

# **The Stables**

## **Traffic Impact Study**



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Level of Service Definitions  
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Background Documentation  
Intersection Capacity Worksheets

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# THE STABLES TRAFFIC IMPACT STUDY

## 1.0 Introduction

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The Fox Tuttle Transportation Group has prepared this traffic impact study for the development of The Stables project. The ±4.79 acre property is located in the City of Aurora south of Exposition Avenue east of Havana Street. The property is currently used as a horse stables and is proposed to be replaced with 85 affordable multifamily residential units. Access to the site is planned to remain at the same location as today, onto Exposition Avenue aligned with the Expo Park ballfields parking lot. There is multifamily housing to the south, west, and north of the site, and a park, elementary school and open space to the east and north. **Figure 1** provides a vicinity map for the proposed project.

The purpose of this study is to assist in identifying potential traffic impacts within the study area as a result of this project. The traffic study addresses existing, short-term, and long-term peak hour intersection conditions in the study area with and without the project-generated traffic. The information contained in this study is anticipated to be used by the City of Aurora staff in identifying any intersection or roadway deficiencies and potential improvements for the build-out condition and long-term future scenarios. This study focused on the weekday AM and PM peak hours which represents the periods of highest trip generation for the proposed use and adjacent street traffic. The study is consistent with the requirements of the City of Aurora's Traffic Impact Study Guidelines (2025).

## 2.0 Project Description

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The Stables project plans to redevelop the property with 85 affordable multifamily residential units within two (2) buildings. The project will include on-site outdoor amenities for the residents to create a community. The project proposes to retain one (1) access on Exposition Avenue aligned with the Expo Park ballfield parking lot and one (1) secondary access to Exposition Avenue on the west side of the property for fire and life safety that will be typically closed with bollards. For the purpose of this traffic study, it was assumed the project will be completed by Year 2027. **Figure 2** shows the site plan and proposed access locations.



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## 3.0 Study Considerations

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### 3.1 Data Collection

Intersection turning movement volumes were collected in December 2024 at two (2) existing intersections on Exposition Avenue at the east site access and Havana Street during the weekday AM and PM peak hours, including pedestrians and bicyclists. Average daily traffic (ADT) was also collected on Exposition Avenue near the site access. Existing and historical traffic volumes on the study roadways were gathered from the Colorado Department of Transportation's (CDOT) Transportation Data Management System (TDMS) and CDOT's Online Transportation Information System (OTIS).

The existing traffic volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on this figure. Count data sheets are provided in the **Appendix**.

### 3.2 Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the *Highway Capacity Manual (HCM)*<sup>1</sup>. Existing peak hour factors (PHF) by approach and peak hour were applied to the study intersections for the existing scenarios. For long-term future scenarios, the PHF was set to 0.92 in the future unless the existing PHF was greater than these values. Study intersections were evaluated using Synchro software (v12).

### 3.3 Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a qualitative scale referred to as "Level of Service" (LOS) that is defined by the *HCM*. LOS characterizes the operational conditions of an intersection's traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). This scale represents the perspective of drivers and are an indication of the comfort and

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<sup>1</sup> *Highway Capacity Manual*, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 7<sup>th</sup> Edition (2022).

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convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D, specifically where there are low volumes and/or no viable alternative per the City of Aurora's Traffic Impact Study Guidelines. Criteria contained in the HCM was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the **Appendix** for reference.

## 4.0 Existing Conditions

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### 4.1 Roadways

The study area boundaries are based on the amount of traffic to be generated by the project and potential impact to the existing roadway network. The primary public roadways that serve the project site are discussed in the following text and illustrated on **Figure 1**.

**Exposition Avenue** is a two-lane collector roadway that provides connections between local streets and arterials in the area between Havana Street and Potomac Street (near I-225). Exposition Avenue provides direct access to single-family home neighborhoods, multi-family complexes, Expo Park, Highline Community Elementary School, retail businesses, and auto dealerships. The posted speed limit is 25 miles per hour (mph) and serves approximately 3,300 vehicles per day (vpd) near the project access. There are on-street bicycle lanes on Exposition Avenue near the project site and sidewalks continuous through the area.

**Havana Street** is a six-lane, north-south, arterial roadway that provides access through Aurora and is designated as State Highway 30 in this area (CDOT Classification of NR-B). Havana Street connects the study area to Hampden Avenue (US-285) to the south and 23<sup>rd</sup> Avenue to the north, with direct access to Colfax Avenue, Lowry Boulevard/6<sup>th</sup> Avenue, Parker Road, and other major arterials. The intersection of Havana Street and Exposition Avenue is a signalized full-movement intersection. The posted speed limit is 40 mph in the vicinity of the project. South of Exposition Avenue, Havana Street serves approximately 38,000 vpd (Year 2024). There are continuous sidewalks and no bicycle facilities on Havana Street in the study area.

## 4.2 Intersections

The study area includes two (2) existing intersections that are listed below with the current traffic control and were analyzed for existing and future background year traffic operations:

1. Exposition Avenue & Havana Street [signalized]
2. Exposition Avenue & Site Access / Park Access [side-street stop-controlled]

The existing lane configuration at each of the study locations is illustrated on **Figure 3**.

## 4.3 Pedestrian and Bicycle

The sidewalk network in the project area consists of attached sidewalks on both Exposition Avenue and Havana Street. There are discontinuous sidewalks on the south side of Exposition Avenue along some older properties to the west of the project site. There is a signalized midblock crosswalk about 630 feet east of the project site that promotes safe crossing for people associated with the elementary school and Expo Park, as well as local residents. The Westerly Creek Trail runs north-south along the east side of the project site, with an underpass to cross Exposition Avenue. This trail follows the irrigation ditch through northwest Aurora and connects to several parks, schools, and the Highline Canal (a 71-mile regional trail).

Exposition Avenue has on-street bicycle lanes in the vicinity of the project site. The bicycle lanes continue east and connect to the wider bicycle network at Moline Street. West of the project site, the dedicated bicycle lanes end near Ironston Street.

## 4.4 Transit

The City of Aurora is serviced by Regional Transportation District (RTD). The nearest bus route to the project site is the 105 bus, with stops on Havana Street just north of Exposition Avenue about 1,200 feet walking from the project site for the southbound stop and 1,325 feet walking from the project site for the northbound stop. This route links the Southmoor Station and Central Park Station, both of which provide connections to numerous other bus routes, light rail, and commuter rail lines that connect throughout the region.

## 4.5 Year 2024 Existing Intersection Capacity Analysis

The existing volumes, lane configuration, and traffic control are illustrated on **Figure 3**. The details of LOS for each movement are provided in **Table 1** and the 95<sup>th</sup> percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**. **Currently, both study intersections operate acceptably overall, with the majority of movements operating at LOS D or**

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**better in both peak hours.** The side-street stop-controlled intersection at the project site and Expo Park parking lot operates with LOS B for the southbound stop-controlled movement and LOS A overall in both peak hours. The following study intersection currently has movements that operate below LOS D in the peak hours:

- **Havana Street & Exposition Avenue:** This signalized intersection currently operates overall at LOS A in both peak hours; however, the westbound right turn was estimated to operate at LOS E in both peak hours. The 95<sup>th</sup> percentile queues for this movement were calculated to be up to 54 feet (about two vehicles). In the PM peak hour, the longer signal cycle length leads to delays on side streets that result in LOS E for all side street movements. The westbound left turn was the only movement estimated to exceed available queue storage by about fifteen (15) feet in the PM peak hour.

**Recommendations:** No changes are recommended. It is understood that minor movements at signalized intersections with long cycle lengths may experience high delay. Signal timing is balanced for demand at the intersection and queues are acceptable. The westbound left turn queue is not anticipated to block any other movements, however, consider restriping the left-turn lane to accommodate the estimated queue.

## 5.0 Future Conditions

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### 5.1 Annual Growth Factor and Future Volume Methodology

In order to forecast the future peak hour traffic volumes, background traffic growth assumptions were estimated using the DRCOG FOCUS Travel Demand Model predictions and estimated traffic from the CDOT OTIS system. Based on CDOT data, the annual growth rate on Havana Street near Mississippi Avenue (south of Exposition Avenue) was 0.6%. This was compared against the DRCOG FOCUS model predicted growth in the area and was found to be consistent with DRCOG predictions as well.

Using a 0.6% annual background traffic growth rate, the Year 2027 background traffic is summarized on **Figure 4** and the Year 2050 background traffic is summarized on **Figure 5**.

### 5.2 Year 2027 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the Year 2027 background scenario and to identify any capacity constraints associated with background traffic (refer to

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**Section 5.1** for growth assumptions). The background volumes, lane configuration, and traffic control are illustrated on **Figure 4**.

The Level of Service criteria discussed previously was applied to the study area intersections to determine the impacts with the short-term background volumes. This analysis assumes signal timing throughout the network would be adjusted to accommodate changes in traffic volumes. The details of LOS for each movement are provided in **Table 1** and the 95<sup>th</sup> percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

**In summary, both study intersections were estimated to operate similarly to the existing condition with overall LOS A and the majority of movements operating at LOS D or better.** The westbound right-turn movement at **Havana Street and Exposition Avenue (#1)** was estimated to continue to operate at LOS E in both peak hours. During the PM peak hour, the eastbound and westbound movements will continue to operate at LOS E. The westbound left-turn at this intersection will continue to have a queue that exceeds the existing storage length by fifteen (15) feet. When restriping Exposition Avenue, consider extending the left-turn storage to accommodate the queue. The southbound side-street stop-controlled movement at Expo Park is estimated to continue to operate at LOS B in both peak hours.

### **5.3 Year 2050 Background Intersection Capacity Analysis**

The study area intersections were evaluated to determine baseline operations for the Year 2050 background scenario and to identify any capacity constraints associated with background traffic in the long-term scenario (refer to **Section 5.1** for growth assumptions). The long-term background volumes, lane configuration, and traffic control are illustrated on **Figure 5**.

The Level of Service criteria discussed previously were applied to the study area intersections to determine the impacts with the long-term background volumes. The analysis assumed the signal timing at all signalized intersections would be adjusted to accommodate the change in traffic volumes. It should be noted that the peak hour factors were adjusted to 0.92 if the existing factor is less than this value since it is assumed that the peak periods will become longer with peak hour traffic spread more evenly over the hour as traffic increases than is experienced today.

The details of LOS for each movement are provided in **Table 1** and the 95<sup>th</sup> percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

**In summary, both of the study intersections were estimated to operate similarly to the existing condition with overall LOS A and the majority of movements operating at LOS D or better.** The

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westbound right-turn movement at **Havana Street and Exposition Avenue (#1)** was estimated to continue to operate at LOS E in both peak hours. Westbound and eastbound movements on Exposition Avenue at Havana Street are expected to continue operating at LOS E in the PM peak hour. The westbound left-turn at this intersection will continue to have a queue that exceeds the existing storage length by thirty (30) feet. When Exposition Avenue is repaved, extend the left-turn storage to accommodate the queue. If the left turn storage is not extended, there may be some brief periods during the PM peak times where the left turn queue may block other movements. The westbound lane of Exposition Avenue is approximately 24 feet wide prior to the beginning of the taper that develops the left turn storage. The lane is wide enough that vehicles could pass one another if the left turn queue extends beyond available storage. The southbound side-street stop-controlled movement at Expo Park is estimated to continue to operate at LOS B in both peak hours.

## 6.0 Future Conditions with the Development

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The Stables project is planned to replace the existing horse stables with 85 affordable multifamily residential units. The project will consist of two (2) buildings with four floors each, with surface parking. Vehicle access to the property will be provided to Exposition Avenue aligned with the Expo Park ballfield parking lot. The vehicle access will continue to provide full movement and be side-street stop-controlled. Pedestrian connections will be provided to Exposition Avenue, and will connect to the internal open space amenities provided on site. An attached sidewalk will be constructed along the project frontage on Exposition Avenue to link to nearby sidewalks and trails.

### 6.1 Trip Generation

A trip generation estimate was performed to determine the traffic characteristics of the proposed development. The trip rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Handbook and Manual*<sup>2</sup> were applied to estimate the traffic. This traffic study applied the trip rates for “Multifamily Residential (Mid-Rise)” [ITE #221]. For the purpose of this analysis, it was assumed that the project will be completed by Year 2027.

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<sup>2</sup> *Trip Generation Handbook and Manual, 11<sup>th</sup> Edition*, Institute of Transportation Engineers, 2021.



**Table 3** provides the detailed trip generation estimates for The Stables project. The proposed project is expected to experience mostly new trips, also known as ‘primary trips’, as well as non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered “new” trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the total number of trips made on a regional basis.

Non-Auto Trips. These trips are those that are completed by carpool, walking, biking, or transit. The non-auto trips were assumed to be 0% to be conservative although there are non-auto services near the site.

**Table 3: Trip Generation Summary**

Land Use	Size	Unit	Average Daily Trips				AM Peak Hour Trips				PM Peak Hour Trips			
			Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
ITE 221: Multifamily Residential (Mid-Rise)	85	Dwelling Units	4.54	386	193	193	0.37	31	7	24	0.39	33	20	13

*Source: ITE Trip Generation 11th Edition, 2021.*

**Total trip generation from The Stables project is estimated to be approximately 386 daily trips with 31 trips in the AM peak hour and 33 trips in the PM peak hour.**

## 6.2 Trip Distribution and Assignment

The estimated trip volumes were distributed onto the study area street network based on existing traffic characteristics, land uses, and traffic patterns in the area, as well as regional growth and future roadway infrastructure. The existing volumes were utilized to determine where vehicles are coming from and going to within the study area, plus the route to get to major highways and anticipated destinations.

The following distributions were assumed for this project and are shown on **Figure 6**:

- North via Havana Street: 50%
- South via Havana Street: 30%
- East via Exposition Avenue: 20%

Using the distribution assumptions, the projected site traffic was assigned to the study area roadway network for the weekday AM and PM peak hour periods.

### 6.3 Year 2027 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of The Stables development trips in the short-term scenario. The site-generated volumes were added to the Year 2027 background volumes and are illustrated on **Figure 7**.

**The project trips will have little to no impact on the performance of the study intersections compared to the background conditions since nearly all of the movement levels of service remain the same letter grade.** The details of LOS for each movement are provided in **Table 1**. The 95<sup>th</sup> percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

The project access approach to Exposition Avenue is anticipated to operate at LOS B in both AM and PM peak hours.

### 6.4 Year 2050 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of The Stables development trips in the long-term scenario. The site-generated volumes were added to the Year 2050 background volumes and are illustrated on **Figure 8**.

**The project trips will have little to no impact on the performance of the study intersections compared to the background conditions since nearly all of the movement levels of service remain the same letter grade.** The westbound right turn at Exposition Avenue and Havana Street is estimated to increase in delay by about sixteen (16) seconds in the AM peak hour, which will reduce LOS for that movement from LOS E to LOS F. Additional mitigation measures are not recommended as there is already a dedicated right turn lane at the signal, and the 95<sup>th</sup> percentile queue in the AM peak hour is estimated to be contained within the available storage. The details of LOS for each movement are provided in **Table 1** and the 95<sup>th</sup> percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

The project access approach to Exposition Avenue is anticipated to operate at LOS B in both AM and PM peak hours.

## 7.0 Queuing Analysis

A queuing analysis was performed to determine if the 95<sup>th</sup> percentile queues would be accommodated by the existing storage length, to determine the storage lengths for future auxiliary lanes, and if any of the queues would impact an upstream intersection/access. **Table 2** provides the existing and proposed storage lengths, as well as the 95<sup>th</sup> percentile queues for each existing and future scenario as calculated by Synchro (assuming each vehicle utilizes 25 feet of space). It should be noted that the 95<sup>th</sup> percentile queue length is a theoretical queue that is 1.65 standard deviations above the average queue length. In theory, the 95<sup>th</sup> percentile queue would be exceeded 5% of the time based on the average queue length, but it is also possible that a queue this long may not occur.

As shown in **Table 2**, the majority of queues are shorter than the provided storage length in all scenarios. The only queue that is anticipated to exceed available storage length is the westbound left turn lane at **Havana Street and Exposition Avenue** as previously discussed. The PM peak 95<sup>th</sup> percentile queue is calculated to exceed available storage, with a longer queue anticipated in the future as background traffic increases. The project-added trips increase the 95<sup>th</sup> percentile queue by only 4 feet in both Year 2027 and Year 2050. The westbound lane on Exposition Avenue approaching Havana Street is about 24 feet wide, so there is adequate space for vehicles to pass the left turn queue if it extends beyond the available storage. It is recommended that an extension of the westbound left turn storage be considered when Exposition Avenue is repaved.

## 8.0 Conclusions

The Stables project plans to construct 85 affordable multifamily residential units on the site of existing horse stables. The project proposes to improve the one (1) existing access on Exposition Avenue and provide a secondary fire and life safety access that will be closed to vehicles with bollards when not in use. For the purpose of this traffic study, it was assumed that the project will be completed by Year 2027.

The Stables project is estimated to generate approximately 386 daily trips with about 31 trips occurring in the AM peak hour and 33 trips occurring in the PM peak hour at full build-out. **It was determined that the proposed roadway system can adequately accommodate the projected traffic volumes for long-term buildout conditions.** The recommendations listed on the following page should be considered.

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**Existing/Background Conditions (Non-Project Related):**

- **Havana Street & Exposition Avenue** – Adjust signal timing as appropriate for increases in volume. Balance the green time to serve all movements and pedestrian crossings. Consider extending the westbound left turn storage length to 150 feet when Exposition Avenue is repaved.

**Project Conditions:**

- **Exposition Avenue at the Expo Park ballfield parking lot & Project Access** – Construct one inbound lane and one outbound lane. Continue to align the access with the ballfield parking lot and maintain full-movement with side-street stop-control.

Note that the traffic study provides technical information and evaluates the need for transportation mitigation as traffic grows, but it does not address infrastructure commitments or obligations of The Stables development.

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# ***Tables and Figures:***

*Table 1 – Level of Service Summary*

*Table 2 – Queue Length Summary*

*Table 3 – Trip Generation [in report]*

*Figure 1 – Vicinity Map*

*Figure 2 – Site and Access Plan*

*Figure 3 – Year 2024 Existing Traffic Volumes*

*Figure 4 – Year 2027 Background Traffic Volumes*

*Figure 5 – Year 2050 Background Traffic Volumes*

*Figure 6 – Trip Distribution and Site-Generated Volumes*

*Figure 7 – Year 2027 Background + Project Traffic Volumes*

*Figure 8 – Year 2050 Background + Project Traffic Volumes*

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Table 1 - Level of Service Summary

Intersection and Lane Groups	2024 Existing				2027 Background				2027 Background + Project				2050 Background				2050 Background + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
<b>SIGNAL CONTROL</b>																				
<b>Havana Street &amp; Exposition Ave</b>	<b>9</b>	<b>A</b>	<b>9</b>	<b>A</b>	<b>8</b>	<b>A</b>	<b>9</b>	<b>A</b>	<b>9</b>	<b>A</b>	<b>9</b>	<b>A</b>	<b>9</b>	<b>A</b>	<b>10</b>	<b>A</b>	<b>10</b>	<b>A</b>	<b>10</b>	<b>A</b>
Eastbound Left+Through+Right	45	D	59	E	46	D	59	E	45	D	58	E	45	D	58	E	45	D	57	E
Westbound Left	46	D	61	E	47	D	61	E	47	D	60	E	46	D	60	E	46	D	60	E
Westbound Through	44	D	58	E	45	D	58	E	45	D	57	E	45	D	56	E	44	D	56	E
Westbound Right	72	E	66	E	64	E	66	E	70	E	65	E	71	E	66	E	87	F	69	E
Northbound Left	0	A	5	A	0	A	5	A	0	A	5	A	0	A	6	A	0	A	7	A
Northbound Through+Right	7	A	7	A	6	A	7	A	6	A	7	A	7	A	8	A	7	A	8	A
Southbound Left	4	A	4	A	3	A	4	A	3	A	4	A	4	A	6	A	4	A	6	A
Southbound Through+Right	3	A	4	A	3	A	4	A	3	A	4	A	3	A	5	A	3	A	5	A
<b>STOP SIGN CONTROL</b>																				
<b>Driveway &amp; Exposition Ave</b>	<b>0</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>A</b>	<b>0</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>A</b>	<b>0</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>
Eastbound Left+Through+Right	8	A	8	A	8	A	8	A	8	A	8	A	8	A	8	A	8	A	8	A
Westbound Left+Through+Right	0	A	0	A	0	A	0	A	7	A	8	A	0	A	0	A	8	A	8	A
Northbound Left+Through+Right	0	A	0	A	0	A	0	A	10	B	11	B	0	A	0	A	11	B	11	B
Southbound Left+Through+Right	11	B	11	B	10	B	10	B	10	B	10	B	10	B	11	B	11	B	11	B

Note: Delay represented in average seconds per vehicle.

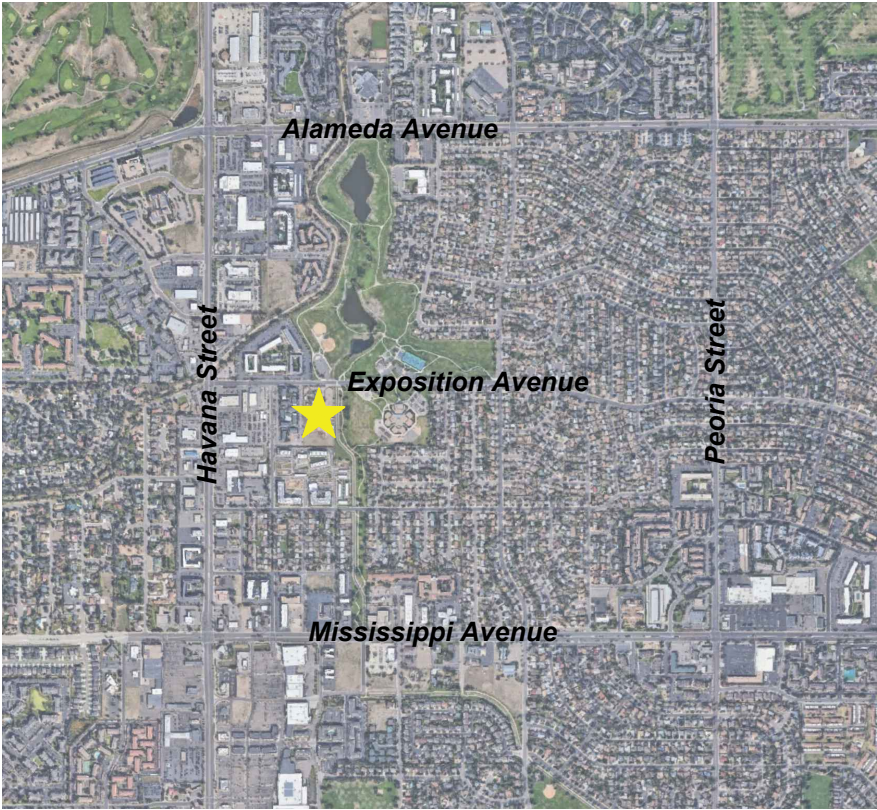


Table 2 - Queue Length Summary

Intersection and  Lane Groups	Storage Length or Dist. to Adj. Int	2024 Existing				2027 Background				2027 Background + Project				2050 Background				2050 Background + Project			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>	Avg.	95 <sup>th</sup>
SIGNAL CONTROL																					
Havana Street & Exposition Ave																					
Eastbound Left+Through+Right	-	22'	52'	37'	69'	21'	52'	33'	69'	21'	52'	33'	69'	24'	58'	38'	76'	24'	58'	38'	76'
Westbound Left	110'	48'	83'	72'	125'	41'	92'	73'	125'	46'	109'	76'	129'	47'	110'	84'	140'	52'	124'	88'	144'
Westbound Through	110'	9'	25'	14'	37'	8'	26'	14'	37'	8'	26'	14'	37'	9'	29'	17'	42'	9'	29'	17'	42'
Westbound Right	110'	0'	34'	0'	54'	0'	49'	0'	54'	0'	51'	0'	56'	0'	52'	5'	62'	0'	55'	10'	69'
Northbound Left	920'	0'	0'	1'	6'	0'	0'	1'	6'	0'	0'	1'	6'	0'	0'	2'	8'	0'	0'	2'	8'
Northbound Through+Right	-	127'	128'	195'	234'	107'	129'	176'	244'	108'	130'	180'	251'	130'	154'	222'	309'	130'	155'	226'	326'
Southbound Left	600'	6'	11'	9'	22'	5'	11'	9'	23'	6'	12'	11'	26'	6'	13'	11'	27'	7'	13'	13'	33'
Southbound Through+Right	-	54'	61'	118'	175'	50'	61'	126'	187'	50'	61'	129'	191'	60'	72'	162'	239'	60'	72'	165'	243'
STOP SIGN CONTROL																					
Driveway & Exposition Ave																					
Eastbound Left+Through+Right	-	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'
Westbound Left+Through+Right	-	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'	-	0'
Northbound Left+Through+Right	-	-	0'	-	0'	-	0'	-	0'	-	3'	-	3'	-	0'	-	0'	-	3'	-	3'
Southbound Left+Through+Right	-	-	0'	-	3'	-	0'	-	0'	-	0'	-	0'	-	0'	-	3'	-	0'	-	3'

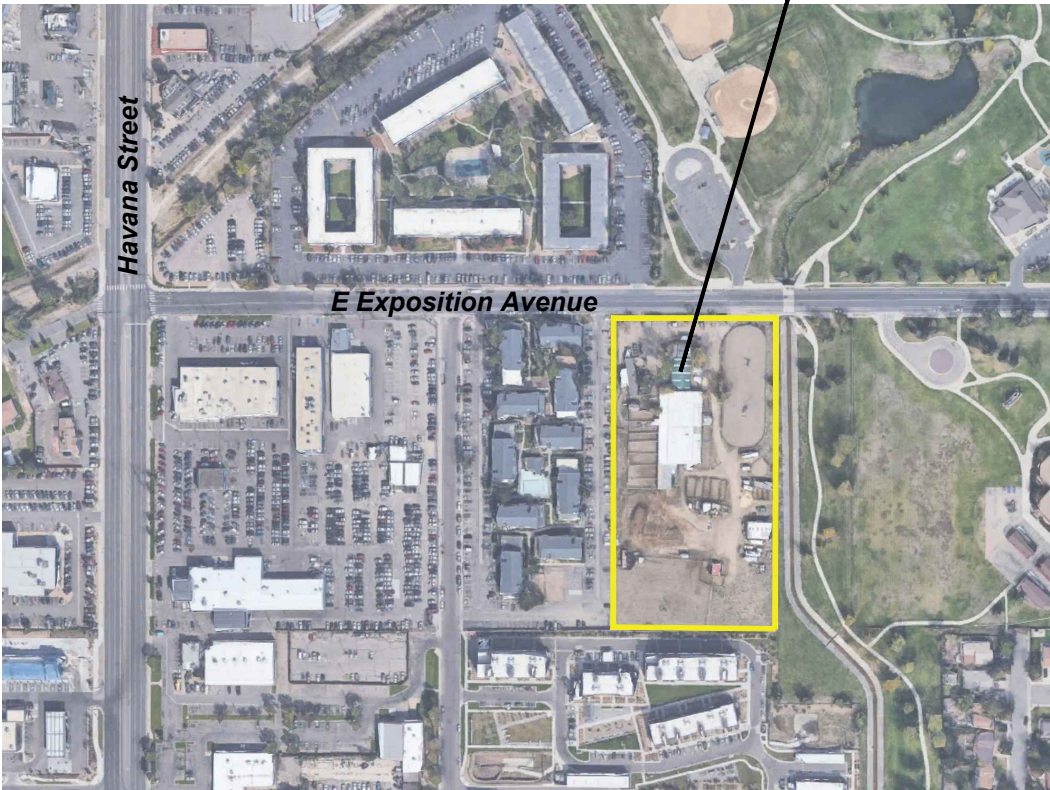
Note: Queues in blue exceed available storage length.

