

**ATTACHMENT J  
TRANSPORTATION ANALYSIS  
PREPARED BY THE DEPARTMENT OF TRANSPORTATION**



**PASADENA**  
DEPARTMENT OF TRANSPORTATION

MOVING PEOPLE TO PLACES,  
**CONNECTIVITY**



**Transportation Analysis**

**Outside of CEQA**

**Category 1**

**Project Address:** Northwest Passage  
233 North Hudson Avenue

**Project Summary:** Development of a mixed-use project with 42 residential units and 5,968 sf commercial

**Applicant:** DC Hudson Holdings, LLC  
Attn: Tom Cao  
135 North San Gabriel Boulevard  
San Gabriel, CA 91775

**Attention:** Kelvin Parker, Zoning Administrator  
City Planning Department

**September 12, 2017**

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## I. Study Objective

The Department of Transportation at its discretion may analyze performance metrics outside of CEQA for projects with size thresholds below 50 units and/or 50,000 square feet of development. The analysis will assess the project's vehicular trips changes to adjacent intersections' Levels of Service (LOS) and "Access and Connector-Neighborhood" Street Type segments. The findings may result in imposing project approval conditions to better manage project trips and protect neighborhoods from the proposed development's vehicular trips, if applicable

## II. Project Description

The City of Pasadena Department of Transportation conducted an analysis to review potential transportation impacts related to the development of a mixed-use project with 42 residential units and 5,968 sf commercial.

Figure 1 depicts the project's first floor. As shown, the driveway is located along Hudson Avenue at the northeast corner of the property. Two existing curb cuts along Hudson Avenue and two existing curb cuts along Walnut Street will be removed.

## III. Project Study Area

The project is a mixed-use project with 42 residential units and 5,968 sf commercial on a vacant lot. The analysis reviewed the project traffic volume changes along the following street segment and intersections:

Street Segment:

- Locust Street between El Molino Avenue and Hudson Avenue
- Locust Street between Hudson Avenue and Lake Street
- Hudson Avenue between Locust Street and Walnut Street

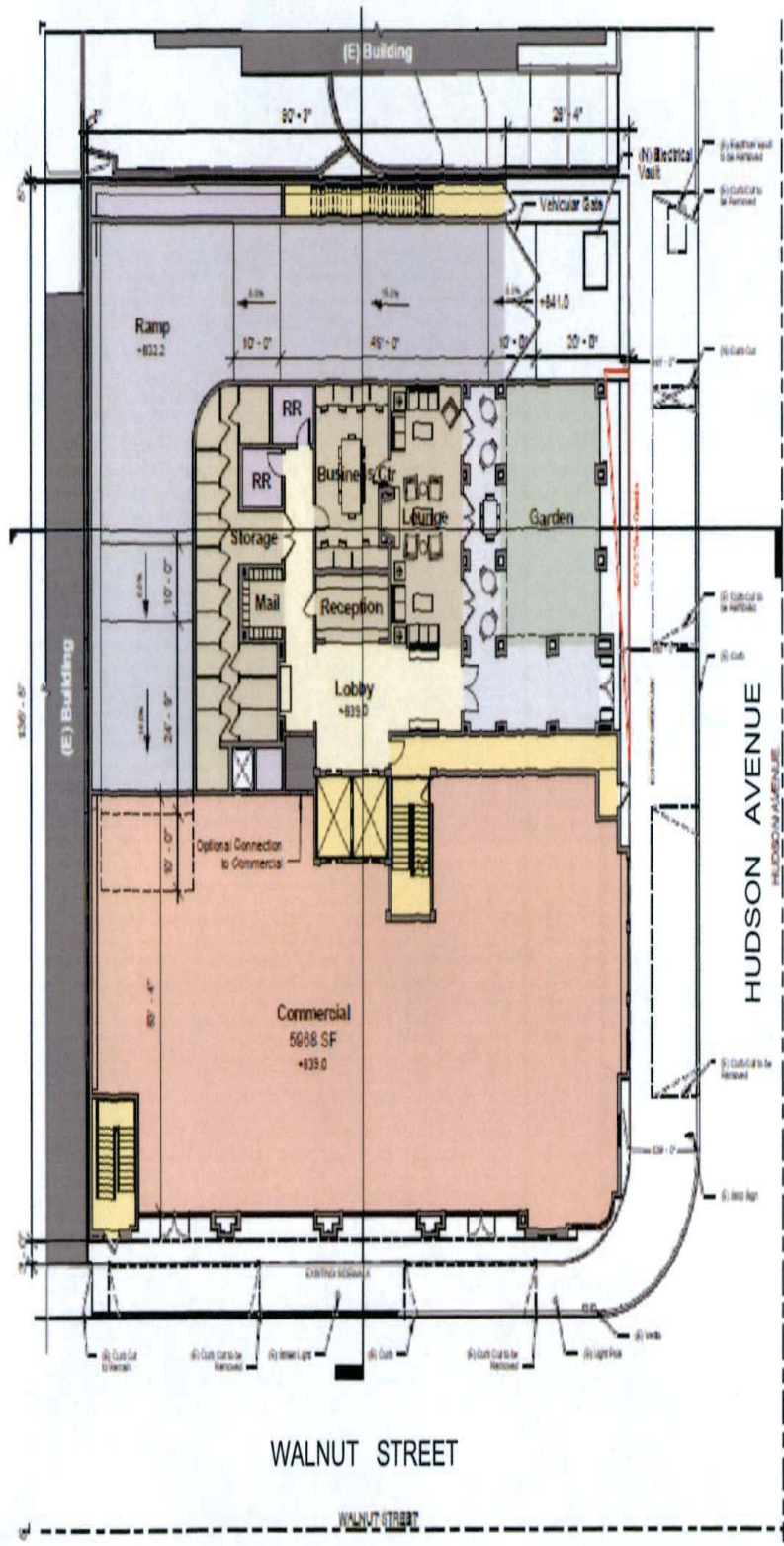
Intersections:

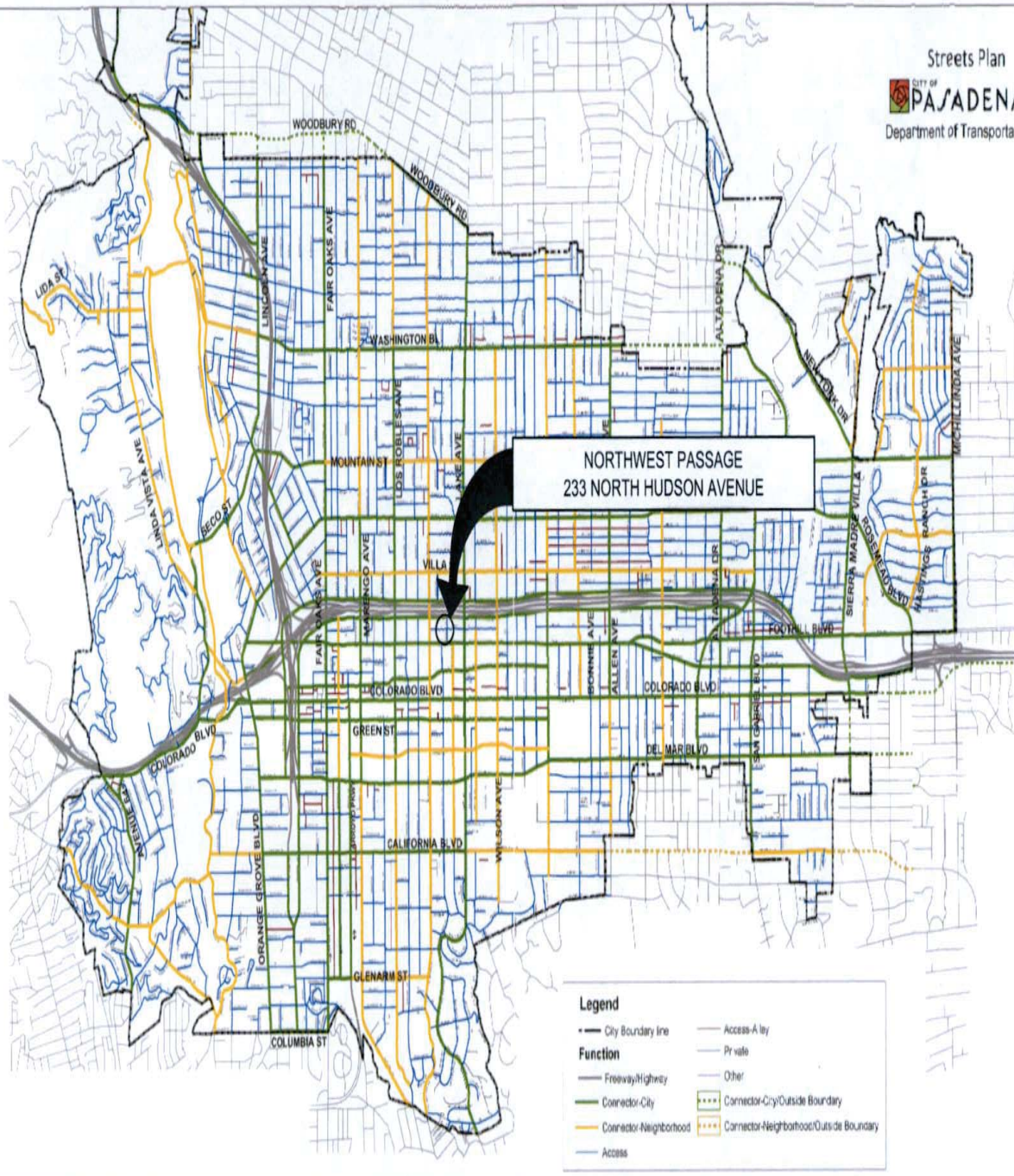
- El Molino Avenue at Corson Street
- El Molino Avenue at Walnut Street

