2024.07.30 MATRIX DESIGN GROUP RESPONSES

Thank you for reviewing our MTIS. More context regarding the existing roadways has been added to the report.

The Aurora Highlands
Master Traffic Impact Study

Please see our responses on the figures.

2024-07-10 (DJK) reviewed, comments include:
- Provide context of roadways that exist today (E-470, 26th Ave, Powhaton Rd & Gun Club Rd - pg 4
- Provide ITE LU Code #, add column for Ave Rate/linear equation values - table 1
- Table 2, provide ITE LU Codes, confirm total trips vs reduced, define school types
- Table 3, school internal capture confirmation, Trip Reduction text should be BEFORE Table 1
- Figures 3, 4 & 5 comments need to be addressed
- Figure 8 comments to roadway classifications
- Appendix docs need to be separated and clearly defined and the text in the body of the document should reflect this change.
- May 13th letter comment regarding detailed steps of aggregation

8390 East Crescent Parkway, Suite 300

Greenwood Village, CO 80111

The appendix section has been revised.

Prepared by:

ITE land use code, and rate/equations columns have been added to the trip generation tables. Please be more specific on any potential issue on reduced vs total trips in the tables.

Detailed clarification with markups on how the volumes were aggregated have been provided. Please see the June 19 2024 **framework letter With Matrix Responses.** We would be happy to provide more clarification during a meeting if needed. Matrix does not wish to include basic calculations in the report.

Excellence by

707 17th Street,
Denver, CO

Contact: Scott Barnhart, PE, PTOE

Tables haven been reordered. For school internal capture please see our response on page 7 (10 of the pdf)

June 19, 2024

COLORADO LICENSED
SCOTT BARNHART
37447
PROFESSIONAL ENGINEER

06/19/2024

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Introduction

The Aurora Highlands (TAH) is a 2,550-acre development located between Denver International Airport (DEN) and Interstate 70 (I-70). This development consists of 13,036 residential units (including 7,334 single-family homes, and 5,702 multi-family homes), 4 schools, and 2,786,580 square feet (sf) of non-residential land uses including retail, office space, and a hospital.

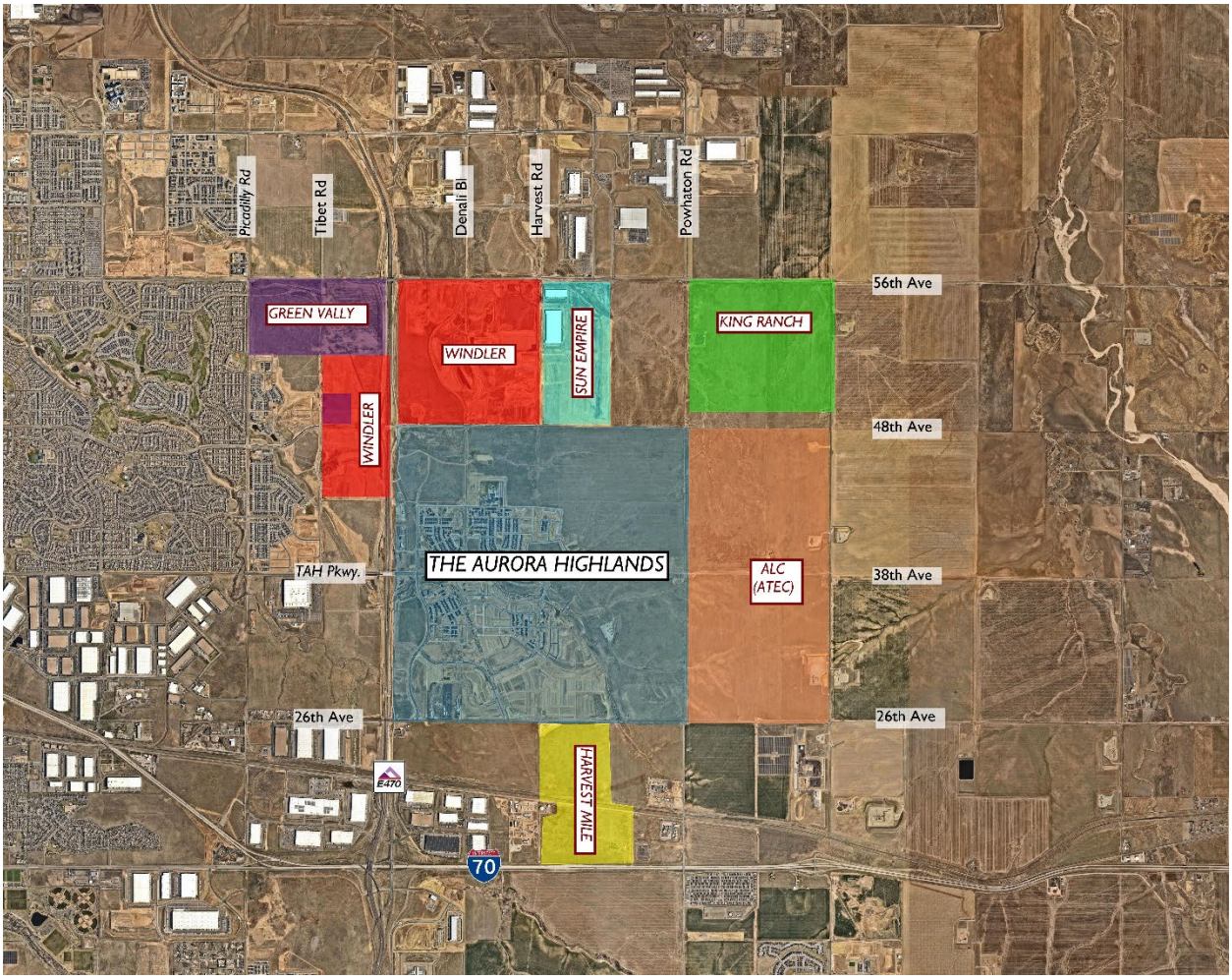
The previous Master Transportation Impact Study (MTIS) for this development was conducted in August 2019. Since the first MTIS (2019), many planning areas obtained the final approval from the City of Aurora. Some of these areas are already built as of the date of preparing this study. Various traffic studies have been prepared and approved for multiple filings and areas as well. In addition, a new alignment, Aerotropolis Parkway alignment to Jackson Gap Way, has been approved by the City of Aurora that would change the previous trip distribution assumptions. Previously, it was assumed the traffic from Aerotropolis Parkway will use 48th Avenue to reach Harvest Road.

The purpose of this MTIS is to update the previous study per the most up-to-date approved, built, or planned studies. Excerpts of the MTIS 2019, and approved studies can be found in Appendix A-Supporting Documents.

The report is organized as follows:

- ***Introduction –*** Describes the purpose and intent of this study.
- ***Area Conditions –*** Describes the study area land uses as well as the existing and future roadway network.
- ***Proposed Development –*** Describes the proposed development and the location.
- ***Projected Traffic –*** Identifies the expected number of daily trips that will be generated by the Aurora Highlands. The expected external trip distribution is also shown.
- ***Transit and Bicycle Network –*** Provides future Transit, bicycle and trail paths within or in the vicinity of the Aurora Highlands.
- ***Findings and Conclusions –*** Identifies the future roadway requirements.
- ***Recommendations –*** Provides a summary of the study findings.

Figure 1. Vicinity Map

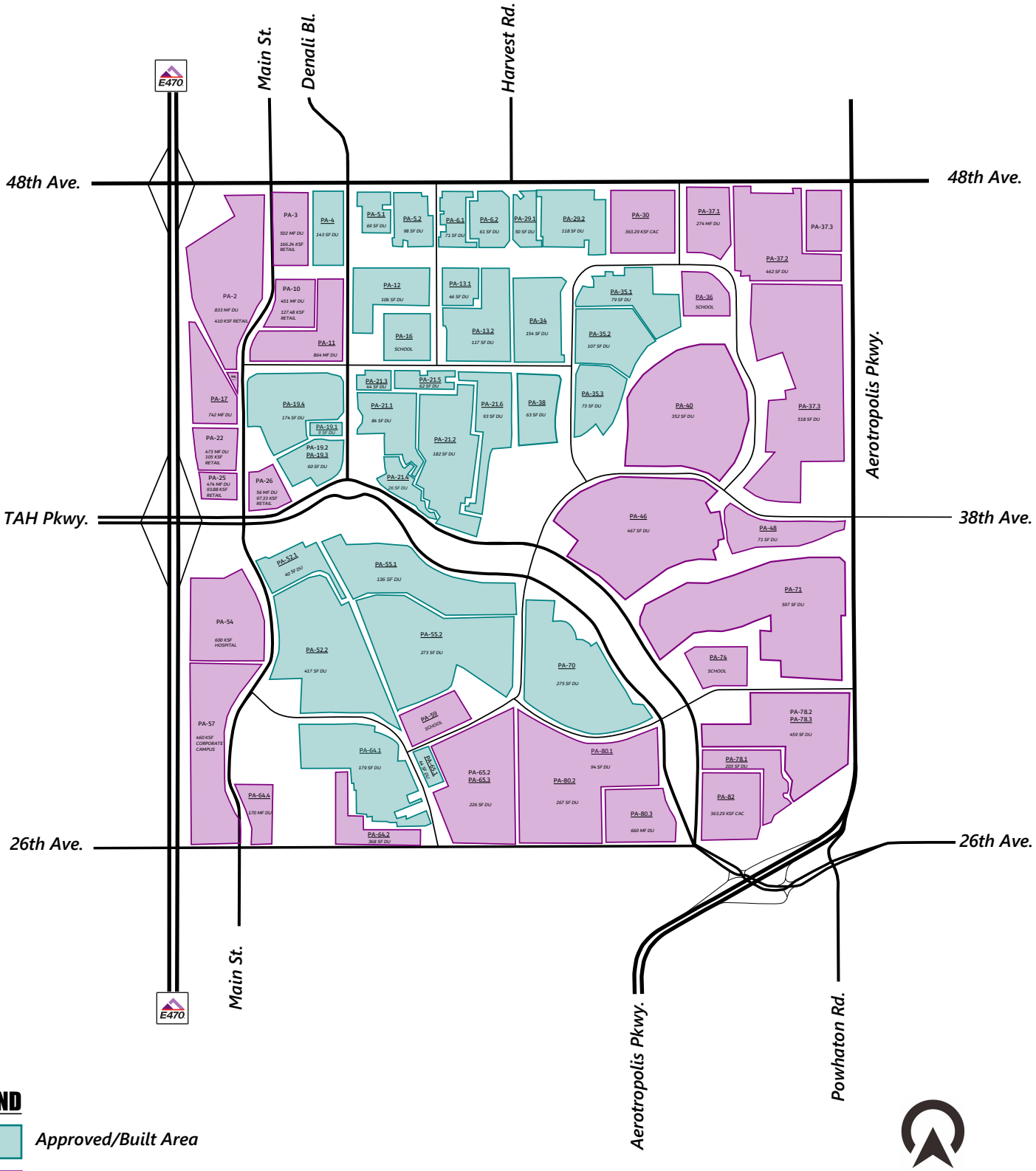


The Aurora Highlands development is located between DEN and I-70. This area is mostly vacant, however, multiple developments are planned in the vicinity of the project. Matrix obtained the traffic studies for the adjacent developments from the City of Aurora to investigate the background volumes. These developments are shown in Figure 1, above. More information regarding the background volumes can be found in 2040 Background volumes section, and in Appendix B- Background volumes Traffic Letter.

Proposed Development

TAH is a 2,550-acre development located between DEN and Interstate 70 (I-70). This development consists of 13,036 residential units, including 7,334 single-family homes, and 5,702 multi-family homes, plus 4 schools, and 2,786, 580 square feet (sf) of non-residentials. Figure 2 illustrates The Aurora Highlands land use map.

Figure 2 - The Aurora Highlands Land Use Map



Area Conditions

This section describes the existing conditions and the planned level of improvements adjacent to the Aurora Highlands development. This section is provided per the Aurora Highlands MTIS (2019). The purpose of this study is to update the transportation network needs based on the changes that have been made to the land uses plus the new roadway alignments that have altered the background volumes and site generated traffic distribution.

Study Area Land Use

The Aurora Highlands will be constructed on vacant land and is bound on the west by E-470, on the east by the future Aerotropolis Parkway, on the north by 48th Avenue, and on the south by 26th Avenue. This area of Aurora is mostly vacant land but is growing rapidly and includes other developments such as Windler, ALC (formerly known as ATEC), Sun Empire, Green Valley, King Ranch, and Harvest Mile. See Figure 1 for the location of each development.

Site Accessibility

Provide context of roadways that exist today (E-470, 26th Ave, Powhaton Rd & Gun Club Rd

The existing roadway system is largely non-existent in this area of Aurora. However, the future roadway network consists of the following transportation facilities:

E-470 is a north-south four-lane tollway that runs along The Aurora Highlands' west side. A grade-separated interchange is provided at 56th Avenue. An interchange is planned and under construction at 48th Avenue and the bridge over E-470 at 48th Avenue.

26th Avenue is a minor two-lane roadway facility along the south side of The Aurora Highlands spanning E-470 (no interchange) and extending to Picadilly Road to the west and Watkins Road to the east. The Northeast Area Transportation Study (NEATS Refresh 2018) recommends this road as a four-lane minor arterial in the 2040 plan.

Powhaton Road (Aerotropolis Parkway) is a two-lane road that will ultimately define the east side of the residential development within The Aurora Highlands. Currently, this road extends south from 26th Avenue as a two-lane facility, crossing the Union Pacific (UP) Railroad at-grade, spanning I-70, and extending south to Jewell Avenue. This road is anticipated to [illegible]orridor with a raised median and multi-use paths per NEATS recommenda[illegible]erotropolis Parkway.

More information has been added to the report.

48th Avenue will be constructed on the north side of The Aurora Highlands. 48th Avenue will ultimately be a 6-lane major arterial and have a grade-separated interchange with E-470. The south half of this arterial will be built in conjunction with The Aurora Highlands by ARTA (Aerotropolis Regional Transportation Authority). The north half of 48th Avenue will be constructed by the Windler development to the north. The timing of individual developments is unclear, so it is difficult to determine when 48th Avenue will need to be constructed beyond each half-road section. It is assumed that if only the north or south half of 48th Avenue is constructed first, that it would serve temporarily as a 3-lane collector road with one lane in each direction and a center turn lane. In this scenario, the daily threshold for the half roadway section would be 12,000 vehicles-per-day.

The Aurora Highlands Parkway currently exists as an east-west four-lane to six-lane facility between Main Street and 38th Parkway. It has a large median east of Denali Boulevard containing a creek and recreational trail. The Aurora Highlands Parkway will ultimately be a four-lane minor arterial.

38th Parkway currently exists as a three-lane (striped median/center turn lane) roadway between The Aurora Highlands Parkway and Reserve Loop (western connection) and extends as a two-lane roadway to Powhaton Road.

Projected Development Traffic

This section documents how much traffic The Aurora Highlands development is expected to generate and how the external site trips will be distributed on the adjacent roadway network. The purpose of this section is to ultimately investigate the roadway requirements in the year 2040. Land uses and their correspondent number of units, or Gross Floor Area (GFA) in Table 1, and Table 2 are either based on the approved or built plans, or based on the maximum numbers that are anticipated for the area. Note that the maximum potential for each planned area may never be reached and an individual traffic study is required with each application.

Trip Generation

The vehicle trips associated with The Aurora Highlands were calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition.* This methodology consists of choosing an independent variable for the land use for a particular time of day. The independent variable correlates to the variation in trip ends and is related to the land use. The value of the independent variable is either multiplied by a weighted average or used in a regression equation to calculate the trips generated by the land use. The *ITE Trip Generation Manual* provides guidance on when to use the weighted average versus the regression equation. In most cases, the regression equations are recommended when there are adequate study data points.

Table 1 shows the trips that are expected to be generated by the approved areas within the Aurora Highlands. Table 2 shows the trips that are expected to be generated by the planned areas within the Aurora Highlands. Table 3 shows the summary of trip generation for this development.

Provide ITE LU Code #, add column for Ave Rate/linear equation values

Table 1. TAH Trip Generation (Approved/Built Areas)

Planning Area	Land Use	Value	Unit	Inbound Trips	Outbound Trips	Total Trips
Approved/Built						
PA-4	Single-Family	143	Dwelling Unit	701	701	1402
PA-5.1	Single-Family	69	Dwelling Unit	359	359	718
PA-5.2	Single-Family	98	Dwelling Unit	495	495	990
PA-6.1	Single-Family	71	Dwelling Unit	368	368	736
PA-6.2	Single-Family	61	Dwelling Unit	320	320	
PA-12	Single-Family	106	Dwelling Unit	532	532	
PA-13.1	Single-Family	46	Dwelling Unit	247	247	
PA-13.2	Single-Family	117	Dwelling Unit	583	583	
PA-16	School	300	Students	340	340	
PA-19.1	Single-Family	9	Dwelling Unit	359	359	718
PA 19.2, PA-19.3	Single-Family	60	Dwelling Unit			
PA-19.4	Single-Family	174	Dwelling Unit	840	840	1680
PA-21.1	Single-Family	84	Dwelling Unit	430	430	860
PA-21.2	Single-Family	182	Dwelling Unit	875	875	1750
PA-21.3	Single-Family	44	Dwelling Unit	237	237	474
PA-21.4	Single-Family	26	Dwelling Unit	146	146	292
PA-21.5	Single-Family	62	Dwelling Unit	325	325	650
PA-21.6	Single-Family	93	Dwelling Unit	472	472	944
PA-29.1	Single-Family	50	Dwelling Unit	267	267	534
PA-29.2	Single-Family	118	Dwelling Unit	588	588	1176
PA-34	Single-Family	154	Dwelling Unit	751	751	1502
PA-35.1	Single-Family	79	Dwelling Unit	406	406	812
PA-35.2	Single-Family	107	Dwelling Unit	537	537	1074
PA-35.3	Single-Family	73	Dwelling Unit	378	378	756
PA-38	Single-Family	63	Dwelling Unit	330	330	660
PA-52.1	Single-Family	40	Dwelling Unit	217	217	434
PA-52.2	Single-Family	417	Dwelling Unit	1877	1877	3754
PA-55.1	Single-Family	136	Dwelling Unit	669	669	1338
PA-55.2	Single-Family	273	Dwelling Unit	1271	1271	2542
PA-64.1	Single-Family	179	Dwelling Unit	862	862	1724
PA-65.1	Single-Family	44	Dwelling Unit	237	237	474
PA-70	Single-Family	275	Dwelling Unit	1280	1280	2560
Total Single-Family Units		**3453**				

Land use code, and rate/equation columns have been added.

Provide ITE LU Code #, add column for Ave Rate/linear equation values

Are these total trips without reduction?

Table 2. TAH Trip Generation (Planned Areas)

Land use code, and rate/equation columns have been added.

Provide the total trips calculated, then provide trip reduction values

Yes. More information has been added.

Done!

is a High school accounted for in PA-37?

Define type of schools

Done!

		Land Use	Value	Unit	Inbound Trips (After Pass-By Reduction)	Outbound Trips (After Pass-By Reduction)	Total Trips (After Reduction)	Inbound Trips	Outbound Trips	Total Trips
Planned										
		Retail	409.99	KSF	7,041	7,041	14,083	8284	8284	16568
		Multi-Family	833	Dwelling Unit	2,707	2,707	5,414	2707	2707	5414
		Retail	166.24	KSF	4,[illegible]				5102	10204
		Multi-Family	502	Dwelling Unit	1,[illegible]				1647	3294
PA-10	14.8	Retail	127.48	KSF	3,[illegible]				4304	8608
		Multi-Family	451	Dwelling Unit	1,[illegible]				1483	2966
PA-11		Multi-Family	864	Dwelling Unit	2,[illegible]				2807	5614
			Included in PA-2							
			742	Dwelling Unit	2,416	2,416	4,832	2416	2416	4832
			105.08	KSF	3,016	3,016	6,032	3548	3548	7096
			473		1,554	1,554	3,108	1554	1554	3108
PA-25	10.9		93.88	KSF	2,694	2,694	5,387	3169	3169	6338
		Multi-Family	474	Dwelling Unit	1,557	1,557	3,114	1557	1557	3114
PA-26	11.3	Retail	97.33	KSF	2,793	2,793	5,586	3286	3286	6572
		Multi-Family				132	264	132	132	264
PA-30		Retail				6,524	13,048	7675	7675	15350
PA-36	15.7	School	300	Students	340	340	680	340	340	680
PA37.1		Multi-Family	274	Dwelling Unit	916	916	1,832	916	916	1832
PA-37.2		Single-Family	462	Dwelling Unit	2,062	2,062	4,124	2062	2062	4124
PA-37.3		Single-Family	518	Dwelling Unit	2,291	2,291	4,582	2291	2291	4582
PA-40		Single-Family	352	Dwelling Unit	1,606	1,606	3,212	1606	1606	3212
PA-46		Single-Family	467	Dwelling Unit	2,083	2,083	4,166	2083	2083	4166
PA-48		Single-Family	71	Dwelling Unit	368	368	736	368	368	736
PA-54	37.9	Hospital	600	KSF	3,322	3,322	6,644	3322	3322	6644
PA-57	34.5	Corporate Campus	60	[illegible]	[illegible]	[illegible]	3,296	1648	1648	3296
		School	3[illegible]				680	340	340	680
		Single-Family	368	[illegible]	[illegible]	[illegible]	3,346	1673	1673	3346
PA-64.4		Multi-Family	170	Dwelling Unit	583	583	1,166	583	583	1166
PA-65.1, PA-65.3		Single-Family	226	Dwelling Unit	1,068	1,068	2,[illegible]		1068	2136
PA-71		Single-Family	597	Dwelling Unit	2,611	2,611	5,[illegible]		2611	5222
PA-74		School	300	Students	340	340	[illegible]		340	680
PA-78.1		Multi-Family	203	Dwelling Unit	347	347	694	347	347	694
PA-78.2, PA-78.3		Single-Family	459	Dwelling Unit	2,050	2,050	4,100	2050	2050	4100
PA-80.1		Single-Family	94	Dwelling Unit	477	477	954	477	477	954
PA-80.2		Single-Family	267	Dwelling Unit	1,245	1,245	2,490	1245	1245	2490
PA-80.3		Multi-Family	660	Dwelling Unit	1,748	1,748	3,496	1748	1748	3496
PA-81		Retail	363.29	KSF	6,524	6,524	13,048	7675	7675	15350
Total Single-Family Units			3,881	Dwelling Unit						
Total Multi-Family Units			5,702	Dwelling Unit						
Total Non-Residentials (Except Schools)			2,786.58	KSF						

1. We understand the school site location is still being discussed and location hasn't been agreed to
2. Matrix analyzed the land use for the 65-acres as a 1,000 student school compared to 330 units of SFD and the 330 units of SFD has approximately 1,400 more trips per day
3. We are going to show the land use as SFD's acknowledging that if it is converted to a school, the traffic report will be conservative and have slightly more vehicles shown in the area

Table 3. TAH Trip Generation Summary

Total Single Family			**7,334 Units**		
Total Multi Family			**5,702 Units**		
Grand Total Residentials			**13,036 Units**		
Total Non-Residentials (Except Schools)			**2,786.58 KSF**		
Inbound Trips (After Pass-By Reduction)	**Outbound Trips (After Pass-By Reduction)**	**Total Trips (After Pass-By Reduction)**	**Inbound Trips**	**Outbound Trips**	**Total Trips**
95,307	95,307	190,613	101,763	101,763	203,526
Net External Trips		165,000			

22,000 less trips than 2019 study

According to the FHU study (Aug 2020) high school had a different internal capture

Trip Reductions:

The ITE Trip Generation Handbook 3rd edition allows for multiple trip reductions for the developments similar to TAH. Summary of the trip reductions that were applied to TAH is as follows:

Pass by trips and internal capture are close to the MTIS 2019. (12,913 pass by trips, and 25,613 internal capture in MTIS 2024). Total trips before reduction is less than 2019 MTIS that is perhaps due to change in land uses. One other possibility could be that the 167K trips shown in the MTIS 2019 is the total external trips although on the table 187K external trips were shown.

- ssarily new traffic added to the transportation ance, can attract vehicular traffic already consistent with the MTIS (2019) a 15-percent ts to account for the pass-by trips. No pass-by e campus or residential units. was assumed that 100 percent of the trips will for more information on the public

- r schools will never leave TAH. Internal trips for dy. These trips were not deducted from the that they will never leave TAH. 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)*. An excerpt of this study can be found in Appendix A– Supporting Documents. 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. It is anticipated that TAH will generate 165,000 external daily trips. This amount is the difference between the total trips after pass-by reductions and internal trips within TAH.

This text needs to be located before Table 1

Revised.

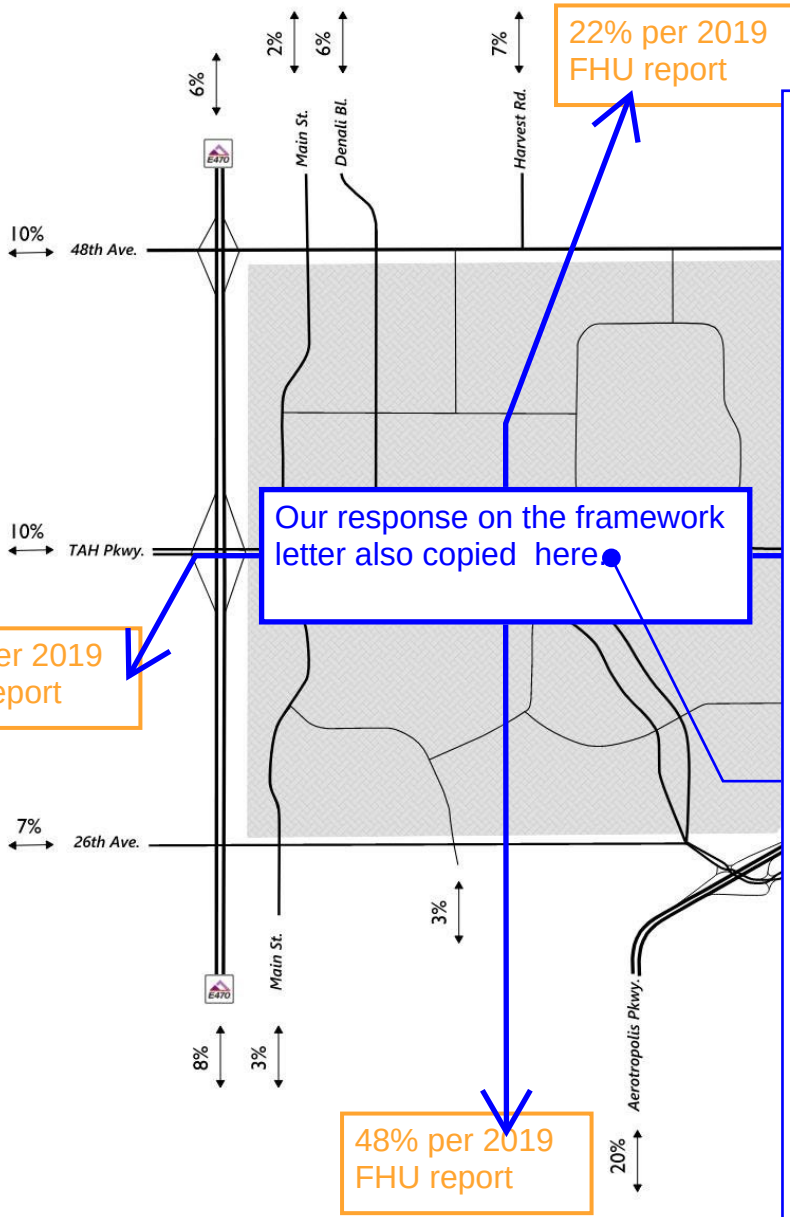
Trip Distribution

More data has been provided. The shift in trip pattern was approved in three traffic studies that Matrix has provided to COA (Area A, Area B and Area C north TIS)

n for residential units. This distribution was determined roadway network in 2019 -*The Aurora Highlands*
The ARTA Program – Aurora Highlands Alternatives
otropolis Parkway & Jackson Gap Way Alignment

Provide data on how distribution assumed

Figure 3. External Trip Distribution (Residentials)



22% per 2019 FHU report

Our response on the framework letter also copied here

20% per 2019 FHU report

48% per 2019 FHU report

Note: The same trip distribution was assumed for the Hospital and Corporate Campus.

