

Technical Memorandum

To: Scott Singleton, Town of Plainfield Director of Transportation
From: Bryant Ficek, PTOE
 Chet Skwarcan, PE
Date: September 17, 2020
Re: AllPoints Midwest Building 12 – Traffic Re-Assessment

AllPoints Midwest Building 12 (APM-12) is located in the northwest quadrant of the Bradford Road/Smith Road intersection. This development site was previously studied in 2017 (Traffic Engineering Analysis – Browning Development Building #12) and 2018 (Traffic Analysis Masterplan – AllPoints Midwest). The current proposed development for this site has changed slightly from that prior work. The most recent site plan is attached to this memorandum.

The Town of Plainfield is concerned about the potential difference in traffic and its impact on operations as compared to those prior planning documents. This technical memorandum compares the current site plan to the prior, and addresses whether changes are needed to the future roadway improvement plans.

Trip Generation

Table 1 provides the comparison of traffic expected at the APM-12 site for the past studies and for the current plan. Traffic data for the current development plan was provided by the client. Traffic forecasts for the prior studies are generally based on the methods published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition*.

Table 1 – APM-12 Trip Generation Comparison (total vehicles)

Study	Description & Size	Daily		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out	In	Out
Current Plan: Initial Launch Full State	516,790 SF	810	810	0	180	5	5
		2,100	2,100	0	460	13	14
2017 Study	750,000 SF	630	630	57	26	28	62
2018 Study: Low Range High Range	1,300,000 SF	1,131	1,131	170	51	67	180
		5,340	5,340	455	455	566	266

As shown, the expected trip generation for the current development plan is generally above the 2017 study and within the two ranges analyzed in the 2018 study. The exception is the p.m. peak hour, where the trip generation is expected to be much lower due to shift changes outside this peak period.

The afternoon peak of the current plan occurs from 2 to 3 p.m. During this time, the initial launch expects to have a peak of 112 entering and 184 exiting vehicles. At full state development, the site is expected to generate 288 entering and 472 exiting vehicles. These numbers are closer to the high range of the 2018 study, but are expected at a lower time of overall traffic.

The hour-by-hour trip generation expected for APM-12, as provided by the client, is attached.

Trip Distribution

The trip distribution shows how the trips generated for the site are expected to use the surrounding roadways. The figures below depict the distribution for the development site as projected for this current study and that previously assumed by the 2017 study. The yellow numbers are the general entering/exiting percentages in each direction. The red numbers are the general percentages for entering and exiting trips at each access driveway.

