



Master Traffic Impact Study

January 2021

Comments 2/5/2021:

- 1) Previous FRA Traffic Study (May 2017) included a list of stakeholders that were engaged for approval of that study. The same stakeholders will need to be engaged for approval of this study, to include CU, FRA, UPI, Children's, UCH, Army, AIMCO, and City of Aurora designees.
- 2) May 2017 study utilized a detailed travel demand model for the FRA land uses to distribute and assign trips throughout the network within the context of surrounding land uses and infrastructure. To deviate from the standard 2.0% growth rate for Peoria/Fitzsimons Pkwy, a similar methodology would be expected.
- 3) Please include a breakdown (possibly as an Appendix) of how land use assumptions have changed from 2017 to now.
- 4) Preliminary warrant analyses will be needed for future proposed signalized locations based on projected traffic volumes. All-way stop warrants will need to be evaluated for proposed all-way stop controls as well.
- 5) Improvements were reviewed in a cursory means only, as there remain pending comments on methodology that may affect recommendations.
- 6) See other comments throughout.

Fitzsimons Innovation Campus

- 1) A memorandum is being prepared to re-engage stakeholders with the update to the master traffic impact study for the Fitzsimons Innovation Campus development (Fitzsimons MTIS).
- 2) Based on the meeting held with City of Aurora staff on Monday, September 12, 2022, it was determined that the 2050 DRCOG model could be utilized for determining appropriate growth rates along Fitzsimons Parkway, Peoria Street, and Montview Boulevard. These calculations have been provided in the revised Fitzsimons MTIS.
- 3) A table has been provided in the appendix with a comparison of the land uses from the original 2017 MTIS to the uses in the current proposal.
- 4) Signal warrants and all-way stop control warrants have been provided for the intersection locations that recommend these controls in the revised MTIS.
- 5) It is understood that a more thorough review will be provided once the trip distribution and traffic volume projections are finalized.
- 6) Please see individual responses throughout this document.

M A S T E R T R A F F I C I M P A C T S T U D Y

Fitzsimons Innovation Campus

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Note that with changed/increased customer area this may change the wet utility projections originally listed in the Master Plan. Need confirmation that these new improvements won't cause any changes as listed in the 2016 Master Plan by Master (Amendment #6) Section 3 and 4.

