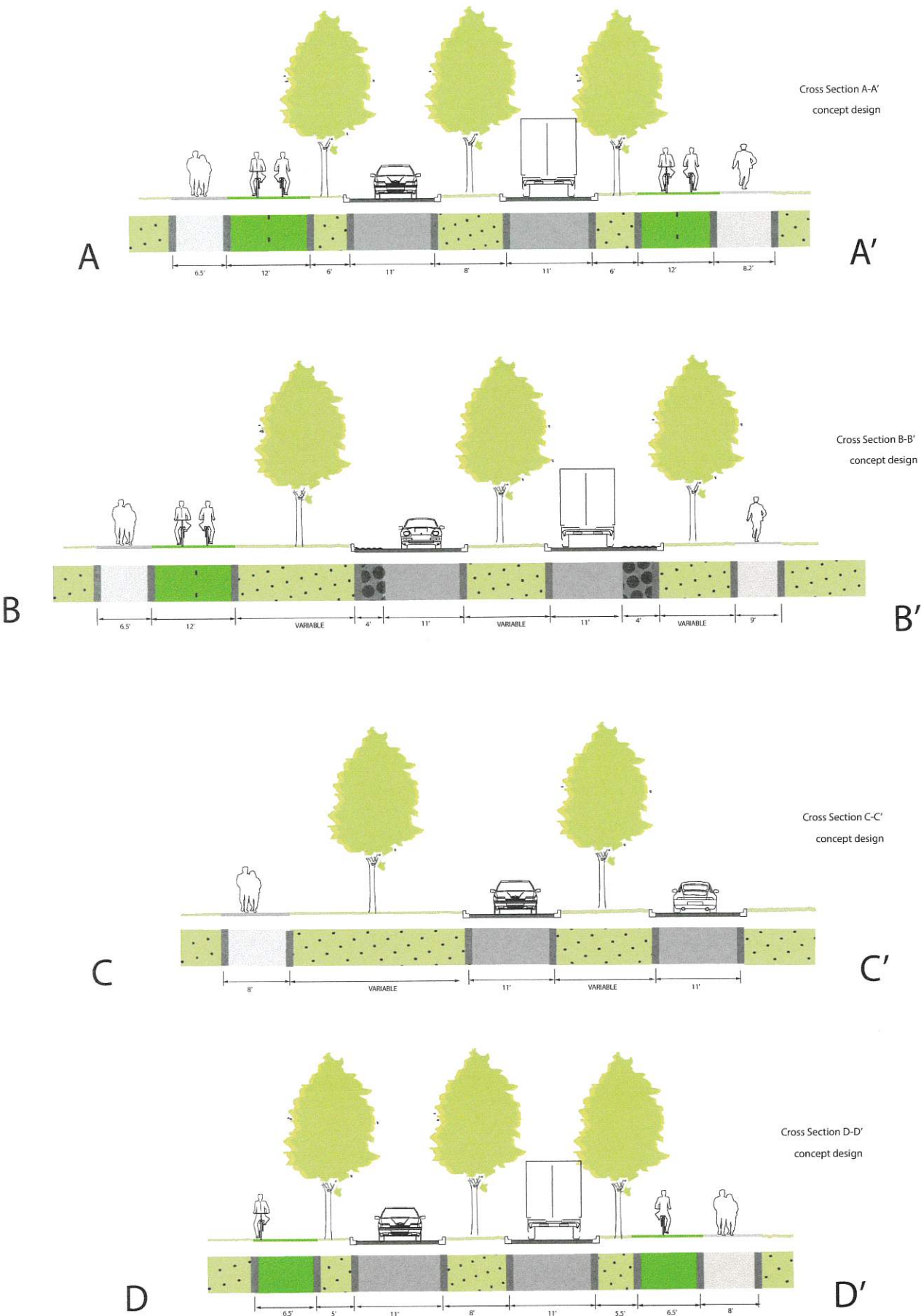
DE-20 / Bridgeville Hwy - N. Front Street Conceptual design Oval Roundabout

date: 20240119

- Car lane
- Apron/shoulder strip
- Bike lane
- Sidewalk
- Landscape
- Tree (row)