Figure 1: Current Plan Car Distribution

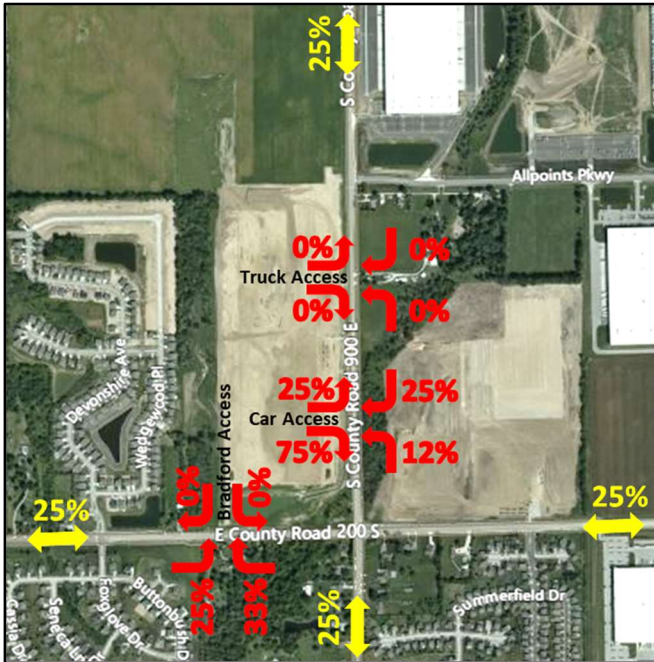


Figure 2: 2017 Study Car Distribution

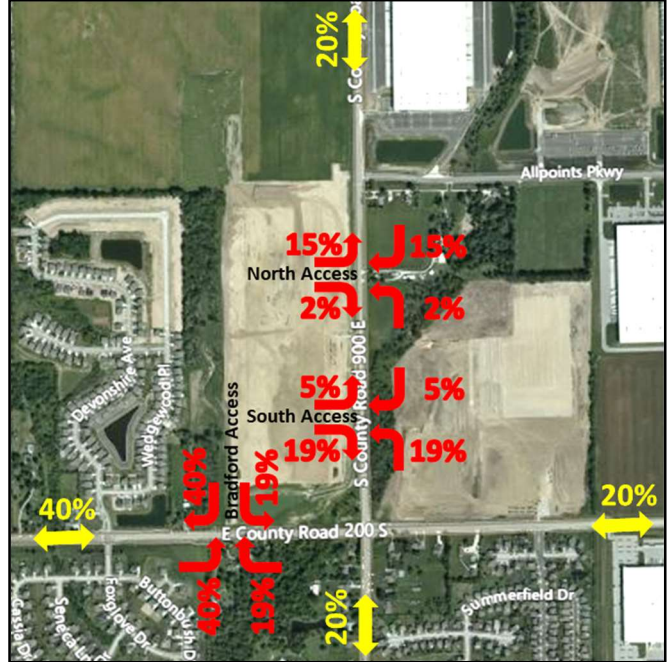


Figure 3: Current Plan Truck Distribution

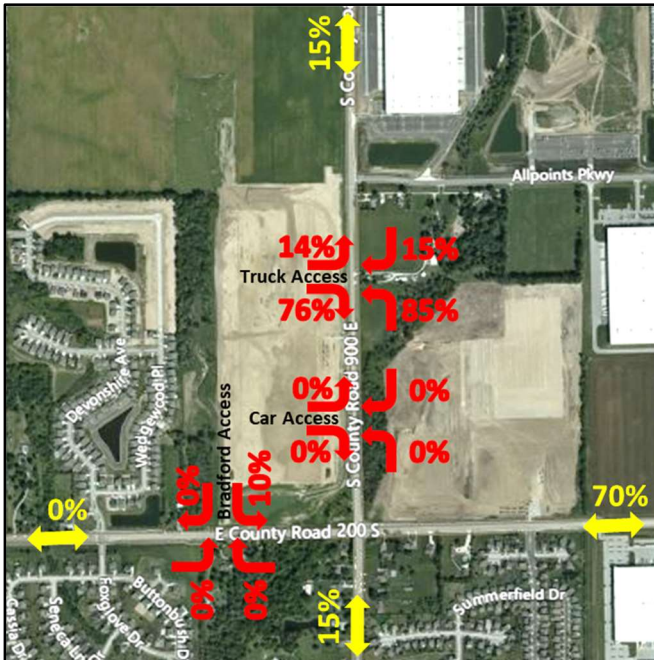
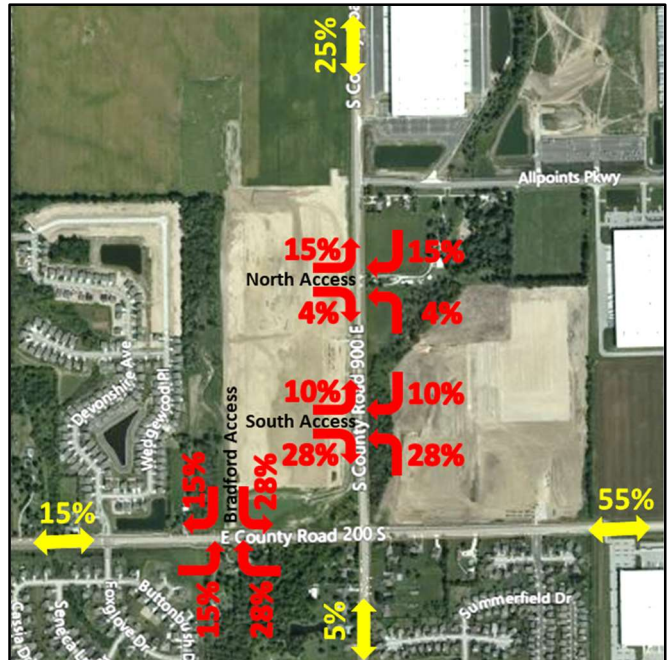


Figure 4: 2017 Study Truck Distribution



2017 Study Re-Analysis

The 2017 study examined the Bradford Road/Smith Road intersection and the site driveways intersections. To re-examine these intersections, the trip generation for this site was replaced with the current volumes, as presented in the previous section. Other volume data (10% background growth and traffic from future development) remained the same. However, to present a conservatively high volume for analysis and ensure future site changes could be accommodated, the following assumptions are applied to the site's trip generation for each peak hour analysis:

- For the a.m. peak hour, the provided trip generation for the 7 a.m. to 9 a.m. period was combined to represent a peak 7:30 to 8:30 a.m. hour with overlapping entries and exits.
- For the a.m. peak hour, four exiting trucks, representing the average of daily truck exits expected and as opposed to zero for this time from the client's data, were used to show results for exiting truck movements during this peak.
- For the p.m. peak hour, the site peak movements (2 to 3 p.m.) were used in combination with the p.m. peak traffic of the surrounding roads.

