November 19, 2021

Mr. Doug McLean
Principal Planner
Cranston City Hall
869 Park Avenue
Cranston, RI 02910

Re: Proposed Warehouse Development
200 Comstock Parkway, Cranston, RI
Responses to Traffic Peer Review Comments

Dear Mr. McLean:

BETA Group, Inc. (BETA) is pleased to submit the following responses to review comments received from the City's Peer Review consultant, Fuss & O'Neill dated November 9, 2021 for the above referenced development project in the City of Cranston. We offer the following responses to address these comments:

Review Comments

1. The proponent should perform MUTCD Signal Warrant Analysis under the Build condition with both the square footage and based upon employee based trip generation estimates for Warrants 1-3. We agree meeting any of the three warrants does not necessarily justify the implementation of a traffic signal, but given that the development has the potential to generate significant traffic even during off peak hours, the potential for signalization as possible mitigation should be evaluated.

   Response: An additional data collection effort was undertaken to determine the daily and hourly distribution of traffic on Western Industrial Drive as part of our review for consideration of a need for a traffic signal at this intersection. Based upon the data obtained, it was determined that only two hours between 3:00 and 5:00 would satisfy the volume thresholds, resulting in meeting only Warrant 3 for Peak Hour conditions. This Warrant is not an appropriate measure for justifying the installation of a traffic signal given the acceptable delays that occur daily during the peak hour for the minor approach.

   Relating to the site driveway as referenced in the comment, it is not necessary or appropriate in this development situation to consider signalization of the intersection based upon estimated future volumes for an end user that is not defined, especially given the low peak hour volumes estimated for this land use that would not even satisfy the peak hour volume warrant.

   The engineer would have to *estimate* eight hours of future traffic from the site which is not practical and could never be used in this situation to warrant a traffic signal as part of mitigation to a condition that may never exist. The MUTCD warns against using this method

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to justify installation of a signal where a study would be required after the development project of this nature is complete and occupied to determine the need based upon actual conditions. A warrant study would be practical to conduct where an analysis was needed to justify a new signal for a known user/business that was being requested as mitigation. Sufficient data would be collected at several existing sites for the known user/business and that would provide the basis for warranting a new signal for a future development.

The first measure for mitigating potential delays for this site driveway exit would be to provide a driveway width to allow a separate right turn lane as it is estimated that at least 80 percent of site exiting traffic would be turning right yielding lower delays for this movement. The final design of the driveway both the width and turning radii will be addressed during the final engineering design of the site at the next review phase with the city.

2. We reiterate that a stop bar and crosswalk should be painted on Western Industrial Drive and that ADA compliant pedestrian ramps should be installed at the crosswalk as recommended in the initial traffic study. The proponent should commit to funding these intersection improvements.

   Response: This requirement would be addressed by the City Planning Department or Planning Commission conditions of approval if determined appropriate.

We have provided an attachment that includes the count data and Warrant analysis for the intersection. Should you have any questions or require additional information or copies of the updated report, please contact us at your earliest convenience in order to facilitate review of the application.

Very truly yours,
BETA Group, Inc.

Paul J. Bannon
Associate

Attachment

cc: file

ATTACHMENTS

A. Traffic Volume Data

B. Warrant Analysis

ATTACHMENT A – Traffic Volume Data

Automatic Traffic Recorder Count

Western Industrial Drive

A

Automatic Traffic Recorder Count

Western Industrial Drive

BETA Group, Inc.
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Project Name: Proposed Industrial Development
Town/City: Cranston, RI
Roadway: Western Industrial Drive
Location: Centerville Bank - UP2