TOOLE dickvanveen
DESIGN STREET DESIGN PUBLIC SPACE







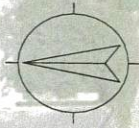
DE-20 / Bridgeville Hwy - N. Front Street Conceptual design Oval Roundabout

date: 20240119

TOOLE dickvanveen
DESIGN STREET DESIGN PUBLIC SPACE

- Car line
- Apenninable strip
- Bike line
- Sidewalk
- Landscape
- Tree (new)





DE-20 / Bridgeville Hwy - N. Front Street Conceptual design Oval Roundabout

date: 20240119



TOOLE dickvanveen
DESIGN STREET DESIGN PUBLIC SPACE





Google Earth

Image © 2024 Airbus

300 ft



AGREEMENT

This is an agreement, made and enters into this 1st day of MARCH, A.D. 1976, by and between the City of Seaford, a Municipal Corporation of the State of Delaware, part of the first part, hereinafter referred to as "City".

AND

Nanticoke Little League Association, Inc. hereinafter referred to as "Little League".

WHEREAS, the City of Seaford has an area in Williams Pond Park where a three field baseball complex can be built, including concession stands, rest rooms and announcement booths.

WHEREAS, the Mayor and Council of Seaford approve the building of this ball field complex, and will aid in the construction of the project.

WHEREAS, the Parties hereto agree to the following financing, construction procedures, rules, regulations, scheduling of games, responsibilities of the City and the responsibilities of the Board of Directors of Nanticoke Little League.

1. It should be understood by both Parties that Seaford City Parks exist for and are maintained for all residents of the City and surrounding area to use regardless of race, creed, color, sex or age in the pursuit of recreation, pleasure and relaxation. Also it is the City's intent to enforce the park rules and regulations fairly and promptly to insure the safety and satisfaction of all Park users and to protect the Park property.
2. Both Parties shall participate and agree on the design and layout of the three ball fields. One field shall be 300', one field 200', and one field 175'. All fields shall be lighted with modern quartz flood lighting to meet Little League standards.
3. Both Parties jointly agree to the fencing of the ball fields. First and third base lines shall be permanent chain link fencing and out fields shall be of removeable snow fencing.
4. Both Parties jointly agree there will be built behind each back-stop some type of booth to announce and control the games (this booth can be permanent or portable).
5. Both Parties jointly agree there will be a permanent concession stand and rest rooms built near the center of the ball field complex.
6. Both Parties agree any bleachers to serve these three fields shall be of the portable type.
7. Both Parties agree the Little League Managers are expected to control the conduct of the ball players.
8. Both Parties agree the conduct of the Public attending the games will be controlled by the Seaford Police on their regular tours. Should special Police be needed Mayor and Council and Board of Directors would need to agree on the expense of this special duty.
9. Both Parties agree that all permanent buildings, fixtures, or equipment placed in this Park at the expense of the Nanticoke Little League, ownership of these buildings, fixtures or equipment is transferred to the City of Seaford. This is necessary because a Private Corporation can not and should not

own permanent buildings, fixtures or equipment in a Public Park (this would include portable bleacher stands).

10. Both Parties agree the Little League shall have exclusive concession stand rights in the Park, with the City reserving the right to make special exceptions.

RESPONSIBILITIES OF THE CITY OF SEAFORD

1. Supply land area in Williams Pond Park to build the asforsaid ball field complex in accordance with Little League regulations and standards.

2. City of Seaford will supply and install all underground high voltage wiring and transformers to light these three fields at the cost of the City.

3. City of Seaford will supply all labor to build lighting system including setting of pole, anchors, guys, mounting of lighting fixtures, wiring of fixtures down the poles to a point approximately 20' above the ground level. All other secondary wiring from this point will be done by a licensed electrical contractor under contract with Little League.

4. City of Seaford will supply equipment and labor to maintain bulb replacement with bulb cost at the expense of Little League.

