Matrix

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June 19, 2024

Mr. Carl Harline
City of Aurora, Traffic Engineering Department
1515 E. Alameda Parkway
Aurora, CO 80012

RE: The Aurora Highlands Master Traffic Impact Study – Framework Letter

Dear Mr. Harline

Matrix Design Group (Matrix) has provided the updated The Aurora Highlands Master Traffic Impact Study (June 2024) to the City of Aurora. This letter explains the steps that were taken to prepare this MTIS.

1. Trip Generation

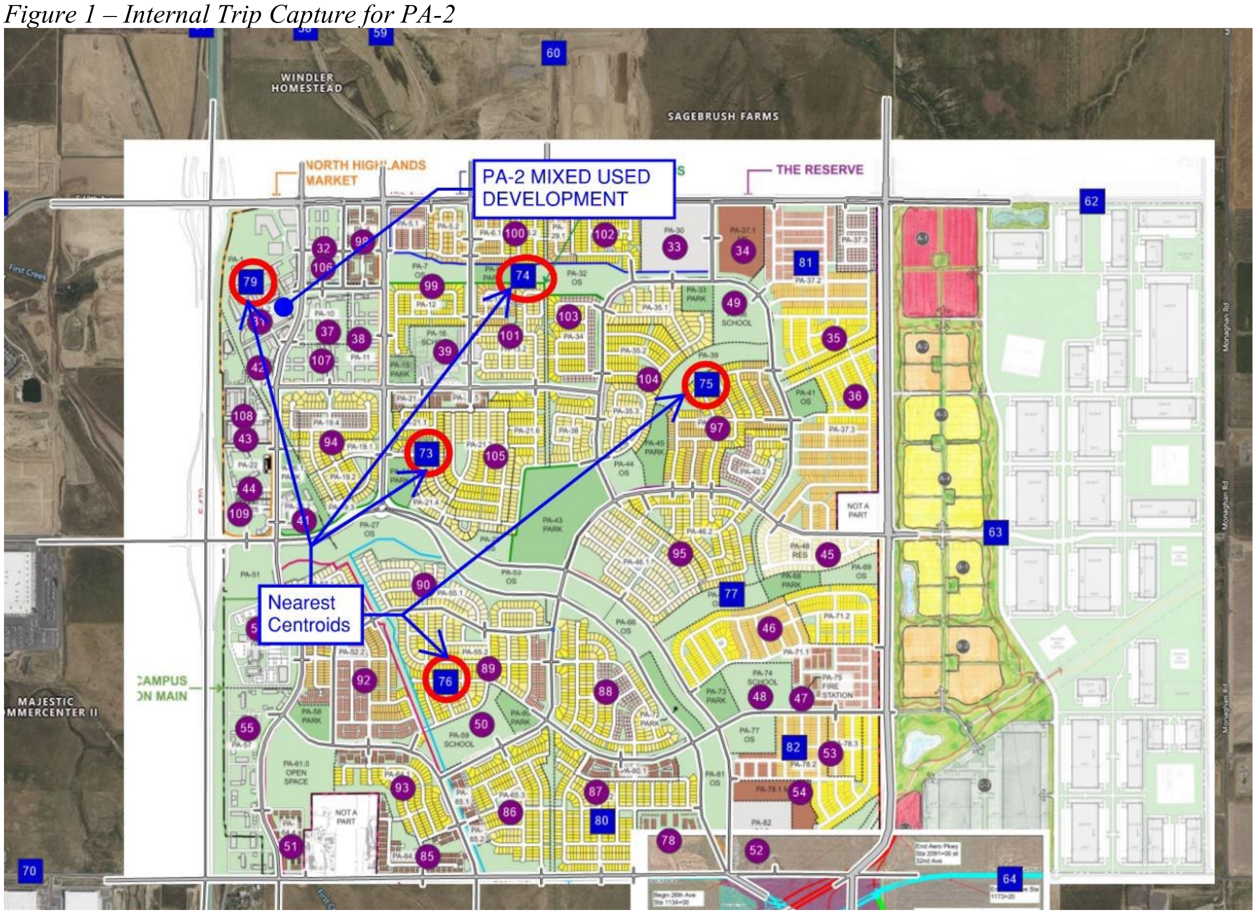
Land use information was obtained from the planning team at Matrix. The 2.7 million square feet of retail derived from the Vision Plan (2022) and the GFA for each area is proportional to the size of the planning area. The size of two Community Activity Centers (PA-30 and PA-82) are based on FAR of 0.3. The ITE trip generation manual 11th edition was used to obtain the daily traffic. Internal and pass by trips were captured as follows (this section was provided in the report as well)

- Not all traffic entering or exiting a driveway is necessarily new traffic added to the transportation network. A new mixed-used development, for instance, can attract vehicular traffic already existing on the street. For this purpose, and to be consistent with the MTIS (2019) a 15-percent trip reduction was applied to the retail developments to account for the pass-by trips. No pass-by trip reduction was applied to the hospital, corporate campus or residential units.
- No transit reduction was applied to daily trips as it was assumed that 100 percent of the trips will be made by personal vehicles. See Transit section of the report for more information on the public transportation network within, or adjacent to The Aurora Highlands (TAH).
- Many of the trips for a mixed-used development, or schools will never leave TAH. Internal trips for these developments were also captured in this study. These trips were not deducted from the network, however, they were assigned in a manner that they will never leave TAH (see section 1.1 of this letter). A 30-percent internal trip factor was assumed for retails, and an 80-percent internal trip factor was assumed for the schools similar to the *Traffic Forecast Memorandum (June 2nd, 2022)*. No internal trips were captured for the medical campus, or for the corporate campus.
- External Trips for TAH after reductions are shown in Table 3 of the MTIS. It is anticipated that TAH will generate 165,000 external daily trips.

1.1 Internal trip Capture in Vistro

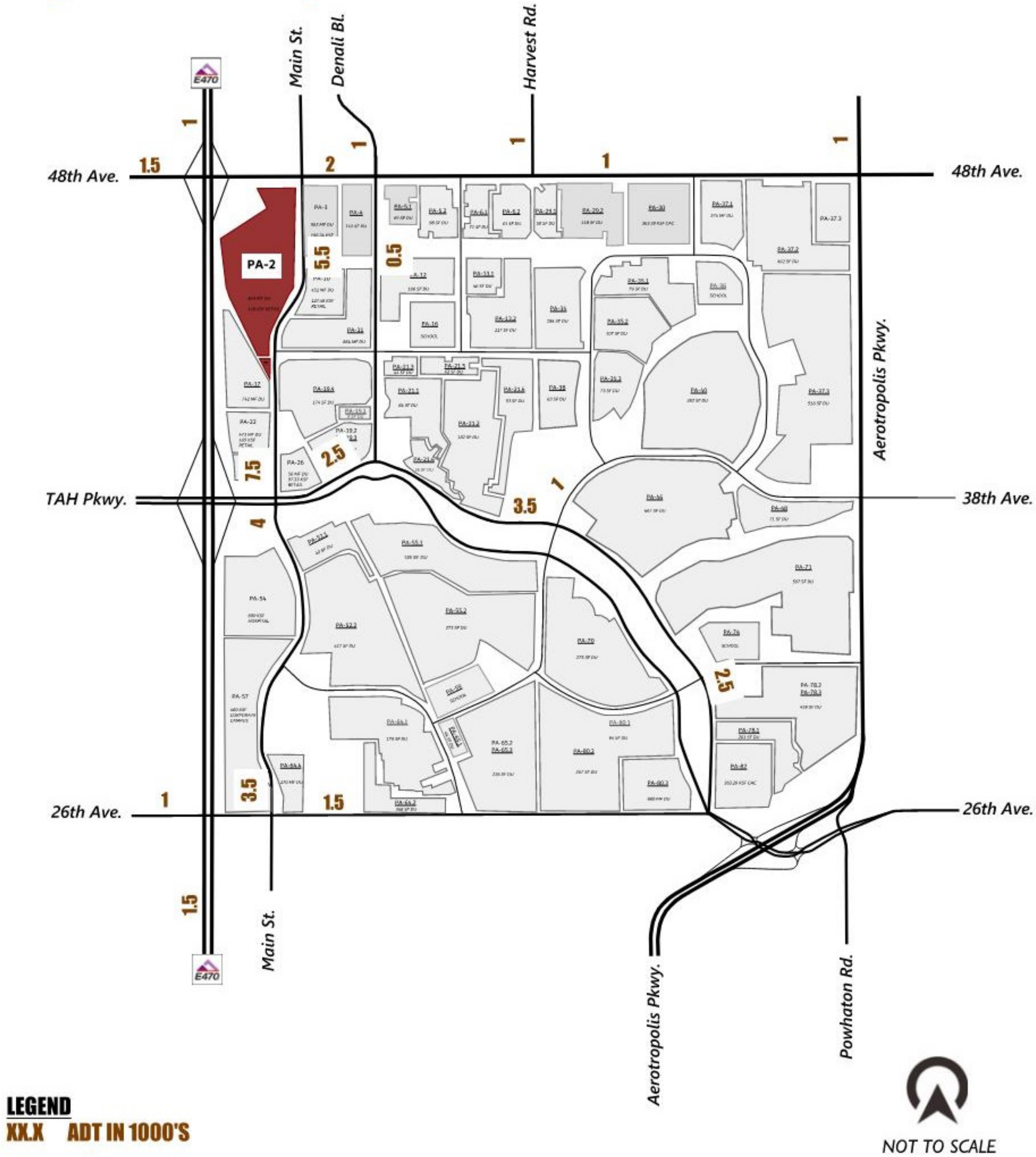
9 centroids within TAH were selected, and 30 percent of the trips for each mixed-used development were assigned to the 5 nearest centroids. Figure 1, shows the 5 internal destinations for PA-2 per their proximity to the development. Many of these trips are passing through the major internal roadways while some are assigned to the local roads that are not shown in the MTIS. The centroids were selected based on the population density, man-made or natural barriers and type of land uses.

Figure 1 – Internal Trip Capture for PA-2



After receiving approval from the City of Aurora on the trip generation, and distribution assumptions, Matrix can provide the daily traffic for each individual planned area and include them in the appendices in the second submittal. Figure 2 is an example of daily traffic for PA-2 only traffic. The intent is to compare the daily traffic for each planning area with the respective filings/area TIS in the future.