The 2017 study also provided recommendations for the roadway geometry around the site. In addition to the geometry shown on the current site plan, the following turn lanes are assumed for the analysis:

- A dedicated northbound left turn lane and dedicated southbound right turn lane on Smith Road at the Car Access (south driveway).
- A dedicated northbound left turn lane and dedicated southbound right turn lane on Smith Road at the Truck Access (north driveway).

Table 2 presents the 2017 study results and the re-analysis results using the above assumptions.

Table 2 – 2017 Study Re-Analysis Results

Intersection	Control	2017 Study Results		2020 Re-Analysis Results	
		AM Peak	PM Peak	AM Peak	PM Peak
Bradford Rd/Smith Rd	Traffic Signal ¹	B – 14.7 sec	C – 25.0 sec	C – 28.3 sec	D – 42.2 sec
Bradford Rd/Site Access	Side-St Stop ²	C – 0.20 veh	C – 0.62 veh	A – 0.11 veh	A – 0.11 veh
Smith Rd/Car Access	Side-St Stop ²	C – 0.05 veh	C – 0.16 veh	C – 1.05 veh	D – 3.32 veh
Smith Rd/Truck Access	Side-St Stop ²	C – 0.02 veh	C – 0.06 veh	C – 0.03 veh	D – 0.05 veh

¹ Results are the overall intersection Level of Service letter and average delay in seconds per vehicle.

² Results are the worst individual movement Level of Service and 95th percentile vehicle queue in number of vehicles.

As shown, results remain acceptable even with assumptions to increase the volumes during the peak periods. Actual operations would be better than what is presented in this memorandum. Based on this re-analysis, the recommendations for the site are:

- Update signal timing at the Bradford Road/Smith Road intersection at least every three to five years to reflect current volumes and travel patterns. The geometry provided on each approach is sufficient in the short term.
- Provide northbound left turn lanes and southbound right turn lanes on Smith Road at the south Car Access and north Truck Access. These lanes will improve both safety and operations.
- Reserve space for an additional outbound lane at the Truck Access exit to Smith Road. A short right turn lane (approximately 100 feet full width length) would separate truck movements and improve overall operations if needed in the future.

Approximately 530 feet separates the Bradford Road/Smith Road intersection and the south Car Access driveway. A new northbound left turn lane for the Car Access would create back-to-back left turn lanes

on Smith Road. Assuming a 100-foot taper between these turn lanes and a 100-foot northbound left turn for the Car Access, the existing southbound left turn lane on Smith Road at Bradford Road could be extended about 50 feet. The result would be an approximately 340-foot southbound left turn lane for that heavy movement.

The full results of the re-analysis for each peak hour, including volumes, are attached.

2018 Study Re-Analysis

The 2018 study focused on a broader study area and full build-out of this industrial area. The Bradford Road/Smith Road intersection was included in this study, but the individual driveways were not. As noted earlier, the trip generation for the full development of the study area included a low-range consisting of the Warehouse trip generation and a high-range consisting of High-Cube Parcel Warehouse.

Based on the results of the 2018 study, the recommended for the Bradford Road/Smith Road intersection included separate left turn, thru, and right turn lanes for each approach. Reserved right-of-way was also recommended to provide dual eastbound left turn lanes on Bradford Road along with two receiving lanes on Smith Road for approximately 500 feet north of the intersection.

To re-examine the Bradford Road/Smith Road intersection, the trip generation for this site was replaced with the current volumes, as presented in the previous section. Other volume data (10% background growth and traffic from future development) remained the same. However, to present a conservatively high volume for analysis and ensure future site changes could be accommodated, the following assumptions are applied to the site's trip generation for each peak hour analysis:

- For the a.m. peak hour, the provided trip generation for the 7 a.m. to 9 a.m. period was combined to represent a peak 7:30 to 8:30 a.m. hour with overlapping entries and exits.
- For the a.m. peak hour, four exiting trucks, representing the average of daily truck exits expected and as opposed to zero for this time from the client's data, were used to show results for exiting truck movements during this peak.
- For the p.m. peak hour, the site peak movements (2 to 3 p.m.) were used in combination with the p.m. peak traffic of the surrounding roads.

Table 3 presents the 2018 study results and the re-analysis results using the above assumptions.

Table 3 – 2018 Study Re-Analysis Results

Intersection & Scenario	Control	2018 Study Results		2020 Re-Analysis Results	
		AM Peak	PM Peak	AM Peak	PM Peak
Bradford Rd/Smith Rd Low-Range	Traffic Signal ¹	N/A ²	B – 19.6 sec	C – 28.0 sec	C – 27.1 sec
Bradford Rd/Smith Rd High-Range	Traffic Signal ¹	N/A ²	C – 33.2 veh	D – 37.3 veh	D – 54.0 veh

¹ Results are the overall intersection Level of Service letter and average delay in seconds per vehicle.