## IV. Existing Transportation Network

Figure 2 depicts the City of Pasadena Adopted Street Types map. Descriptions of the roadways affected by the project are summarized as follows:

Corson Street is a one-way eastbound minor arterial with two travel lanes and a Class II bike lane. It is classified as a multimodal corridor where several I-210 on-and-off ramps are located. The City of Pasadena's adopted street classification for this roadway is a **City Connector**. The posted speed limit is 35 miles per hour.





NO SCALE

FIGURE 2  
 CITY OF PASADENA ADOPTED STREET TYPES

233 NORTH HUDSON AVENUE

El Molino Avenue is a north-south roadway west of the project site. One through travel lane is provided in each direction. The El Molino Avenue at Walnut Street intersection restricts northbound and southbound left-turn movements during 7-9 AM and 4-6 PM on weekdays. El Molino Avenue is posted for a speed limit of 30 miles per hour near the project site. The City of Pasadena's adopted street classification for this roadway is a **City Connector**.

Hudson Avenue is a two-way local street that runs in the north-south direction between Corson Avenue and Walnut Street. Restricted parking is allowed on both sides of the street. This street is classified as an **Access Road**.

Lake Avenue is a minor arterial east of the development that traverses in a north-south direction. The City of Pasadena's adopted street classification for this roadway is a **City Connector**. It is also classified as a multimodal corridor with four travel lanes, or two lanes per direction, with raised median and left-turn lanes at key intersections. The posted speed limit is 35 miles per hour. The I-210 eastbound ramp is located along the east leg of the intersection.

Locust Street is a two-way local street that runs in the east-west direction between El Molino Avenue and Lake Avenue in the vicinity of the project. Restricted parking is allowed on both sides of the street. This street is classified as an **Access Road**.

Walnut Street is an east-west minor arterial and a multimodal corridor. Two through lanes run in each direction with exclusive left-turn pockets provided. The City of Pasadena's adopted street classification for this roadway is a **City Connector**. The posted speed limit is 30 miles per hour.

Average daily traffic counts (ADT) on access and neighborhood connector street types along the shuttle service route are summarized below:

Street Segment	Existing ADT Volumes
Locust Street between El Molino Avenue and Hudson Avenue	1,052
Locust Street between Hudson Avenue and Lake Street	1,978
Hudson Avenue between Locust Street and Walnut Street	2,201

### Existing Transit Service

Public transit service within the project study area is currently provided by LA Metro, Foothill Transit, LA Department of Transportation, and Pasadena Area Rapid Transit Service. The project occupants will have adequate access to the City's transit network within a quarter mile radius from the project address. The locations of public transit stops near the project are summarized in the following table:



ID	Location	Route
1	Northeast corner of Walnut St at N Lake Ave	Metro 180/181/258, CE549 ,PT20
2	Southwest corner of Walnut St at N. Lake Ave	Metro 180/181/258, CE549 ,PT20
3	Northwest corner of Corson St at N. Lake Ave	Metro 180/181/258, PT20
4	Northeast corner of Union St at N. Lake Ave	Metro 485, PT20
5	Lake Ave at 210 Freeway	Gold Line Lake Station

## V. Transportation Analysis Methodology

With the City of Pasadena General Plan, the City's guiding principles cumulatively represent the community's vision for the future:

- Growth will be targeted to serve community needs and enhance quality of life
- New construction that could affect the integrity of historic resources will be compatible with, and differentiated from, the existing historic resource
- Economic vitality will be promoted to provide jobs, services, revenues, and opportunities
- Pasadena will be a socially, economically, and environmentally sustainable community
- Pasadena will be a city where people can circulate without cars.
- Pasadena will be promoted as a cultural, scientific, corporate, entertainment, and educational center for the region
- Community participation will be a permanent part of achieving a greater city.
- Pasadena is committed to public education and a diverse educational system responsive to the broad needs of the community

Understanding the goals and objectives of the General Plan, the Pasadena Department of Transportation sets forth goals and policies to improve overall transportation in Pasadena and create "a community where people can circulate without cars." Inherent in this vision statement is to accommodate different modes of transportation including vehicle, pedestrian, bicycle, and transit. The analysis is based on City Transportation Impact Analysis Guidelines. This report will assess accessibility of these different modes of travel and the project's transportation impacts using the City's adopted transportation performance measures.

## Analysis Threshold Criteria - Transportation Performance Measures

The Department's defined criteria and categories when determining the level of transportation impact of projects fall under three categories based on project size and community-wide significance

- Exempt projects have 10 residential units or less, are 10,000 sf or less, or generate less than 300 daily trips if less than 10,000 sf
- Category 1 Projects considered below community-wide significance are between 11-49 residential units, or 10,001 to 49,999 sf.
- Category 2 Projects classified as having community-wide significance have 50 or more residential units, or are 50,000 sf or more

Pasadena Department of Transportation's mobility performance measures assess the quality of walking, biking, transit, and vehicular travel in the City. A combination of vehicular and multimodal performance measures are employed to evaluate system performance in reviewing new development impacts.

Metrics in the following table shall be analyzed for projects of "communitywide significance" in the City's Metrics Cap Outside of CEQA

Table 1. City of Pasadena Metrics Cap

METRIC	DESCRIPTION	CAP*
1 Street Segment Analysis	The street segment analysis assesses traffic intrusion on local streets in residential neighborhoods	Specific percent increases above existing traffic on streets with more than 1500 ADT would trigger conditions of approval to reduce project vehicular trips
2 Auto Level of Service	Level of Service (LOS) as defined by the Transportation Research Board's <i>Highway Capacity Manual (HCM) 2010</i> .	A decrease beyond LOS D Citywide or LOS E within Transit Oriented Districts (TODs) would trigger conditions of approval to reduce project vehicular trips
3 PEQI	Pedestrian Environmental Quality Index	Below average conditions
4 BEQI	Bicycle Environmental Quality Index	Below average conditions

\*The adopted caps are not intended to be the absolute limits, but rather limits/ranges when exceeded may require additional project approval conditions

### Caps for Determining Project Street Segment Changes

Caps for evaluating changes in vehicular volumes on street segments were developed to measure the potential changes of net new trips from projects that intensify an existing land use, change site access, or alter existing traffic patterns. The caps are designed to capture

a project's anticipated level of changes measured in terms of net new trips over existing conditions

Specific caps have been established to determine whether there would be any potential project changes along neighborhood street segments by project traffic. A conservative approach is taken when calculating the traffic growth by basing the calculation on the increase relative to existing traffic volumes as follows:

$$\text{Percentage of Increase} = \frac{\text{net new project trips}}{\text{existing daily traffic}}$$

The analysis is limited to "access" and "neighborhood connector" street types within a residential context.

The daily traffic growth thresholds for determining the level of street segment transportation changes are summarized as follows:

Table 2 Specific Street Segment Caps

Existing ADT	Project-Related Vehicular Increase in ADT
0 to 1,499 average daily trips	150 trips or more
1,500 to 3,499 average daily trips	10 percent or more of final project ADT
3,500 or more	8 percent or more of final project ADT

Specific percent increases above existing traffic on streets with 1,500 ADT or more would trigger conditions of approval to reduce project vehicular trips. If project-related net trips exceed the caps in the table above, conditions of approval would require the project applicant to implement measures to discourage neighborhood intrusion by project related traffic. Input from the affected residents, Council Districts, and DOT would be involved to encourage use of non-vehicular modes by the project's patrons. If the project traffic increases fall below the street segment thresholds, additional analyses are not required.

### Caps for Determining Intersection Changes

Proposed development projects that meet or exceed the size thresholds to be considered projects of communitywide significance will evaluate intersections using the Highway Capacity Manual (HCM) Level of Service (LOS) analysis criteria. HCM methodology determines an intersection's level of service by calculating delay.

