



## GREEN INTERNATIONAL AFFILIATES, INC.

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**To:** Douglas McLean, Principal Planner  
City of Cranston  
869 Park Avenue  
Cranston, RI 02910

**From:** Corinne Tobias, PE  
Project Manager  
Transportation Planning Group  
Green International Affiliates, Inc.  
100 Ames Pond Road, Suite 200  
Tewksbury, MA 01886

**Cc:** Derek L. Hug, PE., PTOE  
Project Manager  
Pare Corporation

**Date:** May 3, 2023  
**Project Name:** Cranston School Expansion TIAS  
**Project Number:** Green No. 21075  
**Subject:** Response to Transportation Peer Review Comments

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This memorandum summarizes our answers to the Traffic Engineering Peer Review for the proposed expansion of the Achievement First Illuminar Mayoral Academy facility, prepared by Pare Corporation, dated April 11, 2023.

Comment 1: *“Introduction and Executive Summary Section: Standard practice for traffic studies in Rhode Island dictates a design year of five years from the study date, which would be 2028.”*

Response: It should be noted that the turning movement counts were taken in the existing year of 2022. Green projected the existing volumes to 2028 for a more conservative traffic analysis. The revised No-Build and Build volumes and analysis are attached, and the revised LOS table is provided later in the response letter.

Comment 2: *“Study Roadway Network Section: Appears accurately described.”*

No Response Necessary

Comment 3: *“School Traffic Circulation Section: It was noted that during Pare’s visit to the site, none of the school buses went behind the building. Instead, they double-stacked near the southeastern corner of the building. Pare noted 11 school buses and five vans during both the morning arrival and afternoon dismissal.*

*In addition, it was noted that there were cones placed across the connection between the school’s south lot and the Texas Roadhouse lot during the afternoon dismissal. It was also noted that the cones were then moved (presumably by a parent) to allow for parents to egress through the Texas Roadhouse lot, although few did. Several parents were observed parking in the Texas Roadhouse lot, walking to the school to pick up their child/children, and then walking back to their car to avoid parking in one of the school lots.”*

Response: Green received an updated site plan from Kaestle Boos Associates (KBA) showing how the property lines extend further out from both sides of the main driveway to open up 35 additional parking spaces for staff parking, in addition, the play area the north side of the school has been striped for 19 additional parking spaces for parent pick-up/drop-off. Finally, the original parent pick-up/drop-off spaces have now been swapped with a staff parking lot. As a result, there are now 112 staff parking spaces, 6 additional handicap spaces, and 65 spaces for the parent pick-up/drop-off in addition to the queue space available. The parent spaces are also located much closer to the school entrance for easier

access. This should eliminate the need for parents to resort to the Texas Roadhouse Lot as a backup area to park in.

Comment 4: "School Parking Section: Appears accurately described. Pare did not conduct a count of staff cars, but based on observations, this number appears reasonable.

No Response Necessary

Comment 5: "Traffic Volumes Section: No comment."

No Response Necessary

Comment 6: "Public Transportation Network Section: No comments."

No Response Necessary

Comment 7: "Crash History Section: No comments."

No Response Necessary

Comment 8: "No Build Traffic Volumes Section

- a. *Between 2010 and 2020, Cranston's population grew at an average rate of 0.3 percent per year. The 1% per year background growth factor appears appropriate."*
- b. *The methodology utilized to determine the anticipated increase in site trips appears appropriate and should yield a conservative future analysis.*
- c. *As noted in Comment 1, the design year for the project should be 2028.*
- d. *Assuming the 875 students anticipated is the maximum allowed at the facility under existing permits, it is acceptable to include the student increase as part of the background growth and in the no-build traffic volumes."*

Response:

- c. Green updated the design year for the project from 2023 to 2028. Updated figures for the No Build and Build traffic volumes are attached. Revised LOS summary table is shown below.

Comment 9: "Intersection Capacity Analysis Section

- a. *The capacity analyses appear to have been conducted within commonly accepted professional standards.*
- b. *It is noted that there is a significant drop in LOS for eastbound vehicles between existing and no-build conditions due to the addition of the anticipated traffic for the Trolley Barn Plaza development.*
- c. *Pare concurs that the addition of additional athletic facilities for the existing student body is not anticipated to generate additional trips during the morning arrival peak or afternoon dismissal peak. Any increases in traffic volumes will be for sporting events or other special events that will primarily be outside of these times."*

Response:

- b. Green updated the capacity analysis to reflect the new future design year of 2028. The LOS degrades between existing, no-build, and build years, but the intersections do not perform worse than an overall LOS 'D,' with none of the approaches operating at LOS F.' The analysis output files are attached and the capacity analysis tables are shown in below for the morning and afternoon peak hours:

**Table 1 – Summary of Level of Service Analysis Period: Weekday AM Peak Hour**

	2022 Existing Conditions					2028 No-Build Conditions					2028 Build Conditions				
	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)
<b>Exit 2B Off-Ramp/School Driveway at Garfield Avenue</b>															
Iluminar School Driveway EB L	21.7	C	0.69	58	91	39.9	D	0.89	144	153	39.9	D	0.89	144	153
Iluminar School Driveway EB R	2.4	A	0.16	0	8	3.7	A	0.18	10	17	3.7	A	0.18	10	17
Exit 2B Off Ramp WB LT	10.6	B	0.47	66	160	11.3	B	0.47	110	199	11.3	B	0.47	110	199
Exit 2B Off Ramp WB R	2.4	A	0.19	0	25	2	A	0.20	0	26	2	A	0.20	0	26
Garfield Avenue NB LT/T	14	B	0.24	21	40	20.5	C	0.28	39	65	20.5	C	0.28	39	65
Garfield Avenue SB T/TR	15.5	B	0.62	63	94	25.4	C	0.75	138	181	25.4	C	0.75	138	181
<i>Overall Intersection</i>	<i>13.1</i>	<i>B</i>				<i>20.9</i>	<i>C</i>				<i>20.9</i>	<i>C</i>			
<b>Cranston Street at Garfield Avenue</b>															
Cranston Street EB L	--	--	--	--	--	11.6	B	0.28	27	57	11.6	B	0.28	27	57
Cranston Street EB TR	23.9	C	0.74	274	321	68	E	1.04	407	446	68	E	1.04	407	446
Cranston Street WB L	45.8	D	0.79	176	253	41.9	D	0.85	157	317	41.9	D	0.85	157	317
Cranston Street WB T	3.5	A	0.22	37	62	--	--	--	--	--	--	--	--	--	--
Cranston Street WB TR	--	--	--	--	--	17.5	B	0.42	137	181	17.5	B	0.42	137	181
Garfield Avenue NB L	47.1	D	0.63	84	138	--	--	--	--	--	--	--	--	--	--
Garfield Avenue NB LT	--	--	--	--	--	39.8	D	0.71	110	180	39.8	D	0.71	110	180
Garfield Avenue NB R	10.9	B	0.69	0	75	12.5	B	0.46	116	186	12.5	B	0.46	116	186
Trolley Barn Driveway SB LTR	--	--	--	--	--	17.5	B	0.38	59	107	17.5	B	0.38	59	107
<i>Overall Intersection</i>	<i>21.8</i>	<i>C</i>				<i>40.2</i>	<i>D</i>				<i>40.2</i>	<i>D</i>			
<b>Abbreviations:</b>						<b>Notes:</b>									
EB = Eastbound    L = Left    S = Seconds						Delay = Average delay per vehicle (measured in seconds)									
WB = Westbound    T = Through    FT = Feet						95th Q = 95th percentile queue length (measured in feet), assumes 25 feet per vehicle									
NB = Northbound    R = Right    LOS = Level of Service															
SB = Southbound    v/c = Volume-to-Capacity Ratio															