Start Date: 11/8/2021
End Date: 11/11/2021

Time	11/8/21 Mon	11/9/21 Tue	11/10/21 Wed	11/11/21 Thu	11/12/21 Fri	Weekday Average	11/13/21 Sat	11/14/21 Sun
12:00 AM	*	3	10	2	*	5	*	*
01:00	*	5	3	17	*	8	*	*
02:00	*	41	32	36	*	36	*	*
03:00	*	19	22	10	*	17	*	*
04:00	*	27	25	25	*	26	*	*
05:00	*	38	39	31	*	36	*	*
06:00	*	129	126	87	*	114	*	*
07:00	*	166	148	142	*	152	*	*
08:00	*	142	126	111	*	126	*	*
09:00	*	120	111	106	*	112	*	*
10:00	*	118	49	140	*	102	*	*
11:00	*	113	125	101	*	113	*	*
12:00 PM	*	122	151	16	*	96	*	*
01:00	*	104	104	*	*	104	*	*
02:00	*	118	143	*	*	130	*	*
03:00	166	205	192	*	*	188	*	*
04:00	147	237	186	*	*	190	*	*
05:00	99	102	80	*	*	94	*	*
06:00	33	65	46	*	*	48	*	*
07:00	33	88	27	*	*	49	*	*
08:00	27	36	31	*	*	31	*	*
09:00	17	24	14	*	*	18	*	*
10:00	7	10	2	*	*	6	*	*
11:00	1	3	3	*	*	2	*	*
Total	530	2035	1795	824	0	1803	0	0
Percent	29.4%	112.9%	99.6%	45.7%	0.0%		0.0%	0.0%
AM Peak		07:00	07:00	07:00		07:00		
Volume		166	148	142		152		
PM Peak	03:00	04:00	03:00	12:00 PM		04:00		
Volume	166	237	192	16		190		

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Project Name: Proposed Industrial Development
Town/City: Cranston, RI
Roadway: Western Industrial Drive
Location: Centerville Bank - UP2

Start Date: 11/8/2021
End Date: 11/11/2021

11/8/2021	Monday		Tuesday		Wednesday		Thursday		Friday		Weekday Average		Saturday		Sunday	
Time	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2	WB, Lane 1	EB, Lane 2
12:00 AM	*	*	0	3	3	7	1	1	*	*	1	4	*	*	*	*
1:00	*	*	1	4	1	2	3	14	*	*	2	7	*	*	*	*
2:00	*	*	29	12	26	6	30	6	*	*	28	8	*	*	*	*
3:00	*	*	10	9	8	14	5	5	*	*	8	9	*	*	*	*
4:00	*	*	18	9	18	7	18	7	*	*	18	8	*	*	*	*
5:00	*	*	28	10	27	12	25	6	*	*	27	9	*	*	*	*
6:00	*	*	111	18	101	25	67	20	*	*	93	21	*	*	*	*
7:00	*	*	117	49	101	47	97	45	*	*	105	47	*	*	*	*
8:00	*	*	89	53	78	48	65	46	*	*	77	49	*	*	*	*
9:00	*	*	70	50	57	54	44	62	*	*	57	55	*	*	*	*
10:00	*	*	64	54	21	28	47	93	*	*	44	58	*	*	*	*
11:00	*	*	56	57	60	65	43	58	*	*	53	60	*	*	*	*
12:00 PM	*	*	60	62	72	79	8	8	*	*	47	50	*	*	*	*
1:00	*	*	56	48	59	45	*	*	*	*	58	46	*	*	*	*
2:00	*	*	61	57	75	68	*	*	*	*	68	62	*	*	*	*
3:00	44	122	66	139	61	131	*	*	*	*	57	131	*	*	*	*
4:00	38	109	96	141	52	134	*	*	*	*	62	128	*	*	*	*
5:00	27	72	27	75	24	56	*	*	*	*	26	68	*	*	*	*
6:00	13	20	16	49	15	31	*	*	*	*	15	33	*	*	*	*
7:00	8	25	12	76	10	17	*	*	*	*	10	39	*	*	*	*
8:00	10	17	8	28	6	25	*	*	*	*	8	23	*	*	*	*
9:00	5	12	8	16	2	12	*	*	*	*	5	13	*	*	*	*
10:00	0	7	2	8	0	2	*	*	*	*	1	6	*	*	*	*
11:00	0	1	2	1	1	2	*	*	*	*	1	1	*	*	*	*
Total	145	385	1007	1028	878	917	453	371	0	0	871	935	0	0	0	0
Day	530		2035		1795		824		0		1806		0		0	
AM Peak			7:00	11:00	6:00	11:00	7:00	10:00			7:00	11:00				
Volume			117	57	101	65	97	93			105	60				
PM Peak	3:00	3:00	4:00	4:00	2:00	4:00	12:00 PM	12:00 PM			2:00	3:00				
Volume	44	122	96	141	75	134	8	8			68	131				
Comb Total	530		2035		1795		824		0		1806		0		0	
ADT	ADT: 1,806		AADT: 1,806													

ATTACHMENT B – Warrant Analysis

MUTCD Warrants 1 - 3

Comstock Parkway at Western Industrial Drive

BETA GROUP, INC.