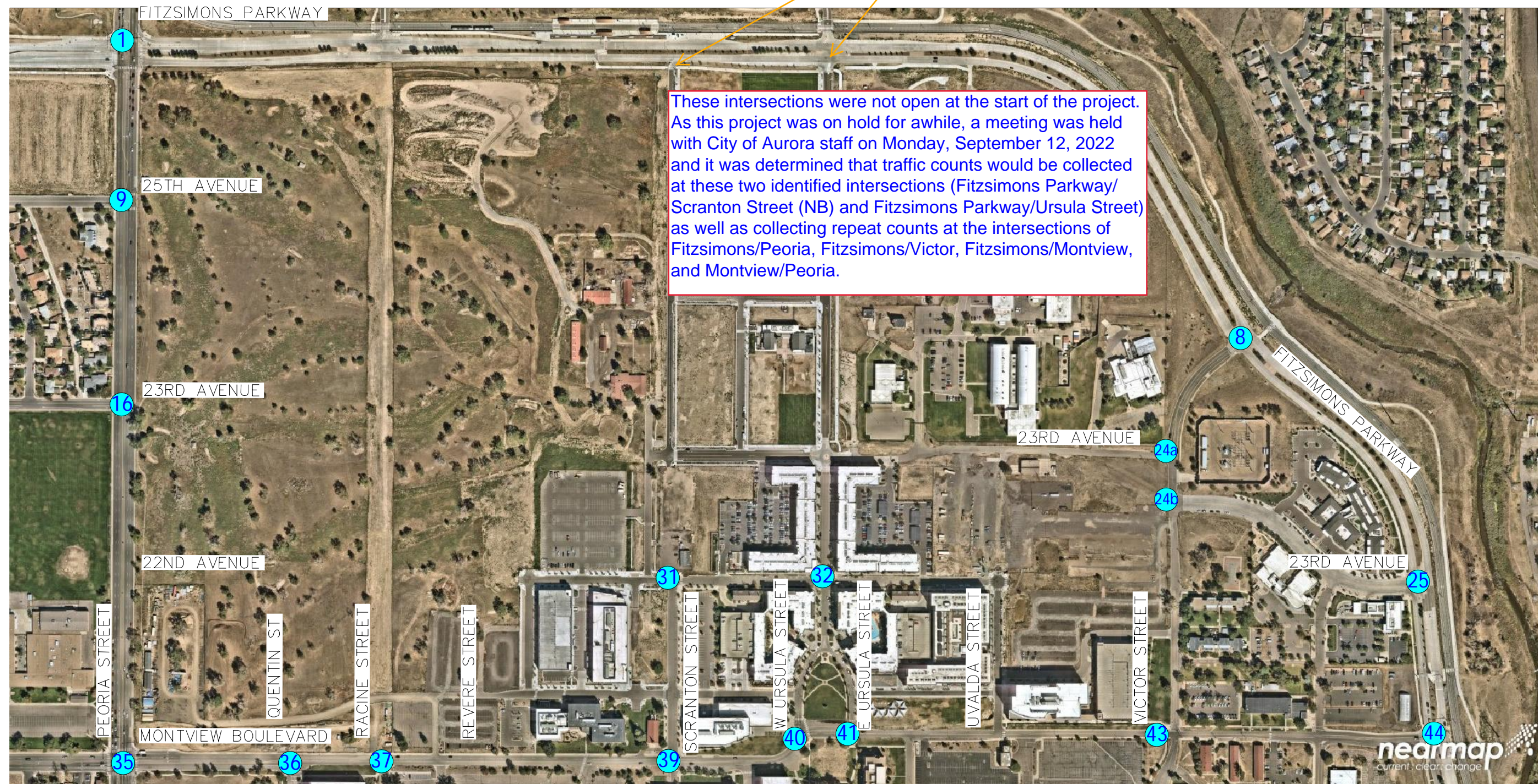
2.0 INTRODUCTION

Kimley-Horn has prepared this report to document the results of an updated Master Traffic Study of future traffic conditions associated with Fitzsimons Innovation Campus in Aurora, Colorado. A vicinity map illustrating the existing site area and key intersections with the surrounding area is shown in **Figure 1**. Fitzsimons Innovation Campus is currently developing and proposing to continue to develop the land area bounded by Fitzsimons Parkway to the north and east, Montview Boulevard to the south, and Peoria Street to the west. A detailed site plan illustrating the development area is shown in **Appendix E**.

It is understood that any recommendation changes may potentially change the wet utility projects in the area. A table has been provided in the updated MTIS identifying recommendation changes from the GDP/Original Master Study.

This study is to provide an update to the previous *City of Aurora Traffic Study of Fitzsimons Innovation Campus* Final Edition completed by Felsburg, Holt, & Ullevig (FHU) in May 2016 for the same development area. The updated evaluation of Fitzsimons Innovation Campus is due to a change in proposed uses and having more defined user access and traffic volumes. This study provides a more detailed intersection operations analysis. Further, with a previous evaluation of Fitzsimons Innovation Campus already developed, baseline traffic data was collected to determine existing traffic patterns and intersection operations. Of note, the FHU Fitzsimons Redevelopment Authority traffic study only provided intersection turning movement data estimates and operational level of service analysis for the external intersections along Fitzsimons Parkway, Montview Boulevard, and Peoria Street with exception of evaluation of the 23rd Avenue and Scranton Parkway intersection. Based on additional access information, this updated traffic evaluation of Fitzsimons Innovation Campus provides turning movements estimates and intersection operational level of service analysis for all key internal and external intersections which accounts for full buildout of the surrounding area. For purposes of this master traffic study, analysis was conducted for the 2040 horizon.

The Fitzsimons Innovation Campus is anticipated to contain a mix of office, multifamily residential, research, industrial, school, and hotel uses. At full buildout with inclusion of several existing uses, Fitzsimons Innovation Campus is expected to include the following development areas as identified in **Table 1** on a block-by-block basis with the blocks identified as labeled on the Site Plan of **Appendix E**.



FITZSIMONS INNOVATION CAMPUS MASTER TRAFFIC IMPACT STUDY
EXISTING SITE AREA AND KEY INTERSECTIONS

FIGURE 1

3.4 Unspecified Development Traffic Growth

In conformance with the City of Aurora Traffic Impact Study Guidelines, a two percent annual growth rate is typically used to estimate future traffic volume conditions for long-term horizons. However, site generated traffic volumes from remaining development within Fitzsimons is expected to account for approximately 1.6 percent growth per year along Peoria Street and higher growth rates along all other studied roadways. As such, and to provide the most accurate analysis, an annual growth rate of 0.5 percent was used along Peoria Street and Fitzsimons Parkway as a baseline to calculate background traffic volumes 2040 prior to the addition of FIC traffic. Further, 2040 traffic volume projections from the *Martin Luther King Jr. Boulevard Extension Traffic Analysis* completed by AECOM in January 2018 were incorporated for the future west leg of Martin Luther King Jr. Boulevard at the Fitzsimons Parkway and Peoria Street intersection. Traffic volumes from this study were also balanced along the Peoria Street and Fitzsimons Parkway corridor. Based on this, remaining development within Fitzsimons and incorporating traffic projections from the Martin Luther King, Jr. Boulevard traffic study is expected to account for approximately 2.05 percent growth per year along Peoria Street and Fitzsimons Parkway. For reference, the Denver Regional Council of Governments (DRCOG) 2040 traffic projections model indicates an average annual growth of approximately 0.90 percent along Peoria Street and Fitzsimons Parkway within the project limits; therefore, traffic estimates within this study exceed estimates from DRCOG and should be conservative. Applicable documents from the Martin Luther King Jr. Boulevard traffic study are attached in **Appendix B**.