Provide explanation for this Note

More information has been provided.

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%

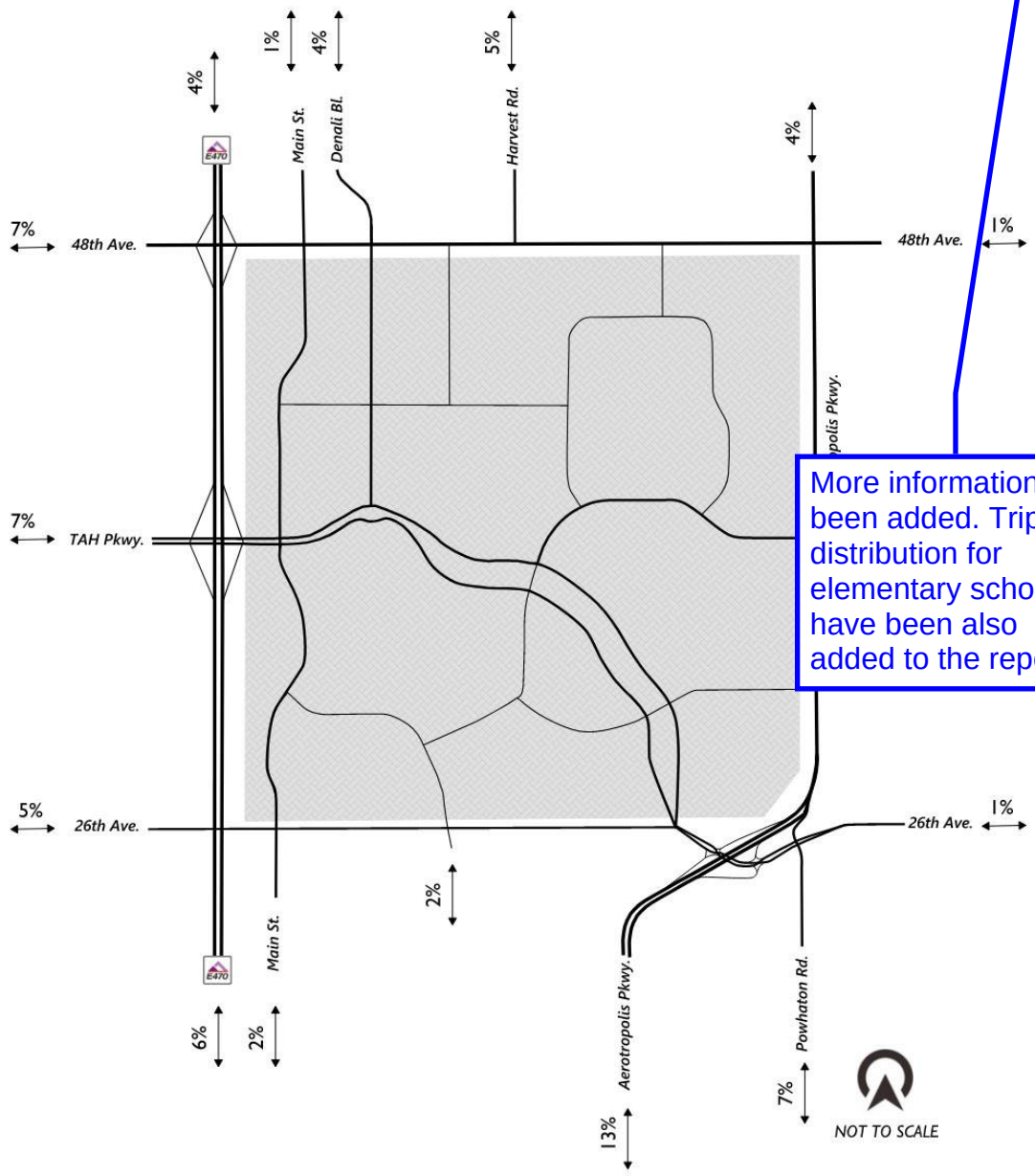
If we assume that those 20K missing trips are all to/from south, then this will be FHU's trip distribution (percentages marked in red in figure 3 of this letter is relevant to this distribution as we assumed 187K daily trips for MTIS 2019):

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

Provide data on how distribution assumed

Figure 4 shows the external trip distribution for retails and schools.

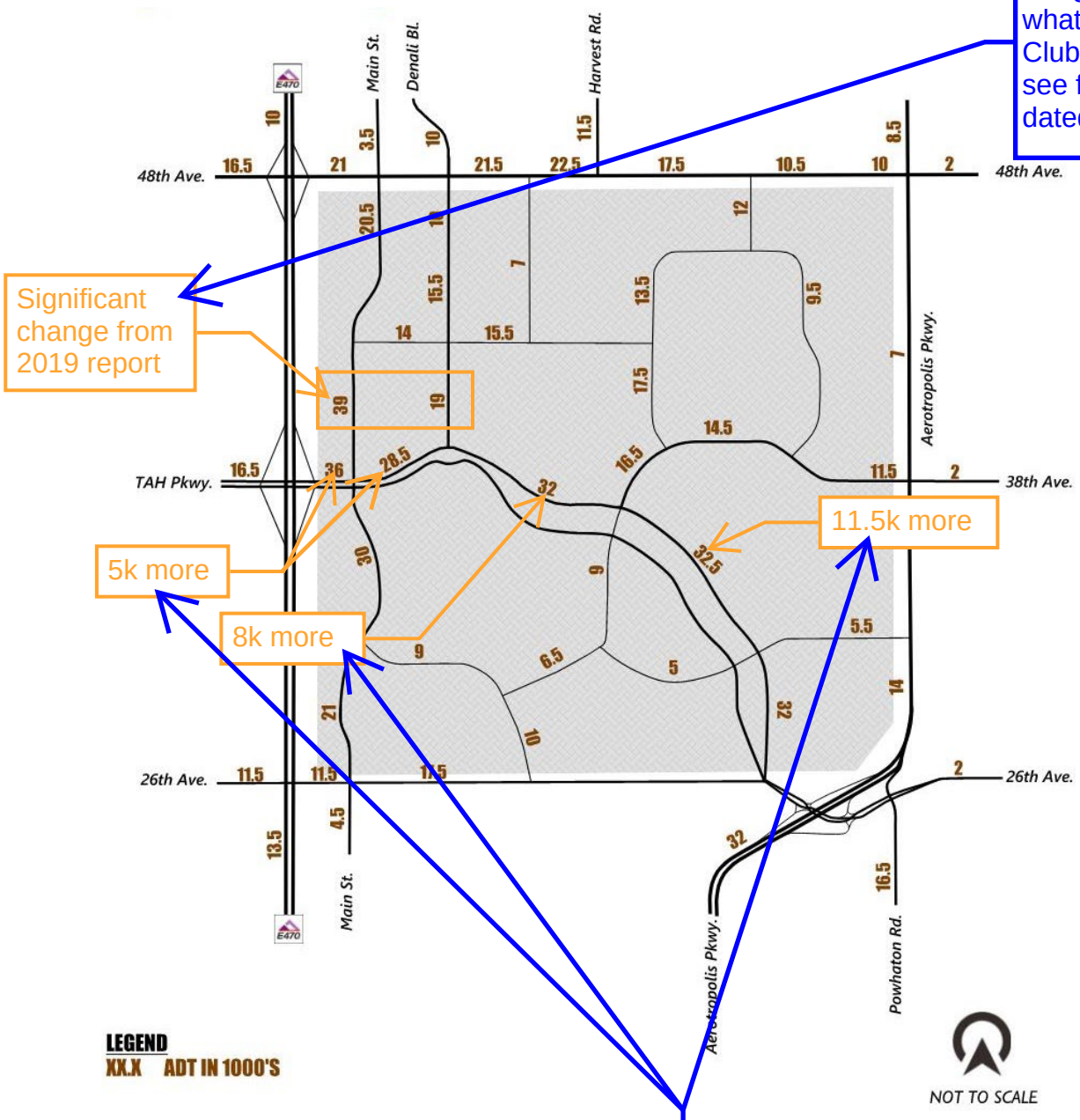
Figure 4. External Trip Distribution (Non-Residentials)



More information has been added. Trip distribution for elementary schools have been also added to the report.

Assigning the site generated trips per distributions shown above resulted in daily trips shown below.

Figure 5. TAH Daily Site Traffic



2040 Background Traffic

Since the majority of the roadways within, or adjacent to TAH are currently non-existent, the NEATS demand model and numerous traffic studies were studied to obtain the background volumes. The list of these studies are as follows.

- Northeastern Area Transportation Study Refresh (October 2018)
- The Aurora Highlands Transportation Impact Study (August 2019)
- ARTA Program, Aurora Highlands Alternative Analysis Report (June 2023)
- Aerotropolis Parkway Traffic Forecast Memorandum (June 2020)
- The Aurora Highlands North Area A (December 2022), North Area B (July 2023) and North Area C (April 2024) Traffic Impact Study
- Aurora Logistic Center (ALC) Traffic Impact Analysis (April 2024)
- Windler Homestead Traffic Impact Study (July 2023)
- Green Valley MP Amendment 2 Traffic Impact Study (September 2023)
- Harvest Mile Industrial Traffic Impact Study (April 2023)
- King Ranch Traffic Impact Study (November 2022)
- Sun Empire Traffic Impact Analysis (March 2022)

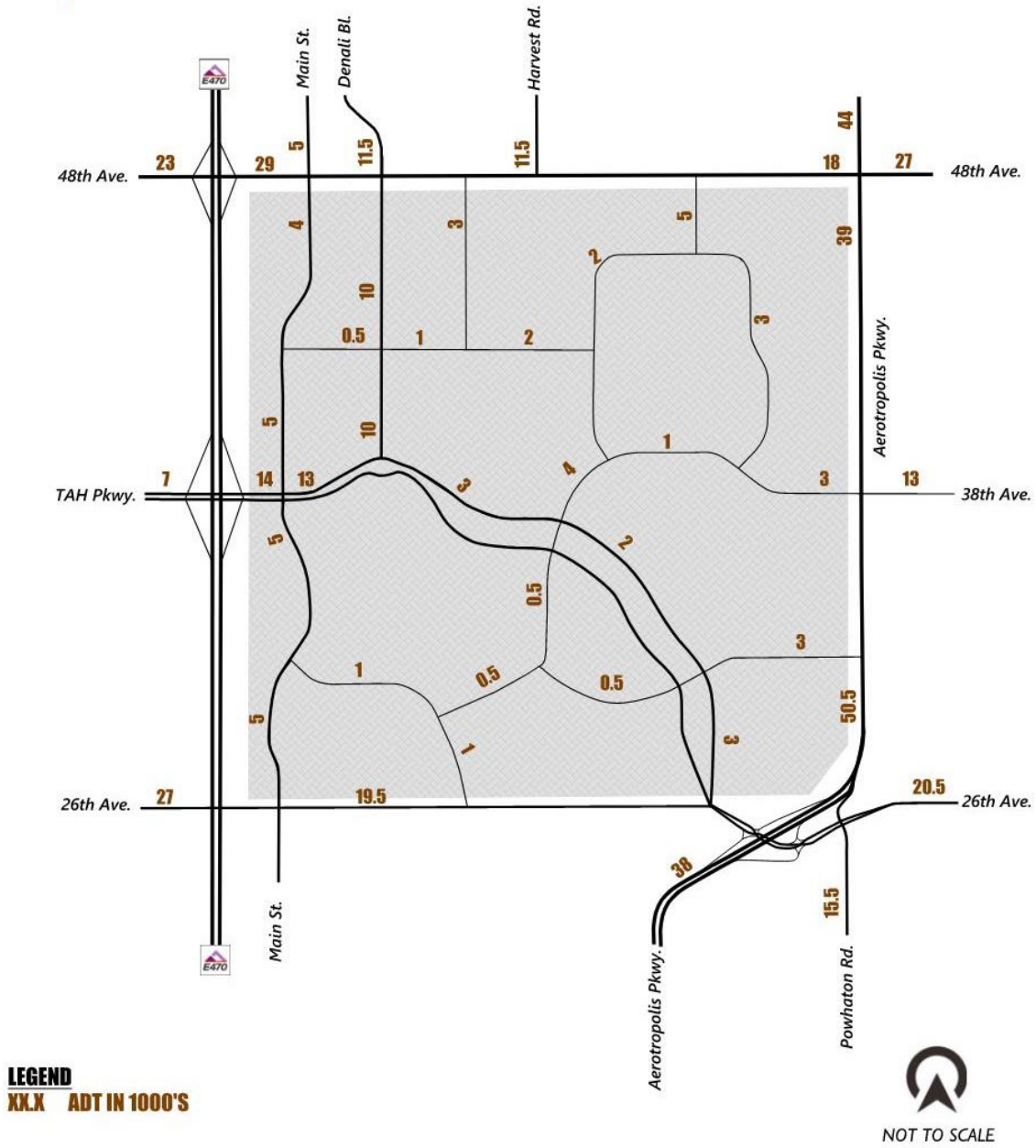
A traffic letter dated May 13, 2024, was sent to the City of Aurora and explained the approach for obtaining the background volumes based on the above references. This letter is included in Appendix B - Background Volumes Traffic Letter. Summary of this letter is as follows.

- Traffic Studies from the adjacent developments were obtained and aggregated.
- The traffic generated by the adjacent developments were compared against
    - a) TAH MTIS background volumes (2019)
    - b) Aerotropolis Parkway Traffic Forecast Memo background volumes (2022) plus ALC traffic (2024)
    - c) Aerotropolis Parkway Traffic Forecast Memo total volumes minus ALC traffic (2024)
- It was determined that the Traffic Forecast memo background (2022) plus ALC (2024) is the most appropriate to use as background volumes for the external roadways.
- Since the Traffic Forecast Memorandum (2022) used NEATS travel demand model, the background volumes in this study are consistent with the NEATS.
- For the roadways within TAH, the MTIS (2019) background volumes was used.

- The only change to the letter was to use adjacent developments aggregated traffic on Harvest Road and Denali Boulevard due to the new alignment between Aerotropolis Parkway and Jackson Gap Parkway. Previously, Aerotropolis Parkway was planned to connect to Harvest Road via 48th Avenue. The new alignment added a relief on Harvest Road. Also, since there is no future plan on constructing Denali Boulevard between 56th and 69th Avenue, only the site generated traffic from the adjacent developments were considered on this street.

Figure 6 shows the 2040 background volumes.

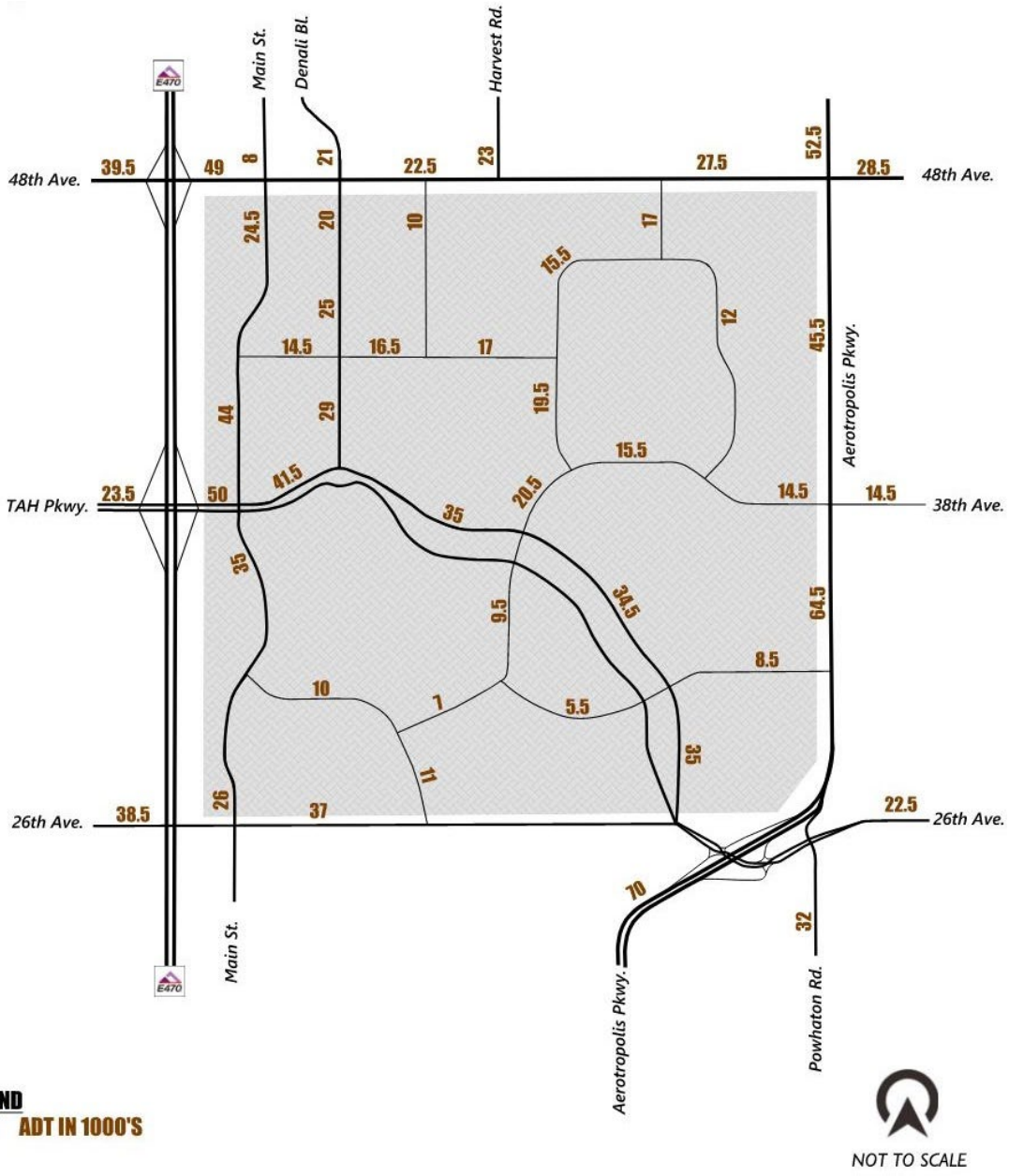
Figure 6. Horizon (2040) Background Traffic Volumes



2040 Total Traffic

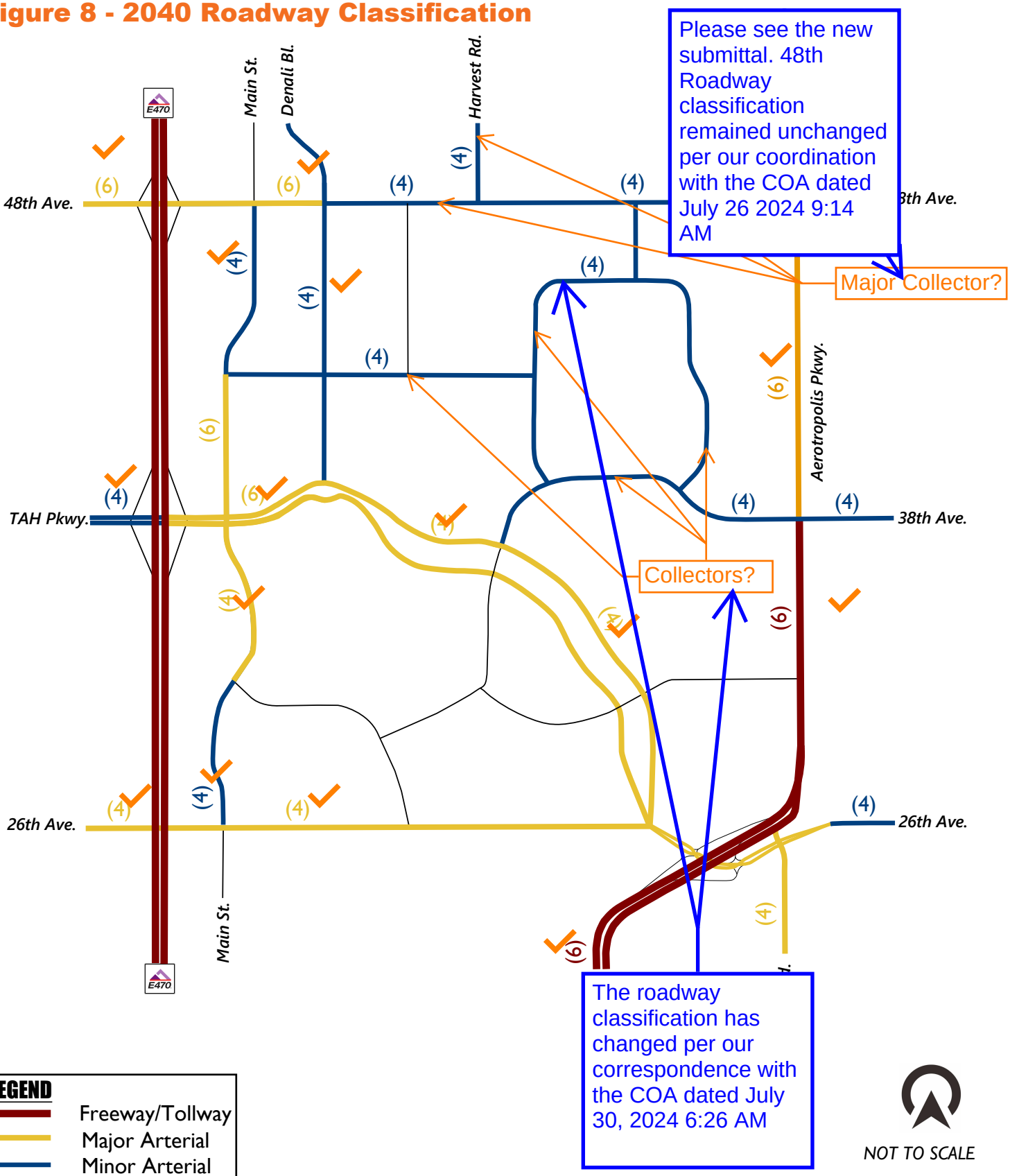
The 2040 traffic with addition of the Aurora Highlands is shown in Figure 7, below.

Figure 7. Horizon (2040) Total Traffic Volumes



Roadway classification is shown in Figure 8. These roadways were classified per NEATS criteria at the LOS- D/E threshold. Note that these roadway recommendations are under the assumption that the development will be built to its full potential. This assumption may never be reached in reality and the roadways might need to be downgraded to a lower classification. A separate study is required as each filing/area is planned to be built.

Figure 8 - 2040 Roadway Classification

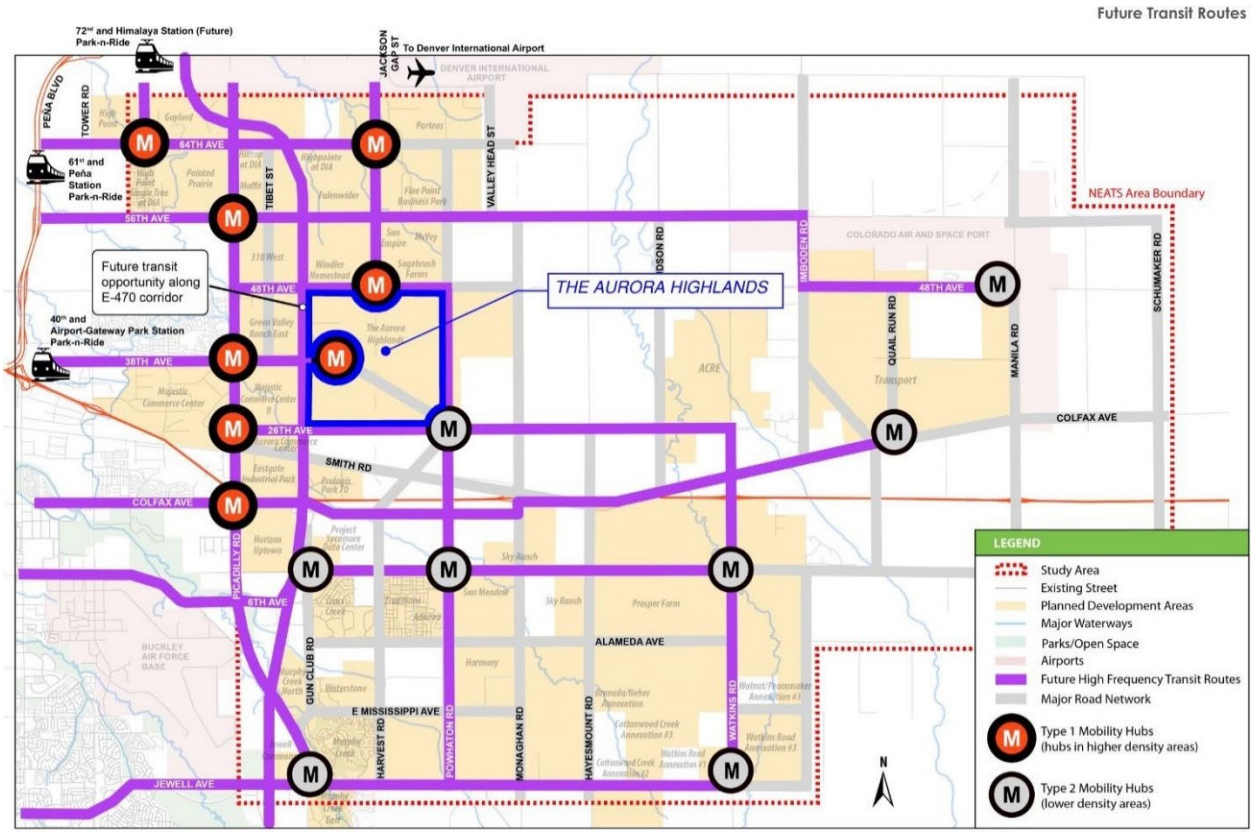


Transit

A transit center is anticipated at the northwest corner of TAH Parkway/Main Street per the Aurora Highlands Design Guidelines (2022) for personal and public vehicles. Another mobility hub is also anticipated at 48th Avenue/Harvest Road according to the NEATS Refresh. Figure 9 shows the location of these two hubs with respect to the Aurora Highlands. Moreover, the Aurora Highlands RTD station is located at 40th Avenue/Gateway Park, approximately 10 minutes away from the westernmost part of the development.