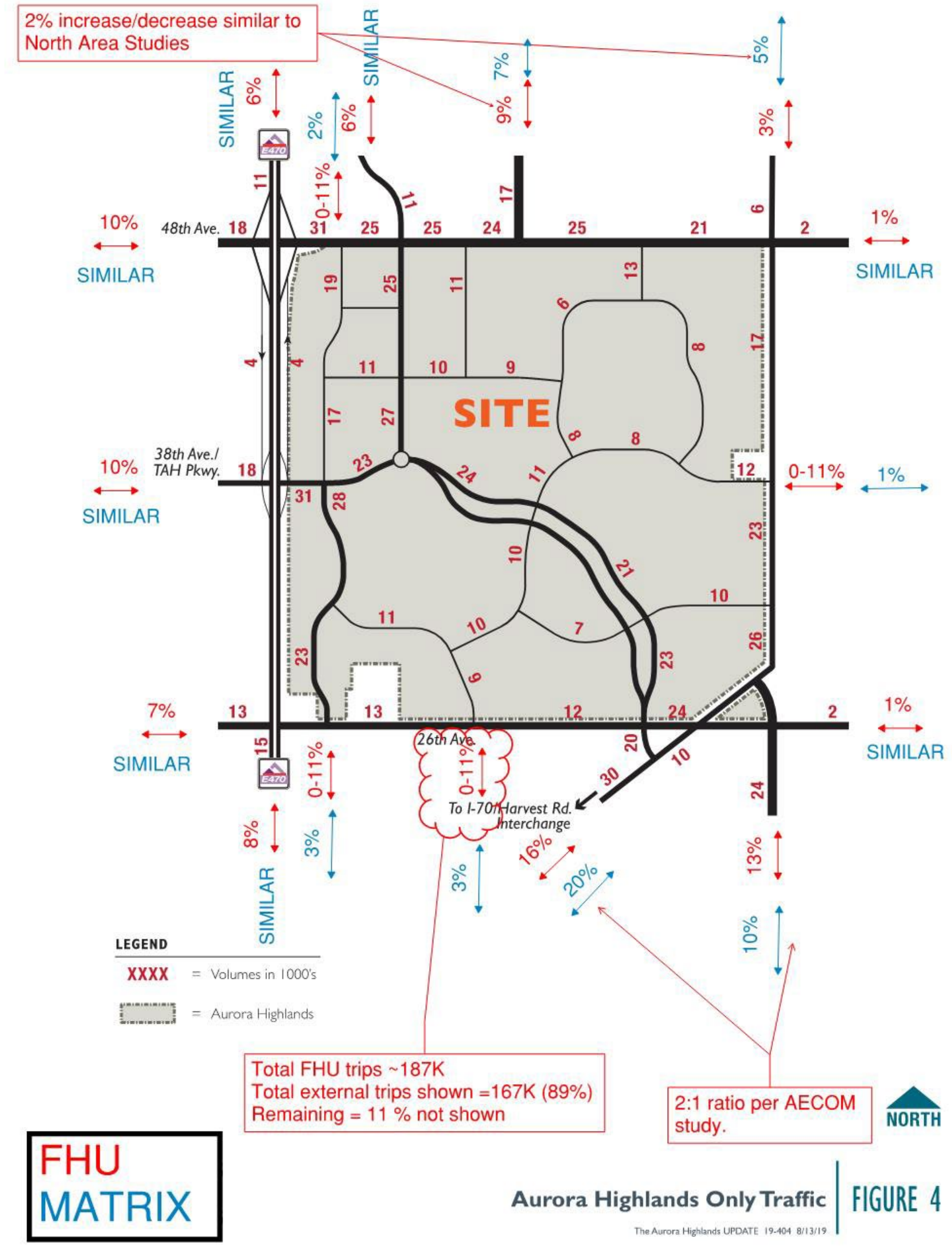
Figure 2 – PA-2 Daily Traffic



2. Trip Distribution

For obtaining the trip distribution, the MTIS 2019 was used as the basis of the work. Trips shown on Figure 4 (Aurora Highland Only Traffic) and table 1 (net external trip generation) in the MTIS (2019) was used to obtain the percentage of external trips on each major roadway. Matrix then adjusted those shares per the latest roadway layouts, traffic studies and engineering judgements. Figure 2 shows the external trip distribution for MTIS 2019 and MTIS 2024.

Figure 3 – Trip Distribution



Values from 8/19 FHU MTIS

- 48 percent to/from the south served by E-470, Picadilly Road, Gun Club Road, and Powhaton Road. Some of these routes entail accessing I-70, but many entail crossing I-70 being associated with robust development ultimately planned for areas south of I-70.
- 20 percent to/from the west served by 56th Avenue, 48th Avenue, 38th Avenue, and 26th Avenue.

- 22 percent to the north served by E-470, Picadilly Road, Harvest Road, and Powhaton Road.
- 10 percent to/from the east, served by 56th Avenue, 48th Avenue, and 26th Avenue.

Total North: 26%
Total South: 44%
Total West: 27%
Total East: 3%

For mixed-used and schools these numbers were adjusted to account for the internal trips (see Figure 4 in the MTIS 2024).

3. Trip Assignments

Please note that no traffic was assigned to Gun Club Road or to Frontage Road (located to the east of E-470). If an alternative will be available for Main Street in the future, that could provide relief to Main Street

Thank you for reviewing our letter. As shown in Figure 3 of this letter, FHU does not show the values similar to the bullet points. We believe the values in bullet points (48% S, 20% W, 22% N, and 10% E) represent the ultimate trip distribution per NEATS which makes sense to us. Please note that FHU shows only 167K external trips which we believe is due to 20K external trips to/from Main Street and other roadways that they are missing on the figure. Here is the real external trip distribution for the roadways immediately adjacent to TAH according to the FHU figure (this is based on 167K trips as shown in Figure 4 MTIS 2019- The percentage marked in red in figure 3 of this letter is not relevant to this distribution)

Total North: 27%
Total South: 41%
Total West: 29%
Total East: 2%

If we assume that those 20K missing trips are all to/from south, then this will be FHU's trip distribution (percentages marked in red in figure 3 of this letter is relevant to this distribution as we assumed 187K daily trips for MTIS 2019):

Total North: 24%
Total South: 48%
Total West: 26%
Total East: 2%

ADT). This segment is recommended as a minor arterial to be consistent with the remainder of the loop.

Please let me know if you have any questions. You c
Scott.Barnhart@matrixdesigngroup.com or at (303) 5

Thank you.

Scott D. Barnhart

Scott D. Barnhart, PE, PTOE
Executive Associate of Transportation Services

Per the City of Aurora's request, detailed calculations on how the adjacent development volumes were determined are provided in the upcoming pages. We would be more than happy to discuss our approach on how we estimated the volumes in detail during a meeting and make the potential revisions. Please contact (navid.shafieirad@matrixdesigngroup.com). Matrix does not wish to include basic calculations in the MTIS.

ALC

This cell is derived from the respected study (typical for all sheets)

Total ADT 39303

Location	ADT	Note
48TH AVE W.O AEROTROPOLIS PKWY	6,682	From the ALC trip distribution see Figure 4 this page
38TH AVE W.O AEROTROPOLIS PKWY	1,179	From the ALC trip distribution see Figure 4 this page
26TH AVE W.O DDI	4,716	From the ALC trip distribution see Figure 4 this page
I-70 HARVEST INTERCHANGE	7,861	From the ALC trip distribution see Figure 4 this page
AEROTRPOLIS S.O 26TH AVE	5,502	From the ALC trip distribution see Figure 4 this page
HARVEST N.O 48TH	1,114	See page "References" - Section A
DENALI N.O 48TH	742	See page "References" - Section A
48TH AVE E.O E-470	4,826	See page "References" - Section A
E-470 S.O 48TH AVE	928	See page "References" - Section A
E-470 N.O 48TH AVE	1,856	See page "References" - Section A
48TH AVE W.O E-470	2,042	See page "References" - Section A
26TH S.O WARMSPRINGS	3,490	See page "References" - Section C
26TH W.O E-470	3,804	See page "References" - Section B
POWHATON N.O 48TH	8,254	From the ALC trip distribution see Figure 4 this page

These are the values that used for aggregation of background traffic on the traffic letter (typical for all developments)

Wherever the ADT was not provided in the study, other studies were used to make assumptions.

Aurora Logistics Center — Traffic Impact Analysis

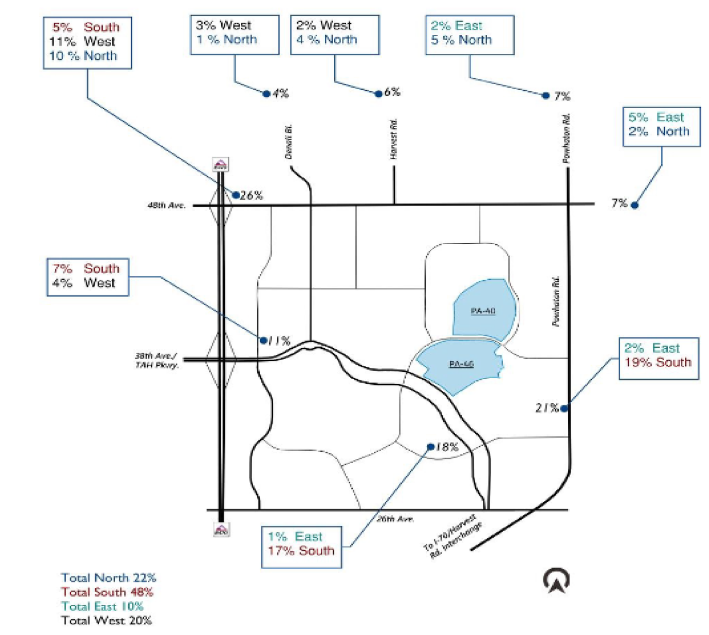
Table 1. Trip Generation Summary[1]

Fig. 3 TAZ Zone #	Acres	Land Use	Developed SF Area (KSF)	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
1	10[illegible].4	Commercial/ Industrial Park	1668	4056	459	108	567	125	442	567
2	148.5	Commercial/ Industrial Park	2264	4755	624	146	770	169	601	770
3	105.8	Commercial/ Industrial Park	1613	3986	444	104	548	121	427	548
4	169.6	Commercial/ Industrial Park	2586	5095	712	167	879	193	686	879
5	80.4	Commercial/ Industrial Park	1226	3456	338	79	417	92	325	417
6	160.4	Commercial/ Industrial Park	2445	4949	673	158	831	183	648	831
7	92.1	Commercial/ Industrial Park	1404	3709	386	91	477	105	372	477
8	118.9	Commercial/ Industrial Park	1813	4236	499	117	616	136	480	616
9	76.1	Commercial/ Industrial Park	1160	3359	319	75	394	87	307	394
10	20.6	Commercial/ Industrial Park	314	1702	87	20	107	24	83	107
			16493	39303	4541	1065	5606	1235	4371	5606

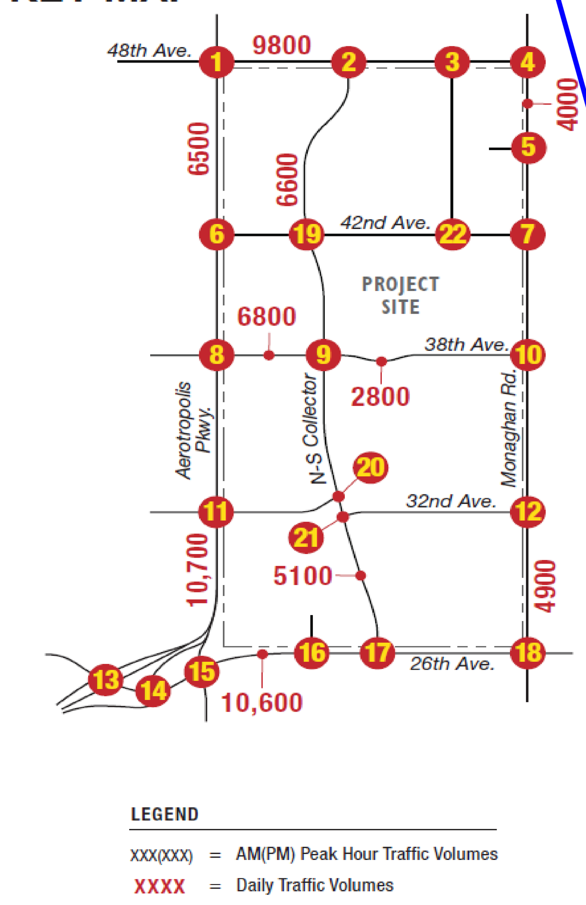
[1]Square footage amounts based on applying a Floor-Area Ratio (FAR) of 0.35.

