

2018 Call for Projects Benefit Cost Analysis Questions (All Investment Categories)

1. Safety Benefits **\$16,457,000**
2. Delay Benefits: **\$726,000**
3. Emissions Benefits: **\$0**
4. Additional BCA Documentation (Optional)
5. Additional BCA Documentation (Optional)
6. Please provide a brief narrative describing the methodology, input data and results. (Optional)
The year 2018, 2025 and 2045 volumes were modified taken from the H-GAC projection models, based on traffic counts taken in the area. Attached are the numbers used for the year 2018,2025 and 2045 volumes.

Total Benefits: **\$17,183,000**

Total Cost: **\$669,000.00**

Federal Request: **\$535,200.00**

B/C: **32.11**

Traffic Management Center (south of IH 10 to 565)	2018 PkPeriod Vol	2018 24Hr Vol	2018 PkPeriod Cap	2025 PkPeriod Vol	2025 24Hr Vol	2025 PkPeriod Cap	2045 PkPeriod Vol	2045 24Hr Vol	2045 PkPeriod Cap	Estimated FFSpd (2018)	Avg Corrdor Spd (2018)
Modified Volumes (based on existing counts)	12,743	23,783	19,908	6,598	13,024	19,908	14,736	29,032	19,908	54	35
H-GAC Volumes	4,057	7,572	19,908	2,100	4,146	19,908	6,050	12,821	19,908	59	56

Eagle Drive at EBFR

Leg Direction Start Time	Eagle Dr Southbound				EBFR I-10 Westbound				Eagle Dr Northbound				EBFR I-10 Eastbound				Int Total	1649 1614 1611 1664 1630 1535 1374 1207 1249 1352 1466 1676 1737 1767 1870 1973 2128 2344 2427 2288 2168 1978 1862 1776 1744	6:30-9:20-4:5:30-7:30 7:15-8:13:30-4:5:30-6:15 1664 2128 2168											
	Right	Thru	Left	U-Turn	App Tot	Peds	CV	Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV				Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV	Peds	CC
2018-10-09 06:30:00	17	42	0	0	59	0	0	0	82	0	0	0	0	82	0	0	0	11	229	0	0	34	0	1	0	35	0	0	416	
2018-10-09 06:45:00	18	72	11	0	101	0	0	0	98	0	0	0	0	98	0	0	0	7	215	0	0	26	0	3	0	29	0	0	450	
2018-10-09 07:00:00	17	93	22	0	132	0	0	0	87	0	1	0	0	88	0	0	0	8	163	0	0	30	0	4	0	34	0	0	425	
2018-10-09 07:15:00	7	101	24	0	132	0	0	0	59	0	0	0	0	59	0	0	0	7	139	0	0	19	0	2	0	21	0	0	358	
2018-10-09 07:30:00	4	58	14	0	76	0	0	0	68	0	0	0	0	68	0	0	0	12	192	0	0	32	0	1	0	33	0	0	381	
2018-10-09 07:45:00	16	81	19	0	116	0	0	0	88	0	0	0	0	88	0	0	0	7	215	0	0	21	0	0	0	21	0	0	447	
2018-10-09 08:00:00	18	108	14	0	140	0	0	0	59	0	0	0	0	59	0	0	0	8	237	0	0	31	0	3	0	34	0	0	478	
2018-10-09 08:15:00	2	86	33	0	121	0	0	0	58	0	0	0	0	58	0	0	0	4	103	0	0	38	0	0	0	38	0	0	324	
2018-10-09 08:30:00	2	53	25	0	80	0	0	0	61	0	0	0	0	61	0	0	0	4	107	0	0	33	0	1	0	34	0	0	286	
2018-10-09 08:45:00	5	49	16	0	70	0	0	0	72	0	1	0	0	73	0	0	0	12	96	0	0	35	0	0	0	35	0	0	286	
2018-10-09 14:00:00	7	64	15	0	86	0	0	0	82	0	1	0	0	83	0	0	0	6	84	0	0	46	0	6	0	52	0	0	311	
2018-10-09 14:15:00	5	55	18	0	78	0	0	0	107	0	2	0	0	109	0	0	0	8	113	0	0	50	0	8	0	58	0	0	366	