In addition, the Comprehensive Plan for the City of Aurora (2018) shows another future transit stations at E-470/48th Avenue. An excerpt of this study can be found in Appendix A – Supporting Documents.

Figure 9. Future Transit Routes

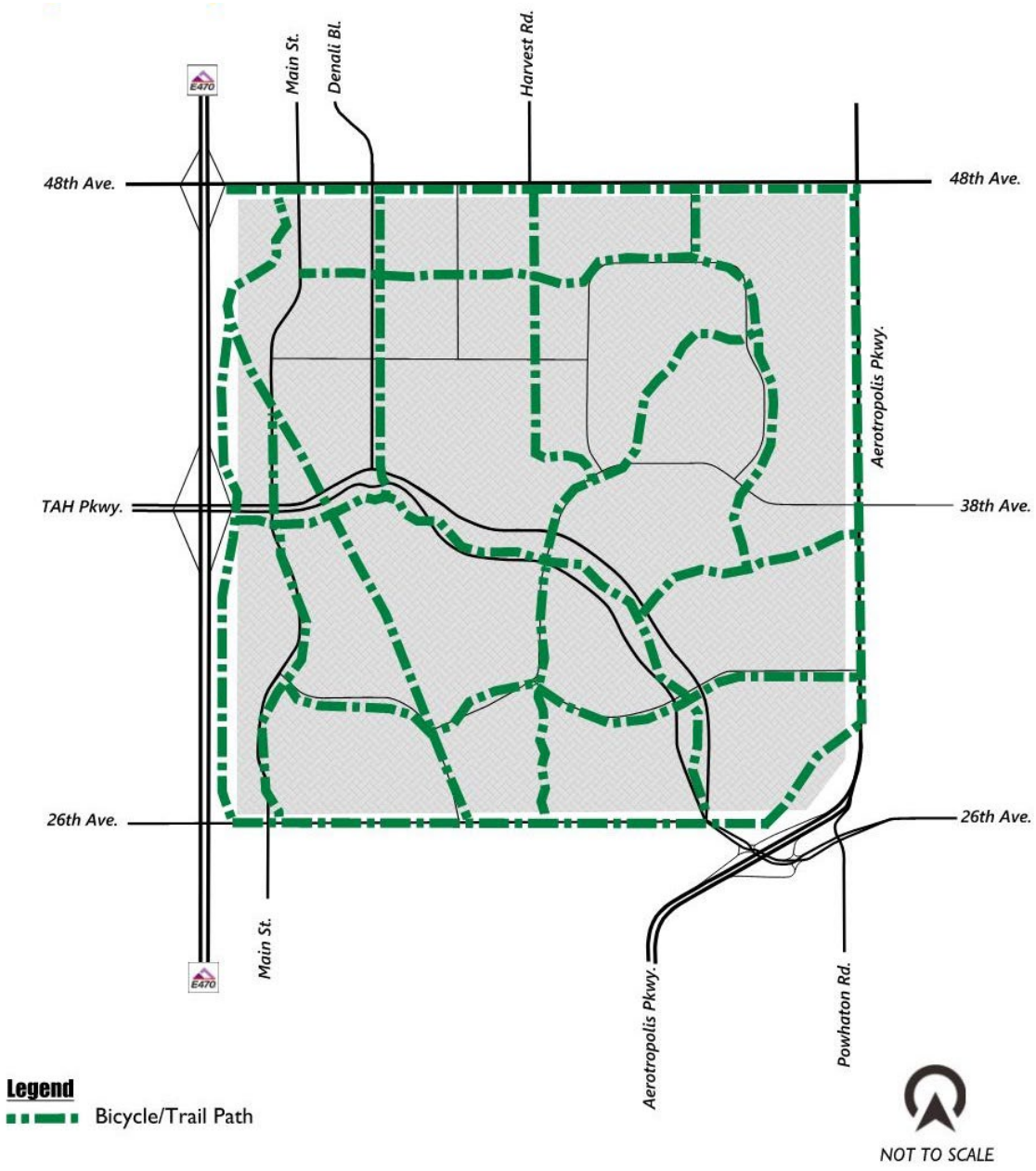


Source: Northeast Area Transportation Study (NEATS) Refresh 2018

Bicycle and Trail Paths

Figure 10 shows the approximate location of bicycle and trail paths within the Aurora Highlands. The Framework Development Plan (FDP) 2023 shows 10-ft and 14-ft regional trails planned for the Aurora Highlands. An excerpt of this document with more details can be found in Appendix A – Supporting Document. A separate study is needed to precisely locate and design the paths.

Figure 10. Bicycle and Trail Map

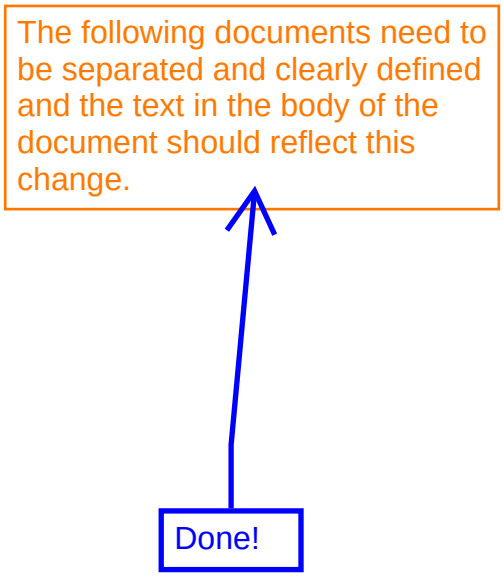


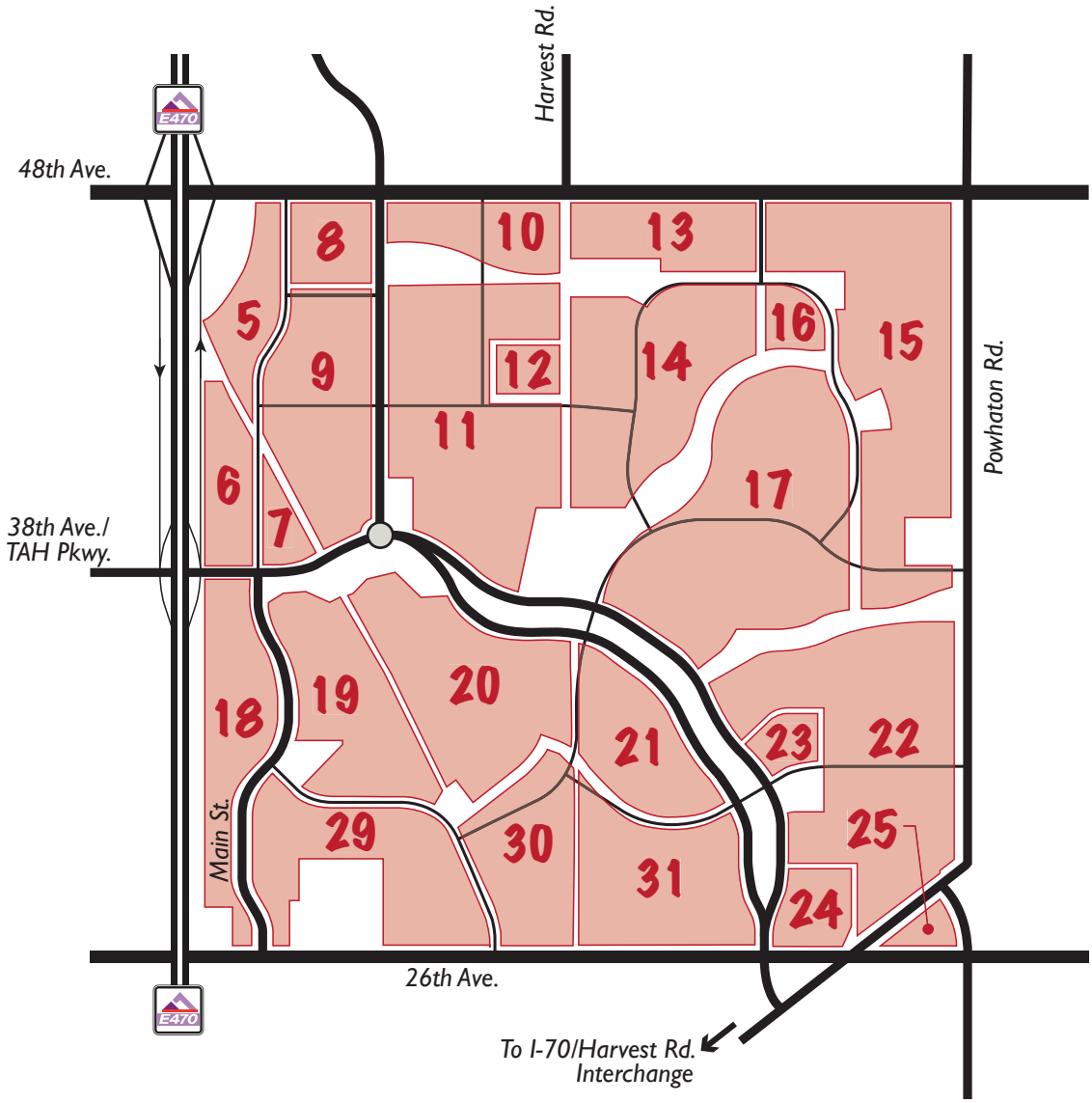
Summary and Conclusion

In this report, the impact of the Aurora Highlands on the transportation roadways within, and adjacent to the development was studied. Since the first MTIS (2019) many planning areas were either built or received approval from the City of Aurora. The density of residential units for the approved/built areas were below the full potential of the parcels per the FDP. On the other hand, mixed used developments on the west side of the project now contain denser multifamily homes. Finally, a new alignment to the east and north of the project, Aerotropolis Parkway and Jackson Gap Way, has been approved that would change the trip distribution and trip assignment for TAH. Background volumes were also adjusted to account for the most up-to-date changes to the developments adjacent to TAH. The proposed roadway network was classified per the NEATS thresholds for LOS D/E. These classifications were done under the assumption that the Aurora Highlands development will be built to its full potential. A separate study is required with each filing application. Major changes with respect to the MTIS (2019) are as follow:

- Due to the alignment between Aerotropolis Parkway and Jackson Gap Way, 48th Avenue east of Denali Boulevard does not require to be a 6-lane major arterial. This roadway segment should be classified as a 4-lane minor arterial.
- Due to the alignment between Aerotropolis Parkway and Jackson Gap Way, Harvest Road does not require to be a 6-lane major arterial. This roadway segment should be classified as a 4-lane minor arterial
- Due to change in land uses to the west of Main Street, Main Street should be classified as a 4-lane minor arterial from 48th Avenue to 42nd Avenue.
- Due to change in land uses to the west of Main Street, Main street should be classified as a 6-lane major arterial from 42nd Avenue to TAH Parkway.
- Due to change in land uses to the west of Main Street, Main Street should be classified as a 4-lane major arterial from TAH Parkway to Warm Springs Avenue.
- Main Street should be classified as a 4-lane minor arterial south of Warm Springs Avenue, similar to the MTIS 2019.
- TAH Parkway east of Denali Boulevard should be classified as a 4-lane major arterial.
- TAH Parkway west of Denali Boulevard should be classified as a 6-lane major arterial, similar to the MTIS 2019.
- Reserve Boulevard should be classified as a 4-lane minor arterial. Reserve Boulevard (E) is right at the threshold for a minor street (12,000 ADT). It might be downgraded to a collector road if a future traffic study supports this assumption.
- 42nd Avenue should be classified as a 4-lane arterial.

Appendix A - Supporting Documents





LEGEND

X = Aurora Highlands TAZ's

NORTH

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Aurora Highlands TAZ Map | FIGURE 3

The Aurora Highlands UPDATE 19-404 8/8/19

Table 1. Aurora Highlands Build-Out Trip Generation Estimates

TAZ	Use	ITE Code	Use Size (1000 sf)	Housing Units	Daily Trips
5	Retail	820	777.5	-	33,201
	Apartments	220	-	378	2,513
	SUBTOTAL		**777.5**	**378**	**35,714**
6	Apartments	220	-	538	3,578
	Library	590	53.1	-	2,989
	Government	733	47.5	-	1,326
	SUBTOTAL		**100.6**	**538**	**7,893**
7	Single Family	210	-	61	581
	SUBTOTAL		**-**	**61**	**581**
8	Retail	820	315.3	-	13,462
	Apartments	220	-	408	2,713
	SUBTOTAL		**315.3**	**408**	**16,175**
9	Single Family	210	-	433	4,122
	Retail	820	241.8	-	10,323
	Apartments	220	-	802	5,333
	SUBTOTAL		**241.8**	**1,235**	**19,778**
10	Single Family	210	-	310	2,951
	Apartments	220	-	264	1,755
	SUBTOTAL		**-**	**574**	**4,706**
11	Single Family	210	-	917	8,730
	SUBTOTAL		**-**	**917**	**8,730**
12	Elementary School	520	79.3	-	1,223
	SUBTOTAL		**79.3**	**-**	**1,223**
13	Single Family	210	-	169	1,609
	Apartments	220	-	185	1,230
	Retail	820	302.7	-	12,927
	SUBTOTAL		**302.7**	**354**	**15,766**
14	Single Family	210	-	627	5,969
	SUBTOTAL		**-**	**627**	**5,969**
15	Single Family	210	-	1,065	10,138
	Apartments	220	-	420	2,793
	SUBTOTAL		**-**	**1,485**	**12,931**

Table 1. Aurora Highlands Build-Out Trip Generation Estimates

TAZ	Use	ITE Code	Use Size (1000 sf)	Housing Units	Daily Trips
16	Elementary School	520	79.3	-	1,223
	SUBTOTAL		**79.3**	**-**	**1,223**
17	Single Family	210	-	1,091	10,387
	SUBTOTAL		**-**	**1,091**	**10,387**
18	Medical Office	720	577.8	-	20,877
	Retail	820	24.0	-	1,023
	Corporate HQ	714	450.8	-	3,598
	SUBTOTAL		**1,052.6**	**-**	**25,498**
19	Single Family	210	-	480	4,570
	SUBTOTAL		**-**	**480**	**4,570**
20	Single Family	210	-	647	6,159
	Elementary School	520	82.3	-	1,270
	SUBTOTAL		**82.3**	**647**	**7,429**
21	Single Family	210	-	369	3,513
	SUBTOTAL		**-**	**369**	**3,513**
22	Single Family	210	-	1,020	9,711
	Apartments	220	-	448	2,979
	Office	710	10.0	-	111
	SUBTOTAL		**10.0**	**1,468**	**12,801**
23	Elementary School	520	78.4	-	1,210
	SUBTOTAL		**78.4**	**-**	**1,210**
24	Retail	820	302.7	-	12,927
	SUBTOTAL		**302.7**	**-**	**12,927**
25	Retail	820	51.2	-	2,186
	SUBTOTAL		**51.2**	**-**	**2,186**
29	Single Family	210	-	444	4,227
	Apartments	220	-	245	1,629
	SUBTOTAL		**-**	**689**	**5,856**
30	Single Family	210	-	346	3,294
	SUBTOTAL		**-**	**346**	**3,294**

Table 1. Aurora Highlands Build-Out Trip Generation Estimates

TAZ	Use	ITE Code	Use Size (1000 sf)	Housing Units	Daily Trips
31	Single Family	210	-	512	4,874
	Apartments	220	-	308	2,048
	SUBTOTAL		**-**	**820**	**6,922**
Gross Residential Totals				12,487	107,406
Gross Non-Residential Totals			3,473.8		119,876
Gross Totals					227,282
Commercial Pass-By Reductions			-15%		-12,906
Internal Capture					-27,300
Net External Trip Generation					**187,076**

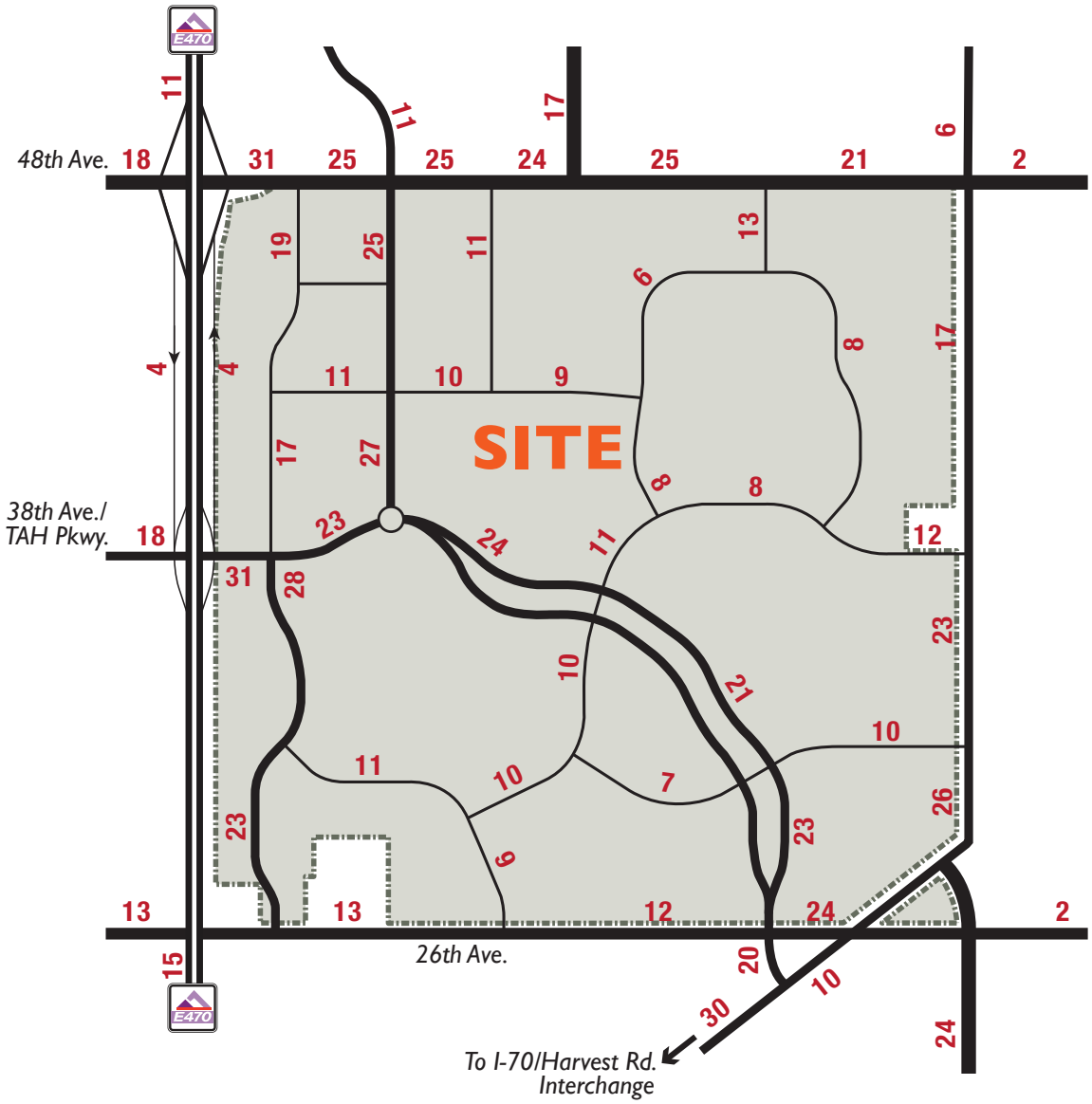
*TAZs 5, 8, and 9 contain Mixed Use parcels, which assumed 75% retail and 25% multi-family
**TAZs 1-4 were removed from the site plan, TAZ 28 was deemed undevelopable.

In addition to pass-by adjustments, the nature of the uses and the mix thereof will produce internal trip-making. That is, some of the trips generated by Aurora Highlands uses will have an origin or destination to other Aurora Highlands uses. ITE also provides guidelines on estimating these. A planning-area by planning-area assessment was made with respect to internal trips taking place between planning area zones. Given the size and nature of the uses, approximately 27,300 trips per day are estimated to be of this nature, representing roughly 12 percent of the total generation. These trips were not discarded from the analysis (other than trips internal to a particular planning area TAZ), but rather they were assigned onto the roadways between Aurora Highlands planning areas.

Given these adjustments, the Aurora Highlands master plan is estimated to generate a net external generation of 187,000 trips per day if each planning area were developed to its full potential across the 2,550 acres. By comparison, the 2040 NEATS travel demand model shows approximately 53,000 vehicle-trips per day being generated by the Aurora Highlands zones; this study reflects a 3.5-times increase in Aurora Highlands trip-making. The build-out NEATS scenario reflects approximately 117,000 vehicle-trips per day by Aurora Highlands zones.

The trip distribution percentages for the long-range (2040) planning horizon were developed from the NEATS modeling that is currently nearing completion. Numerous routes will be available for Aurora Highlands trips at build-out including E-470, 26th Avenue, 38th Avenue (which will interchange with E-470 in the future), 48th Avenue (which will interchange and potentially connect to 38th Avenue via one-way frontage road connections), and Powhaton Road that is proposed to be aligned (south of 26th Avenue) such that it connects with the future I-70/Harvest interchange. The overall cardinal distribution percentages, extracted from the NEATS model, applied to the external trips estimated in this study are:

- 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.



LEGEND

XXXX = Volumes in 1000's

= Aurora Highlands

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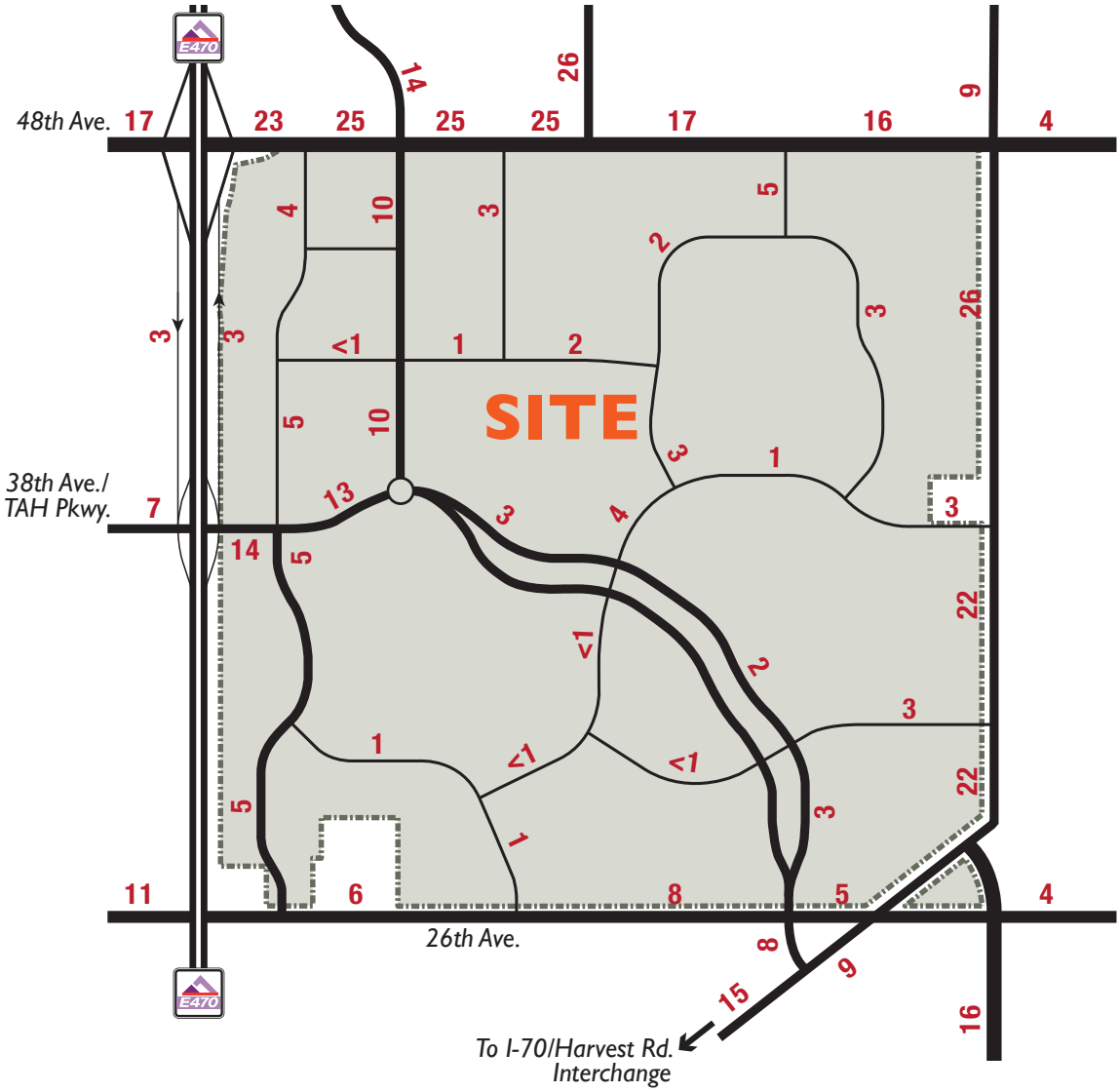
Aurora Highlands Only Traffic | FIGURE 4