Area Map



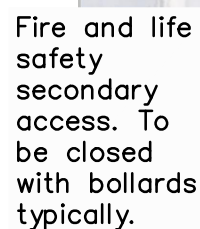
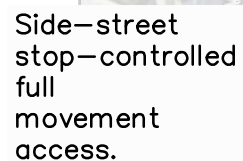
Site Detail

PROJECT SITE



THE STABLES - AURORA, CO  
VICINITY MAP

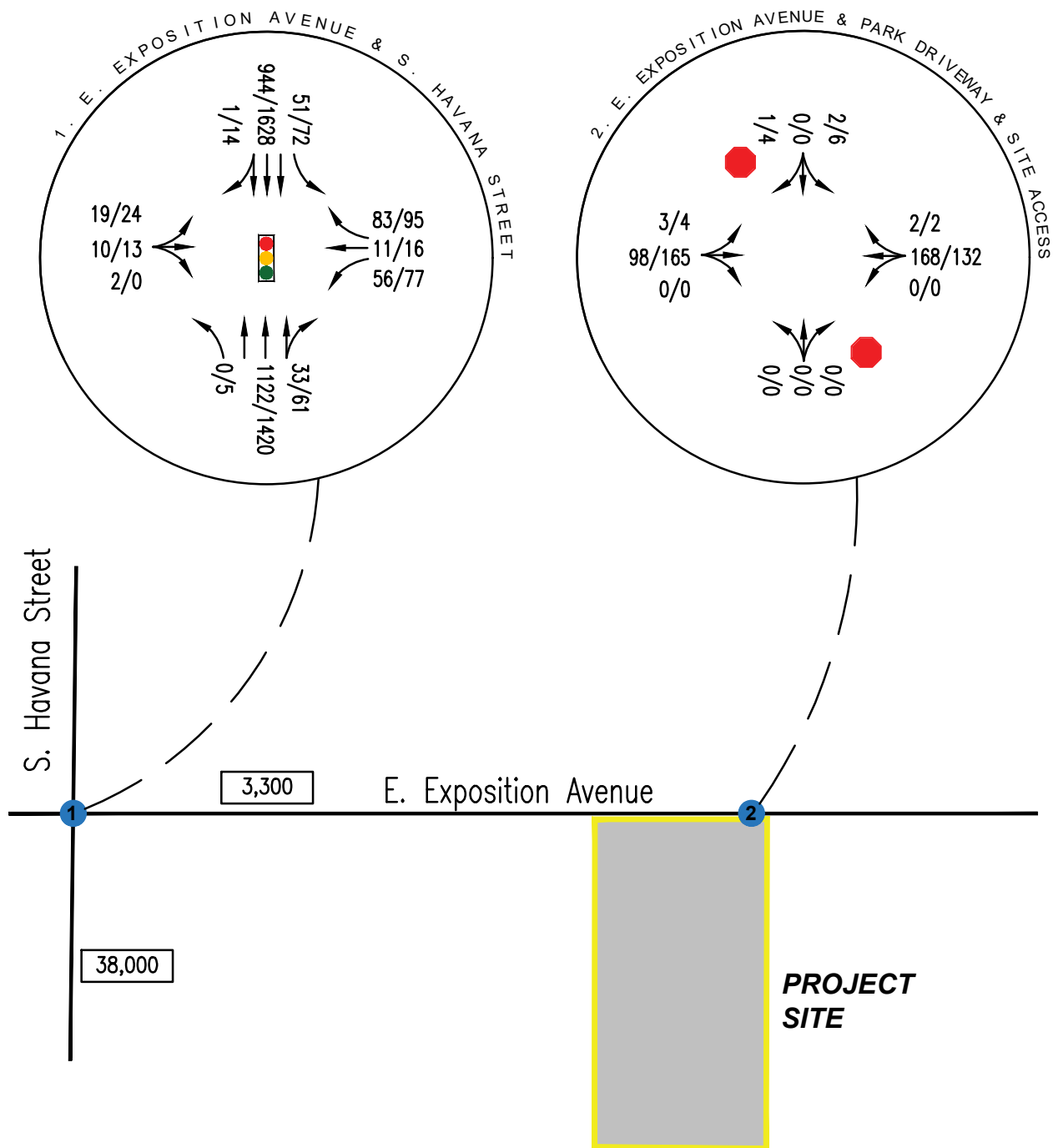




Level 1 Site Plan  
1" = 60'-0"

THE STABLES - AURORA, CO  
SITE PLAN

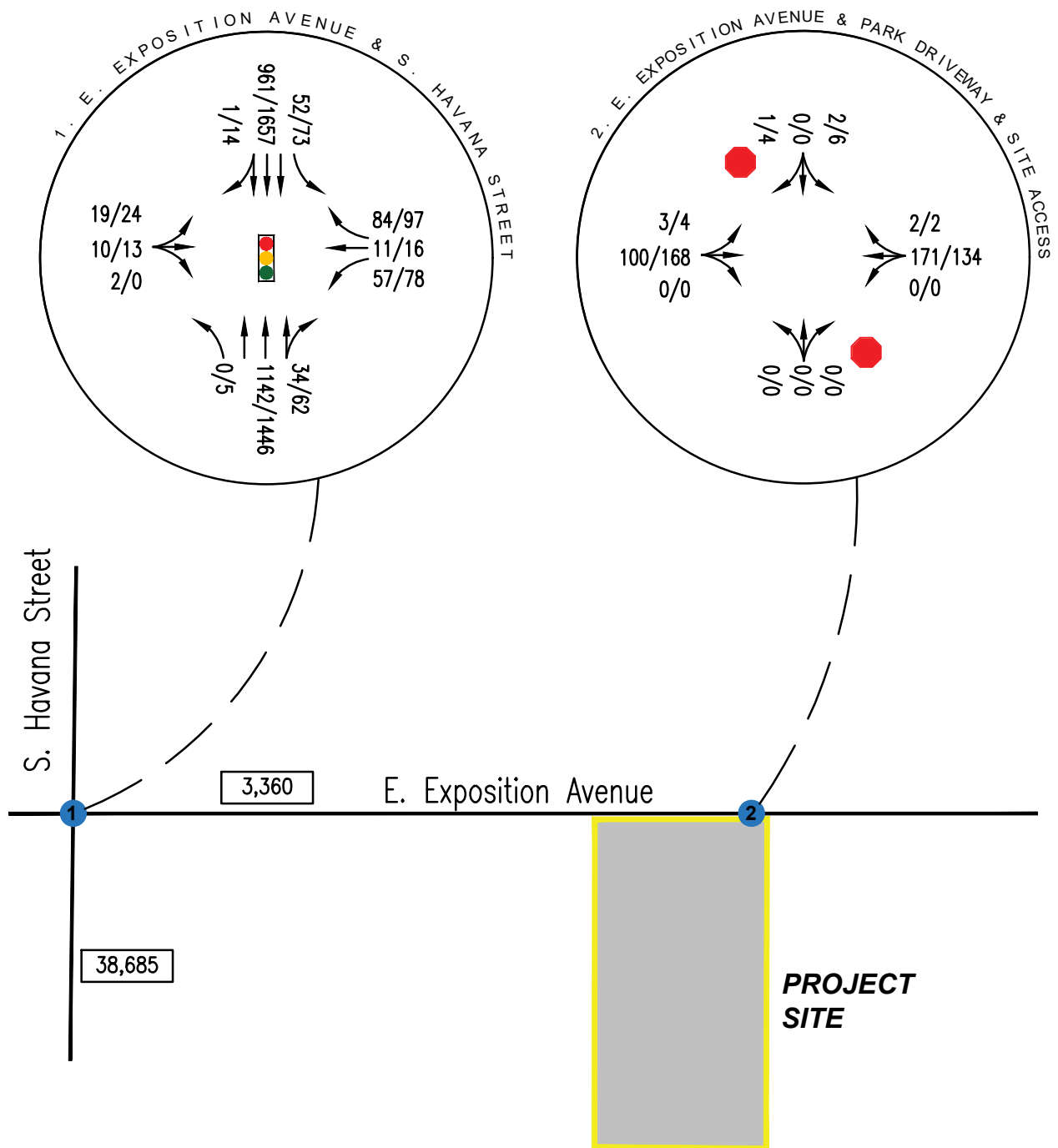
FT Project #	24106	Original Scale	NTS	Date	4/1/2025	Drawn by	SKK	Figure #	2
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## KEY

- XX/XX AM/PM PEAK HOUR TRAFFIC VOLUME
- X,XXX WEEKDAY DAILY TRAFFIC VOLUME
- EXISTING LANE CONFIGURATION
- FUTURE LANE CONFIGURATION

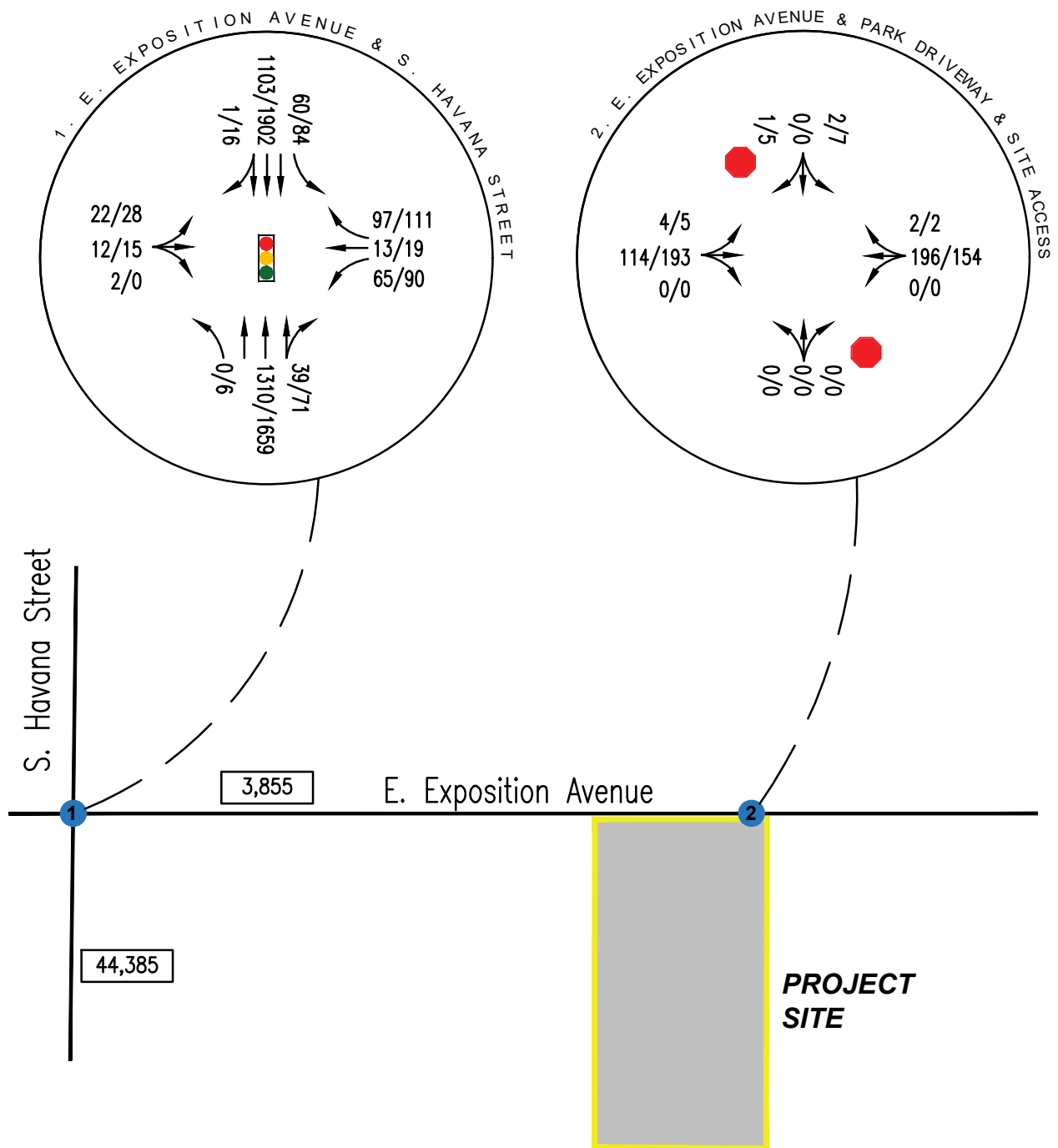




### KEY

- XX/XX AM/PM PEAK HOUR TRAFFIC VOLUME
- X,XXX WEEKDAY DAILY TRAFFIC VOLUME
- EXISTING LANE CONFIGURATION



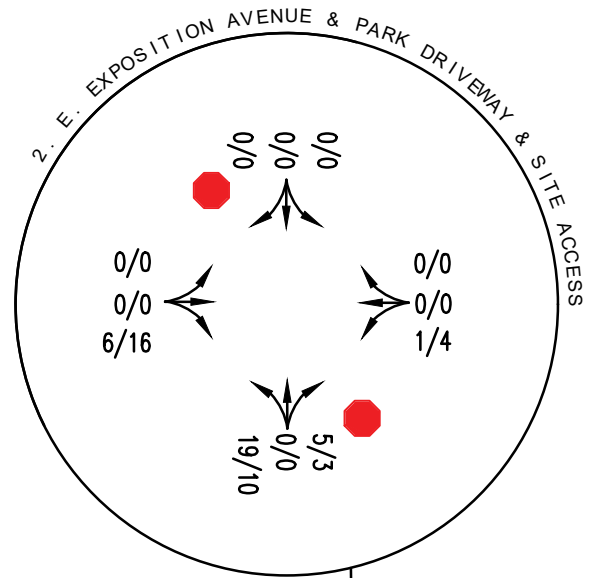
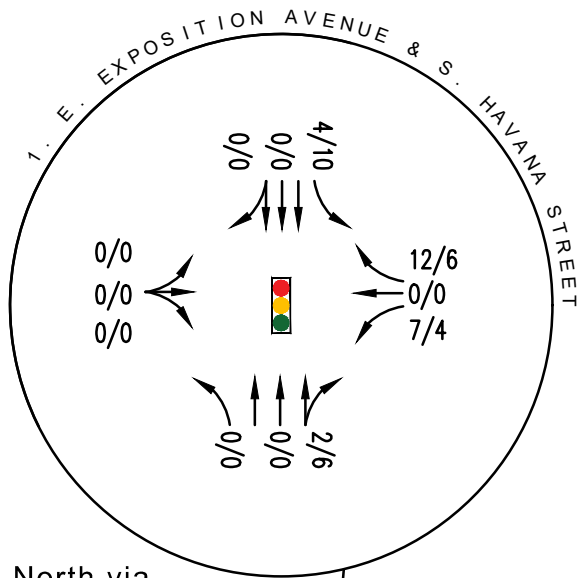


## KEY

- XX/XX AM/PM PEAK HOUR TRAFFIC VOLUME
- X,XXX WEEKDAY DAILY TRAFFIC VOLUME
- EXISTING LANE CONFIGURATION







**50%**

To/From North via  
S. Havana Street

S. Havana Street

1

310

E. Exposition Avenue

2

**20%**

To/From East via  
E. Exposition Avenue

**30%**

To/From South via  
S. Havana Street

115

**PROJECT  
SITE**

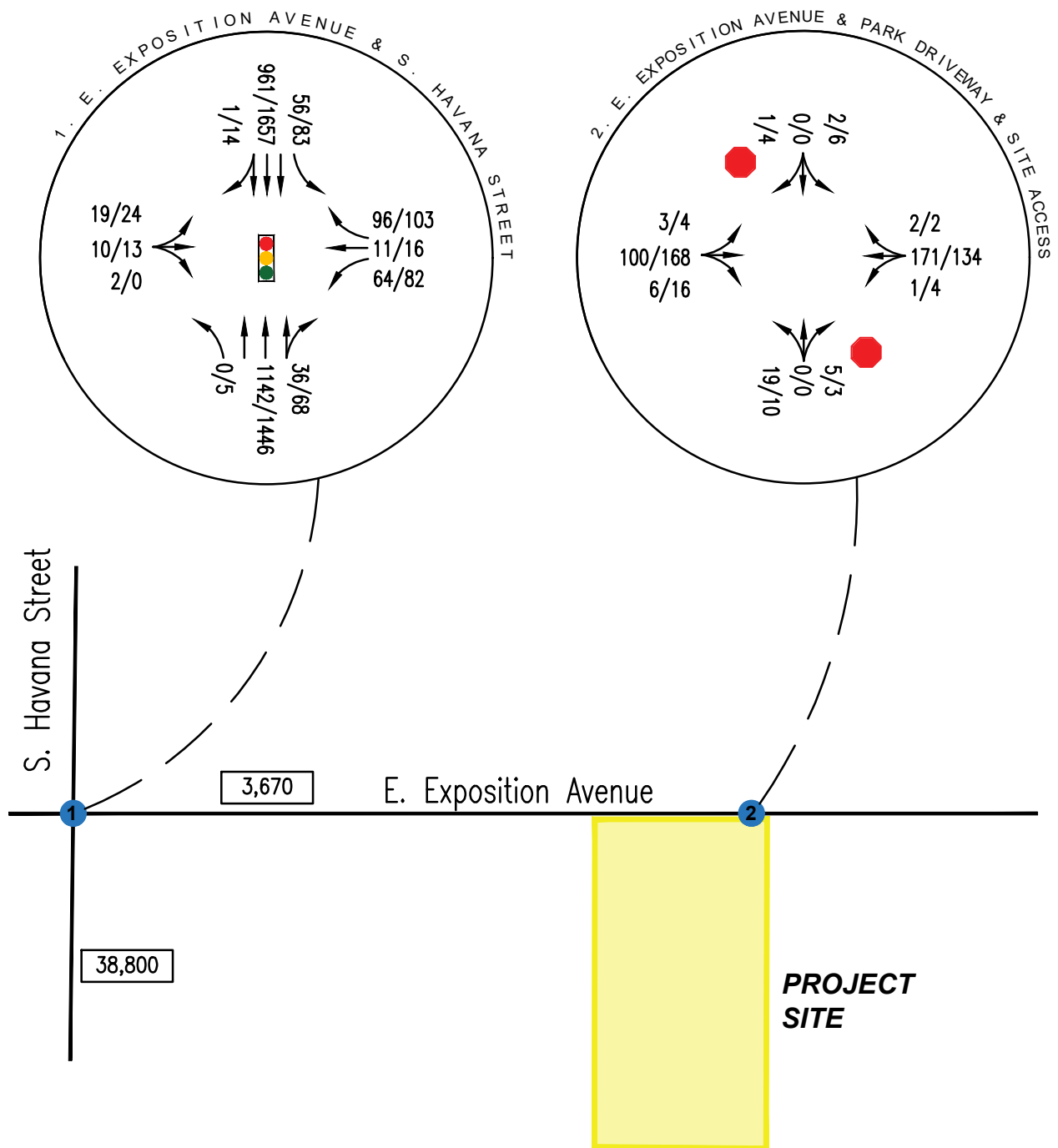
KEY

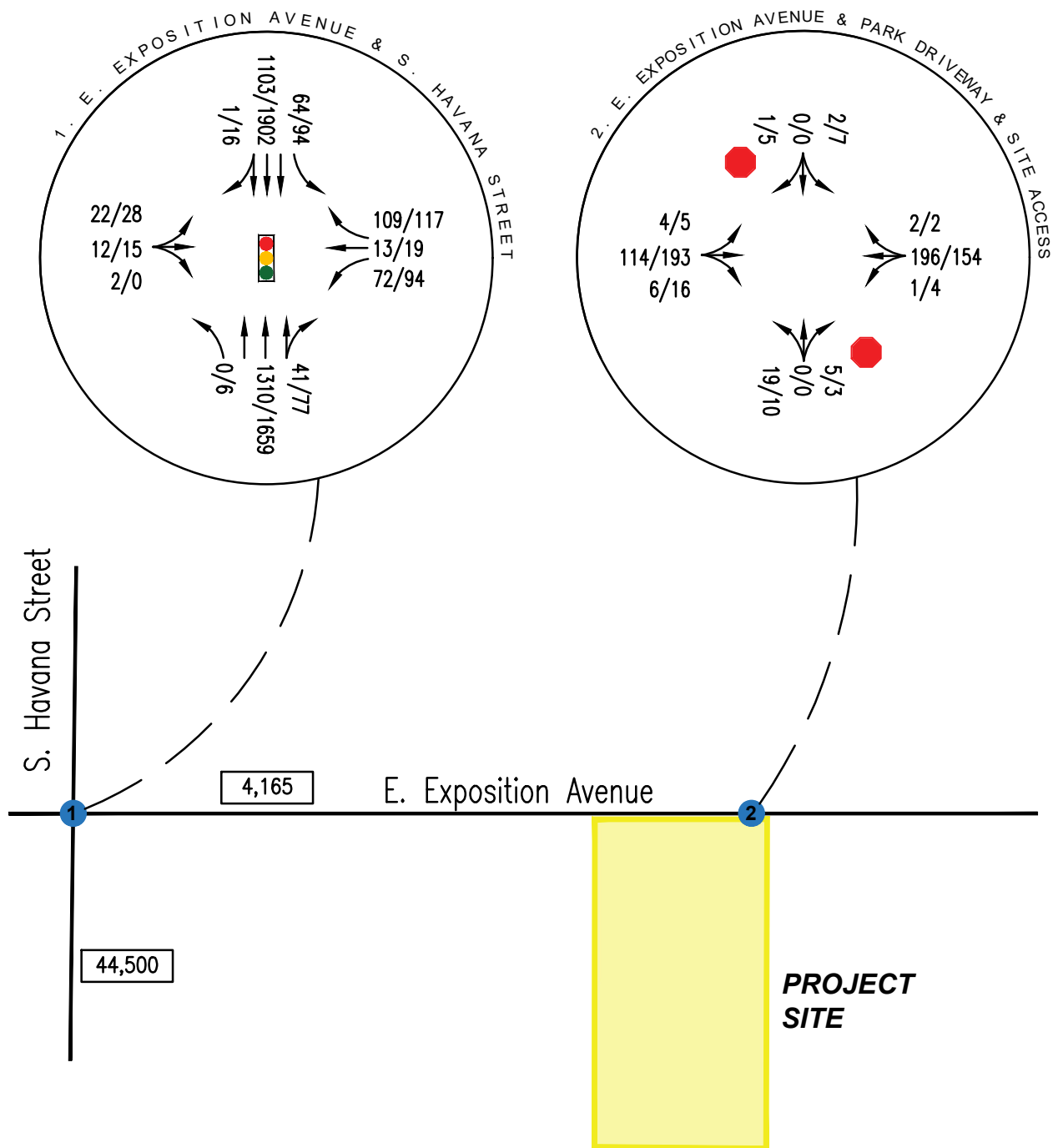
XX/XX AM/PM PEAK HOUR TRAFFIC VOLUME

X,XXX WEEKDAY DAILY TRAFFIC VOLUME

→ EXISTING LANE CONFIGURATION







### KEY

- XX/XX AM/PM PEAK HOUR TRAFFIC VOLUME
- X,XXX WEEKDAY DAILY TRAFFIC VOLUME
- EXISTING LANE CONFIGURATION



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# ***Appendix:***

*Level of Service Definitions*

*Existing Traffic Data*

*Background Documentation*

*Intersection Capacity Worksheets*



## *Level of Service Definitions*

### LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, “Levels of Service” (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

Level of Service Rating	Delay in seconds per vehicle (a)		Definition
	Signalized	Unsignalized	
A	0.0 to 10.0	0.0 to 10.0	Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay.
B	10.1 to 20.0	10.1 to 15.0	Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	20.1 to 35.0	15.1 to 25.0	Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor.
D	35.1 to 55.0	25.1 to 35.0	Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable.
E	55.1 to 80.0	35.1 to 50.0	Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors.
F	> 80.0	> 50.0	Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

(a) Delay ranges based on Highway Capacity Manual (6<sup>th</sup> Edition, 2016) criteria.





## *Existing Traffic Data*



Location: Exposition Ave W/O Site Access  
 Date Range: 12/10/2024 - 12/16/2024  
 Site Code: 01

Time	Tuesday 12/10/2024			Wednesday 12/11/2024			Thursday 12/12/2024			Friday 12/13/2024			Saturday 12/14/2024			Sunday 12/15/2024			Monday 12/16/2024			Mid-Week Average		
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	10	7	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	7	17
1:00 AM	6	9	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	9	15
2:00 AM	12	5	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	5	17
3:00 AM	5	8	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	8	13
4:00 AM	8	10	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	18
5:00 AM	25	15	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	15	40
6:00 AM	35	49	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	49	84
7:00 AM	62	112	174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62	112	174
8:00 AM	102	165	267	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	102	165	267
9:00 AM	87	140	227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87	140	227
10:00 AM	70	98	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	98	168
11:00 AM	76	102	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76	102	178
12:00 PM	99	96	195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99	96	195
1:00 PM	106	103	209	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106	103	209
2:00 PM	136	156	292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	136	156	292
3:00 PM	111	148	259	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	148	259
4:00 PM	169	135	304	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	169	135	304
5:00 PM	123	108	231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123	108	231
6:00 PM	103	70	173	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	103	70	173
7:00 PM	77	63	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77	63	140
8:00 PM	57	43	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	43	100
9:00 PM	47	48	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	48	95
10:00 PM	37	21	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37	21	58
11:00 PM	13	19	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	19	32
Total	1,576	1,730	3,306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,576	1,730	3,306
Percent	48%	52%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48%	52%	
AM Peak	08:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	08:00	08:00	08:00
Vol.	102	165	267	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	102	165	267
PM Peak	16:00	14:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	14:00	16:00
Vol.	169	156	304	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	169	156	304

1. Mid-week average includes data between Tuesday and Thursday.



Count Summaries - All Vehicles																			
Interval Start		Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	9	0	0	0	18	0	0	0	0	0	0	0	0	0	27	0
7:15 AM		0	0	11	0	0	0	23	0	0	0	0	0	0	0	0	0	34	0
7:30 AM		1	0	26	0	0	0	33	0	0	0	0	1	0	0	0	1	62	0
7:45 AM		0	0	14	0	0	0	35	0	0	0	0	0	0	0	0	0	49	172
8:00 AM		0	0	17	0	0	0	23	0	0	0	0	0	0	0	0	0	40	185
8:15 AM		0	1	20	0	0	0	41	0	0	0	0	0	0	0	0	1	63	214
8:30 AM		0	0	29	0	0	0	42	0	0	0	0	0	0	1	0	0	72	224
8:45 AM		0	2	32	0	0	0	62	2	0	0	0	0	0	1	0	0	99	274
Count Total		1	3	158	0	0	0	277	2	0	0	0	1	0	2	0	2	446	
Pk Hr	All	0	3	98	0	0	0	168	2	0	0	0	0	0	2	0	1	274	
	HV	0	0	1	0	0	0	8	2	0	0	0	0	0	1	0	0	12	
	HV%	-	0%	1%	-	-	-	5%	100%	-	-	-	-	-	50%	-	0%	4%	

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
7:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	3	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6
8:00 AM	0	1	0	0	1	0	0	0	0	0	2	0	9	0	11
8:15 AM	0	2	0	0	2	0	0	0	0	0	2	0	2	0	4
8:30 AM	1	1	0	0	2	0	0	0	0	0	0	0	4	0	4
8:45 AM	0	6	0	1	7	0	0	0	0	0	3	0	4	2	9
Count Total	1	11	1	1	14	0	0	0	0	0	7	0	32	2	41
Peak Hour	1	10	0	1	12	0	0	0	0	0	7	0	19	2	28

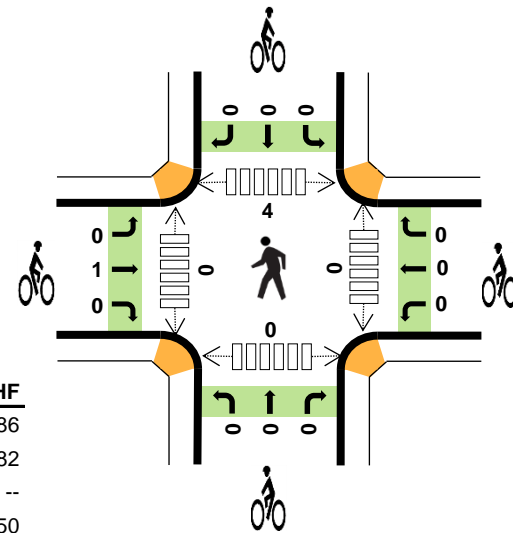
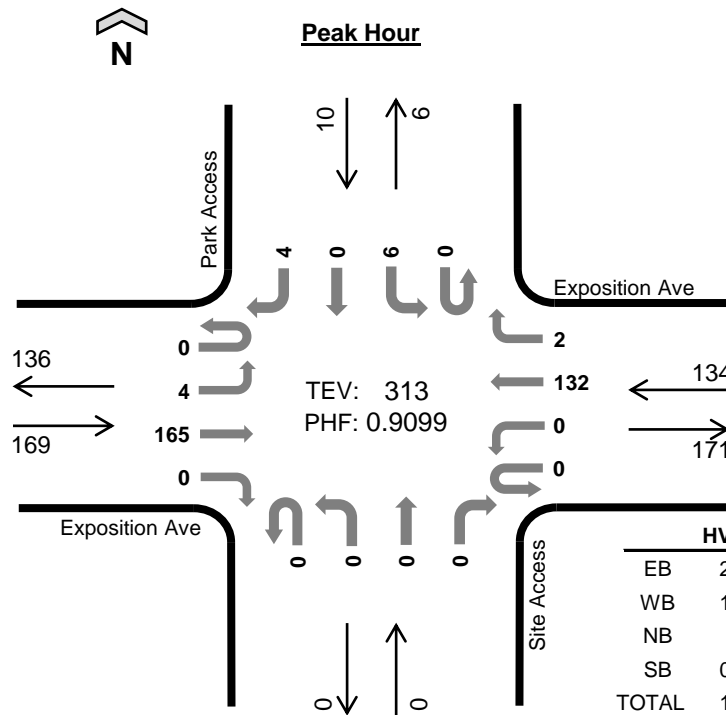
**Count Summaries - Heavy Vehicles**

Interval Start	Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
8:15 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	4
8:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	5
8:45 AM	0	0	0	0	0	0	4	2	0	0	0	0	0	1	0	0	7	12
Count Total	0	0	1	0	0	0	9	2	0	0	0	1	0	1	0	0	14	
Pk Hr Heavy	0	0	1	0	0	0	8	2	0	0	0	0	0	1	0	0	12	

**Count Summaries - Bikes**

Interval Start	Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pk Hr Bike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

## Park Access Exposition Ave



### Peak Hour Count Summaries

Peak Hour Interval Start		Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:45 PM		0	0	35	0	0	0	41	0	0	0	0	0	0	0	0	0	76	0
4:00 PM		0	1	40	0	0	0	29	1	0	0	0	0	0	1	0	3	75	0
4:15 PM		0	1	43	0	0	0	30	1	0	0	0	0	0	1	0	0	76	0
4:30 PM		0	2	47	0	0	0	32	0	0	0	0	0	0	4	0	1	86	313
Pk Hr	All	0	4	165	0	0	0	132	2	0	0	0	0	0	6	0	4	313	
	HV	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4	
	HV%	-	25%	1%	-	-	-	1%	0%	-	-	-	-	-	0%	-	0%	1%	

Note: For complete count summary (all intervals), see following pages.