5. City of Seaford will run water and sewer lines to concession stand and rest rooms.

6. City of Seaford agree rest rooms must be open during all scheduled games and locked after all scheduled games. City agrees any damage occurring during scheduled games to rests rooms will be at the expense of both Parties.

7. City of Seaford agrees because this is a Public Park and built partly by State Funds, final designs and plans will be presented to State for their approval.

8. City of Seaford understands any problems or needed changes arising through the financing, building and use of this ball fields complex not covered under this agreement must be mutually resolved by other Parties.

9. Mayor and Council agree they are entering into this agreement understanding Williams Pond Park will be a home for the Little League program, however, it should also be understood the Little League program can in no way interfere with the Public's use of other areas of the Park.

10. City of Seaford reserves the right to control all parking and traffic flow in the Park.

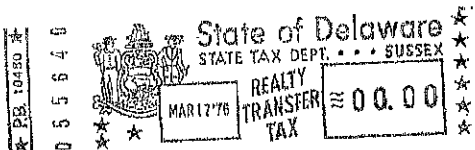
11. City of Seaford will maintain trash collection from within the Park area (this does not include garbage removal from the concession stand). Little League will make their own arrangements for garbage removal.

12. City of Seaford will cut and maintain all grass in the Parks (including out fields).

RESPONSIBILITIES OF THE LITTLE LEAGUE

1. Agree to pay prevailing electric rates on all three ball fields, concession stand, rest rooms, and announcement booths. Ball fields will be metered separately should other organizations want use of fields.
2. Agree to supply the City of Seaford with a schedule of all ball games including regular schedule, special or rain games.
3. Agree to run day to day operations of the Little League, including all phases.
4. Agree to supply funds and pay for all of the equipment to build ball fields, including poles, cross-arms, wire, switches, breakers, conduits, lighting fixtures, etc.
5. Agree to supply funds and pay for all materials, equipment and labor to build concession stand, rest rooms, announcement booths, and permanent fencing.
6. Agree to keep proper maintenance on all buildings, ball fields, including infield care and lining.
7. Agree to keep liability insurance to cover all phases of Little League operations to protect players, managers, referees, the Public and the City of Seaford.
8. Agree ball field complex plans must be submitted to State for approval.
9. Board of Directors, agree ball fields can be used by the Public as long as it does not interfere with Little League requirements.
10. Agree that any problem or change necessary arising through the financing, building, or use of this ball field complex not covered under this agreement must be resolved by both Parties.

IN WITNESS WHERE OF, the Parties hereto have hereunto caused this agreement to be executed by their proper Corporate Officers and their respective Corporate seals to be hereunto affixed, the day and year first above written.



THE CITY OF SEAFORD

BY

William G. Matus
MAYOR

BY

William W. Carey
SECRETARY

1976 MAR 17 PM 3 03

NANTICOKE LITTLE LEAGUE, INC.

BY

John Paul B...
PRESIDENT

BY

Nami C. ...
SECRETARY

NB#2
8/13/24

MEMORANDUM

TO: Charles Anderson, CM
FR: Bill Bennett, Director of Electric
RE: Meter Site Analyzer
DT: August 7, 2024

The City opened bids on August 7, 2024, from two suppliers for the above referenced solicitation.

Bidder	Unit Price	Delivery Time
TESCO	\$33,001.56	2 Weeks
RADIAN RESEARCH, INC.	\$35,781.91	3-6 Weeks
RADIAN RESEARCH, INC.	\$45,159.41	3-6 Weeks

It is my recommendation to award the Meter Site Analyzer Bid to TESCO in the total amount of \$33,001.56. TESCO was the lowest bidder and had the shortest delivery time.

Please present this information to the Mayor and Council at their August 13, 2024 meeting for their consideration.

Please contact me with any questions.

Thank you.



ORDINANCE #2024-04

NB#4
7/23/24
OB#1
8/13/24

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF SEAFORD, an ordinance to amend
Chapter 8, of the Municipal Code of Seaford, Delaware relating to "Curfew", in the manner following,
to wit:

Chapter 8, of the Municipal Code of Seaford, Delaware is hereby amended by adding Article 10
Curfew, to read as shown on the following pages.