2018-10-09 14:30:00	2	47	23	0	72	0	0	0	111	0	2	0	0	113	0	0	0	8	142	0	0	48	1	5	0	54	0	0	389	
2018-10-09 14:45:00	6	82	26	0	114	0	0	0	97	0	2	0	0	99	0	0	0	11	121	0	0	53	0	2	0	55	0	0	400	
2018-10-09 15:00:00	9	179	43	0	231	0	0	0	102	0	1	0	0	103	0	0	0	9	114	0	0	63	0	1	0	64	0	0	521	
2018-10-09 15:15:00	3	85	30	0	118	0	0	0	111	0	0	1	0	112	0	0	0	12	130	0	0	50	0	5	0	55	0	0	427	
2018-10-09 15:30:00	6	68	26	0	100	0	0	0	118	0	0	0	0	118	0	0	0	3	134	0	0	54	0	10	0	64	0	0	419	
2018-10-09 15:45:00	7	128	31	0	166	0	0	0	128	0	1	0	0	129	0	0	0	13	129	0	0	65	0	1	0	66	0	0	503	
2018-10-09 16:00:00	12	192	64	0	268	0	0	0	136	0	1	0	0	137	0	0	0	11	136	0	0	69	0	3	0	72	0	0	624	
2018-10-09 16:15:00	9	143	42	0	194	0	0	0	127	0	1	0	0	128	0	0	0	18	150	0	0	88	0	4	0	92	0	0	582	
2018-10-09 17:30:00	12	151	17	0	180	0	0	0	142	0	0	0	0	142	0	0	0	10	178	0	0	95	0	30	0	125	0	0	635	
2018-10-09 17:45:00	13	132	25	0	170	0	0	0	144	0	0	0	0	144	0	0	0	10	160	0	0	87	0	15	0	102	0	0	586	
2018-10-09 18:00:00	10	75	31	0	116	0	0	0	120	1	1	0	0	122	0	0	0	10	124	0	0	88	0	25	0	113	0	0	485	
2018-10-09 18:15:00	11	71	19	0	101	0	0	0	124	0	0	0	0	124	0	0	0	14	118	0	0	85	0	20	0	105	0	0	462	
2018-10-09 18:30:00	12	74	17	0	103	0	0	0	114	0	1	0	0	115	0	0	0	18	128	0	0	74	0	7	0	81	0	0	445	
2018-10-09 18:45:00	7	78	9	0	94	0	0	0	107	0	1	0	0	108	0	0	0	10	159	0	0	94	0	5	0	99	0	0	470	
2018-10-09 19:00:00	6	90	19	0	115	0	0	0	79	0	1	0	0	80	0	0	0	8	107	0	0	84	0	5	0	89	0	0	399	
2018-10-09 19:15:00	4	111	28	0	143	0	0	0	97	0	0	0	0	97	0	0	0	1	96	0	0	90	0	3	0	93	0	0	430	
Grand Total	247	2568	661	0	3476	0	0	0	2778	1	17	1	0	2797	0	0	0	260	4019	0	0	1582	1	170	0	1753	0	0	12305	
% Approach	7.1%	73.9%	19.0%	0.0%					99.3%	0.0%	0.6%	0.0%						6.1%	93.9%	0.0%	0.0%	90.2%	0.1%	9.7%	0.0%					
% Total	2.0%	20.9%	5.4%	0.0%	28.2%				22.6%	0.0%	0.1%	0.0%		22.7%				2.1%	32.7%	0.0%	0.0%	12.9%	0.0%	1.4%	0.0%	14.2%				
Lights	224	2466	649	0	3339				2665	1	16	1		2683				244	3861	0	0	1496	1	167	0	1664			11791	
% Lights	90.7%	96.0%	98.2%	0.0%	96.1%				95.9%	100.0%	94.1%	100.0%		95.9%				93.8%	96.1%	0.0%	0.0%	94.6%	100.0%	98.2%	0.0%	94.9%			95.8%	
Articulated Trucks	5	25	2	0	32				16	0	0	0		16				12	42	0	0	46	0	0	0	46			148	
% Articulated Trucks	2.0%	1.0%	0.3%	0.0%	0.9%				0.6%	0.0%	0.0%	0.0%		0.6%				4.6%	1.0%	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	2.6%			1.2%	
Buses and Single-Unit Truc	18	77	10	0	105				97	0	1	0		98				4	116	0	0	40	0	3	0	43			366	
% Buses and Single-Unit Tr	7.3%	3.0%	1.5%	0.0%	3.0%				3.5%	0.0%	5.9%	0.0%		3.5%				1.5%	2.9%	0.0%	0.0%	2.5%	0.0%	1.8%	0.0%	2.5%			3.0%	
Pedestrians						0	0								0	0											0	0		
% Pedestrians						0.0%	0.0%								0.0%	0.0%											0.0%	0.0%		