\*\* Heavy Vehicle Classifications include FHWA Classes 4-13.

\*\* Count Summaries include heavy vehicles, but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1
4:15 PM	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1
Peak Hour	3	1	0	0	4	1	0	0	0	1	0	0	4	0	4

**Count Summaries - All Vehicles**

Interval Start		Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM		0	2	24	0	0	0	40	0	0	0	0	0	0	0	0	1	67	0
3:15 PM		0	2	21	0	0	0	28	1	0	0	0	0	0	1	0	2	55	0
3:30 PM		0	2	24	0	0	0	36	1	0	0	0	0	0	0	0	2	65	0
3:45 PM		0	0	35	0	0	0	41	0	0	0	0	0	0	0	0	0	76	263
4:00 PM		0	1	40	0	0	0	29	1	0	0	0	0	0	1	0	3	75	271
4:15 PM		0	1	43	0	0	0	30	1	0	0	0	0	0	1	0	0	76	292
4:30 PM		0	2	47	0	0	0	32	0	0	0	0	0	4	0	1		86	313
4:45 PM		0	1	31	0	0	0	40	0	0	0	0	1	0	0	0	1	74	311
5:00 PM		0	0	37	0	0	0	31	1	0	0	0	0	0	0	0	0	69	305
5:15 PM		0	0	32	0	0	0	23	0	0	0	0	0	0	0	0	1	56	285
5:30 PM		0	0	27	0	0	1	23	0	0	0	0	0	0	0	0	0	51	250
5:45 PM		0	1	27	0	0	0	28	1	0	0	0	0	0	0	0	1	58	234
Count Total		0	12	388	0	0	1	381	6	0	0	0	1	0	7	0	12	808	
Pk Hr	All	0	4	165	0	0	0	132	2	0	0	0	0	0	6	0	4	313	
	HV	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4	
	HV%	-	25%	1%	-	-	-	1%	0%	-	-	-	-	-	0%	-	0%	1%	

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
3:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	2	0	2
3:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	4	1	5
3:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1
4:15 PM	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1
4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
5:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Count Total	7	8	1	0	16	1	0	0	0	1	0	0	12	1	13
Peak Hour	3	1	0	0	4	1	0	0	0	1	0	0	4	0	4

**Count Summaries - Heavy Vehicles**

Interval Start	Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
3:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
3:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
3:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	8
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	4
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4
5:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	4
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4
Count Total	0	1	6	0	0	1	7	0	0	0	0	1	0	0	0	0	16	
Pk Hr Heavy	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4	

**Count Summaries - Bikes**

Interval Start	Exposition Ave				Exposition Ave				Site Access				Park Access				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Pk Hr Bike	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	





**Count Summaries - All Vehicles**

Interval Start		Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	4	2	0	0	10	2	11	0	0	197	2	0	5	142	0	375	0
7:15 AM		0	5	2	0	0	12	2	24	0	0	313	6	0	7	172	0	543	0
7:30 AM		0	4	3	0	0	13	0	18	0	0	351	12	0	9	195	0	605	0
7:45 AM		0	5	1	2	0	14	3	30	0	0	303	5	1	13	223	0	600	2,123
8:00 AM		0	4	3	0	0	10	4	9	0	0	253	4	0	14	280	0	581	2,329
8:15 AM		0	6	3	0	0	19	4	26	0	0	215	12	0	15	246	1	547	2,333
8:30 AM		0	1	1	0	0	11	4	33	0	2	258	6	0	16	216	0	548	2,276
8:45 AM		0	5	0	0	0	23	6	26	0	2	244	12	0	14	229	1	562	2,238
Count Total		0	34	15	2	0	112	25	177	0	4	2,134	59	1	93	1,703	2	4,361	
Pk Hr	All	0	19	10	2	0	56	11	83	0	0	1,122	33	1	51	944	1	2,333	
	HV	0	1	0	0	0	1	0	1	0	0	18	0	0	0	25	0	46	
	HV%	-	5%	0%	0%	-	2%	0%	1%	-	-	2%	0%	0%	0%	3%	0%	2%	

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
7:00 AM	0	0	3	2	5	0	0	0	0	0	0	0	2	0	2
7:15 AM	0	1	2	1	4	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	0	3	7	10	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	0	6	5	12	0	0	0	0	0	0	0	1	0	1
8:15 AM	0	2	4	7	13	0	0	0	0	0	1	0	0	0	1
8:30 AM	0	0	6	5	11	0	0	0	0	0	2	0	2	0	4
8:45 AM	0	3	7	7	17	0	0	0	0	0	0	0	2	1	3
Count Total	1	6	36	40	83	0	0	0	0	0	3	0	8	1	12
Peak Hour	1	2	18	25	46	0	0	0	0	0	1	0	1	0	2

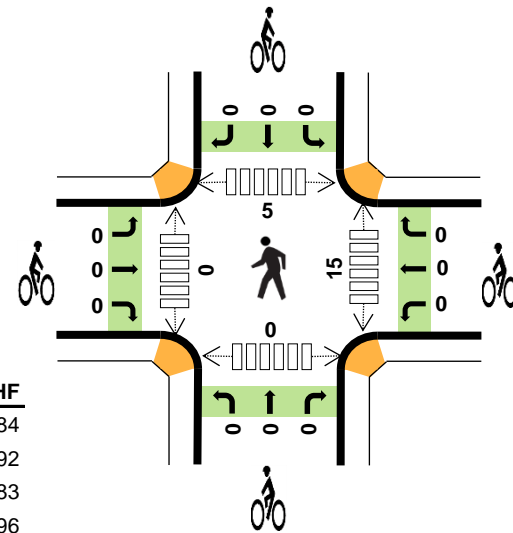
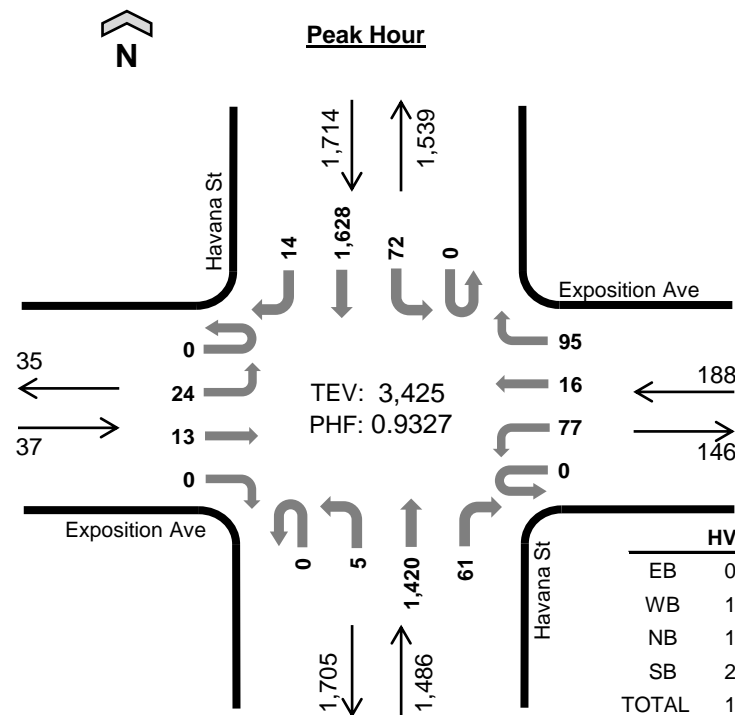
**Count Summaries - Heavy Vehicles**

Interval Start	Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	4	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	7	0	10	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	30
8:00 AM	0	1	0	0	0	0	0	0	0	0	6	0	0	0	5	0	12	37
8:15 AM	0	0	0	0	0	1	0	1	0	0	4	0	0	0	7	0	13	46
8:30 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	11	47
8:45 AM	0	0	0	0	0	0	1	2	0	0	7	0	0	0	7	0	17	53
Count Total	0	1	0	0	0	1	1	4	0	0	36	0	0	0	40	0	83	
Pk Hr Heavy	0	1	0	0	0	1	0	1	0	0	18	0	0	0	25	0	46	

**Count Summaries - Bikes**

Interval Start	Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pk Hr Bike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

# Havana St Exposition Ave



## Peak Hour Count Summaries

Peak Hour Interval Start		Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:15 PM		0	7	2	0	0	18	3	28	0	1	348	15	0	10	398	3	833	0
3:30 PM		0	8	2	0	0	16	4	19	0	2	432	12	0	17	399	7	918	0
3:45 PM		0	6	5	0	0	22	6	21	0	2	289	15	0	25	417	4	812	0
4:00 PM		0	3	4	0	0	21	3	27	0	0	351	19	0	20	414	0	862	3,425
Pk Hr	All	0	24	13	0	0	77	16	95	0	5	1,420	61	0	72	1,628	14	3,425	
	HV	0	0	0	0	0	0	0	2	0	0	17	0	0	2	24	0	45	
	HV%	-	0%	0%	-	-	0%	0%	2%	-	0%	1%	0%	-	3%	1%	0%	1%	

Note: For complete count summary (all intervals), see following pages.

\*\* Heavy Vehicle Classifications include FHWA Classes 4-13.

\*\* Count Summaries include heavy vehicles, but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
3:15 PM	0	1	1	7	9	0	0	0	0	0	3	0	1	0	4
3:30 PM	0	0	5	6	11	0	0	0	0	0	7	0	0	0	7
3:45 PM	0	1	6	7	14	0	0	0	0	0	0	0	2	0	2
4:00 PM	0	0	5	6	11	0	0	0	0	0	5	0	2	0	7
Peak Hour	0	2	17	26	45	0	0	0	0	0	15	0	5	0	20

**Count Summaries - All Vehicles**

Interval Start		Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM		0	4	4	1	0	16	4	28	0	0	319	12	0	15	325	0	728	0
3:15 PM		0	7	2	0	0	18	3	28	0	1	348	15	0	10	398	3	833	0
3:30 PM		0	8	2	0	0	16	4	19	0	2	432	12	0	17	399	7	918	0
3:45 PM		0	6	5	0	0	22	6	21	0	2	289	15	0	25	417	4	812	3,291
4:00 PM		0	3	4	0	0	21	3	27	0	0	351	19	0	20	414	0	862	3,425
4:15 PM		0	7	3	0	0	17	3	20	0	0	318	27	0	21	416	1	833	3,425
4:30 PM		0	2	6	1	0	15	4	18	0	0	382	25	0	21	415	1	890	3,397
4:45 PM		0	4	1	0	0	13	9	31	0	3	323	15	0	19	391	6	815	3,400
5:00 PM		0	8	6	1	0	15	2	15	0	1	334	15	0	28	394	7	826	3,364
5:15 PM		0	0	3	1	0	13	2	19	0	2	305	17	0	16	406	4	788	3,319
5:30 PM		0	0	1	0	0	16	2	14	2	2	322	23	1	19	359	4	765	3,194
5:45 PM		0	2	0	2	0	16	2	15	0	1	292	16	0	19	417	4	786	3,165
Count Total		0	51	37	6	0	198	44	255	2	14	4,015	211	1	230	4,751	41	9,856	
Pk Hr	All	0	24	13	0	0	77	16	95	0	5	1,420	61	0	72	1,628	14	3,425	
	HV	0	0	0	0	0	0	0	2	0	0	17	0	0	2	24	0	45	
	HV%	-	0%	0%	-	-	0%	0%	2%	-	0%	1%	0%	-	3%	1%	0%	1%	

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
3:00 PM	0	3	4	6	13	0	0	0	0	0	1	0	1	0	2
3:15 PM	0	1	1	7	9	0	0	0	0	0	3	0	1	0	4
3:30 PM	0	0	5	6	11	0	0	0	0	0	7	0	0	0	7
3:45 PM	0	1	6	7	14	0	0	0	0	0	0	0	2	0	2
4:00 PM	0	0	5	6	11	0	0	0	0	0	5	0	2	0	7
4:15 PM	0	0	6	5	11	0	0	0	0	0	0	0	5	0	5
4:30 PM	0	0	3	4	7	0	0	0	0	0	1	0	3	0	4
4:45 PM	0	1	4	2	7	0	0	0	0	0	1	0	0	0	1
5:00 PM	0	0	3	2	5	0	0	0	0	0	1	0	2	0	3
5:15 PM	0	0	2	3	5	0	0	0	0	0	3	0	0	0	3
5:30 PM	0	0	4	1	5	0	0	0	0	0	0	0	2	0	2
5:45 PM	1	0	1	3	5	0	0	0	0	0	3	0	2	0	5
Count Total	1	6	44	52	103	0	0	0	0	0	25	0	20	0	45
Peak Hour	0	2	17	26	45	0	0	0	0	0	15	0	5	0	20

**Count Summaries - Heavy Vehicles**

Interval Start	Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	3	0	0	3	1	0	0	6	0	13	0
3:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	1	6	0	9	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	1	5	0	11	0
3:45 PM	0	0	0	0	0	0	0	1	0	0	6	0	0	0	7	0	14	47
4:00 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	45
4:15 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	11	47
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4	0	7	43
4:45 PM	0	0	0	0	0	0	0	1	0	0	4	0	0	0	2	0	7	36
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	5	30
5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	5	24
5:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	5	22
5:45 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3	0	5	20
Count Total	0	0	0	1	0	0	0	6	0	0	41	3	0	2	50	0	103	
Pk Hr Heavy	0	0	0	0	0	0	0	2	0	0	17	0	0	2	24	0	45	

**Count Summaries - Bikes**

Interval Start	Exposition Ave				Exposition Ave				Havana St				Havana St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pk Hr Bike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

## ***Background Documentation***



Office of Development Assistance  
15151 E Alameda Pkwy  
Aurora, Colorado 80012, Suite 5200  
phone 303.739.7345  
email oda@auroragov.org

AuroraGov.org

November 7, 2024

Alisha Hammett - [alisha@shopworksarc.com](mailto:alisha@shopworksarc.com)  
Shopworks Architecture  
301 W 45th Avenue  
Denver, CO 80216

**Re: The Stables (#1842883)/Pre-Application Meeting held October 24<sup>th</sup>, 2024**

Dear Alisha Hammett:

I would like to take this opportunity to thank you for considering the City of Aurora for the The Stables project. As your assigned Project Manager, I remain available as a resource as you initiate the review and approval process in the city.

Attached to this letter are the formal Staff Comments from your Pre-Application Meeting with the Development Review Team. I have taken the opportunity to highlight a few key issues below that may require further consideration prior to a formal submittal of your Development Application. These, as well as those on the attached pages, will need to be addressed either before or during the development review process.

***Key Issues:***

- ▶ **Frontage:** Each multi-family dwelling unit structure must have frontage along a street and require a building entrance connecting to and facing the street without intervening parking lots or other vehicular areas. Planning staff recommends that the Phase 1 Building front E. Exposition Avenue with Phase 2 and the parking moved to the rear of the site. Considering the limitations of the site, Planning recommends having at least one building front E. Exposition Avenue and the second phase building be designed to accommodate an entry towards plaza common area.
- ▶ **Site Access and Connectivity:** With limited street access and connectivity, the applicant is encouraged to further explore cross access with adjacent multifamily parcels. This will help to resolve several code compliance issues with the proposal such as building frontage requirements, percentage of common area, and reduced paved areas for construction and maintenance.
- ▶ **Street Frontage Buffer:** A 20' wide street frontage buffer as measured from the back of walk along E. Exposition Avenue is required and cannot be reduced. See page 11 for further information.
- ▶ **Parks, Recreation and Open Space (PROS):** Land dedication, cash-in-lieu, park development fees, and tree mitigation will apply to this project based on the proposal received. See pages 15-17.
- ▶ **Utilities:** A water main extension will be required along the lot frontage and a looped water supply will be required for any new fire hydrants and fire service lines. A sanitary sewer analysis will be required to ensure that the existing sanitary sewer that is present in Exposition Avenue will have the capacity to meet the needs of the new development.
- ▶ **Westerly Creek Floodplain:** A significant portion of this site is within the Westerly Creek floodplain. Upon completion of the structure, the elevation of the lowest floor, shall be certified by a licensed Colorado Professional Engineer, architect, or land surveyor. This certification must be



submitted to the Floodplain Administrator, prior to the issuance of a certificate of occupancy. No work is allowed in the Floodplain without a Floodplain Development Permit (FPDP), no work is allowed within the Floodway without a CLOMR or a No Rise analysis included within the FPDP.

► **Mile High Flood District (MHFD):** MHFD's Major Drainageway Plan study identified capacity concerns in the existing culverts under Exposition Avenue that convey Westerly Creek, which could be a cause of increased risk of flooding to the site. There have been improvements upstream to Kenton Way culverts and Canterbury Park that may have impacted this condition. This development is not responsible for fixing preexisting drainage system deficiencies. However, this project must protect the proposed structures from existing hazards and must not make conditions worse for other properties. An analysis of this culvert may be required to quantify the flooding impacts the existing culvert may or may not cause to the site.

► **Impervious Area:** For development projects that add more than 5,000 square feet of new impervious area or disturb 1 acre or more, onsite Full Spectrum Detention is required. The proposed SCM(s) shall be in place prior to paving, and it shall be accepted prior to the issuance of Temporary Certificate of Occupancy (TCO) or Certificate of Occupancy (CO).

► **Traffic:** If an interim roadway/access network is proposed, a traffic analysis for this condition will be required. The proposed site access drive shall be located opposite the existing parking lot access on the north side of Exposition Avenue in-leu of being positioned 300' from adjacent property accesses.

► **Public Improvements:** The public improvements required include a 6' detached sidewalk, 8' curbside landscaping, and streetlights along the frontage of E. Exposition Avenue. The pedestrian activity level for the photometric analysis of E. Exposition Avenue is medium and additional lights should be provided if the existing photometric values do not meet current standards. A minimum additional 5' of Right of Way will be required along E. Exposition Avenue. Curb returns with curb ramps are required at the proposed accesses. If the access to the adjacent site on the west side of the project is modified, the curb ramps at the existing access will be required to be updated to current standards. This project will be required to evaluate if a guard rail is required along Exposition Avenue adjacent to Westerly Creek.

► **Fire Life Safety:** It is recommended that a 26' fire lane easement be provided within the site to avoid the installation of mid-block emergency set-up points for aerial fire apparatus (ladder trucks). The first phase of construction must include two points of emergency access and a looped water supply to support on site fire hydrants and fire service lines. See page 27 for further information.

The comments reflect information provided on your submittal materials as well as the discussion within the meeting and are meant to provide general direction to you in the preparation of the actual submittals. If the plans change significantly for the project, another pre-application meeting would be advised.

Again, thank you for attending the Pre-Application Meeting with our Development Review Team; I trust the meeting was helpful. If you have any questions or require additional information, please do not hesitate to contact me at 303.739.7323 or [bvigil@auroragov.org](mailto:bvigil@auroragov.org).

Sincerely,



Brit Vigil  
Senior Project Manager



## City of Aurora

### Development Process

While the development process is described in more detail in the [Development Handbook](#), the following information will help you gain a quick understanding of your next steps in the process and outline the formatting of the attached staff comments:

#### Step I - Planning Phase

- The application is submitted to the Planning Department.
- The Planning Department refers the plan to other city departments for comment.
- Neighborhood meeting(s) are scheduled as necessary.
- The Site Plan is approved at a public hearing.
- The Subdivision Plat is not required at this time.

#### Step II - Construction Document Phase

**Civil Engineering Plans:** This generally includes grading, storm drainage, stormwater management plan, public utilities, and street construction plans. All Civil Plans are submitted electronically.

- A Preliminary Drainage Report is a part of the site plan submittal (Step I above). Final drainage plans are included in the civil engineering plans package.
- Civil Plans are submitted through a pre-acceptance process. Once the Civil Plans have been accepted, then the formal review begins. This review is separate from the Planning Phase review above and requires a per-sheet review fee.

**Building Plans:** (construction plans for structures)

- Typically reviewed after Planning decision is made.

#### Step III - Construction Phase

**Building/Civil Permits:**

- **Stormwater Quality Discharge** permits must be issued prior to any site work (Aurora Water).
- **Public Improvement permits** can be issued after Civil Plan approval.
- **Building permits** are issued only after Steps I & II are complete (Site Plan/Civil Plan), and building plans are approved.

**Inspections:** Certificate of Occupancy (CO) is granted once all work and inspections are complete.

## STAFF COMMENTS - PRE-APPLICATION MEETING

### Purpose of the Pre-Application Notes

These comments summarize the city's land use ordinances, policies, design standards, and code requirements that apply to your project. They are based on the material you have supplied us and will alert you to key issues involved in your project. They are not intended to provide a complete review of your proposal. Several electronic links have been included within the body of these comments, some specific to your project and some more general in nature. Note that these comments are valid for a period of six months.

Please do not hesitate to contact **Brit Vigil, ODA Project Manager**, who assembled these notes.

### Contact Information

Below is a list of City of Aurora Departments/Divisions that were represented at the meeting and contact information for the individual City Staff members present.

#### Development Services

Office of Development Assistance  
Brit Vigil  
303.739.7323  
[bvigil@auroragov.org](mailto:bvigil@auroragov.org)

#### Planning

Zoning and Plan Review  
Ariana Muca  
303.739.7259  
[amuca@auroragov.org](mailto:amuca@auroragov.org)

Landscape Design  
Kelly Bish, RLA, LEED AP  
303.739.7189  
[kbish@auroragov.org](mailto:kbish@auroragov.org)

#### Parks, Recreation & Open Space

Planning Design and Construction  
Adison Petti  
303.739.7437  
[apetti@auroragov.org](mailto:apetti@auroragov.org)

Forestry  
Jacque Chomiak  
303.739.7178  
[jchomiak@auroragov.org](mailto:jchomiak@auroragov.org)

#### Aurora Water

Samantha Bayliff  
303.739.7292  
[sbayliff@auroragov.org](mailto:sbayliff@auroragov.org)

#### Aurora Water - Drainage

Sarah Couture  
303.739.1796  
[scouture@auroragov.org](mailto:scouture@auroragov.org)

#### Public Works

Traffic Division  
Dean Kaiser  
303.739.1718  
[djkaiser@auroragov.org](mailto:djkaiser@auroragov.org)

Roadway & Public  
Improvements  
Engineering Division  
Julie Bingham  
303.739.7403  
[jbingham@auroragov.org](mailto:jbingham@auroragov.org)

Life Safety and Building  
Division  
Richard Tenorio  
303.739.7628  
[rtensorio@auroragov.org](mailto:rtensorio@auroragov.org)

Land Review Services  
Division  
Rebecca Westerfield  
303.739.7325  
[rwesterf@auroragov.org](mailto:rwesterf@auroragov.org)

#### Cherry Creek School District

Matt Schaefer  
720.554.5053  
[mschaefer2@cherrycreekschools.org](mailto:mschaefer2@cherrycreekschools.org)

#### Energy & Environment

Maria Alvarez  
303.739.6824  
[malvarez@auroragov.org](mailto:malvarez@auroragov.org)

## STEP I – PLANNING PHASE

### **Planning and Business Development**

The Planning comments are numbered. When submitting an application, please include a letter of introduction responding to each of the numbered comments, including key issues from other departments.

#### ***Key Issues:***

- ▶ Access to the Adjacent Highline Canal Path and Westerly Creek.
- ▶ Building Frontage - Surface parking along the frontage is limited to 25% of the frontage, parking should be pushed behind the building so that the building is adjacent to the street.

#### ***Project Overview:***

- Zoning: (R-4) High Density Residential District
- Character Area: Subarea A
- Proposed Use: Affordable Multi-Family Residential
- Permitted Use: Yes

#### ***Type of Application:***

- Site Plan

#### ***Procedures:***

- A Summary Table of Procedures can be found in Section 146-5.2, Table 5.2-1.
- The application will require approval in a public hearing before the Planning and Zoning Commission. It will be reviewed in 12- 13 weeks and processed electronically through our development review website.