00/00/2024	Date of First Reading
00/00/2024	Date of Second Reading & Adoption
00/00/2024	Date of Advertisement
00/00/2024	Date the Ordinance is Effective

CITY OF SEAFORD

By: _____
Mayor

Witness: _____

Attest: _____
City Manager

Article 10 - CURFEW

[Amended on --/--/2024 by Ordinance #2024-04]

§ 8.10.1 Definitions.

For the purposes of this chapter, the following definitions shall apply:

EMERGENCY - An unforeseen combination of circumstances or the resulting state that calls for immediate action. The term includes but is not limited to, a fire, natural disaster or automobile accident, or any situation requiring immediate action to prevent serious bodily injury or loss of life.

ESTABLISHMENT - Any privately owned place of business operated for a profit to which the public is invited, including but not limited to, any place of amusement or entertainment.

JUVENILE - Any unemancipated person 17 years or less of age.

OPERATOR - Any individual, firm, association, partnership or corporation operating, managing or conducting any establishment. The term includes the members or partners of any association or partnership and the officers of a corporation.

PARENT - Any person having legal custody or a juvenile:

1. As a natural or adoptive parent;
2. As a legal guardian;
3. As a person who stands in loco parentis; or
4. As a person to whom legal custody has been given by court order.

PUBLIC PLACE - Any place to which the public or a substantial group of the public has access and includes, but is not limited to, streets, common areas of schools, shopping centers, parking lots, parks, playgrounds, transportation facilities, theaters, restaurants, shops, bowling alleys, taverns, cafes, arcades, and similar areas that are open to the use of the public. As a type of public place, a "street" is a way or place, of whatever nature, open to the use of the public as a matter of right for purposes of vehicular travel or in the case of a sidewalk thereof for pedestrian travel. "Street" includes that legal right-of-way, including, but not limited to, the cartway of traffic lanes, the curb and the sidewalks, whether paved or unpaved, and any grass plots or other grounds found within the legal right-of-way of a street.

REMAIN - To stay behind, to tarry and to stay unnecessarily in a public place, including the congregating of groups (or of interacting juveniles) totaling four or

more persons in which any juvenile involved would not be using the streets for ordinary or serious purposes such as mere passage or going home, or to fail to leave the premises of an establishment when requested to do so by a police officer or the operator of an establishment. To implement this provision with additional precision and precaution, numerous exceptions are expressly defined in this chapter. More and more exceptions become available with a juvenile's increasing years and advancing maturity as appropriate to the interest of reasonable regulation.

TIME OF NIGHT - As referred to herein is based upon the prevailing standard of time, whether Eastern Standard time or Eastern daylight savings time, generally observed at that hour by the public in the City of Seaford; prima facie, the time then observed in the City of Seaford administrative offices.

CITY - The City of Seaford, Sussex County, Delaware.

YEARS OF AGE - Continues from one birthday to, but not including the day of the next, making it clear that 15 or less years of age is herein treated as equivalent to the phrase "under 16 years of age."

§ 8.10.2 Curfew for juveniles.

Curfew shall be implemented as necessary by executive order of the Mayor during the hours below:

A. Eleven p.m. through Five a.m. (Monday – Sunday).

§ 8.10.3 Exceptions.

The following shall constitute valid exceptions to the operation of this chapter.

A. Accompanied by parent: when a juvenile is accompanied by a parent of such juvenile.

B. Accompanied by authorized adult: when a juvenile is accompanied by an adult authorized by a parent of such juvenile to take said parent's place in accompanying said juvenile for a designated period of time and within a specified area for a specific purpose.

C. Emergency: when a juvenile is assisting in an emergency, including, by way of example and not in limitation, responding as a member of a volunteer fire company to a fire company or paramedic call.