FELSBURG HOLT & ULLEVIG — Page 8

Figure 3. Trip Distribution



KEY MAP



Park. **Table 1** summarizes the trip generation estimates by planning area. In total, the entire ALC FDP is estimated to generate 39,300 external vehicle trips per day if built out to its absolute maximum. The

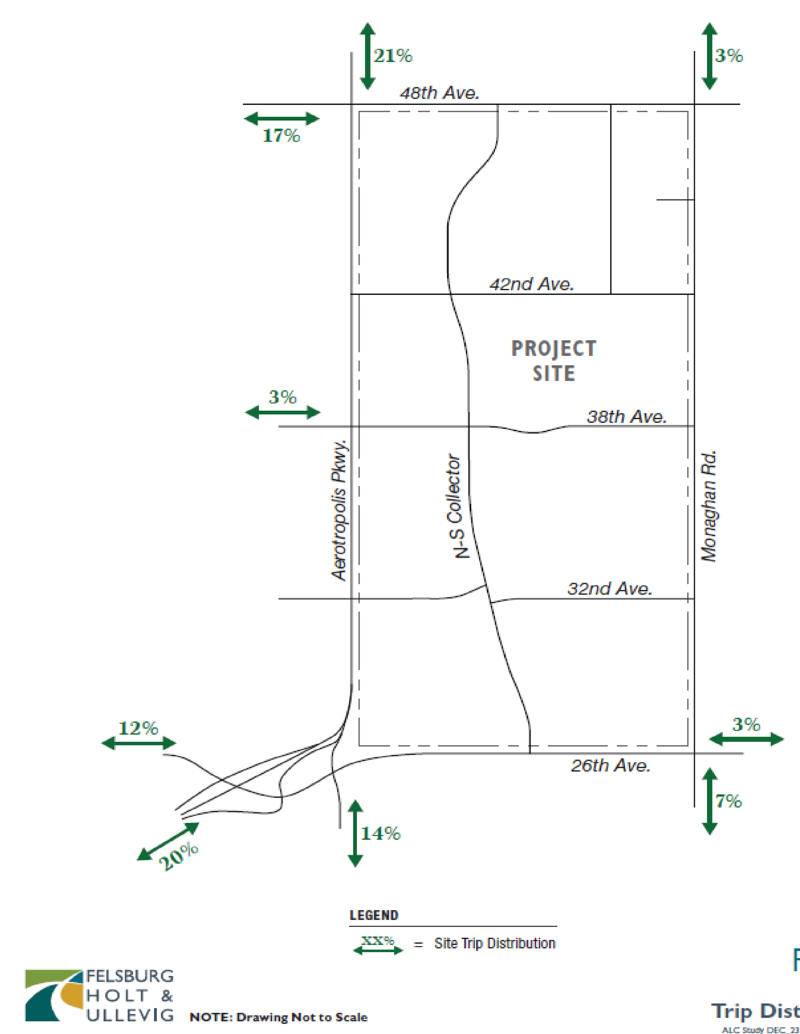


FIGURE 4
ALC
Trip Distribution

	ATEC		MTIS BG		MTIS TAH	
26TH	12	26%	13	30%	24	31%
I-70	20	43%	15	34%	30	38%
AEROTR.	14	30%	16	36%	24	31%
SUM	46		44		78	

Only used to compare different distributions . Refer to the page "References" for the assumptions that were actually used.

Steps:

1. If ADT is provided in the study, then include on the ADT figure. If ADT can be calculated per the study trip distribution then include on the ADT figure. Otherwise go to 2
2. Preferably use Area A, B or C North trip distribution as they are more detailed and include them the ADT figure, otherwise, go to 3.
3. Use other studies (preferably NEATS) to obtain the trip distribution. Include on the ADT Figure. If not go to 4
4. If the volumes are low, and no distribution are available make a reasonable assumption. Include on the ADT Figure
5. Aggregate all Volumes (see page 13 of this document)

KING RANCH

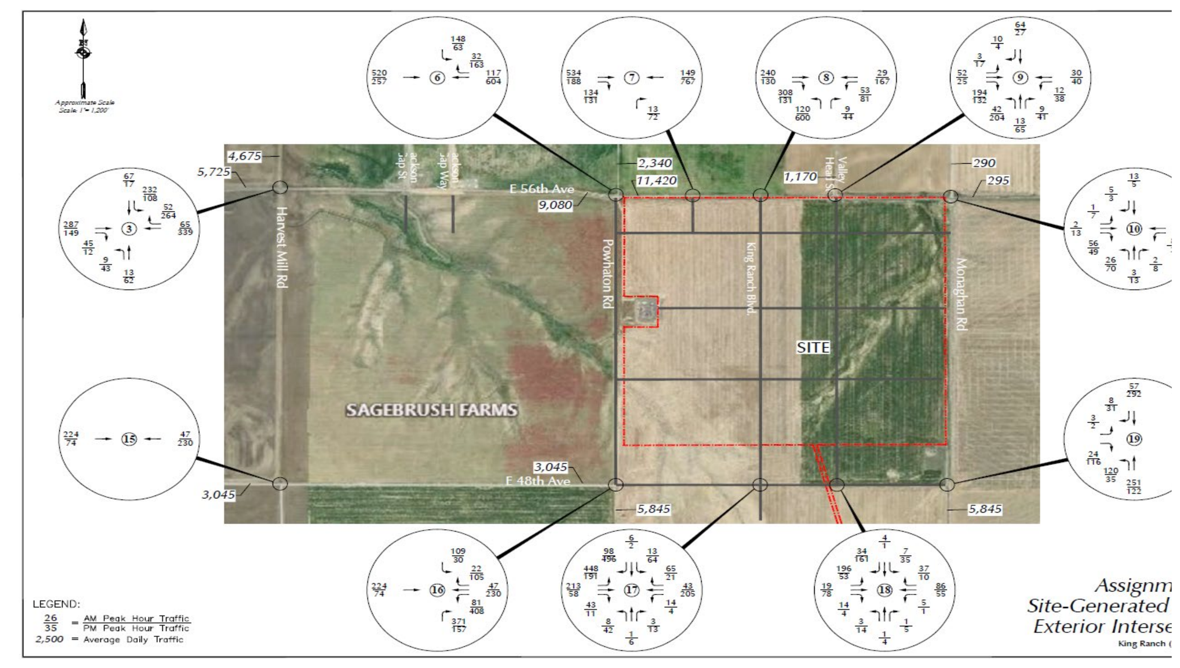
Total ADT 29228

Location	ADT	
48TH AVE W.O AEROTROPOLIS PKWY		
38TH AVE W.O AEROTROPOLIS PKWY		
26TH AVE W.O DDI	1,520	See Reference - Section D (ATEC/ALC Column)
I-70 HARVEST INTERCHANGE	2,513	See Reference - Section D (ATEC/ALC Column)
AEROTRPOLIS S.O 26TH AVE	1,754	See Reference - Section D (ATEC/ALC Column)
HARVEST N.O 48TH	2,338	HLAF OF THE 16% TRIP DISTRIBUTION. ADJUSTED.
DENALI N.O 48TH		
48TH AVE E.O E-470	1,169	Trip distribution show in Figure 6 in this page
E-470 S.O 48TH AVE	2,338	Trip distribution show in Figure 6 in this page
E-470 N.O 48TH AVE	2,338	Trip distribution show in Figure 6 in this page
48TH AVE W.O E-470	1,169	Trip distribution show in Figure 6 in this page
AEROTRPOLIS S.O 48TH AVE	5,846	Trip distribution show in Figure 6 in this page
26TH S.O WARMSPRINGS	1,125	Reference Page - Section C
26TH W.O E-470	1,226	Reference Page - Section D
POWHATON N.O 48TH	1,350	AM/PM ESTIMATE from this traffic study
48TH E.O POWHATON	8,540	AM/PM ESTIMATE
26TH E.O POWHATON	557	Reference Page - Section A trip distribution figure

Table 2
Trip Generation Estimate
King Ranch
Aurora, CO
LSC #210370; November, 2022

Planning Area	Land Use Description	Trip Generation Units	Trip Generation Rates (1): Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Total Trips Generated: Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out
PA-1	Commercial(2)	53.906 KSF(3)	67.52	1.07	0.66	2.54	2.65	3,640	58	35	137	143
	Industrial Park(4)	161.716 KSF	3.37	0.28	0.06	0.07	0.27	545	45	10	12	43
PA-2	Commercial	53.295 KSF	67.52	1.07	0.66	2.54	2.65	3,598	57	35	136	141
	Industrial Park	159.883 KSF	3.37	0.28	0.06	0.07	0.27	539	44	10	12	42
PA-3	Commercial	59.584 KSF	67.52	1.07	0.66	2.54	2.65	4,023	64	39	152	158
	Industrial Park	178.750 KSF	3.37	0.28	0.06	0.07	0.27	602	49	12	13	47
PA-4	Commercial	41.040 KSF	67.52	1.07	0.66	2.54	2.65	2,771	44	27	104	109
	Industrial Park	123.120 KSF	3.37	0.28	0.06	0.07	0.27	415	34	8	9	33
PA-6	Industrial Park	886.350 KSF	3.37	0.28	0.06	0.07	0.27	2,987	244	57	66	235
PA-7	Industrial Park	508.149 KSF	3.37	0.28	0.06	0.07	0.27	1,712	140	33	38	135
PA-8	Industrial Park	534.150 KSF	3.37	0.28	0.06	0.07	0.27	1,800	147	35	40	142
PA-9	Industrial Park	686.401 KSF	3.37	0.28	0.06	0.07	0.27	2,313	189	44	51	182
PA-10	Industrial Park	474.072 KSF	3.37	0.28	0.06	0.07	0.27	1,598	131	31	35	126
PA-11	Industrial Park	667.996 KSF	3.37	0.28	0.06	0.07	0.27	2,251	184	43	50	177
PA-12	Industrial Park	711.000 KSF	3.37	0.28	0.06	0.07	0.27	2,396	196	46	53	189
PA-13	Industrial Park	448.062 KSF	3.37	0.28	0.06	0.07	0.27	1,510	123	29	34	119
PA-14	Industrial Park	612.510 KSF	3.37	0.28	0.06	0.07	0.27	2,064	169	40	46	162
PA-15	Industrial Park	324.000 KSF	3.37	0.28	0.06	0.07	0.27	1,092	89	21	24	86
	Total Floor Area	**6,683.984 KSF**					**Total Trips**	**35,856**	**2,007**	**555**	**1,012**	**2,269**
							Internal Trips(5)	**2,397**	**110**	**110**	**53**	**53**
							External Trips (Total Trips - Internal Trips)	**33,459**	**1,897**	**445**	**959**	**2,216**
							Pass-By Trips(6)	**4,231**	**42**	**42**	**175**	**175**
							Primary Trips (External Trips - Passby Trips)	**29,228**	**1,855**	**403**	**784**	**2,041**

Notes:
(1) Source: *Trip Generation, Institute of Transportation Engineers*, 11th Edition, 2021.
(2) ITE Land Use No. 821 - Shopping Plaza (40-150 KSF with No Supermarket)
(3) KSF = 1,000 square feet of floor space
(4) ITE Land Use No. 130 - Industrial Park
(5) See the attached NCHRP 684 Internal Trip Capture Estimation Tool for internal trip reductions by land use
(6) Source: *Trip Generation Handbook - An ITE Proposed Recommended Practice, Third Edition* 2017 by ITE. Assumes 34% pass-by trips for the Commercial use.
Source: LSC Transportation Consultants, Inc.