Signal Warrant Summary

Town: Johnston, RI

Location: Comstock Parkway at Western Industrial Drive

	Hour	Main Street vph 2 Directions	Side Street vph 1 Direction	Warrant 1 Condition A (100%) 500 / 200 vph	Warrant 1 Condition B (100%) 750 / 100 vph	Warrant 1 Combination A/B n/a
	7-8 AM	1317	47	N	N	
	8-9 AM	1217	49	N	N	
	9-10 AM	946	55	N	N	
	1-2 PM	928	46	N	N	
	2-3 PM	1001	62	N	N	
	3-4 PM	1266	131	N	Y	
	4-5 PM	1424	128	N	Y	
	5-6 PM	1299	68	N	N	

Summary of Warrants

- ☐ WARRANT 1 — ***Eight-Hour Vehcicular Volume***
- ☐ WARRANT 2 — ***Four-Hour Vehicular Volume***
- ■ WARRANT 3 — ***Peak Hour***
- ☐ WARRANT 4 (N/A) — ***Pedestrian Volume***
- ☐ WARRANT 5 (N/A) — ***School Crossing***
- ☐ WARRANT 6 (N/A) — ***Coordinated Signal System***
- ☐ WARRANT 7 (N/A) — ***Crash Experience***
- ☐ WARRANT 8 (N/A) — ***Roadway Network***

Summary of Roadway Data

Accidents:

Accidents Correctable by Signalization

n/a	Year:	Total:	n/a	n/a	Correctable
n/a	Year:	Total:	n/a	n/a	Correctable
n/a	Year:	Total:	n/a	n/a	Correctable

Roadway Features:

Major Road	2 lanes
Minor Road	2 lanes
Speed	S < 40 mph
Population	P > 10,000

TRAFFIC SIGNAL WARRANT 1

Community: **Cranston** Engineer: **BETA Group, Inc.**
State: **Rhode Island** Date: **November, 2021**

Major Street: **Comstock Parkway** Lanes: **1** Critical Approach Speed: **35**
Minor Street: **Western Industrial Drive** Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
Approach Lanes	1		2 or more		7 - 8 AM	8 - 9 AM	9 - 10 AM	1 - 2 PM	2 - 3 PM	3 - 4 PM	4 - 5 PM	5 - 6 PM
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350	600 (480)	420	1,317	1,217	946	928	1,001	1,266	1,424	1,299
Highest Approach on Minor Street	150 (120)	105	200 (160)	140	47	49	55	46	62	131	128	68

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ■ Yes ☐ No
Excessive Delay: ☐ Yes ■ No
100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
Approach Lanes	1		2 or more		6 - 7 AM	7 - 8 AM	8 - 9 AM	9 -10 AM	3 - 4 PM	4 - 5 PM	5 - 6 PM	6 - 7 PM
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525	900 (720)	630	1,317	1,217	946	928	1,001	1,266	1,424	1,299
Highest Approach on Minor Street	75 (60)	53	100 (80)	70	47	49	55	46	62	131	128	68

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Source: Revised from NCHRP Report 457

TRAFFIC SIGNAL WARRANT 2

Community:	**Cranston**	Engineer:	**BETA Group, Inc.**
State:	**Rhode Island**	Date:	**November, 2021**

Major Street:	**Comstock Parkway**	Lanes:	**1**	Critical Approach Speed:	**35**
Minor Street:	**Western Industrial Drive**	Lanes:	**2**		

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

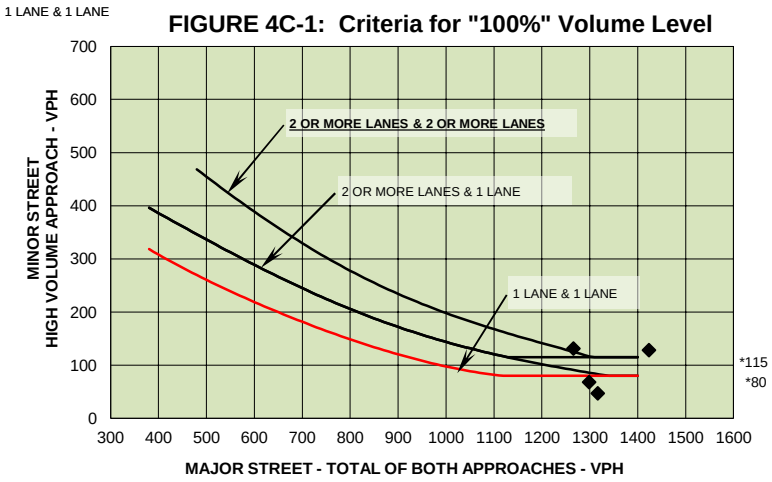
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Plot four volume combinations on the applicable figure below.