The Aurora Highlands UPDATE 19-404 8/13/19



LEGEND

XXXX = Volumes in 1000's

= Aurora Highlands

NORTH

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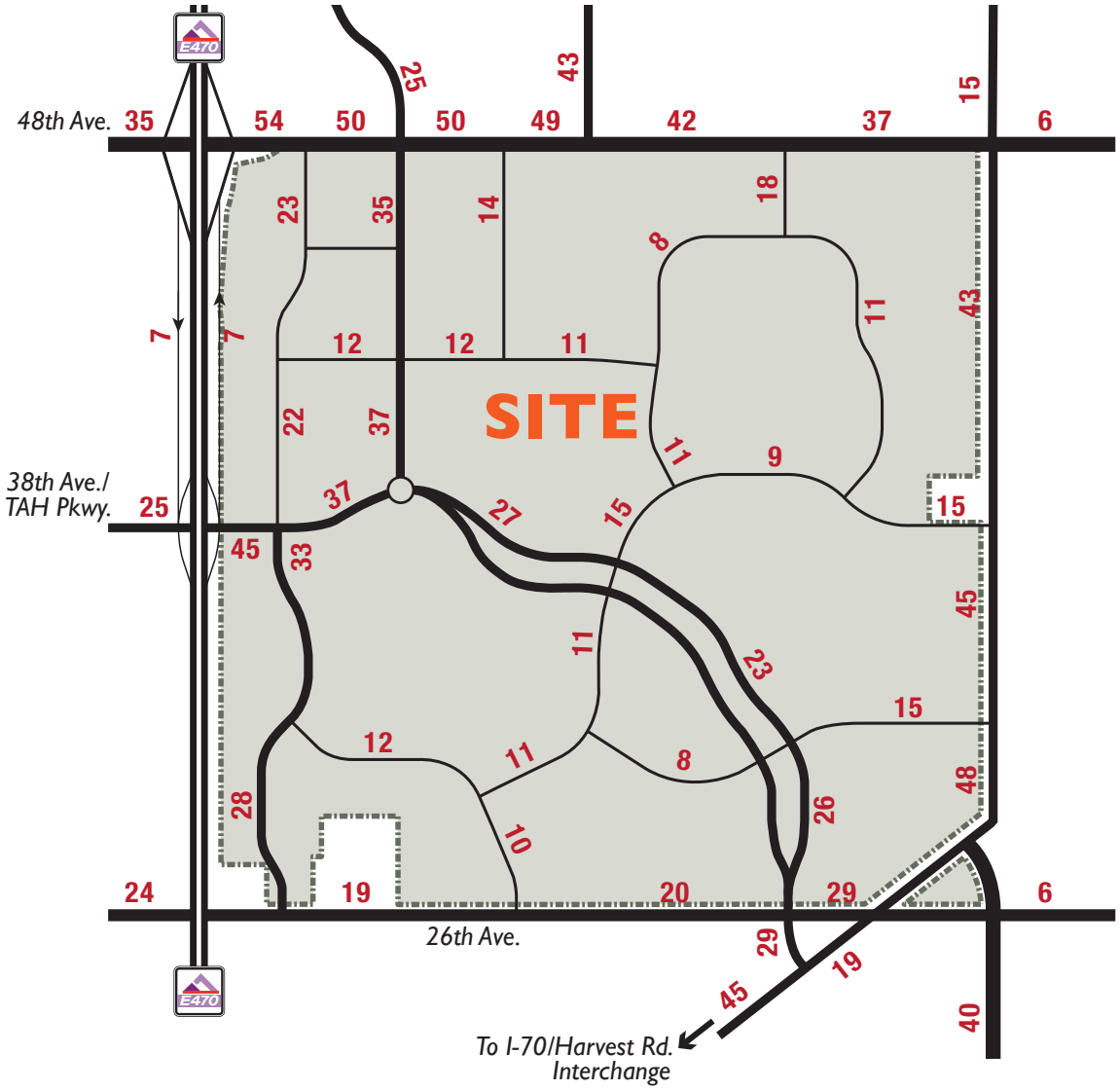
2040 Background Traffic

FIGURE 5

The Aurora Highlands @ I-70/E-470 - REPORT 15-396 8/13/19



LEGEND

XXXX = Volumes in 1000's

= Aurora Highlands

NORTH

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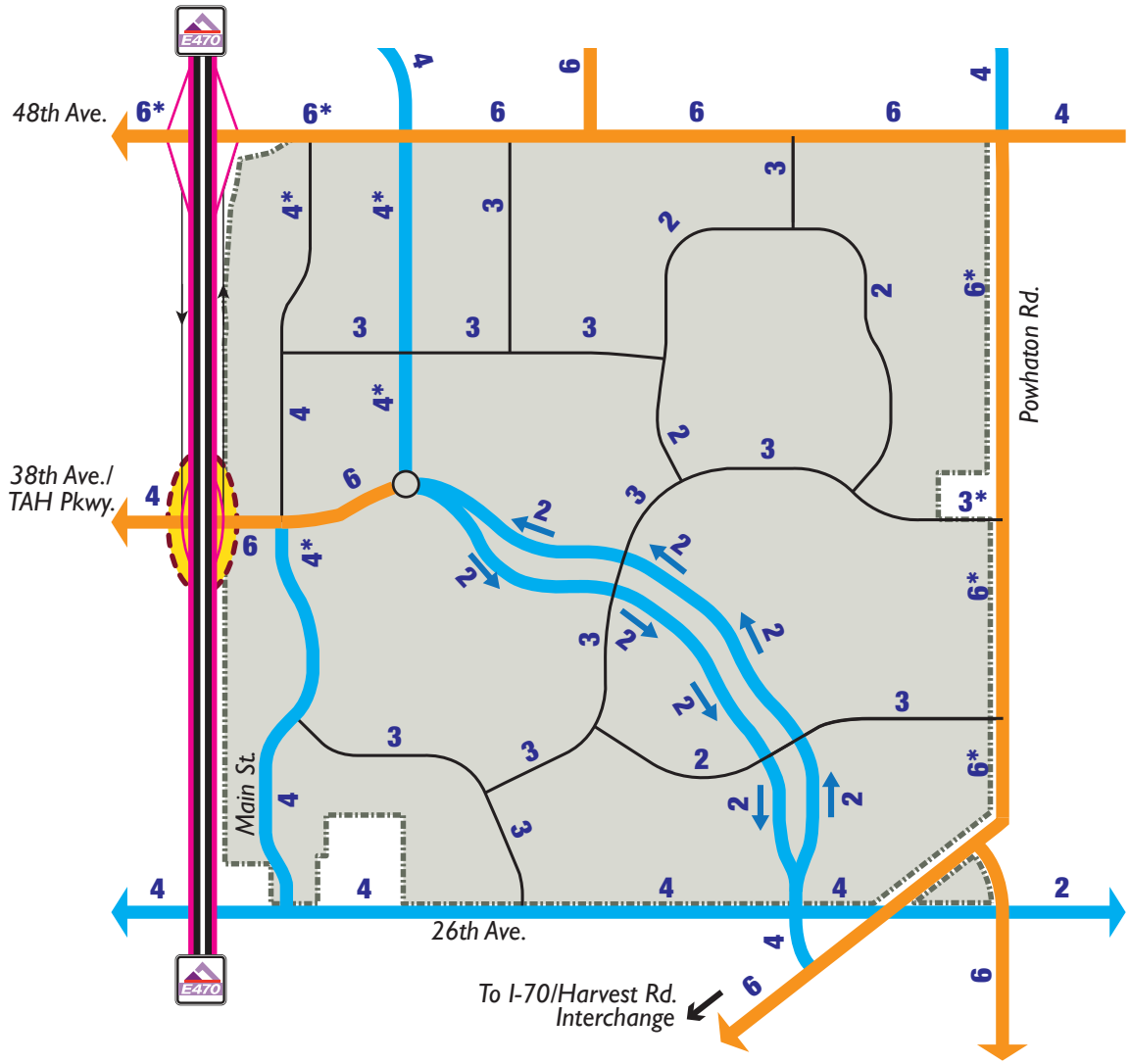
2040 Total Traffic

FIGURE 6



LEGEND

- = Tollway
- = Major Arterial
- = Minor Arterial
- = Collector Roads *(Subject to traffic calming measures at time of contextual site plan)*
- = Potential Interchange
- = Divided Minor Arterial
- X = Laneage
- X* = Accel/Decel Lanes also Needed
- = Aurora Highlands

NOTE:
Access Control and restrictions will along the arterial roadways in the proximity of E-470 interchanges be required.

NORTH

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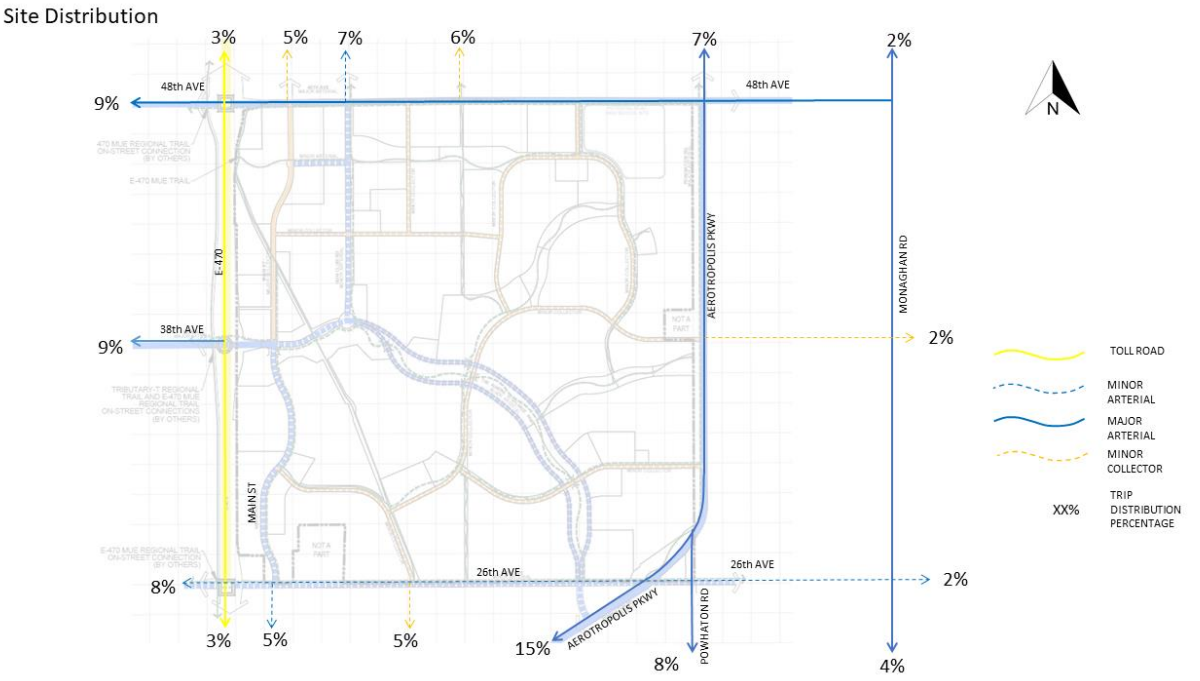
2040 Roadway Needs

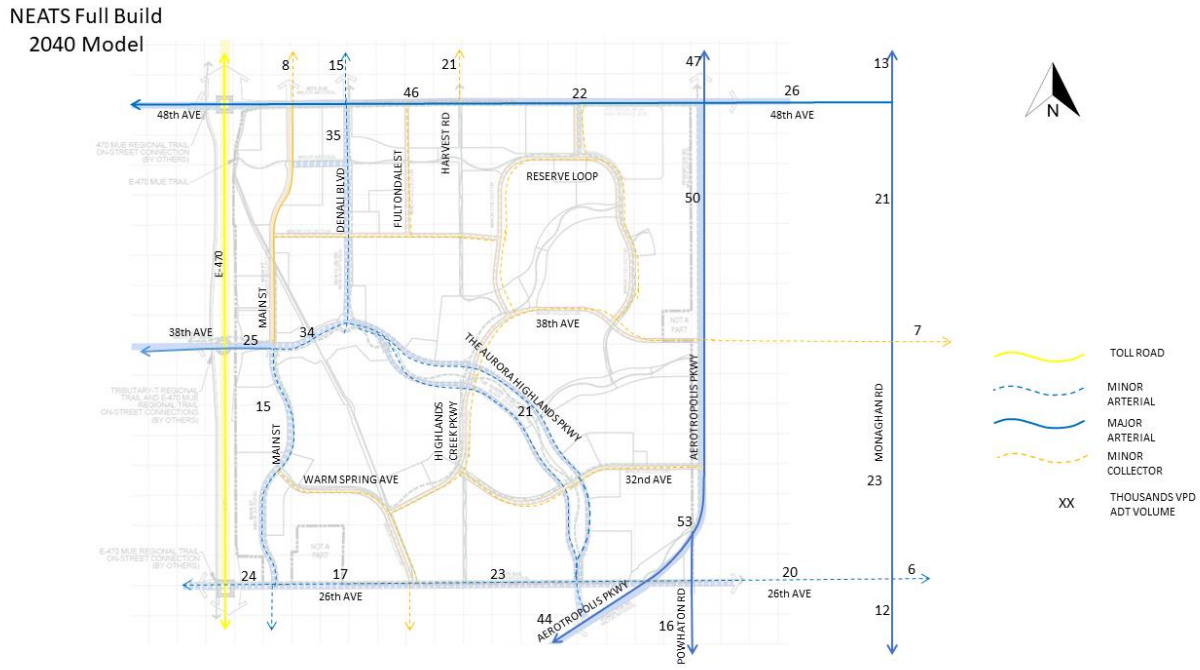
FIGURE 7

The Aurora Highlands UPDATE 19-404 8/8/19



Source: AECOM

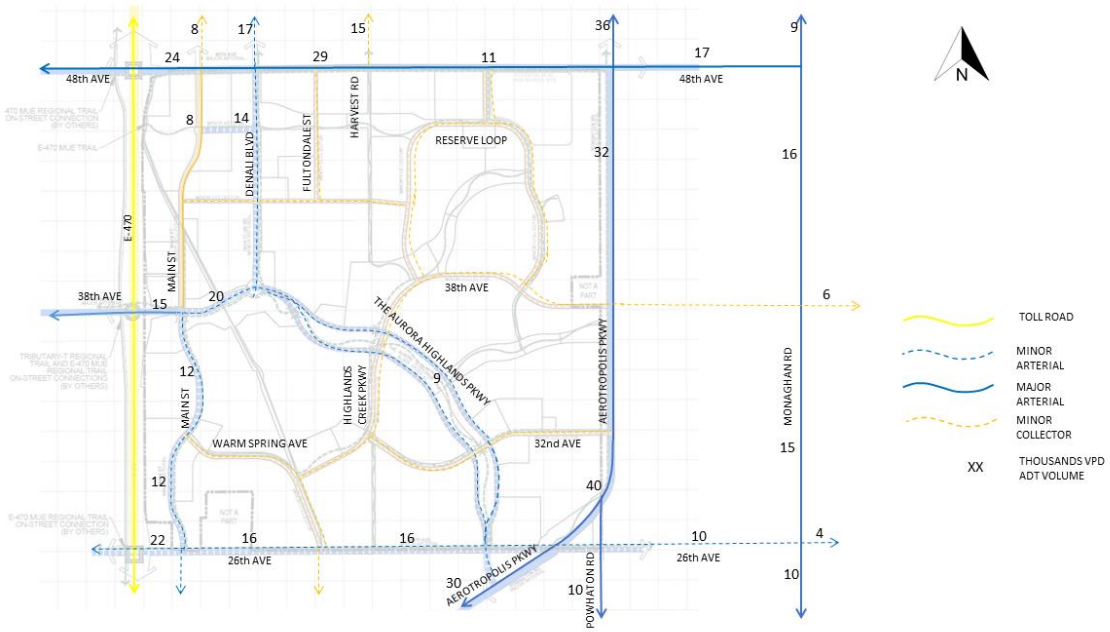
Figure 3 – Study Area Trip Distribution



Source: AECOM

Figure 4 – NEATS Full Build 2040 Model ADT

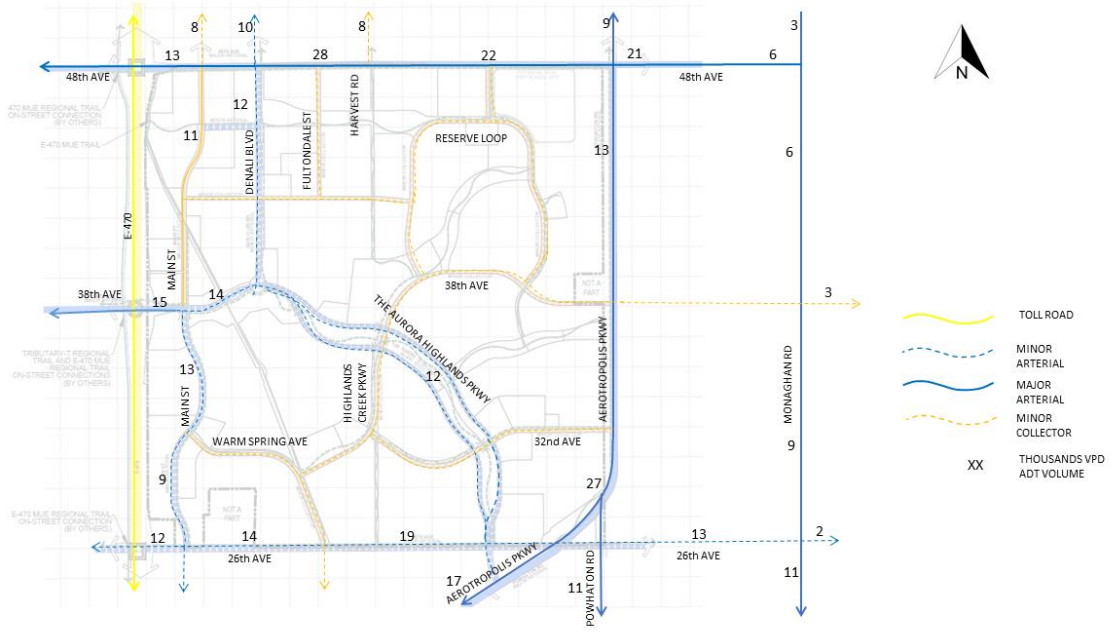
2040 Background



Source: AECOM

Figure 5 – 2040 Background ADT

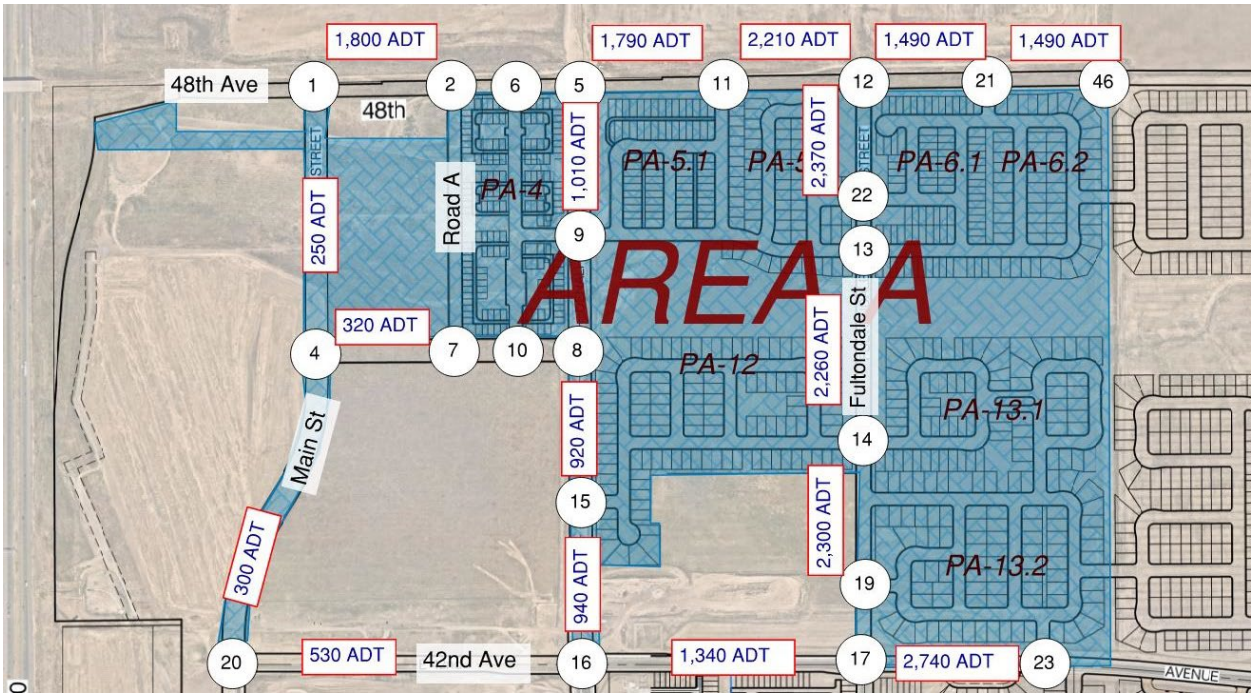
2040 Site Traffic Only



Source: AECOM

Figure 6 – Aurora Highlands/ATEC Site Traffic ADT

Figure 6. The Aurora Highlands North, Area A Daily Site Trips



Traffic Analysis

Traffic conditions both with and without the project have been analyzed for horizon year (2040) conditions.

Horizon (2040) Year No Project Conditions

The horizon year traffic volumes without the Aurora Highlands project are shown in Figures 7 and 8 and daily traffic volumes are shown in Figure 9. The background volumes along 48th Avenue were taken from a combination of the *NEATS (2018), The Aurora Highlands TIS, Windler Master Plan TIS*, and *Powhaton Road Alignment Study*. Intersection configurations are taken from *the Aurora Highlands TIS, Windler Master Plan TIS,* and *ATEC TIS.*

Figure 6. The Aurora Highlands North, Area B Daily Site Trips

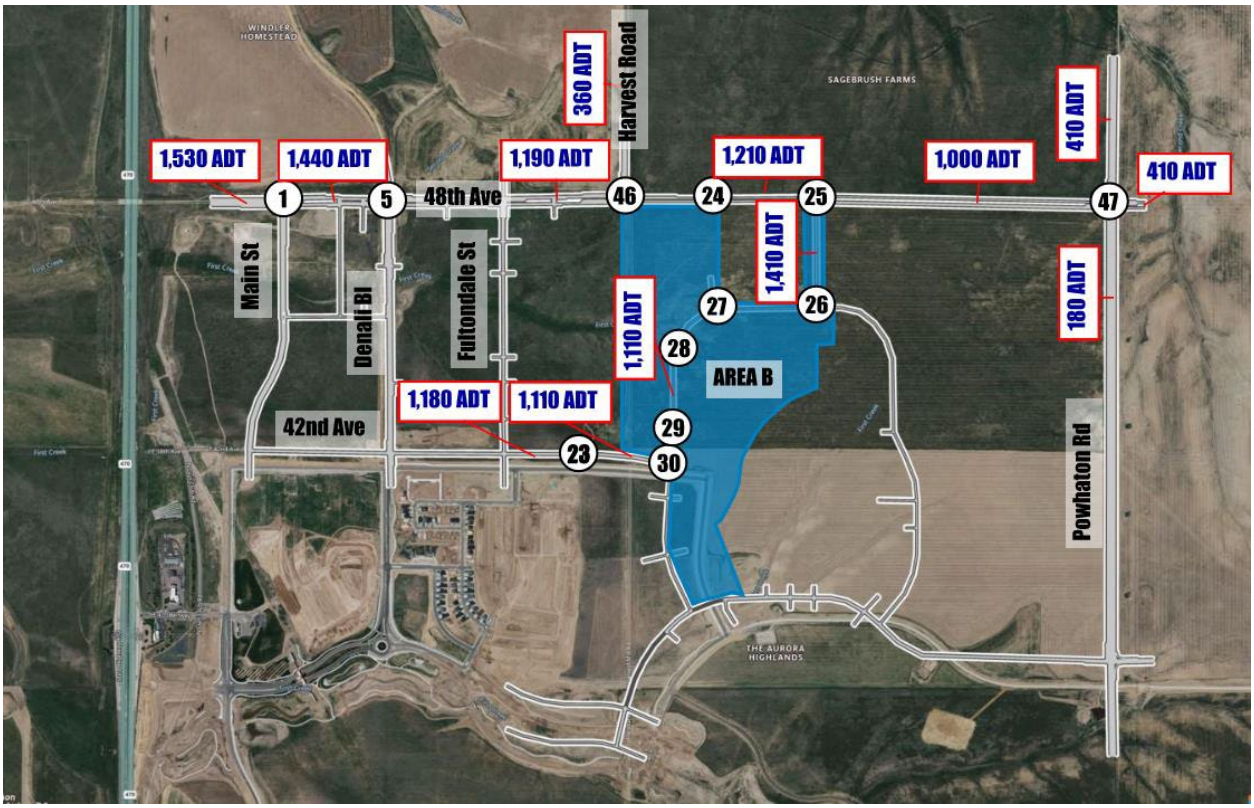
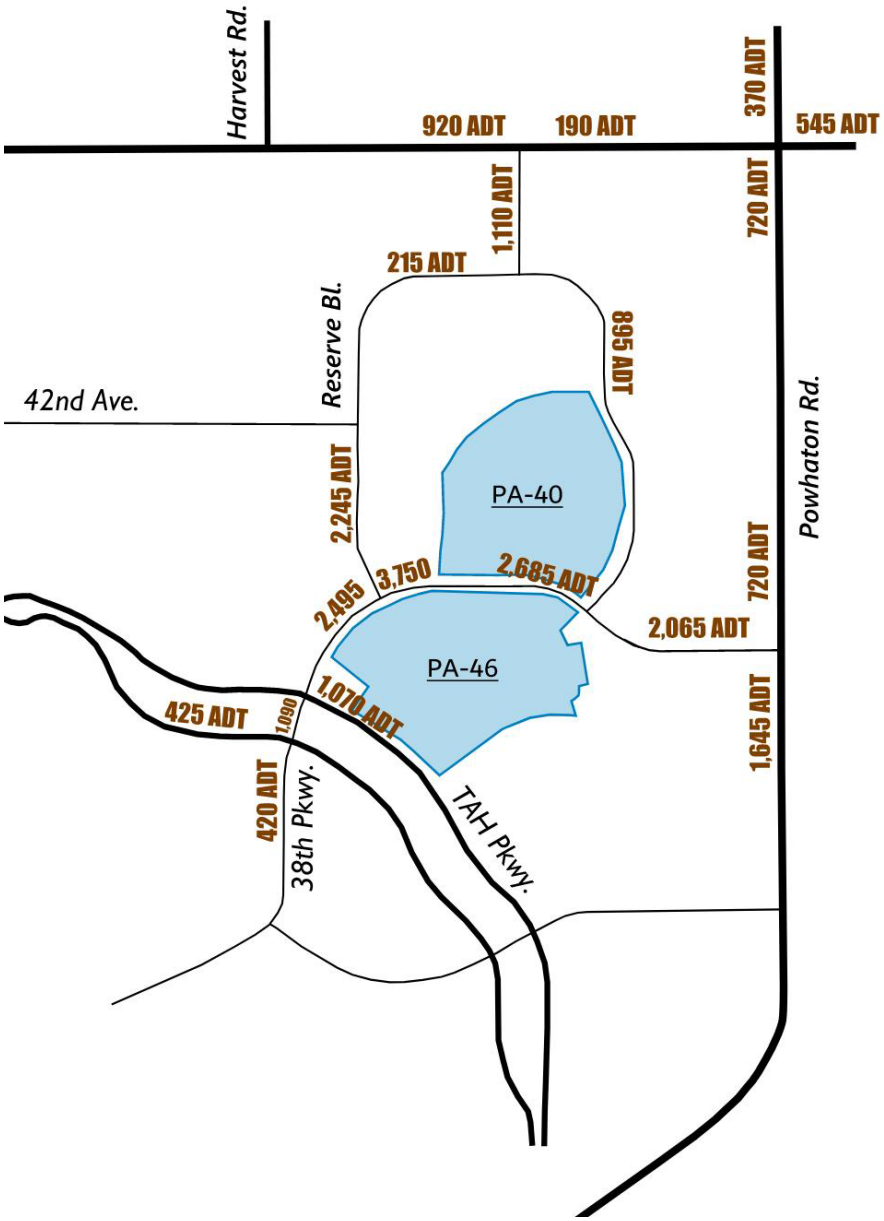


Figure 6. The Aurora Highlands North, Area C Daily Site Trips

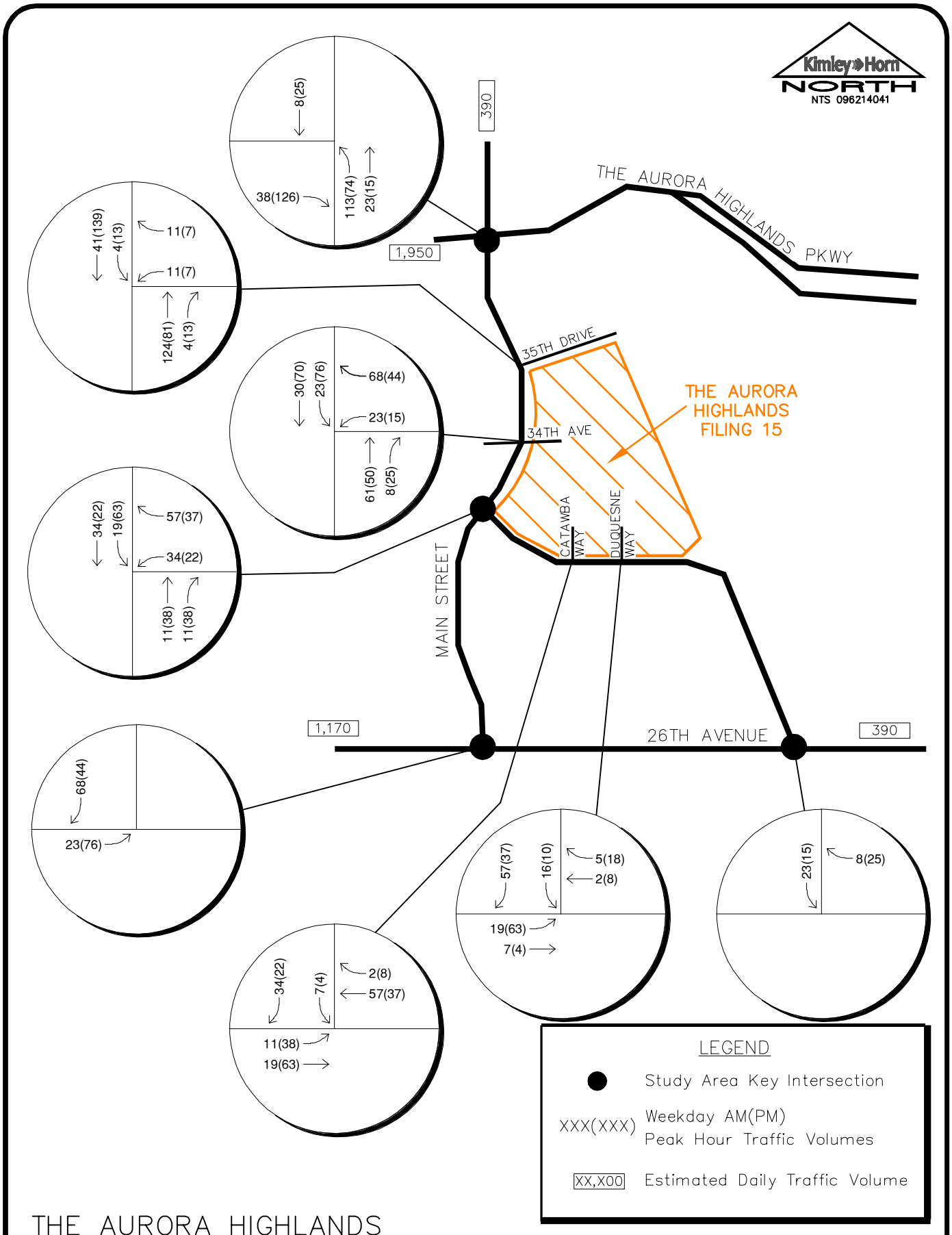


Traffic Analysis

Both traffic conditions with and without the project were studied for the horizon year (2040) conditions.