**Table 2 – Summary of Level of Service Analysis Period: Weekday PM Peak Hour**

	2022 Existing Conditions					2028 No-Build Conditions					2028 Build Conditions				
	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)	Delay (S)	LOS	V/C	50th Q (FT)	95th Q (FT)
<b>Exit 2B Off-Ramp/School Driveway at Garfield Avenue</b>															
Iluminar School Driveway EB L	21.7	C	0.69	58	91	49.8	D	0.94	169	87	49.8	D	0.94	169	87
Iluminar School Driveway EB R	2.4	A	0.16	0	8	5.5	A	0.22	29	20	5.5	A	0.22	29	20
Exit 2B Off Ramp WB LT	10.6	B	0.47	66	160	10.9	B	0.51	146	227	10.9	B	0.51	146	227
Exit 2B Off Ramp WB R	2.4	A	0.19	0	25	5.5	A	0.23	31	62	5.5	A	0.23	31	62
Garfield Avenue NB LT/T	14	B	0.24	21	40	39.2	D	0.84	142	170	39.2	D	0.84	142	170
Garfield Avenue SB T/TR	15.5	B	0.62	63	94	33.1	C	0.80	163	212	33.1	C	0.80	163	212
<i>Overall Intersection</i>	<i>13.1</i>	<i>B</i>				<i>27.8</i>	<i>C</i>				<i>27.8</i>	<i>C</i>			
<b>Cranston Street at Garfield Avenue</b>															
Cranston Street EB L	--	--	--	--	--	14.4	B	0.33	27	51	14.4	B	0.33	27	51
Cranston Street EB TR	23.9	C	0.74	274	321	35	C	0.82	234	335	35	C	0.82	234	335
Cranston Street WB L	45.8	D	0.79	176	253	46.2	D	0.89	138	288	46.2	D	0.89	138	288
Cranston Street WB T	3.5	A	0.22	37	62	--	--	--	--	--	--	--	--	--	--
Cranston Street WB TR	--	--	--	--	--	25	C	0.67	238	321	25	C	0.67	238	321
Garfield Avenue NB L	47.1	D	0.63	84	138	--	--	--	--	--	--	--	--	--	--
Garfield Avenue NB LT	--	--	--	--	--	52.3	D	0.90	202	375	52.3	D	0.90	202	375
Garfield Avenue NB R	10.9	B	0.69	0	75	11	B	0.52	122	166	11	B	0.52	122	166
Trolley Barn Driveway SB LTR	--	--	--	--	--	14.5	B	0.29	46	94	14.5	B	0.29	46	94
<i>Overall Intersection</i>	<i>21.8</i>	<i>C</i>				<i>30</i>	<i>C</i>				<i>30</i>	<i>C</i>			
<b>Abbreviations:</b>						<b>Notes:</b>									
EB = Eastbound    L = Left    S = Seconds						Delay = Average delay per vehicle (measured in seconds)									
WB = Westbound    T = Through    FT = Feet						95th Q = 95th percentile queue length (measured in feet), assumes 25 feet per vehicle									
NB = Northbound    R = Right    LOS = Level of Service															
SB = Southbound    v/c = Volume-to-Capacity Ratio															

Comment 10: *“Proposed Traffic Circulation Section:*

- a. *Pare notes that buses do not currently load and unload behind the building. Pare believes the proposed bus circulation route and loading/unloading zone is superior to the current pattern. However, it is noted that exiting buses will conflict with the parent queue area. When buses leave, they will likely cause a temporary extension of the parent vehicle queue.*
- b. *Pare’s observations noted that during the morning arrival peak, vehicles intermittently, but repeatedly, backed up onto Garfield Avenue. This appears due to a choke point as parents turn right into the northern parking lot, where that turning movement conflicts with pedestrians walking from the northern lot to the school. The proposed traffic pattern will eliminate this choke point, which should help alleviate congestion. However, Pare also noted that some parents, rather than drop off in the drop off queue, prefer to park and walk their child to the door. The revised pattern reduces the availability of this option, potentially adding to the queue line demand. It is also noted that the queue area, even if the additional parent stacking area is used, is shorter than the current queuing area.*
- c. *During the afternoon dismissal peak, parents park their vehicles and walk to the door to pick up their children. As a result, queues do not extend into Garfield Avenue. It was noted during Pare’s site observations that far more than 23 parent vehicles are on-site at dismissal, although a specific count was not taken. Under the revised circulation pattern, where will all these excess vehicles go? It appears this revised pattern has the potential to cause significant queues that would spill over into Garfield Avenue during the dismissal peak, potentially for an extended period of time.”*

Response:

- c. Green received an updated site plan from KBA showing 35 additional parking spaces along the driveway entrance. In addition, the play area to the north of the school has been striped for 19 additional spaces. The latest site plan provides parking for 112 staff, 65 parents, and 6 additional handicap spaces, plus a queue space for the parent pick-up/drop-off operations for approximately 33 additional vehicles. The latest site plan is attached.

Comment 11: *“Proposed Parking Section:*

*While a detailed count was not made of staff parking, it is estimated that approximately 100 staff vehicles were on-site during Pare’s observations. The paved play area may be needed for staff parking immediately. In the short term, will excess staff parking be able to use the open parking on the adjacent parcels? In addition, roughly 30 parked parent vehicles were observed during the morning arrival peak and well in excess of 50 parked parent vehicles were observed at dismissal. The 23 proposed parent spaces will not serve current demand and will force additional parents into drop-off and pick-up queues.”*

Response: As noted in the response to Comment 10, the additional parking spaces that fall within the property limits will open up 65 spaces for parent parking. See attached site plan.

Comment 12: *“Sight Distance Analysis Section: Pare agrees there is ample sight distance from the driveway to the school.”*

No Response Necessary

Comment 13: "Conclusions Section:

- a. Pare concurs with the conclusion that the proposed addition will not present additional capacity concerns at area intersections, as the proposed addition is for amenities for existing students, not to accommodate additional students or staff.
- b. Pare has significant concerns about the effect of the proposed circulation changes, especially during the afternoon dismissal period. Pare believes there is significant risk that without the use of the northern lot, there will be significant queues just before dismissal that have the potential to significantly affect the intersection of the school driveway and Garfield Street that could also potentially spill over into Route 10."

Response:

See Responses to Comments 10 and 11 for site plan improvements.

Comment 14. "Recommendations Section: Pare generally concurs with the recommendations listed, but believes more may need to be done to prevent queues from extending into Garfield Avenue, especially during the dismissal peak period."

Response:

See Responses to Comments 10 and 11 for site plan improvements.

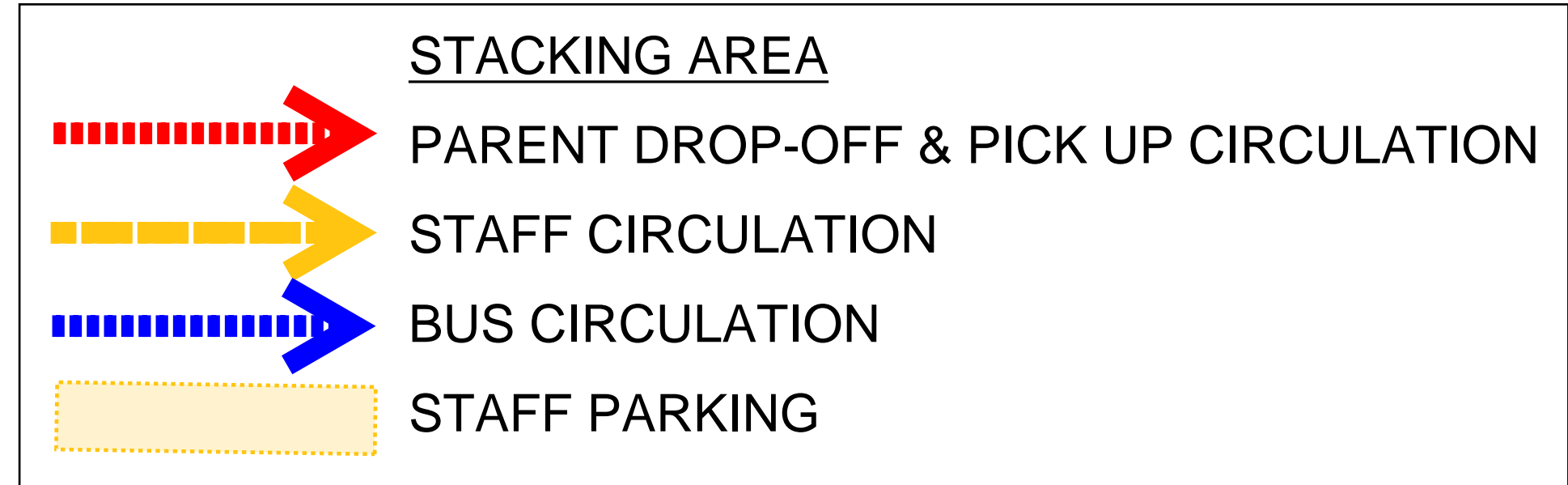
If either the Town staff or the Peer Reviewer would like to discuss any of these comments further, please feel free to contact me at 978-923-0400.

Sincerely,  
Green International Affiliates, Inc.