Leg Direction Start Time	FM 565 Southbound				EBFR I-10 Westbound				FM 565 Northbound				EBFR I-10 Eastbound				Int Total		6:30-9:02:00-4:05:30-7:3 6:45-7:3 3:30-4:1 5:30-6:1 729 681 1016								
	Right	Thru	Left	U-Turn	App Total	Peds	CW	Peds	CC	Right	Thru	Left	U-Turn	App Total	Peds	CW				Peds	CC						
2018-10-09 06:30:00	0	17	0	0	17	0	0	0	0	0	0	0	0	61	0	0	0	5	18	75	0	98	0	0	176	717	
2018-10-09 06:45:00	0	31	9	0	40	0	0	0	0	0	0	0	0	77	0	0	0	4	11	74	0	89	0	0	206	729	
2018-10-09 07:00:00	0	26	16	0	42	0	0	0	0	0	0	0	0	68	0	0	0	6	14	59	0	79	0	0	189	684	
2018-10-09 07:15:00	0	25	5	0	30	0	0	0	0	0	0	0	0	48	0	0	0	4	16	48	0	68	0	0	146	625	
2018-10-09 07:30:00	0	30	12	0	42	0	0	0	0	0	0	0	0	66	0	0	0	4	9	66	1	80	0	0	188	612	
2018-10-09 07:45:00	0	22	11	0	33	0	0	0	0	0	0	0	0	44	0	0	0	4	14	66	0	84	0	0	161	528	
2018-10-09 08:00:00	0	22	7	0	29	0	0	0	0	0	0	0	0	36	0	0	0	2	7	56	0	65	0	0	130	472	
2018-10-09 08:15:00	0	17	10	0	27	0	0	0	0	0	0	0	0	34	0	0	0	2	17	53	0	72	0	0	133	445	
2018-10-09 08:30:00	0	15	11	0	26	0	0	0	0	0	0	0	0	41	0	0	0	8	6	23	0	37	0	0	104	442	
2018-10-09 08:45:00	0	10	5	0	15	0	0	0	0	0	0	0	0	33	0	0	0	6	15	36	0	57	0	0	105	470	
2018-10-09 14:00:00	0	18	7	0	25	0	0	0	0	0	0	0	0	23	0	0	0	7	8	40	0	55	0	0	103	474	
2018-10-09 14:15:00	0	22	8	0	30	0	0	0	0	0	0	0	0	34	0	0	0	5	8	53	0	66	0	0	130	512	
2018-10-09 14:30:00	0	18	9	0	27	0	0	0	0	0	0	0	0	29	0	0	0	9	12	55	0	76	0	0	132	530	
2018-10-09 14:45:00	0	14	5	0	19	0	0	2	0	0	0	0	0	37	0	0	0	1	7	43	0	51	0	0	109	530	
2018-10-09 15:00:00	0	16	8	0	24	0	0	0	0	0	0	0	0	48	0	0	0	6	5	58	0	69	0	0	141	566	
2018-10-09 15:15:00	0	24	7	0	31	0	0	0	0	0	0	0	0	41	0	0	0	6	10	60	0	76	0	0	148	611	
2018-10-09 15:30:00	0	14	8	0	22	0	0	0	0	0	0	0	0	35	0	0	0	2	9	64	0	75	0	0	132	681	
2018-10-09 15:45:00	0	22	5	0	27	0	0	0	0	0	0	0	0	38	0	0	0	3	24	53	0	80	0	0	145	799	
2018-10-09 16:00:00	0	27	13	0	40	0	0	0	0	0	0	0	0	48	0	0	0	7	7	84	0	98	0	0	186	910	
2018-10-09 16:15:00	0	38	17	0	55	0	0	0	0	0	0	0	0	44	0	0	0	7	20	92	0	119	0	0	218	985	
2018-10-09 17:30:00	0	33	15	0	48	0	0	0	0	0	0	0	0	82	0	0	0	20	28	72	0	120	0	0	250	1016	
2018-10-09 17:45:00	0	28	11	0	39	0	0	0	0	0	0	0	0	103	0	0	0	12	15	87	0	114	0	0	256	967	
2018-10-09 18:00:00	0	29	12	0	41	0	0	0	0	0	0	0	0	99	0	0	0	12	16	93	0	121	0	0	261	846	
2018-10-09 18:15:00	0	25	8	0	33	0	0	0	0	0	0	0	0	103	0	0	0	8	14	91	0	113	0	0	249	707	
2018-10-09 18:30:00	0	23	4	0	27	0	0	0	0	0	0	0	0	65	0	0	0	13	9	87	0	109	0	0	201	571	
2018-10-09 18:45:00	0	15	5	0	20	0	0	0	0	0	0	0	0	44	0	0	0	9	6	56	0	71	0	0	135		
2018-10-09 19:00:00	0	15	5	0	20	0	0	0	0	0	0	0	0	36	0	0	0	4	14	48	0	66	0	0	122		
2018-10-09 19:15:00	0	16	3	0	19	0	0	0	0	0	0	0	0	29	0	0	0	8	10	47	0	65	0	0	113		
Grand Total	0	612	236	0	848	0	0	2	0	0	0	0	0	1446	0	0	0	184	349	1739	1	2273	0	0	4569		
% Approach	0.0%	72.2%	27.8%	0.0%				100.0%	72.2%	27.8%	0.0%	0.0%		34.3%	65.7%	0.0%	0.0%	8.1%	15.4%	76.5%	0.0%						
% Total	0.0%	13.4%	5.2%	0.0%	18.6%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.6%				4.0%	7.6%	38.1%	0.0%	49.7%					
Lights	0	572	214	0	786			2	0	0	0	0	0	1383				166	242	1663	1	2072			4243		
% Lights	0.0%	93.5%	90.7%	0.0%	92.7%			100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	93.3%	96.8%	0.0%	0.0%	90.2%	69.3%	95.6%	100.0%	91.2%			92.9%		
Articulated Trucks	0	18	20	0	38			0	0	0	0	0	0	27				13	93	39	0	145			210		
% Articulated Trucks	0.0%	2.9%	8.5%	0.0%	4.5%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%				7.1%	26.6%	2.2%	0.0%	6.4%			4.6%		
Buses and Single-Unit Trucks	0	22	2	0	24			0	0	0	0	0	0	36				5	14	37	0	56			116		
% Buses and Single-Unit Truck	0.0%	3.6%	0.8%	0.0%	2.8%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%				2.7%	4.0%	2.1%	0.0%	2.5%			2.5%		
Pedestrians						0	0								0	0						0	0				
% Pedestrians						0.0%	0.0%								0.0%	0.0%						0.0%	0.0%				