Intersection LOS analysis using HCM criteria will be conducted for peak hour conditions.

LOS caps are summarized below:

Table 3: Intersection Level of Service Caps

Study Intersections	Existing + Project LOS Cap
Citywide	D
Transit Oriented District (TOD)	E

Where the existing LOS for evaluated intersections are worsened with the addition of project traffic, recommended conditions of approval will be consistent with the City's guiding principles to encourage walking, biking, and transit to and from the project site to reduce project-related vehicular trips.

LOS descriptions are summarized in Table 4.

Table 4. LOS Capacity Criteria

TABLE 6- HIGHWAY CAPACITY LEVEL OF SERVICE CRITERIA		
LOS	DESCRIPTION	DELAY (s)
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor (vehicle) progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0

F	This level is considered oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0
Source: 2010 Highway Capacity Manual.		

## VI. Transportation Analysis

### Project Trip Generation

Street segment and intersection LOS analyses are required for projects of “communitywide significance” in the City’s Metrics Cap Outside of CEQA. This analysis involves evaluating existing plus project trip conditions against existing traffic. The industry standard procedure to determine the number of daily and peak hour trips a project would generate is based on published trip generation estimates from the ITE Trip Generation manual.

Utilizing the ITE Trip Generation Manual rates for an office development, it is estimated that the project would generate 477 daily trips, 25 AM peak hour trips, and 43 PM peak hour trips.

Table 5. Trip Generation Calculations

Trip Generation Rates (proposed)											
Proposed Use	Land Use Code	Amount	Units	Measure	Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
Residential Condominium/Townhouse		230	42 DU		1 5.81	0.07	0.37	0.44	0.35	0.17	0.52
Retail	San Diego	5,835	SF	1000	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Volumes											
Proposed Use	Daily		AM Peak Hour			PM Peak Hour					
	In	Out	In	Out	Total	In	Out	Total			
Residential Condominium/Townhouse	244	3	15	18	15	7	22				
Retail	233	4	3	7	11	11	21				
<b>Total Project Trips</b>	<b>477</b>	<b>7</b>	<b>18</b>	<b>25</b>	<b>25</b>	<b>18</b>	<b>43</b>				
Internal Trip Capture	0%	0	0	0	0	0	0				
Walk-In	0%	0	0	0	0	0	0				
Transit Trips	0%	0	0	0	0	0	0				
Pass-By Trips	0%	0	0	0	0	0	0				
<b>Net Project Vehicle Trips</b>	<b>477</b>	<b>7</b>	<b>18</b>	<b>25</b>	<b>25</b>	<b>18</b>	<b>43</b>				
<b>Net total (proposed minus existing trips)</b>					<b>477</b>	<b>7</b>	<b>18</b>	<b>25</b>	<b>25</b>	<b>18</b>	<b>43</b>

### Street Segment Analysis

Figure 3 describes the project trip distribution used to evaluate project traffic volumes on the street network. The calculated increase in average daily traffic along access or neighborhood connector street types is summarized:

Street Segment	Daily Volume	Project Volume	% Vehicular Increase in ADT	Exceeds Cap?
Locust Street between El Molino Avenue and Hudson Avenue	1,052	48	4.5%	No
Locust Street between Hudson Avenue and Lake Street	1,978	0	0.0%	No
Hudson Avenue between Locust Street and Walnut Street	2,201	477	21.7%	Yes

Based on the criteria outlined in Table 2 – Street Segment Caps, the project applicant is required to implement measures to discourage neighborhood intrusion by project-related traffic.

### Intersection Level of Service (LOS) Analysis

Figure 4 indicates that this project lies within the City's Transit Oriented District (TOD) area. Therefore, the intersection LOS threshold for significance under which the intersections shall be evaluated is "LOS E". A decrease in LOS would trigger conditions of approval to reduce project vehicular trips.

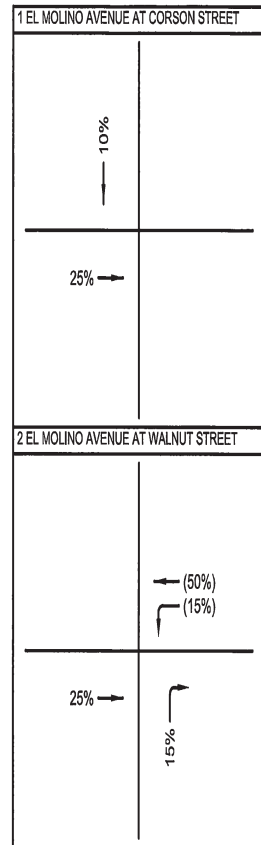
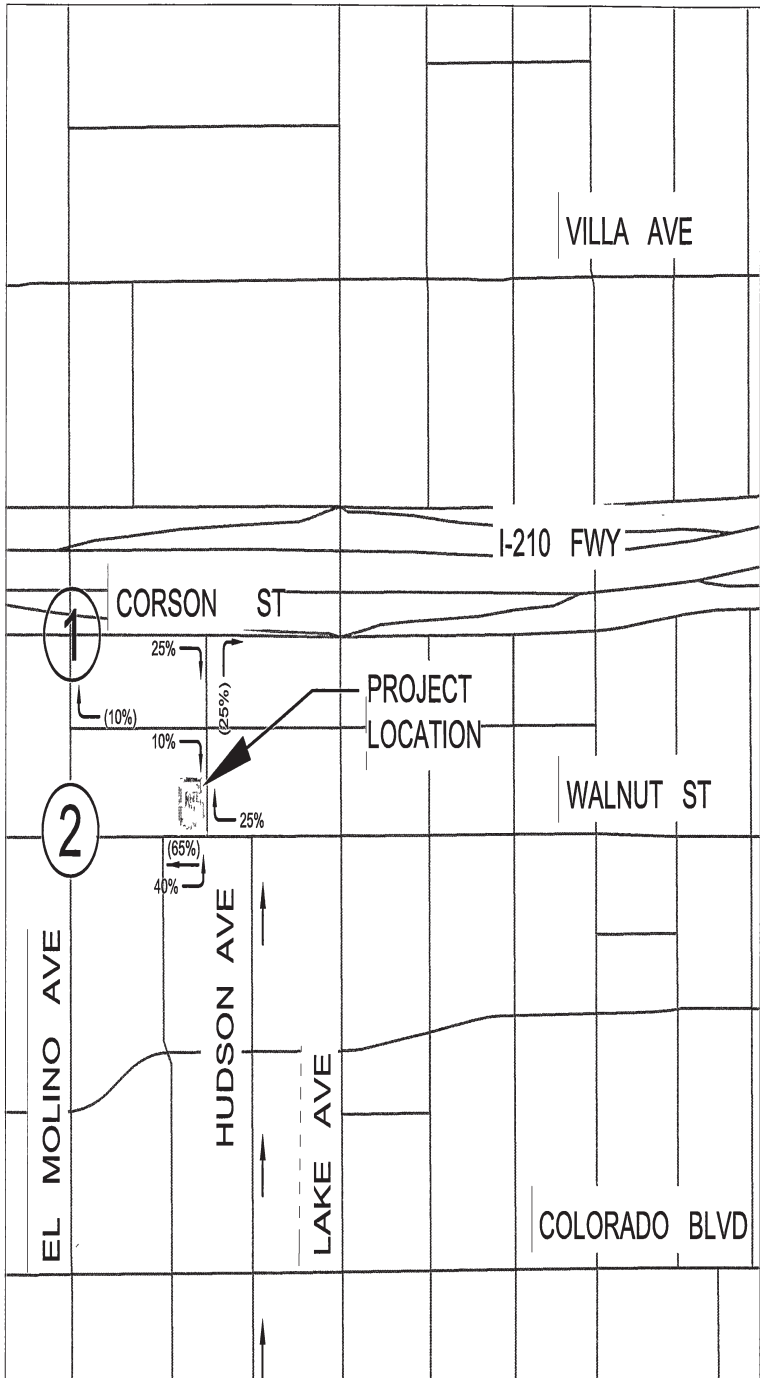
Figure 5 shows the existing and existing plus project peak hour traffic volumes.

The following table summarizes the LOS calculations for the study intersections.

Table 6. Signalized Intersection LOS Summary

Intersection	Peak Hour	Existing		Existing w/Project		Exceeds LOS Cap?
		Delay	LOS	Delay	LOS	Yes/No
1. El Molino Avenue at Corson Street	AM	12.7	B	12.7	B	No
	PM	18.3	B	18.4	B	No
2. El Molino Avenue at Walnut Street	AM	12.0	B	12.0	B	No
	PM	12.5	B	12.5	B	No

Since the evaluated intersections do not exceed the LOS caps described in Table 3, the project is not required to reduce project-related vehicular trips.