#### ***Important Links:***

- [Unified Development Ordinance \(UDO\)](#)
- [Aurora Places Comprehensive Plan](#)
- [CAD Data Submittal Standard](#)
- [Landscape Reference Manual](#)
- [Development Review Website](#)
- [Online Application and Plan Submittal Guide](#)
- [Transportation Studies & Plans](#)
- [Pre-Submittal Checklist](#)
- [Forms and Applications](#)
- [Aurora Map Gallery](#)
- [Arapahoe County Assessor Map](#)
- [Site Plan Manual](#)
- [Preliminary Drainage Report \(PDR\) Review Checklist](#)
- [Master Drainage Report \(MDR\) Review Checklist](#)
- [Civil \(Utility\) Plan Pre-Acceptance Review Checklist](#)

***Standards and Issues:***

**1. Zoning and Placetype**

*1A. Zoning*

The purpose of the R-4 district is to allow for high-density residential development to occur in close proximity to arterial or collector streets, public transit facilities, and other public amenities. Uses in this district include a diverse range of housing types ranging from single family and two-family residences to the highest density multifamily housing and limited lodging and rooming facilities. Some of the higher density developments may include ground floor commercial uses. Development of neighborhood services should include convenient automobile, bicycle, and pedestrian connections to nearby residential uses. The R-4 district also generally permits home occupations, neighborhood services, medical facilities, and some limited office uses.

*1B. Placetype*

City Corridors are a placetype that will contribute to the economic and fiscal success of the city. Corridors are centered along the city's major roadways, home to a wide range of uses, including commercial, retail, institutional, service and some residential. This placetype is generally auto oriented, but should also accommodate pedestrians, bicyclists, and transit service. City Corridors should include amenities such as sidewalks, crosswalks, benches, pedestrian-scale lighting, and landscaping that make it easy for pedestrians to navigate the area safely and comfortably. Multifamily residential and institutional uses are secondary uses and allow for the development of mixed-use projects.

**2. Land Use**

*2A. Historic Land Use*

This property has been used as a horse stable for decades. It serves as an equestrian training center offering boarding and riding lesson programs.

*2B. Proposed Land Use*

The application was reviewed as a future LIHTC workforce/affordable housing development meeting the definition of “affordable structure” in the UDO. If the application were not to get funding and is not able to meet the UDO definition of affordable structure, then standard multi-family requirements would apply.

**3. Development Standards**

*3A. Dimensional Standards*

All development shall comply with the standards in Section 146-4.2.2. Dimensional standards for mixed-use districts are shown in Table 4.2-3, which notes that residential uses shall follow the standards for the R-4 zone district. The building setback areas required under Section 146-4.2 shall be unobstructed from the ground upward except for fences, landscaping, and other specific building features specified as exceptions to the required setbacks in Section 146-4.2.4.

- Lot frontage at front lot line, minimum: 60'
- Front setback, minimum: 12'
- Side interior setback, minimum: 5'
- Side setback, abutting a local street, minimum: 7.5'
- Side setback, abutting non-residential use, minimum: 25'
- Rear setback, abutting non-residential use, minimum: 25'
- Rear setback general, minimum: 10'
- Building height, maximum: 65' (Portions of Affordable Housing structures located more than 75 feet from an R-R, R-1, or R-2 zone district have a maximum height of 75 feet.)

**3B. *Use-Specific Standards***

Per Section 146-3.3.2.H, each multi-family dwelling unit structure shall have frontage along a street and require a building entrance connecting to and facing the street without intervening parking lots or other vehicular areas. Per the pre-application meeting, staff would like to see the Phase 1 Building front Exposition Avenue with Phase 2 and parking moved to the rear of the site.

Multi-family dwelling structures with outside staircases leading to units on floors above the ground floor are prohibited.

On-site usable outdoor space shall occupy a minimum of 20% of the site. The purpose is to ensure that multi-family development includes adequate outdoor space for residents and guests. Adequate outdoor space includes a mixture of 1) usable green spaces for unstructured recreation, playgrounds, outdoor swimming pools, and athletic courts; and 2) common gathering spaces such as plazas and courtyards. A significant portion of the outdoor space shall be consolidated within a centralized portion of the development.

Twenty percent of the site will be designed as usable green spaces and common gathering spaces such as courtyards and plazas. Outdoor amenities such as pools and basketball courts, dog parks, private balconies, and rooftop amenities may also contribute to the requirement. Detention ponds may only count toward the requirement for the portions designed to include usable green space and common gathering space.

The expectation is that significant portions of the open space are consolidated into “large”, centrally located amenities. Typically, usable turf areas should have a minimum dimension of 50 feet. Normally, these spaces will have a minimum dimension of 15 feet.

Access to the Highline Canal is supported and encouraged.

**3C. *Building Layout***

The expectation is that buildings along the street will have functional entrances oriented toward the street and will have direct connections to the public sidewalk. Ground floor units shall have front doors oriented to and be accessible from the public sidewalk. Planning suggests moving the detention and parking away from the street, giving room for one of the apartment buildings.

- Per Section 146-4.8.4.B.1, each primary structure shall be arranged so that the primary façade and each façade with a main pedestrian entry, orients onto and provides direct pedestrian access onto, one of the following.
  - A public or private street;
  - A public park, open space or common green;
  - A plaza or courtyard; or
  - A pedestrian passage.

Considering the limitations of the site, staff recommends having at least one building front Exposition Avenue and the second phase building be designed to accommodate an entry towards plaza common area.

***Sidewalks***

- All properties shall provide an interconnected system of sidewalks that directly connect all lots to and within commercial centers, employment areas, designated parks and open

spaces, and other uses. Accessible routes meeting the ADA shall also be provided from the building or site entries to a public or private street.

*Staircases*

- Per Section 146-3.3.2.H.2, multifamily dwelling structures with outside staircases leading to units on floors above the ground floor are prohibited. All corridors and stairwells shall be fully enclosed within the building envelope.

*3D. Common Space and Amenities*

Multi-family development requires adequate usable common space and amenities per code. Twenty percent of the site will be designed as usable green spaces and common gathering spaces such as courtyards and plazas. Outdoor amenities such as pools and basketball courts, dog parks, private balconies, and rooftop amenities may also contribute to the requirement. Detention ponds may only count toward the requirement for the portions designed to include usable green space and common gathering space.

The expectation is that significant portions of the open space are consolidated into “large”, centrally located amenities. Typically, usable turf areas should have a minimum dimension of 50 feet. Normally, these spaces will have a minimum dimension of 15 feet.

*3E. Access and Connectivity*

Section 146-4.5 provides site design standards to promote safe and convenient vehicle, bicycle, wheelchair, pedestrian, public transit, and other mobility device connectivity among individual development sites, trails, sidewalks, transit stations, and convenience shopping areas to encourage travel by bicycles, transit, other micro-mobility devices, or walking as an alternative to automobile trips, to reduce the frequency and shorten the distance of automobile trips, to provide multiple routes to many destinations, and to implement the Comprehensive Plan goals or other approved plans or design studies.

Pedestrian connections should provide a safe, convenient, and accessible pedestrian connection from the main entrance of a building to a public sidewalk or internal walkway that connects to a public sidewalk is required. Further, sidewalks and walkways serving a site shall align and connect with any sidewalks on adjacent properties that extend to the boundary of such properties. Multiple pedestrian connections between adjacent developments shall be provided to the maximum extent practicable.

A 6' detached sidewalk with tree lawn and streetlights will be required along Exposition Avenue.

The site plan proposal should provide safe and convenient connections to the community elementary school to the east as well as a pedestrian connection to Expo Park to the north of the proposed development.

With limited street access and connectivity, the applicant is encouraged to further explore cross access with adjacent multifamily parcels. This will help to resolve several code compliance issues with the proposal such as building frontage requirements, percentage of common area, and reduced paved areas for construction and maintenance. Please reach out to staff if any assistance is needed to discuss potential process solutions for such an arrangement.

*3F. Parking, Loading, and Stacking*

On-site parking is required by Section 146-4.6 (Table 4.6-1) of the Unified Development Ordinance. Affordable multi-family residential development requires .85 space per dwelling unit,

and 1 additional space per 5 dwelling units for guest parking. Based on the information provided (166 residential units), a total of 174 spaces would be required. Parking spaces on private streets or driveways within multifamily developments may be used to meet the requirements for guest parking. Table 4.6-2 provides the number of required handicapped spaces. For 147 parking spaces, 5 shall be designated as handicapped accessible spaces. At this location the surface parking along the street frontage is limited to 25% of the frontage, and the remainder of the frontage is required to be building frontage.

Section 146-4.6.5 details requirements for the design and placement of parking areas. Generally, parking areas should be located and designed to provide for adequate vehicle circulation, safe pedestrian connections, screening from adjacent sites and streets, and to avoid abutting significant stretches of adjacent streets.

Multifamily and non-residential development in Subarea A shall provide bicycle parking spaces equal to at least 10 percent of required automobile parking spaces. Each inverted-U bicycle rack counts as two bicycle parking spaces.

*3G. Landscape, Water Conservation, Stormwater Management*

Prepare your landscape plans in accordance with the Landscape Reference Manual as well as the Unified Development Ordinance (UDO). Both documents are available online. The landscape requirements within the UDO should follow Section 146-4.7 Landscape, Water Conservation, Stormwater Management. Please ensure that the landscape architect or designer has a copy of these documents as well as our project specific comments.

While understood to be preliminary or draft concept, the water feature as noted is no longer permitted due to the passage of the Non-Functional Turf and Ornamental Water Features Ordinance in October of 2022. Exterior decorative fountains, waterfalls, basins, ponds, lakes or similar aesthetic structures are no longer permitted in order to conserve water.

*– Landscape Plan Preparation*

Please label all landscape sheets “Not for Construction”. Landscape construction drawings are not required and therefore do not necessitate the signature, stamp and seal of a licensed landscape architect upon final approval by the City of Aurora. Landscape plans submitted with a site plan or redevelopment plan are used by the City to determine compliance with the landscape standards and for code enforcement purposes.

Landscape plans submitted during the Development Application submittal process must be prepared on 24” x 36” sheets and have plant symbols, plant labels with quantities and a plant schedule upon first submission or a complete review will not be possible and may result in additional submittals and ultimately delays in approval of the plan set.

*– Sight Triangles*

Include sight distance triangles per the Roadway Design and Construction Specifications document. All landscaping within the designated triangles shall not exceed 26” in height as measured from the roadway surface.

*– Section 146-4.7 Landscape, Water Conservation, Stormwater Management*

The following bullet points are not necessarily an all-inclusive list of the landscape requirements. The applicant is responsible for reviewing this section and determining all applicable landscape conditions.



– Section 146-4.7.5 Required Landscaping (C) Curbside Landscaping 2a.

Street trees are required at a ratio of one street tree per 40 linear feet along E. Exposition Avenue. Street trees shall be provided in the curbside landscape when a detached walk is provided or 4'-5' from behind the back of walk when an attached walk is provided. Turf is no longer permitted within the curbside landscape but shall be landscaped in accordance with this section of the UDO. Street trees shall be located 50' from the face of a stop sign to maintain regulatory sign visibility. Refer to Figure 4.7-2.

– Section 146-4.7.5 D. Street Frontage Landscape Buffers

Provide a 20' wide street frontage buffer as measured from the back of walk along E. Exposition Avenue. All multi-family developments that abut an arterial and/or collector street require a street frontage buffer. A reduction in the buffer width is not permitted.

Landscaping shall consist of one tree and ten shrubs per each forty linear feet of buffer length and shall be installed along the exterior sides of proposed fencing or walls. Shrubs and ornamental grasses may not be substituted for trees in the buffer unless the applicant demonstrates to staff that the site is encumbered. Encumbrances shall include overhead and underground utilities, floodplain, easements or similar.

No portions of buildings, including porches or patios, drive lanes, detention ponds, parking stalls, dumpsters or dumpster enclosures shall be permitted within the buffer.

– Section 146-4.7.5.E.2.b. Non-Street Perimeter Buffers

Provide a 15' wide non-street perimeter buffer along the western and southern property boundary lines adjacent to the existing multi-family developments. A reduction in the buffer width to 10' is possible depending upon the buffer reduction feature chosen as specified in Table 4.7-2 Required Landscaping Buffer Widths and Allowed Reductions. While the buffer widths are less restrictive, plant quantities remain consistent. Plant material shall be provided at a ratio of one tree and five shrubs per 40 linear feet.

No buildings or portions of buildings, including patios, drive lanes, parking, dumpster, dumpster enclosures as well as detention pond infrastructure such as rip rap, outlet structures or trickle channels may encroach into the buffer.

– Section 146-4.7.5 H. Special Landscape Buffers for Development Adjacent to I-79, I-225, E-470, Public Parks, Open Space and Trails

Typically a 25' wide special landscape buffer would be required along the eastern property line where it abuts the Westerly Creek Trail corridor. Given the drainage tract that separates the trail from this proposed development, the city will not impose the mandatory 25' wide buffer width, but requests that the landscaping required to screen the parking lot (see parking lot screening requirements below) be increased beyond what is required for screening. The buffer width provided should consider future maintenance of the plantings as well as the plantings at their mature size. Coordination with PROS and Planning will be necessary to ensure an appropriate buffer is being provided.

The encroachment of buildings or portions of buildings including porches, patios, trash enclosures, dumpsters, parking lots and internal vehicular drives, sidewalks and detention and water quality pond infrastructure into landscape buffers is prohibited. The provision of trail connections is generally permitted through the buffers but shall be approved by PROS on a case-by-case basis and is based upon unique site conditions and alternatives to those impacts including mitigation measures.

## Re: The Stables (#1842883)/Pre-Application Meeting held October 24th, 2024

These landscape requirements are based upon the proposed layout presented for the pre-application meeting. Should the layout change, staff will re-evaluate the need to require the 25' wide Special Landscape Buffer based upon formal site plan submittal.

### – Section 146-4.7.5.I. Private Common Open Space/Tract Landscaping

All areas of land that have been disturbed during construction and are required or designated to be preserved and protected from future development for non-public active and passive recreation areas and facilities, trails, wildlife habitat or preservation of view corridors and natural land features shall be landscaped with one tree and ten shrubs per 4,000 square feet. Open space areas that will be activated or programmed for use by the residents can contain sod. Include information on the landscape plan on how any cultural activities, organized social gatherings etc. may occur in the space including the placement of benches, trash receptacles, picnic tables or any covered pavilions.

### – Section 146-4.7.5.J.3. Multi-family and Single Family Attached (Townhome) Residential Structures

All new multifamily buildings shall provide building perimeter landscaping. Plant beds shall be an average of six feet wide and shall consist of 1.25 plants per five linear feet of unit perimeter footage. At least five percent should be a mixture of evergreen and deciduous trees, at least 15% shall be tall shrubs with a mature height of six feet and up to 80% shall be a mixture of evergreen and deciduous shrubs chosen to create seasonal interest. An example table demonstrating compliance has been provided below.

Building Perimeter Landscape Table								
Building	Building Perimeter Landscape Description	Length	Trees Required	Trees Provided	Tall Shrubs Required	Tall Shrubs Provided	Regular Shrubs Required	Regular Shrubs Provided
1	Building 1 Elevation	207 LF						
	5% Trees (Mix of Evergreen and Deciduous)		3	3				
	15% Tall Shrubs				8	8		
	80% Other Shrubs						42	42
2	Building 2 Elevation	238 LF						
	5% Trees (Mix of Evergreen and Deciduous)		3	3				
	15% Tall Shrubs				9	9		
	80% Other Shrubs						48	48
3	Building 3 Elevation	208 LF						
	5% Trees (Mix of Evergreen and Deciduous)		3	3				

### – Section 146-4.7.5 K. Parking Lot Landscaping

Both interior and exterior parking lot landscaping is required for all proposed parking lots. No parking row shall exceed 15 spaces without an intervening landscaped island, median or landscaped peninsula. All parking rows must terminate in a landscaped island. The perimeter of all parking lots shall be screened from public rights-of-way, public open space and adjacent property with one or a combination of methods shown in this section. If required, street and non-street frontage landscape buffers may be combined with the parking lot screening requirements to satisfy both if the two requirements should overlap. City staff will determine whether the overlap exists once a formal site plan submittal is made.

An increase in plantings is being required in lieu of the 25' wide Special Landscape Buffer along the eastern property boundary. See commentary above under 25' Special Landscape Buffer.

### – Section 146-4.7.8. B. 2.b. Service, Loading, Storage and Trash Area Screening

All trash and recycling bins must be enclosed and setback at least 12 feet from adjacent properties with residential or commercial uses. Service areas visible from streets or residences shall be screened by fences, walls, landscaping, berms or any combination of items. Fencing and wall

## Re: The Stables (#1842883)/Pre-Application Meeting held October 24th, 2024

screening shall be accompanied by landscaping on the exterior side to soften the appearance of the wall and/or fence. Evergreen plantings are required along the exterior.

### – Section 146-4.7.5 L. Site Entryways and Intersections

Provide a distinctive landscape feature at each site entrance. Distinctive landscape features should consist of specimen quality plant material that will provide visual interest during all seasons. This is often provided around any proposed signage and/or monumentation.

### – Section 146-4.7.3 M. Detention and Water Quality Ponds

All detention pond facilities shall not exceed six feet in depth. The area within the tract surrounding the pond shall contain a minimum of one tree and 10 shrubs or the approved tree and shrub equivalents per 4000 square feet above the 100-year water surface elevation. When overlapping landscape standards occur such as when buffers, detention/water quality and parking lot landscape requirements fall within the buffer, they may be counted towards meeting the buffer requirements, however the most restrictive requirements shall be met.

### – Section 146-4.8.3. C. Irrigation

All developments shall install an automatic irrigation system for landscape areas. To assess irrigation tap fees, the Water Department will require the applicant divide their landscape into water conserving, non-water conserving and non-irrigated areas as part of the landscape submittal. A table summarizing the quantities along with a plan that clearly delineates these areas should be provided. Contact Timothy York at (303) 739-8819 or [tyork@auroragov.org](mailto:tyork@auroragov.org) regarding irrigation plan requirements and application fees. An irrigation permit is required prior to the installation of an irrigation system.

## 3H. *Building Design Standards*

Section 146-4.8 of the UDO contains specific standards for the design of buildings. These standards include requirements for building orientation and spacing, breaking up the massing of building facades with articulation elements, four-sided building design, and permitted materials, among other things.

Code requires that you incorporate material changes and architectural features such as glazing, textured surfaces, projections, color, overhangs, and changes in parapet height to improve the

<b>Table 4.8-1</b> <b>Building Design Standards Applicability by Building Type</b> <b>Adjustments for Affordable Housing Structures appear in Sections 146-4.8.5 and 146-4.8.6</b>						
<b>Standard</b>	<b>Single-family detached or two-family dwellings</b>	<b>Single-family attached</b>	<b>Multifamily buildings</b>	<b>Single-story non-residential buildings</b>	<b>Multi-story mixed-use or non-residential buildings</b>	<b>Large-scale retail large format-over 75,000 sq. ft. gfa.</b>
<b>General building design standards</b>						
Design variety	✓					
Distribution of masonry and architectural features	✓					
Windows	✓					
Building orientation and spacing			✓	✓	✓	✓
<b>Massing and articulation</b>						
Horizontal articulation		✓	✓	✓	✓	✓
Vertical articulation	✓		✓		✓	✓ [1]
Maximum building length			✓	✓	✓	
<b>Building materials</b>						
Primary building materials	✓		✓	✓	✓	✓
Masonry standards		✓	✓			
<b>Four-sided building design</b>						
Facade character elements			✓	✓	✓	✓
Entry design			✓	✓	✓	✓
<b>Roof design</b>						
Roof materials	✓		✓	✓	✓	✓
Roof form	✓		✓	✓	✓	✓
<b>Screening of mechanical equipment</b>						
Rooftop equipment	✓		✓	✓	✓	✓
Ground-mounted equipment	✓		✓	✓	✓	✓
Garbage storage areas			✓	✓	✓	✓

Notes:

[1] Only applies when more than two stories or over 30 feet tall.

façade and create an inviting and attractive street presence. Buildings must be designed to create a clear base, middle, and cap, with specific instructions and tips for how this can be achieved in Section 146-4.8.5.C. Ground floor designs should support a pedestrian-friendly environment, provide visual interest, and help to create an atmosphere that promotes foot traffic. Code also requires that you use changes in the wall planes, both horizontally and vertically, at specific intervals and provide a variety of durable materials to create visually interesting buildings. Architectural details shall be continued on all four sides of the buildings to prevent the back of house appearance. See the table above for applicable building design standards and ensure that the building elevations meet all applicable requirements.

Multifamily buildings are required to have frontage on a street and to have main or dwelling unit entrance off the public sidewalk. Please be sure your proposal is able to meet this requirement.

<b>Table 4.8-6</b>	
<b>Masonry Standards for Single-Family Attached and Multifamily</b>	
<b>Type of Structure</b>	<b>Minimum Percentage of Masonry on Net Façade Area (not each elevation)</b>
<b>Multifamily (excluding two-family)</b>	<p>Either:</p> <ul style="list-style-type: none"><li>• 60 percent (or 30 percent for an Affordable Housing Structure) shall be clad in brick or stone; or</li><li>• 80 percent (or 40 percent for an Affordable Housing Structure) shall be clad in stucco; or</li><li>• 80 percent (or 40 percent for an Affordable Housing Structure) shall be clad in a combination of stucco and brick, or stucco and stone.</li></ul>

3I. *Exterior Lighting*

Standards for exterior lighting are found in Section 146-4.9. Show typical details of lighting on the plan and on building elevations.

3J. *Signs*

Section 146-4.10 governs signage standards. Please review this section for complete details. Show the location of any monument signs on the plans and indicate the location of wall-mounted signs on the building elevations.

**4. Adjustments**

Section 146-5.4.4 details the definitions, applicability, procedures, and criteria of approval for all adjustments to development standards. If any adjustments are requested, they must clearly be listed and justified in the Letter of Introduction. They must also be listed on the cover sheet of the Site Plan and any other sheets on which they are applicable. Approval of adjustment requests are not guaranteed. Adjustment requests should identify the reason for the adjustment, efforts to minimize the adjustment, and design elements proposed to mitigate the standards proposed for reduction. Typically, mitigation techniques should go *above and beyond* requirements from other code sections. If an adjustment does not meet the limits for administrative approval under Section 146-5.4.4.F, then the adjustment will require approval from the Planning and Zoning Commission.

## **5. Submittal Reminders**

### *5A. PDF Requirements*

The application will be uploaded through the city's development review website as separate PDFs. Please ensure that all AutoCAD SHX text items are removed from the "Comment" section during the PDF creation process and that the sheets are flattened to reduce ability to select items. PDFs will be rejected during pre-acceptance reviews if they do not comply with this requirement, which could result in delays.

### *5B. Mineral Rights Notification*

Please fill out the [Mineral Rights Affidavit](#) and supply this document to your Case Manager with the application submittal.

### ***Pre-Submittal Meeting:***

Contact the assigned Case Manager to schedule a pre-submittal meeting at least one week prior to submitting an application. At the pre-submittal meeting, staff will review the submittal requirements, discuss the review timeline, provide a fee estimate, and review the process for uploading files and inputting adjacent property owners.

Please note that a separate pre-submittal meeting is required with the Land Development Review Services Division for the Subdivision Plat prior to application submittal. Please contact them directly to schedule this meeting.

### ***Community Participation:***

The City of Aurora promotes citizen participation in the development review process. One way to promote this participation is through a community meeting. Registered neighborhood organizations within a one-mile radius and adjacent property owners will formally be notified of the application when a submittal has been made to the Planning and Development Services Department. Occasionally, it will be necessary to hold a community meeting to discuss the application. Your Planning Case Manager can assist and inform you if a community meeting will be required.

### ***Community Meetings:***

- Currently, the city is utilizing Kerri Drumm with Purpose Aligned Consulting to facilitate these meetings. Please work with your assigned Planning Case Manager to schedule these meetings.
- These community meetings allow applicants an opportunity to present their proposal to adjacent neighborhoods and any impacted citizens. The meetings also allow residents to share their questions and opinions about the proposal to both the applicant and City staff.
- All meetings with registered neighborhood organizations should also include the Planning and Development Services Department Case Manager so that questions concerning the UDO and land use procedures can be properly addressed. The applicant will be expected to take meeting notes and include any project-related commitments that are made to the community at these meetings. After the meeting, please continue to work with the organizations that express interest in your project to address comments and mitigate concerns.
- Additional information about Community Meetings can be provided by reaching out to the Planning Case Manager for the application or by visiting the Planning and Development Services page of the city website.

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- You can also find adjacent neighborhood groups associated with your site via this link: [Aurora Registered Neighborhood Associations - HOAs \(arcgis.com\)](https://arcgis.com)

**Energy and Environment Division**

There are no known plugged and abandoned (P&A) wells within your site and no existing or planned oil and gas surface facilities on your site at this time. There may be existing underground pipelines in rights-of-way. If you have questions or concerns about this, the Energy & Environment Division can assist by providing additional information.

The City of Aurora has no authority or control over subsurface well equipment or operations. Contact the Colorado Energy & Carbon Management Commission (ECMC) for more information. Should you have any questions about oil and gas development, please reach out to Jeffrey S. Moore, Manager of the Energy & Environment Division.

**Parks, Recreation & Open Space Department (PROS)**

***Land Dedication, Cash-in-Lieu, and Park Development Fees***

Qualified affordable housing constructed in collaboration with the Aurora Housing Authority (AHA) may be exempt from PROS land dedication and park fee requirements. LIHTC funding alone does not qualify for exemption. Without documentation from AHA, the following standards will apply to the project.

The population multiplier for multi-family homes is 2.5 persons per unit. The projected population for the project is 415 persons residing in 166 multi-family units. PROS' required dedication acreage is computed by applying the following standards to the projected population for the project:

- 3.0 acres for neighborhood park purposes per 1,000 persons
- 1.1 acres for community park purposes per 1,000 persons
- 7.8 acres for open space purposes per 1,000 persons

The resulting acreage required for 415 persons residing in 166 units is as follows:

Neighborhood Park Land	1.25 acres
<u>Community Park Land</u>	<u>0.46 acres</u>
<b>Standard Parks Dedication</b>	<b>1.71 acres</b>

The required dedication can be met on-site or via a cash-in-lieu-of land payment. The final qualified acreage dedicated on site will be subtracted from the initial CIL calculation below. The remaining land dedication shall be satisfied by a cash-in-lieu payment prior to subdivision plat/replat. Total CIL is computed by multiplying the dedication acreage by the estimated infill-or-market value for the land.

Infill Value Per Acre	\$ 64,000
<u>Total Park Acres</u>	<u>x 1.71 acres</u>
<b>Standard CIL Payment</b>	<b>\$ 109,440.00</b>

Park Development Fees shall be collected by the city to cover the cost of constructing new park facilities to serve the needs of the projected population. These fees apply to any required facilities that are not proposed to be provided on-site. Fees are based on the park land dedication acreages and an annual cost per acre for construction of park facilities. The fees, which are computed and collected on a per-unit basis, shall be paid at time of building permit issuance, according to the calculation below, updated annually. The total PDF may be reduced according to the amount of parks dedication on site, in relation to the total unit count.



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Per Unit Fee (2024)	\$ 2,098.46
Total MF Units	x 166 units
<b>Total PDF</b>	<b>\$ 348,344.24</b>

The timing for implementation of the project may affect the ultimate amount of fees collected and other payments imposed to satisfy park-related obligations. Furthermore, if aspects of your project change, such as the number of dwelling units proposed, the park land dedication requirements may also change.

***Waiver of 25' Special Landscape Buffer for Projects Adjacent to Trails and Open Space***

The project is located ¼ mile east of Highline Canal, directly south of Expo Park across the street, and shares a property boundary with Westerly Creek Greenway. Typically, a 25' wide special landscape buffer would be required on the east property line abutting Westerly Creek (UDO 146-4.7.5 H.). Given the drainage tract that separates the trail from this proposed development, the city will not impose the mandatory 25' wide buffer width, but requests that the landscaping required to screen the parking lot (see parking lot screening requirements below) be increased beyond what is required for screening. The buffer width provided should consider future maintenance and mature size of the plantings. Coordination with PROS to ensure an appropriate buffer is provided. Should the concept change, staff will re-evaluate the need to require the 25' wide Special Landscape Buffer based upon the formal site plan submittal.