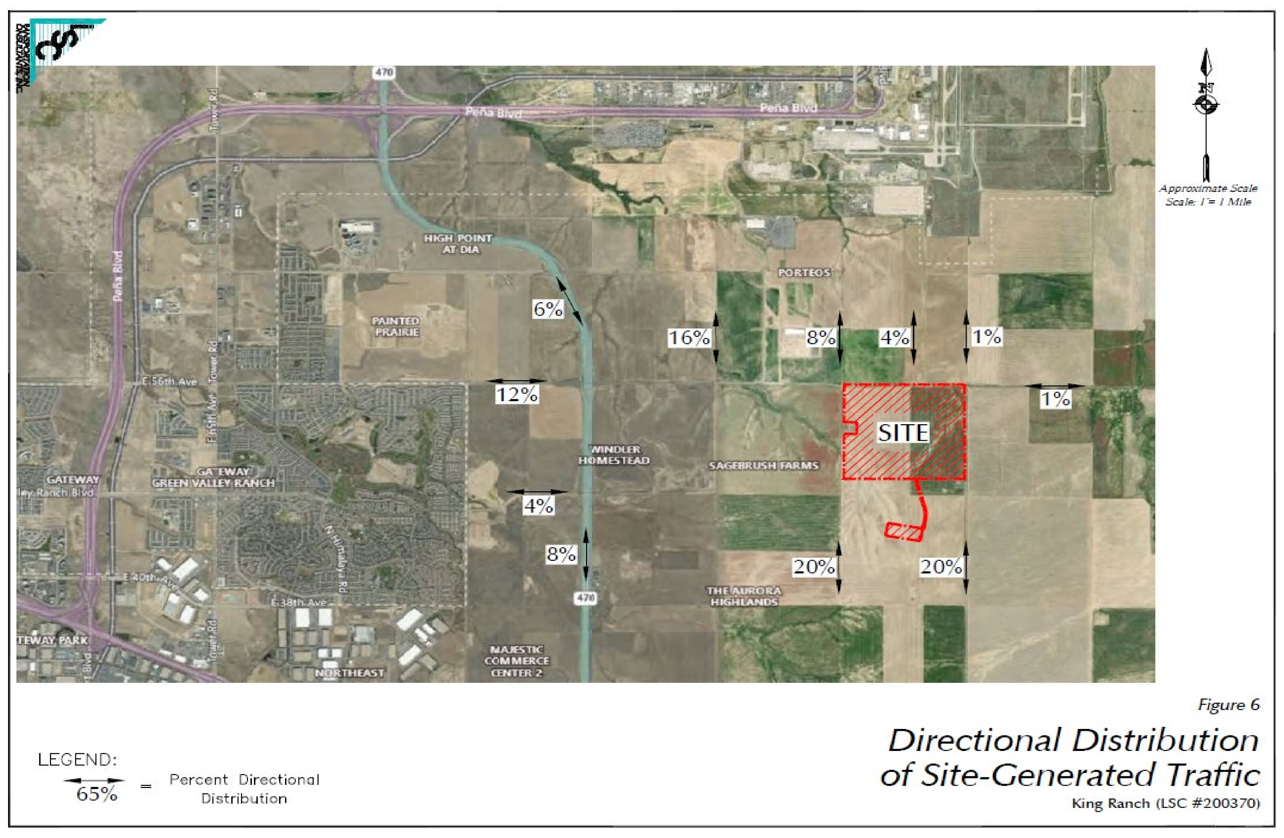


Figure 6

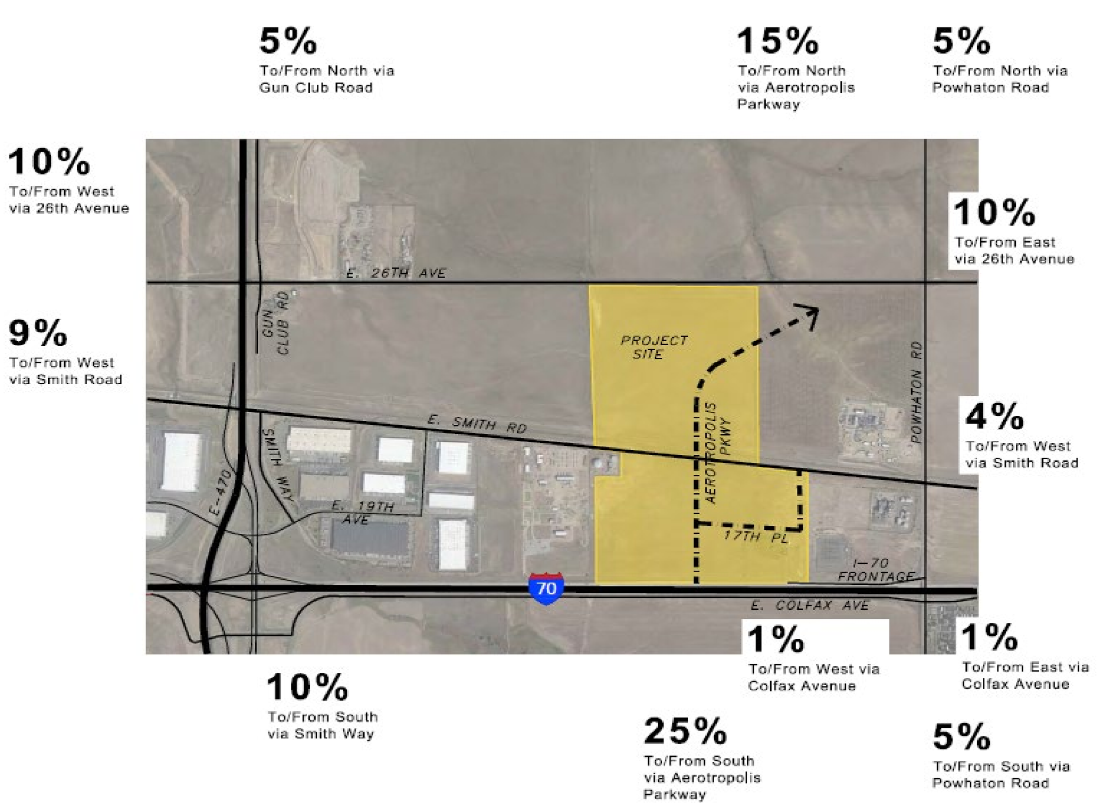
Directional Distribution of Site-Generated Traffic

King Ranch (LSC #200370)

HARVEST MILE

Total ADT 13312

Location	ADT	
48TH AVE W.O POWHATON	453	Reference page - Section E
38TH AVE W.O POWHATON		
26TH AVE W.O DDI	3,690	From the traffic study. See volume figure in this page
I-70 HARVEST INTERCHANGE	1,997	Reference page - Section F
POWHATON S.O 26TH AVE	2,662	Engineering Judgment
HARVEST N.O 48TH		
DENALI N.O 48TH		
48TH AVE E.O E-470	2,662	Estimated from Trip Distribution see figure below
E-470 S.O 48TH AVE		
E-470 N.O 48TH AVE		
48TH AVE W.O E-470		
POWHATON S.O 48TH AVE	2,662	Estimated from Trip Distribution see figure below
26TH S.O WARMSPRINGS DEVELOPMENT	3,940	From the traffic study. See volume figure in this page
26TH W.O E-470	1,331	from Trip Distribution see figure below
MAIN STREET S.O 48TH AVE	666	from Trip Distribution see figure below
POWHATON N.O 48TH AVE	1,491	Estimated from Trip Distribution see figure below
48TH AVE E.O POWHATON	719	Estimated from Trip Distribution see figure below

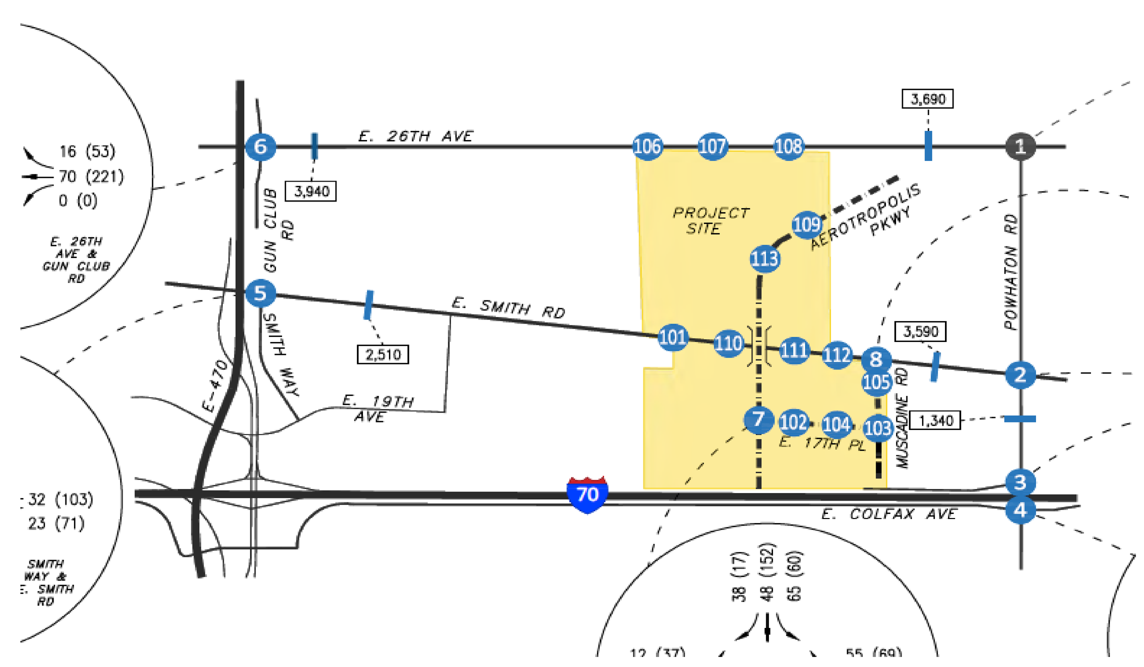


FT #20100 **Harvest Mile Industrial Traffic Impact Study** 2/1/2023

Table 3 - Trip Generation Summary

Bldg. #	Land Use	Size	Unit	Internal Capture	Non-Auto Factor	Average Daily Trips Rate	Total	In	Out	AM Peak Hour Trips Rate	Total	In	Out	PM Peak Hour Trips Rate	Total	In	Out
	Northwest Property																
1, 2, 3, & 4	ITE 140: Manufactoring	983.0	ksf	1.00	0.95	4.75	4,436	2,218	2,218	0.68	635	483	152	0.74	691	214	477
	ITE 150: Warehousing	983.2	ksf	1.00	0.95	1.71	1,597	799	798	0.17	159	122	37	0.18	168	47	121
	Subtotal of Northwest Property New Trips						***6,033***	***3,017***	***3,016***		***794***	***605***	***189***		***859***	***261***	***598***
	Northeast Property																
5	ITE 140: Manufactoring	210.0	ksf	1.00	0.95	4.75	948	474	474	0.68	136	103	33	0.74	148	46	102
	ITE 150: Warehousing	210.0	ksf	1.00	0.95	1.71	341	171	170	0.17	34	26	8	0.18	36	10	26
	Subtotal of Northeast Property New Trips						***1,289***	***645***	***644***		***170***	***129***	***41***		***184***	***56***	***128***
	Southwest Property																
6 & 7	ITE 140: Manufactoring	408.0	ksf	1.00	0.95	4.75	1,841	921	920	0.68	264	201	63	0.74	287	89	198
	ITE 150: Warehousing	408.8	ksf	1.00	0.95	1.71	664	332	332	0.17	66	51	15	0.18	70	20	50
	Subtotal of Southwest Property New Trips						***2,505***	***1,253***	***1,252***		***330***	***252***	***78***		***357***	***109***	***248***
	Southeast Property																
8 & 9	ITE 140: Manufactoring	568.0	ksf	1.00	0.95	4.75	2,563	1,282	1,281	0.68	367	279	88	0.74	399	124	275
	ITE 150: Warehousing	567.3	ksf	1.00	0.95	1.71	922	461	461	0.17	92	71	21	0.18	97	27	70
	Subtotal of Southeast Property New Trips						***3,485***	***1,743***	***1,742***		***459***	***350***	***109***		***496***	***151***	***345***
	Total New Trips:						***13,312***	***6,658***	***6,654***	***AM >***	***1,753***	***1,336***	***417***	***PM >***	***1,896***	***577***	***1,319***

Source : ITE Trip Generation 11th Edition, 2021.