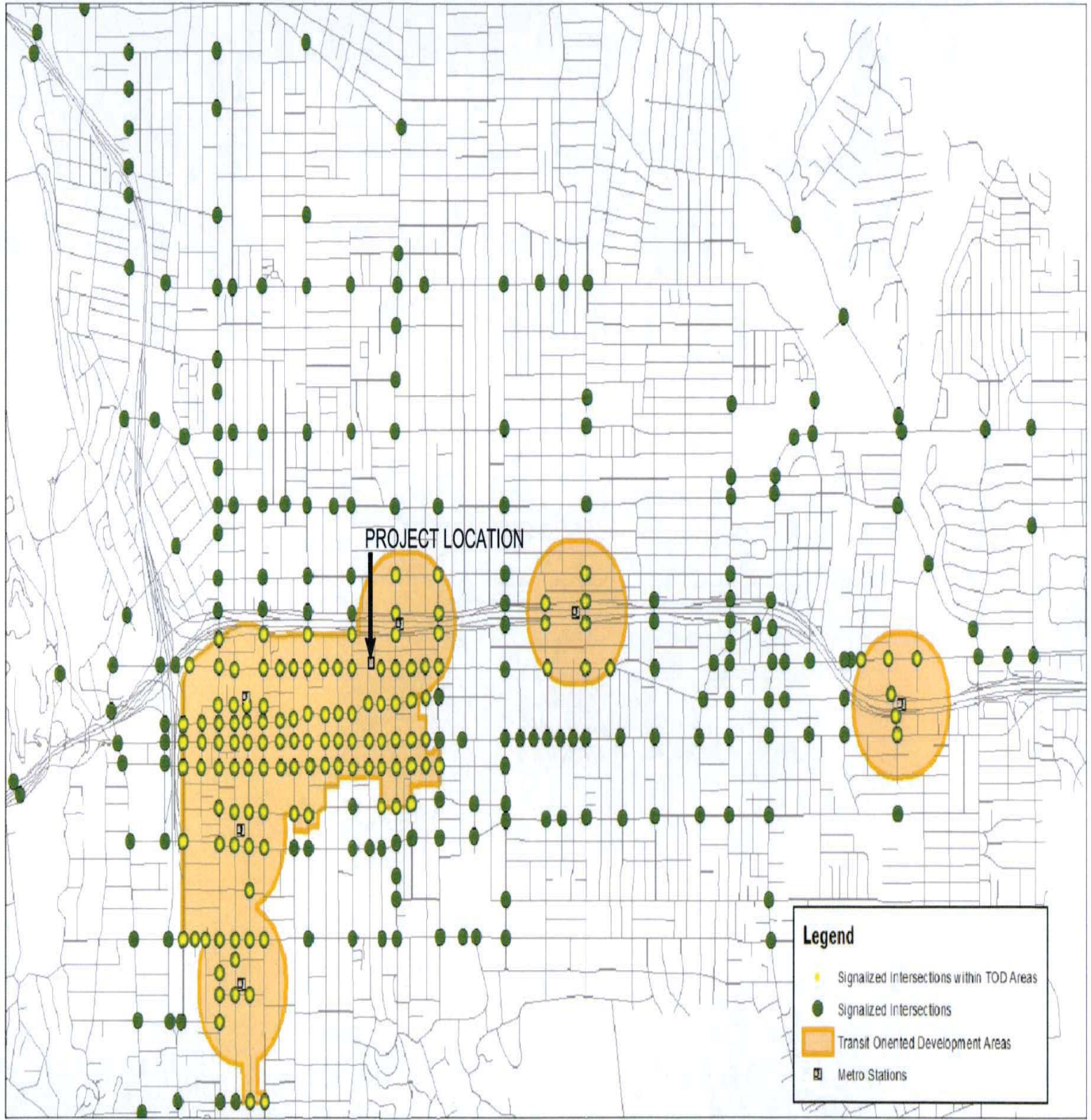


NO SCALE

LEGEND

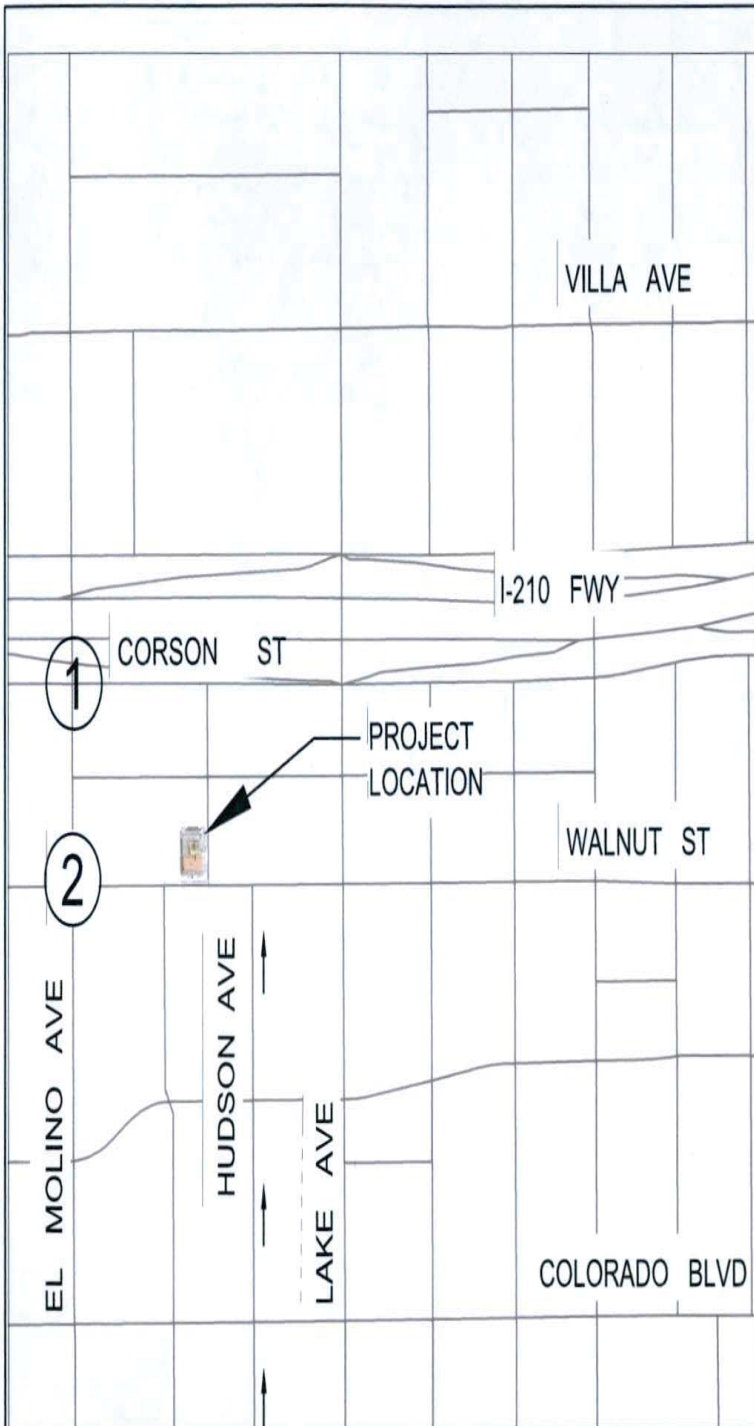
X% % CARS INBOUND  
(X%) % CARS OUTBOUND

# Pasadena Proposed Transportation Performance Measures



NO SCALE





**EXISTING PEAK HOUR VOLUMES**

1 EL MOLINO AVENUE AT CORSON STREET	
0/0 357/222 85/34	0/0 0/0 0/0
37/78 366/650 63/48	0/0 154/427 40/93
2 EL MOLINO AVENUE AT WALNUT STREET	
97/75 360/187 6/5	42/114 631/679 44/50
12/46 325/641 41/38	9/8 140/294 17/70

**EXISTING+PROJECT PEAK HOUR VOLUMES**

1 EL MOLINO AVENUE AT CORSON STREET	
0/0 358/225 85/34	0/0 0/0 0/0
37/78 368/656 63/48	0/0 154/427 40/93
2 EL MOLINO AVENUE AT WALNUT STREET	
97/75 360/187 6/5	42/114 640/688 47/53
12/46 327/647 41/38	9/8 140/294 18/74



NO SCALE

**LEGEND**

XX/YY AM / PM PEAK HOUR VOLUMES

FIGURE 5  
PEAK HOUR INTERSECTION VOLUMES

233 NORTH HUDSON AVENUE

### PEQI/BEQI Analysis

A field observational survey was conducted along Hudson Avenue between Locust Street and Walnut Street to document existing pedestrian and bicycle environmental quality (PEQI/BEQI) conditions. Vehicle traffic features (i.e., number of lanes, vehicle speed, etc.) as well as street quality features (i.e., sidewalk widths and impediments, driveway cuts, land use characteristics, etc.) were evaluated along the east and west sides of the street.