May 2017 study utilized a detailed travel demand model for the FRA land uses to distribute and assign trips throughout the network within the context of surrounding land uses and infrastructure. To deviate from the standard 2.0% growth rate for Peoria/Fitzsimons Pkwy, a similar methodology would be expected.

Based on the meeting held with City of Aurora staff on Monday, September 12, 2022, it was determined that the 2050 DRCOG model could be utilized for determining appropriate growth rates along Fitzsimons Parkway, Peoria Street, and Montview Boulevard. These calculations have been provided in the revised Fitzsimons MTIS.

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

Fitzsimons Innovation Campus is categorized with 37 blocks labeled A-KK with blocks CC-EE providing current operations within Bioscience Buildings 1 and 2 as illustrated in the development site plan of **Appendix E** and represented in existing traffic counts. At full buildout, Fitzsimons Innovation Campus is anticipated to include approximately the following uses:

- 4,300,000 Square Feet of Office
- 350,000 Square Feet of Research/Innovation Center
- 275,000 Square Feet of Industrial
- 900 Multifamily Residences
- Two (2) Schools with 1,230 Students
- 120 Room Hotel

A breakdown of how trip gen compares to 2017 study would be helpful (i.e. how land use has changed from then to now). This could be included in an appendix.

A table has been provided in the appendix with a comparison of the land uses from the original 2017 MTIS to the uses in the current proposal.

For this study, Kimley-Horn used the ITE Trip Generation equations that apply to Industrial Park (ITE Code 130), Hotel (ITE 310), Public Park (ITE 411), High School (ITE 420), General Office (ITE 430), and Research and Development Center (ITE 760) for traffic associated with the development. Further, site generated trips from the following traffic studies were included in the traffic volumes for this study:

- *APS Science and Technology School at Fitzsimons Traffic Impact Study (Nov. 2018)*
- *Fitzsimons Compositive School Traffic Impact Study (October 2018)*
- *UCH Lot 23rd Avenue and Peoria Street Transportation Impact Study (July 2020)*
- *Fitzsimons Phase 3A Apartments and Hotel Traffic Impact Study Update (August 2018)*

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.

The trip generation worksheets/calculations and applicable documents from adjacent traffic studies are included in **Appendix C**. These calculations illustrate the equations used and directional distribution of trips based on ITE studies.

Remaining development within Fitzsimons Innovation Campus not represented in existing traffic counts is expected to generate approximately 57,196 daily weekday trips with 5,918 of these trips occurring during the morning peak hour and 5,897 of these trips occurring during the afternoon peak hour. Since Fitzsimons Innovation Campus is proposed to contain a mix of uses and to be a walkable area, internal capture trips are expected to occur on site as well. These internal capture trips are shared trips from vehicles already within the internal street network. Ride sharing, flexible working hours, and multimodal usage are other factors to reduce trips to the Fitzsimons Innovation Campus. Programmed trip reductions from the original Fitzsimons Redevelopment Authority traffic study were utilized in the updated master traffic impact study and are as follows:

- Office: 22.5%
- Industrial: 9.0%
- Research: 27%
- Residential: 25%

Previously approved
reductions are
acceptable.

Acknowledged.

It should be noted that the original master traffic impact study incorporated a reduction rate of 49.5 percent for education and 27 percent for hotel uses; however, these uses were accounted for in adjacent development traffic impact studies, and the full site generated traffic volumes from these studies were incorporated in this study.

Accounting for internal capture, Fitzsimons Innovation Campus is expected to generate approximately 45,376 daily weekday external vehicle trips with 4,788 of these vehicle trips occurring during the morning peak hour and 4,724 of these trips occurring during the afternoon peak hour. **Table 2** summarizes the estimated external trip generation for the proposed development.

A breakdown of how trip gen compares to 2017 study would be helpful (i.e. how land use has changed from then to now). This could be included in an appendix.