***Standard Design Criteria***

**PROS 3.1.F-- INFILL & TRANSIT STATION AREA DEVELOPMENT CRITERIA** – Special dedication and development criteria applicable to infill development and development within transit station areas include the following: (1) Land provided in conformance with small urban park (SUP) criteria shall be credited toward satisfying, in whole or in part, neighborhood park land dedication requirements. (2) Land provided to complete or enhance the system of regional trails or greenways that connect bicyclists and pedestrians to major destinations on the development site and to adjacent properties shall be credited toward satisfying, in whole or in part, community park land dedication requirements.

**PROS 6.13 SMALL URBAN PARK (SUP) CRITERIA:** The user experience at SUPs should be geared toward social interaction and leisure opportunities. A SUP shall be no less ten thousand (10,000) square feet in size. Due to their small size, SUPs shall be owned and maintained by a non-city entity, such as a metropolitan district or homeowner's association, for all parks less than 5 acres in size. Coordination with PROS is necessary to define appropriate programmatic and design elements prior to site plan or final plat. See section 6.13.D for a complete list of potential and required elements such as furnishings and recreation features. SUPs should be equitably distributed throughout a project. SUPs should be aligned with sidewalks and trails and destinations on adjoining property to facilitate direct pedestrian and bicycle connectivity. SUPs should serve as landmarks, focal points and centers of activity relative to other complementary uses (not necessarily at the geographic center of the development). SUPs should help to create a visual identity to strengthen a sense of place and orientation through specific design criteria.

PROS is supportive of the park-like amenities proposed. [PROS Dog Park Study \(Aurora Channel, 2024, starts at 37 minutes\)](#) could be a good resource when designing the pet amenities proposed.

**Forestry Division**

There will be several trees impacted on this property due to development. Qualified affordable housing constructed in collaboration with the AHA may be exempt from tree mitigation fee requirements. Without documentation showing partnership with AHA, the following standards will apply to your project.

### **Tree Mitigation Requirements**

- Trees on site that are 4" or greater in caliper that will be impacted by development require tree preservation or mitigation. The intention of the Tree Preservation Policy is to preserve trees that are in good condition and of high value during the process of development. Mitigation for trees removed from the property can be accomplished by trees being planted back onto the site through the landscape plan, payment made into the Tree Planting Fund, or a combination of the two. If trees are planted on the site, the mitigation requirement is an inch-for-inch replacement. This is in addition to the regular landscape requirements. For example, if a 10" tree is removed, 10 caliper inches must be replaced back onto the site. The use of tree equivalents is not acceptable for tree mitigation.

### **Forestry's Role in Site Plan Review**

- When the site plan is submitted, please show and label all existing trees on a separate sheet called Tree Mitigation Plan and indicate which existing trees will be preserved or removed. Please include grading on this sheet as well. Forestry Division staff will conduct a tree assessment after the initial submittal, which includes species, size, condition, and location factors. If there is interest in determining mitigation requirements before your submittal, there is the option of hiring a consulting arborist; a list can be obtained from Forestry upon request. Forestry would require a meeting with the arborist selected to make sure that we agree on the appraisal.
- Once Forestry Staff conducts the tree assessment, a spreadsheet will be provided showing the dollar value of the trees that will be removed as well as the number of inches required for replacement back onto the site. If a Consulting Arborist is hired, this information will be supplied by them. In most cases, the mitigation inches can be replaced on the site through upgrades to the landscape plan.
- Civil and SWMP plans will not be approved by Aurora Forestry until tree mitigation has been approved through the Site Plan Process.
- Any trees that are preserved on the site during construction activities shall follow the standard details for Tree Protection per the current Parks, Recreation & Open Space Dedication and Development Criteria manual. The Tree Protection notes shall be included on the plan.
- The link for the manual can be found at:  
<https://auroraver2.hosted.civiclive.com/cms/One.aspx?portalId=16242704&pageId=16529352>

### **Ash Trees Prohibited**

- Due to the invasive Emerald Ash Borer that has been infesting trees along the Front Range, all species of Ash are prohibited from planting within the City of Aurora – please be sure that your Landscape Architect is aware of this requirement.

### **Cherry Creek School District**

The district has reviewed the development proposal in terms of required land dedications and/or cash-in-lieu contributions.

1. Land dedication for public school sites or cash-in-lieu of land dedication  
Utilizing the City of Aurora Unified Development Ordinance (the "UDO"), the land dedication calculation for the school district is **0.5432 acres** or an appropriate cash-in-lieu fee. This acreage was calculated using the Section 4.3.18.A.2 of the UDO based on student yield ratios for ***multi-family high density housing***. The district proposes to utilize an appraisal method to determine the



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fair market value as outlined in section 4.3.18.A.4 of the UDO. Based on the Arapahoe County assessor's 2024 appraisal, the cash-in-lieu of land calculation is **\$236,632.71**. Based on the size and location of this development, the School District requests cash-in-lieu of land dedication.

Cherry Creek School District #5					
Planning Department					
Student Generation Worksheet - Aurora					
Project Name:		The Stables			
Project Number:		Pre App #1842883			
Developer/Contact Person:		Alisha Hammett, Shopworks Architecture			
Submitted for Review:		10/17/2024			
		166 units on 4.79 acres			
Students Generated					
Type of Unit	#D.U.s	ES	MS	HS	Total
< 7.49 du/ac	0	0	0	0	0
7.5 - 14.99 du/ac	0	0	0	0	0
> 15.00 du/ac	166	12	7	5	24
Totals	166	12	7	5	24
Acres per Child		0.0175	0.025	0.032	
Land Dedication Total		0.22	0.17	0.16	0.5432
Arapahoe County Assessor - Current Land Value					\$ 2,086,520.00
Arapahoe County Assessor - Acres					4.790
Arapahoe County Assessor - Current Land Value (per acre)					\$ 435,599.16
Cash in Lieu of Land Dedication Calculation					\$ 236,632.71

**Aurora Water**  
**Utilities**

*Aurora Water will receive a referral of the Site Plan and Subdivision Plat for review and comment. Please respond to all Water Department comments with your initial submittal.*

***Key Issues:***

- ▶ A water main extension will be required along lot frontage, and a looped water supply will be required for any new fire hydrants and for fire service lines.
- ▶ Each individual building will need its own water service meter, and each meter will need its own fixture unit table.
- ▶ A separate irrigation water meter will be required for common landscaped areas.
- ▶ Domestic service allocation agreements (DSAA) will be required.
- ▶ A sanitary sewer analysis will be required to ensure that the existing sanitary sewer that is present in Exposition Avenue will have the capacity to meet the needs of the new development.
- ▶ A SWMP report and plan will be required.

***Utility Services Available:***

- Water service may be provided from: water main in E Exposition Avenue.
- Sanitary sewer service may be provided from: sanitary sewer main in E Exposition Avenue.
- Project is located on the following Map Pages: 10C

***Utility Service Requirements:***

- A Site Plan is required for this project and must show existing and proposed utilities including:
  - Public/Private Mains
  - Service Lines

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- Water Meters
- Fire Suppression Lines
- Fire Hydrants are necessary to service your development.
- All utility connections in the arterial roadway are required to be bores.
- General utility design criteria can be found in Section 5 of the [Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure](#) (Utility Manual).
- All commercial and industrial users that discharge wastewater to the City of Aurora are to meet [Metro Water Recovery's Industrial Pre-Treatment Program](#). Applicants are encouraged to reach out to Metro Water Recovery early in the planning process to learn more about the program requirements.
- Note that Aurora Water reserves the right to enact certain restrictions that may include curtailment of water taps or usage of non-functional turf as established by City Ordinance.
- Please reference Ordinance No. 2022-46 pertaining to the use and restrictions of turf and ornamental water features.

***Utility Development Fees:***

- A partial Storm Drainage Development fee is required prior to the recording of the Subdivision Plat or at the time of building permit approval if a Plat is not required. Additional Storm Drainage fees may be charged and are based on the amount of impervious surface created by this project.
- The Water Transmission Development Fee and the Sanitary Sewer Interceptor Fee have been combined into the water connection fee and are required to be paid after issuance of building permit and prior to issuance of the Certificate of Occupancy.
- For a full listing of Utility Fees, please see the [Aurora Water Fee Schedules](#). Connection fees should be paid prior to December 31<sup>st</sup> which are subject to increases as approved by City Council.
- Commercial users with meters one and one-half inches and smaller with landscaped areas not served by a separate irrigation system shall be charged an outdoor fee based upon the total landscaped area.

**Stormwater Management**

*Aurora Water reviews the drainage and public improvement components of your project plans. Drainage design standards can be found in the city's ["Storm Drainage Design and Technical Criteria"](#) and ["Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure"](#).*

***Key Issues:***

- ▶ A significant portion of this site is within the Westerly Creek floodplain. See chapter 4.0 of the City of Aurora Storm Drainage and Design Technical Criteria manual for submittal requirements of non-FEMA identified floodplains.
- ▶ Per Section 4.5.3 Residential Construction. New construction and Substantial Improvement of any residential structure shall have the lowest floor (including basement or crawl space), electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities (including ductwork), elevated to two feet above the base flood elevation. Upon completion of the structure, the elevation of the lowest floor, including basement or crawl space, shall be certified by a licensed Colorado Professional Engineer, architect, or land surveyor. Such certification shall be submitted to the Floodplain Administrator, prior to issuance of a certificate of occupancy.

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- ▶ No work is allowed in the Floodplain without a Floodplain Development Permit (FPDP), no work is allowed within the Floodway without a CLOMR or a No Rise analysis included within the FPDP.
  - ▶ MHFD's Major Drainageway Plan study identified capacity concerns in the existing culverts under Exposition Avenue that convey Westerly Creek, which could be a cause of increased risk of flooding to the site. There have been improvements upstream to Kenton Way culverts and Canterbury Park that may have impacted this condition. This development is not responsible for fixing preexisting drainage system deficiencies. However, this project must protect the proposed structures from existing hazards and must not make conditions worse for other properties. An analysis of this culvert may be required to quantify the flooding impacts the existing culvert may or may not cause to the site.
  - ▶ A Preliminary Drainage Report shall be submitted with the site plan. Note that a Final Drainage Report shall be submitted with the Civil Plans. The Preliminary Drainage Report shall be submitted at the time of Planning Department application submittal. Refer to Sections 2.4.3 & 2.4.4 for submittal requirements. A review fee shall be paid to the City prior to acceptance of the Preliminary Drainage Report.
    - The Drainage Plan and Report needs to address the drainage design for both phase 1 and phase 2. This likely will require two separate drainage plans, one drainage plan sheet for phase 1 and one drainage plan sheet for phase 2.
  - ▶ For development projects that add more than 5,000 square feet of new impervious area or disturb 1 acre or more, onsite Full Spectrum Detention (FSD) per Chapters 10 and 11 of the SDDTC is required. The proposed SCM(s) shall be in place prior to paving, and it shall be accepted prior to the issuance of Temporary Certificate of Occupancy (TCO) or Certificate of Occupancy (CO).
  - ▶ A Drainage Report Review Checklist should be completed and signed by a professional engineer and uploaded with the Report for the first review. The Checklist can be located at the following link: [Design Standards and Checklists](#).
  - ▶ The lowest point of entry (LPE) shall be minimum one-foot above all Emergency Overflow Elevations and all 100-year ponding and flow depths.
  - ▶ Note that Preliminary Drainage Report (PDR) review fees will be limited to the first three reviews. If additional reviews are required, fourth and greater, then new fees will be required.
  - ▶ The City of Aurora has an updated Drainage Criteria Manual (August 2024) which should be used for this and all future submittals. You are highly encouraged to read section 1.5 SIGNIFICANT UPDATES BY CHAPTER and Section 1.6 REVISIONS for a summary of the changes in the City's Criteria. The Manual can be downloaded at the following link: [Aurora Water Design Standards](#)
- Important reference materials can be accessed via the City's [GIS tools](#).
  - Drainage references provided in these notes may not be an exhaustive list or include all potentially relevant existing or under-review documents. Approved reports and plans can be found via the City's [Property Map](#). Please note that approved City documents before approximately the year 2000 are generally not available on the City's website and must be requested by the Design Engineer from Aurora Water. The City can only provide copies of approved Master Drainage, Preliminary Drainage, Final Drainage, and Civil Plan documents. In cases where City review of these documents is on-going and they may have some impact on the project, it is the Design Engineer's responsibility to contact the Designers of the documents under-review and coordinate designs.
  - Refer to Electronic Drawing Numbers (EDNs) 221380 (Mississippi Avenue and Kenton Way Stormwater Improvements), 221228 (Canterbury Park Renovation) for supporting information related to your site. Refer to MHFD's Westerly Creek (Upstream of Westerly Creek Dam) FHAD 2017 and MHFD's Westerly Creek Major Drainageway Plan 2015. MHFD studies can be found at the following link (<https://onbase.mhfd.org/mapsearch/>).

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- The Engineer is responsible for researching and determining if a study by Mile High Flood District (MHFD) has been completed proposing improvements within or adjacent to the Engineer's proposed development. Any such improvements may be required to be constructed as a part of that project. Coordination with the City shall be initiated in those instances at the Master Plan Level or as soon as determined with any proposed development.
- Under the provisions of Colorado Revised Statute 37-92-602(8), any detention or infiltration facility that becomes operational after August 5, 2015, is required to notify downstream water rights holders prior to operation. Mile High Flood District (MHFD) has created a spreadsheet form (called *SDI Design Data*) for determining compliance with the statute and a web portal that will send a weekly e-mail notification to downstream water rights holders, satisfying the notification requirements. The Developer will be responsible for having a Professional Engineer, licensed in the State of Colorado, complete the *SDI Design Data* and uploading to the State's [web portal](#). Aurora Water will verify the information matches the final drainage report. Notification must be made before Civil Plans will be approved or Stormwater Permits will be issued.
- Release rate for the detention pond shall be based upon the SDDTC Manual, latest revision.
- Per the [Roadway Design Manual](#): The slope away from the building shall have a minimum grade of five (5) percent for the first ten feet or to the property line, whichever occurs first, then a minimum of two (2) percent until the slope reaches the swale around the building. If physical obstructions or lot lines prohibit the ten feet of horizontal distance, a five (5) percent slope shall be provided to an approved alternative method of diverting storm runoff away from the foundation. Swales used for this purpose shall be sloped a minimum of two (2) percent. In no condition shall the bottom of the swale at its highest point be less than six inches below the grade at the foundation of any adjacent structure. Impervious surfaces within ten feet of the building foundation shall be sloped a minimum of two (2) percent away from the building.
- Per the [Roadway Design Manual](#): Storm water from concentrated points of discharge from a storm event shall not be allowed to flow over sidewalks but shall drain to the roadway by the use of sidewalk chase sections. Sidewalk chase sections shall not be located within a curb cut, driveway, curb ramp, or curb return.
- See section 3.20 EASEMENTS AND TRACTS for specific information for maintenance access for channels, ponds, and all other storm features.
- Storm sewer system does not extend to this site.
  - Extend storm sewer to this site, including inlets, pipes, manholes, etc.; or
  - Discharge onto the street through a chase
- Stormwater Conveyance - Notification of Adjacent Property Owners link: [Stormwater Conveyance - Notification of Adjacent Property Owners](#)
- Digital files supporting this submittal should be uploaded at the time of first review, examples are CUHP, SWMM, HEC-RAS, and MHFD Detention files.

## **Public Works Department**

*Traffic Engineering will receive a referral of the Site Plan, Subdivision Plat, and Civils for review and comment.*

### ***Key Issues:***

- ▶ A Detailed Traffic Impact Study (TIS) will be required for this development. See below for additional information.
  - If an interim roadway/access network is proposed, a traffic analysis for this condition will be required.
- ▶ The proposed site access drive shall be located opposite the existing parking lot access on the north side of Exposition Avenue in-leu of being positioned 300' from adjacent property accesses (Traffic Division's preference, per discussion during the pre-application meeting).
- ▶ Gates, if provided, are required to be setback from public road flowline a minimum of 45-feet. If the gating system swings, it shall swing into the site.
- Show all adjacent and opposing access points on the Site Plan.
- Label the access movements on the Site Plan.
- Objects and structures shall not impede vision within the sight triangles. Show sight triangles on the site plan and landscaping plan at all access points in accordance with [City of Aurora Standard Traffic Detail TE-13](#). In addition, street trees shall be set back from Stop signs and other Regulatory signs as detailed in [City of Aurora Standard Traffic Detail TE-13.3](#).

**Add the following note landscape plans:** 'All proposed landscaping within the sight triangle shall be in compliance with COA Roadway Specifications, Section 4.04.2.10'

- Show existing stop signs and street name signs or the installation of new stop signs and street name signs by developer at the site access points onto public streets. Add the following note to the Site Plan:
  - The developer is responsible for signing and striping all public streets. The developer is required to place traffic control, street name, and guide signs on all public streets and private streets approaching an intersection with a public street. Signs shall be furnished and installed per the most current editions of The Manual on Uniform Traffic Control Devices (MUTCD) and City Standards and shown on the signing and striping plan for the development.
- Mail kiosk locations shall be specified in the Site Plan. In coordination with any Postal Service requirements, mail kiosks shall be located:
  - Outside of sight triangles as defined by COA Roadway Manual, standard TE-13
  - Outside of the influence area (including traffic queues) for a controlled intersection (stop-controlled, signal controlled, or otherwise)
  - A minimum of 30' away from stop signs (for stop sign visibility)
  - A maximum of 50' away from curb ramp crossings (curb ramps to be located on both sides of roadway)
  - Preferred location for mail kiosks is on side lots or other common areas for a neighborhood, and while meeting the above criteria, to avoid conflicts with mail kiosk traffic and specific homeowner ingress/egress

### ***Improvements:***

- Ensure a throat depth of 50' is located between the roadway flowline and the first head-in parking space.



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- Provide an ADA accessible pathway from the buildings to the public Right-of-Way.
- Provide vehicle turning templates for the site access and within the site on the site plans

***Traffic Impact Study:***

- A Traffic Impact Study will be required for this site which will include addressing the following specific items:
  - 1) Existing, buildout and 2050 average daily traffic counts.
  - 2) Trip Generation to/from the site.
  - 3) Site Circulation Plan
  - 4) Include detailed analysis of the proposed site access point.

The Traffic Study shall be prepared in accordance with the updated [City of Aurora Traffic Impact Study Guidelines](#).

***Submitting the Traffic Study:***

- The Traffic Study shall be sent directly to *Dean J. Kaiser* at [djkaiser@auroragov.org](mailto:djkaiser@auroragov.org) as soon as possible.
- The Traffic Study shall also be uploaded with the rest of the submittal.
- Previously approved Traffic Impact Studies/Letters are available through this [link](#).
- Based on our review of the Traffic Impact Study / Traffic Letter, additional improvements may be required.

**Engineering Division**

*The Engineering Division reviews the roadway and public improvement components of your project plans. Engineering reviews referrals of the Site Plan and Subdivision Plat from the Planning Department.*

***Key Issues:***

- ▶ The public improvements required for this application include providing a 6' detached sidewalk, 8' curbside landscaping, and streetlights along the frontage of E. Exposition Avenue. The pedestrian activity level for the photometric analysis of Exposition is medium and additional lights shall be provided if the existing photometric values do not meet current standards. A minimum additional 5' of Right of Way will be required along Exposition Avenue.
- ▶ Curb returns with curb ramps are required at the proposed accesses. If the access to the adjacent site on the west side of the project is modified, the curb ramps at the existing access will be required to be updated to current standards.
- ▶ This project will be required to evaluate if guard rail is required along Exposition Avenue adjacent to the Westerly Creek.
- ▶ The 2023 Roadway Manual has been adopted as of February 1, 2023. The link to the updated Roadway Manual can be found below. Should your civil plans be submitted after January 1, 2025, they must meet the criteria of the 2025 Roadway Manual, which will be adopted on January 1, 2025.
- ▶ The City has updated its civil plan submittal intake process which became effective June 26, 2023. A civil plan pre-submittal is no longer required. Please review the new submittal instructions [here](#).
- ▶ Previously approved plans and reports can be found on the City's website. Instructions can be found here: [Getting to Engineering Documents Online](#). Older documents can be provided upon request.

***Improvements:***

*Sections and details referenced in the Improvements section refer to the City's [Roadway Design and Construction Specifications \(Roadway Manual\)](#).*

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- Typical roadway sections are specified in the City Code and summarized in Section 4.08 with details shown in the Standard Detail S1.
- Mountable curb and gutter shall be used on all Type 1 and 2 streets. All other streets, including those within the Urban Centers and TODs shall use 6" vertical curb and gutter.
- Curb ramps must be shown (located) on the plans at all curb returns, residential mail kiosks or clustered mailboxes, and any other location of public necessity. Detailed grading of the curb ramps shall be included in the civil plans.
- Flared curb cuts, Standard Detail S7.4, are not permitted for commercial/industrial or residential driveways where traffic movements would be substantial. When the number of parking spaces exceeds 20, curb returns are required, and the curb return radii shall be labeled on the plan.
- Pedestrian Bicycle Railings will be required at and continuous along vertical separations of 30 inches, or greater, or on slopes greater than or equal to 3:1 adjacent to pedestrian areas. See Standard Detail S18.
- Retaining walls shown on plans shall indicate material type and a height range or indicate a maximum height. Where appropriate, guards or handrails may be required. Structural calculations are required with the first civil plan submittal for walls that fall under the specifications listed in Table 4.02.7.03 in the Roadway Manual. Please refer to Section 4.02 of the Roadway Manual for additional retaining wall requirements.
- The maximum private access drive slope may be 4% (non-residential) when sloping down toward the public street and up to 6% maximum when sloping up toward the public street.
- Street lights are required along adjacent roadways. Please refer to the 2023 Roadway Manual for street light spacing, location, wattage, etc., information. Street lights along public right-of-way shall become City owned and maintained once they have been installed and the final acceptance letter for the lights has been issued. Street light locations shown on the site plan are conceptual. The street lighting plan shall be included with the Civil Plan submittal and will determine final street light locations based on a photometric analysis.

***ROW/Easements/Plat:***

- ROW dedication is required for public streets.
- Please coordinate with the Real Property Division of Public Works for the dedication of any required easements. If a plat will be prepared for this development, the plat can cover the required easements.
  - Sidewalk easements may be required for new sidewalk installed.
  - A drainage easement shall be required for any detention/water quality facilities on site. This drainage easement shall tie to a public way. Please coordinate with Aurora Water for their alignment.
  - Utility easements shall be required for any proposed water/sanitary sewer/public storm sewer located outside of public right-of-way. Please coordinate with Aurora Water for their alignment.
  - Public access/fire lane easement shall be required for fire lanes outside of public right-of-way. Please coordinate with Life Safety for their alignment.

### **Fire/Life Safety Comments - Building Division**

*The Building Division will receive a referral of the Site Plan and Subdivision Plat for review and comment. They will review these documents for Life Safety (Fire Code) and Building Code issues.*

#### **Key Issue:**

- The Aurora Building Division currently utilizes the adopted 2021 International Codes Series except for the 2023 NEC. This includes the International Existing Building Code (IEBC).

#### **Advisory Comment:**

On behalf of the Aurora Fire Department, all plan reviews, permits, and inspection associated to site plans, civil plans, platting documents, the International Fire Code and fire protection systems are conducted by the Aurora Building Division's Fire/Life Safety Group. Please avoid contacting Aurora Fire Rescue or the Fire Prevention Bureau with associated questions since they will only differ your inquiries to the Aurora Building Division Fire/Life Safety Group.

#### **Accessibility Requirements:**

The City of Aurora reviews accessibility requirements based on 2021 IBC, Chapter 11, the 2017 ICC A117.1 and the revised 2003 Colorado State [House Bill 03-1221](#), Article 5, Standards for Accessible Housing.

- Accessibility Requirements - Residential - Apartments and Townhomes

#### **Addressing Requirements:**

All buildings or structures, except accessory buildings, shall display the proper building number in the manner provided in this article. It shall be the responsibility of the owner, occupant or any person obtaining a building permit to place such numbers in the manner provided in the Aurora City Code of Ordinance, Chapter 126 - Article VII - Numbering of Buildings.

#### **Adopted Codes by the City of Aurora – Setbacks:**

The site plan and civil plans must reflect the setback requirements of the 2021 International Building and Fire Code for placement of the structure(s) in relation to adjacent buildings, property lines, public ways, accessible walkways, etc. To view the 2021 International Codes please utilize the following hyperlink: [ICC Codes Online](#).

- The City of Aurora has adopted the 2021 International Codes and the 2023 National Electrical Code.
- Using the 2021 International Building Code adopted by the City of Aurora, the site plan submittal must show the distance between new or existing property lines and proposed exterior walls of structure(s).

#### **Civil Plans:**

Based on the discussion within the pre-application meeting the following information must be reflected within the Civil Plan package submitted to Public Works Department.

- [Alternative Fire Lane Surfacing Material](#)
- Rename [Alternative Fire Lane Surface Signs](#) to Civil Plan Sign and Detail Package.
- [Combined Fire Lane and Pedestrian Sidewalks](#)
- [Grading Plan](#)
- [Handicap Accessible Parking Signs](#)
- [Sign Package](#)
- [Signature Block](#)
- [Street Standards and Street Section Details](#)



**Emergency Responder Communication Coverage:**

The 2021 International Fire Code requires all buildings to be assessed for adequate emergency responder radio coverage.

- The 2021 International Fire Code (IFC) requires all buildings to be assessed for adequate Emergency Responder Radio Coverage (ERCC). At the time the structure is at final frame and final electrical inspections, the
- The General Contractor (GC) will be required to hire an approved and qualified independent 3rd party to assess the radio frequency levels within the structure. Once completed, the 3rd party will provide the results of the test to both the GC and the Aurora Building Division as to whether the structure passed or failed the preliminary radio surveillance. A structure that has passed this surveillance requires no further action by the GC. A failed radio surveillance will require a licensed contractor to submit plans to the aurora building division to obtain a building permit for the installation of an ERRC system prior to installation. This assessment and installation are at the owner or developer's expense. Future interior or exterior modifications to the structure after the original Certificate of Occupancy is issued will require a reassessment for adequate radio frequency coverage.

**Where required in new buildings:**

- All building construction types will be assessed for adequate radio frequency levels.
- The total building area is 50,000 square feet or more without basements.
- Buildings 4 stories in height or greater.

**Fire Department Access:**

Based on the information presented so far, the type(s) of fire apparatus access road(s) needed for this site is:

- [Designated Fire Lane](#)
- [Fire Lane Easement](#)
  - Buildings less than 30' in height require only a 23' wide fire lane easement with 29' inside and 52' outside turning radii. Buildings greater than 30' in height require a 26' wide fire lane easement with a 26' inside and 49' outside turning radii.
  - Buildings greater than 30' in height are regulated by the 2021 IFC Section D105 and require both a 26' Fire Lane Easement and two points of emergency access. Typically, the 26' fire lane easement is located on the front main entry side of the structure within a minimum of 15' and a maximum of 30' from the exterior wall of the building. Structures greater than 30' in height also require a second point of emergency access.
  - *During the pre-application meeting it had been recommended that a 26' fire lane easement be provided within the site to avoid the installation of mid-block emergency set-up points for aerial fire apparatus (ladder trucks).*
  - The first phase of construction must include two points of emergency access and a looped water supply to support on site fire hydrants and fire service lines.
- [Emergency Access Easement](#)

**Fire Hydrants:**

The number and spacing of fire hydrants are determined using the 2021 IFC, Appendix B & C. As indicated in the previously stated code sections, fire hydrant coverage requirements include both internal site areas and abutting public street systems.