Environmental quality of non-vehicular modes must be improved when assessment of project study street segments and intersections reveal less than average conditions. According to the PEQI and BEQI indicator and indicator category scores, the following observational scores adjacent to the project are as follows

Segment	PEQI Score	BEQI Score
Hudson Avenue between Locust Street and Walnut Street		
- East Side	69 – High	46 – Average
- West Side	64 – High	42 – Average

The PEQI and BEQI scoring categories and calculations are summarized in tables found in the appendix.

### VII. Conclusion

The City of Pasadena Department of Transportation conducted an analysis to review potential transportation impacts related to the mixed-use development at 233 North Hudson Avenue

Hudson Avenue between Locust Street and Walnut Street exceeds adopted caps along access road street types

No intersections exceed the LOS caps with the project

The Pedestrian Environmental Quality Index score was high.

The Bicycle Environmental Quality Index score was average.

## **VIII. Appendices**

Memorandum of Understanding  
Traffic Volumes  
HCM Analysis  
PEQI/BEQI Worksheets

Appendix:

## Memorandum of Understanding



PLANNING DIVISION MASTER APPLICATION FORM

Project Address: 233 North Hudson Avenue

Project Name: Northwest Passage

Project Description: (Please describe demolitions, alterations and any new construction) Development of a new density bonus mixed use project with 42 total units (3 very low income units), 5,968 square feet of commercial space and 78 parking spaces.

Zoning Designation: CD-3 General Plan Designation: Central District Specific Plan

Valuation (Cost of Project): \$8,600,000.00

APPLICANT/OWNER INFORMATION

APPLICANT NAME: DC Hudson Holdings, LLC – Tom Cao

Telephone: [ 626 ] 570-1918

Address 135 North San Gabriel Boulevard

Fax: [ ]

City San Gabriel State CA Zip 91775

E-mail tom\_cao91775@yahoo.com

CONTACT PERSON: Odyssey Development Services – Burke Farrar

Telephone: [ 626 ] 683-8159

Address 711 East Walnut Street, Suite 306

Fax: [ 626 ] 683-2897

City Pasadena State CA Zip 91101-4402

E-mail BFarrar@OdysseyPasadena.com

PROPERTY OWNER NAME: Duan Hai Rong and Maggie Maohuanjin

Telephone [ 626 ] 570-1918

Address 3015 Wagon Train Lane

Fax [ ]

City Diamond Bar State CA Zip 91765

E-mail tom\_cao91775@yahoo.com

TYPE OF CITY REVIEW AND APPROVALS REQUIRED:

Mark clearly the type of approval required in the space provided below.

Table with 3 columns of permit types and checkboxes. Includes: ADJUSTMENT PERMIT, AFFORDABLE HOUSING CONCESSION OR WAIVER, CERTIFICATE OF APPROPRIATENESS, CERTIFICATE OF EXCEPTION, CHANGES TO APPROVED PROJECT, CONDITIONAL USE PERMIT, DESIGN REVIEW, DEVELOPMENT AGREEMENT, EXPRESSIVE USE PERMIT, FLOOR AREA RATIO (FAR) INCREASE, GENERAL PLAN AMENDMENT, HEIGHT AVERAGING, HILLSIDE DEVELOPMENT PERMIT, HISTORIC DESIGNATION (MONUMENT, LANDMARK, TREE OR SIGN), HISTORICAL RESEARCH/EVALUATION, LANDMARK TREE PRUNING, MASTER DEVELOPMENT PLAN, MASTER SIGN PLAN, MINOR CONDITIONAL USE PERMIT, MINOR VARIANCE, PLANNED DEVELOPMENT ZONE, PRELIMINARY PLAN CHECK, PREDEVELOPMENT PLAN REVIEW, RELIEF FROM THE REPLACEMENT BUILDING PERMIT REQUIREMENT, SIGN EXCEPTION, TENTATIVE PARCEL/TRACT MAP, TEMP. CONDITIONAL USE PERMIT, TREE PROTECTION PLAN REVIEW, TREE REMOVAL, VARIANCE, VARIANCE FOR HISTORIC RESOURCES, ZONE CHANGE (MAP AMENDMENT), OTHER.

Note: Space for signature is on reverse side

MAP – Master Application REVISED.doc1/20/11

**Appendix:  
Traffic Volumes**

# CITY TRAFFIC COUNTERS

www.ctcounters.com

File Name : EIMolino\_Corson

Site Code : 249

Start Date : 3/3/2016

Page No : 1

## Groups Printed- Unshifted

Start Time	El Molino Ave Southbound			Westbound			El Molino Ave Northbound			Corson St Eastbound			Int Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07 00 AM	5	27	0	0	0	0	0	15	4	3	65	9	128
07 15 AM	27	35	0	0	0	0	0	21	10	2	56	2	153
07 30 AM	24	67	0	0	0	0	0	23	10	8	88	8	228
07 45 AM	24	98	0	0	0	0	0	34	17	4	90	17	284
<b>Total</b>	<b>80</b>	<b>227</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>93</b>	<b>41</b>	<b>17</b>	<b>299</b>	<b>36</b>	<b>793</b>
08 00 AM	17	105	0	0	0	0	0	44	5	13	100	18	302
08 15 AM	29	85	0	0	0	0	0	37	7	7	97	13	275
08 30 AM	15	69	0	0	0	0	0	39	11	13	79	15	241
08 45 AM	19	80	0	0	0	0	0	36	8	12	69	19	243
<b>Total</b>	<b>80</b>	<b>339</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>156</b>	<b>31</b>	<b>45</b>	<b>345</b>	<b>65</b>	<b>1061</b>
04 00 PM	9	59	0	0	0	0	0	62	17	16	163	13	339
04 15 PM	6	46	0	0	0	0	0	73	12	18	109	10	274
04 30 PM	6	49	0	0	0	0	0	84	13	16	153	11	332
04 45 PM	11	62	0	0	0	0	0	95	21	16	118	10	333
<b>Total</b>	<b>32</b>	<b>216</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>314</b>	<b>63</b>	<b>66</b>	<b>543</b>	<b>44</b>	<b>1278</b>
05 00 PM	14	53	0	0	0	0	0	133	36	19	150	16	421
05 15 PM	5	47	0	0	0	0	0	100	26	23	174	9	384
05 30 PM	7	57	0	0	0	0	0	127	15	17	178	12	413
05 45 PM	8	65	0	0	0	0	0	67	16	19	148	11	334
<b>Total</b>	<b>34</b>	<b>222</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>427</b>	<b>93</b>	<b>78</b>	<b>650</b>	<b>48</b>	<b>1552</b>
<b>Grand Total</b>	<b>226</b>	<b>1004</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>990</b>	<b>228</b>	<b>206</b>	<b>1837</b>	<b>193</b>	<b>4684</b>
<b>Apprch %</b>	<b>18.4</b>	<b>81.6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>81.3</b>	<b>18.7</b>	<b>9.2</b>	<b>82.2</b>	<b>8.6</b>	
<b>Total %</b>	<b>4.8</b>	<b>21.4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21.1</b>	<b>4.9</b>	<b>4.4</b>	<b>39.2</b>	<b>4.1</b>	