Leg Direction Start Time	FM 565 Southbound				WBFR I-10 Westbound				FM 565 Northbound				West Eastbound				Int Total										
	Right	Thru	Left	U-Turn	App	Tot	Peds C	Peds C	Right	Thru	Left	U-Turn	App	Tot	Peds C	Peds C		Right	Thru	Left	U-Turn	App	Tot	Peds C	Peds C		
2018-10-09 06:30:00	2	1	0	0	3	0	0	2	14	18	0	34	0	0	0	0	124	0	124	0	0	0	0	0	161		
2018-10-09 06:45:00	48	22	0	0	70	0	0	6	7	17	0	30	0	0	0	19	117	0	136	0	0	0	0	0	236		
2018-10-09 07:00:00	29	30	0	0	59	0	0	3	5	11	0	19	0	0	0	14	103	0	117	0	0	0	0	0	195		
2018-10-09 07:15:00	33	18	0	0	51	0	0	8	5	11	0	24	0	0	0	24	50	0	74	0	0	0	0	0	149		
2018-10-09 07:30:00	44	28	0	0	72	0	0	8	11	13	0	32	0	0	0	28	80	0	108	0	0	0	0	0	212		
2018-10-09 07:45:00	46	23	0	0	69	0	0	5	5	10	0	20	0	0	0	21	76	0	97	0	0	0	0	0	186		
2018-10-09 08:00:00	16	15	0	0	31	0	0	3	3	14	0	20	0	0	0	14	73	0	87	0	0	0	0	0	138		
2018-10-09 08:15:00	15	18	0	0	33	0	0	6	5	9	0	20	0	0	0	26	44	0	70	0	0	0	0	0	123		
2018-10-09 08:30:00	16	16	0	0	32	0	0	3	8	9	0	20	0	0	0	14	29	0	43	0	0	0	0	0	95		
2018-10-09 08:45:00	12	7	0	0	19	0	0	1	5	7	0	13	0	0	0	22	31	0	53	0	0	0	0	0	85		
2018-10-09 14:00:00	19	12	0	0	31	0	0	8	21	10	0	39	0	0	0	20	34	0	54	0	0	0	0	0	124		
2018-10-09 14:15:00	17	16	0	0	33	0	0	3	10	10	0	23	0	0	0	32	41	0	73	0	0	0	0	0	129		
2018-10-09 14:30:00	22	15	0	0	37	0	0	9	5	12	0	26	0	0	0	36	40	0	76	0	0	0	0	0	139		
2018-10-09 14:45:00	16	7	0	0	23	0	0	10	10	10	0	30	0	0	0	30	39	0	69	0	0	0	0	0	122		
2018-10-09 15:00:00	15	19	0	0	34	0	0	5	6	8	0	19	0	0	0	42	44	0	86	0	0	0	0	0	139		
2018-10-09 15:15:00	17	14	0	0	31	0	0	6	13	16	0	35	0	0	0	29	55	0	84	0	0	0	0	0	150		
2018-10-09 15:30:00	24	14	0	0	38	0	0	6	10	8	0	24	0	0	0	36	42	0	78	0	0	0	0	0	140		
2018-10-09 15:45:00	9	13	0	0	22	0	0	18	11	15	0	44	0	0	0	44	32	0	76	0	0	0	0	0	142		
2018-10-09 16:00:00	19	22	0	0	41	0	0	12	8	19	0	39	0	0	0	60	46	0	106	0	0	0	0	0	186		
2018-10-09 16:15:00	19	36	0	0	55	0	0	7	14	16	0	37	0	0	0	71	47	0	118	0	0	0	0	0	210		
2018-10-09 17:30:00	26	24	0	0	50	0	0	35	15	24	0	74	0	0	0	71	60	0	131	0	0	0	0	0	255		
2018-10-09 17:45:00	23	16	0	0	39	0	0	23	5	21	0	49	0	0	0	83	77	0	160	0	0	0	0	0	248		
2018-10-09 18:00:00	18	22	0	0	40	0	0	12	5	18	0	35	0	0	0	87	73	0	160	0	0	0	0	0	235		
2018-10-09 18:15:00	13	14	0	0	27	0	0	10	6	18	0	34	0	0	0	91	68	0	159	0	0	0	0	0	220		
2018-10-09 18:30:00	14	13	0	0	27	0	0	12	9	15	0	36	0	0	0	76	60	0	136	0	0	0	0	0	199		
2018-10-09 18:45:00	18	12	0	0	30	0	0	8	12	8	0	28	0	0	0	47	37	0	84	0	0	0	0	0	142		
2018-10-09 19:00:00	7	9	0	0	16	0	0	7	4	11	0	22	0	0	0	42	30	0	72	0	0	0	0	0	110		
2018-10-09 19:15:00	7	10	0	0	17	0	0	6	4	9	0	19	0	0	0	34	30	0	64	0	0	0	0	0	100		
Grand Total	564	466	0	0	1030	0	0	242	236	367	0	845	0	0	0	1113	1582	0	2695	0	0	0	0	0	0	4570	
% Approach	54.8%	45.2%	0.0%	0.0%				28.6%	27.9%	43.4%	0.0%				0.0%	41.3%	58.7%	0.0%									
% Total	12.3%	10.2%	0.0%	0.0%	22.5%			5.3%	5.2%	8.0%	0.0%	18.5%			0.0%	24.4%	34.6%	0.0%	59.0%					0.0%			
Lights	554	438	0	0	992			209	212	331	0	752			0	1085	1505	0	2590					0		4334	
% Lights	98.2%	94.0%	0.0%	0.0%	96.3%			86.4%	89.8%	90.2%	0.0%	89.0%			0.0%	97.5%	95.1%	0.0%	96.1%					0.0%		94.8%	
Articulated Trucks	3	20	0	0	23			28	15	18	0	61			0	9	36	0	45					0		129	
% Articulated Trucks	0.5%	4.3%	0.0%	0.0%	2.2%			11.6%	6.4%	4.9%	0.0%	7.2%			0.0%	0.8%	2.3%	0.0%	1.7%					0.0%		2.8%	
Buses and Single-Unit Trucks	7	8	0	0	15			5	9	18	0	32			0	19	41	0	60					0		107	
% Buses and Single-Unit Trucks	1.2%	1.7%	0.0%	0.0%	1.5%			2.1%	3.8%	4.9%	0.0%	3.8%			0.0%	1.7%	2.6%	0.0%	2.2%					0.0%		2.3%	
Pedestrians						0	0						0	0											0	0	
% Pedestrians						0.0%	0.0%						0.0%	0.0%											0.0%	0.0%	