SUN EMPIRE

Total ADT 15679

	Location	ADT	
	48TH AVE W.O POWHATON	2,300	From the traffic study, See figure 5, below.
	38TH AVE W.O POWHATON		
	26TH AVE W.O DDI	553	Reference page - Section D (Powhaton Minus east leg ADT tin
	I-70 HARVEST INTERCHANGE	915	Reference page - Section D (Powhaton Minus east leg ADT times percentage on section D)
	POWHATON S.O 26TH AVE	638	Reference page - Section D (Powhaton Minus east leg ADT times percentage on section D)
	HARVEST N.O 48TH	3,200	From the traffic study, See figure 5, below.
	DENALI N.O 48TH	493	(4/30)*3700 (3700 is ADT on 48th W.O Harvest) see section A figure in references
c	48TH AVE E.O E-470	3,207	(26/30)*3700 (3700 is ADT on 48th W.O Harvest) see section A figure in references
	E-470 S.O 48TH AVE	609	19% of row c
	E-470 N.O 48TH AVE	1,219	38% of row c
	48TH AVE W.O E-470	1,347	42% of row c
a	POWHATON S.O 48TH AVE	2,352	Trip distribution (figure 3 of this page)
	26TH S.O WARMSPRINGS DEVELOPMENT		
	26TH W.O E-470		
	MAIN STREET W.O 48TH AVE		
	POWHATON N.O 48TH AVE	960	BASED ON AM/PM
	48TH AVE E.O POWHATON	157	Trip distribution (figure 3 of this page)
b	26TH E.O POWHATON	224	MATRIX trip distribution see section A in references
	(POHATON MIUNUS EAST LEG (Row a - row b)	2,128	

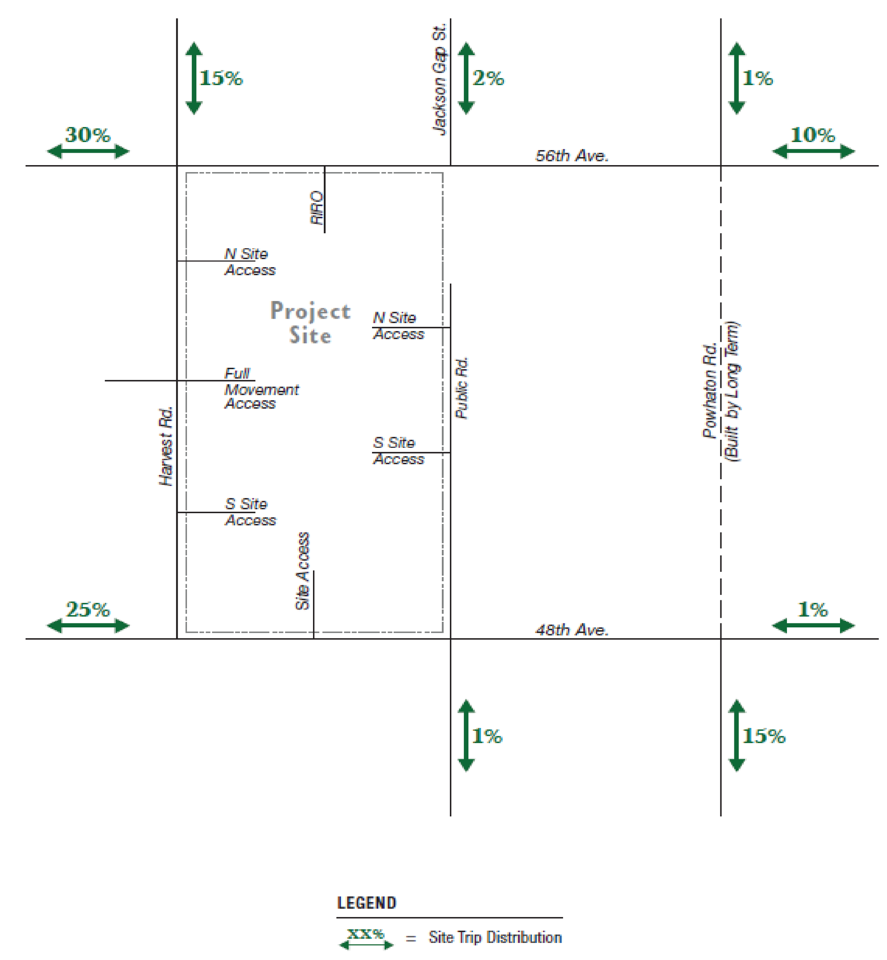
Table 2. Trip Generation Summary

Land Use	ITE Code*	Quantity (Square Feet)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				In	Out	Total	In	Out	Total
Distribution Center	154 & 156	4,102	15,679	1,267	968	2,235	1,202	899	2,070

*Trip generation rates for Categories 154 and 156 were averaged, placing a 75% weight on the higher generating category (156) and 25% on the lower (154).

127 961.9483
118 827.7951

PM AM
14% 13%



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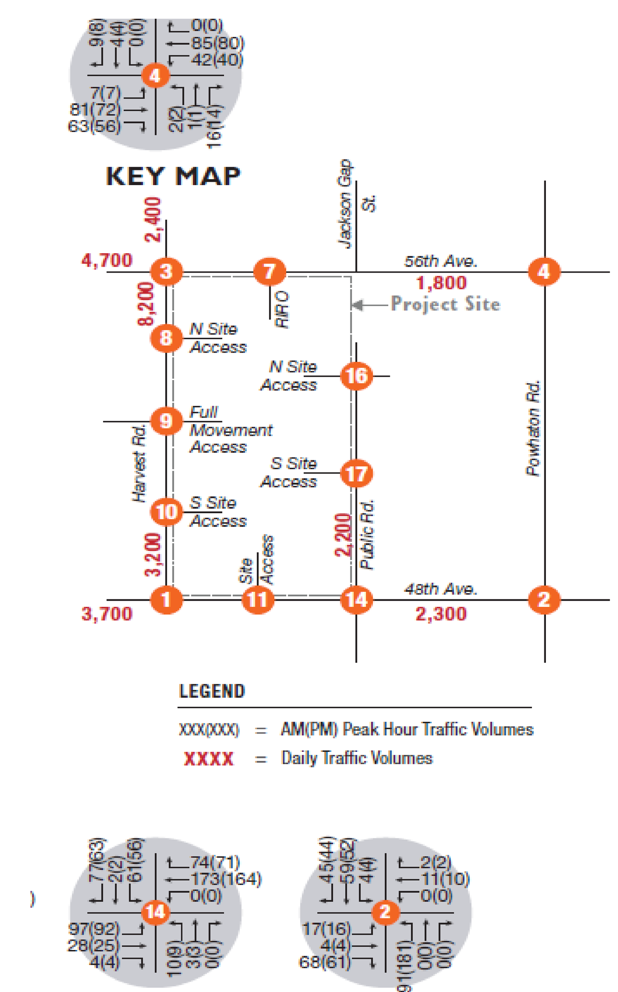
NOTE: Drawing Not to Scale

NORTH
FIGURE 3
Site Trip Distribution



NORTH
FIGURE 5
Buildout (Post 2040) Site Generated Peak Hour Traffic Volumes

Only the external trips were used.

WINDLER

		Minus 15% internal trips	
Total ADT	88,699	75,394	
	ADT		
Location			
48TH AVE W.O POWHATON	7,539	Distribution shown in figure bewlo	
38TH AVE W.O POWHATON			
26TH AVE W.O DDI	ASSUMED ZERO		
I-70 HARVEST INTERCHANGE	3,008	ATEC DISTRIBUTION SEE REFERENCES section G	
POWHATON S.O 26TH AVE	2,090	ATEC DISTRIBUTION SEE REFERENCES section G	
HARVEST N.O 48TH	4,500	Volume shown in figure below	
DENALI N.O 48TH	10,100	Volume shown in figure below	
48TH AVE E.O E-470	20,500	Volume shown in figure below	
E-470 S.O 48TH AVE	11,309	per DISTRIBUTION SHOWN BELOW	
E-470 N.O 48TH AVE	3,770	50% DISTRIBUTION SHOWN BELOW	
48TH AVE W.O E-470	16,600	Volume shown in figure below	
POWHATON S.O 48TH AVE	5,202	Reference - Section H	
26TH S.O WARMSPRINGS DEVELOPMENT	ASSUMED ZERO		
26TH W.O E-470	ASSUMED ZERO		
MAIN STREET W.O 48TH AVE			
POWHATON N.O 48TH AVE	2,337	Reference - Section H	
48TH AVE E.O POWHATON	369	SUN EMPIRE DISTRIBUTION	
26TH E.O POWHATON	104	ASSUMED 2 PERCENT OF TRAFFIC ON POWHATON	S
DENALI S.O 48TH	5,278	per DISTRIBUTION SHOWN BELOW	
POWHATON N.O 26TH	5,202		
POWHATON MINUS 26TH EAST LEG	*5,098*		