# CITY TRAFFIC COUNTERS

www.ctcounters.com

File Name EIMolino\_Corson

Site Code 249

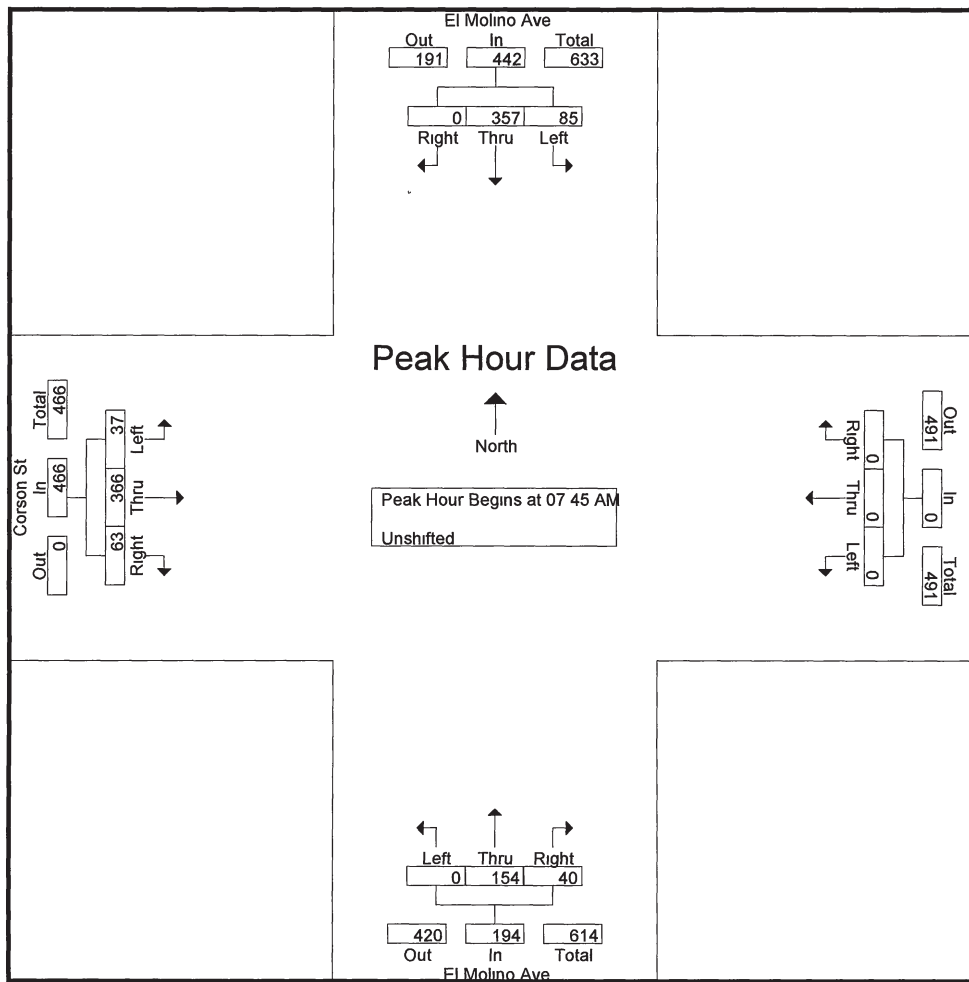
Start Date . 3/3/2016

Page No . 2

Start Time	El Molino Ave Southbound			App Total	Westbound			App Total	El Molino Ave Northbound			App Total	Corson St Eastbound			Int Total	
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
07 45 AM	24	98	0	122	0	0	0	0	0	34	17	51	4	90	17	111	284
08 00 AM	17	105	0	122	0	0	0	0	0	44	5	49	13	100	18	131	302
08 15 AM	29	85	0	114	0	0	0	0	0	37	7	44	7	97	13	117	275
08 30 AM	15	69	0	84	0	0	0	0	0	39	11	50	13	79	15	107	241
Total Volume	85	357	0	442	0	0	0	0	0	154	40	194	37	366	63	466	1102
% App Total	19.2	80.8	0		0	0	0	0	0	79.4	20.6		7.9	78.5	13.5		
PHF	733	850	000	906	000	000	000	000	000	875	588	951	712	915	875	889	912

Peak Hour Analysis From 07 00 AM to 11 45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07 45 AM





# CITY TRAFFIC COUNTERS

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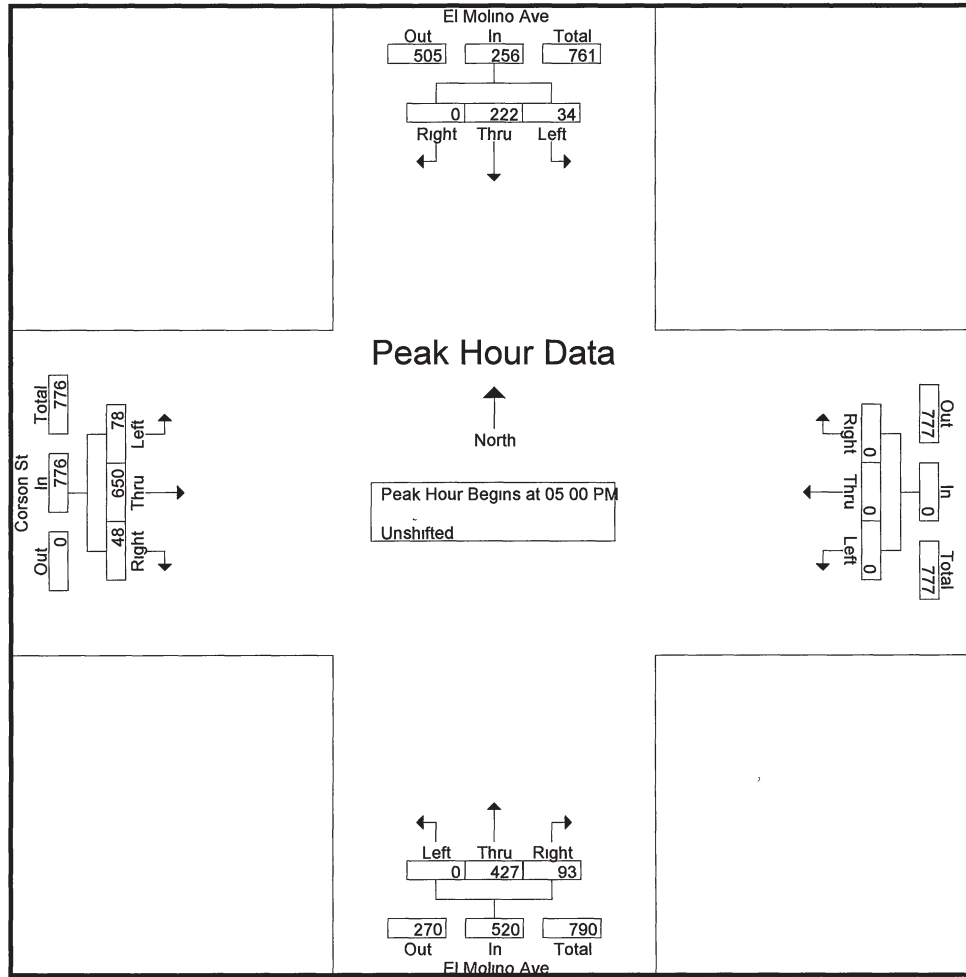
File Name EIMolino\_Corson

Site Code : 249

Start Date : 3/3/2016

Page No . 3

Start Time	El Molino Ave Southbound				Westbound				El Molino Ave Northbound				Corson St Eastbound				Int Total
	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	
Peak Hour Analysis From 12 00 PM to 05 45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05 00 PM																	
05 00 PM	14	53	0	67	0	0	0	0	0	133	36	169	19	150	16	185	421
05 15 PM	5	47	0	52	0	0	0	0	0	100	26	126	23	174	9	206	384
05 30 PM	7	57	0	64	0	0	0	0	0	127	15	142	17	178	12	207	413
05 45 PM	8	65	0	73	0	0	0	0	0	67	16	83	19	148	11	178	334
Total Volume	34	222	0	256	0	0	0	0	0	427	93	520	78	650	48	776	1552
% App Total	13.3	86.7	0		0	0	0		0	82.1	17.9		10.1	83.8	6.2		
PHF	607	854	000	877	000	000	000	000	000	803	646	769	848	913	750	937	922