- Changes made to the site from the current proposal may require additional onsite hydrants once the site plan is submitted.
- An onsite looped water supply will be needed where there are two or more fire appliances, such as fire hydrants and fire service lines supporting a fire sprinkled structure.

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- A fire department connection will be required at the front main entry side of the structure. A fire hydrant will be required within 100' of the fire department connection.
- Please show the location of all fire hydrants within 400' of this site. Where fire hydrants are outside the boundaries of the site plan you can indicate the distance using a fire hydrant label or symbol with an arrow and distance.

**Fire Sprinkled Structures:**

The requirements for the installation of a fire sprinkler system are provided within Chapter 9 of the 2021 IFC and IBC.

**General Comments:**

- Based on proposed structure(s) proximity to the adjacent streets a fire lane easement is typically not required for a site such as this one. The drive lane providing access to the fire department connection should reflect the ability to sustain an 85,000 lb.-imposed weight limit for a fire apparatus setting up adjacent to the fire department connection. This will ensure fire apparatus do not damage the road surface in this area.
- Fire sprinkled structures will require fire apparatus access to the fire department connection (FDC). Where the FDC is located interior of the site a dedicated fire lane easement will be required to ensure fire apparatus the ability to access the FDC.
- R-2 Apartments or Condominiums. A heated fire riser room with an exterior door will be required. A Knox box will be required on the right side of the entrance to the fire riser room. A fire control panel or unit that is tied into a master fire alarm panel will be required within the fire riser room. A fire department connection will be required at the front main entry side of the structure and within 100' of a fire hydrant.

**Gated Entry:**

The installation of any gating system will require a City of Aurora licensed contractor to obtain a building permit through the Aurora Building Division prior to the start of any work. This would be considered a structural, life safety and electrical review within the Building Division that is conducted on behalf of the Fire Chief.

- If a gating system is to be installed at a site access point, it must be set back from the flow line of the street at least 35 feet or one design vehicle length, whichever is larger, and be approved by the City of Aurora's Fire and Life Safety department. Gating systems located within close proximity to public right-of-way (ROW) may also be assessed by the City of Aurora Traffic Manager or designee and could require a traffic analysis to determine the appropriate distance of gating system to said flow line of ROW. Where a gating system crosses a dedicated or designated fire access roadway, please reference the Security Gates section of the latest edition of the International Fire Code (IFC). The installation of security gates across a fire apparatus access road shall be approved by the designated Fire Code representative within the Aurora Building Division.
- A separate building permit is required for the installation of any gating system that may obstruct fire department access to the internal areas of a site. Prior to construction, please submit plans and specifications of your proposed gating system to the Aurora Building Division. If you have any questions, please contact a Fire/Life Safety representative by calling 303-739-7420.
- Note: The applicant has indicated that this site will not be a gating community.

**Knox Hardware:**

Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for lifesaving of fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an accessible location.

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- Approved Knox Hardware is required for new and existing buildings at the main entry of the structure, at the exterior door of a fire riser/fire pump room and at the fire department connections (caps/plugs). Please label and show these Knox devices on the site plan submitted to the Planning & Development Service Department.

**Legend:**

The cover sheet must include a “Site Plan Legend” reflecting both existing and/or proposed site elements that are existing or proposed within site.

**Loading and Unloading Areas:**

The site plan must show the location of the loading and unloading areas. These areas must not encroach into the dedicated or designated fire lane easement.

**Phasing Plans:**

A phasing plan must be provided with the Planning Departments Site Plan and the Public Works Departments Civil Plans submittals.

**Photometric Plan:**

- Add the following note to the Photometric Site Plan:  
ILLUMINATION WITHIN THE SITE MUST COMPLY WITH THE 2015/2021 INTERNATIONAL BUILDING CODE REQUIREMENT FROM SECTION 1006 - MEANS OF EGRESS ILLUMINATION. SECTION 1006. ILLUMINATION REQUIRED: THE MEANS OF EGRESS, INCLUDING THE EXIT DISCHARGE, SHALL BE ILLUMINATED AT ALL TIMES THE BUILDING IS OCCUPIED. SECTION 1006.2 ILLUMINATION LEVEL. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 1 FOOT-CANDLE (11 LUX) AT THE FLOOR LEVEL AND CONTINUING TO THE "PUBLIC WAY".
- Add the “accessible route” (heavy dashed line) to the photometric plan and verify minimum 1 foot-candle of illumination along its entire length.

***Site Plan, Civil Plan, Framework and General Development Plan, and Plat Notes:***

The notes being provided below must be included on the cover sheet of the indicated submittal type.

- [\(Framework and General Development Plan Note\) On-Site and Off-Site Infrastructure Requirement](#)
- [\(Plat Note\) If Plat does not contain a Dedicated Fire Lane Easement](#)
- [\(Plat Note\) If Plat Contains Fire Lane Easement](#)
- [\(Plat Note\) If Plat Contains an Emergency Access Easement](#)
- [\(Site Plan Note\) Access Control Gate or Barrier Systems](#)
- [\(Site Plan Note\) Accessibility Note for Multi-Family Projects Built under the 2021 IBC/IRC and HB-1221](#)
- [\(Site Plan Note\) Addressing](#)
- [\(Site Plan Note\) Americans with Disabilities Act](#)
- [\(Site Plan Note\) Emergency Ingress and Egress](#)
- [\(Site Plan Note\) Emergency Responder Radio Coverage](#)
- [\(Site Plan Note\) Fire Lane Easements](#)
- [\(Site Plan Note\) Fire Lane Signs](#)

**Site Plan Data Block:**

The site plan must include a “Data Block” on the cover sheet that reflects all items indicated within the “link” that apply to your project.

**Special Design Considerations:**

Based on the information presented in the pre-application meeting, these additional Life Safety criteria must be shown on the site plan, plat and civil plans.

- [Access to within 150 feet of Each Structure](#)
  - The fire code official is authorized to increase the dimension of 150 feet reach requirement where the building is fire sprinkled in accordance with the 2021 IFC, Section 503.1.1. If granted approval, a fire sprinkled structure may utilize 200-foot reach criteria in place of the 150-foot standard requirement.
  - Where fire hydrants and fire department connections are provided adjacent to vehicular access drive aisles, they will need to be dedicated as fire lane easements in order to provide emergency access to them.
- [Access Road Width with a Hydrant](#)
- [Aerial Fire Apparatus Access Roads](#)
- [Alternative Fire Lane Surfaces](#)
  - Alternative fire lane surfaces other than asphalt or concrete will require a license agreement through Land Development Services within Public Works. The civil plans must include a detail of the alternative surfacing material that reflects the current Public Works fire lane specifications.
- [Fire Apparatus Access Road Specifications](#)
  - If an existing fire lane or public roadway must be removed or relocated for any reason, the portion replaced must follow the current specifications of the Public Works Department.
- [Combined Fire Lane, Public Access and Utility Easements](#)
- [Construction of Fire Lane Easements and Emergency Access Easement](#)
- [Encroachment into Emergency Access or Fire Lane Easements are Prohibited](#)
- [Grade](#)
- [Labeling of Easements on the Site Plan, Plat and Civil Plans](#)
- [License Agreement](#)
  - Construction of fire lanes using alternative surfacing materials other than asphalt and concrete and/or installations of gating systems crossing a dedicated fire lane easement will require a license agreement though Real Property.
- [No Parking is allowed within a Fire Lane Easement](#)
- [Pocket Utility Easements for Fire Hydrants](#)
- [Public Street Systems Adjacent to Site](#)
- [Remoteness](#)
- [Speed Bumps](#)
- [Snow Removal Storage Areas](#)
- [Two points of Emergency Access](#)
- [Width and Turning Radius](#)

**Trash Enclosure:**

Per the 2021 International Fire Code, Section 304.3.3, dumpsters and containers with an individual capacity of 1.5 cubic yards or more shall not be stored in buildings or placed within 5 feet of combustible walls, openings, or combustible roof eave lines.

## Land Review Services Division

*The Land Review Services Division reviews the Site Plan and processes Subdivision Plats, Easements, and License Agreements that may be necessary for development of property.*

### **Key Issues:**

- ▶ Any easements which may need to be released must be done so by separate document.
- ▶ Any new easements which may need to be dedicated must be done so by separate document.
- ▶ If more than five easements need to be dedicated, please submit a Map of Dedication.
- ▶ If there are any other encroachments into easements, a Master License Agreement will be needed.

### **Subdivision Plats:**

- A subdivision plat is not required at this time.

### **Site Plans:**

A Site Plan will be required by the Planning Department. Land Review Services has items that need to appear on that site plan above and beyond what other departments may require. These items are listed on the Land Review Services [Subdivision Plat Checklist](#).

### **Separate Documents:**

- A separate document refers to a process to describe and record an encumbrance (easement, license etc.) or release of such on property when a subdivision plat already exists. The document usually consists of a legal description and drawing. Each are reviewed and approved by the city, signed by the property owner as well as the appropriate city officials and recorded with the county.
- During the pre-application meeting no requirement for separate documents were specifically identified for your site as proposed. However, review of your actual Site Plan when submitted may identify additional conditions which will require a separate document. Following are the links to additional information if needed later in your formal review process:
  - [Dedications Packet](#)
  - [Easement Release](#)
  - [Revocable License Packet](#)
  - [License Agreement Packet](#)
- **Offsite easement dedications** may be required to make your project work. It's up to the developer to obtain these easements for the city, pay compensation, etc. Dedication documents must be prepared using Land Review Services specifications which can be found in the [Dedications Packet](#). Once complete and accurate easement dedication information is submitted to Land Development Review Services, it takes **about 8-10 weeks** to complete the process. They must be complete and ready to record before Land Review Services will record the Plat and/or Site Plan.
- If there are existing easements that are no longer needed, the city will require the developer to make application to the city to release those easements. Easement release documents must be prepared using Land Review Services specifications and are available in the [Easement Release Packet](#). Once complete and accurate easement release information is submitted to Land Development Review Services, it takes about **8-10 weeks** to complete the process. They must be complete and ready to record before Land Review Services will record the Plat and/or Site Plan.
- The developer may need to **dedicate new easements** and/or street right-of-way on the site. Since a new subdivision plat is not required, these dedications must be done by separate legal document. These legal documents must be prepared using Land Review Services specifications which are found in the

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[Dedications Packet](#). Once complete and accurate easement dedication information is submitted to Land Review Services, it takes about **4-6 weeks** to complete the process. They must be complete and ready to record before Land Review Services will record the Plat and/or Site Plan.

- **(Residential only)** No portion of any roofed structure may encroach into any easement. However, the city will allow certain items to encroach in easements such as fences, gates, retaining walls, monument signs, etc. as long as they do not interfere with the use of the easement. If your encroachment is approved, you must obtain a **Revocable License** from Land Review Services. It is the responsibility of the applicant to identify and include all encroachments on their Revocable License application which can be found in the [Revocable License Packet](#). A Revocable License takes about **1-2 weeks** to complete and must be complete before Land Development Review Services will record the Site Plan.
- You may have items that encroach into city-owned property or easements (i.e. retaining walls, medians, stairs, etc.). If allowed, these types of encroachments require a **License Agreement**. Requirements can be found in the [License Agreement Packet](#). It takes **8-10 weeks** to complete the process after submittal. The License Agreement must be completed before the Site Plan is recorded.
- The project has been classified as a Redevelopment so a resubdivision is not required. However, street right-of-way and/or easements may need to be dedicated to the city. These are legal documents and must be prepared using Land Review Services specifications which can be found in the [Dedications Packet](#). Once complete and accurate information is submitted to Land Review Services, it takes about **4-6 weeks** to complete the process. These documents must be complete and ready to record before Land Review Services will record the Site Plan.
- Land Review Services may require a Monumented Field Survey but are unable to determine that until the 1<sup>st</sup> review is completed.

If a requirement for new street lighting is identified during the review process, this may be an opportunity to partner with cell carrier providers. New technology allows these providers to incorporate their technology with street lighting. These carriers are willing to take on the cost of purchasing and installing a light with qualifying projects. Please contact *Leslie Gaylord* at 303.739.7901 for additional details and contact information.



## STEP II – CONSTRUCTION DOCUMENT PHASE

*The Construction Document Phase is when Engineering and Building plans are reviewed against City Codes for compliance. It is an administrative process and usually occurs after Planning Commission or Planning Director decisions and after the preliminary drainage report is approved or has been requested for signature process. Permits are issued from these documents.*

### Civil Engineering Plans

- Civil Construction Plans are required for your project as proposed and shall be submitted electronically.
- Use of the Batch Standards Checker Tool is requested for this project.
- Civil Engineering Plan Review (*see links below for additional information*):
  - [Process](#)
  - [Review Schedule](#)
  - [Fees](#)
  - [Civil Plan Submittal Form](#)
  - [Civil Plan Submittal Pre-Acceptance Checklist](#)

#### Civil Plan Pre-Acceptance Process:

1. Prior to submittal of the electronic Civil Construction Plans, the civil consultant will submit the [Submittal Form](#) to the Permit Center via [engineering@auroragov.org](mailto:engineering@auroragov.org). If the Permit Center accepts the submittal form, the civil portal will be opened, and the applicant will upload the Civil Construction Plans.
  2. The Permit Center will evaluate the uploaded plans to check that all required documents have been uploaded. The Permit Center will either indicate if any documents are missing via email to the applicant, or they will progress the application to Pre-Acceptance.
  3. During Pre-Acceptance, the appropriate City departments will do a superficial review of the application within two business days after document check in for all the items listed in the [City of Aurora Civil Plan Submittal & Review Pre-Acceptance Checklist](#). This review is only for completeness and does not constitute a full review.
  4. If one or more department(s) determines that the application is incomplete, the application will not be accepted in for 1<sup>st</sup> review and the applicant shall re-upload the revised, complete documents. If all the departments determine that the application is complete, the project submittal will enter the 1<sup>st</sup> formal review and follow our standard civil plan timelines.
- Civil Construction Document Plan Set generally includes the following plans:
    - Stormwater Management Plan
    - Final Drainage Plan/Report
    - Final Grading Plan
    - Utility Plan and Profiles
    - Structural Calculations
    - Signing and Striping Plan
    - Street Lighting Plan
- *Phasing shown on the Site Plan shall also be represented on the Civil Plan drawings.*

## Aurora Water

### Utilities

#### ***General Requirements:***

- Utility Plans will be required with the Civil Engineering Plans:
  - Utility Plans shall be prepared in accordance with the Utility Manual
  - Utility Plans must be approved prior to obtaining building permits
  - Utility Plans must include:
    - Fixture Unit Table and Meter Sizing Tables
    - Water Service and Water Meter locations
    - Sanitary Sewer Service Lines
    - Resistivity Tests for any public water mains installation per Section 20 of the Utility Manual.
  - Cross Connection Control Devices are required for:
    - Fire Service Lines
    - Commercial and Domestic Water Service Lines
    - These devices are required to be located within the building or within a heated and drained vault after the water meter.
  - All service line construction information (horizontal and vertical information, lengths, slopes, etc.) must be provided on the Site Plan Utility Sheet.
  - Individual service line connections and fire line connections must be approved through Aurora Water. Include all applicable standard notes from Section 5.05.1 of the Utility Manual on the Site Plan Utility Sheet.

#### ***Construction Stormwater Quality Requirements:***

- A Stormwater Quality Discharge Permit and Stormwater Management Plan and Report will be required for this project. See the latest revision of the City of Aurora [Rules and Regulations Regarding Stormwater Discharges Associated with Construction Activities](#) Manual (SWMP Manual) for more detailed requirements. A [Colorado Discharge Permit System \(CDPS\)](#) (CDPS) permit may be required by the State Health Department if a City of Aurora Stormwater Quality Discharge Permit is required.
- A Stormwater Quality Discharge Permit and Stormwater Management Plan and Report may be required for this project if an acre or more of disturbance is anticipated (which includes equipment and material storage areas). See the latest revision of the [City of Aurora SWMP Manual](#) for more detailed requirements. A [CDPS](#) permit may be required by the State Health Department if a City of Aurora Stormwater Quality Discharge Permit is required.
- CAD Data Submittal Standard: The City of Aurora has developed a CAD Data Submittal Standard for internal and external use to streamline the process of importing AutoCAD information into the city's Enterprise GIS. Digital Submission meeting the CAD Data Submittal Standard are required by consultants on development projects when submitting to the city for signature sets and on capital projects funded by the city. Details of the CAD Data Submittal Standard can be found on the [CAD Standards](#) web page.

### Stormwater Management

#### ***General Requirements:***

- All new developments and redevelopments are required to develop and implement a permanent condition Stormwater Management Plan (SWMP) in conjunction with the overall drainage plan for the



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site. The SWMP shall be included in and become part of the preliminary and final drainage reports. The SWMP shall discuss and propose solutions to permanently enhance the quality of stormwater runoff through the site.

- The SWMP shall be developed by applying the permanent water quality “best management practices” described in Volume 3 of the USDCM. The SWMP shall be shown in a separate section of the drainage report. Proposed permanent stormwater quality enhancement facilities shall be sized and located on the drainage map (see section 2.42, [“Storm Drainage Design and Technical Criteria”](#) manual). The development community is encouraged to use multiple BMPs in creative and non-traditional site design to achieve the water quality objectives.
- An Inspection and Maintenance Plan (I&M Plan) shall be developed concurrently with the design of the permanent BMP’s and submitted with the final drainage plan and report for approval. Refer to Section 5.09 of the [Water, Sanitary Sewer, and Storm Drainage Infrastructure Standards and Specifications](#) as well as the 2010 [Storm Drainage Design & Technical Criteria](#) manual’s appendices for direction on preparing an I&M Plan, including the Maintenance Agreement. A signed Maintenance Agreement shall be submitted with the signature set of civil plans and must be approved prior to approval of the Civil plans.
- The civil plans will not be approved until the Preliminary Drainage Report is approved, and the plat is ready for recordation.

### **Public Works Department**

*Construction documents should reflect all approved Access, Right of Way, Easements, and Public Improvements that were included and approved on the Site Plan and Plat for your project.*

### **Traffic Engineering**

- The Construction Documents shall include an Interim and an Ultimate Signing and Striping Plan, and Traffic Control Plans. If lane closures are required per the Traffic Control Plans, occupancy fees will apply. The calculation for these fees is available on the City’s website or in the Development Handbook.
- Critical Traffic Control Areas, as identified by the Traffic Manager during Civil Plan review, are circumstances that develop resulting from temporary modifications to the roadway network. Critical Traffic Control Areas can include, but are not limited to:
  - lane closures resulting in reduction in vehicles capacity greater than 50%,
  - proximity to intersections, access drives, rail lines,
  - locations with higher multimodal movements, or
  - other special circumstances

When identified, the contractor shall submit Traffic Control Plans (TCPs) to the City through the Public Improvement Permit Application process for the City’s review as soon as possible or a minimum of four weeks in advance of construction. In addition, as part of the Public Improvement Permit and TCP, the contractor may be required to provide advance notice (minimum two weeks) to nearby impacted users. Notifications by the contractor may be required to neighboring residences, businesses, or impacted operations of emergency response entities (law enforcement, fire, and medical), transit, delivery companies, etc., as determined by the Traffic Manager at time of the TCP review.

- Place a note on the Construction Site Plan or Grading Plan indicating all construction vehicles (including construction workers’ vehicles) shall access the site from Exposition Avenue, via Havana Street and not through any adjacent residential neighborhood(s).

## **Engineering Division**

### ***Roadway Design and Construction Specifications:***

- All road cuts or other roadway disturbances within the City of Aurora's public right-of-way shall be repaired and restored according to the standards specified in Section 36 of the City's Roadway Design and Construction Specifications, and any other requirements specified elsewhere. If more than 500 square feet of existing roadway is disturbed within one block, the construction area shall be milled and overlaid prior to the issuance of the Certificate of Occupancy.
- Fire lanes. All primary fire lanes shall be constructed to an improved pavement surface (concrete, asphalt, or pavers). Secondary accesses in landscaping and other areas, need to be designed in accordance with the City's adopted Fire Code requirements, but may be permitted to utilize other materials and options. The proposed secondary access materials shall be approved by both Life Safety (Fire Marshal) and the City Engineer.

## **Building Plans**

### **Building Division Comments:**

#### Building Plan Review

- [Process](#)
- [Review Schedule](#)
- [Fees](#)

*The comments made during the meeting address large-scale issues. We strongly recommend that a code consultation meeting be scheduled to discuss more detailed concerns.*

*During the development review process, you will not need to submit any documentation to the Fire Department for review. The Life Safety group within the Aurora Building Division conducts all site development and construction plan reviews on behalf of the Aurora Fire Department.*

The links below contain additional information and requirements for completion, submittal, and permitting of your building plans.

#### ***Permit Types:***

- Based on the information provided during the pre-application meeting, the Building Division would classify your proposed scope of work under the following permit type.
  - [Commercial Permits](#)
  - [Counter Permits](#)
  - [Demolition Permit](#)
  - [Limited Plan Permits](#)
  - [Master Multi-Family or Multi-Family Permits](#)

*Additional Building Construction Plan Checklists: Based on the information provided, you may also need the following Checklists:*

- [Maximum Occupant Load Sign](#)

*Fire (click on this [link](#) to find checklist below)*

- Fire Alarm
- Fire Sprinkler & Standpipe Systems

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- Gating Systems across Fire Apparatus Roads
- Knox Box
- Knox Box Rapid Entry
- Wet and Dry Chemical Hood Suppression Systems

### ***Key Issues:***

- ▶ If your architect would like to set up a preliminary building construction plan submittal meeting, please contact our Plans Examiner Manager Jose Rodriguez ([jcrodrig@auroragov.org](mailto:jcrodrig@auroragov.org)).
- ▶ The City of Aurora has adopted the 2021 International Codes and the 2023 National Electrical Code.

### ***Accessibility:***

The City of Aurora enforces handicapped accessibility requirements based on 2021 IBC, Chapter 11, and the 2017 ICC 117.1.

### ***Adopted Codes by the City of Aurora:***

This “link” will provide a current listing of all adopted building codes and ordinances utilized by the Aurora Building Division. To view the 2021 International Codes please utilize the following hyperlink: [ICC Codes Online](#)

### ***Building Division General Comments:***

The function of the Building Division in the development process involves assistance with building code questions. This “link” will provide answers to the most typical initial questions concerning the role of the Building Division.

### ***Checklist for Plan Review Submittals:***

The Aurora Building Division has established a number of checklists that reflect specific construction plan submittal and permit requirements. A copy of these checklists can be obtained through the City of Aurora website or by clicking on the link provided here.

### ***Demolition Permits:***

A separate demolition permit must be obtained for each individually addressed structure through the Aurora Building Division prior to the start of any removal of any structure within the site.

- [City of Aurora Demolition Permit Information](#)
- All demolition permits must be routed to Aurora Water to assess the BMP requirements for ground disturbances.

### ***General Fire Protection System Requirements:***

Based on the information provided during the Pre-Application meeting the following fire protection systems are likely to be required for this structure:

- **Emergency Alarm Systems** – 2021 IFC, Section 908.
- **Fire Alarm and Detection System** – 2021 IFC, Section 907.
- **Fire Command Center** – 2021 IFC, Section 508.
- **Fire Pump** – 2021 IFC, Section 913.
- **Fire Sprinkler System** – 2021 IFC, Section 903.
- **Standpipe System** – 2021 IFC, Section 905.

### ***Geographic Design Criteria:***

New construction must adhere to the climatic and geographic design criteria provided using the hyperlink above.

***Occupancy Specific Building Code Requirements:***

Based on the information provided, your building occupancy or occupancies are as follows.

- A-3 Occupancy - Assembly uses intended for worship, recreation or amusement, and other assembly uses not classified elsewhere in Group A.
- B Occupancy - A building or structure or portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Building or tenant space used for assembly purposes by fewer than 50 persons may be considered a Group B occupancy.
- R-2 Occupancy - Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature.

***Request for Modification or Alternative Material:***

Per the 2021 IFC, Section 104.10 and 104.10.1, whenever there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided the fire code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements.

**Land Development Review Services Division**

***Reminder*** – Prior to building plans submittal, processing of any/all required separate documents should be started so that this process does not interfere with permit issuance.

## STEP III – CONSTRUCTION PHASE

*Before any construction may commence, a contractor licensed in the City of Aurora must be issued the appropriate **permits** for all work to be performed. [Licensing](#) information is available on the city's website.*

### [Aurora Water](#)

#### Utility Connection Fees:

- Water Service Connection Fee
- Metro Sanitary Sewer Connection Fee
- Sanitary Sewer Connection Fee

Fees may only be paid after issuance of building permit and must be paid prior to issuance of the Certificate of Occupancy. This is required for new services and when meter sizes are upsized.

- Wet Tap Fees:
  - Apply when making connections to existing water mains for water line extensions, fire hydrant lines, and fire service lines.
- Irrigation Water Meter Fees:
  - Will be calculated in accordance with the City Ordinance for irrigated common areas in Single-Family Detached and Commercial areas.
  - The Landscape Plan must identify the “NON-WATER CONSERVING” and “WATER CONSERVING” areas used for the meter fee calculations.
- For a full listing of Utility Fees, please see the [Aurora Water Fee Schedule](#).

#### Stormwater Management

- A Pond Certificate is required prior to TCO or CO.

### [Public Works Department](#)

#### Engineering Division

- A geotechnical and pavement design report is not required for paving of new or existing private parking lots, fire lanes, driveways, and private streets (other than TODs and Urban Centers). The civil plans shall have the default pavement thickness, obtained from the Roadway Manual, labeled on the plans and a note indicating the type of soils within the project, unless the developer submits a pavement design for review and approval. A paving permit for this private infrastructure is **not** required. **A Private Development Pavement certification shall be required to be submitted prior to issuing a Certificate of Occupancy.** See [Section 5.01.2.02](#) for more information. The developer/contractor is responsible for the required testing, backfill, and compaction for all wet utilities prior to paving. It is the developer/contractor's risk to begin paving without the initial acceptance of the wet utilities.
- A new Certificate of Occupancy needs to be issued for this site. Aurora City Code requires all public improvements (see definition below) be completed, escrowed for, a deferral granted, or have a Public Improvement Plan (PIP), indicating when the improvements will be installed, in place prior to issuance of the Certificate of Occupancy.

**Re: The Stables (#1842883)/Pre-Application Meeting held October 24th, 2024**

- Public improvements shall mean and include, but not by way of limitation, the construction, reconstruction, and improvement of the following:
  - fire lanes
  - curbs, gutters, curb ramps, and sidewalks
  - guard rail
  - sanitary sewer mains, including laterals to each lot line
  - storm drainage
  - detention and water quality facilities, including necessary structures
  - street lighting
  - water mains, hydrants, and valves
  - tree plantings and landscaping
  - repairs and replacements thereof necessitated by construction activity pursuant to issuance of a City of Aurora certificate of occupancy.

**Building Division**

***Key Issue:***

- Once the building permit is issued it is recommended that the General Contractor (GC) schedule a pre-construction meeting with the Office of Development Assistance Project Manager. The meeting will consist of the Public Improvement Supervisor, Building Division Inspector Supervisors, and a Fire/Life Safety Supervisor. These meetings are highly beneficial to both the GC and city staff in addressing inspection requirements that assist in obtaining a TCO or CO in a timely manner.

**Construction Permits:**

Please click on the link provided for a listing of required construction permits.

***Fire Safety during Construction, Alteration or Demolition of a Building:***

Utilize the requirements of the 2021 IFC, Chapter 33 for both construction and demolition of any structure within your site. To obtain a full copy for fire department access and water supplies to a construction site, please call the Building Department by calling 303.739.7420.

**Access Roadways during Construction:**

Please click on the “link” provided for requirements for fire department access during construction.
