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 - 8 AM	1,317	47
3 - 4 PM	1,266	131
4 - 5 PM	1,424	128
5 - 6 PM	1,299	68

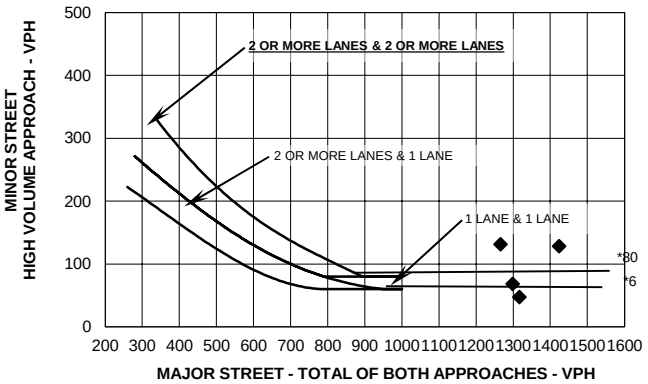
FIGURE 4C-1: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph))



** Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

Source: Revised from NCHRP Report 457

TRAFFIC SIGNAL WARRANT 3

Community: **Cranston** Engineer: **BETA Group, Inc.**
State: **Rhode Island** Date: **November, 2021**

Major Street: **Comstock Parkway** Lanes: **1** Critical Approach Speed: **35**
Minor Street: **Western Industrial Drive** Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 3 - PEAK HOUR

Applicable: ■ Yes ☐ No
Satisfied: ■ Yes ☐ No

If all three criteria are fullfilled or the plotted point lies above the appropriate line, then the warrant is satisfed.

Unusual condition justifying use of warrant:
None

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour		
4-5 PM	1,424	138

Criteria

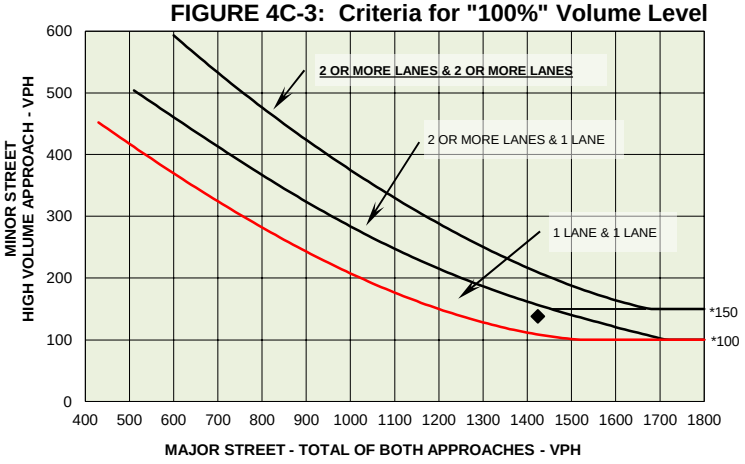
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?: ☐ Yes	☐ No	

2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?: ☐ Yes	☐ No	

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?: ☐ Yes	☐ No	

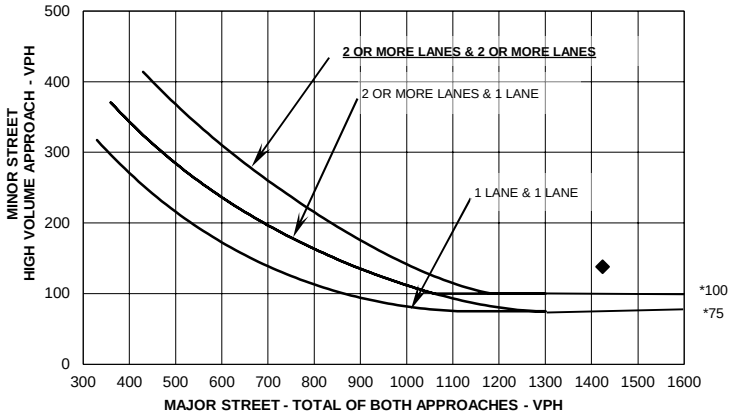
Plot volume combination on the applicable figure below.

FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major



** Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*