Horizon (2040) Background Conditions

The horizon year traffic volumes without the Aurora Highlands Area C project are shown in Figure 7 and Figure 8, and daily traffic volumes are shown in Figure 9. In this study, *The Aurora Highlands North, Area A (2022)* and *The Aurora Highlands North, Area B (2023)* background volumes were used as the basis of the report. The site traffic from both north areas (Area A and Area B) were later added to the background volumes.



THE AURORA HIGHLANDS
FILING 15
2040 PROJECT TRAFFIC ASSIGNMENT

FIGURE 7

Kimley»Horn

Land Use	ITE Code	Units	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Weekday Overall In	Weekday Overall Out
Study Area/ Filing 16								
Single-Family Detached Housing	210	277 dwellings	50	155	175	100	1325	1330
Filing 10								
Single-Family Detached Housing	210	179 dwellings	35	100	110	65	890	890
Filing 15								
Single-Family Detached Housing	210	416 dwellings	75	230	260	155	1965	1965
Filing 7								
Single-Family Detached Housing	210	374 dwellings	70	210	235	135	1765	1765
Filings North of TAH Pkwy								
Single-Family Detached Housing	210	800 dwellings	150	445	500	295	3775	3775
TOTAL NEW TRIPS			**380**	**1140**	**1280**	**750**	**9720**	**9725**

Table 2 – Trip Generation for Build-Out Year 2023

According to FHU's Transportation Analysis Zone (TAZ) map in the Master Traffic Study, the current study area is located within TAZ 20 along with planning area 55.1 from Filing 10. TAZ 20 was projected to have approximately 647 dwelling units in the original study, resulting in an estimated 6,159 total daily trips. The development plans of Filings 10 and 16 indicate that a total of 420 homes will be constructed, generating 3,965 total daily trips. This is a significant reduction to the Master Traffic Study. In this case, as the intersections were designed to accommodate the 2040 traffic volumes as presented in the Master Traffic Study. With traffic volumes lower than anticipated in the preliminary study, it is expected that the intersections will operate acceptably under lighter traffic demand.

Trip Distribution

Trips to and from the site were generally distributed according to the directional percentages presented in the Master Traffic Study. These percentages were derived from the City of Aurora Northeast Area Transportation Study (NEATS). According to this regional transportation plan,

determined that the construction of 100 homes resulted in approximately 115-120 construction trips per day.

Trip generation estimates for the opening year, Phase I build scenario for the proposed development can be seen in **Table 1**.

Land Use	ITE Code	Units	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Weekday Overall In	Weekday Overall Out
Single-Family Detached Housing	210	100 dwellings	19	57	64	38	520	520
Construction		500 dwellings	105	35	35	105	294	294
TOTAL NEW TRIPS			**124**	**92**	**99**	**143**	**814**	**814**

Table 1 – Phase 1 Proposed Trip Generation

The full development plan includes 589 dwelling units; 473 dwellings are single-family homes, while 116 duplex lots are located in the northwest corner of the CSP. All of these residences are classified under ITE Land Use Code 210, Single-Family Detached Housing. Trip generation estimates were derived from the fitted curve equations provided by ITE.

The 46.6 acres of public park in the CSP will be classified as ITE Land Use Code 411 – Public Park. Where provided, fitted curve equations were used to calculate the expected trip generation by this land use. During the AM peak hour, the average rate of 0.02 vehicles per acre was used due to the lack of a fitted curve equation.

Trip generation estimates for the full build scenario for the proposed development can be seen in **Table 2**.

Land Use	ITE Code	Units	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Weekday Overall In	Weekday Overall Out
Single-Family Detached Housing	210	589 dwellings	106	317	351	206	2657	2657
Public Park	411	46.6 ac.	0	1	14	11	59	59
TOTAL NEW TRIPS			**106**	**318**	**365**	**217**	**2716**	**2716**

Table 2 – Full Build Proposed Trip Generation

Land Use	ITE Code	Units	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out	Weekday Overall In	Weekday Overall Out
Study Area								
Single-Family Detached Housing	210	251 dwellings	45	135	150	90	1215	1215
Filings 1 and 2								
Single-Family Detached Housing	210	360 dwellings	65	195	220	130	1690	1690
Construction		230 dwellings	100	20	20	100	585	585
Filings South of TAH Pkwy								
Construction		400 dwellings	170	30	30	170	1020	1020
TOTAL NEW TRIPS			**380**	**380**	**420**	**490**	**4510**	**4510**

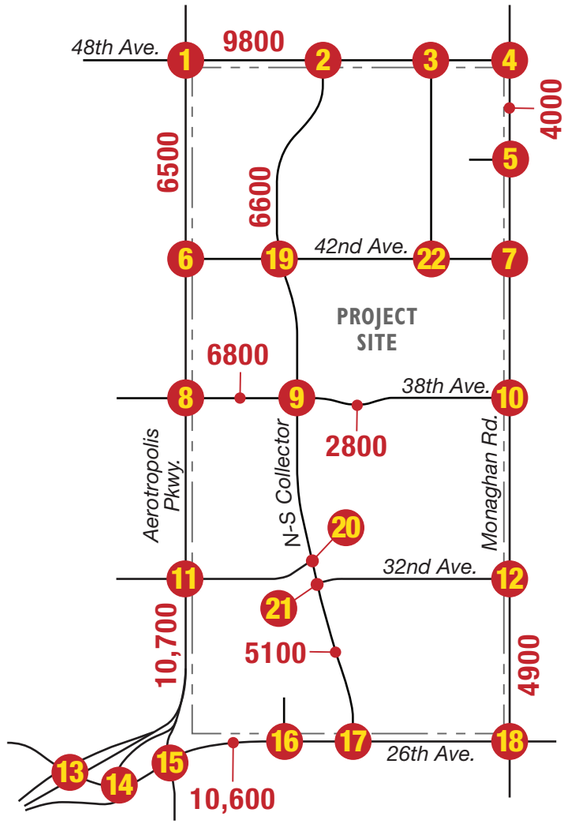
Table 2 – Trip Generation for Build-Out Year 2023

According to FHU's Transportation Analysis Zone (TAZ) map in the Master Traffic Study, the current study area is located within TAZ 9. By studying the land use map in **Figure 2**, it was found that the study area accounts for approximately 63% of TAZ 9's residential land area. The Master Traffic Study indicates that 63% of the traffic generated by the residential portion of the TAZ is estimated at approximately 2,600 total daily trips. As our more detailed trip generation in **Table 1** shows, the 2,430 projected trips in this study area is a slight reduction to the Master Traffic Study.

Trip Distribution

Trips to and from the site were distributed according to the directional percentages presented in the Master Traffic Study. These percentages were derived from the City of Aurora Northeast Area Transportation Study (NEATS). According to this regional transportation plan, approximately 48% of the site-generated external trips will travel to and from the south via major roadways like E-470, Picadilly Road, and Powhaton Road, while 22% of the trips will travel to and from the north using the same arterials. Many of the trips to the south will access Interstate 70. Approximately 20% of the external trips will travel to and from the west via 56th Avenue, 48th Avenue, 38th Avenue, and 26th Avenue. Finally, 10% of the traffic will travel to and from the east using 56th Avenue, 48th Avenue, and 26th Avenue. This directional distribution is represented in **Figure 5**.

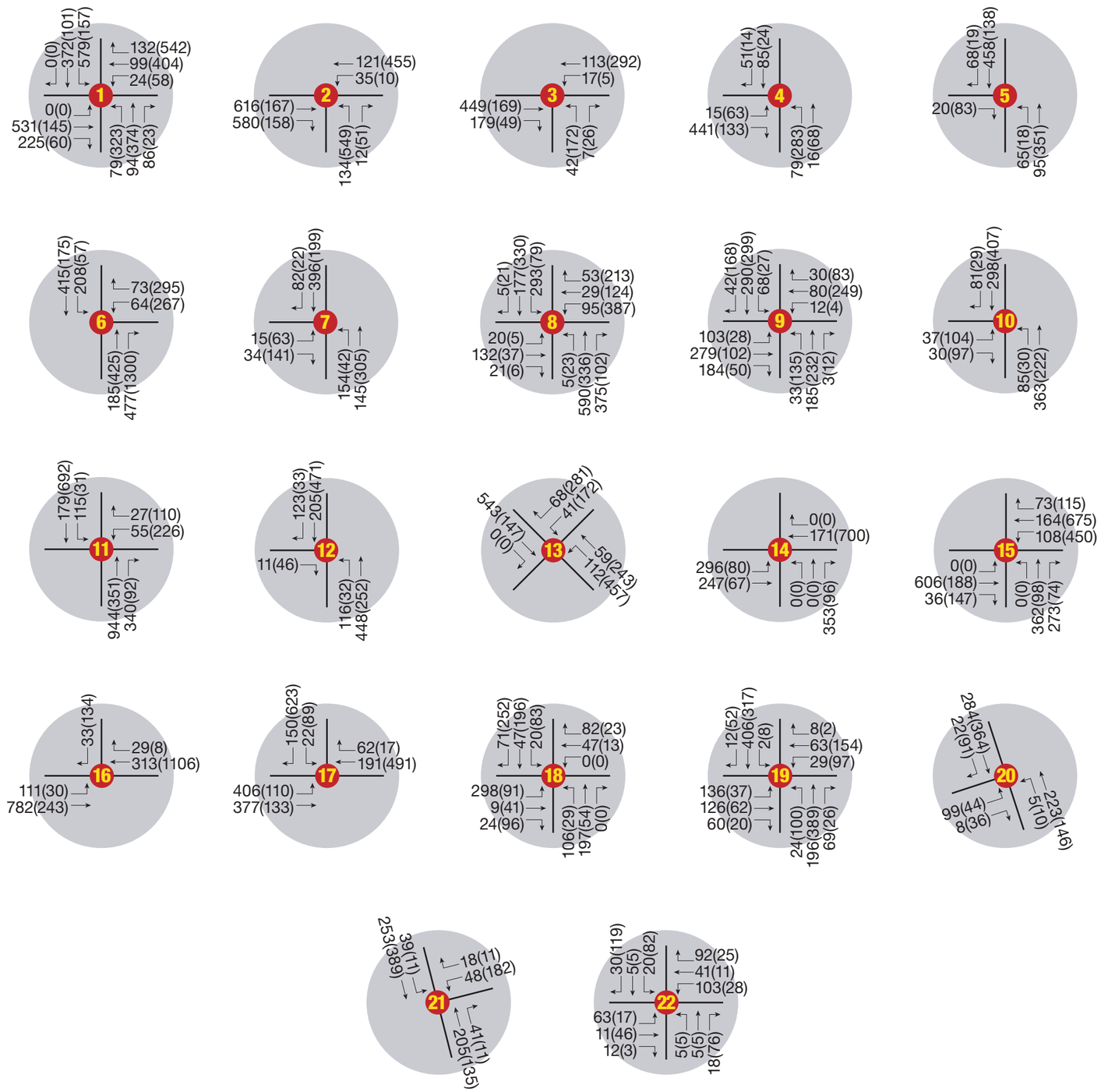
KEY MAP



LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes



FELSBURG HOLT & ULLEVIG

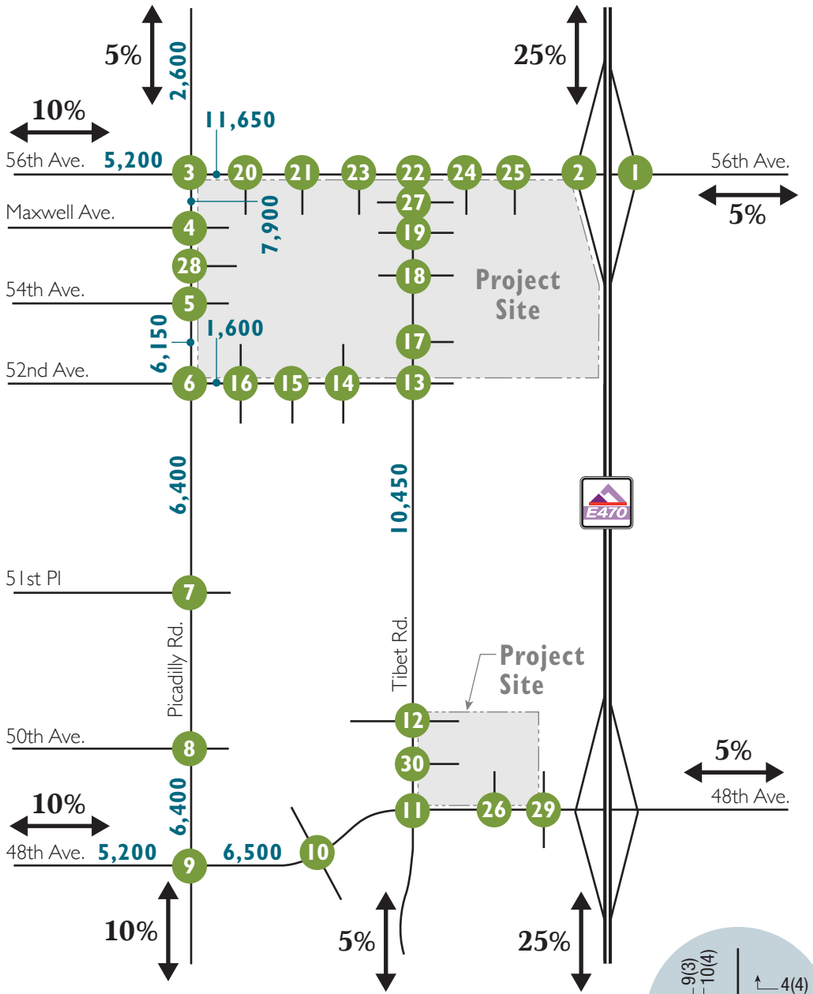
NOTE: Drawing Not to Scale

NORTH

FIGURE 5

ALC Site Generated Traffic Volumes

ALC Study DEC23_FEB24 122-279-01 2/13/24

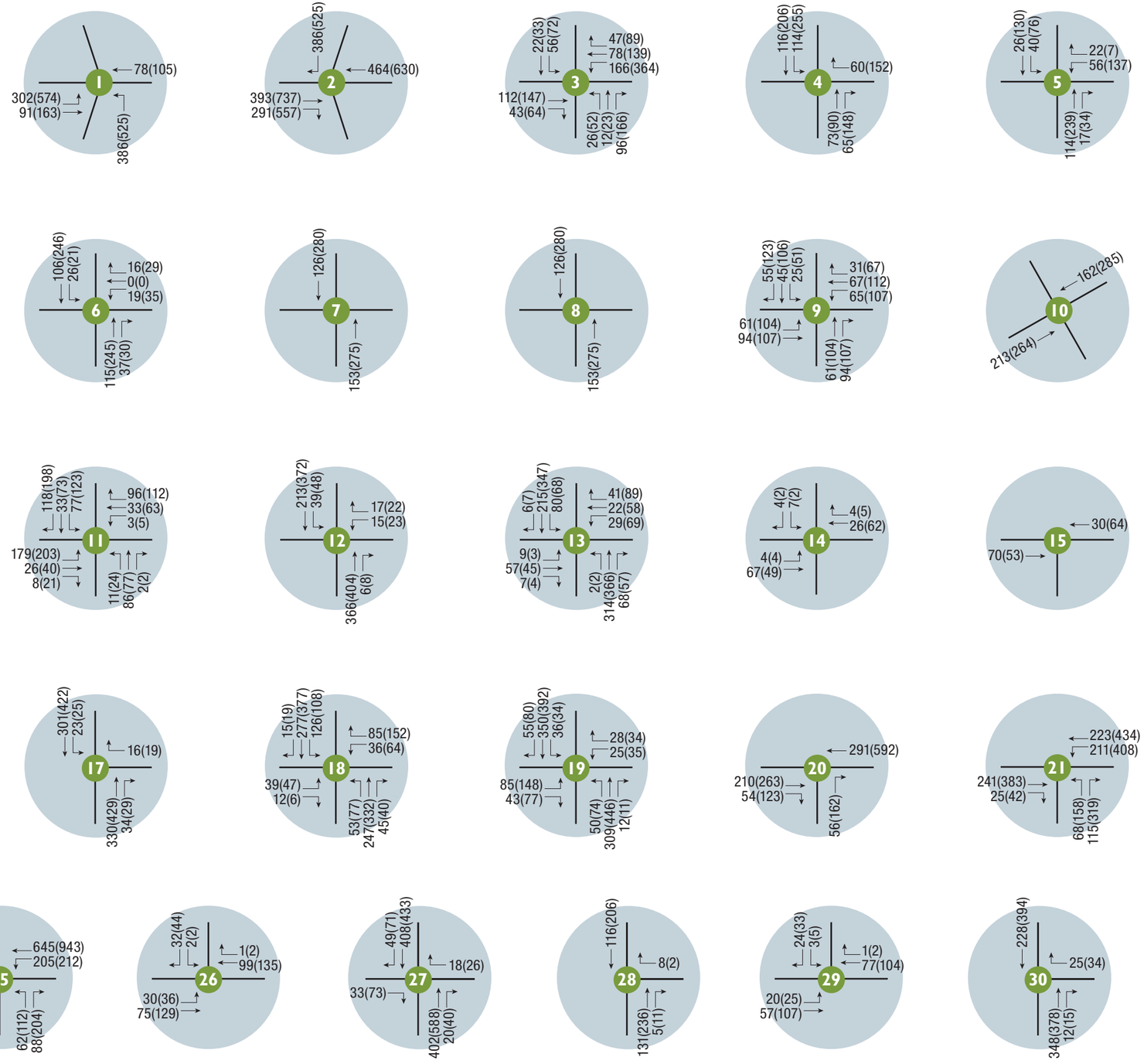


LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

XX% = Site Trip Distribution



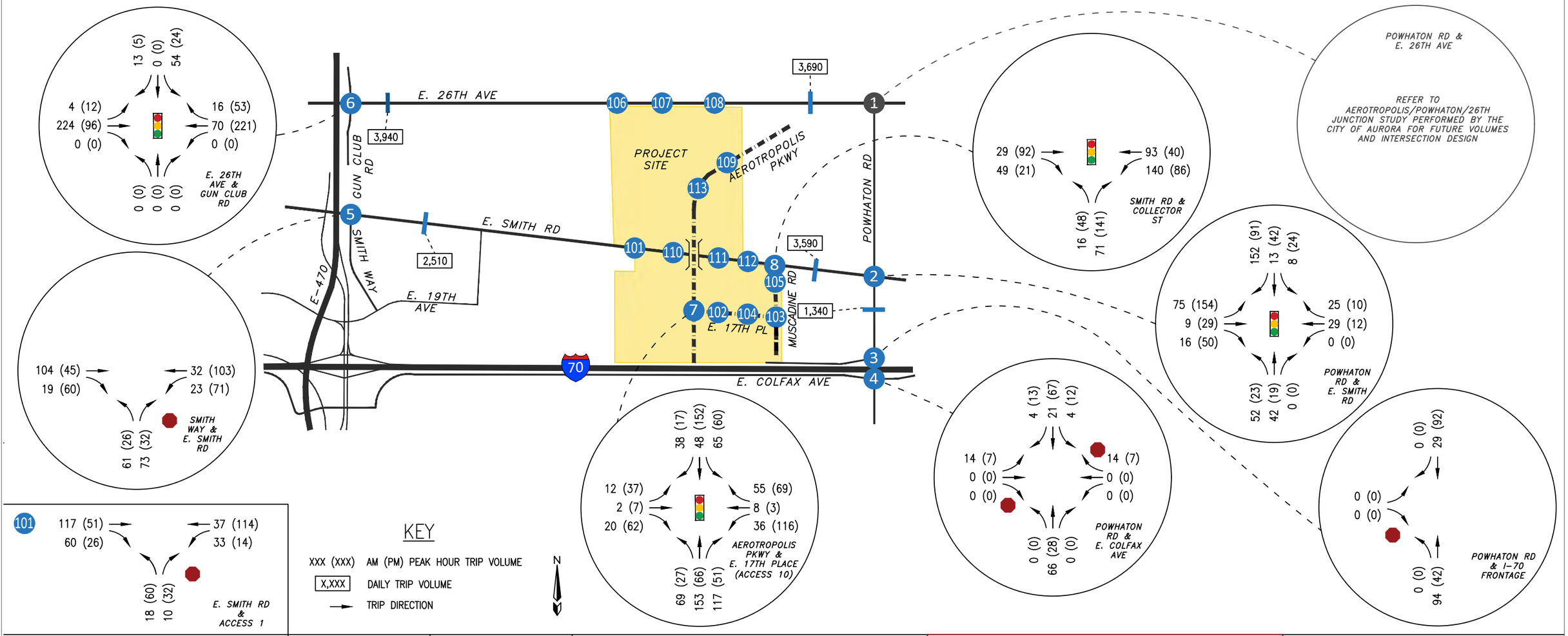
FELSBURG HOLT & ULLEVIG

NORTH

NOTE: Drawing Not to Scale

FIGURE 4

Site Generated Traffic and Distribution



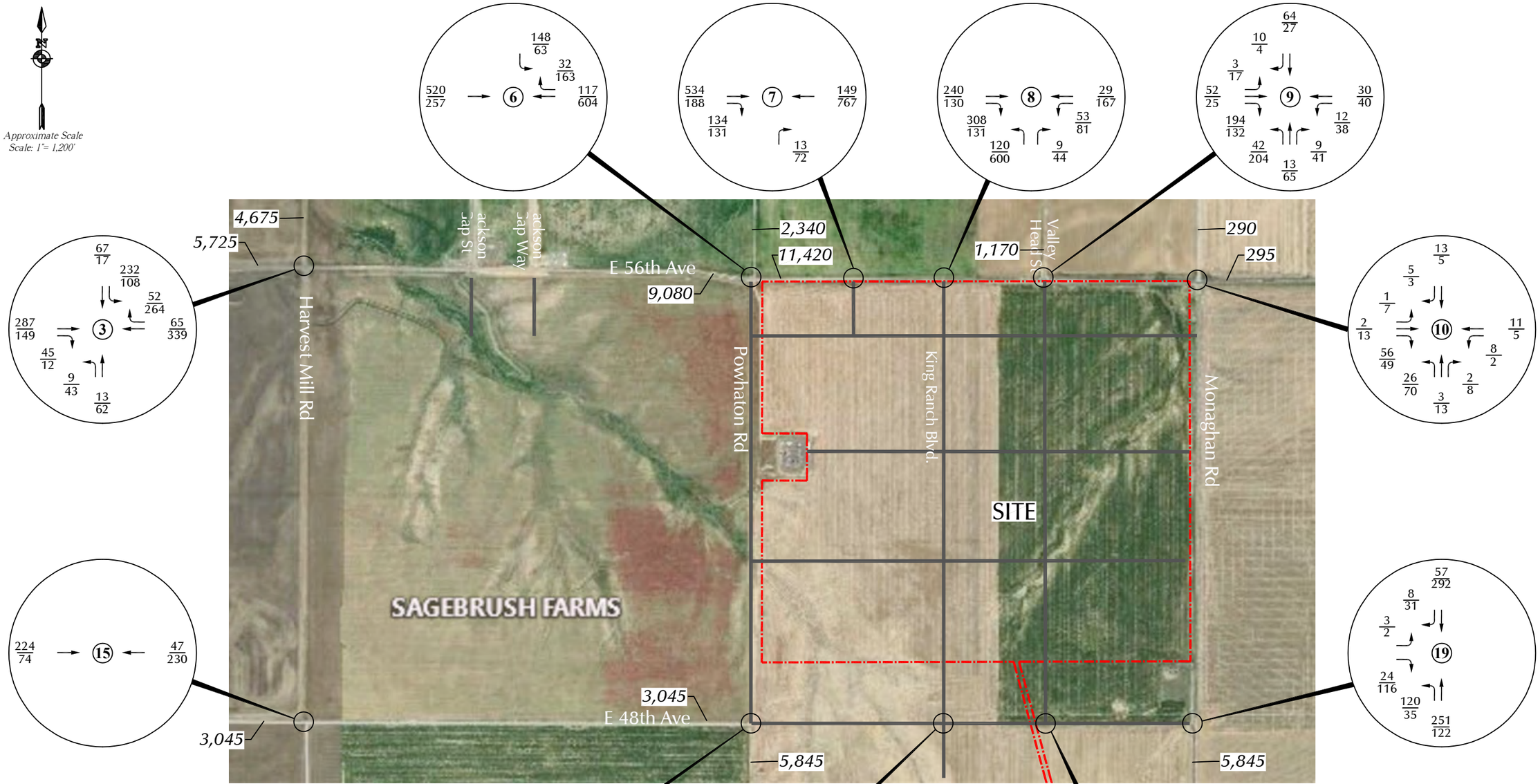
FOX TUTTLE TRANSPORTATION GROUP

HARVEST MILE INDUSTRIAL TRAFFIC IMPACT STUDY - AURORA, CO

PROJECT GENERATED TRAFFIC VOLUMES

FT Project #	20100	Original Scale	NTS	Date	4/13/2023	Drawn by	CRS	Figure #	7A

Approximate Scale
Scale: 1"= 1,200'