Table 2 – Fitzsimons Innovation Campus External Project Traffic Generation

Block	Land Use & ITE Code	Quantity	Weekday Vehicle Trips						
			Daily						
A	Office (ITE 710)	410,000 SF	3,232						
B	Office (ITE 710)	120,000 SF	982						
C	Office (ITE 710)	333,000 SF	2,642						
D	Office (ITE 710)	416,360 SF	3,280						
E-F	APS High School (Traffic Study)	950 Students	2,146	531	163	454	100	229	531
G-H	Office (UCH Peoria Lot Traffic Study)	675,000 SF	5,244	522	85	607	96	505	601
I	Office (ITE 710)	174,600 SF	1,414	127	21	148	24	126	150
J	Office (ITE 710)	138,000 SF	1,124	104	17	121	19	101	120
K-L	Public Park (ITE 411)	6 Acres	4	0	0	0	1	0	1
N	Office (ITE 710)	227,000 SF	1,822	160	26	186	31	161	192
O	Office (ITE 710)	94,800 SF	782	78	12	90	13	71	84
P	Compositive School (Traffic Study)	280 Students	1,050	135	112	247	80	93	173
Q	Mid-Rise Multifamily Housing (ITE 221)	200 Units	818	14	37	51	39	26	65
R	Mid-Rise Multifamily Housing (ITE 221)	200 Units	818	14	37	51	39	26	65
S	Office (ITE 710)	470,000 SF	3,690	312	51	363	61	322	383
T	Industrial Park (ITE 130)	271,000 SF	832	79	19	98	21	78	99
U	Office (ITE 710) - Bio5 Traffic Study	45,000 SF	380	46	8	54	6	35	41
	Research/Innovation Center (ITE 760)	45,000 SF	372	10	4	14	2	14	16
V	Office (ITE 710)	194,650 SF	1,570	140	22	162	26	140	166
W	Office (ITE 710)	430,000 SF	3,386	288	47	335	57	296	353
X	Office (ITE 710)	160,000 SF	1,298	118	19	137	22	116	138
Y-Z	Research/Innovation Center (ITE 760)	100,000 SF	822	23	7	30	5	31	36
AA	Research/Innovation Center (ITE 760)	80,000 SF	660	18	7	25	4	24	28
BB	Research/Innovation Center (ITE 760)	118,874 SF	980	26	10	36	7	36	43
CC-DD	Existing Bioscience 1	Represented in Existing Traffic Counts							
EE	Existing Bioscience 2	Represented in Existing Traffic Counts							
FF	Mid-Rise Multifamily Housing (ITE 221)	206 Units	842	14	38	52	41	26	67
GG	Office (ITE 710)	200,000 SF	1,612	143	23	166	27	143	170
HH-JJ-KK	Residential/Hotel (Phase 3A Traffic Study)	253 DU/120 RM	1,962	45	97	142	103	68	171
ii	Office (ITE 710)	200,000 SF	1,612	143	23	166	27	143	170
Total Trips after Internal Reductions			45,376	3,757	1,030	4,788	1,028	3,695	4,724

A table has been provided in the appendix with a comparison of the land uses from the original 2017 MTIS to the uses in the current proposal.

4.2 Internal Street Network and Development Access

The notable internal roadway network will be served by

and three (3) east-west collector streets. These 10 streets are categorized as primary collector streets or secondary collector streets. The primary collector streets have higher traffic volumes than the secondary collectors

arterial roadways. The secondary collector streets are designed to provide access to parking for the proposed development and create a pedestrian friendly environment. Racine Street, Scranton Street, Ursula Street, Uvalda Street, and 23rd Avenue are designed as primary collector streets while Quentin Street, Revere Street, Victor Street, 25th Avenue, and 22nd Avenue are the notable secondary collector streets. Most of the primary and secondary internal collector streets will be new roadways to the Fitzsimons Innovation Campus while some are existing but will be extended beyond their existing limits with continued development within the

Provide trip gen for Bioscience buildings as well to provide comparison with the 2017 study. It is noted that those trips were counted as Existing Traffic.

Trips have been quantified and in the appendix for currently proposed or existing developments within Fitzsimons.

Fitzsimons Innovation Campus. Scranton Street will be constructed as a couplet street with a wide center median with one-way travel northbound on the east side of the median and one-way travel southbound on the west side of the median.

Some technical analysis will need to be performed to provide a basis for this assumption.

4.3 Trip Distribution

Distribution of Fitzsimons Innovation Campus traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding development areas and type, and the proposed access and roadway network system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. Trip distribution in this study essentially remained the same from the original Fitzsimons Redevelopment Authority traffic study with exception of incorporating additional trips to and from the northwest area of the study limits. It is believed that the connection of Martin

Luther King Jr. Boulevard to Peoria Street was underrepresented in the original traffic study.

Further, with a portion of Fitzsimons Innovation Campus already developed, baseline traffic data was collected in this study to determine traffic data and the close proximity to I-70, it is also believed that traffic data and the along Peoria Street. A trip distribution including trips to and from the north was assigned to the northwest and the removed from trips to and from the southeast. It should be noted that the trips expected to and from the southeast along Fitzsimons Parkway are still anticipated to be the highest trip distribution percentage even with this change. The project trip distribution is illustrated in **Figure 5**.