Corinne Tobias, P.E.  
Transportation Planning Group

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**PARKING & STACKING**

112 STAFF SPACES  
+65 PARENT DROP-OFF/VISITOR SPACES  
+ 6 HANDICAP SPACES

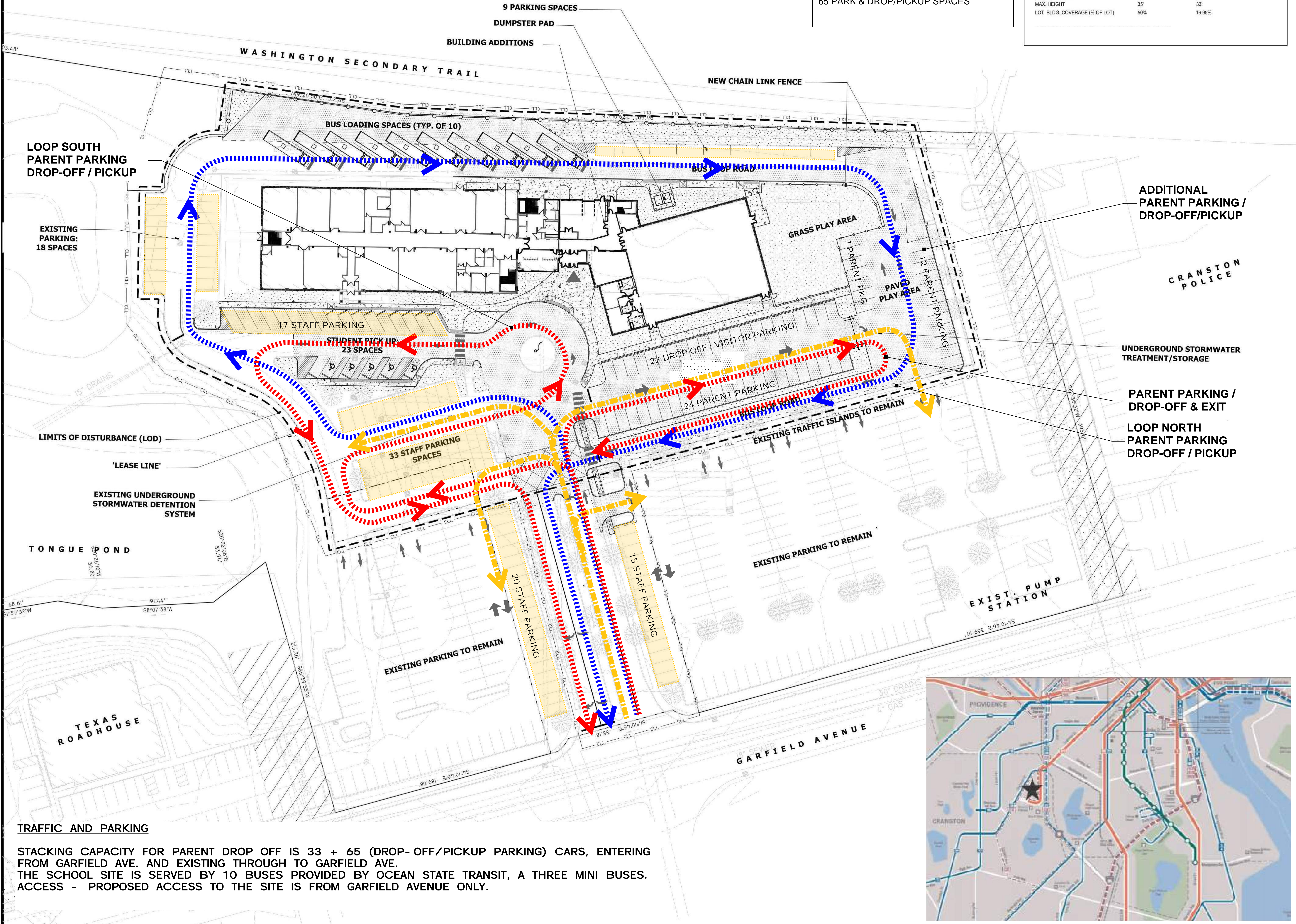
**STACKING**

33 IN LANE STACKING  
65 PARK & DROP/PICKUP SPACES

**SITE STATISTICS**

ZONE: C-4 COMMERCIAL HIGHWAY BUSINESS (CHARTER SCHOOLS ARE PERMITTED)  
TOTAL PARCEL AREA: 17.85 AC  
PURCHASED AREA: 4.83 AC  
PARCEL ID: GRAN-000007-000002-000091

	REQUIRED	PROPOSED
MIN. LOT AREA	12,000 SF	197,437 SF
MIN. LOT WIDTH	120'	541'
MIN. F.Y. SETBACK	40'	76'
S.Y. SETBACK	8'	79'
MIN. R.Y. SETBACK	20'	58'
MAX. HEIGHT	35'	33'
LOT BLDG. COVERAGE (% OF LOT)	50%	16.95%

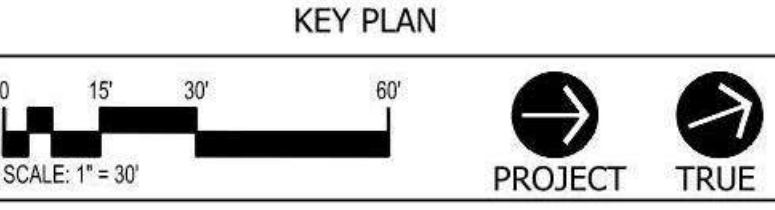
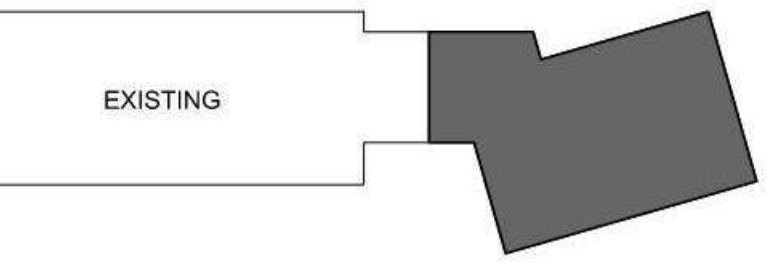


**ISSUE DATE**

DATE	DESCRIPTION
APRIL 20, 2022	ISSUED FOR RIDER REVIEW
MAY 2, 2022	ISSUED FOR BID PRICING
AUGUST 18, 2022	24X36 LAYOUTS - RIDER
FEBRUARY 7, 2023	DRP REVIEW
MARCH 16, 2023	REV. DEMOVE PRICING SET
APRIL 23, 2023	REV.

**REVISIONS**

DATE	DESCRIPTION
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**ACHIEVEMENT  
FIRST ILLUMINAR  
SCHOOL ADDITION**

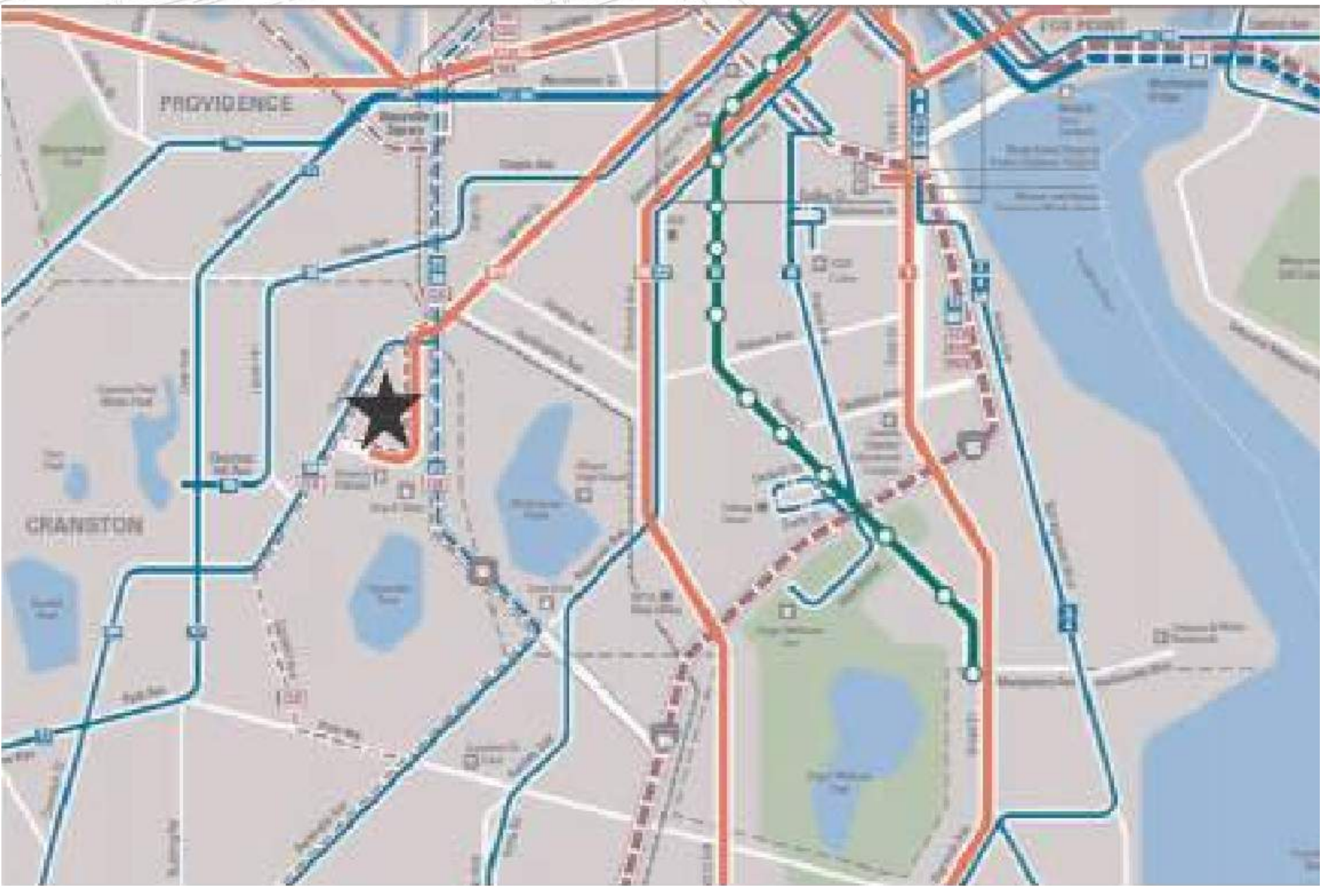
85 GARFIELD AVE, CRANSTON,  
RI, 02920

PROJECT NO.: 21012.02 DRAWN BY: DGM

**PICKUP-DROPOFF  
CIRCULATION  
PLAN**

**TRAFFIC AND PARKING**

STACKING CAPACITY FOR PARENT DROP OFF IS 33 + 65 (DROP-OFF/PICKUP PARKING) CARS, ENTERING FROM GARFIELD AVE. AND EXISTING THROUGH TO GARFIELD AVE.  
THE SCHOOL SITE IS SERVED BY 10 BUSES PROVIDED BY OCEAN STATE TRANSIT, A THREE MINI BUSES.  
ACCESS - PROPOSED ACCESS TO THE SITE IS FROM GARFIELD AVENUE ONLY.