LEGEND:

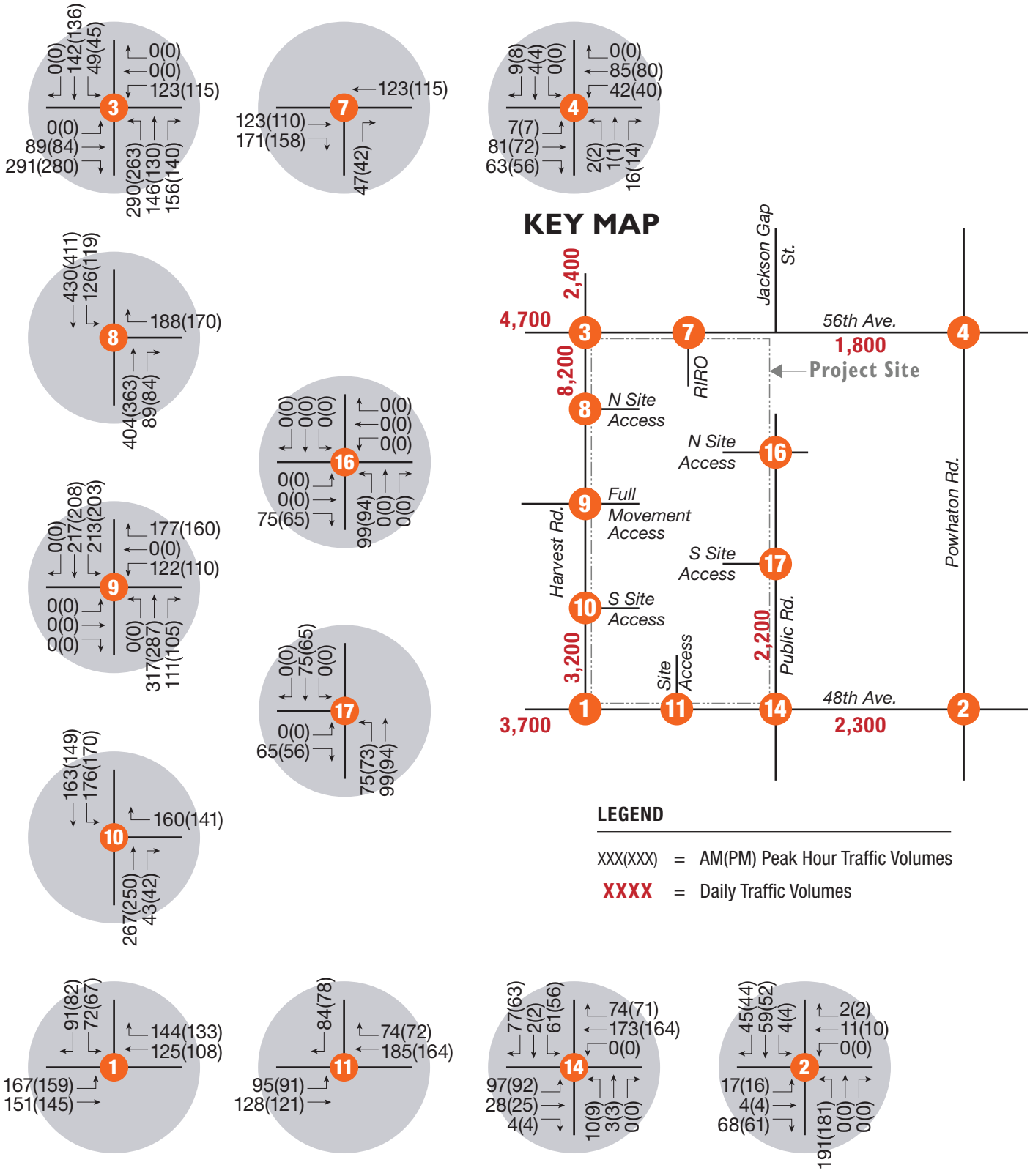
$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Figure 7a

Assignment of Site-Generated Traffic Exterior Intersections

King Ranch (LSC #200370)



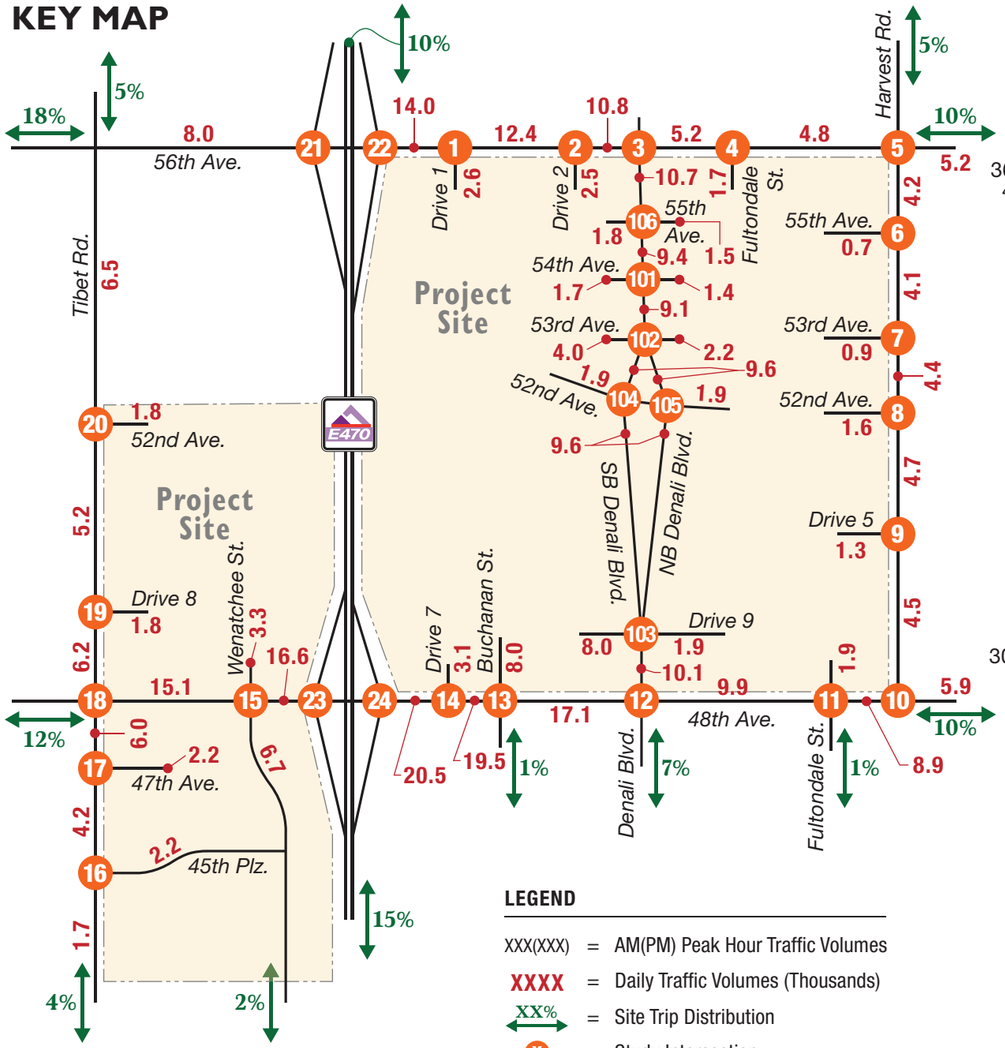
NOTE: Drawing Not to Scale

FIGURE 5

Buildout (Post 2040) Site Generated Peak Hour Traffic Volumes

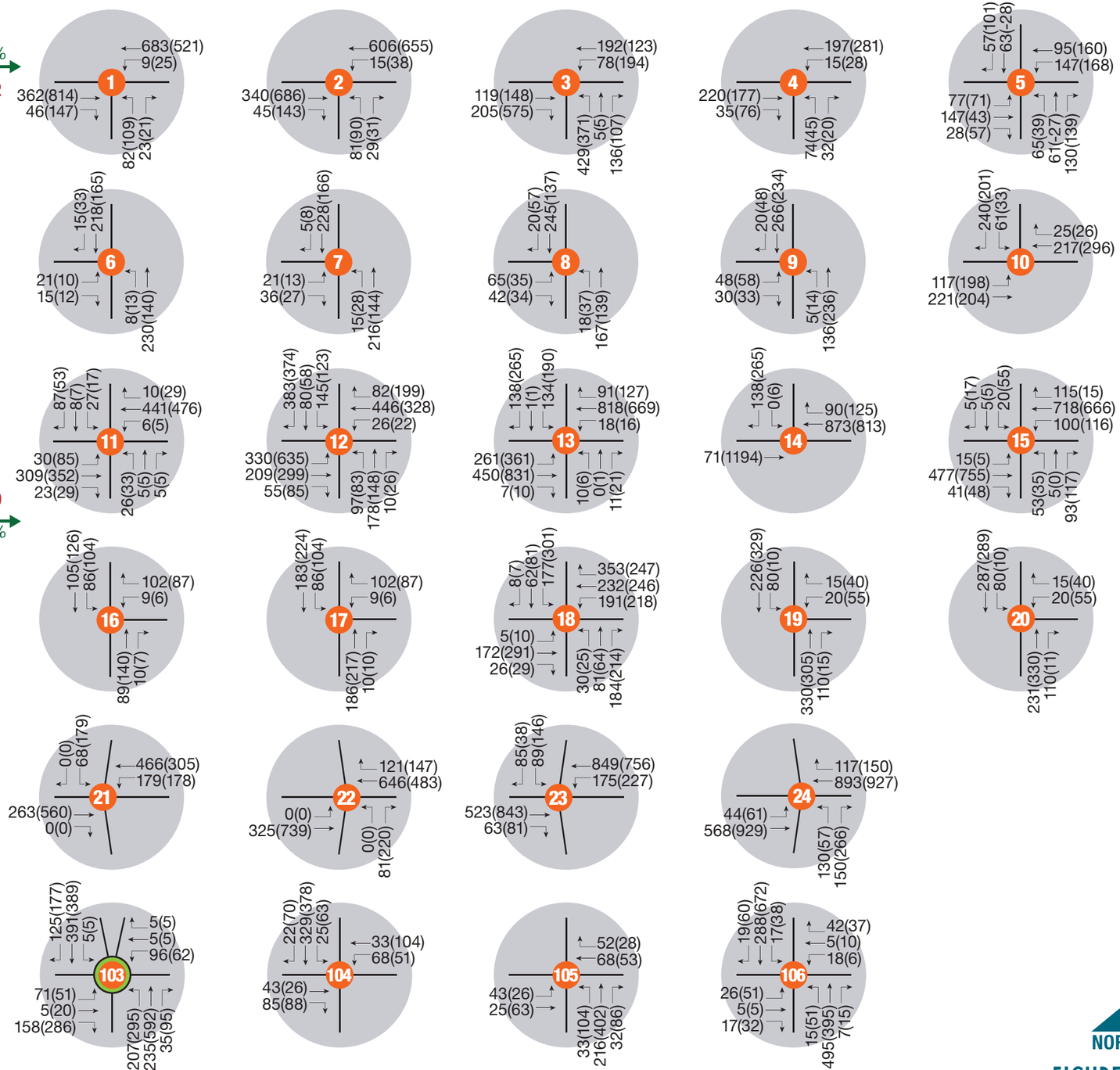
Sun Empire - REPORT 121-188-01 7/27/21

KEY MAP



LEGEND

XXX(XXX)	=	AM(PM) Peak Hour Traffic Volumes
XXXX	=	Daily Traffic Volumes (Thousands)
XX%	=	Site Trip Distribution
X	=	Study Intersection
	=	Roundabout



NORTH

NOTE: Drawing Not to Scale

FELSBURG HOLT & ULLEVIG

FIGURE 4

Site Trip Distribution and Traffic Assignment - External Trips

Windler TIS 123657-01 6/14/23

Trip Generation

The projected 2040 weekday traffic volumes for the site-generated traffic for both Aurora Highland and ATEC were estimated based on preliminary land use concepts presented in **Attachment A.** A generally accepted method of estimating the number of trips to be generated by new developments is to use the regression equations and/or average trip rates developed by the Institute of Transportation Engineers (ITE). These trip generation equations and rates were developed through a compilation of extensive field studies and traffic counts at existing developments throughout the United States. Trip Generation, Eleventh Edition, published by ITE, is the result of these studies and provides these trip generation rates for various developments. **Table 2** presents the current proposed land uses summarized by land use type and resultant ADT traffic for Aurora Highlands.

Table 3 presents the anticipated AM and PM Peak hour generation for Aurora Highlands. External Trip generation for the ATEC site was taken by summing the assigned volumes coming out of ATEC site as outlined on Figure 5 of the *Traffic Impact Analysis, ATEC*[4].In the study, there were two sources of trip generation in the FHU study: Table 1 showing the Trip Generation Study and Figure 5 showing traffic assignments. The comparison between these two is depicted in **Table 4**. For this study, the higher of the two trip generations was assumed, those depicted on Figure 5 of the FHU study. **Table 5** compares the calculated generated trips per the ITE Trip Generation Manual and NEATS model build out 2040 trips. As shown, there is a difference of 58,517 trip generated by Aurora Highlands compared to the NEATS 2040 forecast, similarly with a difference of 35,572 trips generated by ATEC. The NEATS 2040 build-out model is not meeting the anticipated number of vehicle trips generated for the proposed land use categories.

Table 2 – Daily Trip Generation Summary for Aurora Highlands

	LUC	Units	Intensity	Average Rate Weekday	ADT(1)
Residential-Single Family	210	DU	7,800	7.12	55,536
Residential-Apartments	220	DU	4,200	6.16	25,872
School-Elementary	520	Students	2,700	2.27	6,130
School-Middle	522	Students	1,000	2.10	2,100
School-High	525	Students	1,800	1.94	3,492
Commercial-Retail	820	1000 GLA	1,745	29.47	51,426
Medical Campus HOSPITAL	610	Beds	200	27.78	5,556
Corporate Campus	714	1000 GLA	451	7.19	3,242
Fire Station	575	1000 GLA	25	4.80	120
				SUBTOTAL	153,474
				Internal Capture - Generated from Schools(2)	7,632
				Internal Capture - 30% Commercial	16,400
				Internal Capture - 30% Corporate Campus	1,703
				External Generated Trips	127,739
Notes:					
(1) Average weekday rates and ADT are rounded. Intermediate values used in calculations are the exact rates established from using the ITE Trip Generation Manual 11th Edition.					
(2) Assumed 80% internal capture for elementary and middle schools, 30% internal capture for high school					

Source: AECOM, ITE Trip Generation Manual, 11th Edition

[4] *Traffic Impact Analysis, ATEC, Felsburg Holt & Ullevig, August 2020*

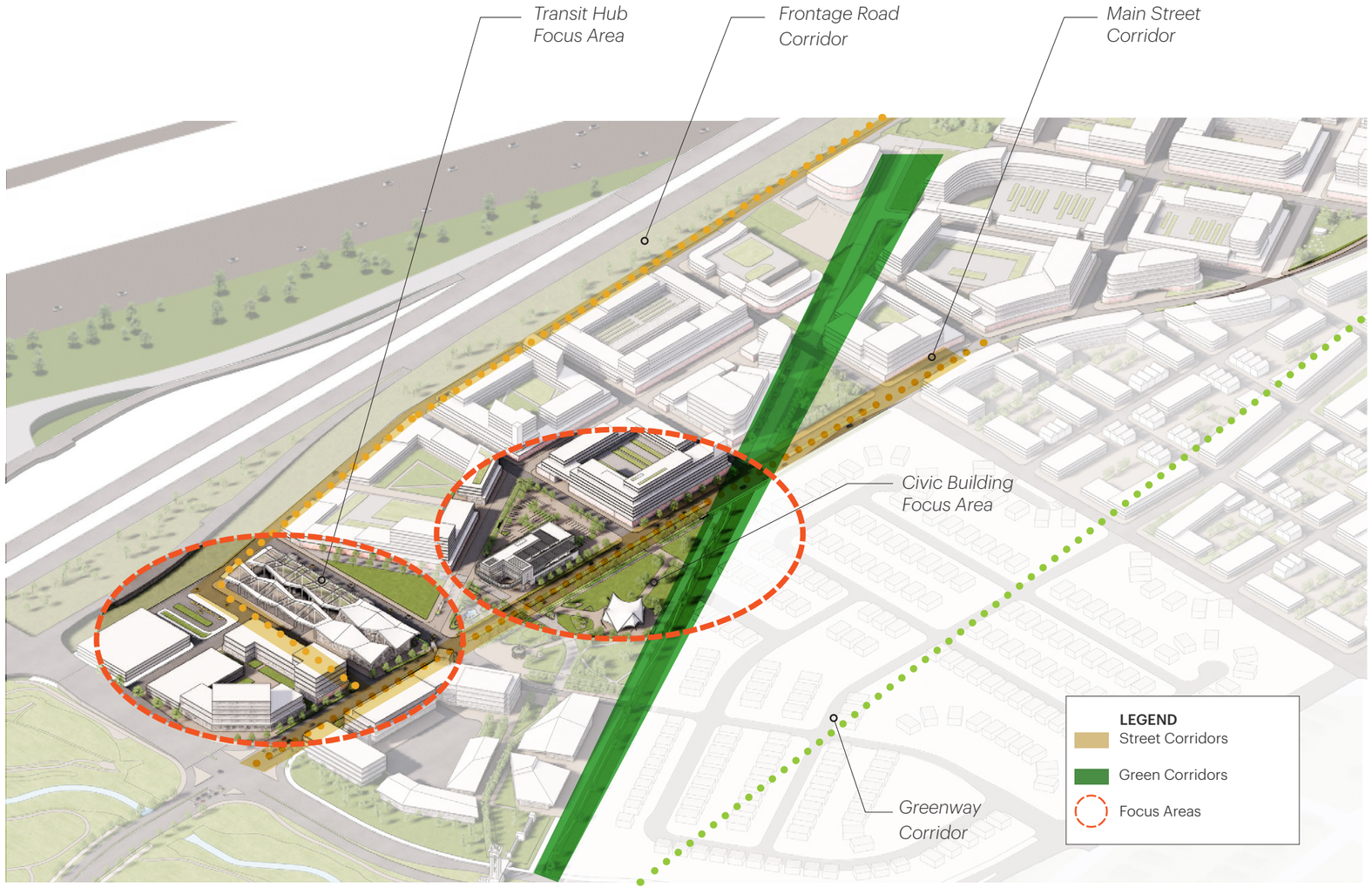
SECTION 7.1.3

Mixed-Use Civic District

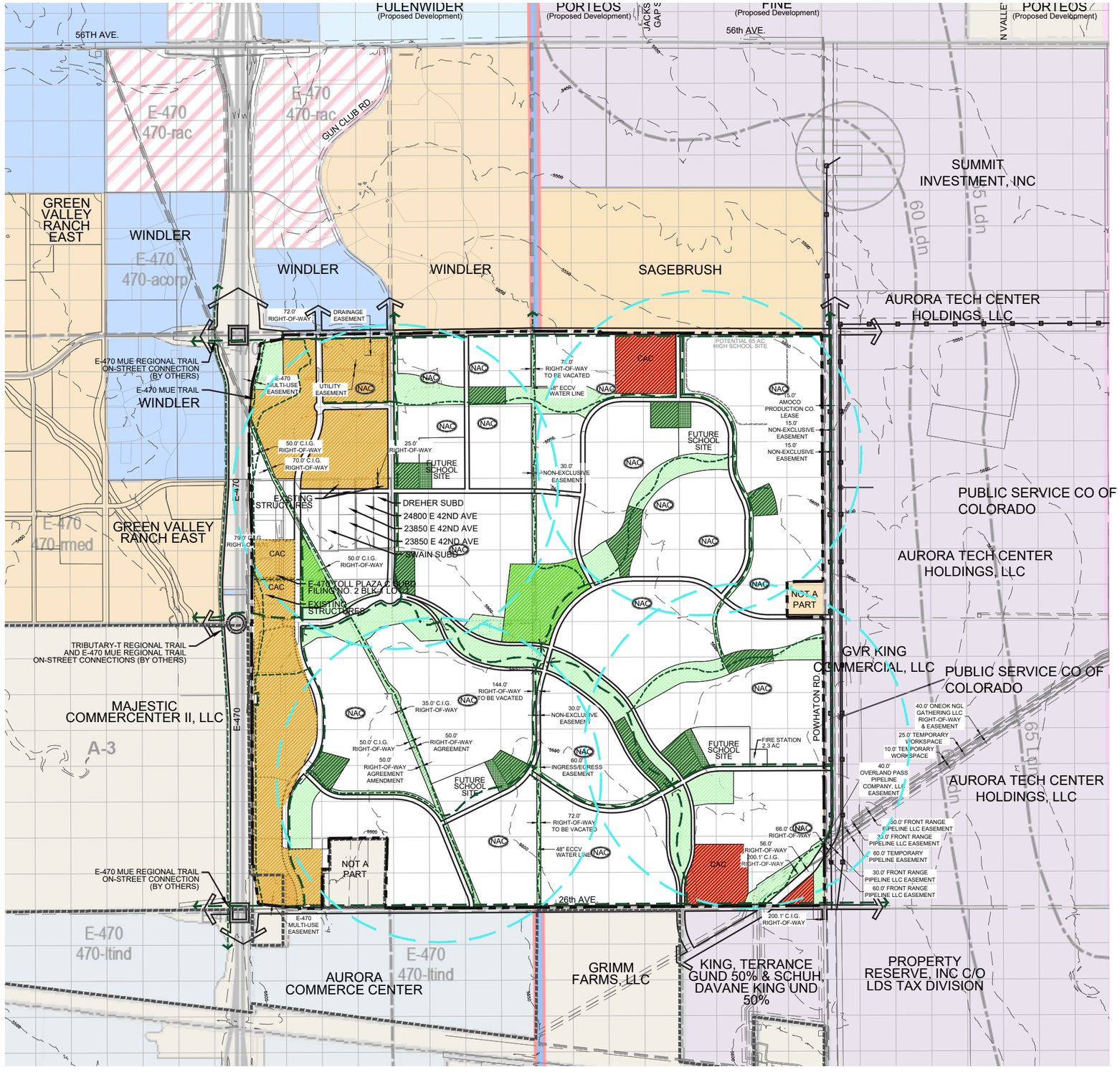
The Mixed-Use, Civic District responds to the regional needs for medium and high residential density, civic, and mixed-use, with access to public transit, bike trails, and pedestrian paths. As an example of deliberate transit-oriented development, it expands housing options, commercial and retail spaces, civic buildings, and recreational spaces. The district borders the E-470 highway and Frontage/Service Road on the west, making it visible and easily accessible from the highway.

The defining features of this district include views of Downtown Denver and the Rocky Mountains from the west, a civic program and civic park, a transit hub for the city and regional access and connections, a Town Center, the regional natural landscape corridor over the existing easement, a Public Plaza, neighborhood pocket parks, internal courtyards, terraces, and green roofs over proposed structural parking.

Key Plan



Mixed-Use Civic District Axon



- PROPERTY BOUNDARY
- POWERLINES
- EXISTING / PROPOSED ROAD
- PROPOSED COLLECTOR ROAD
- PROPOSED PARCEL BOUNDARY
- 10' REGIONAL TRAIL
- 14' REGIONAL TRAIL
- EXISTING OVERPASS
- FUTURE OVERPASS
- WHELEN SIREN SERVICE RADIUS
- MIXED USE
- COMMERCIAL
- OPEN SPACE/DETENTION
- COMMUNITY PARK
- NEIGHBORHOOD PARK
- SCHOOL / PARK SHARED USE

NOTES:
1.) CONTOURS SHOWN REPRESENT 50' INTERVAL SPACING.
2.) APPROXIMATELY 26 ACRES OF NAC WILL BE LOCATED WITHIN THE AURORA HIGHLANDS PROPERTY BOUNDARY TO SERVE A 1/4 MILE WALKABLE SERVICE RADIUS. LOCATIONS SHOWN IN THIS FDP ARE CONCEPTUAL. FINAL SIZE (GENERALLY .05 - 3 ACRES) AND LOCATION SHALL BE REFLECTED IN FUTURE CSP SUBMITTALS AND SHALL NOT TRIGGER A FDP AMENDMENT IF NAC LOCATIONS CHANGE. THE DISTRICT SHALL OWN AND MAINTAIN ALL NACs.
3.)ZONING BOUNDARIES ARE REFLECTED IN TAB 14 PROPOSED ZONING PLAN
4.) 10' and 14' REGIONAL TRAILS ARE SHOWN. ADDITIONAL WIDTHS SHALL BE IDENTIFIED WITH INDIVIDUAL ISP/CSPs.