² The a.m. peak hour with mitigation was not analyzed in the 2018 study as the p.m. peak hour had higher delays and drove the results.

As shown, results remain acceptable even with assumptions to increase the volumes during the peak periods. Actual operations would be better than what is presented in this memorandum. Based on this re-analysis, the recommendations for the site are:

- Update signal timing at the Bradford Road/Smith Road intersection at least every three to five years to reflect current volumes and travel patterns.

- In the near-term future, provide dedicated left turn, thru, and right turn lanes on each approach to the intersection.
- Reserve additional right-of-way for the future addition of an eastbound left turn lane (for dual left turn lanes) and two receiving lanes on Smith Road north of the intersection.

These recommendations match those of the prior study. Since this site's primary impact is the Bradford Road/Smith Road intersection, other intersections of the 2018 study were not included in this review.

Full results of this analysis, including volumes, are attached.

Site Plan Review

Beyond the study intersection analysis presented above, the current site plan was reviewed. The following comments were noted:

- The site plan provides for connections to trail on Bradford Road and the trail on Smith Road, through the site to the main entrance. These internal routes encourage walking and bicycle travel, reducing the vehicle trip generation of the site.
- Similarly, walking paths are provided through the car parking area which will improve the safety for employees and visitors walking to and from their vehicle to and from the entrance.
- The North Plainfield Connector, operated by the Central Indiana Regional Transportation Authority (CIRTA), runs on Smith Road north of the site. Providing a transit stop near the south Car Access on Smith Road would encourage transit travel, reducing the vehicle trip generation of the site. The site owners should work with CIRTA on this recommendation.
- The site plan shows space for seven outbound trucks on the access to Bradford Road while the outbound Truck Access to Smith Road is more limited. If the assumption of most truck exits to Smith Road holds, the outbound route on the Truck Access to Smith Road should be re-examined to allow for sufficient stacking.
- To reinforce to drivers that trucks exiting to Bradford Road should turn left toward Smith Road, the curb radius could be reduced from 40-feet to 30-feet. A 'Left Turn Only' sign could also be posted beneath the stop sign for the access.
- In general, the layout of the car parking area will force slow vehicle speeds, which improves pedestrian safety. The road curves to and from the access driveways as well as raised medians through the parking area limit opportunities for fast driving. The design, with the primary entrance off Bradford Road, also results in most entering traffic on the south side of the lot and not crossing pedestrian movements to the front door.
- Under the current site plan orientation, the car drop-off/pick-up route would be entering off Bradford Road, proceeding along the southern internal road, and exiting to the Car Access to Smith Road. This route avoids circling through parking areas. Since drop-off/pick-up maneuvers would occur on the passenger side of the vehicle, these facilities should focus on the south side of the parking area/south internal road. These facilities could include a pull-off area for vehicles to stop, a paved sidewalk on the south side of the internal road, a shelter, and marked crosswalks for crossing the south internal road connecting to the pedestrian paths currently provided in the site plan parking area.
- Internal facilities should be considered for employees before or after their shifts. A break room with vending machines, places to site, and a television or other entertainment would help avoid having all internal traffic arrive just before a shift begins and leave immediately after a shift ends.
- An internal car pool program would facilitate employees travelling together, reducing vehicle traffic entering and exiting the site.

Conclusions

Based upon the review and analyses contained in this memorandum, the following is recommended:

1. Update signal timing at the Bradford Road/Smith Road intersection at least every three to five years to reflect current volumes and travel patterns. This matches prior recommendations.
2. Provide northbound left turn lanes and southbound right turn lanes on Smith Road at the south Car Access and north Truck Access. This matches the recommendation of the 2017 study.
3. Reserve space for an outbound right turn lane at the Truck Access exit to Smith Road.
4. In the near-term future, provide dedicated left turn, thru, and right turn lanes on each approach to the Bradford Road/Smith Road intersection. This matches the recommendation of the 2018 study.
5. Reserve additional right-of-way for the future addition of an eastbound left turn lane (for dual left turn lanes) and two receiving lanes on Smith Road north of the intersection. This matches the recommendation of the 2018 study.
6. Work with the CIRT in regard to a new transit stop near the south Car Access on Smith Road to encourage transit travel.
7. Re-examine the outbound route and facilities on the Truck Access to Smith Road to allow for sufficient onsite stacking at the primary truck exit.
8. Reduce to 30-feet the curb radius of the access to Bradford Road adjacent to the right turn movement and post a 'Left Turn Only' sign beneath the stop sign for the access.
9. Under the current site plan orientation, the car drop-off/pick-up route would be entering off Bradford Road, proceeding along the southern internal road, and exiting to the Car Access to Smith Road. This route avoids circling through parking areas. Since drop-off/pick-up maneuvers would occur on the passenger side of the vehicle, these facilities should focus on the south side of the parking area/south internal road. These facilities could include a pull-off area for vehicles to stop, a paved sidewalk on the south side of the internal road, a shelter, and marked crosswalks for crossing the south internal road connecting to the pedestrian paths currently provided in the site plan parking area.
10. Provide internal facilities for employees, such as a break room with vending machines, places to site, and a television or other entertainment, as a comfortable space for time before or after a work shift.
11. Provide an internal car pool program to facilitate employee traveling together instead of single-occupant only cars.