# CITY TRAFFIC COUNTERS

www.ctcounters.com

File Name : EIMolino\_Walnut

Site Code : 248

Start Date . 3/3/2016

Page No : 1

**Groups Printed- Unshifted**

Start Time	El Molino Ave Southbound			Walnut St Westbound			El Molino Ave Northbound			Walnut St Eastbound			Int Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07 00 AM	0	24	17	8	71	1	0	17	2	2	47	5	194
07 15 AM	1	31	16	7	107	3	0	26	3	5	46	6	251
07 30 AM	1	50	25	7	132	3	2	16	5	5	54	11	311
07 45 AM	1	93	32	20	164	9	2	30	3	3	76	8	441
<b>Total</b>	<b>3</b>	<b>198</b>	<b>90</b>	<b>42</b>	<b>474</b>	<b>16</b>	<b>4</b>	<b>89</b>	<b>13</b>	<b>15</b>	<b>223</b>	<b>30</b>	<b>1197</b>
08 00 AM	3	100	22	10	147	9	2	37	5	5	87	12	439
08 15 AM	1	88	23	8	164	15	3	34	4	1	87	11	439
08 30 AM	1	79	20	6	156	9	2	39	5	3	75	10	405
08 45 AM	2	66	29	18	172	4	1	32	10	10	79	8	431
<b>Total</b>	<b>7</b>	<b>333</b>	<b>94</b>	<b>42</b>	<b>639</b>	<b>37</b>	<b>8</b>	<b>142</b>	<b>24</b>	<b>19</b>	<b>328</b>	<b>41</b>	<b>1714</b>
04 00 PM	2	50	13	10	153	14	7	61	17	5	164	9	505
04 15 PM	3	48	12	9	143	19	4	45	9	8	121	8	429
04 30 PM	1	44	11	10	149	23	0	56	12	9	179	7	501
04 45 PM	1	45	12	6	164	23	1	71	13	17	124	9	486
<b>Total</b>	<b>7</b>	<b>187</b>	<b>48</b>	<b>35</b>	<b>609</b>	<b>79</b>	<b>12</b>	<b>233</b>	<b>51</b>	<b>39</b>	<b>588</b>	<b>33</b>	<b>1921</b>
05 00 PM	0	49	24	18	181	50	1	101	25	6	168	6	629
05 15 PM	1	45	19	8	178	24	6	69	11	10	155	11	537
05 30 PM	0	38	15	14	159	24	0	76	17	17	172	9	541
05 45 PM	4	55	17	10	161	16	1	48	17	13	146	12	500
<b>Total</b>	<b>5</b>	<b>187</b>	<b>75</b>	<b>50</b>	<b>679</b>	<b>114</b>	<b>8</b>	<b>294</b>	<b>70</b>	<b>46</b>	<b>641</b>	<b>38</b>	<b>2207</b>
<b>Grand Total</b>	<b>22</b>	<b>905</b>	<b>307</b>	<b>169</b>	<b>2401</b>	<b>246</b>	<b>32</b>	<b>758</b>	<b>158</b>	<b>119</b>	<b>1780</b>	<b>142</b>	<b>7039</b>
<b>Apprch %</b>	<b>1 8</b>	<b>73 3</b>	<b>24 9</b>	<b>6</b>	<b>85 3</b>	<b>8 7</b>	<b>3 4</b>	<b>80</b>	<b>16 7</b>	<b>5 8</b>	<b>87 2</b>	<b>7</b>	
<b>Total %</b>	<b>0 3</b>	<b>12 9</b>	<b>4 4</b>	<b>2 4</b>	<b>34 1</b>	<b>3 5</b>	<b>0 5</b>	<b>10 8</b>	<b>2 2</b>	<b>1 7</b>	<b>25 3</b>	<b>2</b>	

# CITY TRAFFIC COUNTERS

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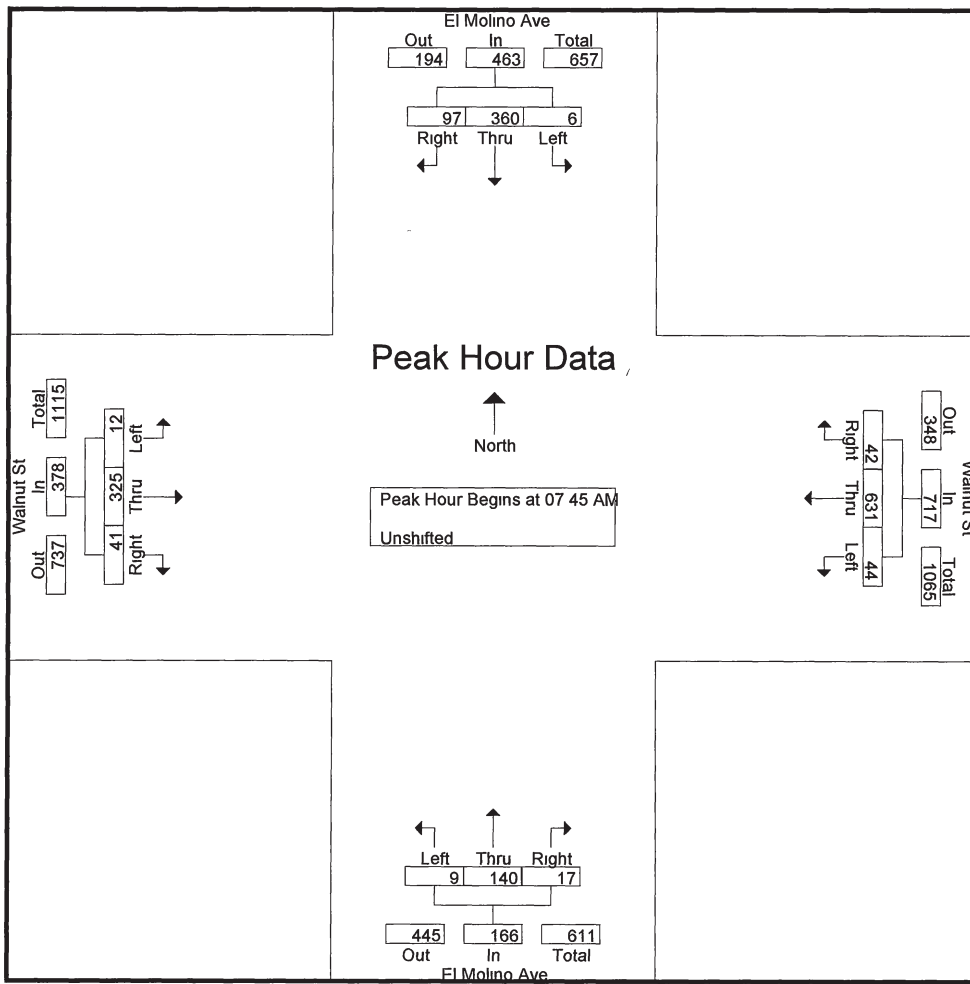
File Name : EIMolino\_Walnut

Site Code : 248

Start Date : 3/3/2016

Page No : 2

Start Time	El Molino Ave Southbound				Walnut St Westbound				El Molino Ave Northbound				Walnut St Eastbound				Int Total
	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	
Peak Hour Analysis From 07 00 AM to 11 45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07 45 AM																	
07 45 AM	1	93	32	126	20	164	9	193	2	30	3	35	3	76	8	87	441
08 00 AM	3	100	22	125	10	147	9	166	2	37	5	44	5	87	12	104	439
08 15 AM	1	88	23	112	8	164	15	187	3	34	4	41	1	87	11	99	439
08 30 AM	1	79	20	100	6	156	9	171	2	39	5	46	3	75	10	88	405
Total Volume	6	360	97	463	44	631	42	717	9	140	17	166	12	325	41	378	1724
% App Total	1.3	77.8	21		6.1	88	5.9		5.4	84.3	10.2		3.2	86	10.8		
PHF	500	900	758	919	550	962	700	929	750	897	850	902	600	934	854	909	977



# CITY TRAFFIC COUNTERS

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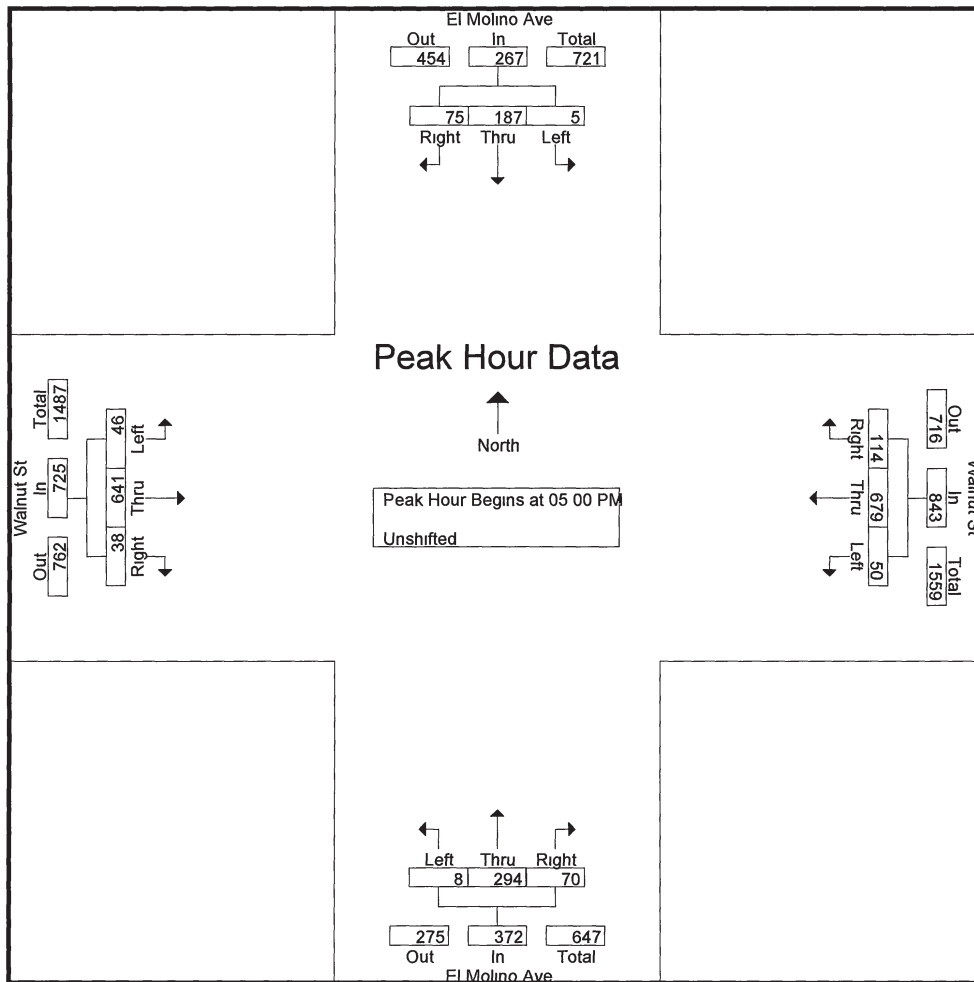
File Name · EIMolino\_Walnut