0 2,000 4,000

Scale: 1" = 2,000' North

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Denver, Colorado 80202
P 303.572.0200
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THE AURORA HIGHLANDS
AURORA, COLORADO
MASTER FRAMEWORK DEVELOPMENT PLAN

NOT FOR CONSTRUCTION

Owner:
Carlo Ferreira
The Aurora Highlands, LLC
6550 S Pecos Rd., Suite 124
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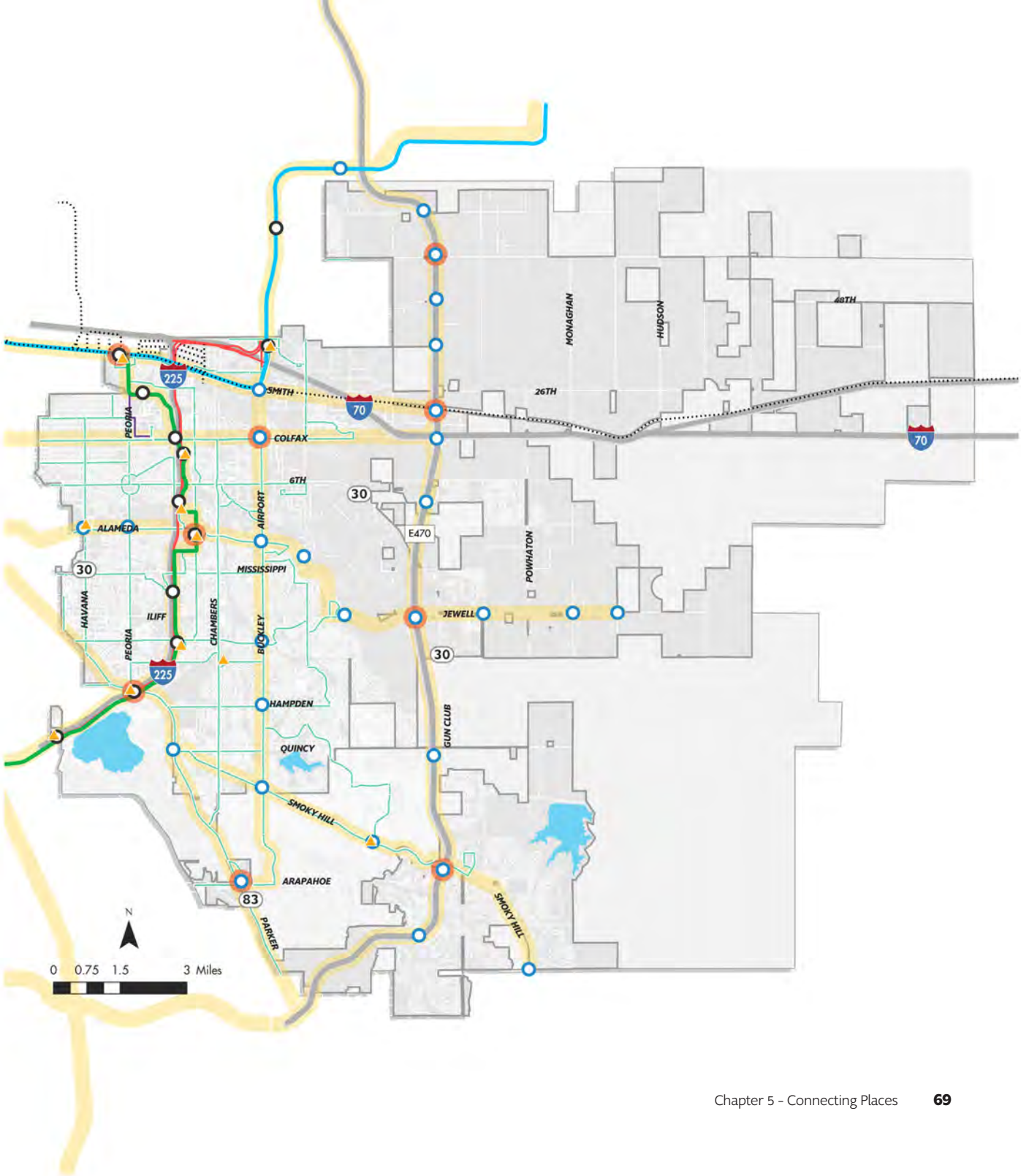
(720) 436-1572
carlo@theaurorahighlands.com

Issue Date
JUNE 9, 2017
APRIL 13, 2018
JULY 13, 2018
AUGUST 22, 2018
DECEMBER 21, 2018
FEBRUARY 15, 2019
MAY 3, 2019
FDP Amendment 3 Revision Date
September 12, 2023

CONTEXT MAP
Sheet Title

Sheet Number

TRANSIT SYSTEM



Appendix B – Background Volumes Traffic Letter

Matrix Design Group, Inc.
707 17 Street, Suite 3150
Denver, CO 80202
O 303.572.0200
F 303.206.0202
matrixdesigngroup.com

May 13, 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 Update – Background Volumes

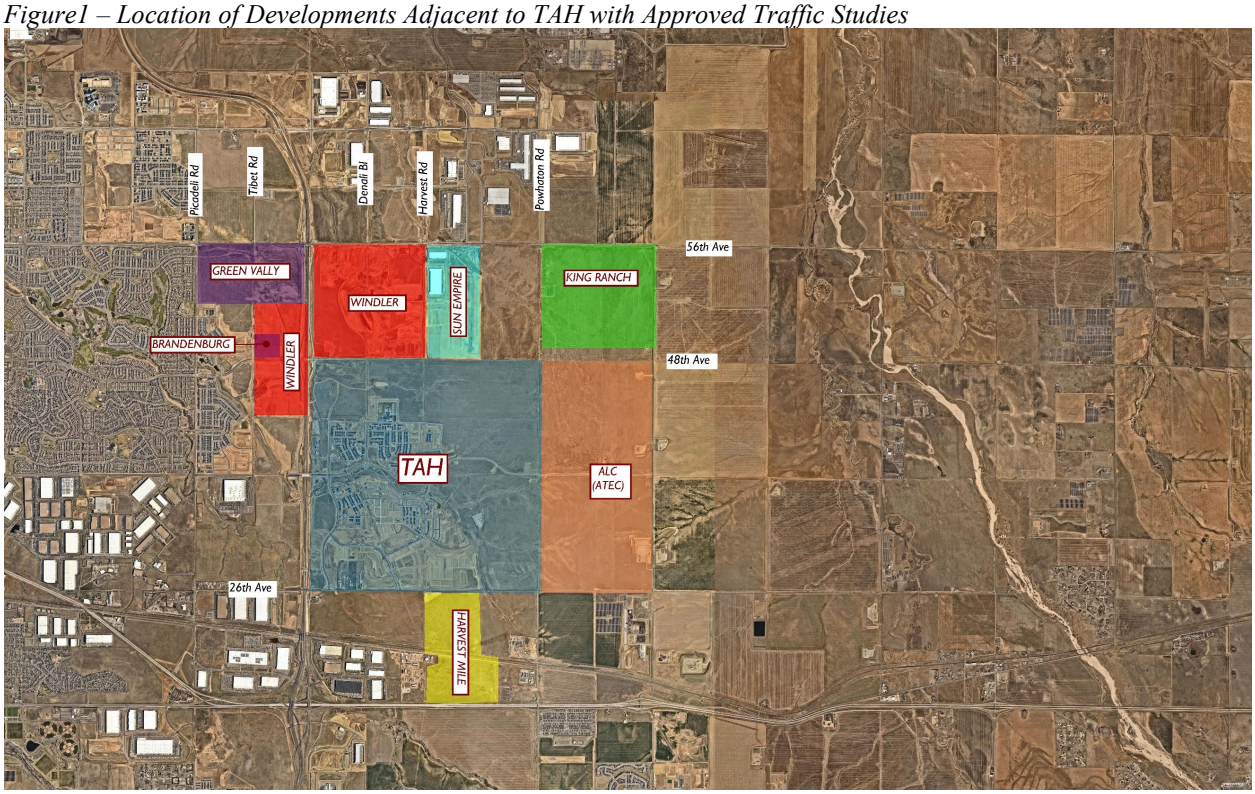
Dear Mr. Harline

Matrix Design Group (Matrix) is in the process of updating the Master Traffic Study (MTIS) for the Aurora Highlands (TAH). This letter is provided to summarize our findings on the background volumes in the vicinity of the project. Additionally, Matrix is provided the finalized external roads background volumes for the year 2040 at the end of this letter (Figure 6). These volumes were obtained after carefully reviewing multiple approaches that were taken for this purpose, as presented below.

External Roadways Volumes

First, the adjacent developments traffic studies were obtained from the City of Aurora (COA). The location of these developments is shown in Figure 1, below.

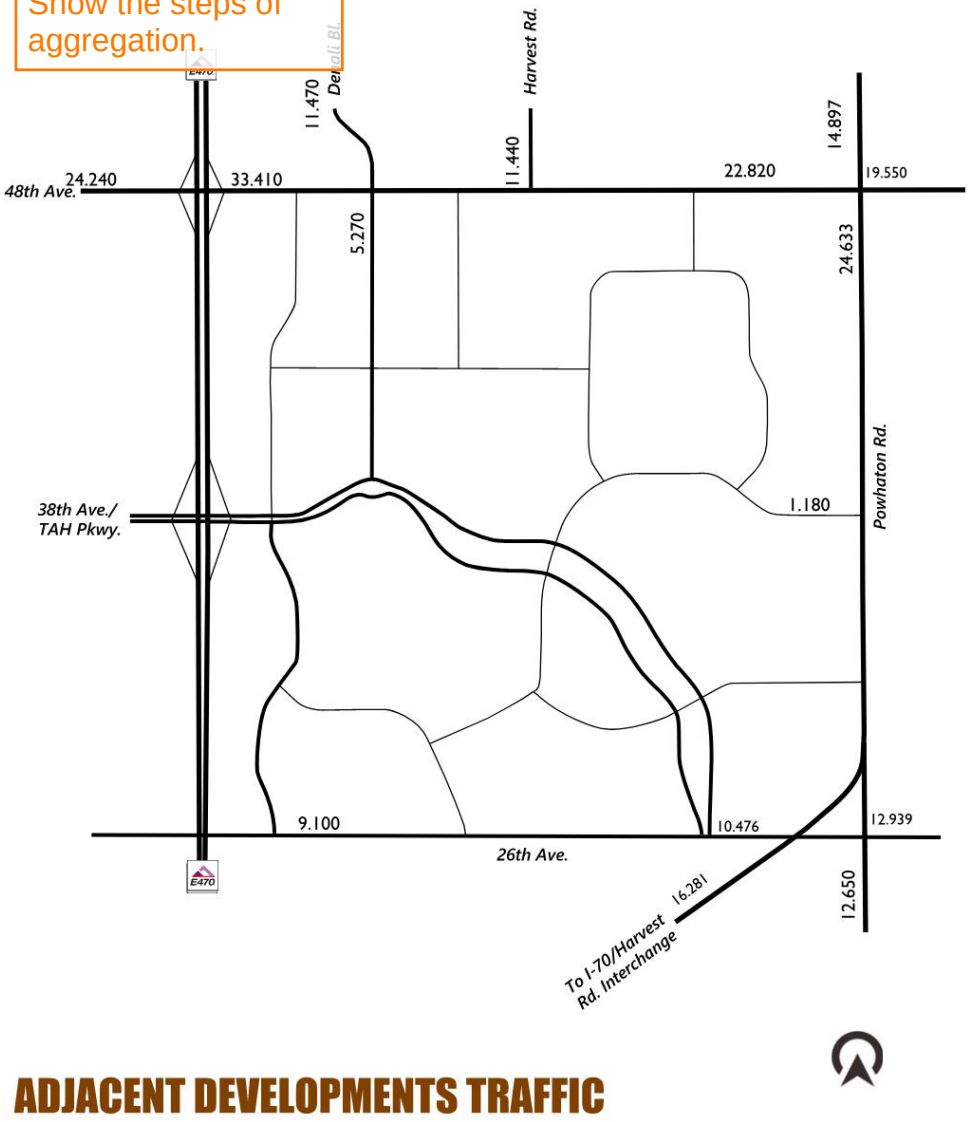
Figure1 – Location of Developments Adjacent to TAH with Approved Traffic Studies



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

This is suppose to be detailed discussion. Show the steps of aggregation.



ADJACENT DEVELOPMENTS TRAFFIC

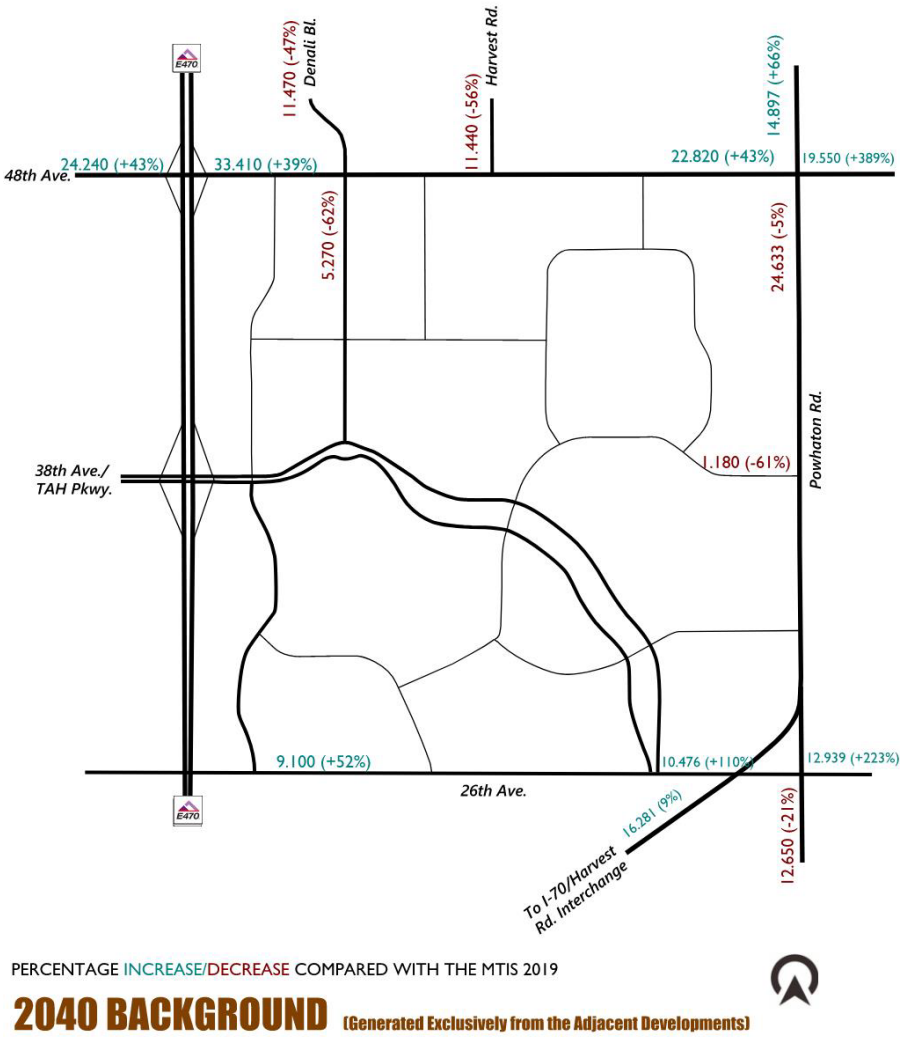
Numbers represent ADT in 1,000s.

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.

Second, we compared the volumes shown above with what was provided in the MTIS (2019).

The original MTIS, *The Aurora Highlands Transportation Impact Study,* (August 2019) shows the background volumes in Figure 5 of the report. Matrix compared those volumes with the aggregated traffic generated from the developments immediately adjacent to TAH and results are shown in Figure 3. An excerpt of the MTIS (2019) can be found in the appendix.

Figure 3 – Percentage Increase/Decrease - Adjacent Developments Traffic Compared with the MTIS 2019



Numbers represent ADT in 1,000s.

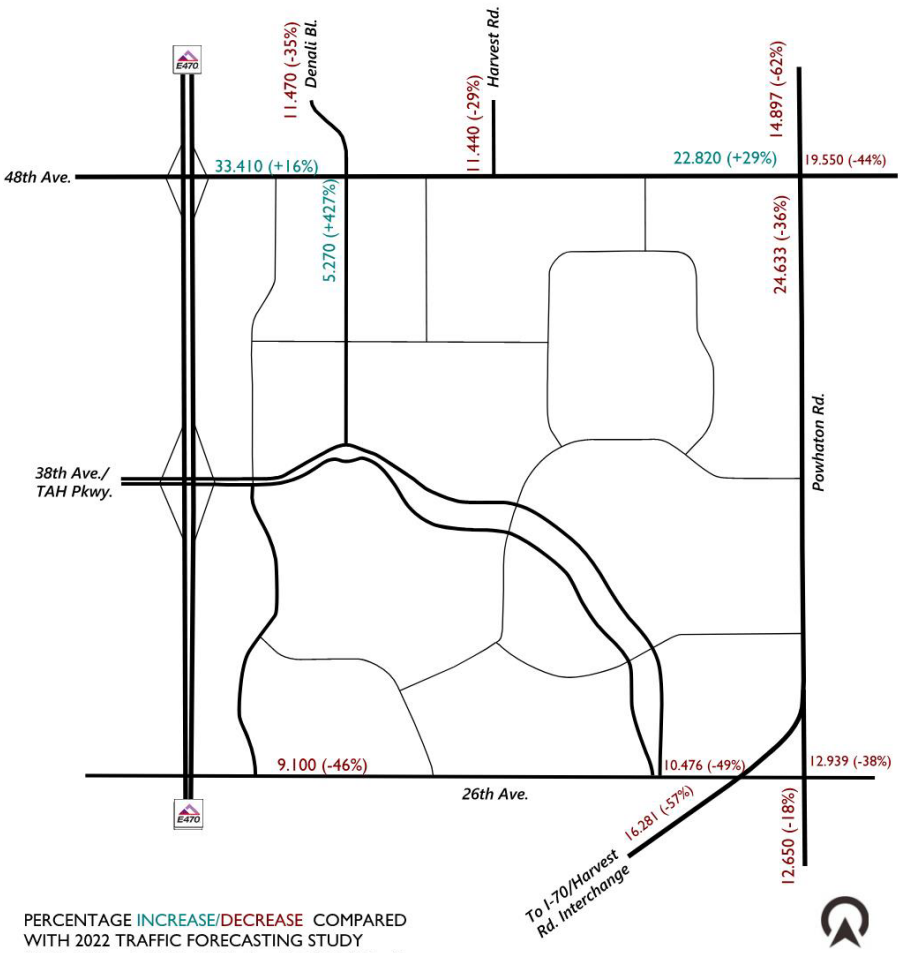
Since the MTIS (2019), much more information has become available regarding the future developments surrounding TAH, the new Jackson Gap alignment, and the new Diverging Diamond Interchange (DDI) to the south of the project. As a result, the traffic on the external roadways has mainly increased compared with what was provided in the MTIS (2019).

Third, we compared the aggregated traffic from the surrounding developments to what was provided in Arta Program Traffic Analysis Report (2023).

As a part of the *Arta Program – Aurora Highlands Alternatives Analysis Report* (June 2023), a *Traffic Forecast Memorandum* (June 2022) was included in the report that shows the background traffic by excluding TAH and a development immediately to the east, ALC (formerly known as ATEC), from the NEATS. Matrix used this figure (Figure 5 – Traffic Forecast Memo) and added the ALC traffic from the most up to date study, *Aurora Logistics Center TIA* (April 2024) to the background volumes for another comparison.

A figure similar to what was shown in Figure 3, is shown in Figure 4, below, to assess how much traffic is increased or decreased compared with the traffic forecasting memorandum background volumes, plus the ALC (2024) traffic.

Figure 4 – Percentage Increase/Decrease - Adjacent Developments Traffic Compared with the Traffic Forecasting Memorandum Background (2022) plus ALC (2024)

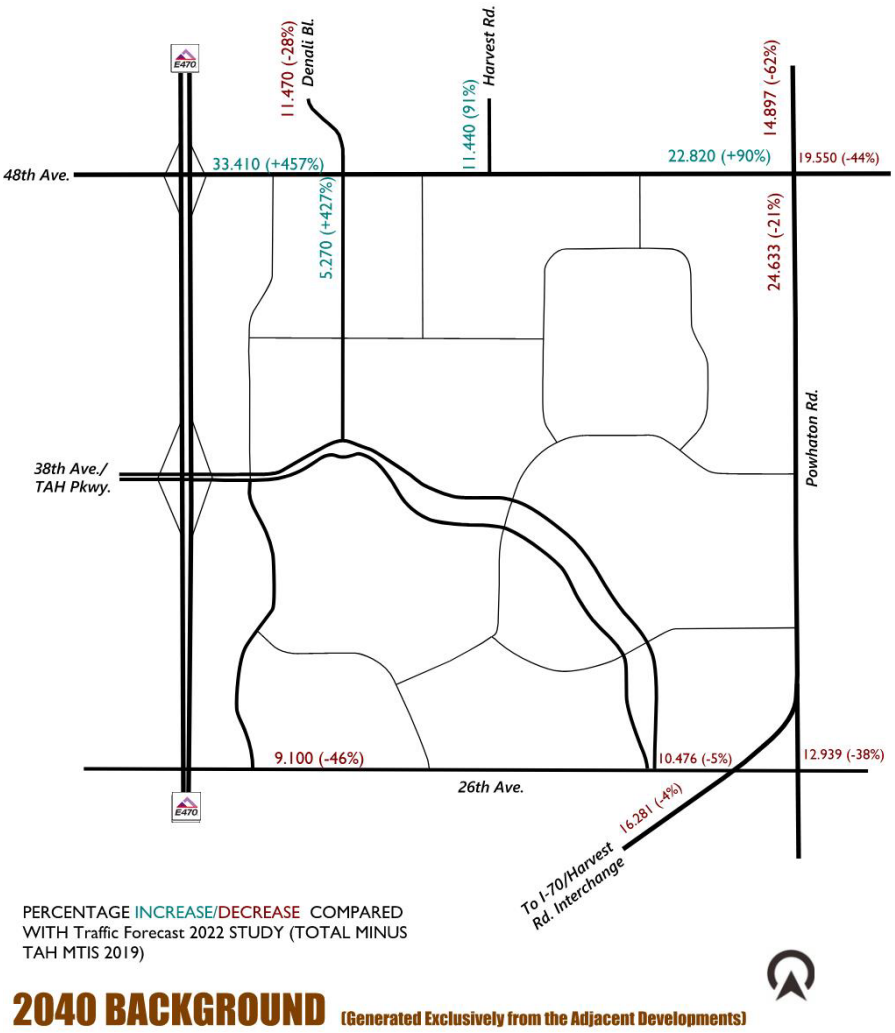


Numbers represent ADT in 1,000s.

As shown in Figure 5, using only the traffic generated by the adjacent developments, underestimates the traffic on all roadways except for 48th Avenue, and Denali Boulevard south of 48th Avenue.

For the last comparison, Matrix deducted TAH traffic estimated in the MTIS (2019) from the total site traffic ADT shown in Figure 7 of the Traffic Forecast Memorandum (2022). Results are shown in Figure 5, below.

Figure 5 – Percentage Increase/Decrease - Adjacent Developments Traffic Compared with the Total Site Traffic ADT (Memo 2022) minus TAH Traffic (MTIS 2019)



Numbers represent ADT in 1,000s.

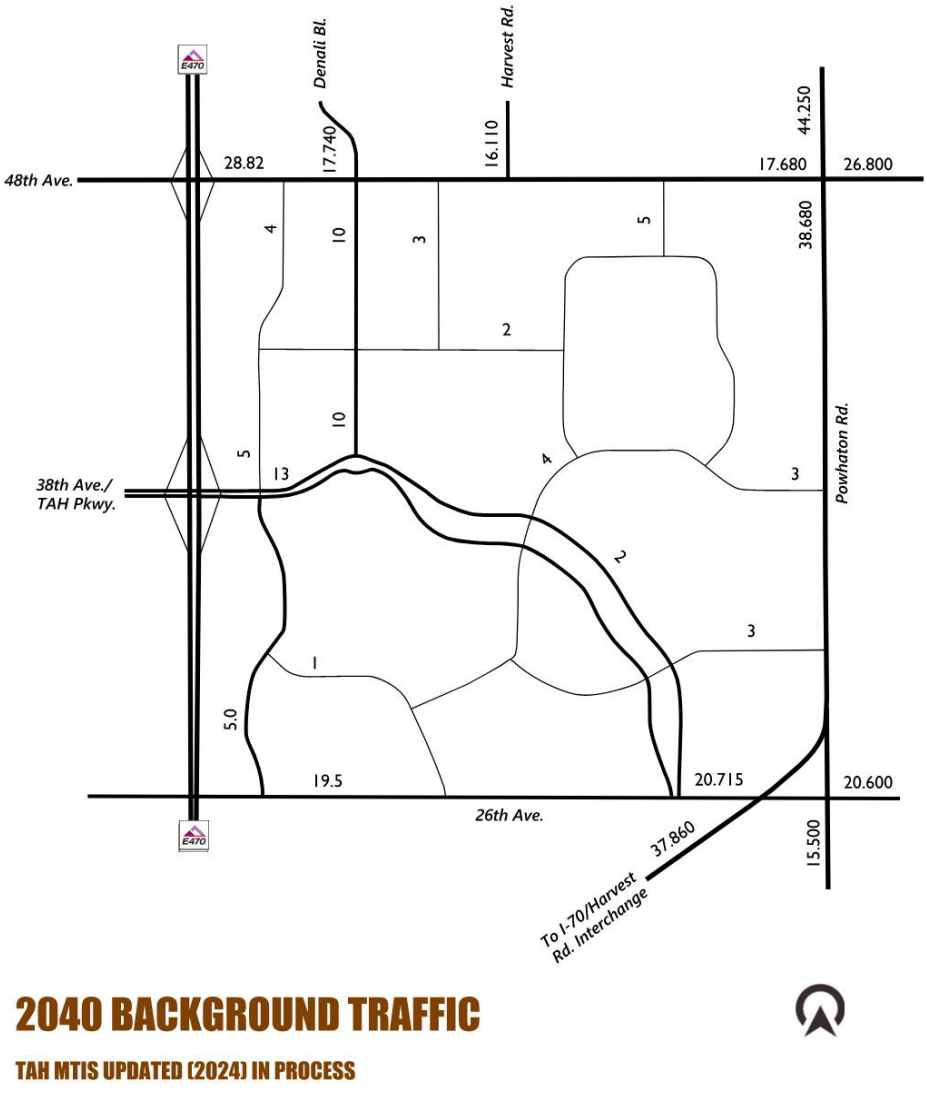
In the traffic forecast memo (2022) a new trip distribution and assignment was used for TAH as it is in the proximity of the new DDI. In addition, a new internal capture was preformed for this development as well. As a result, Matrix disregarded using the memorandum total site ADT minus TAH as an alternative. For example, the TAH only ADT for Powhaton Road south of 26th Avenue, or for 48th Avenue east of E-470 (Figure 4 – MTIS 2019) are higher than TAH plus ATEC volumes shown in Figure 6 of the memorandum.