The proposed site plan and generation is similar to the traffic previously studied. As described above, the prior recommendations remain valid for the area and are expected to accommodate future traffic growth with acceptable intersection and corridor operations.

Attachments

AllPoints Midwest Building #12 Site Plan, dated August 21, 2020

APM-12 Trip Generation, as provided by the client

Re-Analysis Detailed Results

2017 Study Re-Analysis, AM Peak Hour

2017 Study Re-Analysis, PM Peak Hour

2018 Study Re-Analysis, AM Peak Hour – Low-Range

2018 Study Re-Analysis, PM Peak Hour – Low-Range

2018 Study Re-Analysis, AM Peak Hour – High-Range

2018 Study Re-Analysis, PM Peak Hour – High-Range

ATTACHMENT

SITE DATA TABLE	
PROPERTY AREA	±64.63 AC
PROPOSED BUILDING S.F.	516,790 SF
REQ'D. RATIO WAREHOUSE	1/3,000 SF
REQ'D. SPACES	173
PROPOSED CAR PARKING	486
PROPOSED A.D.A. PARKING (INCLUDES 4 VAN ACCESSIBLE)	10
TOTAL PROPOSED CAR PARKING	496
PROPOSED TRAILER STAGING	369
PROPOSED DOCK POSITIONS	122
PROPOSED MOTORCYCLE PARKING	16

- GENERAL NOTES:**
- CONTRACTOR SHALL PROTECT AND NOT DESTROY THE PROPERTY CORNER MONUMENTS DURING CONSTRUCTION.
 - CONTRACTOR TO VERIFY LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION. CONTACT ENGINEER IF VARIATION EXISTS.
 - SEE SHEET C002 GENERAL NOTES FOR MORE INFORMATION.