***Intersection Capacity Worksheets:***  
***2024 Existing***

# Timings

## 3: Havana Street & Exposition Ave

2024 Existing AM

Greenwood Stables Affordable Housing - Aurora, CO

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	19	10	56	11	83	1122	51	944
Future Volume (vph)	19	10	56	11	83	1122	51	944
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		8		4		2	1	6
Permitted Phases	8		4		4		6	
Detector Phase	8	8	4	4	4	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	10.0	17.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0	75.0	15.0	90.0
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	71.4%	14.3%	85.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		8.3	8.3	8.3	8.3	76.7	86.7	84.7
Actuated g/C Ratio		0.08	0.08	0.08	0.08	0.73	0.83	0.81
v/c Ratio		0.30	0.68	0.10	0.48	0.39	0.19	0.27
Control Delay (s/veh)		50.2	77.2	45.9	16.6	6.1	3.1	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		50.2	77.2	45.9	16.6	6.1	3.1	2.7
LOS		D	E	D	B	A	A	A
Approach Delay (s/veh)		50.2		41.4		6.1		2.8
Approach LOS		D		D		A		A

### Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

Offset: 65 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay (s/veh): 7.7


Intersection LOS: A

Intersection Capacity Utilization 50.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)		Ø4
15 s		75 s		15 s	
	Ø6 (R)				Ø8
90 s				15 s	



## Queues

2024 Existing AM

## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	36	73	14	108	1444	60	1112
v/c Ratio	0.30	0.68	0.10	0.48	0.39	0.19	0.27
Control Delay (s/veh)	50.2	77.2	45.9	16.6	6.1	3.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.2	77.2	45.9	16.6	6.1	3.1	2.7
Queue Length 50th (ft)	22	48	9	0	127	6	54
Queue Length 95th (ft)	52	#83	25	34	128	11	61
Internal Link Dist (ft)	113		1156		892		761
Turn Bay Length (ft)		120		120		600	
Base Capacity (vph)	129	117	159	234	3702	386	4103
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.62	0.09	0.46	0.39	0.16	0.27

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.























Queue shown is maximum after two cycles.

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2024 Existing AM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	10	2	56	11	83	0	1122	33	51	944	1
Future Volume (veh/h)	19	10	2	56	11	83	0	1122	33	51	944	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	12	2	73	14	108	0	1402	41	60	1111	1
Peak Hour Factor	0.86	0.86	0.86	0.77	0.77	0.77	0.80	0.80	0.80	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	56	7	196	160	136	69	3644	107	377	4215	4
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.00	0.71	0.71	0.05	0.80	0.80
Sat Flow, veh/h	757	657	83	1400	1870	1585	507	5098	149	1781	5269	5
Grp Volume(v), veh/h	36	0	0	73	14	108	0	936	507	60	718	394
Grp Sat Flow(s),veh/h/ln	1497	0	0	1400	1870	1585	507	1702	1844	1781	1702	1870
Q Serve(g_s), s	0.8	0.0	0.0	2.6	0.7	7.0	0.0	11.4	11.4	0.8	5.6	5.6
Cycle Q Clear(g_c), s	2.1	0.0	0.0	4.7	0.7	7.0	0.0	11.4	11.4	0.8	5.6	5.6
Prop In Lane	0.61		0.06	1.00		1.00	1.00		0.08	1.00		0.00
Lane Grp Cap(c), veh/h	184	0	0	196	160	136	69	2433	1318	377	2723	1496
V/C Ratio(X)	0.20	0.00	0.00	0.37	0.09	0.79	0.00	0.38	0.38	0.16	0.26	0.26
Avail Cap(c_a), veh/h	184	0	0	196	160	136	69	2433	1318	479	2723	1496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	0.0	0.0	45.9	44.2	47.1	0.0	5.9	5.9	3.6	2.7	2.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.1	25.1	0.0	0.5	0.9	0.1	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.9	0.3	3.7	0.0	3.4	3.8	0.2	1.2	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.0	0.0	0.0	46.3	44.3	72.2	0.0	6.4	6.7	3.7	2.9	3.1
LnGrp LOS	D			D	D	E		A	A	A	A	A
Approach Vol, veh/h	36			195			1443			1172		
Approach Delay, s/veh	45.0			60.5			6.5			3.0		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.0	81.0		15.0		90.0		15.0				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	2.8	13.4		9.0		7.6		4.1				
Green Ext Time (p_c), s	0.0	13.4		0.0		8.9		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				9.2								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2024 Existing AM  
Greenwood Stables Affordable Housing - Aurora, CO


















Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	98	0	0	168	2	0	0	0	2	0	1
Future Vol, veh/h	3	98	0	0	168	2	0	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	66	66	66	92	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	132	0	0	255	3	0	0	0	3	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	258	0	0	132	0	0	395	398	132	397	397	256
Stage 1	-	-	-	-	-	-	141	141	-	256	256	-
Stage 2	-	-	-	-	-	-	255	258	-	141	141	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1307	-	-	1452	-	-	565	540	917	563	541	783
Stage 1	-	-	-	-	-	-	862	780	-	748	696	-
Stage 2	-	-	-	-	-	-	750	695	-	862	780	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1452	-	-	562	538	917	561	539	783
Mov Cap-2 Maneuver	-	-	-	-	-	-	562	538	-	561	539	-
Stage 1	-	-	-	-	-	-	860	778	-	748	696	-
Stage 2	-	-	-	-	-	-	749	695	-	860	778	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.23			0			0			10.85		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	53	-	-	1452	-	-	620				
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.006				
HCM Control Delay (s/veh)	0	7.8	0	-	0	-	-	10.8				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0				

# Timings

## 3: Havana Street & Exposition Ave

2024 Existing PM

Greenwood Stables Affordable Housing - Aurora, CO

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	13	77	16	95	5	1420	72	1628
Future Volume (vph)	24	13	77	16	95	5	1420	72	1628
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		8		4			2	1	6
Permitted Phases	8		4		4	2		6	
Detector Phase	8	8	4	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	17.0	10.0	17.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	97.0	97.0	12.0	109.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	19.3%	71.9%	71.9%	8.9%	80.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		12.1	12.1	12.1	12.1	102.9	102.9	112.9	110.9
Actuated g/C Ratio		0.09	0.09	0.09	0.09	0.76	0.76	0.84	0.82
v/c Ratio		0.34	0.62	0.10	0.44	0.03	0.46	0.33	0.41
Control Delay (s/veh)		62.8	78.0	55.3	15.8	6.0	7.0	6.2	3.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		62.8	78.0	55.3	15.8	6.0	7.0	6.2	3.8
LOS		E	E	E	B	A	A	A	A
Approach Delay (s/veh)		62.8		44.7			7.0		3.9
Approach LOS		E		D			A		A

### Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 67 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay (s/veh): 8.2

Intersection LOS: A

Intersection Capacity Utilization 64.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)			Ø4
12 s		97 s			26 s	
	Ø6 (R)					Ø8
109 s					26 s	

## Queues

## 3: Havana Street &amp; Exposition Ave

2024 Existing PM

Greenwood Stables Affordable Housing - Aurora, CO
























Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	84	17	103	6	1784	75	1711
v/c Ratio	0.34	0.62	0.10	0.44	0.03	0.46	0.33	0.41
Control Delay (s/veh)	62.8	78.0	55.3	15.8	6.0	7.0	6.2	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	62.8	78.0	55.3	15.8	6.0	7.0	6.2	3.8
Queue Length 50th (ft)	37	72	14	0	1	195	9	118
Queue Length 95th (ft)	69	125	37	54	6	234	22	175
Internal Link Dist (ft)	113		1156			892		761
Turn Bay Length (ft)		120		120	900		600	
Base Capacity (vph)	218	224	276	322	183	3854	250	4174
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.38	0.06	0.32	0.03	0.46	0.30	0.41
Intersection Summary								

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2024 Existing PM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	13	0	77	16	95	5	1420	61	72	1628	14
Future Volume (veh/h)	24	13	0	77	16	95	5	1420	61	72	1628	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	15	0	84	17	103	6	1711	73	75	1696	15
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.83	0.83	0.83	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	49	0	176	151	128	267	3813	163	296	4336	38
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.76	0.76	0.76	0.04	0.83	0.83
Sat Flow, veh/h	842	613	0	1398	1870	1585	285	5022	214	1781	5220	46
Grp Volume(v), veh/h	44	0	0	84	17	103	6	1159	625	75	1106	605
Grp Sat Flow(s),veh/h/ln	1455	0	0	1398	1870	1585	285	1702	1832	1781	1702	1862
Q Serve(g_s), s	2.6	0.0	0.0	3.1	1.1	8.6	0.7	16.8	16.8	1.1	11.0	11.0
Cycle Q Clear(g_c), s	3.7	0.0	0.0	6.8	1.1	8.6	2.1	16.8	16.8	1.1	11.0	11.0
Prop In Lane	0.66		0.00	1.00		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	161	0	0	176	151	128	267	2584	1391	296	2828	1547
V/C Ratio(X)	0.27	0.00	0.00	0.48	0.11	0.81	0.02	0.45	0.45	0.25	0.39	0.39
Avail Cap(c_a), veh/h	258	0	0	271	277	235	267	2584	1391	328	2828	1547
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.7	0.0	0.0	60.0	57.6	61.0	4.3	5.9	5.9	4.2	2.9	2.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.1	4.5	0.2	0.6	1.1	0.2	0.4	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	2.9	0.6	3.7	0.0	5.2	5.8	0.3	2.6	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	59.0	0.0	0.0	60.8	57.7	65.6	4.5	6.5	7.0	4.4	3.3	3.6
LnGrp LOS	E			E	E	E	A	A	A	A	A	A
Approach Vol, veh/h	44			204			1790			1786		
Approach Delay, s/veh	59.0			62.9			6.7			3.4		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.6	108.5		16.9		118.1		16.9				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	3.1	18.8		10.6		13.0		5.7				
Green Ext Time (p_c), s	0.0	21.0		0.2		19.3		0.1				
Intersection Summary												
HCM 7th Control Delay, s/veh	8.8											
HCM 7th LOS	A											
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2024 Existing PM  
Greenwood Stables Affordable Housing - Aurora, CO

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	165	0	0	132	2	0	0	0	6	0	4
Future Vol, veh/h	4	165	0	0	132	2	0	0	0	6	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	82	82	82	92	92	92	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	192	0	0	161	2	0	0	0	12	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	163	0	0	192	0	0	362	365	192	363	363	162
Stage 1	-	-	-	-	-	-	201	201	-	162	162	-
Stage 2	-	-	-	-	-	-	161	163	-	201	201	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1415	-	-	1382	-	-	594	564	850	593	564	883
Stage 1	-	-	-	-	-	-	801	735	-	840	764	-
Stage 2	-	-	-	-	-	-	841	763	-	801	735	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1415	-	-	1382	-	-	586	561	850	590	562	883
Mov Cap-2 Maneuver	-	-	-	-	-	-	586	561	-	590	562	-
Stage 1	-	-	-	-	-	-	798	732	-	840	764	-
Stage 2	-	-	-	-	-	-	834	763	-	798	732	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v 0.18				0			0			10.45		
HCM LOS							A			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	43	-	-	1382	-	-	681
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.029
HCM Control Delay (s/veh)	0	7.6	0	-	0	-	-	10.5
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

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## ***Intersection Capacity Worksheets: 2027 Background***

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# Timings

## 3: Havana Street & Exposition Ave

2027 Background AM

Greenwood Stables Affordable Housing - Aurora, CO

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	19	10	57	11	84	1142	52	961
Future Volume (vph)	19	10	57	11	84	1142	52	961
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		8		4		2	1	6
Permitted Phases	8		4		4		6	
Detector Phase	8	8	4	4	4	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	10.0	17.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0	75.0	15.0	90.0
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	71.4%	14.3%	85.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		8.1	8.1	8.1	8.1	80.5	89.3	88.5
Actuated g/C Ratio		0.08	0.08	0.08	0.08	0.77	0.85	0.84
v/c Ratio		0.29	0.59	0.08	0.44	0.33	0.15	0.24
Control Delay (s/veh)		50.0	69.3	45.7	17.0	5.3	2.6	2.3
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		50.0	69.3	45.7	17.0	5.3	2.6	2.3
LOS		D	E	D	B	A	A	A
Approach Delay (s/veh)		50.0		38.7		5.3		2.4
Approach LOS		D		D		A		A

### Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

Offset: 13.5 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay (s/veh): 6.8

Intersection LOS: A

Intersection Capacity Utilization 51.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)		Ø4
15 s		75 s		15 s	
	Ø6 (R)				Ø8
90 s				15 s	

## Queues

2027 Background AM

## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	34	62	12	91	1278	57	1046
v/c Ratio	0.29	0.59	0.08	0.44	0.33	0.15	0.24
Control Delay (s/veh)	50.0	69.3	45.7	17.0	5.3	2.6	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.0	69.3	45.7	17.0	5.3	2.6	2.3
Queue Length 50th (ft)	21	41	8	0	107	5	50
Queue Length 95th (ft)	52	#92	26	49	129	11	61
Internal Link Dist (ft)	113		1156		892		761
Turn Bay Length (ft)		120		120		600	
Base Capacity (vph)	129	117	159	218	3886	443	4287
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.53	0.08	0.42	0.33	0.13	0.24

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.























Queue shown is maximum after two cycles.

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2027 Background AM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	10	2	57	11	84	0	1142	34	52	961	1
Future Volume (veh/h)	19	10	2	57	11	84	0	1142	34	52	961	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	11	2	62	12	91	0	1241	37	57	1045	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	50	7	181	141	120	69	3699	110	427	4269	4
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.00	0.73	0.73	0.05	0.81	0.81
Sat Flow, veh/h	760	664	89	1401	1870	1585	539	5095	152	1781	5268	5
Grp Volume(v), veh/h	34	0	0	62	12	91	0	829	449	57	675	371
Grp Sat Flow(s),veh/h/ln	1514	0	0	1401	1870	1585	539	1702	1843	1781	1702	1869
Q Serve(g_s), s	0.8	0.0	0.0	1.9	0.6	5.9	0.0	9.3	9.3	0.7	4.9	4.9
Cycle Q Clear(g_c), s	2.0	0.0	0.0	3.9	0.6	5.9	0.0	9.3	9.3	0.7	4.9	4.9
Prop In Lane	0.62		0.06	1.00		1.00	1.00		0.08	1.00		0.00
Lane Grp Cap(c), veh/h	170	0	0	181	141	120	69	2471	1338	427	2758	1515
V/C Ratio(X)	0.20	0.00	0.00	0.34	0.09	0.76	0.00	0.34	0.34	0.13	0.24	0.24
Avail Cap(c_a), veh/h	185	0	0	196	160	136	69	2471	1338	531	2758	1515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	0.0	46.6	45.2	47.6	0.0	5.2	5.2	3.1	2.4	2.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.1	16.4	0.0	0.4	0.7	0.1	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.6	0.3	2.9	0.0	2.7	3.0	0.2	1.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.0	0.0	0.0	47.0	45.3	64.0	0.0	5.6	5.9	3.1	2.6	2.7
LnGrp LOS	D			D	D	E		A	A	A	A	A
Approach Vol, veh/h	34			165			1278			1103		
Approach Delay, s/veh	46.0			56.2			5.7			2.7		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.9	82.2		13.9		91.1		13.9				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	2.7	11.3		7.9		6.9		4.0				
Green Ext Time (p_c), s	0.0	11.0		0.0		8.1		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				8.2								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2027 Background AM  
Greenwood Stables Affordable Housing - Aurora, CO


















Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	100	0	0	171	2	0	0	0	2	0	1
Future Vol, veh/h	3	100	0	0	171	2	0	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	109	0	0	186	2	0	0	0	2	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	109	0	0	301	303	109	302	302	187
Stage 1	-	-	-	-	-	-	115	115	-	187	187	-
Stage 2	-	-	-	-	-	-	186	188	-	115	115	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1386	-	-	1482	-	-	651	610	945	650	611	855
Stage 1	-	-	-	-	-	-	890	800	-	815	745	-
Stage 2	-	-	-	-	-	-	816	744	-	890	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1482	-	-	649	608	945	649	609	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	649	608	-	649	609	-
Stage 1	-	-	-	-	-	-	887	798	-	815	745	-
Stage 2	-	-	-	-	-	-	815	744	-	887	798	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.22			0			0			10.13		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	52	-	-	1482	-	-	705				
HCM Lane V/C Ratio	-	0.002	-	-	-	-	-	0.005				
HCM Control Delay (s/veh)	0	7.6	0	-	0	-	-	10.1				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0				

# Timings


## 3: Havana Street & Exposition Ave

2027 Background PM

Greenwood Stables Affordable Housing - Aurora, CO

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	13	78	16	97	5	1446	73	1657
Future Volume (vph)	24	13	78	16	97	5	1446	73	1657
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		8		4			2	1	6
Permitted Phases	8		4		4	2		6	
Detector Phase	8	8	4	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	10.0	17.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	97.0	97.0	12.0	109.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	19.3%	71.9%	71.9%	8.9%	80.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		12.8	12.8	12.8	12.8	102.2	102.2	112.2	110.2
Actuated g/C Ratio		0.09	0.09	0.09	0.09	0.76	0.76	0.83	0.82
v/c Ratio		0.29	0.59	0.10	0.43	0.03	0.43	0.30	0.42
Control Delay (s/veh)		60.2	73.6	54.4	15.1	6.4	7.0	5.5	4.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		60.2	73.6	54.4	15.1	6.4	7.0	5.5	4.1
LOS		E	E	D	B	A	A	A	A
Approach Delay (s/veh)		60.2		42.4			7.0		4.1
Approach LOS		E		D			A		A
Intersection Summary									
Cycle Length: 135									
Actuated Cycle Length: 135									
Offset: 118.5 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow									
Natural Cycle: 50									
Control Type: Actuated-Coordinated									
Maximum v/c Ratio: 0.59									
Intersection Signal Delay (s/veh): 8.1					Intersection LOS: A				
Intersection Capacity Utilization 65.2%					ICU Level of Service C				
Analysis Period (min) 15									

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)						Ø4
12 s		97 s						26 s	
	Ø6 (R)								Ø8
109 s								26 s	

## Queues

## 3: Havana Street &amp; Exposition Ave

2027 Background PM

Greenwood Stables Affordable Housing - Aurora, CO























Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	85	17	105	5	1639	76	1741
v/c Ratio	0.29	0.59	0.10	0.43	0.03	0.43	0.30	0.42
Control Delay (s/veh)	60.2	73.6	54.4	15.1	6.4	7.0	5.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	60.2	73.6	54.4	15.1	6.4	7.0	5.5	4.1
Queue Length 50th (ft)	33	73	14	0	1	176	9	126
Queue Length 95th (ft)	69	125	37	54	6	244	23	187
Internal Link Dist (ft)	113		1156			892		761
Turn Bay Length (ft)		120		120	900		600	
Base Capacity (vph)	218	228	276	323	176	3828	277	4148
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.37	0.06	0.33	0.03	0.43	0.27	0.42
Intersection Summary								

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2027 Background PM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	13	0	78	16	97	5	1446	62	73	1657	14
Future Volume (veh/h)	24	13	0	78	16	97	5	1446	62	73	1657	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	14	0	85	17	105	5	1572	67	76	1726	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	52	0	177	153	130	260	3806	162	326	4330	38
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.76	0.76	0.76	0.04	0.83	0.83
Sat Flow, veh/h	834	631	0	1400	1870	1585	277	5022	214	1781	5221	45
Grp Volume(v), veh/h	40	0	0	85	17	105	5	1065	574	76	1125	616
Grp Sat Flow(s),veh/h/ln	1465	0	0	1400	1870	1585	277	1702	1832	1781	1702	1862
Q Serve(g_s), s	2.2	0.0	0.0	3.8	1.1	8.8	0.6	14.9	14.9	1.1	11.4	11.4
Cycle Q Clear(g_c), s	3.3	0.0	0.0	7.1	1.1	8.8	2.4	14.9	14.9	1.1	11.4	11.4
Prop In Lane	0.65		0.00	1.00		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	164	0	0	177	153	130	260	2580	1388	326	2823	1544
V/C Ratio(X)	0.24	0.00	0.00	0.48	0.11	0.81	0.02	0.41	0.41	0.23	0.40	0.40
Avail Cap(c_a), veh/h	259	0	0	270	277	235	260	2580	1388	357	2823	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.3	0.0	0.0	60.0	57.4	61.0	4.5	5.8	5.8	3.8	2.9	2.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.8	0.1	4.5	0.1	0.5	0.9	0.1	0.4	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	2.9	0.5	3.7	0.0	4.6	5.1	0.3	2.7	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.6	0.0	0.0	60.7	57.6	65.5	4.6	6.2	6.7	4.0	3.4	3.7
LnGrp LOS	E			E	E	E	A	A	A	A	A	A
Approach Vol, veh/h	40			207			1644			1817		
Approach Delay, s/veh	58.6			62.9			6.4			3.5		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.7	108.3		17.0		118.0		17.0				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	3.1	16.9		10.8		13.4		5.3				
Green Ext Time (p_c), s	0.0	17.8		0.2		20.0		0.1				
Intersection Summary												
HCM 7th Control Delay, s/veh				8.7								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2027 Background PM  
Greenwood Stables Affordable Housing - Aurora, CO

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	168	0	0	134	2	0	0	0	6	0	4
Future Vol, veh/h	4	168	0	0	134	2	0	0	0	6	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	183	0	0	146	2	0	0	0	7	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	183	0	0	337	339	183	338	338	147
Stage 1	-	-	-	-	-	-	191	191	-	147	147	-
Stage 2	-	-	-	-	-	-	146	148	-	191	191	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1434	-	-	1392	-	-	617	582	860	616	583	900
Stage 1	-	-	-	-	-	-	810	742	-	856	776	-
Stage 2	-	-	-	-	-	-	857	775	-	810	742	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1434	-	-	1392	-	-	612	580	860	614	581	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	612	580	-	614	581	-
Stage 1	-	-	-	-	-	-	808	740	-	856	776	-
Stage 2	-	-	-	-	-	-	853	775	-	808	740	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.17			0			0			10.2		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	42	-	-	1392	-	-	703				
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.015				
HCM Control Delay (s/veh)	0	7.5	0	-	0	-	-	10.2				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0				


















## ***Intersection Capacity Worksheets: 2050 Background***





# Timings

## 3: Havana Street & Exposition Ave

2050 Background AM  
Greenwood Stables Affordable Housing - Aurora, CO

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	22	12	65	13	97	1310	60	1103
Future Volume (vph)	22	12	65	13	97	1310	60	1103
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		8		4		2	1	6
Permitted Phases	8		4		4		6	
Detector Phase	8	8	4	4	4	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	10.0	17.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0	75.0	15.0	90.0
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	71.4%	14.3%	85.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		8.2	8.2	8.2	8.2	76.8	86.8	84.8
Actuated g/C Ratio		0.08	0.08	0.08	0.08	0.73	0.83	0.81
v/c Ratio		0.33	0.67	0.10	0.48	0.40	0.21	0.29
Control Delay (s/veh)		51.4	76.4	45.9	16.6	6.1	3.3	2.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		51.4	76.4	45.9	16.6	6.1	3.3	2.8
LOS		D	E	D	B	A	A	A
Approach Delay (s/veh)		51.4		41.1		6.1		2.8
Approach LOS		D		D		A		A
Intersection Summary								
Cycle Length: 105								
Actuated Cycle Length: 105								
Offset: 13.5 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow								
Natural Cycle: 40								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.67								
Intersection Signal Delay (s/veh): 7.5					Intersection LOS: A			
Intersection Capacity Utilization 54.1%					ICU Level of Service A			
Analysis Period (min) 15								

Splits and Phases: 3: Havana Street & Exposition Ave

 Ø1	 Ø2 (R)		 Ø4
15 s	75 s		15 s
 Ø6 (R)			 Ø8
90 s			15 s

## Queues

2050 Background AM

## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	39	71	14	105	1466	65	1200
v/c Ratio	0.33	0.67	0.10	0.48	0.40	0.21	0.29
Control Delay (s/veh)	51.4	76.4	45.9	16.6	6.1	3.3	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.4	76.4	45.9	16.6	6.1	3.3	2.8
Queue Length 50th (ft)	24	47	9	0	130	6	60
Queue Length 95th (ft)	58	#110	29	52	154	13	72
Internal Link Dist (ft)	113		1156		892		761
Turn Bay Length (ft)		120		120		600	
Base Capacity (vph)	129	116	159	231	3704	381	4105
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.61	0.09	0.45	0.40	0.17	0.29

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.























Queue shown is maximum after two cycles.