D. First Amendment rights: when a juvenile is exercising First Amendment rights protected by the United States Constitution, such as free exercise of religion, freedom of speech and the right of assembly, by first delivering to the person designated by the Chief of Police to receive such information a written

communication, signed by the juvenile and countersigned by a parent of the juvenile with their home address and telephone number, specifying when, where and in what manner the juvenile will be in a public place during hours when this chapter is applicable to said juvenile in the exercise of a First Amendment right specified in such communication.

- E.** Reasonable necessity: in case of reasonable necessity for the juvenile remaining in a public place but only after the juvenile's parent has communicated to the Chief of Police or the person designated by the Chief of Police to receive such notifications the facts establishing the reasonable necessity relating to a specified public place at a designated time for a described purpose, including points of origin and destination. A copy of the communication, or of the police record thereof, duly certified by the Chief of Police to be correct, with an appropriate notation of the time it was received and of the names and addresses of the parent and juvenile, shall be admissible evidence.
- F.** Returning directly home: without detour or stop within one hour of the end of a school, religious or recreational activity supervised by adults and sponsored by the City of Seaford, a civil organization or a voluntary association that takes responsibility for the juveniles or a place of public entertainment, such as a movie, play or sporting event.
- G.** Special permits (individual): when authorized by a special permit from the City of Seaford, carried on the person of the juvenile thus authorized, as follows:

 - 1.** When necessary, night-time activities of the juvenile may be inadequately provided for by other provisions of this chapter, then recourse may be had to the Chief of Police, either for a regulation as provided in Subsection (H) or for a special permit as the circumstances warrant.
 - 2.** Upon a finding of undue hardship and reasonable necessity for the use of a public place to the extent warranted by a written application signed by a juvenile and by a parent of the juvenile, if feasible, stating:

 - a)** The name, age and address of the juvenile;
 - b)** The name, address and telephone number of a parent thereof;
 - c)** The height, weight, sex, color of eyes and hair and other physical characteristics of the juvenile;
 - d)** The necessity that requires the juvenile to remain upon a public place during the curfew hours otherwise applicable, and the undue hardship that will result if such permit is not granted;
 - e)** The public place; and

- f) The beginning and ending of the period of time involved by date and hour. The Chief of Police may grant a permit in writing for the juvenile's use of a public place at such hours as in the opinion of the Chief of Police may reasonably be necessary and consistent with the purposes of this chapter. In an emergency this may be handled by prior telephone or other effect communication, with a corresponding record being made contemporaneously by the Chief of Police or by the person designed by the Chief of Police to act on his or her behalf in an emergency, at the police station.
- H. Special regulation (group). When authorized by regulation issued by the Chief of Police in other similar cases of reasonably necessity, similarly, handled but adapted to reasonably necessary night-time activities of more juveniles that can readily be dealt with on an individual special basis, but only where such juveniles will be under the active supervision of adults responsible for such juveniles. Normally such regulation by the Chief of Police permitting use of public places should be issued sufficiently in advance to permit appropriate publicity through news media and through other agencies such as the schools, and shall define the activity, the scope of the use of the public places permitted, the period of time involved, not to extend more than one hour beyond the time for termination of the activity, and the reason for finding that the regulation is reasonably necessary and is consistent with the purposes of this chapter.
- I. Employment necessity: when the juvenile is legally employed, going to or returning home from employment and carries a certified card of employment, renewable each calendar month when the current facts so warrant, dated or reissued not more than 45 days previously, signed by the parent and employer and briefly identifying the juvenile, the addresses and telephone numbers of the juvenile's home and of the juvenile's place of employment and of the juvenile's employment. The City of Seaford shall prepare a form to be used by employers for the purposes of this subsection.
- J. Operator of establishment: in the case of an operator of an establishment, when the operator has notified the police that a juvenile was present on the premises of the establishment during curfew hours and refused to leave.

§ 8.10.4 Parental responsibility.

- A. The foregoing exceptions to the operation of this chapter shall act only to create a waiver of enforcement and affirmative defense(s) to such enforcement. By authorizing such exceptions, neither the City of Seaford nor any member of the Police Department shall assume any affirmative obligation or duty to supervise the well-being of any juvenile acting pursuant to such authorized exception.