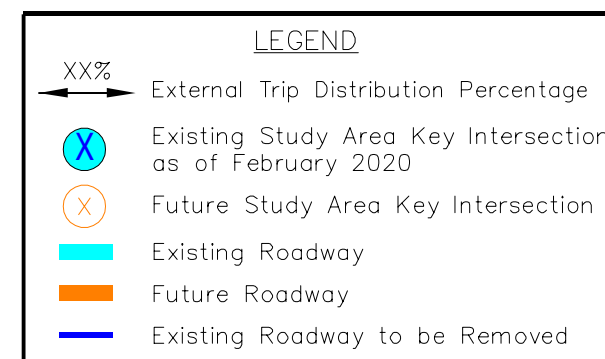
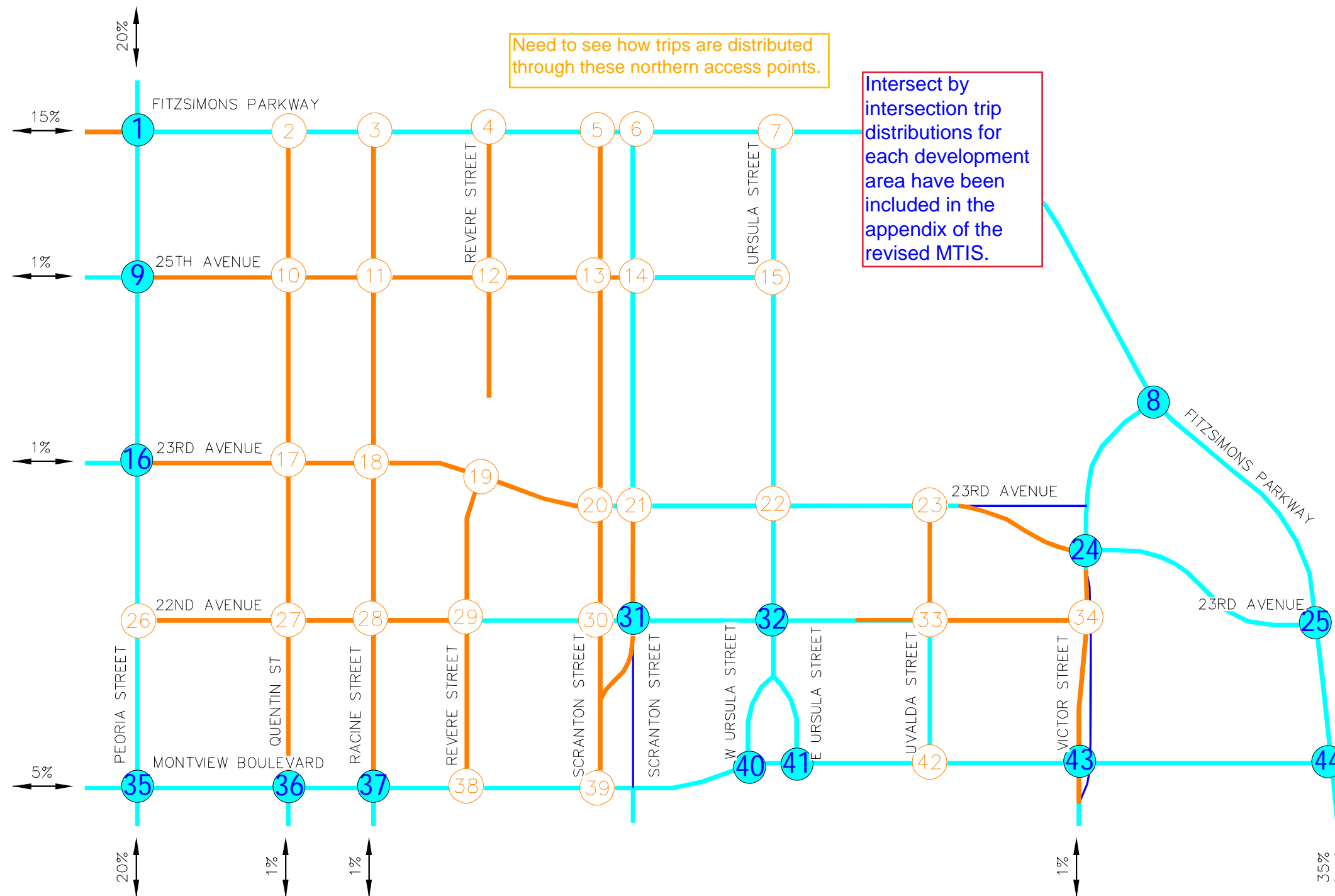
Existing traffic volumes and travel patterns have been quantified to justify changes in the external trip distribution from the original MTIS.

4.4 2040 Total Traffic Volume Projections

Project traffic volumes were added to background traffic volume projections to represent estimated future traffic conditions for the long-term 2040 horizon. **Figure 6** and **Figure 7** illustrate the total traffic volume projections in 2040 at the study key intersections for the northern and southern campus.

FRA Traffic Study utilized a stochastic trip

Understood, now that parking accesses have been planned at a high level, a micro model of trip distribution has been developed with each development area. Stochastic characteristics have also been applied with developing travel patterns based on intersection control and vehicle delays.