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave





2050 Background AM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	12	2	65	13	97	0	1310	39	60	1103	1
Future Volume (veh/h)	22	12	2	65	13	97	0	1310	39	60	1103	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	13	2	71	14	105	0	1424	42	65	1199	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	55	6	194	157	133	69	3645	107	374	4224	4
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.00	0.72	0.72	0.05	0.80	0.80
Sat Flow, veh/h	763	659	77	1398	1870	1585	466	5097	150	1781	5269	4
Grp Volume(v), veh/h	39	0	0	71	14	105	0	951	515	65	775	425
Grp Sat Flow(s),veh/h/ln	1498	0	0	1398	1870	1585	466	1702	1843	1781	1702	1870
Q Serve(g_s), s	1.1	0.0	0.0	2.2	0.7	6.8	0.0	11.6	11.6	0.9	6.1	6.1
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.5	0.7	6.8	0.0	11.6	11.6	0.9	6.1	6.1
Prop In Lane	0.62		0.05	1.00		1.00	1.00		0.08	1.00		0.00
Lane Grp Cap(c), veh/h	181	0	0	194	157	133	69	2434	1318	374	2729	1499
V/C Ratio(X)	0.22	0.00	0.00	0.37	0.09	0.79	0.00	0.39	0.39	0.17	0.28	0.28
Avail Cap(c_a), veh/h	184	0	0	197	160	136	69	2434	1318	474	2729	1499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	0.0	46.0	44.4	47.2	0.0	5.9	5.9	3.6	2.7	2.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.1	23.6	0.0	0.5	0.9	0.1	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	1.8	0.3	3.6	0.0	3.4	3.9	0.2	1.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.3	0.0	0.0	46.4	44.5	70.7	0.0	6.4	6.8	3.7	2.9	3.1
LnGrp LOS	D			D	D	E		A	A	A	A	A
Approach Vol, veh/h	39			190			1466			1265		
Approach Delay, s/veh	45.3			59.7			6.5			3.0		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.1	81.1		14.8		90.2		14.8				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	2.9	13.6		8.8		8.1		4.3				
Green Ext Time (p_c), s	0.0	13.7		0.0		10.0		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				9.0								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2050 Background AM  
Greenwood Stables Affordable Housing - Aurora, CO


















Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	114	0	0	196	2	0	0	0	2	0	1
Future Vol, veh/h	4	114	0	0	196	2	0	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	124	0	0	213	2	0	0	0	2	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	215	0	0	124	0	0	346	348	124	347	347	214
Stage 1	-	-	-	-	-	-	133	133	-	214	214	-
Stage 2	-	-	-	-	-	-	213	215	-	133	133	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1355	-	-	1463	-	-	609	576	927	608	577	826
Stage 1	-	-	-	-	-	-	871	787	-	788	725	-
Stage 2	-	-	-	-	-	-	789	725	-	871	787	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1355	-	-	1463	-	-	606	574	927	606	575	826
Mov Cap-2 Maneuver	-	-	-	-	-	-	606	574	-	606	575	-
Stage 1	-	-	-	-	-	-	868	784	-	788	725	-
Stage 2	-	-	-	-	-	-	788	725	-	868	784	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.26			0			0			10.44		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	61	-	-	1463	-	-	665				
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.005				
HCM Control Delay (s/veh)	0	7.7	0	-	0	-	-	10.4				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0				

# Timings

## 3: Havana Street & Exposition Ave

2050 Background PM

Greenwood Stables Affordable Housing - Aurora, CO

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	28	15	90	19	111	6	1659	84	1902
Future Volume (vph)	28	15	90	19	111	6	1659	84	1902
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		8		4			2	1	6
Permitted Phases	8		4		4	2		6	
Detector Phase	8	8	4	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	17.0	10.0	17.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	97.0	97.0	12.0	109.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	19.3%	71.9%	71.9%	8.9%	80.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		13.4	13.4	13.4	13.4	99.4	99.4	111.6	109.6
Actuated g/C Ratio		0.10	0.10	0.10	0.10	0.74	0.74	0.83	0.81
v/c Ratio		0.32	0.67	0.11	0.47	0.05	0.50	0.43	0.48
Control Delay (s/veh)		60.4	79.0	54.2	16.5	7.5	8.4	8.9	4.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		60.4	79.0	54.2	16.5	7.5	8.4	8.9	4.7
LOS		E	E	D	B	A	A	A	A
Approach Delay (s/veh)		60.4		45.3			8.4		4.9
Approach LOS		E		D			A		A
Intersection Summary									
Cycle Length: 135									
Actuated Cycle Length: 135									
Offset: 118.5 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow									
Natural Cycle: 55									
Control Type: Actuated-Coordinated									
Maximum v/c Ratio: 0.67									
Intersection Signal Delay (s/veh): 9.3					Intersection LOS: A				
Intersection Capacity Utilization 70.3%					ICU Level of Service C				
Analysis Period (min) 15									

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)			Ø4
12 s		97 s			26 s	
	Ø6 (R)					Ø8
109 s					26 s	

## Queues

## 3: Havana Street &amp; Exposition Ave

2050 Background PM

Greenwood Stables Affordable Housing - Aurora, CO

























Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	98	21	121	7	1880	88	1998
v/c Ratio	0.32	0.67	0.11	0.47	0.05	0.50	0.43	0.48
Control Delay (s/veh)	60.4	79.0	54.2	16.5	7.5	8.4	8.9	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	60.4	79.0	54.2	16.5	7.5	8.4	8.9	4.7
Queue Length 50th (ft)	38	84	17	5	2	222	11	162
Queue Length 95th (ft)	76	140	42	62	8	309	27	239
Internal Link Dist (ft)	113		1156			892		761
Turn Bay Length (ft)		120		120	900		600	
Base Capacity (vph)	218	220	276	332	128	3725	229	4124
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.45	0.08	0.36	0.05	0.50	0.38	0.48
Intersection Summary								

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave





2050 Background PM  
Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	15	0	90	19	111	6	1659	71	84	1902	16
Future Volume (veh/h)	28	15	0	90	19	111	6	1659	71	84	1902	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	16	0	98	21	121	7	1803	77	88	1981	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	55	0	192	172	146	206	3750	160	276	4278	37
Arrive On Green	0.09	0.09	0.00	0.09	0.09	0.09	0.75	0.75	0.75	0.04	0.82	0.82
Sat Flow, veh/h	816	596	0	1397	1870	1585	216	5022	214	1781	5222	45
Grp Volume(v), veh/h	46	0	0	98	21	121	7	1222	658	88	1291	707
Grp Sat Flow(s),veh/h/ln	1412	0	0	1397	1870	1585	216	1702	1832	1781	1702	1862
Q Serve(g_s), s	2.7	0.0	0.0	4.0	1.4	10.1	1.3	19.1	19.2	1.4	14.9	14.9
Cycle Q Clear(g_c), s	4.1	0.0	0.0	8.2	1.4	10.1	6.5	19.1	19.2	1.4	14.9	14.9
Prop In Lane	0.65		0.00	1.00		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	174	0	0	192	172	146	206	2542	1368	276	2789	1526
V/C Ratio(X)	0.26	0.00	0.00	0.51	0.12	0.83	0.03	0.48	0.48	0.32	0.46	0.46
Avail Cap(c_a), veh/h	253	0	0	271	277	235	206	2542	1368	305	2789	1526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	0.0	0.0	59.2	56.3	60.3	5.9	6.7	6.8	5.3	3.6	3.6
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.8	0.1	6.1	0.3	0.7	1.2	0.2	0.6	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	3.3	0.7	4.4	0.1	6.1	6.8	0.4	3.8	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.8	0.0	0.0	59.9	56.4	66.4	6.2	7.4	8.0	5.6	4.1	4.6
LnGrp LOS	E			E	E	E	A	A	A	A	A	A
Approach Vol, veh/h	46			240			1887			2086		
Approach Delay, s/veh	57.8			62.9			7.6			4.3		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.8	106.8		18.4		116.6		18.4				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	3.4	21.2		12.1		16.9		6.1				
Green Ext Time (p_c), s	0.0	23.4		0.3		26.9		0.1				
Intersection Summary												
HCM 7th Control Delay, s/veh				9.7								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												



HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2050 Background PM  
Greenwood Stables Affordable Housing - Aurora, CO

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	193	0	0	154	2	0	0	0	7	0	5
Future Vol, veh/h	5	193	0	0	154	2	0	0	0	7	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	210	0	0	167	2	0	0	0	8	0	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	170	0	0	210	0	0	388	390	210	389	389	168
Stage 1	-	-	-	-	-	-	221	221	-	168	168	-
Stage 2	-	-	-	-	-	-	167	170	-	221	221	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1408	-	-	1361	-	-	571	545	830	570	546	876
Stage 1	-	-	-	-	-	-	782	721	-	833	759	-
Stage 2	-	-	-	-	-	-	835	758	-	782	721	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1408	-	-	1361	-	-	565	543	830	567	544	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	565	543	-	567	544	-
Stage 1	-	-	-	-	-	-	778	718	-	833	759	-
Stage 2	-	-	-	-	-	-	829	758	-	778	718	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.19			0			0			10.52		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	45	-	-	1361	-	-	665				
HCM Lane V/C Ratio	-	0.004	-	-	-	-	-	0.02				
HCM Control Delay (s/veh)	0	7.6	0	-	0	-	-	10.5				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1				
















***Intersection Capacity Worksheets:  
2027 Background  
+ Project***

# Timings

## 3: Havana Street & Exposition Ave

2027 Build AM

Greenwood Stables Affordable Housing - Aurora, CO

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	19	10	64	11	96	1142	56	961
Future Volume (vph)	19	10	64	11	96	1142	56	961
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		8		4		2	1	6
Permitted Phases	8		4		4		6	
Detector Phase	8	8	4	4	4	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	6.0	6.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	10.0	17.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0	75.0	15.0	90.0
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	71.4%	14.3%	85.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		8.2	8.2	8.2	8.2	76.8	86.8	84.8
Actuated g/C Ratio		0.08	0.08	0.08	0.08	0.73	0.83	0.81
v/c Ratio		0.29	0.65	0.08	0.47	0.35	0.17	0.25
Control Delay (s/veh)		49.7	75.0	45.6	16.7	5.7	2.8	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		49.7	75.0	45.6	16.7	5.7	2.8	2.7
LOS		D	E	D	B	A	A	A
Approach Delay (s/veh)		49.7		40.5		5.7		2.7
Approach LOS		D		D		A		A
Intersection Summary								
Cycle Length: 105								
Actuated Cycle Length: 105								
Offset: 13.5 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow								
Natural Cycle: 40								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.65								
Intersection Signal Delay (s/veh): 7.5					Intersection LOS: A			
Intersection Capacity Utilization 51.1%					ICU Level of Service A			
Analysis Period (min) 15								

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)		Ø4
15 s		75 s		15 s	
	Ø6 (R)				Ø8
90 s				15 s	

## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	34	70	12	104	1280	61	1046
v/c Ratio	0.29	0.65	0.08	0.47	0.35	0.17	0.25
Control Delay (s/veh)	49.7	75.0	45.6	16.7	5.7	2.8	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.7	75.0	45.6	16.7	5.7	2.8	2.7
Queue Length 50th (ft)	21	46	8	0	108	6	50
Queue Length 95th (ft)	52	#109	26	51	130	12	61
Internal Link Dist (ft)	113		1156		892		761
Turn Bay Length (ft)		120		120		600	
Base Capacity (vph)	129	117	159	230	3702	433	4106
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.60	0.08	0.45	0.35	0.14	0.25

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.





















Queue shown is maximum after two cycles.

# HCM 7th Signalized Intersection Summary

2027 Build AM

## 3: Havana Street & Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	10	2	64	11	96	0	1142	36	56	961	1
Future Volume (veh/h)	19	10	2	64	11	96	0	1142	36	56	961	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	11	2	70	12	104	0	1241	39	61	1045	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	54	7	192	156	132	69	3645	115	423	4227	4
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.00	0.72	0.72	0.05	0.80	0.80
Sat Flow, veh/h	766	644	88	1401	1870	1585	539	5086	160	1781	5268	5
Grp Volume(v), veh/h	34	0	0	70	12	104	0	831	449	61	675	371
Grp Sat Flow(s),veh/h/ln	1498	0	0	1401	1870	1585	539	1702	1842	1781	1702	1869
Q Serve(g_s), s	0.8	0.0	0.0	2.5	0.6	6.8	0.0	9.6	9.6	0.8	5.1	5.1
Cycle Q Clear(g_c), s	2.0	0.0	0.0	4.5	0.6	6.8	0.0	9.6	9.6	0.8	5.1	5.1
Prop In Lane	0.62		0.06	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	180	0	0	192	156	132	69	2440	1320	423	2731	1500
V/C Ratio(X)	0.19	0.00	0.00	0.36	0.08	0.79	0.00	0.34	0.34	0.14	0.25	0.25
Avail Cap(c_a), veh/h	184	0	0	196	160	136	69	2440	1320	525	2731	1500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	0.0	46.0	44.4	47.2	0.0	5.6	5.6	3.3	2.6	2.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.1	23.1	0.0	0.4	0.7	0.1	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.8	0.3	3.5	0.0	2.8	3.2	0.2	1.1	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.1	0.0	0.0	46.5	44.5	70.3	0.0	6.0	6.3	3.4	2.8	3.0
LnGrp LOS	D			D	D	E		A	A	A	A	A
Approach Vol, veh/h	34			186			1280			1107		
Approach Delay, s/veh	45.1			59.7			6.1			2.9		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.0	81.3		14.8		90.2		14.8				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+l1), s	2.8	11.6		8.8		7.1		4.0				
Green Ext Time (p_c), s	0.0	11.0		0.0		8.1		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				9.0								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

2027 Build AM  
Greenwood Stables Affordable Housing - Aurora, CO


















Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	100	6	1	171	2	19	0	5	2	0	1
Future Vol, veh/h	3	100	6	1	171	2	19	0	5	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	109	7	1	186	2	21	0	5	2	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	115	0	0	307	309	112	304	311	187
Stage 1	-	-	-	-	-	-	118	118	-	189	189	-
Stage 2	-	-	-	-	-	-	188	190	-	115	122	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1386	-	-	1474	-	-	646	606	941	648	604	855
Stage 1	-	-	-	-	-	-	886	798	-	813	744	-
Stage 2	-	-	-	-	-	-	814	743	-	890	795	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1474	-	-	643	604	941	642	602	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	643	604	-	642	602	-
Stage 1	-	-	-	-	-	-	884	796	-	812	743	-
Stage 2	-	-	-	-	-	-	812	742	-	882	793	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.21			0.04			10.44			10.17		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	688	49	-	-	10	-	-	700				
HCM Lane V/C Ratio	0.038	0.002	-	-	0.001	-	-	0.005				
HCM Control Delay (s/veh)	10.4	7.6	0	-	7.4	0	-	10.2				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

# Timings

## 3: Havana Street & Exposition Ave

2027 Build PM

Greenwood Stables Affordable Housing - Aurora, CO

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	13	82	16	103	5	1446	83	1657
Future Volume (vph)	24	13	82	16	103	5	1446	83	1657
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		8		4			2	1	6
Permitted Phases	8		4		4	2		6	
Detector Phase	8	8	4	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	17.0	10.0	17.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	97.0	97.0	12.0	109.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	19.3%	71.9%	71.9%	8.9%	80.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		13.2	13.2	13.2	13.2	99.7	99.7	111.8	109.8
Actuated g/C Ratio		0.10	0.10	0.10	0.10	0.74	0.74	0.83	0.81
v/c Ratio		0.28	0.60	0.09	0.44	0.03	0.44	0.34	0.42
Control Delay (s/veh)		59.4	73.6	53.9	14.7	6.6	7.6	6.2	4.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		59.4	73.6	53.9	14.7	6.6	7.6	6.2	4.2
LOS		E	E	D	B	A	A	A	A
Approach Delay (s/veh)		59.4		41.8			7.6		4.3
Approach LOS		E		D			A		A

### Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 118.5 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay (s/veh): 8.5

Intersection LOS: A

Intersection Capacity Utilization 65.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)			Ø4
12 s		97 s			26 s	
	Ø6 (R)					Ø8
109 s					26 s	

## Queues

2027 Build PM

## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	89	17	112	5	1646	86	1741
v/c Ratio	0.28	0.60	0.09	0.44	0.03	0.44	0.34	0.42
Control Delay (s/veh)	59.4	73.6	53.9	14.7	6.6	7.6	6.2	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	59.4	73.6	53.9	14.7	6.6	7.6	6.2	4.2
Queue Length 50th (ft)	33	76	14	0	1	180	11	129
Queue Length 95th (ft)	69	129	37	56	6	251	26	191
Internal Link Dist (ft)	113		1156			892		761
Turn Bay Length (ft)		120		120	900		600	
Base Capacity (vph)	218	227	276	329	171	3733	274	4133
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.06	0.34	0.03	0.44	0.31	0.42
Intersection Summary								

























# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2027 Build PM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	13	0	82	16	103	5	1446	68	83	1657	14
Future Volume (veh/h)	24	13	0	82	16	103	5	1446	68	83	1657	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	14	0	89	17	112	5	1572	74	86	1726	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	54	0	183	161	136	258	3761	177	324	4307	37
Arrive On Green	0.09	0.09	0.00	0.09	0.09	0.09	0.75	0.75	0.75	0.04	0.82	0.82
Sat Flow, veh/h	835	623	0	1400	1870	1585	277	4997	235	1781	5221	45
Grp Volume(v), veh/h	40	0	0	89	17	112	5	1071	575	86	1125	616
Grp Sat Flow(s),veh/h/ln	1458	0	0	1400	1870	1585	277	1702	1828	1781	1702	1862
Q Serve(g_s), s	2.1	0.0	0.0	4.1	1.1	9.4	0.6	15.3	15.3	1.3	11.7	11.7
Cycle Q Clear(g_c), s	3.3	0.0	0.0	7.4	1.1	9.4	2.6	15.3	15.3	1.3	11.7	11.7
Prop In Lane	0.65		0.00	1.00		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	170	0	0	183	161	136	258	2562	1376	324	2808	1536
V/C Ratio(X)	0.24	0.00	0.00	0.49	0.11	0.82	0.02	0.42	0.42	0.27	0.40	0.40
Avail Cap(c_a), veh/h	258	0	0	270	277	235	258	2562	1376	353	2808	1536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	0.0	59.6	56.9	60.7	4.7	6.0	6.0	4.1	3.1	3.1
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.1	4.6	0.1	0.5	0.9	0.2	0.4	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	3.0	0.5	4.0	0.0	4.8	5.3	0.4	2.9	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.0	0.0	0.0	60.3	57.0	65.2	4.8	6.5	7.0	4.3	3.5	3.9
LnGrp LOS	E			E	E	E	A	A	A	A	A	A
Approach Vol, veh/h	40			218			1651			1827		
Approach Delay, s/veh	58.0			62.6			6.7			3.7		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.8	107.6		17.6		117.4		17.6				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	3.3	17.3		11.4		13.7		5.3				
Green Ext Time (p_c), s	0.0	17.9		0.2		20.0		0.1				
Intersection Summary												
HCM 7th Control Delay, s/veh				9.0								
HCM 7th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	168	16	4	134	2	10	0	3	6	0	4
Future Vol, veh/h	4	168	16	4	134	2	10	0	3	6	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	183	17	4	146	2	11	0	3	7	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	200	0	0	354	357	191	347	364	147
Stage 1	-	-	-	-	-	-	200	200	-	155	155	-
Stage 2	-	-	-	-	-	-	154	157	-	191	209	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1434	-	-	1372	-	-	601	569	850	608	564	900
Stage 1	-	-	-	-	-	-	802	736	-	847	769	-
Stage 2	-	-	-	-	-	-	848	768	-	810	729	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1434	-	-	1372	-	-	594	565	850	601	560	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	594	565	-	601	560	-
Stage 1	-	-	-	-	-	-	799	733	-	844	766	-
Stage 2	-	-	-	-	-	-	841	765	-	805	727	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.16			0.22			10.77			10.28		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	638	38	-	-	51	-	-	693				
HCM Lane V/C Ratio	0.022	0.003	-	-	0.003	-	-	0.016				
HCM Control Delay (s/veh)	10.8	7.5	0	-	7.6	0	-	10.3				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				
















***Intersection Capacity Worksheets:  
2050 Background +  
Project***

# Timings

## 3: Havana Street & Exposition Ave

2050 Build AM

Greenwood Stables Affordable Housing - Aurora, CO

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	22	12	72	13	109	1310	64	1103
Future Volume (vph)	22	12	72	13	109	1310	64	1103
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		8		4		2	1	6
Permitted Phases	8		4		4		6	
Detector Phase	8	8	4	4	4	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	10.0	17.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0	75.0	15.0	90.0
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	71.4%	14.3%	85.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		8.4	8.4	8.4	8.4	76.6	86.6	84.6
Actuated g/C Ratio		0.08	0.08	0.08	0.08	0.73	0.82	0.81
v/c Ratio		0.33	0.72	0.09	0.50	0.40	0.23	0.29
Control Delay (s/veh)		51.1	82.4	45.9	16.5	6.1	3.5	2.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		51.1	82.4	45.9	16.5	6.1	3.5	2.8
LOS		D	F	D	B	A	A	A
Approach Delay (s/veh)		51.1		42.9		6.1		2.9
Approach LOS		D		D		A		A

### Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

Offset: 13.5 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay (s/veh): 7.9

Intersection LOS: A

Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave



## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	39	78	14	118	1469	70	1200
v/c Ratio	0.33	0.72	0.09	0.50	0.40	0.23	0.29
Control Delay (s/veh)	51.1	82.4	45.9	16.5	6.1	3.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.1	82.4	45.9	16.5	6.1	3.5	2.8
Queue Length 50th (ft)	24	52	9	0	130	7	60
Queue Length 95th (ft)	58	#124	29	55	155	13	72
Internal Link Dist (ft)	113		1156		892		761
Turn Bay Length (ft)		120		120		600	
Base Capacity (vph)	129	116	159	243	3695	381	4099
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.67	0.09	0.49	0.40	0.18	0.29

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.





















Queue shown is maximum after two cycles.

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2050 Build AM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	12	2	72	13	109	0	1310	41	64	1103	1
Future Volume (veh/h)	22	12	2	72	13	109	0	1310	41	64	1103	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	13	2	78	14	118	0	1424	45	70	1199	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	56	7	197	160	136	69	3621	114	374	4215	4
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.00	0.71	0.71	0.05	0.80	0.80
Sat Flow, veh/h	759	652	76	1398	1870	1585	466	5085	161	1781	5269	4
Grp Volume(v), veh/h	39	0	0	78	14	118	0	953	516	70	775	425
Grp Sat Flow(s),veh/h/ln	1487	0	0	1398	1870	1585	466	1702	1841	1781	1702	1870
Q Serve(g_s), s	1.1	0.0	0.0	2.7	0.7	7.7	0.0	11.8	11.8	0.9	6.2	6.2
Cycle Q Clear(g_c), s	2.3	0.0	0.0	5.0	0.7	7.7	0.0	11.8	11.8	0.9	6.2	6.2
Prop In Lane	0.62		0.05	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	183	0	0	197	160	136	69	2424	1311	374	2723	1496
V/C Ratio(X)	0.21	0.00	0.00	0.40	0.09	0.87	0.00	0.39	0.39	0.19	0.28	0.28
Avail Cap(c_a), veh/h	183	0	0	197	160	136	69	2424	1311	472	2723	1496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	46.0	44.2	47.4	0.0	6.0	6.0	3.7	2.7	2.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.1	39.7	0.0	0.5	0.9	0.1	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	2.0	0.3	4.6	0.0	3.5	4.0	0.2	1.3	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.1	0.0	0.0	46.5	44.3	87.1	0.0	6.5	6.9	3.8	3.0	3.2
LnGrp LOS	D			D	D	F		A	A	A	A	A
Approach Vol, veh/h	39			210			1469			1270		
Approach Delay, s/veh	45.1			69.2			6.7			3.1		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.2	80.8		15.0		90.0		15.0				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	2.9	13.8		9.7		8.2		4.3				
Green Ext Time (p_c), s	0.0	13.8		0.0		10.0		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh	10.0											
HCM 7th LOS	B											
Notes												
User approved pedestrian interval to be less than phase max green.												


















Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	114	6	1	196	2	19	0	5	2	0	1
Future Vol, veh/h	4	114	6	1	196	2	19	0	5	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	124	7	1	213	2	21	0	5	2	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	215	0	0	130	0	0	351	353	127	349	355	214
Stage 1	-	-	-	-	-	-	136	136	-	216	216	-
Stage 2	-	-	-	-	-	-	215	217	-	133	139	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1355	-	-	1455	-	-	604	572	923	606	570	826
Stage 1	-	-	-	-	-	-	867	784	-	786	724	-
Stage 2	-	-	-	-	-	-	787	723	-	871	781	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1355	-	-	1455	-	-	600	569	923	600	568	826
Mov Cap-2 Maneuver	-	-	-	-	-	-	600	569	-	600	568	-
Stage 1	-	-	-	-	-	-	864	781	-	785	723	-
Stage 2	-	-	-	-	-	-	785	722	-	863	779	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.25			0.04			10.79			10.48		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	647	57	-	-	9	-	-	660				
HCM Lane V/C Ratio	0.04	0.003	-	-	0.001	-	-	0.005				
HCM Control Delay (s/veh)	10.8	7.7	0	-	7.5	0	-	10.5				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

# Timings

## 3: Havana Street & Exposition Ave

2050 Build PM

Greenwood Stables Affordable Housing - Aurora, CO

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	28	15	94	19	117	6	1659	94	1902
Future Volume (vph)	28	15	94	19	117	6	1659	94	1902
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		8		4			2	1	6
Permitted Phases	8		4		4	2		6	
Detector Phase	8	8	4	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	11.0	11.0	6.0	11.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	17.0	17.0	10.0	17.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	97.0	97.0	12.0	109.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	19.3%	71.9%	71.9%	8.9%	80.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		13.8	13.8	13.8	13.8	98.8	98.8	111.2	109.2
Actuated g/C Ratio		0.10	0.10	0.10	0.10	0.73	0.73	0.82	0.81
v/c Ratio		0.31	0.68	0.11	0.48	0.06	0.51	0.47	0.49
Control Delay (s/veh)		59.6	78.9	53.7	17.9	8.0	8.8	10.6	4.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		59.6	78.9	53.7	17.9	8.0	8.8	10.6	4.8
LOS		E	E	D	B	A	A	B	A
Approach Delay (s/veh)		59.6		45.8			8.8		5.1
Approach LOS		E		D			A		A

### Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 118.5 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay (s/veh): 9.7


Intersection LOS: A

Intersection Capacity Utilization 70.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Havana Street & Exposition Ave

	Ø1		Ø2 (R)			Ø4
12 s		97 s			26 s	
	Ø6 (R)					Ø8
109 s					26 s	



## 3: Havana Street &amp; Exposition Ave

Greenwood Stables Affordable Housing - Aurora, CO























Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	102	21	127	7	1887	98	1998
v/c Ratio	0.31	0.68	0.11	0.48	0.06	0.51	0.47	0.49
Control Delay (s/veh)	59.6	78.9	53.7	17.9	8.0	8.8	10.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	59.6	78.9	53.7	17.9	8.0	8.8	10.6	4.8
Queue Length 50th (ft)	38	88	17	10	2	226	13	165
Queue Length 95th (ft)	76	144	42	69	8	326	33	243
Internal Link Dist (ft)	113		1156			892		761
Turn Bay Length (ft)		120		120	900		600	
Base Capacity (vph)	218	220	276	332	127	3698	227	4109
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.46	0.08	0.38	0.06	0.51	0.43	0.49
Intersection Summary								

# HCM 7th Signalized Intersection Summary

## 3: Havana Street & Exposition Ave

2050 Build PM

Greenwood Stables Affordable Housing - Aurora, CO

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	15	0	94	19	117	6	1659	77	94	1902	16
Future Volume (veh/h)	28	15	0	94	19	117	6	1659	77	94	1902	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	16	0	102	21	127	7	1803	84	98	1981	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	122	56	0	197	179	152	205	3713	173	274	4258	37
Arrive On Green	0.10	0.10	0.00	0.10	0.10	0.10	0.74	0.74	0.74	0.04	0.82	0.82
Sat Flow, veh/h	818	590	0	1397	1870	1585	216	5000	233	1781	5222	45
Grp Volume(v), veh/h	46	0	0	102	21	127	7	1227	660	98	1291	707
Grp Sat Flow(s),veh/h/ln	1408	0	0	1397	1870	1585	216	1702	1828	1781	1702	1862
Q Serve(g_s), s	2.7	0.0	0.0	4.4	1.4	10.6	1.3	19.6	19.6	1.6	15.2	15.2
Cycle Q Clear(g_c), s	4.1	0.0	0.0	8.5	1.4	10.6	6.7	19.6	19.6	1.6	15.2	15.2
Prop In Lane	0.65		0.00	1.00		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	179	0	0	197	179	152	205	2528	1358	274	2776	1519
V/C Ratio(X)	0.26	0.00	0.00	0.52	0.12	0.84	0.03	0.49	0.49	0.36	0.47	0.47
Avail Cap(c_a), veh/h	252	0	0	271	277	235	205	2528	1358	302	2776	1519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.0	0.0	0.0	58.8	55.8	60.0	6.2	7.0	7.0	5.8	3.7	3.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.8	0.1	8.6	0.3	0.7	1.2	0.3	0.6	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	3.4	0.7	4.7	0.1	6.3	7.0	0.5	3.9	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.3	0.0	0.0	59.6	55.9	68.6	6.5	7.7	8.2	6.1	4.3	4.7
LnGrp LOS	E			E	E	E	A	A	A	A	A	A
Approach Vol, veh/h	46			250			1894			2096		
Approach Delay, s/veh	57.3			63.9			7.9			4.5		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.8	106.2		18.9		116.1		18.9				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	3.6	21.6		12.6		17.2		6.1				
Green Ext Time (p_c), s	0.0	23.6		0.3		26.9		0.1				
Intersection Summary												
HCM 7th Control Delay, s/veh	10.0											
HCM 7th LOS	B											
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 7th TWSC  
6: Driveway/Park Access & Exposition Ave

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Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	193	16	4	154	2	10	0	3	7	0	5
Future Vol, veh/h	5	193	16	4	154	2	10	0	3	7	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	210	17	4	167	2	11	0	3	8	0	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	170	0	0	227	0	0	405	408	218	398	415	168
Stage 1	-	-	-	-	-	-	229	229	-	177	177	-
Stage 2	-	-	-	-	-	-	176	178	-	221	238	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1408	-	-	1341	-	-	556	533	821	562	528	876
Stage 1	-	-	-	-	-	-	773	714	-	825	753	-
Stage 2	-	-	-	-	-	-	826	752	-	782	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1408	-	-	1341	-	-	548	529	821	556	524	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	548	529	-	556	524	-
Stage 1	-	-	-	-	-	-	770	711	-	822	750	-
Stage 2	-	-	-	-	-	-	818	749	-	775	705	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.18			0.19			11.21			10.6		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	594	41	-	-	45	-	-	655				
HCM Lane V/C Ratio	0.024	0.004	-	-	0.003	-	-	0.02				
HCM Control Delay (s/veh)	11.2	7.6	0	-	7.7	0	-	10.6				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				