6:30-9:2:00-4: 5:30-7:
6:45-7: 4:30-5: 5:30-6:
792 678 958

Leg Direction Start Time	SH 146 Southbound				I-10 EBFR Westbound				SH 146 Northbound				I-10 EBFR Eastbound				Int Total	6:30-9:2:00-4:5:30-7:									
	Right	Thru	Left	U-Turn	App Tot	Peds	CV	Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV			Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV
2018-10-09 06:30:00	0	206	20	0	226	0	0	0	0	0	0	0	0	333	0	0	0	0	75	27	137	6	245	0	0	804	2941
2018-10-09 06:45:00	0	216	41	0	257	0	0	0	0	0	0	0	0	313	0	0	0	0	69	6	108	14	197	0	0	767	2809
2018-10-09 07:00:00	0	193	19	0	212	0	0	0	0	0	0	0	0	274	0	0	0	0	58	22	104	21	205	0	0	691	2743
2018-10-09 07:15:00	0	190	30	0	220	0	0	0	0	0	0	0	0	296	0	0	0	0	53	26	76	8	163	0	0	679	2670
2018-10-09 07:30:00	0	206	37	0	243	0	0	0	0	0	0	0	0	258	0	0	0	0	65	24	68	14	171	0	0	672	2597
2018-10-09 07:45:00	0	197	40	0	237	0	0	0	0	0	0	0	0	277	0	0	0	0	69	20	88	10	187	0	0	701	2508
2018-10-09 08:00:00	0	165	31	0	196	0	0	0	0	0	0	0	0	285	0	0	0	0	59	11	61	6	137	0	0	618	2352
2018-10-09 08:15:00	0	203	37	0	240	0	0	0	0	0	0	0	0	201	0	0	0	0	64	18	72	11	165	0	0	606	2399
2018-10-09 08:30:00	0	180	30	0	210	0	0	0	0	0	0	0	0	215	0	0	0	0	68	16	67	7	158	0	0	583	2450
2018-10-09 08:45:00	0	174	31	0	205	0	0	0	0	0	0	0	0	197	0	0	0	0	55	17	66	5	143	0	0	545	2571
2018-10-09 14:00:00	0	170	45	0	215	0	0	0	0	0	0	0	0	244	0	0	0	0	76	34	85	11	206	0	0	665	2693
2018-10-09 14:15:00	0	147	35	0	182	0	0	0	0	0	0	0	0	258	0	0	0	0	88	26	92	11	217	0	2	657	2756
2018-10-09 14:30:00	0	158	39	0	197	0	0	0	0	0	0	0	0	280	0	0	0	0	101	32	87	7	227	0	0	704	2811
2018-10-09 14:45:00	0	166	29	0	195	0	0	0	0	0	0	0	0	250	0	0	0	0	85	29	102	6	222	0	2	667	2851
2018-10-09 15:00:00	0	171	44	0	215	0	0	0	0	0	0	0	0	270	0	0	0	0	99	37	92	15	243	0	0	728	3018
2018-10-09 15:15:00	0	169	40	0	209	0	0	0	0	0	0	0	0	293	0	0	0	0	79	23	96	12	210	0	0	712	3116
2018-10-09 15:30:00	0	157	41	0	198	0	0	0	0	0	0	0	0	299	0	0	0	0	80	41	116	10	247	0	0	744	3348
2018-10-09 15:45:00	0	171	52	0	223	0	0	0	0	0	0	0	0	360	0	0	0	0	97	35	112	7	251	0	0	834	3585
2018-10-09 16:00:00	0	191	57	0	248	0	0	0	0	0	0	0	0	326	0	0	0	0	112	27	104	9	252	0	0	826	3689
2018-10-09 16:15:00	0	239	65	0	304	0	0	0	0	0	0	0	0	328	0	0	0	0	116	52	129	15	312	0	0	944	3751
2018-10-09 17:30:00	0	264	78	0	342	0	0	0	0	0	0	0	0	313	0	0	0	0	103	39	169	15	326	0	5	981	3695
2018-10-09 17:45:00	0	191	44	0	235	0	0	0	0	0	0	0	0	390	0	0	0	0	117	43	145	8	313	0	3	938	3475
2018-10-09 18:00:00	0	142	40	0	182	0	0	0	0	0	0	0	0	368	0	0	0	0	117	54	148	19	338	0	0	888	3254
2018-10-09 18:15:00	0	190	56	0	246	0	0	0	0	0	0	0	0	356	0	0	0	0	95	39	124	28	286	0	0	888	3099
2018-10-09 18:30:00	0	160	49	0	209	0	0	0	0	0	0	0	1	322	0	0	0	0	93	36	83	18	230	0	0	761	2810
2018-10-09 18:45:00	0	146	40	0	186	0	0	0	0	0	0	0	0	302	0	0	0	0	113	31	63	22	229	0	0	717	
2018-10-09 19:00:00	0	143	55	0	198	0	0	0	0	0	0	0	1	262	0	0	0	0	116	52	85	20	273	0	0	733	
2018-10-09 19:15:00	0	143	22	0	165	0	0	0	0	0	0	0	0	219	0	0	0	0	103	33	70	9	215	0	0	599	
Grand Total	0	5048	1147	0	6195	0	0	0	0	0	0	0	1	8089	0	0	0	0	2425	850	2749	344	6368	0	12	20652	
% Approach	0.0%	81.5%	18.5%	0.0%					0.0%	0.0%	0.0%	0.0%		26.4%	73.6%	0.0%	0.0%		38.1%	13.3%	43.2%	5.4%					
% Total	0.0%	24.4%	5.6%	0.0%	30.0%				0.0%	0.0%	0.0%	0.0%	0.0%	39.2%				11.7%	4.1%	13.3%	1.7%	30.8%					
Lights	0	4441	1028	0	5469				0	0	0	0	0	7278				2266	732	2421	314	5733				18480	
% Lights	0.0%	88.0%	89.6%	0.0%	88.3%				0.0%	0.0%	0.0%	0.0%		90.0%				93.4%	86.1%	88.1%	91.3%	90.0%				89.5%	
Articulated Trucks	0	474	71	0	545				0	0	0	0	0	596				91	72	262	18	443				1584	
% Articulated Trucks	0.0%	9.4%	6.2%	0.0%	8.8%				0.0%	0.0%	0.0%	0.0%		7.4%				3.8%	8.5%	9.5%	5.2%	7.0%				7.7%	
Buses and Single-Unit Truc	0	133	48	0	181				0	0	0	0	0	215				68	46	66	12	192				588	
% Buses and Single-Unit T	0.0%	2.6%	4.2%	0.0%	2.9%				0.0%	0.0%	0.0%	0.0%		2.7%				2.8%	5.4%	2.4%	3.5%	3.0%				2.8%	
Pedestrians						0	0						1	1					0	0			0	12			
% Pedestrians						0.0%	0.0%						100.0%	100.0%				0.0%	0.0%				0.0%	100.0%			