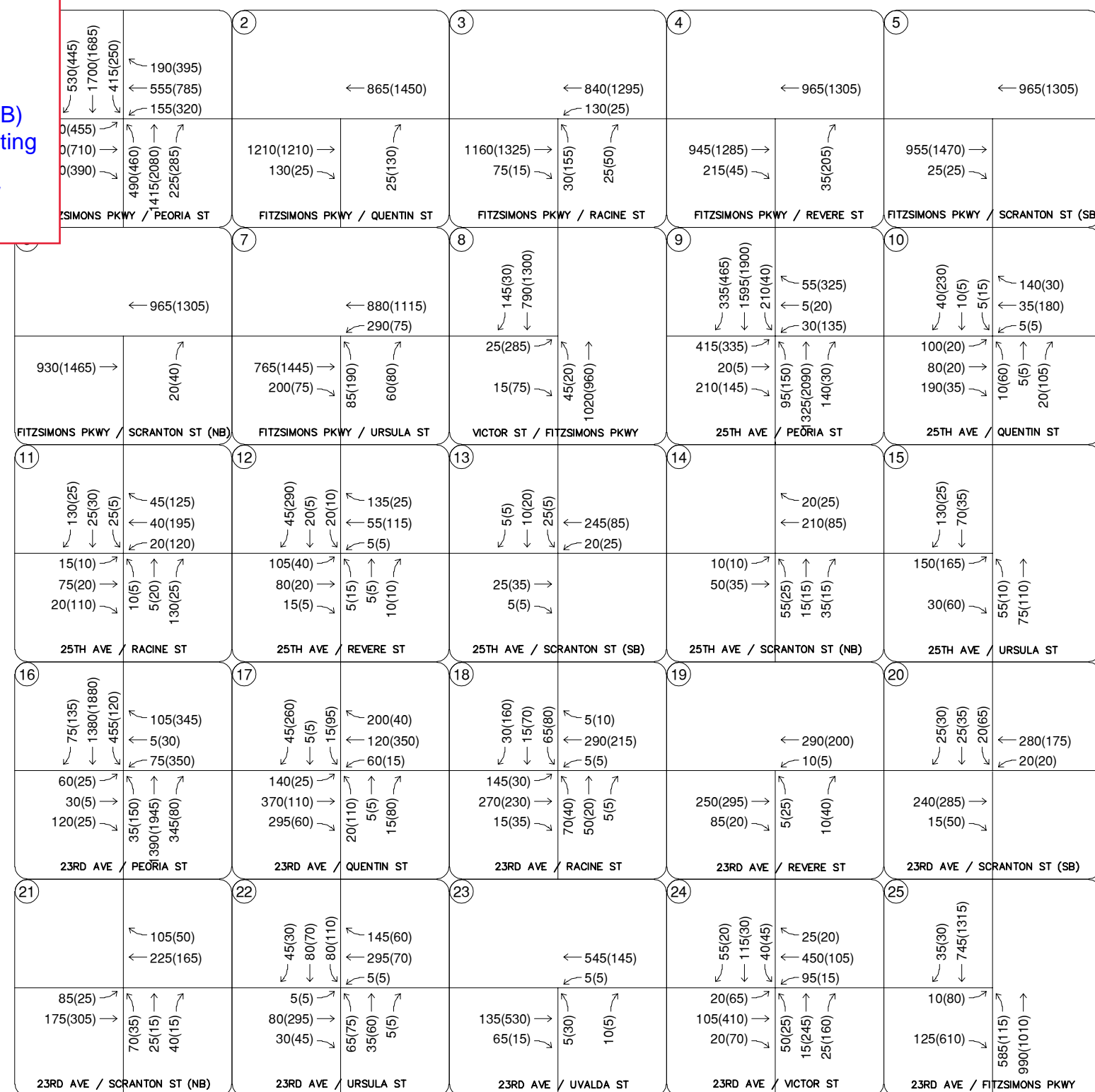
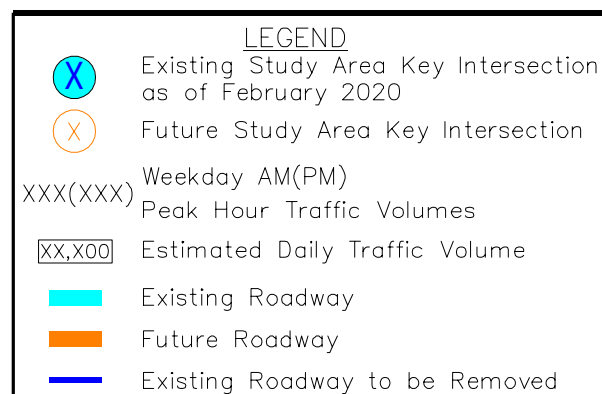
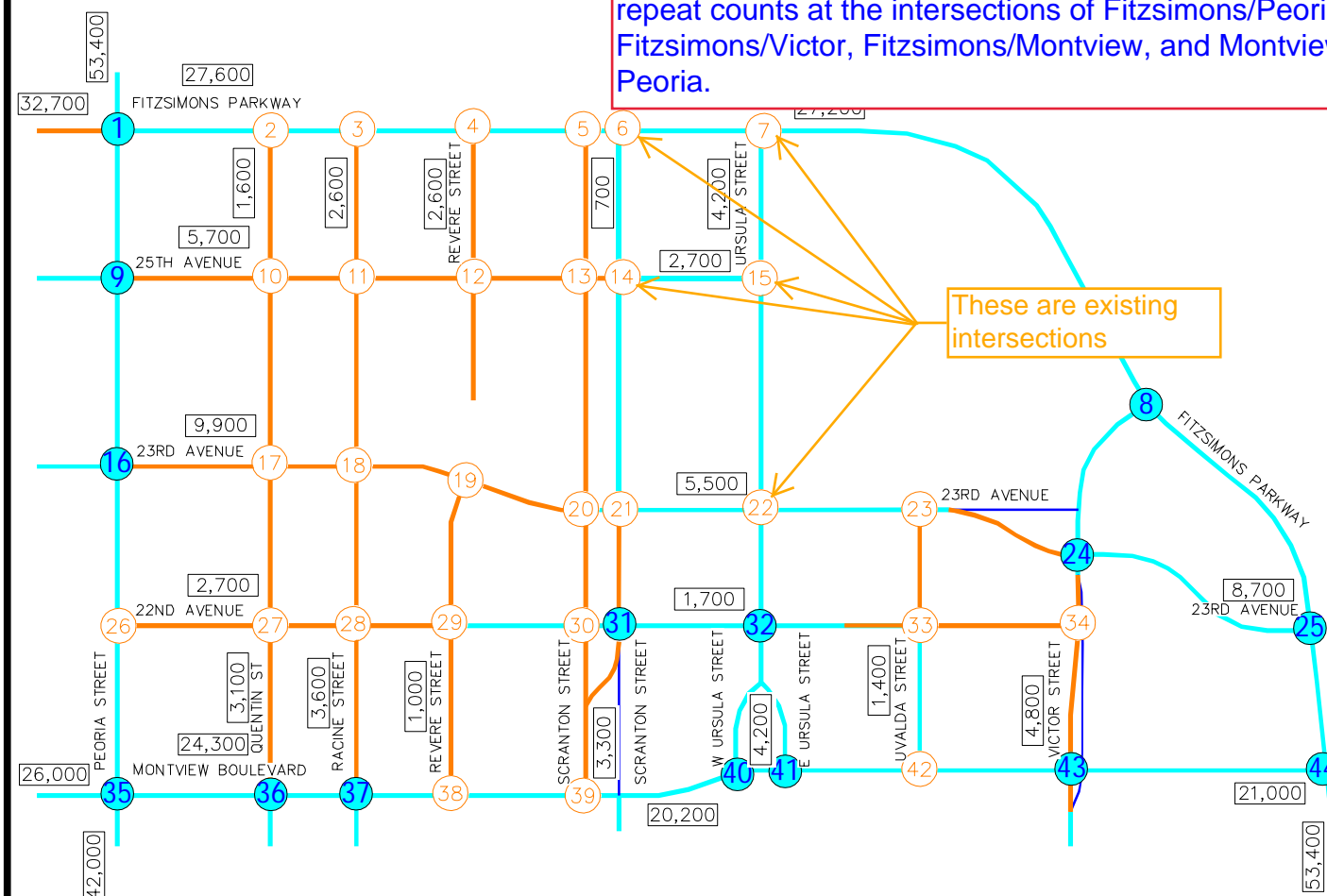