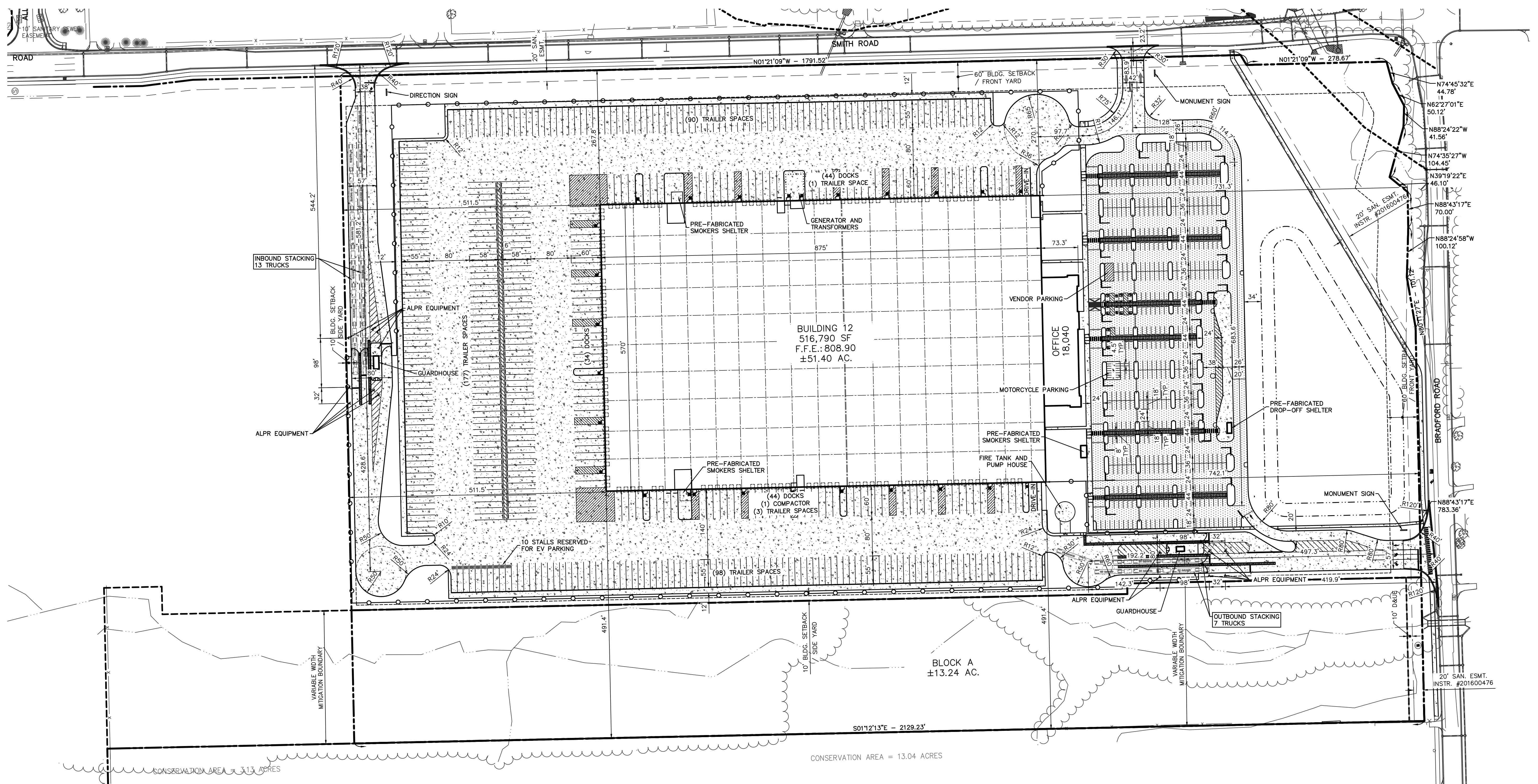
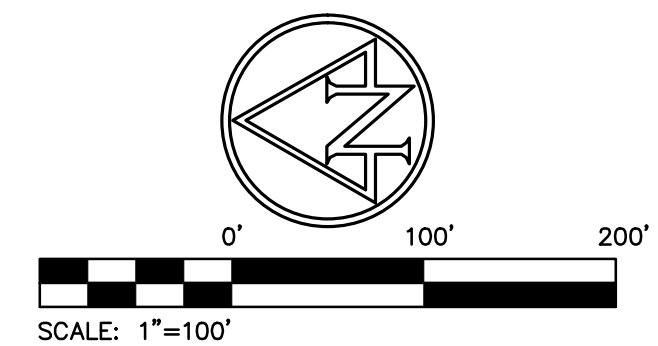
CAUTION !!

THE LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED UPON ABOVE GROUND EVIDENCE (including, but not limited to, manholes, inlets, valves, and marks made upon the ground by others) AND ARE SPECULATIVE IN NATURE. THERE MAY ALSO BE OTHER EXISTING UNDERGROUND UTILITIES FOR WHICH THERE IS NO ABOVE GROUND EVIDENCE OR FOR WHICH NO ABOVE GROUND EVIDENCE WAS OBSERVED. THE EXACT LOCATIONS OF SAID EXISTING UNDERGROUND UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY AND ALL CONSTRUCTION.

CALL TOLL FREE
 811 OR 1-800-382-5544
 - INDIANA UNDERGROUND -

EXISTING LEGEND			
	BEEHIVE INLET		PINE
	BUSH		POST
	CURB INLET		POWER POLE
	COMBINATION POLE		SIGN
	DELINEATOR		SANITARY MANHOLE
	DRAINAGE MANHOLE		STAND PIPE
	ELECTRIC HANDHOLE		STUMP
	ELECTRIC METER BOX		TELEPHONE HANDHOLE
	FIRE HYDRANT		TELEPHONE POLE
	GAS MARKER SIGN		TELEPHONE PEDESTAL
	GAS VALVE		TREE
	GUY WIRE		VENT
	INLET		WELL
	LIGHT POLE		WATER METER
	MAILBOX		WATER MANHOLE
			WATER VALVE

SITE LEGEND	
	LIGHT DUTY ASPHALT PAVEMENT
	CONCRETE PAVEMENT



PLOT DATE: 8/27/2020 9:24 AM
 PLOT SCALE: 1/2"=50'
 EDITED BY: WINISLOW
 DRAWING FILE: P:\2017\0114\BID_Drawing\Civil\Construction Documents\02017_0114_C200_CSP.dwg
 DRAWING DATE: 8/26/2020

American STRUCTUREPOINT INC.
 6025 RIVER ROAD, SUITE 200
 INDIANAPOLIS, IN 46240
 TEL 317.547.5560 FAX 317.543.0270
 www.structurepoint.com

