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Craig Morgan

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City Attorney
Stephan L. Sheets

TO: Gerald Lankes, P.E., SLG Engineering
 FROM: Matt Bushak, P.E., City of Round Rock
 DATE: August 9, 2019 (Revised)
 PROJECT: University Boulevard – A.W. Grimes Boulevard to SH 130
 SUBJECT: Traffic Data for Noise Analysis

The following traffic data are to be used for the Traffic Noise Model (TNM) in conjunction with the University Drive project. The traffic data was gathered by Quality Counts, LLC on December 5th and 6th, 2017 (attached). Although some growth has occurred along the corridor since that time, the traffic characteristics have not changed significantly, and the data is still assumed to be valid. The counts were taken at a location between AW Grimes Blvd. and CR 110 and should be applied along the entire length of the project. Traffic volume counts for cross streets and intersecting streets along the project length were not provided and do not need to be modeled in the impact analysis since they are not directly associated with the project (per the TxDOT User’s Guide: Traffic Noise Model).

Location: University Blvd - AW Grimes to SH 130

Growth Rate (2017-2037)	3.20%
Growth Rate (2038-2050)	1.00%
K-Factor	10%
Dir. Dist. (EB-WB)	49.99 - 50.01

Year	ADT			
	2017	2020 (Base Year)	2040 (Horizon Year)	2050 (Pavement Design Year)
East Bound	6466	6890	12120	13260
West Bound	6469	6900	12120	13260
Total	12936	13790	24240	26520

Vehicle Class Distribution		
	% of ADT	% of DHV
Auto	83.5%	87.1%
Medium Truck	11.6%	9.9%
Heavy Truck	4.9%	3.0%

2017 Average Daily Traffic

The Average Daily Traffic (ADT) is the average value of the two days in which the counts were taken.

Growth Rate

The annual growth rate of 3.20% was developed from the TxDOT Statewide Planning Map. The growth rate was reduced to 1.0% for the period between 2037 and 2050 to account for anticipated drop in growth due to build out.

K-Factor

Continuous counts have not been performed along the roadway, so the K-factor of 10% was assumed based on several factors. Assuming that the ADT closely represents K_{30} , the ratio of the average peak hour volume to ADT of the data results in a K-factor for 9.9%. Furthermore, the TxDOT Guidelines for Analysis and Abatement of Roadway Traffic Noise state that the K-factor is normally 0.1 (or 10%). Finally, TxDOT Roadway Design Manual suggests the K-factor for urban arterials is typically between 8% and 12%.

Traffic Distribution

The direction distribution was calculated based on the average distribution from the ADT. Design Hourly Volume (DHV) should be evenly distributed over multiple lanes.

Vehicle Class Distribution

Vehicle classes shown in the Quality Counts data was consolidated as follows to match the TNM vehicle classes according to the TxDOT Traffic Data and Analysis Manual:

- Autos = Motorcycles + Cars & Trailers + 2 Axle Long
- Medium Truck = Buses + 2 Axle 6 Tire
- Heavy Truck = 3 Axle Single + 4 Axle Single + <5 Axle Double + 5 Axle Double + >6 Axle Double + <6 Axle Multi + 6 Axle Multi + >6 Axle Multi + Not Classified

% of ADT was calculated as the ratio of the average daily value to ADT

% of DHV was calculated as the ratio of the average of the four peak hour values collected by Quality Counts to DHV

Attachments: Traffic Tube Counts (6 sheets)

LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110 SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1 CITY/STATE: Round Rock, TX														QC JOB #: 14567462 DIRECTION: EB DATE: Dec 05 2017	
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	25	5	1	3	0	0	0	0	0	0	0	0	1	35
1:00 AM	0	10	3	0	1	0	0	1	0	0	0	0	0	1	16
2:00 AM	0	9	3	0	2	0	0	0	0	0	0	0	0	0	14
3:00 AM	0	9	4	0	1	0	0	0	0	0	0	0	0	0	14
4:00 AM	0	18	8	0	4	0	0	0	2	0	0	0	0	0	32
5:00 AM	0	49	21	0	15	1	0	3	1	0	0	0	0	1	91
6:00 AM	0	178	84	3	46	2	0	4	7	0	0	0	0	1	325
7:00 AM	1	262	127	4	54	5	1	14	5	1	1	0	0	4	479
8:00 AM	1	206	106	8	67	8	3	7	9	1	0	0	0	0	416
9:00 AM	1	115	110	7	49	11	5	19	11	1	0	0	0	2	331
10:00 AM	1	126	71	12	44	9	7	11	15	0	0	0	0	2	298
11:00 AM	1	129	79	7	38	19	7	9	16	0	0	0	0	2	307
12:00 PM	0	137	100	5	49	8	3	9	17	0	0	0	0	2	330
1:00 PM	0	172	100	8	63	7	3	7	14	0	0	0	0	8	382
2:00 PM	1	227	113	8	49	5	9	17	14	0	0	0	2	2	447
3:00 PM	4	249	152	10	62	7	5	11	13	0	1	0	2	4	520
4:00 PM	0	380	159	9	94	3	3	13	16	0	0	0	2	2	681
5:00 PM	0	436	201	7	85	4	0	8	4	0	0	0	0	2	747
6:00 PM	1	300	124	6	52	2	0	7	1	0	0	0	1	1	495
7:00 PM	1	207	87	0	28	0	0	3	0	0	0	0	0	0	326
8:00 PM	0	145	62	0	30	0	0	1	0	0	0	0	0	0	238
9:00 PM	0	105	38	0	21	0	0	0	0	0	0	0	0	0	164
10:00 PM	0	72	26	0	8	0	0	0	0	0	0	0	0	4	110
11:00 PM	0	40	13	0	8	0	0	0	0	0	0	0	0	1	62
Day Total	12	3606	1796	95	873	91	46	144	145	3	2	0	7	40	6860
Percent	0.2%	52.6%	26.2%	1.4%	12.7%	1.3%	0.7%	2.1%	2.1%	0.0%	0.0%	0.0%	0.1%	0.6%	
ADT 6860															
AM Peak	7:00 AM	7:00 AM	7:00 AM	10:00 AM	8:00 AM	11:00 AM	10:00 AM	9:00 AM	11:00 AM	7:00 AM	7:00 AM			7:00 AM	7:00 AM
Volume	1	262	127	12	67	19	7	19	16	1	1			4	479
PM Peak	3:00 PM	5:00 PM	5:00 PM	3:00 PM	4:00 PM	12:00 PM	2:00 PM	2:00 PM	12:00 PM		3:00 PM		2:00 PM	1:00 PM	5:00 PM
Volume	4	436	201	10	94	8	9	17	17		1		2	8	747
<i>Comments:</i>															

LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110 SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1 CITY/STATE: Round Rock, TX														QC JOB #: 14567462 DIRECTION: EB DATE: Dec 06 2017	
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	26	10	0	1	0	0	0	0	0	0	0	0	2	39
1:00 AM	0	11	2	0	3	0	0	0	0	0	0	0	0	2	18
2:00 AM	0	10	1	0	2	0	0	0	0	0	0	0	0	1	14
3:00 AM	0	8	6	0	3	0	0	0	1	0	0	0	0	0	18
4:00 AM	0	15	9	0	4	1	0	0	0	0	0	0	0	1	30
5:00 AM	0	37	10	1	12	1	0	0	0	0	0	0	0	7	68
6:00 AM	2	154	77	2	31	3	0	2	2	0	1	0	0	7	281
7:00 AM	0	221	120	5	71	3	0	4	8	0	0	0	0	4	436
8:00 AM	0	182	83	7	74	3	0	2	3	1	0	0	0	1	356
9:00 AM	0	123	73	4	35	2	0	6	5	0	0	0	0	0	248
10:00 AM	0	138	72	8	49	5	0	6	1	0	0	0	0	0	279
11:00 AM	0	141	76	6	43	4	0	7	0	0	0	0	0	3	280
12:00 PM	0	133	99	6	37	4	0	3	3	0	0	0	0	1	286
1:00 PM	1	203	86	3	54	8	0	5	3	1	0	0	0	1	365
2:00 PM	0	200	103	10	53	0	0	8	4	0	0	0	0	1	379
3:00 PM	1	251	122	6	55	3	0	7	2	0	0	0	0	2	449
4:00 PM	1	309	158	1	78	1	0	7	0	0	0	0	0	2	557
5:00 PM	0	403	173	3	57	0	0	4	1	0	0	0	0	0	641
6:00 PM	0	290	125	1	44	0	0	1	0	0	0	0	0	0	461
7:00 PM	0	188	82	0	22	0	0	1	0	1	0	0	0	0	294
8:00 PM	1	163	69	0	27	0	0	2	0	0	0	0	0	1	263
9:00 PM	0	113	41	0	15	0	0	1	0	0	0	0	0	0	170
10:00 PM	0	70	18	0	5	0	0	0	0	0	0	0	0	0	93
11:00 PM	0	34	12	0	2	0	0	0	0	0	0	0	0	0	48
Day Total	6	3423	1627	63	777	38	0	66	33	3	1	0	0	36	6073
Percent	0.1%	56.4%	26.8%	1.0%	12.8%	0.6%	0.0%	1.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.6%	
ADT 6073															
AM Peak Volume	6:00 AM	7:00 AM	7:00 AM	10:00 AM	8:00 AM	10:00 AM		11:00 AM	7:00 AM	8:00 AM	6:00 AM			5:00 AM	7:00 AM
	2	221	120	8	74	5		7	8	1	1			7	436
PM Peak Volume	1:00 PM	5:00 PM	5:00 PM	2:00 PM	4:00 PM	1:00 PM		2:00 PM	2:00 PM	1:00 PM				3:00 PM	5:00 PM
	1	403	173	10	78	8		8	4	1				2	641
<i>Comments:</i>															

LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110													QC JOB #: 14567462		
SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1													DIRECTION: EB		
CITY/STATE: Round Rock, TX													DATE: Dec 05 2017 - Dec 06 2017		
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	18	7029	3423	158	1650	129	46	210	178	6	3	0	7	76	12933
Percent	0.1%	54.3%	26.5%	1.2%	12.8%	1.0%	0.4%	1.6%	1.4%	0.0%	0.0%	0.0%	0.1%	0.6%	
ADT 6466															
<i>Comments:</i>															



LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110 SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1 CITY/STATE: Round Rock, TX														QC JOB #: 14567462 DIRECTION: WB DATE: Dec 05 2017	
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	11	3	0	2	0	0	0	1	0	0	0	0	0	17
1:00 AM	0	8	1	0	0	0	0	0	0	0	0	0	0	0	9
2:00 AM	0	5	2	0	0	0	0	0	0	0	0	0	0	0	7
3:00 AM	0	13	7	0	1	0	0	1	0	0	0	0	0	0	22
4:00 AM	0	45	15	0	1	0	0	0	1	0	0	0	0	0	62
5:00 AM	0	98	70	5	18	0	0	1	7	0	0	0	0	0	199
6:00 AM	2	275	147	4	45	15	1	14	15	1	0	1	0	1	521
7:00 AM	1	448	203	10	54	21	2	16	7	0	0	0	0	1	763
8:00 AM	2	310	127	9	39	11	0	16	14	1	0	0	0	0	529
9:00 AM	4	208	106	6	34	16	0	7	18	0	0	0	0	0	399
10:00 AM	1	163	97	15	35	19	0	15	15	0	0	0	0	1	361
11:00 AM	1	172	97	10	38	13	0	11	18	0	0	0	0	2	362
12:00 PM	0	184	104	12	36	16	0	5	16	0	0	0	0	1	374
1:00 PM	1	191	83	7	36	7	1	8	14	0	0	0	0	0	348
2:00 PM	1	208	110	13	27	7	0	5	11	0	0	0	0	0	382
3:00 PM	2	200	111	11	38	13	0	6	10	0	0	0	0	3	394
4:00 PM	0	320	129	7	40	7	0	9	8	0	0	0	0	0	520
5:00 PM	0	403	154	4	38	6	0	5	4	0	0	0	0	0	614
6:00 PM	1	307	110	0	26	0	0	3	0	0	0	0	0	0	447
7:00 PM	0	129	56	1	13	0	0	7	1	0	0	0	0	1	208
8:00 PM	0	93	29	1	9	1	0	0	0	0	0	0	0	0	133
9:00 PM	0	61	25	1	9	0	0	1	1	0	0	0	0	0	98
10:00 PM	0	45	13	0	4	0	0	0	0	0	0	0	0	0	62
11:00 PM	0	16	8	0	1	0	0	0	0	0	0	0	0	0	25
Day Total	16	3913	1807	116	544	152	4	130	161	2	0	1	0	10	6856
Percent	0.2%	57.1%	26.4%	1.7%	7.9%	2.2%	0.1%	1.9%	2.3%	0.0%	0.0%	0.0%	0.0%	0.1%	
ADT 6856															
AM Peak Volume	9:00 AM	7:00 AM	7:00 AM	10:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	9:00 AM	6:00 AM		6:00 AM		11:00 AM	7:00 AM
	4	448	203	15	54	21	2	16	18	1		1		2	763
PM Peak Volume	3:00 PM	5:00 PM	5:00 PM	2:00 PM	4:00 PM	12:00 PM	1:00 PM	4:00 PM	12:00 PM					3:00 PM	5:00 PM
	2	403	154	13	40	16	1	9	16					3	614
<i>Comments:</i>															

LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110 SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1 CITY/STATE: Round Rock, TX														QC JOB #: 14567462 DIRECTION: WB DATE: Dec 06 2017	
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	16	2	0	1	0	0	0	0	0	0	0	0	0	19
1:00 AM	0	6	2	0	1	0	0	0	0	0	0	0	0	0	9
2:00 AM	0	5	2	0	0	0	0	0	1	0	0	0	0	0	8
3:00 AM	0	14	5	0	1	1	0	0	0	0	0	0	0	0	21
4:00 AM	0	34	21	0	1	0	0	1	0	0	0	0	0	0	57
5:00 AM	0	107	56	2	15	2	0	0	2	0	0	0	0	0	184
6:00 AM	1	249	143	2	37	2	1	2	7	0	0	1	0	0	445
7:00 AM	0	433	174	5	56	1	0	5	5	0	0	0	0	1	680
8:00 AM	1	279	118	5	47	7	0	6	5	0	0	0	0	2	470
9:00 AM	1	193	94	7	34	4	0	5	3	0	0	0	0	0	341
10:00 AM	0	174	102	6	25	2	0	2	5	0	0	0	0	0	316
11:00 AM	1	160	86	6	26	6	0	4	3	0	0	0	0	0	292
12:00 PM	0	194	99	3	38	5	0	5	0	1	0	0	0	0	345
1:00 PM	1	183	71	5	37	3	0	2	2	0	0	0	0	0	304
2:00 PM	0	186	85	1	28	2	1	4	1	0	0	0	0	1	309
3:00 PM	0	220	89	3	28	0	0	2	5	0	0	0	0	0	347
4:00 PM	0	278	92	1	28	3	0	4	1	0	0	0	0	0	407
5:00 PM	0	377	153	1	31	0	0	1	0	0	0	0	0	0	563
6:00 PM	0	294	87	0	20	0	0	4	1	1	0	0	0	0	407
7:00 PM	0	160	50	0	18	0	0	3	0	0	0	0	0	0	231
8:00 PM	0	97	29	1	11	0	0	0	0	0	0	0	0	0	138
9:00 PM	0	81	22	0	7	1	0	0	0	0	0	0	0	0	111
10:00 PM	0	39	17	0	3	0	0	0	0	0	0	0	0	1	60
11:00 PM	0	13	5	0	1	0	0	0	0	0	0	0	0	0	19
Day Total	5	3792	1604	48	494	39	2	50	41	2	0	1	0	5	6083
Percent	0.1%	62.3%	26.4%	0.8%	8.1%	0.6%	0.0%	0.8%	0.7%	0.0%	0.0%	0.0%	0.0%	0.1%	
ADT 6083															
AM Peak Volume	6:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM	8:00 AM	6:00 AM	8:00 AM	6:00 AM			6:00 AM		8:00 AM	7:00 AM
	1	433	174	7	56	7	1	6	7			1		2	680
PM Peak Volume	1:00 PM	5:00 PM	5:00 PM	1:00 PM	12:00 PM	12:00 PM	2:00 PM	12:00 PM	3:00 PM	12:00 PM				2:00 PM	5:00 PM
	1	377	153	5	38	5	1	5	5	1				1	563
<i>Comments:</i>															

LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 110													QC JOB #: 14567462		
SPECIFIC LOCATION: University Blvd btwn A.W. Grimes Blvd & CR 1													DIRECTION: WB		
CITY/STATE: Round Rock, TX													DATE: Dec 05 2017 - Dec 06 2017		
Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	21	7705	3411	164	1038	191	6	180	202	4	0	2	0	15	12939
Percent	0.2%	59.5%	26.4%	1.3%	8.0%	1.5%	0.0%	1.4%	1.6%	0.0%	0.0%	0.0%	0.0%	0.1%	
ADT 6469															
<i>Comments:</i>															