FITZSIMONS INNOVATION CAMPUS MASTER TRAFFIC IMPACT STUDY
PROJECT TRIP DISTRIBUTION

FIGURE 5

The currently open intersections have been identified in the revised MTIS. As this project was on hold for awhile, a meeting was held with City of Aurora staff on Monday, September 12, 2022 and it was determined that traffic counts would be collected at the recently opened intersections of Fitzsimons Parkway/Scranton Street (NB) and Fitzsimons Parkway/Ursula Street as well as collecting repeat counts at the intersections of Fitzsimons/Peoria, Fitzsimons/Victor, Fitzsimons/Montview, and Montview/Peoria.

These are existing intersections



FITZSIMONS INNOVATION CAMPUS MASTER TRAFFIC IMPACT STUDY
2040 TOTAL TRAFFIC VOLUMES (NORTH)

FIGURE 6

Improvements were reviewed in a cursory means only, as there remain pending comments on methodology that may affect recommendations.

5.3 Improvement Summary

Based on the analysis presented in the development of Fitzsimons Innovation Campus and incorporated into the existing and future roadway network and expected traffic volumes resulted in the recommended intersection control and roadway segments summarized in **Table 5**. Based on the results of the intersection analysis, improvements were identified as being needed at key study intersections in the long term 2040 planning horizon to provide an update to the Fitzsimons Redevelopment Authority master traffic study. These improvements are summarized in **Table 6** as well as **Figures 8** and **9** for the 2040 horizon for the northern and southern areas of campus. The roadway plan for the Fitzsimons Innovation Campus is illustrated in **Figure 10**.

It is understood that a more thorough review will be provided once the trip distribution and traffic volume projections are finalized.