Browning Duke
 A Browning-Duke Joint Venture

Scale:	Date:	Drawn By:	Checked By:
	08/21/20	PED	NW

ALLPOINTS
 - MIDWEST -

ALLPOINTS MIDWEST BLDG 12

ALLPOINTS MIDWEST BUILDING 12
 BRADFORD RD & SMITH RD
 PLAINFIELD, INDIANA

OVERALL SITE PLAN

Certified By:	Drawing Number:
	C200
	Of Sheets
Date Job Number:	
A/E Job Number:	

APM 12 - Trip Generation Provided By Client

Peak Traffic At Launch 2021

ATTACHMENT

Time of Day	Automobiles		Trailers		Total Vehicles	
	Arrive	Depart	Arrive	Depart	Arrive	Depart
12am to 1am	0	0	4	4	4	4
1am to 2am	108	180	3	5	111	185
2am to 3am	72	0	3	3	75	3
3am to 4am	0	0	4	4	4	4
4am to 5am	0	0	5	4	5	4
5am to 6am	0	0	2	6	2	6
6am to 7am	0	0	0	2	0	2
7am to 8am	0	180	0	0	0	180
8am to 9am	144	0	3	0	147	0
9am to 10am	36	0	3	3	39	3
10am to 11am	0	0	4	3	4	3
11am to 12noon	0	0	4	5	4	5
12 noon to 1pm	0	0	4	5	4	5
1pm to 2pm	0	0	4	4	4	4
2pm to 3pm	108	180	4	4	112	184
3pm to 4pm	72	0	4	4	76	4
4pm to 5pm	0	0	4	5	4	5
5pm to 6pm	0	0	4	5	4	5
6pm to 7pm	0	0	4	5	4	5
7pm to 8pm	144	144	3	4	147	148
8pm to 9pm	36	36	4	4	40	40
9pm to 10pm	0	0	4	4	4	4
10pm to 11pm	0	0	3	4	3	4
11pm to midnight	0	0	4	3	4	3
Total Day	720	720	81	90	801	810

Peak Traffic At Final State

Time of Day	Automobiles		Trailers		Total Vehicles	
	Arrive	Depart	Arrive	Depart	Arrive	Depart
12am to 1am	0	0	13	13	13	13
1am to 2am	276	460	8	14	284	474
2am to 3am	184	0	10	8	194	8
3am to 4am	0	0	12	11	12	11
4am to 5am	0	0	15	13	15	13
5am to 6am	0	0	6	16	6	16
6am to 7am	0	0	0	7	0	7
7am to 8am	0	460	0	0	0	460
8am to 9am	368	0	8	0	376	0
9am to 10am	92	0	9	8	101	8
10am to 11am	0	0	12	10	12	10
11am to 12noon	0	0	12	14	12	14
12 noon to 1pm	0	0	11	13	11	13
1pm to 2pm	0	0	11	12	11	12
2pm to 3pm	276	460	11	12	287	472
3pm to 4pm	184	0	12	12	196	12
4pm to 5pm	0	0	12	13	12	13
5pm to 6pm	0	0	12	14	12	14
6pm to 7pm	0	0	11	13	11	13
7pm to 8pm	368	368	9	12	377	380
8pm to 9pm	92	92	11	10	103	102
9pm to 10pm	0	0	12	13	12	13
10pm to 11pm	0	0	8	13	8	13
11pm to midnight	0	0	11	9	11	9
Total Day	1840	1840	236	260	2076	2100

APM 12 - Adjusted Trip Generation Provided By Client (Truck Arrival Increased for Balance)

Peak Traffic At Launch 2021

ATTACHMENT

Time of Day	Automobiles		Trailers		Total Vehicles	
	Arrive	Depart	Arrive	Depart	Arrive	Depart
12am to 1am	0	0	5	4	5	4
1am to 2am	108	180	3	5	111	185
2am to 3am	72	0	4	3	76	3
3am to 4am	0	0	4	4	4	4
4am to 5am	0	0	6	4	6	4
5am to 6am	0	0	2	6	2	6
6am to 7am	0	0	0	2	0	2
7am to 8am	0	180	0	0	0	180
8am to 9am	144	0	3	0	147	0
9am to 10am	36	0	3	3	39	3
10am to 11am	0	0	5	3	5	3
11am to 12noon	0	0	5	5	5	5
12 noon to 1pm	0	0	4	5	4	5
1pm to 2pm	0	0	4	4	4	4
2pm to 3pm	108	180	4	4	112	184
3pm to 4pm	72	0	5	4	77	4
4pm to 5pm	0	0	5	5	5	5
5pm to 6pm	0	0	5	5	5	5
6pm to 7pm	0	0	4	5	4	5
7pm to 8pm	144	144	4	4	148	148
8pm to 9pm	36	36	4	4	40	40
9pm to 10pm	0	0	4	4	4	4
10pm to 11pm	0	0	3	4	3	4
11pm to midnight	0	0	4	3	4	3
Total Day	720	720	90	90	810	810