Leg Direction Start Time	SH 146 Southbound				I-10 WBFR Westbound				SH 146 Northbound				I-10 WBFR Eastbound				Int Total	Total	6:30-9: 6:45-7: 2842	2:00-4: 3:30-4: 3153	5:30-7: 5:30-6: 3376													
	Right	Thru	Left	U-Turn	App Tot	Peds	CV	Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV						Peds	CC	Right	Thru	Left	U-Turn	App Tot	Peds	CV	Peds	CC		
2018-10-09 06:30:00	108	148	0	0	256	0	0	0	59	14	54	16	143	0	0	0	0	315	76	0	0	0	0	0	0	0	0	790	2972					
2018-10-09 06:45:00	112	148	0	0	260	0	0	0	50	12	80	23	165	0	0	0	0	250	98	0	0	0	0	0	0	0	0	773	2842					
2018-10-09 07:00:00	105	145	0	0	250	0	0	0	37	9	53	22	121	0	0	0	0	213	113	0	0	0	0	0	0	0	697	2739						
2018-10-09 07:15:00	142	127	0	0	269	0	0	0	36	12	79	18	145	0	0	0	0	174	124	0	0	0	0	0	0	0	712	2658						
2018-10-09 07:30:00	144	162	0	0	306	0	0	0	29	8	53	22	112	0	0	0	0	143	99	0	0	0	0	0	0	0	660	2506						
2018-10-09 07:45:00	112	157	0	0	269	0	0	0	35	12	52	7	106	0	0	0	0	179	116	0	0	0	0	0	0	0	670	2438						
2018-10-09 08:00:00	103	98	0	0	201	0	0	0	32	10	78	27	147	0	0	0	0	157	111	0	0	0	0	0	0	0	616	2357						
2018-10-09 08:15:00	100	125	0	0	225	0	0	0	26	10	78	17	131	0	0	0	0	134	70	0	0	0	0	0	0	0	560	2311						
2018-10-09 08:30:00	103	132	0	0	235	0	0	0	40	13	62	22	137	0	0	0	0	149	71	0	0	0	0	0	0	0	592	2353						
2018-10-09 08:45:00	105	139	0	0	244	1	0	0	25	11	61	21	118	0	0	0	0	160	67	0	0	0	0	0	0	0	589	2348						
2018-10-09 14:00:00	73	132	0	0	205	0	1	0	14	5	86	21	126	0	1	0	0	181	58	0	0	0	0	0	0	0	570	2354						
2018-10-09 14:15:00	77	119	0	0	196	0	0	0	24	7	63	15	109	1	0	0	0	206	91	0	0	0	0	0	0	0	602	2435						
2018-10-09 14:30:00	76	98	0	0	174	0	0	0	17	14	77	23	131	0	0	0	0	202	80	0	0	0	0	0	0	0	587	2508						
2018-10-09 14:45:00	75	130	0	0	205	0	0	0	13	11	68	17	109	0	0	0	0	210	71	0	0	0	0	0	0	0	595	2605						
2018-10-09 15:00:00	90	137	0	1	228	0	0	0	29	7	70	17	123	0	1	0	0	214	84	2	0	0	0	0	0	0	651	2809						
2018-10-09 15:15:00	80	134	0	0	214	0	1	0	18	8	80	34	140	0	0	0	0	249	72	0	0	0	0	0	0	0	675	2901						
2018-10-09 15:30:00	81	130	0	0	211	0	0	0	22	5	63	24	114	0	0	0	0	265	94	0	0	0	0	0	0	0	684	3153						
2018-10-09 15:45:00	105	163	0	0	268	0	0	0	31	15	66	21	133	0	0	0	0	301	95	2	0	0	0	0	0	0	799	3480						
2018-10-09 16:00:00	99	148	0	0	247	0	0	0	35	15	80	21	151	0	0	0	0	254	91	0	0	0	0	0	0	0	743	3513						
2018-10-09 16:15:00	155	221	0	0	376	0	1	0	22	7	81	33	143	0	1	0	0	308	100	0	0	0	0	0	0	0	927	3519						
2018-10-09 17:30:00	145	273	0	0	418	0	0	0	48	15	77	37	177	0	0	0	0	310	106	0	0	0	0	0	0	0	1011	3376						
2018-10-09 17:45:00	63	138	0	0	201	1	0	0	39	8	92	48	187	1	0	0	0	323	121	0	0	0	0	0	0	0	832	3074						
2018-10-09 18:00:00	64	119	0	0	183	0	0	0	38	11	71	39	159	0	0	0	0	321	86	0	1	0	0	0	0	0	749	2865						
2018-10-09 18:15:00	71	162	0	0	233	0	0	0	25	13	78	25	141	0	0	0	0	301	109	0	0	0	0	0	0	0	784	2706						
2018-10-09 18:30:00	82	136	0	0	218	0	0	0	39	6	57	31	133	0	0	0	0	250	108	0	0	0	0	0	0	0	709	2457						
2018-10-09 18:45:00	76	91	0	0	167	0	0	0	27	17	85	41	170	0	0	0	0	194	92	0	0	0	0	0	0	0	623							
2018-10-09 19:00:00	56	131	0	0	187	0	0	0	22	11	59	38	130	0	0	0	0	186	87	0	0	0	0	0	0	0	590							
2018-10-09 19:15:00	62	111	0	0	173	0	0	0	20	4	57	27	108	0	0	0	0	175	79	0	0	0	0	0	0	0	535							
Grand Total	2664	3954	0	1	6619	2	3	852	290	1960	707	3809	2	3	0	6324	2569	4	8897	0	1	0	0	0	0	0	0	2	2	19325				
% Approach	40.2%	59.7%	0.0%	0.0%				22.4%	7.6%	51.5%	18.6%				0.0%	71.1%	28.9%	0.0%																
% Total	13.8%	20.5%	0.0%	0.0%	34.3%			4.4%	1.5%	10.1%	3.7%	19.7%			0.0%	32.7%	13.3%	0.0%	46.0%							0.0%								
Lights	2380	3537	0	1	5918			737	234	1672	655	3298			0	5683	2387	2	8072							0							17288	
% Lights	89.3%	89.5%	0.0%	100.0%	89.4%			86.5%	80.7%	85.3%	92.6%	86.6%			0.0%	89.9%	92.9%	50.0%	90.7%														89.5%	
Articulated Trucks	204	295	0	0	499			81	50	236	32	399			0	476	114	0	590							0							1488	
% Articulated Trucks	7.7%	7.5%	0.0%	0.0%	7.5%			9.5%	17.2%	12.0%	4.5%	10.5%			0.0%	7.5%	4.4%	0.0%	6.6%														7.7%	
Buses and Single-Unit Truc	80	122	0	0	202			34	6	52	20	112			0	165	68	2	235							0							549	
% Buses and Single-Unit Tr	3.0%	3.1%	0.0%	0.0%	3.1%			4.0%	2.1%	2.7%	2.8%	2.9%			0.0%	2.6%	2.6%	50.0%	2.6%														2.8%	
Pedestrians						2	3								2	3											2	2						
% Pedestrians						100.0%	100.0%								100.0%	100.0%											100.0%	100.0%						