PARENT STACKING (22'x10' CARS SHOWN)

**PARKING & STACKING**  
 112 STAFF SPACES  
 +65 PARENT DROP-OFF/VISITOR SPACES  
 + 6 HANDICAP SPACES

**STACKING**  
 33 IN LANE STACKING  
 65 PARK & DROP/PICKUP SPACES

**SITE STATISTICS**

ZONE: C-4 COMMERCIAL HIGHWAY BUSINESS (CHARTER SCHOOLS ARE PERMITTED)  
 TOTAL PARCEL AREA: 17.65 AC  
 PURCHASED AREA: 4.83 AC  
 PARCEL ID: CRAN-000007-000002-000091

	REQUIRED	PROPOSED
MIN. LOT AREA	12,000 SF	197,437 SF
MIN. LOT WIDTH	120'	541'
MIN. F.Y. SETBACK	40'	76'
S.Y. SETBACK	8'	79'
MIN. R.Y. SETBACK	20'	58'
MAX. HEIGHT	35'	33'
LOT BLDG. COVERAGE (% OF LOT)	50%	16.95%

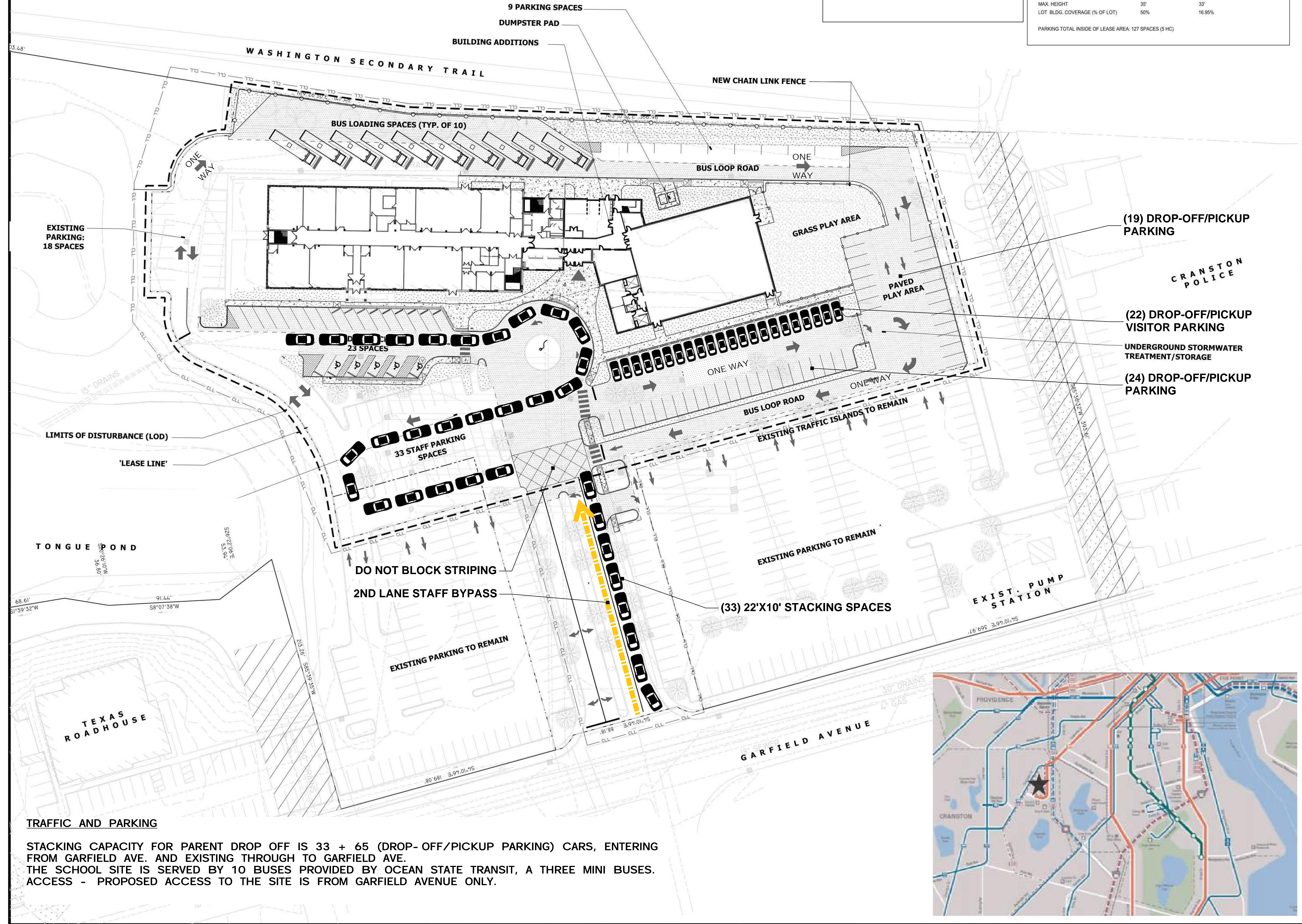
PARKING TOTAL INSIDE OF LEASE AREA: 127 SPACES (6 HC)

**KAESTLE BOOS**  
 associates, inc

16 Chestnut Street, Suite 301, Foxborough, MA 02035  
 Phone: 508-549-9908 ▲ Fax: 508-549-9907

416 Slater Road, P.O. Box 2590, New Britain, CT 06150-2590  
 Phone: 860-229-0361 ▲ Fax: 860-229-5303

Additional offices located in Massachusetts and Rhode Island  
 Email: kba@kba-architects.com ▲ Web: www.kba-architects.com

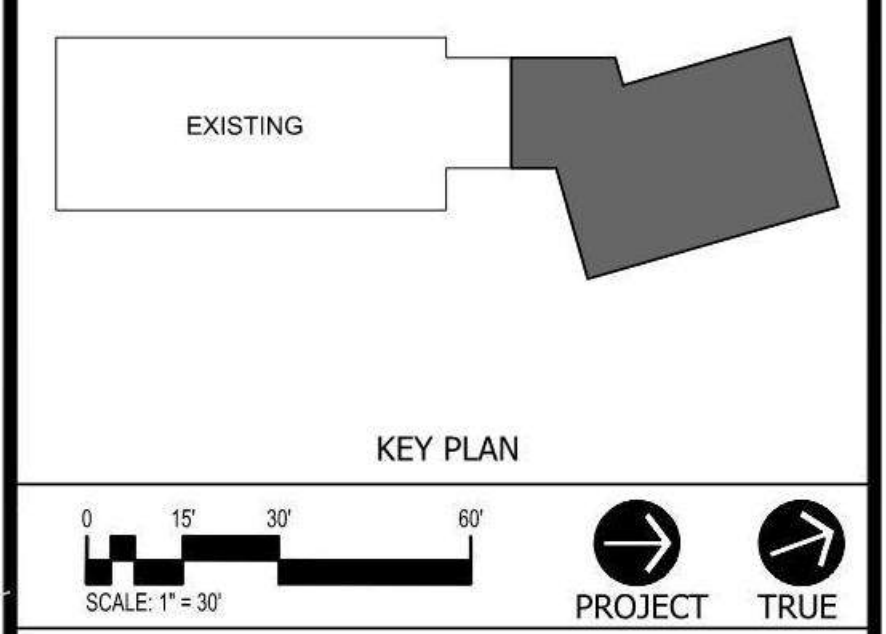


**ISSUE DATE**

DATE	DESCRIPTION
APRIL 29, 2022	ISSUED FOR RIDEM REVIEW
MAY 2, 2022	ISSUED FOR BID PRICING
AUGUST 18, 2022	24X36 LAYOUTS - RIDEM
FEBRUARY 7, 2023	DPR REVIEW
MARCH 16, 2023	REV. DEMOVE PRICING SET
APRIL 23, 2023	REV.