Peak Traffic At Final State

Time of Day	Automobiles		Trailers		Total Vehicles	
	Arrive	Depart	Arrive	Depart	Arrive	Depart
12am to 1am	0	0	14	13	14	13
1am to 2am	276	460	8	14	284	474
2am to 3am	184	0	11	8	195	8
3am to 4am	0	0	13	11	13	11
4am to 5am	0	0	16	13	16	13
5am to 6am	0	0	7	16	7	16
6am to 7am	0	0	0	7	0	7
7am to 8am	0	460	0	0	0	460
8am to 9am	368	0	8	0	376	0
9am to 10am	92	0	10	8	102	8
10am to 11am	0	0	14	10	14	10
11am to 12noon	0	0	13	14	13	14
12 noon to 1pm	0	0	12	13	12	13
1pm to 2pm	0	0	12	12	12	12
2pm to 3pm	276	460	12	12	288	472
3pm to 4pm	184	0	13	12	197	12
4pm to 5pm	0	0	14	13	14	13
5pm to 6pm	0	0	13	14	13	14
6pm to 7pm	0	0	12	13	12	13
7pm to 8pm	368	368	10	12	378	380
8pm to 9pm	92	92	13	10	105	102
9pm to 10pm	0	0	13	13	13	13
10pm to 11pm	0	0	9	13	9	13
11pm to midnight	0	0	13	9	13	9
Total Day	1840	1840	260	260	2100	2100

ATTACHMENT

Generated with **PTV VISTRO**

Version 2020 (SP 0-7)

Vistro File: C:\...\VAPM 12 - Analysis.vistro

Scenario 1 2017 Study Re-Analysis AM Peak

Report File: C:\...\VAPM 12 - 2017 ReAnalysis AM Peak.pdf

9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	SB Left	0.547	28.3	C
20	Site Access at Bradford Road	Two-way stop	HCM 6th Edition	EB Left	0.034	8.2	A
30	South Site Access to Smith Rd	Two-way stop	HCM 6th Edition	EB Left	0.265	19.4	C
40	North Site Access to Smith Rd	Two-way stop	HCM 6th Edition	EB Left	0.004	19.6	C

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

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Generated with 

Version 2020 (SP 0-7)

Vistro File: C:\...\APM 12 - Analysis.vistro

Scenario 2 2017 Study Re-Analysis PM Peak

Report File: C:\...\APM 12 - 2017 ReAnalysis PM Peak.pdf

9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	SB Thru	0.686	42.2	D
20	Site Access at Bradford Road	Two-way stop	HCM 6th Edition	EB Left	0.035	9.5	A
30	South Site Access to Smith Rd	Two-way stop	HCM 6th Edition	EB Left	0.376	28.8	D
40	North Site Access to Smith Rd	Two-way stop	HCM 6th Edition	EB Left	0.006	27.5	D

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

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Generated with **PTV VISTRO**

Version 2020 (SP 0-7)

Intersection Level Of Service Report Intersection 10: Bradford Rd & Smith Rd

Control Type:	Signalized	Delay (sec / veh):	42.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name	Smith Road			Smith Road			Bradford Road			Bradford Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇑⇒			⇑⇒⇐			⇑⇒⇐			⇑⇒⇐⇑		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	175.00	100.00	100.00	290.00	100.00	100.00	270.00	100.00	100.00	330.00	100.00	330.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			Yes		

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Vistro File: C:\...\APM 12 - Analysis.vistro
Report File: C:\...\APM 12 - 2018 ReAnalysis AM Peak-Low.pdf

Scenario 3 2018 Study Re-Analysis AM Peak-Low
9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	EB Left	0.428	23.0	C

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

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Low.pdf

Scenario 4 2018 Study Re-Analysis PM Peak-Low
9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	NB Left	0.517	27.1	C

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

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Version 2020 (SP 0-7)

Intersection Level Of Service Report Intersection 10: Bradford Rd & Smith Rd

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.517

Intersection Setup

Name	Smith Road			Smith Road			Bradford Road			Bradford Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	175.00	100.00	150.00	290.00	100.00	150.00	270.00	100.00	150.00	330.00	100.00	330.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			Yes		

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Scenario 5 2018 Study Re-Analysis AM Peak-High
9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	SB Left	0.645	37.3	D

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

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Version 2020 (SP 0-7)

Vistro File: C:\...\APM 12 - Analysis.vistro
Report File: C:\...\APM 12 - 2018 ReAnalysis PM Peak-High.pdf

Scenario 6 2018 Study Re-Analysis PM Peak-High
9/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
10	Bradford Rd & Smith Rd	Signalized	HCM 6th Edition	SB Left	0.772	54.0	D

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