After carefully assessing the different alternatives to obtain the background volumes, Matrix decided to use the traffic forecast memo background volumes and add the ALC traffic manually to the volumes. This decision was made after comparing Figures 3-5 and reviewing the Northeast Area – Development Proposals sketch plan (see appendix) that shows multiple other developments in the vicinity of the project that does not have an approved TIS yet, or perhaps an immediate plan to be constructed. The NEATS travel demand model with the adjustment mentioned above seems the most appropriate reference that Matrix will utilize. The background traffic for TAH MTIS update (2024-Ongoing) is shown in Figure 6.

Internal Roadway Volumes

Matrix is going to use the background volumes shown in the MTIS (2019) for the updated MTIS. The background volumes are shown in the Figure 6, below.

Figure 6 – TAH MTIS (Updated 2024) – 2040 Background Volumes



Numbers represent ADT in 1,000s.

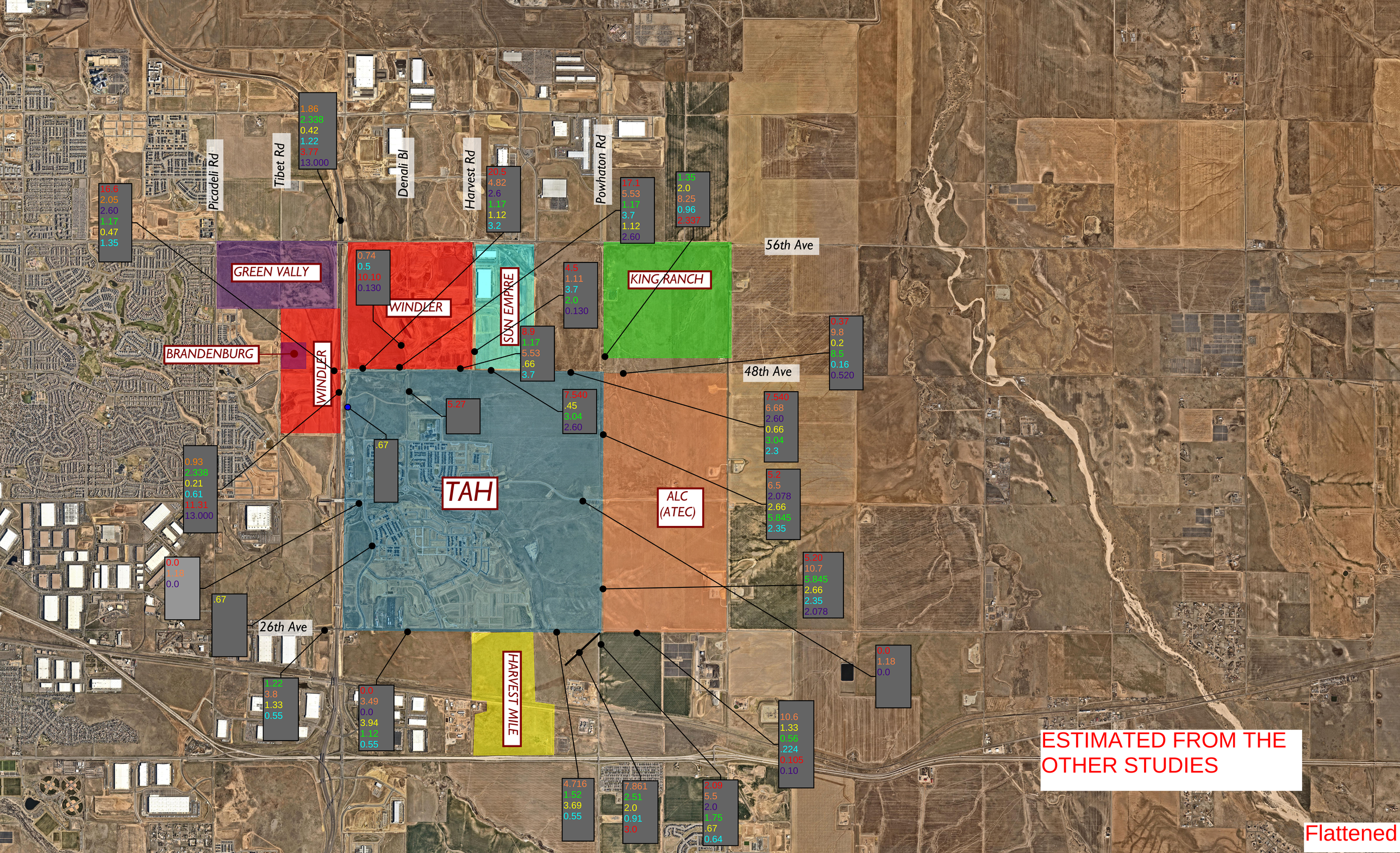
Summary

- Traffic studies from the adjacent developments were obtained and aggregated.
- The traffic generated from the adjacent developments were compared against a) TAH MTIS (2019) b) Traffic Forecast Memo background (2022) plus ALC (2024), and c) Traffic Forecast Memo total (2022) minus TAH (2019)
- It was determined that the Traffic Forecast memo background (2022) plus ALC, 2024 (Figure 6 of this letter) is the most appropriate to use as background volumes for the external road
- For the roadways within TAH, Matrix is going to use the MTIS (2019) background volumes.

Please let me know if you have any questions. You can contact me at Scott.Barnhart@matrixdesigngroup.com or at (303) 572.0200

Thank you.

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


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
15.6
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
3.9
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
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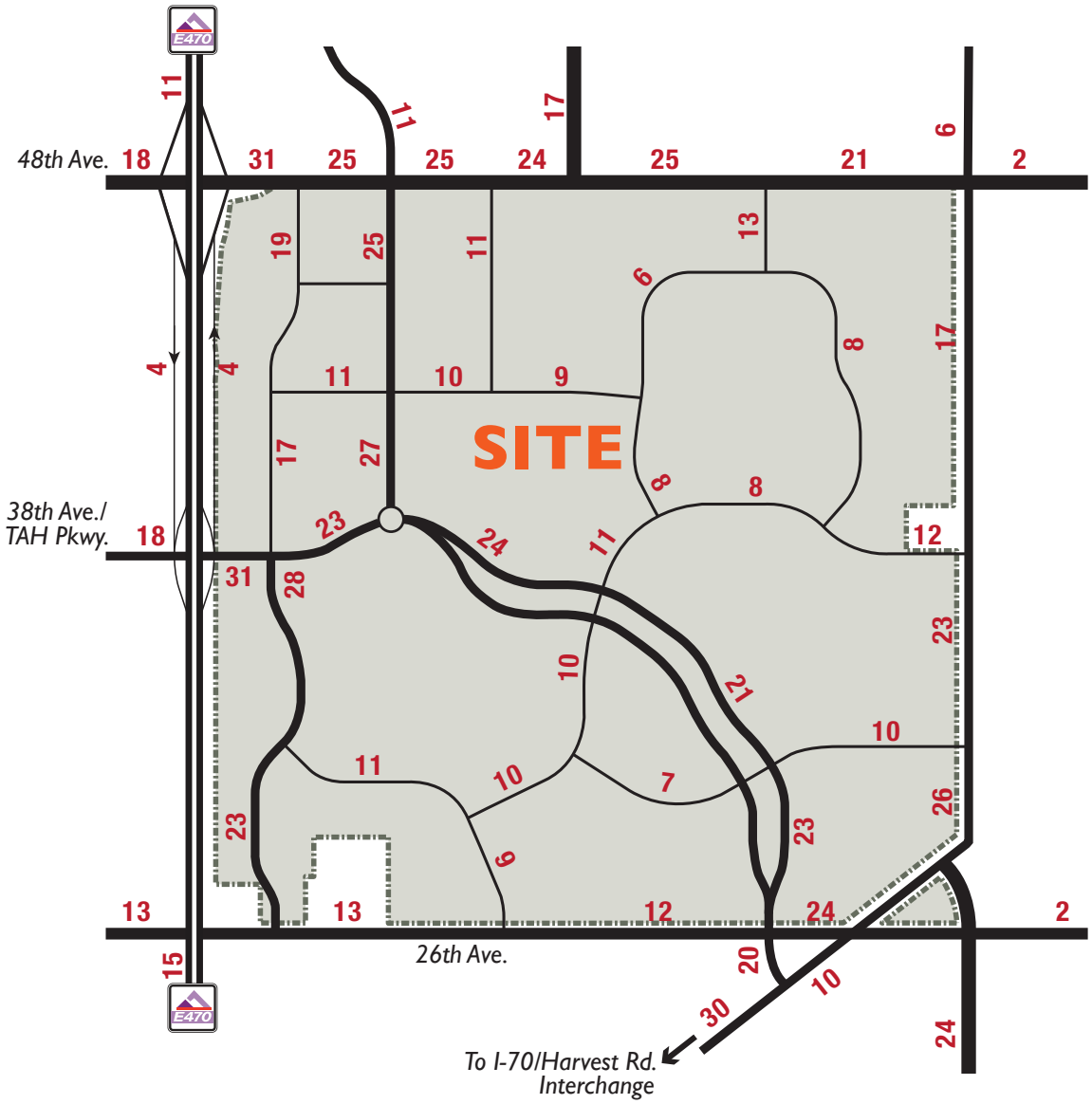
0.105
0.10
4.716
1.52
3.69
0.55
7.861
2.51
2.0
0.91
3.0
2.09
5.5
2.0
1.75
.67
0.64
ESTIMATED FROM THE
OTHER STUDIES
Flattened



LEGEND

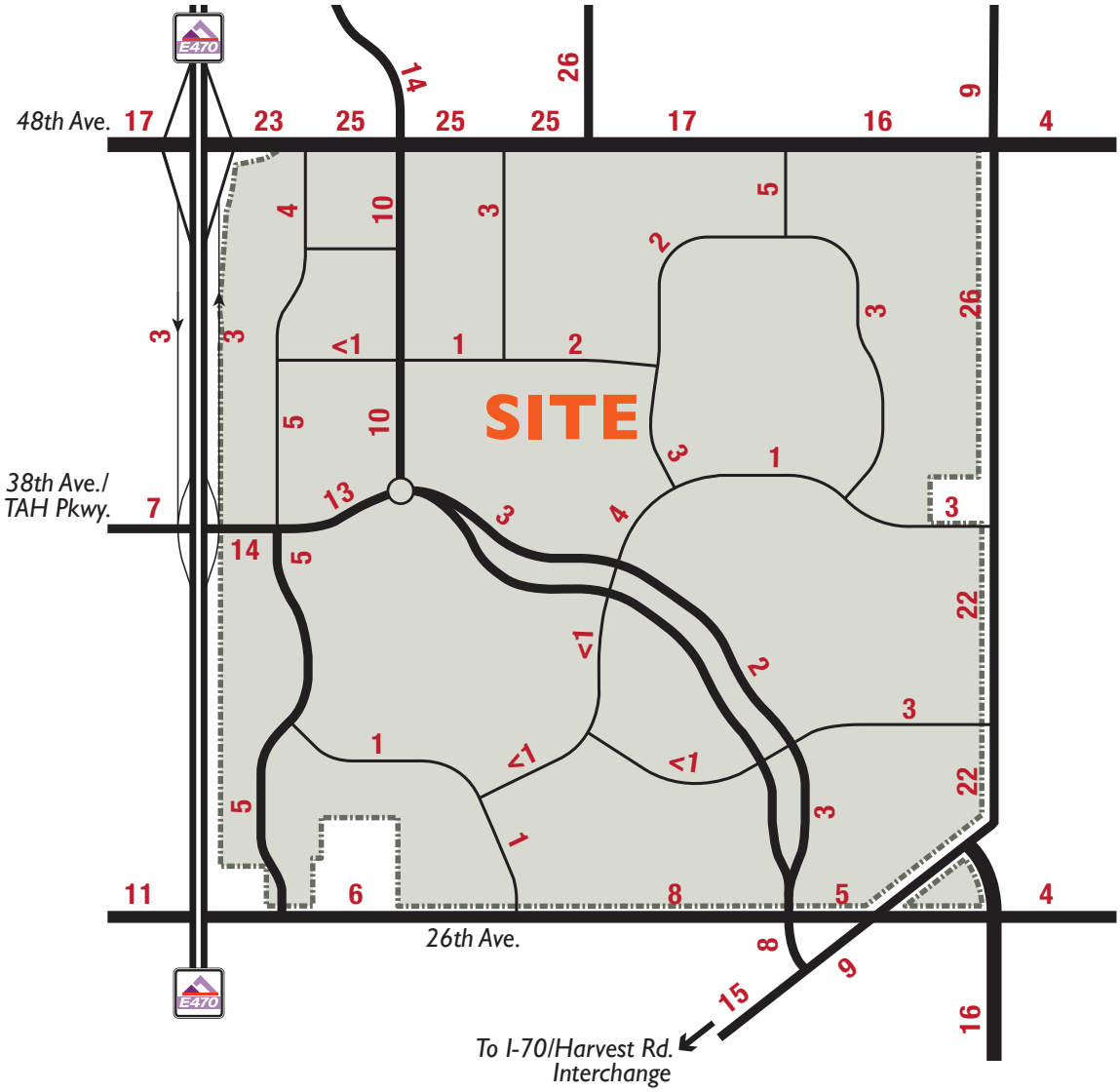
XXXX = Volumes in 1000's

= Aurora Highlands

FELSBURG HOLT & ULLEVIG

Aurora Highlands Only Traffic | FIGURE 4

The Aurora Highlands UPDATE 19-404 8/13/19



LEGEND

XXXX = Volumes in 1000's

= Aurora Highlands

NORTH

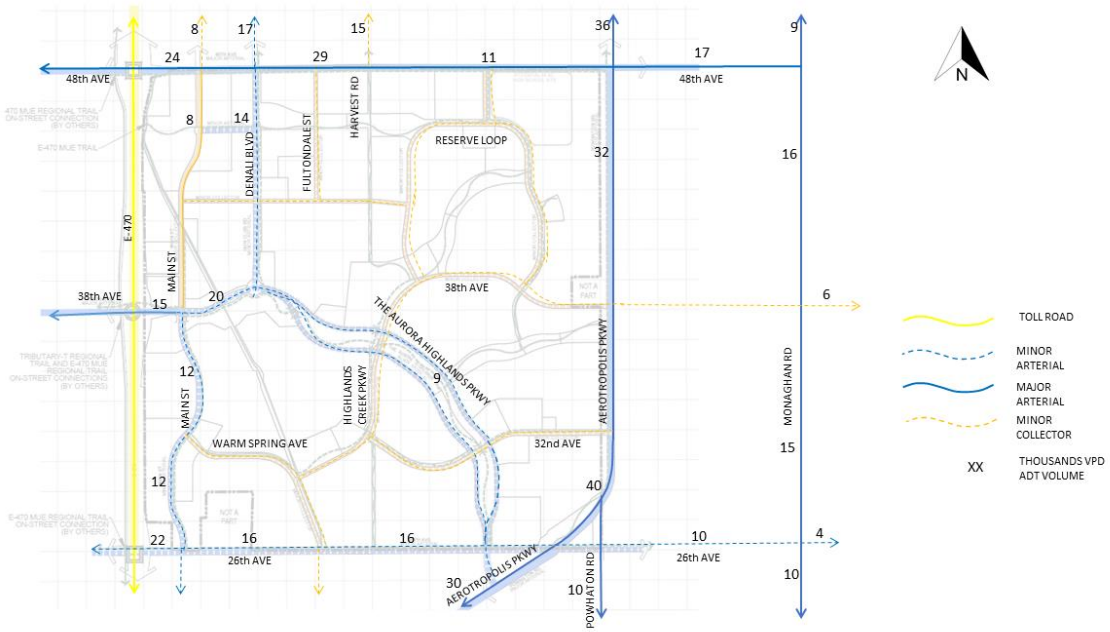
FELSBURG HOLT & ULLEVIG

2040 Background Traffic

FIGURE 5

The Aurora Highlands @ I-70/E-470 - REPORT 15-396 8/13/19

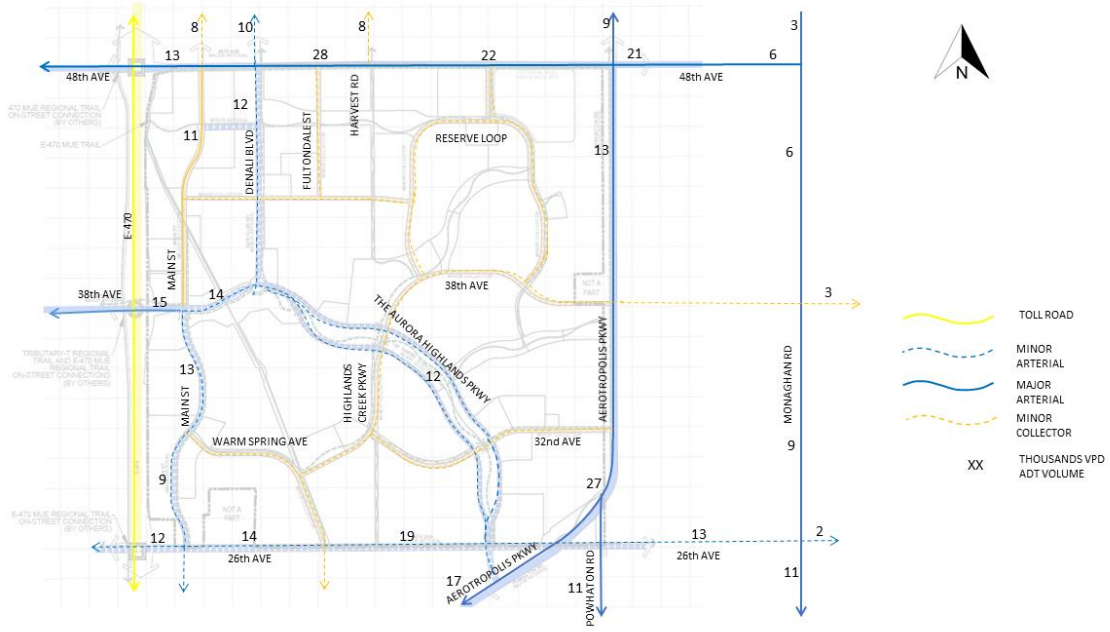
2040 Background



Source: AECOM

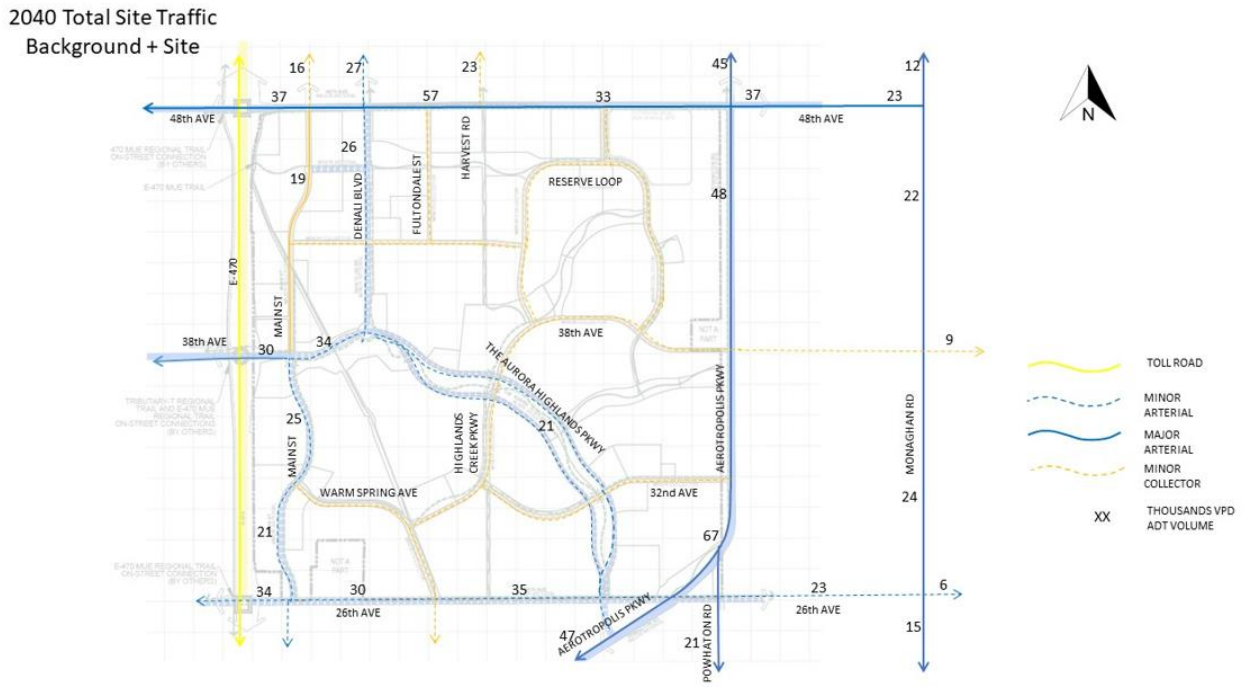
Figure 5 – 2040 Background ADT

2040 Site Traffic Only



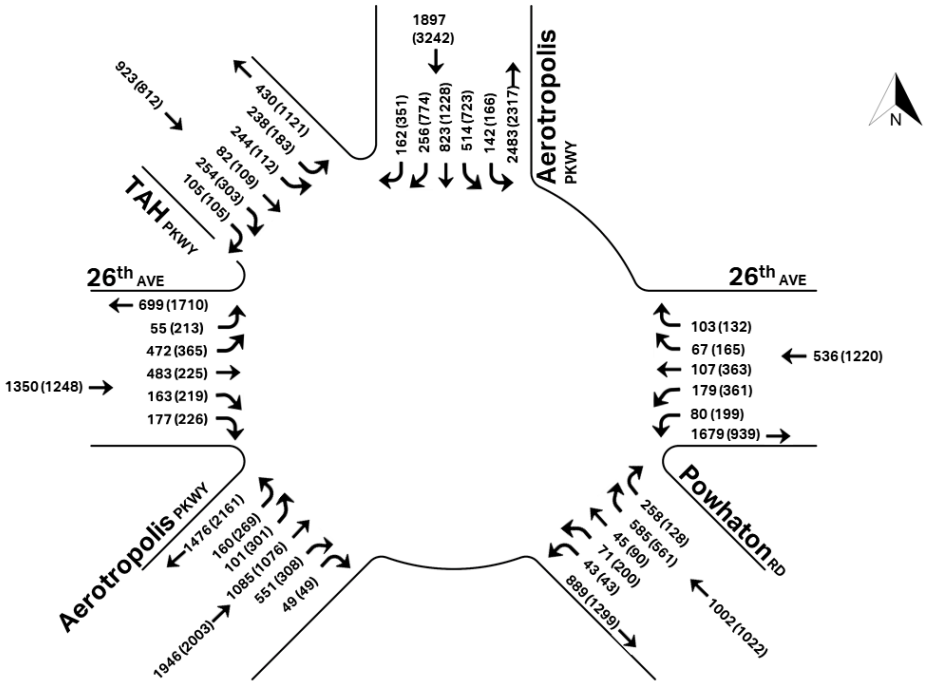
Source: AECOM

Figure 6 – Aurora Highlands/ATEC Site Traffic ADT



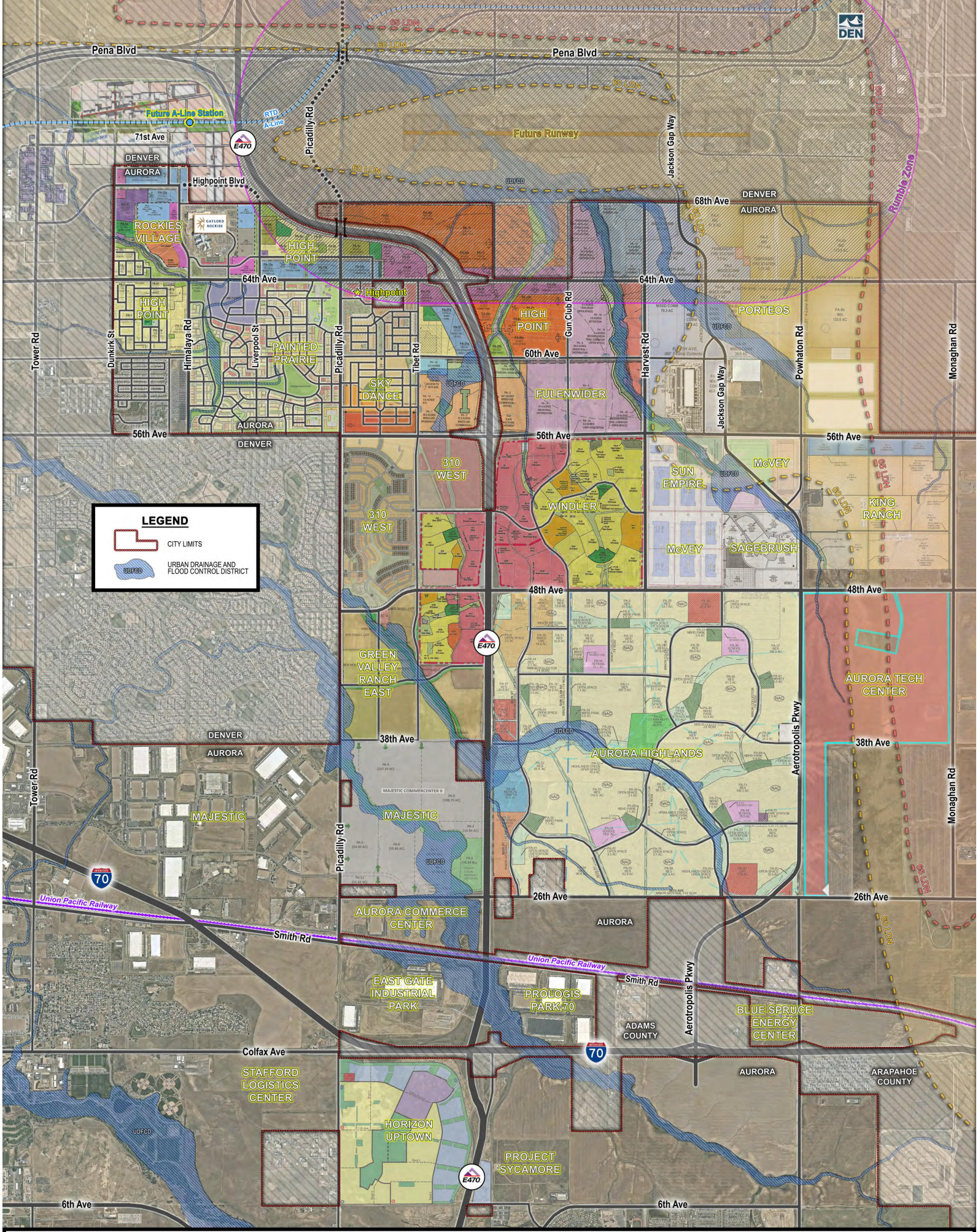
Source: AECOM

Figure 7 – Total Site Traffic ADT (Background + Site)



Source: AECOM

Figure 8 – 2040 Resultant One Intersection Total Volumes



NORTH EAST AREA - DEVELOPMENT PROPOSALS

0 .5 1mi North

11-10-2021