**REVISIONS**

DATE	DESCRIPTION



**ACHIEVEMENT  
 FIRST ILLUMINAR  
 SCHOOL ADDITION**

85 GARFIELD AVE, CRANSTON,  
 RI, 02920

PROJECT NO.: 21012.02 DRAWN BY: DGM

**TRAFFIC  
 STACKING  
 DIAGRAM**

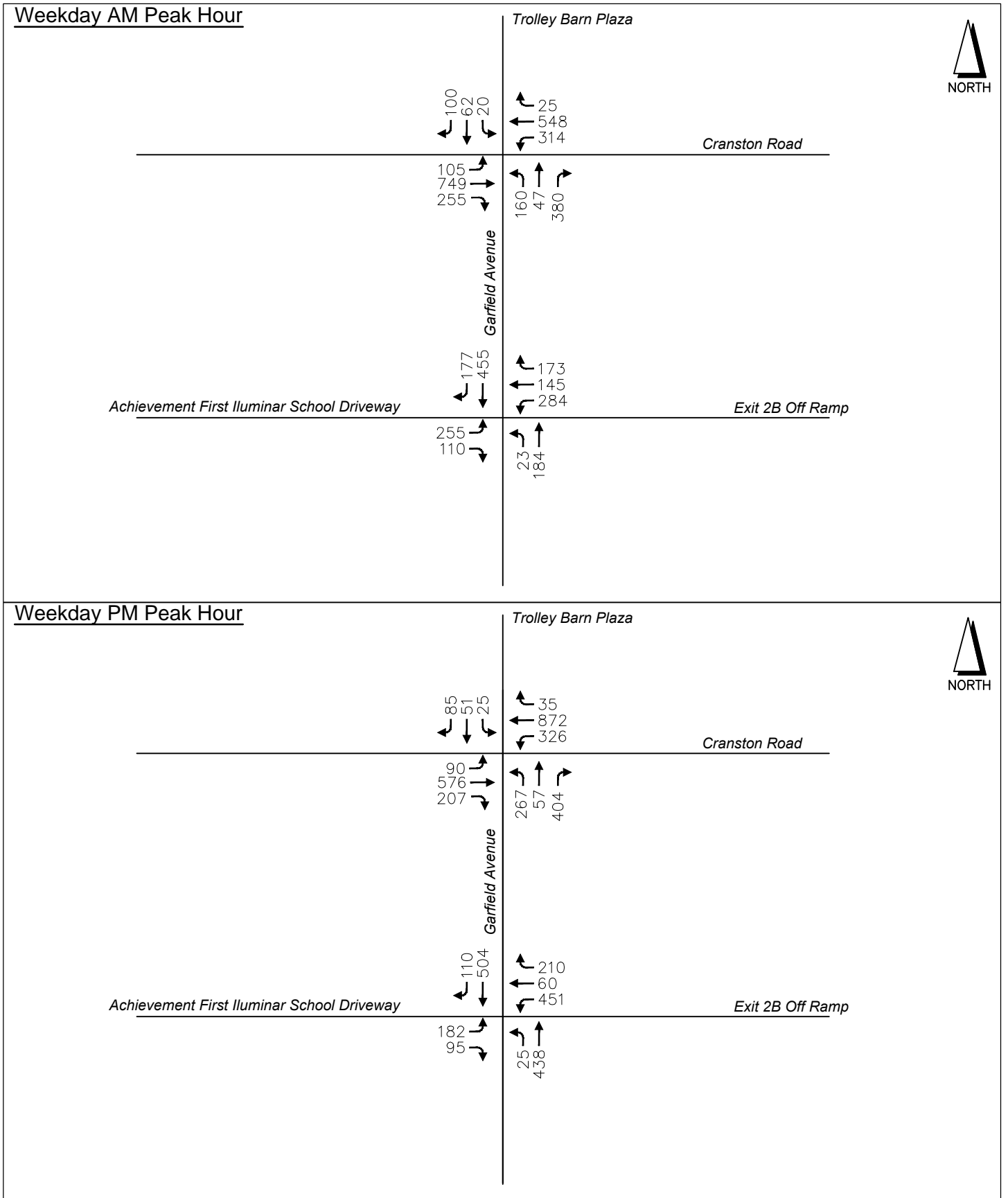
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**PU2.00**

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**TRAFFIC AND PARKING**





















STACKING CAPACITY FOR PARENT DROP OFF IS 33 + 65 (DROP-OFF/PICKUP PARKING) CARS, ENTERING FROM GARFIELD AVE. AND EXISTING THROUGH TO GARFIELD AVE.  
 THE SCHOOL SITE IS SERVED BY 10 BUSES PROVIDED BY OCEAN STATE TRANSIT, A THREE MINI BUSES.  
 ACCESS - PROPOSED ACCESS TO THE SITE IS FROM GARFIELD AVENUE ONLY.


















Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

No Build 2028  
Morning Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	749	255	314	548	25	160	47	380	20	62	100
Future Volume (vph)	105	749	255	314	548	25	160	47	380	20	62	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.994				0.850		0.926	
Flt Protected	0.950			0.950				0.963			0.995	
Satd. Flow (prot)	1770	3339	0	1719	3390	0	0	1754	1553	0	1716	0
Flt Permitted	0.387			0.118				0.588			0.953	
Satd. Flow (perm)	721	3339	0	214	3390	0	0	1071	1553	0	1644	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			6				25		63	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		221			564			978			312	
Travel Time (s)		6.0			15.4			26.7			7.1	
Peak Hour Factor	0.90	0.81	0.81	0.82	0.82	0.90	0.92	0.90	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	4%	5%	6%	2%	5%	2%	4%	2%	2%	2%
Adj. Flow (vph)	117	925	315	383	668	28	174	52	413	22	69	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	1240	0	383	696	0	0	226	413	0	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6		3	8	1		4	

Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

No Build 2028  
Morning Peak Hour

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Permitted Phases	2			6			8		8	4			
Detector Phase	5	2		1	6		3	8	1	4	4		
Switch Phase													
Minimum Initial (s)	8.0	10.0		10.0	10.0		8.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	11.0	31.0		13.0	15.0		13.0	15.0	13.0	25.0	25.0		
Total Split (s)	11.0	35.0		17.0	41.0		13.0	38.0	17.0	25.0	25.0		
Total Split (%)	12.2%	38.9%		18.9%	45.6%		14.4%	42.2%	18.9%	27.8%	27.8%		
Maximum Green (s)	8.0	30.0		14.0	36.0		10.0	33.0	14.0	20.0	20.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0		
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	0.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	3.0	5.0		3.0	5.0		5.0	3.0	5.0	3.0	5.0		
Lead/Lag	Lead	Lag		Lead	Lag		Lead		Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5		
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None		
Walk Time (s)		5.0								5.0	5.0		
Flash Dont Walk (s)		21.0								15.0	15.0		
Pedestrian Calls (#/hr)		0								0	0		
Act Effct Green (s)	41.0	31.0		55.2	44.4		26.8	51.0		26.8			
Actuated g/C Ratio	0.46	0.34		0.61	0.49		0.30	0.57		0.30			
v/c Ratio	0.28	1.04		0.85	0.42		0.71	0.46		0.38			
Control Delay	11.6	68.0		41.9	17.5		39.8	12.5		17.5			
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0			
Total Delay	11.6	68.0		41.9	17.5		39.8	12.5		17.5			
LOS	B	E		D	B		D	B		B			
Approach Delay		63.1			26.1		22.2			17.5			
Approach LOS		E			C		C			B			
Queue Length 50th (ft)	27	-407		157	137		110	116		59			
Queue Length 95th (ft)	57	#446		#317	181		180	186		107			
Internal Link Dist (ft)		141			484		898			232			
Turn Bay Length (ft)	100			200									
Base Capacity (vph)	421	1187		452	1676		392	890		547			
Starvation Cap Reductn	0	0		0	0		0	0		0			
Spillback Cap Reductn	0	0		0	0		0	0		0			
Storage Cap Reductn	0	0		0	0		0	0		0			
Reduced v/c Ratio	0.28	1.04		0.85	0.42		0.58	0.46		0.37			
<b>Intersection Summary</b>													
Area Type:	Other												
Cycle Length:	90												
Actuated Cycle Length:	90												
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle:	95												
Control Type:	Actuated-Coordinated												
Maximum v/c Ratio:	1.04												
Intersection Signal Delay:	40.2						Intersection LOS: D						
Intersection Capacity Utilization	83.9%						ICU Level of Service E						
Analysis Period (min)	15												
~ Volume exceeds capacity, queue is theoretically infinite.													

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.





















Queue shown is maximum after two cycles.