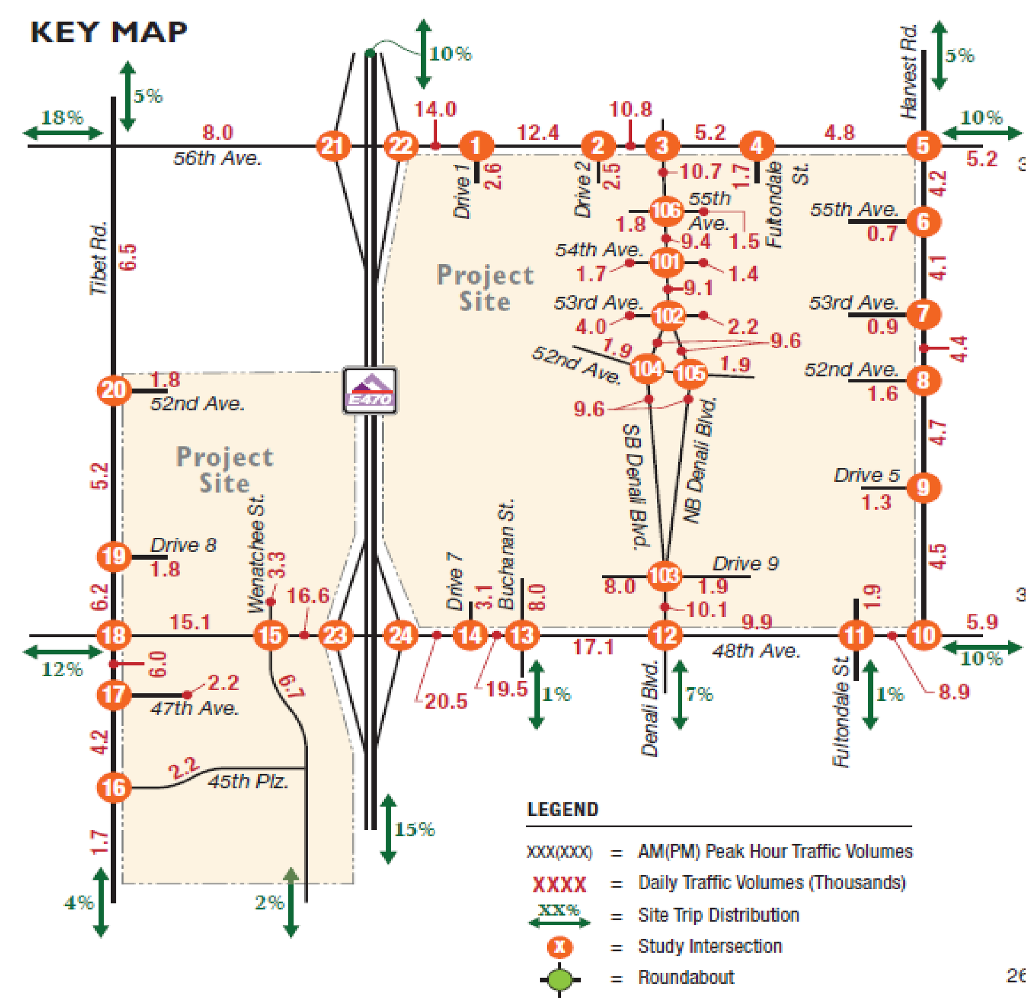
Table 3. Site Trip Generation

Map Code	ITE Code	Land Use Description	Size	Unit	Daily	AM Peak Hour Total Trip Generation			AM Peak Hour Internal Capture Trips					AM Peak Hour External Trips			PM Peak Hour Total Trip Generation			PM Peak Hour Internal Capture Trips					PM Peak Hour External Trips			PM Pass-By %	PM Pass-By Trips
					Total	In	Out	Total	In %	Out %	In	Out	Total	In	Out	Total	In	Out	Total	In %	Out %	In	Out	Total	In	Out	Total		
PA-1	820	Shopping Center	338.0	KSF	14,689	206	127	333	7%	10%	61	31	92	145	96	241	651	705	1,356	15%	28%	98	197	295	553	508	1,061	19%	105
PA-2	220	Multifamily Housing (Low-Rise)	711	DU	4,633	58	185	243	2%	2%	1	4	5	57	181	238	205	121	326	16%	12%	33	20	53	172	101	273	-	-
PA-3.1	210	Single Family Detached Housing	76	DU	784	15	43	58	2%	2%	0	1	1	15	42	57	49	28	77	16%	12%	8	3	11	41	25	66	-	-
PA-3.2	822	Strip Retail Plaza	10.0	KSF	652	14	10	24	7%	10%	1	1	2	13	9	22	39	39	78	15%	28%	6	11	17	33	28	61	40%	13
PA-4	210	Single Family Detached Housing	316	DU	2,908	53	159	212	2%	2%	1	9	10	52	150	202	185	108	293	16%	12%	30	18	48	155	90	245	-	-
PA-5	220	Multifamily Housing (Low-Rise)	228	DU	1,537	23	71	94	2%	2%	1	2	3	22	69	91	75	44	119	16%	12%	12	5	17	63	39	102	-	-
PA-6	220	Multifamily Housing (Low-Rise)	322	DU	2,139	30	93	123	2%	2%	1	2	3	29	91	120	100	59	159	16%	12%	16	7	23	84	52	136	-	-
PA-7.1	210	Single Family Detached Housing	269	DU	2,508	46	137	183	2%	2%	2	3	5	44	134	178	159	93	252	16%	12%	26	11	37	133	82	215	-	-
PA-7.2	822	Strip Retail Plaza	5.0	KSF	441	7	5	12	7%	10%	1	1	2	6	4	10	24	24	48	15%	28%	4	7	11	20	17	37	40%	8
PA-8	210	Single Family Detached Housing	160	DU	1,555	29	86	114	2%	2%	1	2	3	28	84	111	98	57	155	16%	12%	16	7	23	82	50	132	-	-
PA-9	520	Elementary School	300	Students	681	120	102	222	33%	42%	40	42	82	80	60	140	22	26	48	68%	62%	15	16	31	7	10	17	-	-
PA-10	210	Single Family Detached Housing	185	DU	1,777	33	98	130	2%	2%	1	2	3	32	96	127	112	65	177	16%	12%	18	8	26	94	57	151	-	-
PA-11	210	Single Family Detached Housing	206	DU	1,962	36	108	144	2%	2%	1	2	3	35	106	141	123	73	196	16%	12%	20	9	29	103	64	167	-	-
PA-12	210	Single Family Detached Housing	205	DU	1,953	36	107	143	2%	2%	1	6	7	35	101	136	123	72	195	16%	12%	20	9	29	103	63	166	-	-
PA-13.1	210	Single Family Detached Housing	160	DU	1,555	29	86	114	2%	2%	1	2	3	28	84	111	98	57	155	16%	12%	16	7	23	82	50	132	-	-
PA-13.2	220	Multifamily Housing (Low-Rise)	338	DU	2,242	31	97	128	2%	2%	1	2	3	30	95	125	105	61	166	16%	12%	17	7	24	88	54	142	-	-
PA-14.1	210	Single Family Detached Housing	195	DU	1,865	34	103	137	2%	2%	1	2	3	33	101	134	117	69	186	16%	12%	19	8	27	98	61	159	-	-
PA-14.2	220	Multifamily Housing (Low-Rise)	320	DU	2,127	29	93	122	2%	2%	1	5	6	28	88	116	100	58	158	16%	12%	16	7	23	84	51	135	-	-
PA-14.3	710	General Office Building	130	KSF	1,458	185	25	210	7%	27%	40	7	47	145	18	163	35	171	206	88%	22%	31	11	42	4	160	164	-	-
PA-15	210	Single Family Detached Housing	313	DU	2,883	53	158	210	2%	2%	1	9	10	52	149	200	183	107	290	16%	12%	29	13	42	154	94	248	-	-
PA-16	210	Single Family Detached Housing	59	DU	621	12	35	46	2%	2%	1	1	2	11	34	44	38	23	61	16%	12%	6	3	9	32	20	52	-	-
PA-17.1	210	Single Family Detached Housing	152	DU	1,483	27	82	109	2%	2%	1	2	3	26	80	106	93	54	147	16%	12%	15	7	22	78	47	125	-	-
PA-17.2	822	Strip Retail Plaza	10.9	KSF	690	15	11	26	7%	10%	5	1	6	10	10	20	41	42	83	15%	28%	6	9	15	35	33	68	40%	14
PA-18	210	Single Family Detached Housing	142	DU	1,393	26	77	102	2%	2%	1	4	5	25	73	97	87	51	138	16%	12%	14	6	20	73	45	118	-	-
PA-19	210	Single Family Detached Housing	161	DU	1,564	29	86	115	2%	2%	1	2	3	28	84	112	98	57	155	16%	12%	16	10	26	82	47	129	-	-
PA-20	710	General Office Building	160	KSF	1,747	221	30	251	7%	27%	16	8	24	205	22	227	42	203	245	88%	22%	37	13	50	5	190	195	-	-
PA-21.1	220	Multifamily Housing (Low-Rise)	320	DU	2,127	29	93	122	2%	2%	1	2	3	28	91	119	100	58	158	16%	12%	16	10	26	84	48	132	-	-
PA-21.2	821	Shopping Plaza	45	KSF	4,252	98	61	159	7%	10%	7	6	13	91	55	146	223	241	464	15%	28%	34	49	83	189	192	381	29%	55
PA-22.1	820	Shopping Center	240.0	KSF	12,130	171	105	275	7%	10%	12	11	23	159	94	252	509	551	1,060	15%	28%	76	154	230	433	397	830	19%	82
PA-22.2	220	Multifamily Housing (Low-Rise)	103	DU	736	13	42	55	2%	2%	1	2	3	12	40	52	41	24	65	16%	12%	7	3	10	34	21	55	-	-
PA-23	210	Single Family Detached Housing	209	DU	1,988	37	110	146	2%	2%	1	6	7	36	104	139	125	74	199	16%	12%	20	9	29	105	65	170	-	-
PA-24	210	Single Family Detached Housing	118	DU	1,175	22	65	87	2%	2%	1	1	2	21	64	85	73	43	116	16%	12%	12	5	17	61	38	99	-	-
PA-25	210	Single Family Detached Housing	276	DU	2,568	47	141	188	2%	2%	1	8	9	46	133	179	163	95	258	16%	12%	26	16	42	137	79	216	-	-
PA-26.1	154	High-Cube Transload and Short-Term Storage Warehouse	250	KSF	350	15	5	20	0%	0%	0	0	0	15	5	20	7	18	25	0%	0%	0	0	0	7	18	25	-	-
PA-26.2	110	General Light Industrial	250	KSF	990	153	21	174	0%	0%	0	0	0	153	21	174	11	67	78	0%	0%	0	0	0	11	67	78	-	-
PA-27.1	154	High-Cube Transload and Short-Term Storage Warehouse	100	KSF	140	6	2	8	0%	0%	0	0	0	6	2	8	3	7	10	0%	0%	0	0	0	3	7	10	-	-
PA-21.2	110	General Light Industrial	100	KSF	42[illegible]	63	9	72	0%	0%	0	0	0	63	9	72	6	34	40	0%	0%	0	0	0	6	34	40		-
PA-28.1	154	High-Cube Transload and Short-Term Storage Warehouse	375	KSF	52[illegible]	23	7	30	0%	0%	0	0	0	23	7	30	11	27	38	0%	0%	0	0	0	11	27	38	-	-
PA-28.2	110	General Light Industrial	375	KSF	1,4[illegible]0	228	31	259	0%	0%	0	0	0	228	31	259	15	89	104	0%	0%	0	0	0	15	89	104	-	-
PA-29.1	154	High-Cube Transload and Short-Term Storage Warehouse	375	KSF	5[illegible]5	23	7	30	0%	0%	0	0	0	23	7	30	11	27	38	0%	0%	0	0	0	11	27	38	-	-
PA-29.2	110	General Light Industrial	375	KSF	[illegible]	228	31	259	0%	0%	0	0	0	228	31	259	15	89	104	0%	0%	0	0	0	15	89	104	-	-
		Total Vehicles			88,699	2,553	2,944	5,497	-	-	207	189	396	2,346	2,755	5,101	4,315	3,911	8,226	-	-	735	675	1,410	3,580	3,236	6,816	-	277