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Technical Memorandum

To: City of Mont Belvieu

From: Courtney Carr, P.E.

Date: October 29, 2018

Subject: Eagle Drive/FM 3180, SH 146, FM 565 Traffic Study, Mont Belvieu, TX

The City of Mont Belvieu requested a traffic study for the intersections of IH-10 Frontage Roads at SH 146, Eagle Drive/FM 3180 and FM 565. Turning movement counts were taken at all the intersections on October 9th, 2018 for three time periods. The three time periods were the AM Peak Hour (6:30 to 9:00 AM), School Dismissal (2:00 to 4:30 PM), and PM Peak Hour (5:30 to 7:30 PM).

Eagle Drive/FM 3180 is proposed to be renovated in the coming years and will be closed during construction. The City requested that the three roadways be analyzed for two conditions: the existing condition and the construction condition with Eagle Drive closed. The existing Eagle Drive traffic volumes were redistributed to SH 146 and FM 565, based on a general 50% split between the two roadways and the more direct path for vehicles.

Synchro was utilized to analyze the conditions to find delay, level of service, and 95th percentile queue. The results are shown in the table below. The closure of Eagle Drive will greatly increase the delay and queues at SH 146 and FM 565 intersections.





Intersection	Condition	Result	AM Peak Hour												
			Intersection	EB			WB			NB			SB		
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Eagle Drive/FM 3180 at Westbound IH-10 Frontage Road	Existing	LOS/Delay	A/9.8	D/40.5	-	A/0.2	D/37.6	C/33.8	B/14.6	A/6.0	B/11.7	A/3.4	B/13.2	B/13.3	A/3.0
		95th % Queue	-	22	-	0	32	11	73	56	544	39	12	244	59
Eagle Drive/FM 3180 at Eastbound IH-10 Frontage Road	Existing	LOS/Delay	C/19.5	-	F/920.3	B/11.1	-	E/36.9	F/64.8	A/0	-	-	A/9.8	-	-
		95th % Queue	-	-	52.5	15	-	0	252.5	0	-	-	5	-	-
SH 146 at Westbound Frontage Road	Existing	LOS/Delay	C/34.4	-	-	-	E/73.8	E/65.9	C/27.3	D/49.8	A/5.2	-	-	E/68.4	B/18.5
		95th % Queue	-	-	-	-	247	150	150	478	344	-	-	289	219
	Construction	LOS/Delay	F/106.3	-	-	-	E/74.5	E/66.3	C/28.4	D/50.3	A/6.4	-	-	F/85.8	F/311.3
		95th % Queue	-	-	-	-	247	150	154	423	500	-	-	388	1593
SH 146 at Eastbound Frontage Road	Existing	LOS/Delay	D/39.6	F/236.3	F/104.0	B/17.0	-	-	-	C/23.5	A/2.7	C/26.2	A/5.0	-	
		95th % Queue	-	581	299	105	-	-	-	-	272	49	51	7	-
	Construction	LOS/Delay	E/73.3	F/448.9	F/165.3	E/71.8	-	-	-	-	C/26.7	A/3.4	C/20.6	B/10.6	-
		95th % Queue	-	852	433	383	-	-	-	-	413	59	35m	5	-
FM 565 at Westbound Frontage Road	Existing	LOS/Delay	B/12.8	-	-	-	B/10.3	A/9.3	-	-	C/15.3	-	-	A/9.8	-
		95th % Queue	-	-	-	-	7.5	7.5	-	-	110	-	-	37.5	-
	Construction	LOS/Delay	F/214.3	-	-	-	C/16	D/34.4	-	-	F/351.6	-	-	F/176.2	-
		95th % Queue	-	-	-	-	30	167.5	-	-	1277.5	-	-	697.5	-
FM 565 at Eastbound Frontage Road	Existing	LOS/Delay	B/12.5	C/15.4	A/8.5	-	-	-	-	-	B/11.3	-	-	A/10	-
		95th % Queue	-	77.5	7.5	-	-	-	-	-	45	-	-	20	-
	Construction	LOS/Delay	F/114.9	F/93.4	B/12.3	-	-	-	-	-	F/189.4	-	-	E/42.1	-
		95th % Queue	-	375	20	-	-	-	-	-	765	-	-	217.5	-
Intersection	Condition	Result	School Dismissal Peak Hour												
			Intersection	EB			WB			NB			SB		
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Eagle Drive/FM 3180 at Westbound IH-10 Frontage Road	Existing	LOS/Delay	B/11.1	D/42.9	-	A/0.9	D/40.3	-	A/1.4	A/8.6	A/8.8	A/2.5	B/15.5	C/25.6	A/3.8