- B. It shall be unlawful for a parent having legal custody of a juvenile knowingly to permit or by inefficient control to allow a juvenile to remain in any public place under circumstances not constituting an exception to, or otherwise beyond the scope of, this chapter. The term "knowingly" includes knowledge that a parent should reasonably be expected to have concerning the whereabouts of a juvenile in that parent's legal custody. This requirement is intended to hold a negligent or careless parent up to a reasonable community standard of parental responsibility through an objective test. It shall, therefore, be no defense that a parent was completely indifferent to the activities or conduct or whereabouts of such juvenile.
- C. It shall be unlawful for any parent to "knowingly" (as defined above) provide any false authorization, information, or certification, written or verbal, to the Seaford Police Department in order to obtain an exception to the operation of this chapter under § 8.10.3 hereof.

§ 8.10.5 Operator responsibility.

It shall be unlawful for any operator of an establishment to knowingly permit a juvenile to remain at the establishment under circumstances not constituting an exception to, or otherwise beyond the scope of this chapter. The term "knowingly" includes knowledge that an operator should reasonably be expected to have concerning the patrons of the establishment. The standard for "knowingly" shall be applied through an objective test: whether a reasonable person in the operator's position should have known that the patron was a juvenile in violation of this chapter.

§ 8.10.6 Enforcement procedures.

- A. If a police officer reasonably believes that a juvenile is in a public place in violation of this chapter, the officer shall notify the juvenile that he or she is in violation of this chapter and shall require the juvenile to provide his or her name, address and telephone number and how to contact his or her parent or guardian. In determining the age of the juvenile and in the absence of convincing evidence such as a birth certificate or State of Delaware Identification Card, a police officer, in the first instance of violation of this chapter, shall use his or her best judgment in determining age.
- B. The police officer shall issue the juvenile a written warning that the juvenile is in violation of this chapter and order the juvenile to go promptly and directly home. The Chief of Police shall send the parent or guardian of the juvenile written notice of the violation pursuant to § 8.10.6(F).
- C. The police officer may deliver to a parent or guardian thereof a juvenile under appropriate circumstances; for example, a juvenile of tender age, near home, whose identity and address may readily be ascertained or are known.

- D. Notwithstanding Section B of this section, when a juvenile has received one previous written warning for violation of this chapter; or a police officer has reasonable grounds to believe that the juvenile has engaged in delinquent conduct, the procedure shall then be to take the juvenile to the police station where a parent or guardian shall be questioned. This is intended to permit ascertainment, under Constitutional safeguards, of relevant facts, and to centralize responsibility in the person designated there and then on duty for accurate, effective, fair, impartial and uniform enforcement and recording, thus, making available experienced personnel and access to information and records.
- E. When a parent or guardian, immediately called, has come to take charge of the juvenile, and the appropriate information has been recorded, the juvenile shall be released to the custody of such parent or guardian. If the parent or guardian cannot be located or fails to take charge of the juvenile, then the juvenile shall be released to the juvenile authorities, except to the extent that in accordance with police regulations, approved in advance by the juvenile authorities, the juvenile may temporarily be entrusted to an adult, neighbor or other person who will on behalf of a parent or guardian assume the responsibility of caring for the juvenile pending the availability or arrival of a parent or guardian.
- F. In the case of a first violation of this chapter by a juvenile, the Chief of Police shall by certified mail send to a parent or guardian written notice of the violation with a warning that any subsequent violation will result in full enforcement of this chapter, including enforcement of the parental responsibility and applicable penalties.
- G. For the first violation of this chapter by an operator of an establishment who permits a juvenile to remain on the premises, a police officer shall issue a written notice of the violation with a warning that any subsequent violation will result in full enforcement of this chapter, including enforcement of operator responsibility and of applicable penalties.
- H. In any event the police officer shall, within 24 hours, file a written report with the Chief of Police or shall participate to the extent of the information for which he or she is responsible in the preparation of a report on curfew violation. It is not the intention of this section to require extensive reports that will prevent police officers from performing their primary police duties. The reports shall be as simple as is reasonably possible and may be completed by police departmental personnel other than sworn police officers.