DU = Dwelling Units KSF = 1,000 SF

FELSBURG HOLT & ULLEVIG

Page 8



8870	2970
5900	
0.334837	

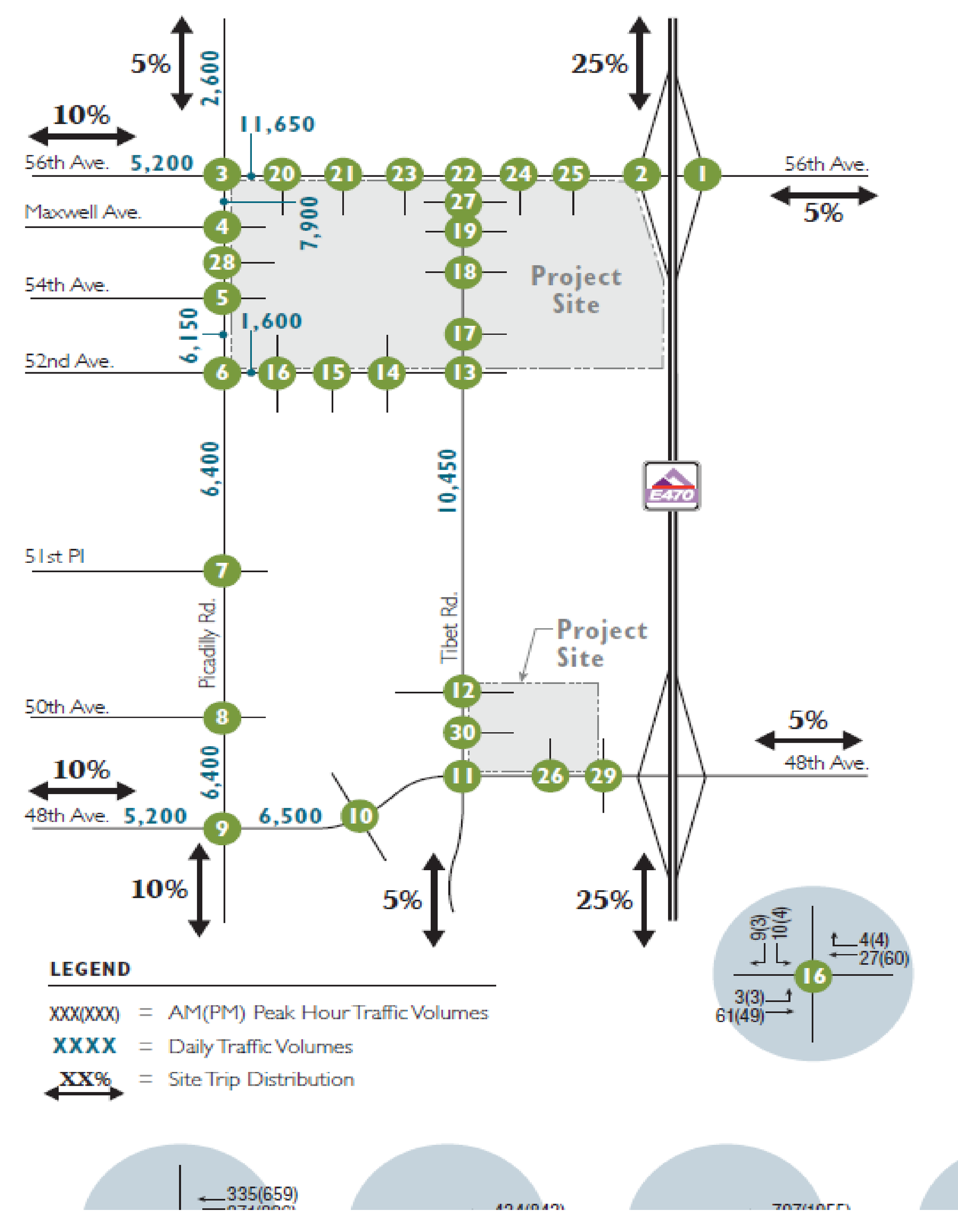
GREEN VALLEY

	Total ADT	
	ADT	52,000
Location		
48TH AVE W.O POWHATON	2,600	Per distribution shown below
38TH AVE W.O POWHATON		
26TH AVE W.O DDI		
I-70 HARVEST INTERCHANGE		
POWHATON S.O 26TH AVE		
HARVEST N.O 48TH	130	
DENALI N.O 48TH	130	
48TH AVE E.O E-470	2,600	Per distribution shown below
E-470 S.O 48TH AVE	13,000	Per distribution shown below
E-470 N.O 48TH AVE	13,000	Per distribution shown below
48TH AVE W.O E-470	2,598	AM/PM TMC
POWHATON S.O 48TH AVE	2,078	ASSUMED 80 PERCENT OF 48TH W.O E-470
26TH S.O WARMSPRINGS DEVELOPMENT		
26TH W.O E-470		
MAIN STREET W.O 48TH AVE		
POWHATON N.O 48TH AVE		
48TH AVE E.O POWHATON	520	ASSUMED 20 PERCENT OF 48TH W.O E-470
26TH E.O POWHATON		
DENALI S.O 48TH		
POWHATON N.O 26TH		
POWHATON MINUS 26TH EAST LEG		

Green Valley MP Amendment 2 — Traffic Impact Study

Planning Area	Land Use	ITE Code	Unit	Quantity	Daily	AM Peak			PM Peak		
						In	Out	Total	In	Out	Total
	Shopping Center	822	KSF	6.4	498	9	6	15	21	21	42
	Shopping Center	821	KSF	8.1	547	9	5	14	21	21	42
	Shopping Center	821	KSF	8.1	547	9	5	14	21	21	42
	Shopping Center	821	KSF	9.6	647	11	6	17	25	25	50
	Grocery Store	850	KSF	124.0	11,636	209	146	355	555	555	1,110
	Shopping Center	822	KSF	7.8	559	11	7	18	26	25	51
	Fitness Center	492	KSF	40	N/A	27	25	52	79	59	138
	Shopping Center	822	KSF	22	1,158	31	21	52	73	72	145
	Gas Station	945	FP	10	2,651	81	80	161	92	92	184
	Subtotal				18,741	406	307	713	934	912	1,846
55	Multi-Family (Low-Rise)	220	DU	258	1,729	25	78	103	83	48	131
	Shopping Center	822	KSF	29.799	1,487	42	28	70	98	98	196
	General Office	710	KSF	59.598	646	80	11	91	15	71	86
	Subtotal				3,862	147	117	264	196	217	413
Subtotal Trips					61,782	1,803	1,392	3,195	2,791	2,957	5,748
Total Internal Trips					5,200	143	137	286	504	481	981
Total Pass-by Trips					4,582	99	73	170	202	201	403
Total New External Trips					52,000	1,561	1,182	2,739	2,085	2,275	4,364

PM	4364	8.39%
DAILY	52000	

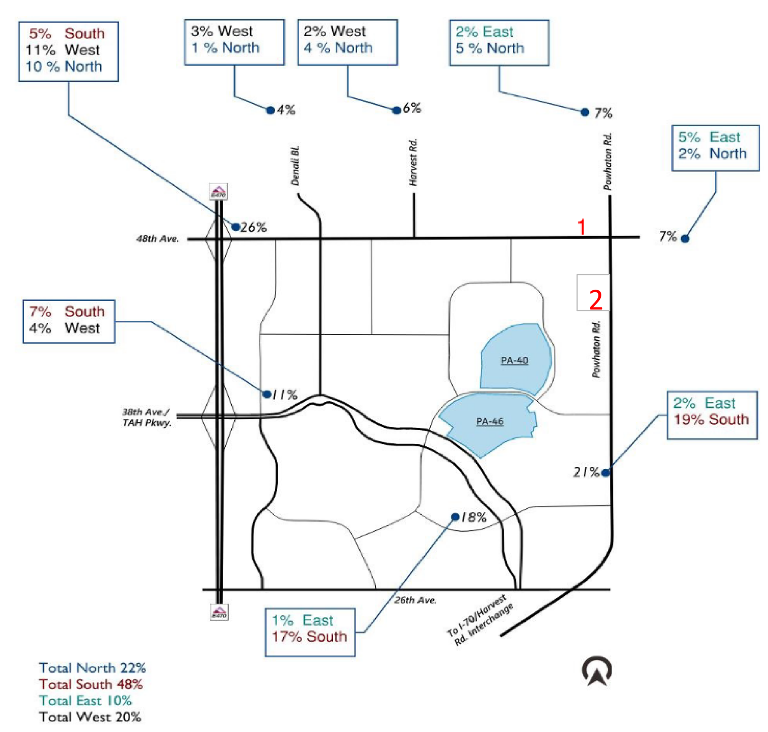


INTERSECTION	TMC
29	
EAST LEG	104
	2
	107
	5
	2,598

REFERENCES

SECTION A

Approved trip distribution for Area A, B and C North



SECTION A

	35					
	Harvest	Denali	48th E.O E-470	E-470 north	48TH W.O E-470	E-470 S.O 48TH AVE
IF ADT AT LOCATION #1 IS KNOW (see figure on the left)	6/36	4/36	26/36	USE REFERENCE MAP AT 48TH E.O E-470	USE REFERENCE MAP AT 48TH E.O E-470	USE REFERENCE MAP AT 48TH E.O E-470
	17%	11%	72%	38%	42%	19%
					(11/26)=42%	(5/26)=11%