		95th % Queue	-	59	-	0	17	-	0	87	306	34	8	506	63
Eagle Drive/FM 3180 at Eastbound IH-10 Frontage Road	Existing	LOS/Delay	C/24.4	-	-	C/21.2	-	F/118.2	F/98.3	A/0	-	-	A/9.5	-	-
		95th % Queue	-	-	-	92.5	-	7.5	447.5	0	-	-	17.5	-	-
SH 146 at Westbound Frontage Road	Existing	LOS/Delay	C/33.4	-	-	-	E/74.6	E/65.4	A/8.8	D/49.4	A/6.2	-	-	E/71.3	B/11.2
		95th % Queue	-	-	-	-	262	153	48	384	361	-	-	339	124
	Construction	LOS/Delay	F/137.3	-	-	-	E/74.6	E/65.4	A/8.8	E/56.3	A/7.6	-	-	F/129.8	F/378.2
		95th % Queue	-	-	-	-	262	153	48	340	449	-	-	564	1876
SH 146 at Eastbound Frontage Road	Existing	LOS/Delay	E/58.7	F/276.3	F/167.4	E/75.7	-	-	-	-	C/24.2	A/7.0	C/27.9	A/4.3	-
		95th % Queue	-	636	439	452	-	-	-	-	291	124	151	2	-
	Construction	LOS/Delay	F/161.7	F/629.3	F/326.3	F/407.9	-	-	-	-	C/26.5	A/7.0	C/20.3	C/25.0	-
		95th % Queue	-	1059	643	1081	-	-	-	-	397	124	50	538	-
FM 565 at Westbound Frontage Road	Existing	LOS/Delay	B/11.3	-	-	-	A/9.9	A/9.2	-	-	B/12.9	-	-	A/8.9	-
		95th % Queue	-	-	-	-	10	12.5	-	-	80	-	-	20	-
	Construction	LOS/Delay	F/151.2	-	-	-	C/20.5	C/18.5	-	-	F/208.8	-	-	F/175.1	-
		95th % Queue	-	-	-	-	67.5	67.5	-	-	835	-	-	745	-
FM 565 at Eastbound Frontage Road	Existing	LOS/Delay	B/12.7	C/16	A/8.3	-	-	-	-	-	A/9.8	-	-	B/10.1	-
		95th % Queue	-	87.5	5	-	-	-	-	-	25	-	-	22.5	-
	Construction	LOS/Delay	F/146.7	F/222.8	C/15.2	-	-	-	-	-	F/72.4	-	-	F/174	-
		95th % Queue	-	725	47.5	-	-	-	-	-	327.5	-	-	645	-
Intersection	Condition	Result	PM Peak Hour												
			Intersection	EB			WB			NB			SB		
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Eagle Drive/FM 3180 at Westbound IH-10 Frontage Road	Existing	LOS/Delay	B/15.5	D/44.1	C/34	B/13	D/37.8	D/36.1	B/15	A/8.5	B/19.6	A/3.2	B/17.7	B/18.8	A/3.4
		95th % Queue	-	79	5	54	24	20	63	81	795	29	20	319	60
Eagle Drive/FM 3180 at Eastbound IH-10 Frontage Road	Existing	LOS/Delay	D/33.1	-	-	C/21.4	-	F/58.9	F/133.5	A/0	-	-	A/9.2	-	-
		95th % Queue	-	-	-	117.5	-	2.5	542.5	0	-	-	10	-	-
SH 146 at Westbound Frontage Road	Existing	LOS/Delay	D/35.3	-	-	-	E/74.9	E/64.7	B/18.0	E/55.5	A/7.1	-	-	E/72.8	B/10.2
		95th % Queue	-	-	-	-	284	164	101	420	434	-	-	356	102
	Construction	LOS/Delay	F/83.2	-	-	-	E/74.9	E/64.7	B/18.0	E/65.4	B/17.1	-	-	F/133.2	F/201.0
		95th % Queue	-	-	-	-	284	164	101	329	511	-	-	519	1189
SH 146 at Eastbound Frontage Road	Existing	LOS/Delay	F/93	F/432.2	F/259.7	F/113.3	-	-	-	-	C/25.5	A/5.7	C/29.5	A/4.2	-
		95th % Queue	-	831	562	559	-	-	-	-	348	95	167	0	-
	Construction	LOS/Delay	F/234.7	F/909.6	F/484.9	F/483.8	-	-	-	-	C/28.1	A/5.7	C/23.9	B/11.5	-
		95th % Queue	-	1369	825	1237	-	-	-	-	468	95	73	531	-
FM 565 at Westbound Frontage Road	Existing	LOS/Delay	D/25.5	-	-	-	B/11.3	B/10.4	-	-	D/34.2	-	-	A/9.8	-
		95th % Queue	-	-	-	-	15	20	-	-	285	-	-	22.5	-
	Construction	LOS/Delay	F/307.5	-	-	-	D/25.6	E/41.4	-	-	F/576.4	-	-	F/104	-
		95th % Queue	-	-	-	-	87.5	192.5	-	-	2052.5	-	-	420	-
FM 565 at Eastbound Frontage Road	Existing	LOS/Delay	C/20.5	D/28.3	A/9.6	-	-	-	-	-	C/18.8	-	-	B/12.1	-
		95th % Queue	-	172.5	12.5	-	-	-	-	-	122.5	-	-	32.5	-
	Construction	LOS/Delay	F/200	F/290.5	C/20.1	-	-	-	-	-	F/254.5	-	-	F/102.8	-
		95th % Queue	-	880	85	-	-	-	-	-	897.5	-	-	402.5	-