With the recommended improvements, all intersections are expected to operate acceptably during the peak hours in 2040 with exception of the Fitzsimons Parkway/Peoria Street and Montview Boulevard/Peoria Street signalized intersections as they both report LOS E during one or both studied peak hours. The ultimate roadway section lane configurations feasible have been recommended at both of these intersections and the results at the intersection of Martin Luther King Jr Boulevard/Fitzsimons Parkway and Peoria Street are consistent with the findings from the results within the *Martin Luther King Jr. Boulevard Extension Traffic Analysis*. Further, the intersection of Montview Boulevard and Peoria Street currently operates at LOS E during the afternoon peak hour and ultimate roadway improvements have been recommended to maintain a LOS E during the afternoon peak hour in 2040.

Fitzsimons Innovation Campus desires that the intersections of 23rd Avenue/Quentin Street and 23rd Avenue/Victor Street operate with all-way stop control.

Eastbound left turn movements at the 23rd Avenue and Fitzsimons Parkway intersection are expected to experience long delays during the peak hours in 2040. Vehicles performing eastbound left turn movements at the 23rd Avenue and Fitzsimons Parkway intersection can reroute to the future signalized intersection of Victor Street and Fitzsimons Parkway if long vehicle delays are experienced during the peak hours. The City of Aurora could consider restricting the 23rd Avenue and Fitzsimons Parkway intersection to three-quarter movements in the future if vehicle delays are experienced at this intersection.

Preliminary warrant analyses will be needed for future proposed signalized locations based on projected traffic volumes. All-way stop warrants will need to be evaluated for proposed all-way stop controls as well. If an all-way stop control is not warranted, it is possible that a roundabout be the preferred control for the proposed intersection, if such would provide enhanced safety and operational benefits to vehicular/pedestrian/bicycle modes.

Table 5 – Fitzsimons Inter

Control Type	
Traffic Signals (12)	<ul style="list-style-type: none"> • Fitzsimons Pkwy & Peoria St (#1) • Fitzsimons Pkwy & Racine St (#3) • Fitzsimons Pkwy & Uvalda St (#7) • Fitzsimons Pkwy & Scranton St (#8) • 25th Ave & Peoria St (#9) • 23rd Ave & Peoria St (#10) • Montview Blvd & Peoria St (#35) • Montview Blvd & Racine St (#37) • Montview Blvd & Scranton St (#38)
Two-Way Stop (29)	<ul style="list-style-type: none"> • Fitzsimons Pkwy & Racine St (#2: Stop NB) • Fitzsimons Pkwy & Revere St (#4: NB) • Fitzsimons Pkwy & Scranton St (#5: None) • Fitzsimons Pkwy & Scranton St (#6: NB) • 25th Ave & Quentin St (#10: NB/SB) • 25th Ave & Racine St (#11: NB/SB) • 25th Ave & Revere St (#12: NB/SB) • 25th Ave & Scranton St (#13: EB/WB) • 25th Ave & Scranton St (#14: EB/WB) • 25th Ave & Ursula St (#15: EB) • 23rd Ave & Racine St (#18: NB/SB) • 23rd Ave & Revere St (#19: NB) • 23rd Ave & Scranton St (#20: EB/WB) • 23rd Ave & Scranton St (#21: EB/WB) • 23rd Ave & Fitzsimons Pkwy (#25: EB) • 25th Ave & Uvalda St (#26: WB) • 22nd Ave & Peoria St (#26: WB) • 22nd Ave & Quentin St (#27: EB/WB) • 22nd Ave & Racine St (#28: EB/WB) • 22nd Ave & Revere St (#29: EB/WB) • 22nd Ave & Scranton St (#30: EB/WB) • 22nd Ave & Scranton St (#31: EB/WB) • 22nd Ave & Ursula St (#32: EB/WB) • 22nd Ave & Uvalda St (#33: NB/SB) • 22nd Ave & Victor St (#34: EB) • Montview Blvd & Quentin St (#36: NB/SB) • Montview Blvd & Revere St (#38: SB) • Montview Blvd & E Ursula St (#41: None) • Montview Blvd & Uvalda St (#42: SB)
All-Way Stop or Roundabout (3)	<ul style="list-style-type: none"> • 23rd Ave & Quentin St (#17) • 23rd Ave & Ursula St (#22) • 23rd Avenue & Victor St (#24)
Lane Segments	Roadway
2-Lane Segment (10)	<ul style="list-style-type: none"> • Quentin Street • Racine Street • Revere Street • Scranton Street • Ursula Street • Uvalda Street • Victor Street • 25th Avenue • 23rd Avenue • 22nd Avenue
4-Lane Segment (2)	<ul style="list-style-type: none"> • Fitzsimons Parkway • Montview Boulevard
6-Lane Segment (1)	<ul style="list-style-type: none"> • Peoria Street

Black Text in Control Section = Existing Control Type; Blue Text in Control Section = Future Control Type