SECTION H

Location 1 originating from the west

south	48	69%
north	22	31%
(per neats)		
SUM	70	

SECTION D

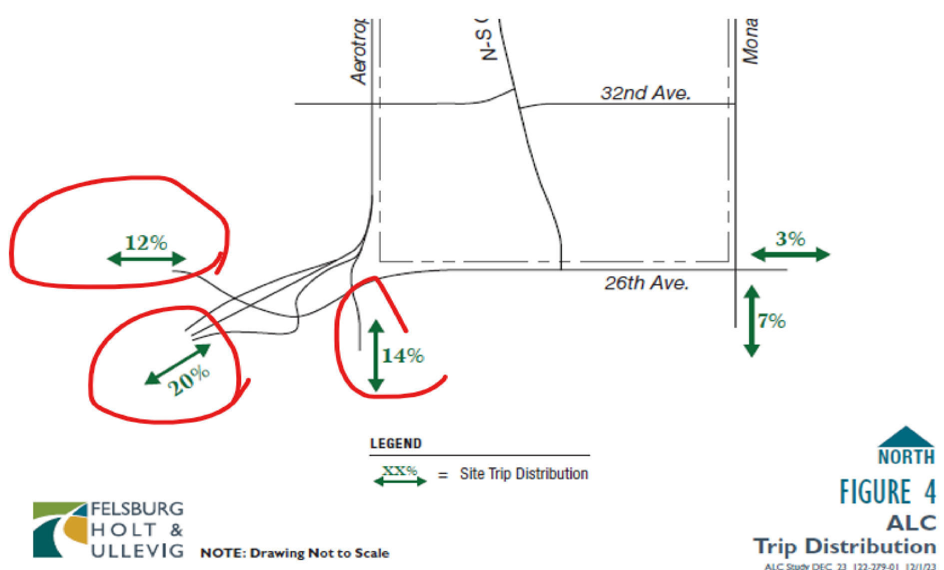


FIGURE 4
ALC
Trip Distribution

SECTION D

	ATEC		MTIS BG		MTIS TAH	
26TH	12	26%	13	30%	24	31%
I-70	20	43%	15	34%	30	38%
AEROTR.	14	30%	16	36%	24	31%
SUM	46		44		78	

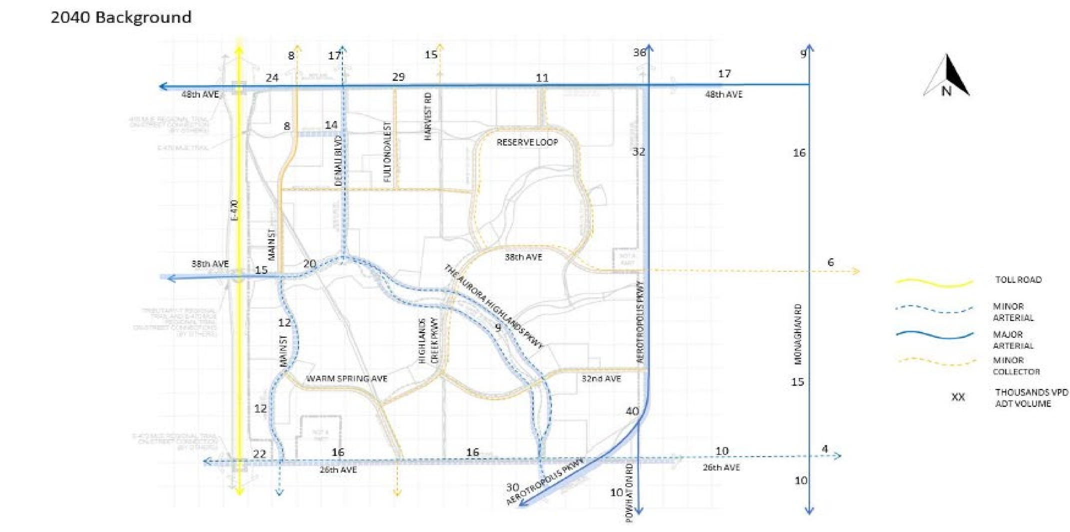
SECTION G

FOR WINDLER

I-70	20	59%
26TH SOUT	14	41%
	34	

SECTION E & F

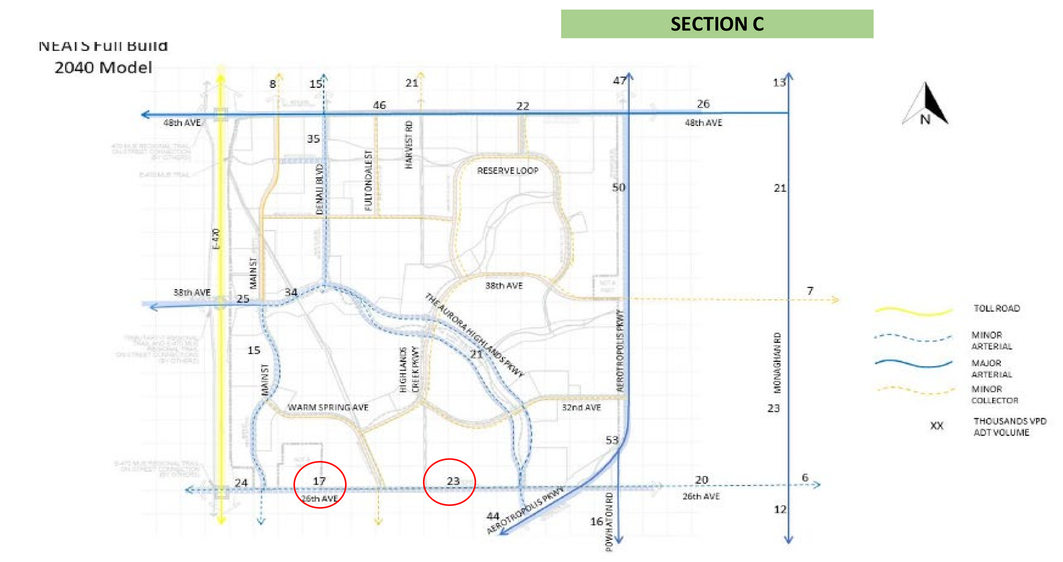
2040 Background



Source: AECOM

Figure 5 – 2040 Background ADT

SECTION C



Source: AECOM

Figure 4 – NEATS Full Build 2040 Model ADT

NEW INTERCHANGE SE CORNER OF TAH

NEATS

26TH WEST LEG	23	22%
I-70	44	43%
AEROTR.	16	16%
26 ESAT LEG	20	19%
SUM	103	

SECTION C

TO OBTAIN 26TH S.O WARMSPRINGS DEVELOPMENT

26TH W.O PKWY	23
26TH S.O WARMSPRINGS	17
	74%

E.O Warmsprings

SECTION F

NEW INTERCHANGE SE CORNER OF TAH

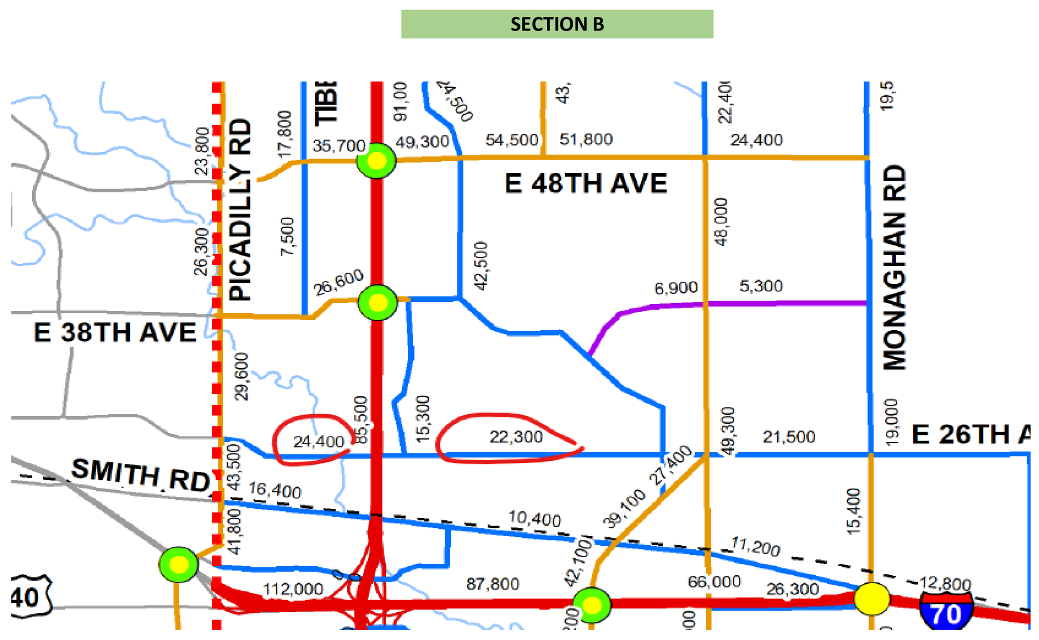
			Diff FROM FULL BUILT
26TH WEST LEG	16	24%	-2%
I-70	30	45%	-3%
AEROTR.	10	15%	0%
26 ESAT LEG	10	15%	NOT IN THE MODEL
SUM	66		

SECTION E

POWHATON/48TH

POWHATON N.O 48	36	56%
48TH WEST LEG	11	17%
48TH EAST LEG	17	27%
SUM	64	

SECTION B



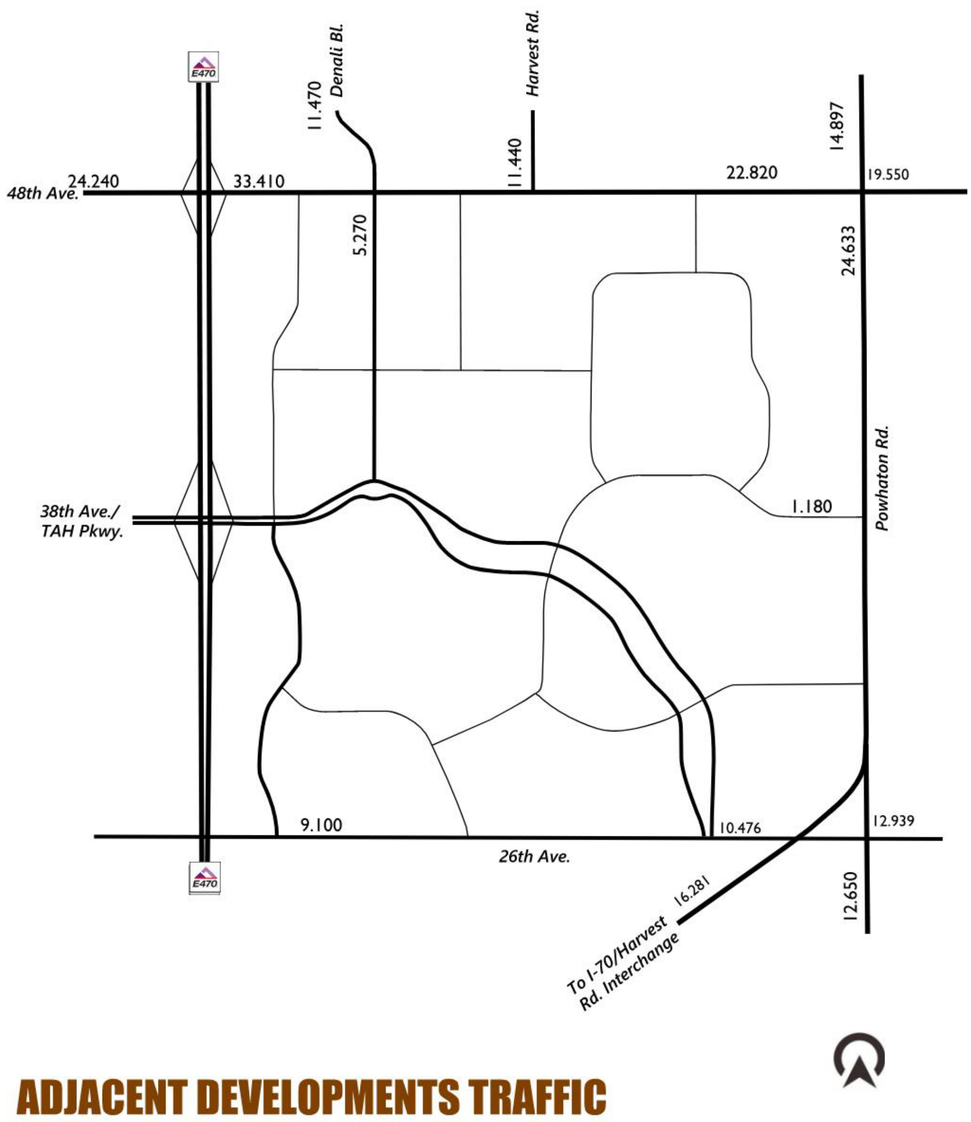
SECTION B

26TH W.O E-470	24400
26TH E.O E-470	22300
	1.094170404

Picadeli Rd
Tibet Rd
Denali Bl
Harvest Rd
Powhaton Rd
56th Ave
48th Ave
26th Ave
GREEN VALLY
WINDLER
SUN EMPIRE
KING RANCH
BRANDENBURG
WINDLER
TAH
ALC (ATEC)
HARVEST MILE
1.86 2.338 0.42 1.22 3.77 13.000
16.6 2.05 2.60 1.17 0.47 1.35
20.5 4.82 2.6 1.17 1.12 3.2
17.1 5.53 1.17 3.7 1.12 2.60
1.35 2.0 8.25 0.96 2.337
0.74 0.5 10.10 0.130
4.5 1.11 3.7 2.0 0.130
8.9 1.17 5.53 .66 3.7
0.37 9.8 0.2 8.5 0.16 0.520
5.27
7.540 .45 3.04 2.60
7.540 6.68 2.60 0.66 3.04 2.3
.67
0.93 2.338 0.21 0.61 11.31 13.000
5.2 6.5 2.078 2.66 5.845 2.35
0.0 1.18 0.0
.67
5.20 10.7 5.845 2.66 2.35 2.078
0.0 1.18 0.0
1.22 3.8 1.33 0.55
0.0 3.49 0.0 3.94 1.12 0.55
10.6 1.33 0.56 .224 0.105 0.10
4.716 1.52 3.69 0.55
7.861 2.51 2.0 0.91 3.0
2.09 5.5 2.0 1.75 .67 0.64
ESTIMATED FROM THE OTHER STUDIES

Matrix aggregated the traffic generated by the surrounding developments based on the trip distribution provided in the study, the NEATS travel demand model, TAH Area A/B/C north trip distribution assumptions approved by the COA and engineering judgement. The results are summarized in Figure 2, below. A detailed trip distribution for each development can be found in the appendix.

Figure 2 – Adjacent Developments Traffic



Numbers represent ADT in 1,000s.

The remainder of this letter compares the volumes shown in Figure 2, above, with multiple different studies and proposes a set of background volumes for the external roads that were determined to be the most appropriate for the MTIS update.