§ 8.10.7 Violations and penalties.

- A. Parents.

1. If after the warning notice pursuant to § 8.10.6(F) of a first violation by a juvenile, a parent violates § 8.10.4 (in connection with a second violation by the juvenile), this shall be treated as a first offense by the parent. For the first offense by a parent, the fine shall be \$50, and for each subsequent offense by a parent the fine shall be increased by an additional \$25, e.g., \$75 for a second offense, \$100 for a third offense. Any court of competent jurisdiction, upon finding a parent guilty, shall sentence the parent to pay this fine, the victim's compensation fund assessment and the cost of prosecution.
 2. The parent or legal guardian having custody of a juvenile subject to this section shall be liable for all costs incurred by the City of Seaford for providing personnel to remain in the company of a juvenile who has been detained as a curfew violator if the parent or guardian does not pick up the juvenile within one hour after receiving notice from the City of Seaford that the City of Seaford is detaining the juvenile for a curfew violation. The amount to be paid by the parent or guardian shall be based upon the hourly wage of the City of Seaford employee who is assigned to remain with the juvenile plus the cost of benefits for that employee.
 3. The parent or legal guardian having custody of a juvenile subject to this section shall be liable for any fine or condition of restitution or reparation imposed by a court upon a curfew violator, provided that the curfew violator has not paid the fine or made restitution or reparation within the time order by the Court, and further provided that the parent or guardian has been made a party defendant in all enforcement proceedings against the curfew violator and shall be served with all citations, summons, complaints, notices and other documents required to be served on the curfew violator defendant.
- B. Juveniles.** Any juvenile who shall violate any of the provisions of this chapter more than three times shall be reported by the Chief of Police to the juvenile authorities as a juvenile in need of supervision, and the Chief of Police may proceed to file such charges with the courts as he or she may deem appropriate.
- C. Operators.** If, after the warning notice pursuant to § 8.10.6 of violation of this chapter, an operator of an establishment violates § 8.10.5 a second time, this shall be treated as a first offense by the operator. For the first offense by an operator, the fine shall be \$50, and for each subsequent offense by an operator the fine shall be increased by an additional \$50, e.g., \$100 for a second offense, \$150 for a third offense.
- D. False certification.** Any parent or guardian convicted of knowingly providing any false authorization, information, or certification, written or verbal, to the City of Seaford Police Department in violation of § 8.10.4(C) shall pay a fine of \$50 for the first offense, and for each subsequent offense, the fine shall be

increased by an additional \$50 plus the victim's compensation fund assessment and costs.

§ 8.10.8 Severability.

Should any section, subsection, sentence, clause, or phrase of this Article be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of this Article in its entirety or of any part thereof other than that so declared to be invalid.

§ 8.10.9 Continuing evaluation.

The Mayor and City Council shall continue its evaluation and updating of this chapter through methods, including but not limited to:

- A. Within six months after the implementation of this chapter, the Chief of Police shall provide the Mayor and City Council with a report concerning the effect of this chapter on crimes committed by and against juveniles, and of the number of warnings issued and arrests of juveniles, parents, guardians, and operators hereunder, and such other information as the Mayor and City Council of Seaford may request.
- B. On a regular basis, the Mayor and City Council of Seaford shall receive informal reports of all exceptional cases hereunder or reasonable necessity, the notices of school and other activities, the special permits and the regulations authorized above and the advisory opinions for consideration by the Mayor and City Council in further updating and continuing evaluation of this chapter.

§ 8.10.10 Notice.

Notice of the existence of this chapter and of the curfew regulations established by it shall be posted in, on or about such public or quasi-public places as may be determined by the Chief of Police and City Manager of Seaford in order that the public may be constantly informed of the existence of this chapter and its regulations.

§ 8.10.11 through § 8.10.99 RESERVED