Splits and Phases: 2: Garfield Avenue & Cranston Street



Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

No Build 2028  
 Morning Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	0	110	284	145	173	23	184	0	0	455	177
Future Volume (vph)	255	0	110	284	145	173	23	184	0	0	455	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Flt			0.850			0.850					0.958	
Flt Protected	0.950				0.968			0.995				
Satd. Flow (prot)	1805	0	1615	0	1757	1509	0	3364	0	0	3306	0
Flt Permitted	0.425				0.968			0.811				
Satd. Flow (perm)	808	0	1615	0	1757	1509	0	2742	0	0	3306	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120			190					80	
Link Speed (mph)		20			25			25			25	
Link Distance (ft)		295			585			553			978	
Travel Time (s)		10.1			16.0			15.1			26.7	
Peak Hour Factor	0.62	0.62	0.62	0.91	0.91	0.91	0.94	0.94	0.94	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	6%	2%	7%	5%	7%	0%	0%	6%	1%
Adj. Flow (vph)	411	0	177	312	159	190	24	196	0	0	535	208
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	0	177	0	471	190	0	220	0	0	743	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2	1	1	2				2
Detector Template	Left		Right	Left	Thru	Right	Left	Thru				Thru
Leading Detector (ft)	20		20	20	100	20	20	100				100
Trailing Detector (ft)	0		0	0	0	0	0	0				0
Detector 1 Position(ft)	0		0	0	0	0	0	0				0
Detector 1 Size(ft)	20		20	20	6	20	20	6				6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases	4		4	8		8	2					
Detector Phase	4		4	8	8	8	2	2				6
Switch Phase												

Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

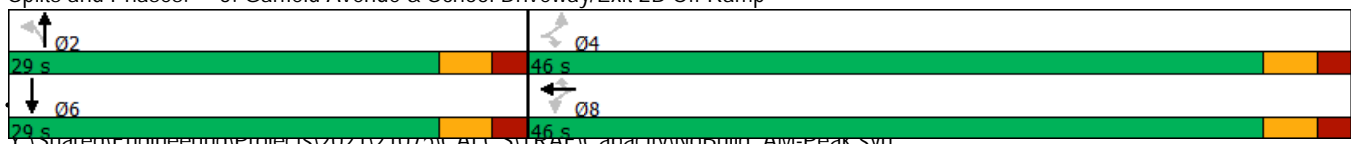
No Build 2028  
 Morning Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)	27.0		27.0	22.5	22.5	22.5	22.5	22.5			29.0	
Total Split (s)	46.0		46.0	46.0	46.0	46.0	29.0	29.0			29.0	
Total Split (%)	61.3%		61.3%	61.3%	61.3%	61.3%	38.7%	38.7%			38.7%	
Maximum Green (s)	41.0		41.0	41.0	41.0	41.0	24.0	24.0			24.0	
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0		5.0	5.0		5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.4		2.4	2.4	2.4	2.4	2.4	2.4			2.4	
Recall Mode	None		None	None	None	None	Min	Min			Min	
Walk Time (s)	5.0		5.0								5.0	
Flash Dont Walk (s)	17.0		17.0								17.0	
Pedestrian Calls (#/hr)	0		0								0	
Act Effct Green (s)	39.8		39.8		39.8	39.8		19.7			19.7	
Actuated g/C Ratio	0.57		0.57		0.57	0.57		0.28			0.28	
v/c Ratio	0.89		0.18		0.47	0.20		0.28			0.75	
Control Delay	39.9		3.7		11.3	2.0		20.5			25.4	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	39.9		3.7		11.3	2.0		20.5			25.4	
LOS	D		A		B	A		C			C	
Approach Delay		29.0				8.7		20.5			25.4	
Approach LOS		C				A		C			C	
Queue Length 50th (ft)	144		10		110	0		39			138	
Queue Length 95th (ft)	153		17		199	26		65			181	
Internal Link Dist (ft)		215			505			473			898	
Turn Bay Length (ft)												
Base Capacity (vph)	480		1009		1045	975		955			1203	
Starvation Cap Reductn	0		0		0	0		0			0	
Spillback Cap Reductn	0		0		0	0		0			0	
Storage Cap Reductn	0		0		0	0		0			0	
Reduced v/c Ratio	0.86		0.18		0.45	0.19		0.23			0.62	

Intersection Summary





















Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 69.5  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 20.9 Intersection LOS: C  
 Intersection Capacity Utilization 72.2% ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp















Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

No Build 2028  
Afternoon Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	576	207	326	872	35	267	57	404	25	51	85
Future Volume (vph)	90	576	207	326	872	35	267	57	404	25	51	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.994				0.850		0.929	
Flt Protected	0.950			0.950				0.960			0.992	
Satd. Flow (prot)	1770	3356	0	1736	3485	0	0	1788	1553	0	1717	0
Flt Permitted	0.222			0.130				0.629			0.908	
Satd. Flow (perm)	414	3356	0	237	3485	0	0	1172	1553	0	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			5				54		58	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		221			564			978			312	
Travel Time (s)		6.0			15.4			26.7			7.1	
Peak Hour Factor	0.90	0.89	0.89	0.94	0.94	0.90	0.82	0.90	0.82	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	4%	4%	3%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	100	647	233	347	928	39	326	63	493	28	57	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	880	0	347	967	0	0	389	493	0	179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6		3	8	1		4	

Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

No Build 2028  
Afternoon Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		3	8	1	4	4	
Switch Phase												
Minimum Initial (s)	8.0	10.0		10.0	10.0		8.0	8.0	10.0	8.0	8.0	
Minimum Split (s)	11.0	31.0		13.0	15.0		11.0	13.0	13.0	25.0	25.0	
Total Split (s)	13.0	31.0		20.0	38.0		13.0	39.0	20.0	26.0	26.0	
Total Split (%)	14.4%	34.4%		22.2%	42.2%		14.4%	43.3%	22.2%	28.9%	28.9%	
Maximum Green (s)	10.0	26.0		17.0	33.0		10.0	34.0	17.0	21.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.0		3.0	5.0		5.0	3.0	5.0	3.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		5.0								5.0	5.0	
Flash Dont Walk (s)		21.0								15.0	15.0	
Pedestrian Calls (#/hr)		0								0	0	
Act Effct Green (s)	38.3	27.8		48.6	37.4		33.4	54.2		33.4		
Actuated g/C Ratio	0.43	0.31		0.54	0.42		0.37	0.60		0.37		
v/c Ratio	0.33	0.82		0.89	0.67		0.90	0.52		0.29		
Control Delay	14.4	35.0		46.2	25.0		52.3	11.0		14.5		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		
Total Delay	14.4	35.0		46.2	25.0		52.3	11.0		14.5		
LOS	B	C		D	C		D	B		B		
Approach Delay		32.9			30.6		29.2			14.5		
Approach LOS		C			C		C			B		
Queue Length 50th (ft)	27	234		138	238		202	122		46		
Queue Length 95th (ft)	51	#335		#288	321		#375	166		94		
Internal Link Dist (ft)		141			484		898			232		
Turn Bay Length (ft)	100			200								
Base Capacity (vph)	333	1077		411	1451		442	975		618		
Starvation Cap Reductn	0	0		0	0		0	0		0		
Spillback Cap Reductn	0	0		0	0		0	0		0		
Storage Cap Reductn	0	0		0	0		0	0		0		
Reduced v/c Ratio	0.30	0.82		0.84	0.67		0.88	0.51		0.29		

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 30.0

Intersection LOS: C

Intersection Capacity Utilization 83.5%

ICU Level of Service E

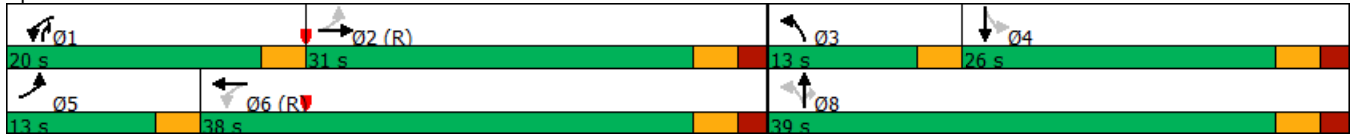
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.



Queue shown is maximum after two cycles.

Splits and Phases: 2: Garfield Avenue & Cranston Street



Synchro 11; Lanes, Volumes, Timings  
5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

No Build 2028  
Afternoon Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	0	95	451	60	210	25	438	0	0	504	110
Future Volume (vph)	182	0	95	451	60	210	25	438	0	0	504	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Flt			0.850			0.850					0.973	
Flt Protected	0.950				0.958			0.997				
Satd. Flow (prot)	1736	0	1524	0	1773	1553	0	3506	0	0	3401	0
Flt Permitted	0.376				0.958			0.776				
Satd. Flow (perm)	687	0	1524	0	1773	1553	0	2729	0	0	3401	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			63			74						32
Link Speed (mph)		20			25			25			25	
Link Distance (ft)		295			585			553			978	
Travel Time (s)		10.1			16.0			15.1			26.7	
Peak Hour Factor	0.46	0.46	0.46	0.92	0.92	0.92	0.79	0.79	0.79	0.86	0.86	0.86
Heavy Vehicles (%)	4%	0%	6%	3%	0%	4%	14%	2%	0%	0%	4%	0%
Adj. Flow (vph)	396	0	207	490	65	228	32	554	0	0	586	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	0	207	0	555	228	0	586	0	0	714	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2	1	1	2				2
Detector Template	Left		Right	Left	Thru	Right	Left	Thru				Thru
Leading Detector (ft)	20		20	20	100	20	20	100				100
Trailing Detector (ft)	0		0	0	0	0	0	0				0
Detector 1 Position(ft)	0		0	0	0	0	0	0				0
Detector 1 Size(ft)	20		20	20	6	20	20	6				6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases	4		4	8		8	2					
Detector Phase	4		4	8	8	8	2	2				6
Switch Phase												

Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

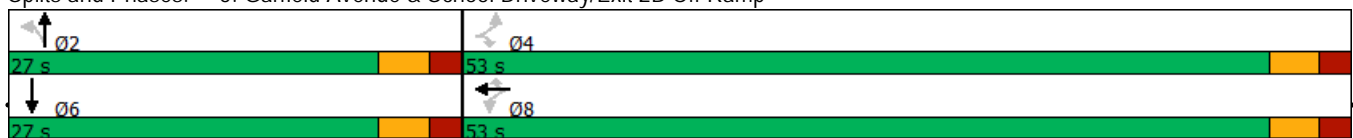
No Build 2028  
 Afternoon Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)	27.0		27.0	9.0	9.0	9.0	9.0	9.0			27.0	
Total Split (s)	53.0		53.0	53.0	53.0	53.0	27.0	27.0			27.0	
Total Split (%)	66.3%		66.3%	66.3%	66.3%	66.3%	33.8%	33.8%			33.8%	
Maximum Green (s)	48.0		48.0	48.0	48.0	48.0	22.0	22.0			22.0	
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0		5.0	5.0		5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.4		2.4	2.4	2.4	2.4	2.4	2.4			2.4	
Recall Mode	None		None	None	None	None	Min	Min			Min	
Walk Time (s)	5.0		5.0								5.0	
Flash Dont Walk (s)	17.0		17.0								17.0	
Pedestrian Calls (#/hr)	0		0								0	
Act Effct Green (s)	47.3		47.3		47.3	47.3		19.8			19.8	
Actuated g/C Ratio	0.61		0.61		0.61	0.61		0.26			0.26	
v/c Ratio	0.94		0.22		0.51	0.23		0.84			0.80	
Control Delay	49.8		5.5		10.9	5.5		39.2			33.1	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	49.8		5.5		10.9	5.5		39.2			33.1	
LOS	D		A		B	A		D			C	
Approach Delay		34.6			9.3			39.2			33.1	
Approach LOS		C			A			D			C	
Queue Length 50th (ft)	169		29		146	31		142			163	
Queue Length 95th (ft)	87		20		227	62		170			212	
Internal Link Dist (ft)		215			505			473			898	
Turn Bay Length (ft)												
Base Capacity (vph)	429		975		1107	998		781			996	
Starvation Cap Reductn	0		0		0	0		0			0	
Spillback Cap Reductn	0		0		0	0		0			0	
Storage Cap Reductn	0		0		0	0		0			0	
Reduced v/c Ratio	0.92		0.21		0.50	0.23		0.75			0.72	

Intersection Summary





















Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 77.1  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 27.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.9%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp
















Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

Build 2028  
Morning Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	749	255	314	548	25	160	47	380	20	62	100
Future Volume (vph)	105	749	255	314	548	25	160	47	380	20	62	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.994				0.850		0.926	
Flt Protected	0.950			0.950				0.963			0.995	
Satd. Flow (prot)	1770	3339	0	1719	3390	0	0	1754	1553	0	1716	0
Flt Permitted	0.387			0.118				0.588			0.953	
Satd. Flow (perm)	721	3339	0	214	3390	0	0	1071	1553	0	1644	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			6				25		63	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		221			564			978			312	
Travel Time (s)		6.0			15.4			26.7			7.1	
Peak Hour Factor	0.90	0.81	0.81	0.82	0.82	0.90	0.92	0.90	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	4%	5%	6%	2%	5%	2%	4%	2%	2%	2%
Adj. Flow (vph)	117	925	315	383	668	28	174	52	413	22	69	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	1240	0	383	696	0	0	226	413	0	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6		3	8	1		4	

Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

Build 2028  
Morning Peak Hour

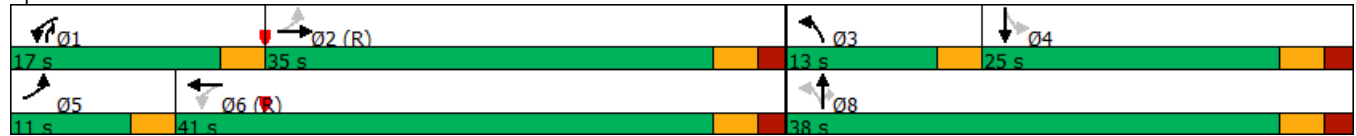
													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Permitted Phases	2			6			8		8	4			
Detector Phase	5	2		1	6		3	8	1	4	4		
Switch Phase													
Minimum Initial (s)	8.0	10.0		10.0	10.0		8.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	11.0	31.0		13.0	15.0		13.0	15.0	13.0	25.0	25.0		
Total Split (s)	11.0	35.0		17.0	41.0		13.0	38.0	17.0	25.0	25.0		
Total Split (%)	12.2%	38.9%		18.9%	45.6%		14.4%	42.2%	18.9%	27.8%	27.8%		
Maximum Green (s)	8.0	30.0		14.0	36.0		10.0	33.0	14.0	20.0	20.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0		
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	0.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	3.0	5.0		3.0	5.0		5.0	3.0	5.0	3.0	5.0		
Lead/Lag	Lead	Lag		Lead	Lag		Lead		Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5		
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None		
Walk Time (s)		5.0								5.0	5.0		
Flash Dont Walk (s)		21.0								15.0	15.0		
Pedestrian Calls (#/hr)		0								0	0		
Act Effct Green (s)	41.0	31.0		55.2	44.4		26.8	51.0		26.8			
Actuated g/C Ratio	0.46	0.34		0.61	0.49		0.30	0.57		0.30			
v/c Ratio	0.28	1.04		0.85	0.42		0.71	0.46		0.38			
Control Delay	11.6	68.0		41.9	17.5		39.8	12.5		17.5			
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0			
Total Delay	11.6	68.0		41.9	17.5		39.8	12.5		17.5			
LOS	B	E		D	B		D	B		B			
Approach Delay		63.1			26.1		22.2			17.5			
Approach LOS		E			C		C			B			
Queue Length 50th (ft)	27	-407		157	137		110	116		59			
Queue Length 95th (ft)	57	#446		#317	181		180	186		107			
Internal Link Dist (ft)		141			484		898			232			
Turn Bay Length (ft)	100			200									
Base Capacity (vph)	421	1187		452	1676		392	890		547			
Starvation Cap Reductn	0	0		0	0		0	0		0			
Spillback Cap Reductn	0	0		0	0		0	0		0			
Storage Cap Reductn	0	0		0	0		0	0		0			
Reduced v/c Ratio	0.28	1.04		0.85	0.42		0.58	0.46		0.37			
<b>Intersection Summary</b>													
Area Type:	Other												
Cycle Length:	90												
Actuated Cycle Length:	90												
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle:	95												
Control Type:	Actuated-Coordinated												
Maximum v/c Ratio:	1.04												
Intersection Signal Delay:	40.2						Intersection LOS: D						
Intersection Capacity Utilization	83.9%						ICU Level of Service E						
Analysis Period (min)	15												
~ Volume exceeds capacity, queue is theoretically infinite.													

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Garfield Avenue & Cranston Street



Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

Build 2028  
 Morning Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	0	110	284	145	173	23	184	0	0	455	177
Future Volume (vph)	255	0	110	284	145	173	23	184	0	0	455	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Flt			0.850			0.850					0.958	
Flt Protected	0.950				0.968			0.995				
Satd. Flow (prot)	1805	0	1615	0	1757	1509	0	3364	0	0	3306	0
Flt Permitted	0.425				0.968			0.811				
Satd. Flow (perm)	808	0	1615	0	1757	1509	0	2742	0	0	3306	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120			190					80	
Link Speed (mph)		20			25			25			25	
Link Distance (ft)		295			585			553			978	
Travel Time (s)		10.1			16.0			15.1			26.7	
Peak Hour Factor	0.62	0.62	0.62	0.91	0.91	0.91	0.94	0.94	0.94	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	6%	2%	7%	5%	7%	0%	0%	6%	1%
Adj. Flow (vph)	411	0	177	312	159	190	24	196	0	0	535	208
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	0	177	0	471	190	0	220	0	0	743	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2	1	1	2				2
Detector Template	Left		Right	Left	Thru	Right	Left	Thru				Thru
Leading Detector (ft)	20		20	20	100	20	20	100				100
Trailing Detector (ft)	0		0	0	0	0	0	0				0
Detector 1 Position(ft)	0		0	0	0	0	0	0				0
Detector 1 Size(ft)	20		20	20	6	20	20	6				6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases	4		4	8		8	2					
Detector Phase	4		4	8	8	8	2	2				6
Switch Phase												

Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

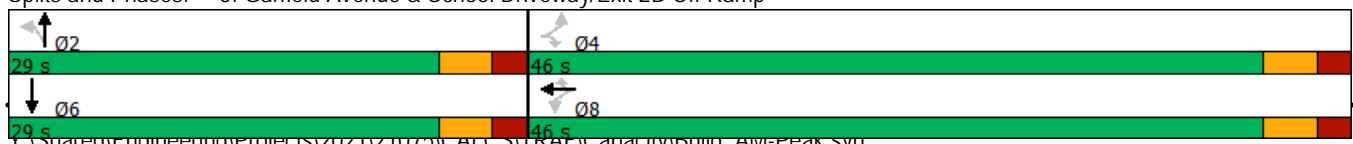
Build 2028  
 Morning Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)	27.0		27.0	22.5	22.5	22.5	22.5	22.5			29.0	
Total Split (s)	46.0		46.0	46.0	46.0	46.0	29.0	29.0			29.0	
Total Split (%)	61.3%		61.3%	61.3%	61.3%	61.3%	38.7%	38.7%			38.7%	
Maximum Green (s)	41.0		41.0	41.0	41.0	41.0	24.0	24.0			24.0	
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0		5.0	5.0		5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.4		2.4	2.4	2.4	2.4	2.4	2.4			2.4	
Recall Mode	None		None	None	None	None	Min	Min			Min	
Walk Time (s)	5.0		5.0								5.0	
Flash Dont Walk (s)	17.0		17.0								17.0	
Pedestrian Calls (#/hr)	0		0								0	
Act Effct Green (s)	39.8		39.8		39.8	39.8		19.7			19.7	
Actuated g/C Ratio	0.57		0.57		0.57	0.57		0.28			0.28	
v/c Ratio	0.89		0.18		0.47	0.20		0.28			0.75	
Control Delay	39.9		3.7		11.3	2.0		20.5			25.4	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	39.9		3.7		11.3	2.0		20.5			25.4	
LOS	D		A		B	A		C			C	
Approach Delay		29.0			8.7			20.5			25.4	
Approach LOS		C			A			C			C	
Queue Length 50th (ft)	144		10		110	0		39			138	
Queue Length 95th (ft)	153		17		199	26		65			181	
Internal Link Dist (ft)		215			505			473			898	
Turn Bay Length (ft)												
Base Capacity (vph)	480		1009		1045	975		955			1203	
Starvation Cap Reductn	0		0		0	0		0			0	
Spillback Cap Reductn	0		0		0	0		0			0	
Storage Cap Reductn	0		0		0	0		0			0	
Reduced v/c Ratio	0.86		0.18		0.45	0.19		0.23			0.62	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 69.5  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 20.9 Intersection LOS: C  
 Intersection Capacity Utilization 72.2% ICU Level of Service C  
 Analysis Period (min) 15





















Splits and Phases: 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

















Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

Build 2028  
Afternoon Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	576	207	326	872	35	267	57	404	25	51	85
Future Volume (vph)	90	576	207	326	872	35	267	57	404	25	51	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.994				0.850		0.929	
Flt Protected	0.950			0.950				0.960			0.992	
Satd. Flow (prot)	1770	3356	0	1736	3485	0	0	1788	1553	0	1717	0
Flt Permitted	0.222			0.130				0.629			0.908	
Satd. Flow (perm)	414	3356	0	237	3485	0	0	1172	1553	0	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			5				54		58	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		221			564			978			312	
Travel Time (s)		6.0			15.4			26.7			7.1	
Peak Hour Factor	0.90	0.89	0.89	0.94	0.94	0.90	0.82	0.90	0.82	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	4%	4%	3%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	100	647	233	347	928	39	326	63	493	28	57	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	880	0	347	967	0	0	389	493	0	179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6		3	8	1		4	

Synchro 11; Lanes, Volumes, Timings  
2: Garfield Avenue & Cranston Street

Build 2028  
Afternoon Peak Hour

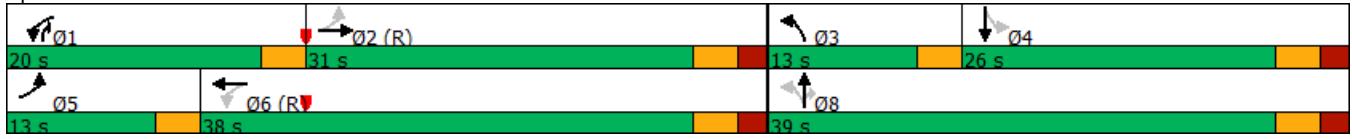
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		3	8	1	4	4	
Switch Phase												
Minimum Initial (s)	8.0	10.0		10.0	10.0		8.0	8.0	10.0	8.0	8.0	
Minimum Split (s)	11.0	31.0		13.0	15.0		11.0	13.0	13.0	25.0	25.0	
Total Split (s)	13.0	31.0		20.0	38.0		13.0	39.0	20.0	26.0	26.0	
Total Split (%)	14.4%	34.4%		22.2%	42.2%		14.4%	43.3%	22.2%	28.9%	28.9%	
Maximum Green (s)	10.0	26.0		17.0	33.0		10.0	34.0	17.0	21.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.0		3.0	5.0		5.0	3.0	5.0	3.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		5.0								5.0	5.0	
Flash Dont Walk (s)		21.0								15.0	15.0	
Pedestrian Calls (#/hr)		0								0	0	
Act Effct Green (s)	38.3	27.8		48.6	37.4		33.4	54.2		33.4		
Actuated g/C Ratio	0.43	0.31		0.54	0.42		0.37	0.60		0.37		
v/c Ratio	0.33	0.82		0.89	0.67		0.90	0.52		0.29		
Control Delay	14.4	35.0		46.2	25.0		52.3	11.0		14.5		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		
Total Delay	14.4	35.0		46.2	25.0		52.3	11.0		14.5		
LOS	B	C		D	C		D	B		B		
Approach Delay		32.9			30.6		29.2			14.5		
Approach LOS		C			C		C			B		
Queue Length 50th (ft)	27	234		138	238		202	122		46		
Queue Length 95th (ft)	51	#335		#288	321		#375	166		94		
Internal Link Dist (ft)		141			484		898			232		
Turn Bay Length (ft)	100			200								
Base Capacity (vph)	333	1077		411	1451		442	975		618		
Starvation Cap Reductn	0	0		0	0		0	0		0		
Spillback Cap Reductn	0	0		0	0		0	0		0		
Storage Cap Reductn	0	0		0	0		0	0		0		
Reduced v/c Ratio	0.30	0.82		0.84	0.67		0.88	0.51		0.29		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 30.0 Intersection LOS: C  
 Intersection Capacity Utilization 83.5% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Garfield Avenue & Cranston Street



Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

Build 2028  
 Afternoon Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	0	95	451	60	210	25	438	0	0	504	110
Future Volume (vph)	182	0	95	451	60	210	25	438	0	0	504	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Fr <sub>t</sub>			0.850			0.850					0.973	
Fl <sub>t</sub> Protected	0.950				0.958			0.997				
Satd. Flow (prot)	1736	0	1524	0	1773	1553	0	3506	0	0	3401	0
Fl <sub>t</sub> Permitted	0.376				0.958			0.776				
Satd. Flow (perm)	687	0	1524	0	1773	1553	0	2729	0	0	3401	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			63			74					32	
Link Speed (mph)		20			25			25			25	
Link Distance (ft)		295			585			553			978	
Travel Time (s)		10.1			16.0			15.1			26.7	
Peak Hour Factor	0.46	0.46	0.46	0.92	0.92	0.92	0.79	0.79	0.79	0.86	0.86	0.86
Heavy Vehicles (%)	4%	0%	6%	3%	0%	4%	14%	2%	0%	0%	4%	0%
Adj. Flow (vph)	396	0	207	490	65	228	32	554	0	0	586	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	0	207	0	555	228	0	586	0	0	714	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2	1	1	2				2
Detector Template	Left		Right	Left	Thru	Right	Left	Thru				Thru
Leading Detector (ft)	20		20	20	100	20	20	100				100
Trailing Detector (ft)	0		0	0	0	0	0	0				0
Detector 1 Position(ft)	0		0	0	0	0	0	0				0
Detector 1 Size(ft)	20		20	20	6	20	20	6				6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases	4		4	8		8	2					
Detector Phase	4		4	8	8	8	2	2				6
Switch Phase												

Synchro 11; Lanes, Volumes, Timings  
 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

Build 2028  
 Afternoon Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)	27.0		27.0	9.0	9.0	9.0	9.0	9.0			27.0	
Total Split (s)	53.0		53.0	53.0	53.0	53.0	27.0	27.0			27.0	
Total Split (%)	66.3%		66.3%	66.3%	66.3%	66.3%	33.8%	33.8%			33.8%	
Maximum Green (s)	48.0		48.0	48.0	48.0	48.0	22.0	22.0			22.0	
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0		5.0	5.0		5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.4		2.4	2.4	2.4	2.4	2.4	2.4			2.4	
Recall Mode	None		None	None	None	None	Min	Min			Min	
Walk Time (s)	5.0		5.0								5.0	
Flash Dont Walk (s)	17.0		17.0								17.0	
Pedestrian Calls (#/hr)	0		0								0	
Act Effct Green (s)	47.3		47.3		47.3	47.3		19.8			19.8	
Actuated g/C Ratio	0.61		0.61		0.61	0.61		0.26			0.26	
v/c Ratio	0.94		0.22		0.51	0.23		0.84			0.80	
Control Delay	49.8		5.5		10.9	5.5		39.2			33.1	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	49.8		5.5		10.9	5.5		39.2			33.1	
LOS	D		A		B	A		D			C	
Approach Delay		34.6			9.3			39.2			33.1	
Approach LOS		C			A			D			C	
Queue Length 50th (ft)	169		29		146	31		142			163	
Queue Length 95th (ft)	87		20		227	62		170			212	
Internal Link Dist (ft)		215			505			473			898	
Turn Bay Length (ft)												
Base Capacity (vph)	429		975		1107	998		781			996	
Starvation Cap Reductn	0		0		0	0		0			0	
Spillback Cap Reductn	0		0		0	0		0			0	
Storage Cap Reductn	0		0		0	0		0			0	
Reduced v/c Ratio	0.92		0.21		0.50	0.23		0.75			0.72	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 77.1  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 27.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.9%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 5: Garfield Avenue & School Driveway/Exit 2B Off Ramp