Site Code · 248

Start Date · 3/3/2016

Page No · 3

Start Time	El Molino Ave Southbound				Walnut St Westbound				El Molino Ave Northbound				Walnut St Eastbound				Int Total
	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	
Peak Hour Analysis From 12 00 PM to 05 45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05 00 PM																	
05 00 PM	0	49	24	73	18	181	50	249	1	101	25	127	6	168	6	180	629
05 15 PM	1	45	19	65	8	178	24	210	6	69	11	86	10	155	11	176	537
05 30 PM	0	38	15	53	14	159	24	197	0	76	17	93	17	172	9	198	541
05 45 PM	4	55	17	76	10	161	16	187	1	48	17	66	13	146	12	171	500
Total Volume	5	187	75	267	50	679	114	843	8	294	70	372	46	641	38	725	2207
% App Total	1.9	70	28.1		5.9	80.5	13.5		2.2	79	18.8		6.3	88.4	5.2		
PHF	313	850	781	878	694	938	570	846	333	728	700	732	676	932	792	915	877



**CITY TRAFFIC COUNTERS**  
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Locust Street  
Btwn El Molino Ave & Hudson Ave

Start Time	06-Sep-17 Wed	East		Hour Totals		West		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12 00		0	5			0	14				
12 15		0	5			0	11				
12 30		0	8			0	12				
12 45		0	8	0	26	1	10	1	47	1	73
01 00		2	3			1	8				
01 15		0	4			1	8				
01 30		0	7			1	7				
01 45		0	10	2	24	1	11	4	34	6	58
02 00		1	10			0	3				
02 15		0	5			0	10				
02 30		0	11			1	10				
02 45		0	7	1	33	1	11	2	34	3	67
03 00		1	6			0	12				
03 15		1	6			1	11				
03 30		0	10			0	7				
03 45		0	9	2	31	0	11	1	41	3	72
04 00		0	4			0	10				
04 15		1	10			2	7				
04 30		0	4			0	16				
04 45		0	10	1	28	1	9	3	42	4	70
05 00		0	8			0	15				
05 15		0	9			1	11				
05 30		1	7			2	18				
05 45		2	7	3	31	5	13	8	57	11	88
06 00		0	4			4	12				
06 15		1	6			3	13				
06 30		1	5			7	6				
06 45		7	5	9	20	9	14	23	45	32	65
07 00		7	6			8	7				
07 15		3	5			9	4				
07 30		12	4			18	4				
07 45		13	3	35	18	13	8	48	23	83	41
08 00		6	6			12	6				
08 15		10	6			12	10				
08 30		10	7			16	10				
08 45		10	1	36	20	14	1	54	27	90	47
09 00		6	0			9	2				
09 15		5	4			13	3				
09 30		8	3			8	6				
09 45		7	1	26	8	12	4	42	15	68	23
10 00		2	0			5	2				
10 15		7	2			11	3				
10 30		8	0			11	1				
10 45		6	3	23	5	14	1	41	7	64	12
11 00		7	1			6	1				
11 15		4	0			9	1				
11 30		5	1			6	2				
11 45		13	2	29	4	10	3	31	7	60	11
Total		167	248			258	379			425	627
Percent		40 2%	59 8%			40 5%	59 5%			40 4%	59 6%
Grand Total		167	248			258	379			425	627
Percent		40 2%	59 8%			40 5%	59 5%			40 4%	59 6%
ADT		ADT 1,052		AADT 1,052							

**CITY TRAFFIC COUNTERS**  
www.ctcounters.com

Locust Street  
Btwn Hudson Ave & Lake Ave

Start Time	06-Sep-17 Wed	East		Hour Totals		West		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12 00		0	18			5	22				
12 15		2	6			4	40				
12 30		1	15			3	28				
12 45		0	17	3	56	1	26	13	116	16	172
01 00		0	16			0	22				
01 15		1	16			1	19				
01 30		0	10			3	18				
01 45		0	12	1	54	1	25	5	84	6	138
02 00		0	1			0	26				
02 15		2	2			0	32				
02 30		0	3			2	21				
02 45		0	11	2	17	0	13	2	92	4	109
03 00		0	5			1	13				
03 15		0	3			0	19				
03 30		0	4			0	21				
03 45		0	8	0	20	0	19	1	72	1	92
04 00		0	4			1	22				
04 15		1	3			0	24				
04 30		0	3			1	27				
04 45		0	4	1	14	1	23	3	96	4	110
05 00		0	6			4	23				
05 15		2	8			1	6				
05 30		1	8			2	25				
05 45		3	5	6	27	6	31	13	85	19	112
06 00		0	10			11	26				
06 15		2	7			11	19				
06 30		2	7			15	13				
06 45		0	5	4	29	26	26	63	84	67	113
07 00		1	5			24	17				
07 15		1	0			29	16				
07 30		1	4			30	25				
07 45		5	1	8	10	42	18	125	76	133	86
08 00		0	5			38	17				
08 15		4	2			43	16				
08 30		7	3			62	7				
08 45		7	4	18	14	62	5	205	45	223	59
09 00		8	2			52	9				
09 15		3	0			31	13				
09 30		8	1			40	5				
09 45		6	1	25	4	33	6	156	33	181	37
10 00		5	2			29	11				
10 15		5	0			29	7				
10 30		8	2			24	5				
10 45		5	1	23	5	20	3	102	26	125	31
11 00		7	1			20	0				
11 15		14	1			25	0				
11 30		8	1			36	2				
11 45		6	0	35	3	18	1	99	3	134	6
<b>Total</b>		126	253			787	812			913	1065
<b>Percent</b>		33.2%	66.8%			49.2%	50.8%			46.2%	53.8%
<b>Grand Total</b>		126	253			787	812			913	1065
<b>Percent</b>		33.2%	66.8%			49.2%	50.8%			46.2%	53.8%

ADT

ADT 1,978

AADT 1,978

**CITY TRAFFIC COUNTERS**  
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Hudson Ave  
Btwn Locust St & Walnut St

Start Time	06-Sep-17 Wed	North		Hour Totals		South		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12 00		2	36			3	14				
12 15		0	18			1	33				
12 30		0	20			1	15				
12 45		3	28	5	102	1	14	6	76	11	178
01 00		1	19			0	13				
01 15		2	25			1	17				
01 30		0	24			0	13				
01 45		0	20	3	88	0	15	1	58	4	146
02 00		1	27			0	16				
02 15		0	24			0	18				
02 30		0	26			1	13				
02 45		1	19	2	96	0	20	1	67	3	163
03 00		0	24			1	12				
03 15		2	28			0	13				
03 30		0	20			0	10				
03 45		0	15	2	87	0	15	1	50	3	137
04 00		0	17			0	14				
04 15		0	15			0	17				
04 30		0	21			0	22				
04 45		0	20	0	73	0	22	0	75	0	148
05 00		0	23			0	26				
05 15		1	20			0	21				
05 30		3	26			0	16				
05 45		1	26	5	95	5	27	5	90	10	185
06 00		5	22			4	26				
06 15		1	18			10	15				
06 30		6	14			6	12				
06 45		10	15	22	69	8	8	28	61	50	130
07 00		6	22			10	11				
07 15		17	16			12	7				
07 30		14	25			16	18				
07 45		16	19	53	82	31	9	69	45	122	127
08 00		22	13			23	9				
08 15		17	10			20	7				
08 30		22	23			27	2				
08 45		25	12	86	58	33	1	103	19	189	77
09 00		13	5			20	5				
09 15		20	9			15	3				
09 30		15	4			22	7				
09 45		7	11	55	29	17	2	74	17	129	46
10 00		20	10			16	3				
10 15		15	7			13	2				
10 30		14	5			13	2				
10 45		25	3	74	25	13	0	55	7	129	32
11 00		14	7			30	2				
11 15		19	6			14	0				
11 30		14	4			27	1				
11 45		18	3	65	20	22	1	93	4	158	24
<b>Total</b>		372	824			436	569			808	1393
<b>Percent</b>		31 1%	68 9%			43 4%	56 6%			36 7%	63 3%
<b>Grand Total</b>		372	824			436	569			808	1393
<b>Percent</b>		31 1%	68 9%			43 4%	56 6%			36 7%	63 3%

ADT

ADT 2,201

AADT 2,201

Appendix:  
HCM Analysis



AM

	→	↑	↗	↘	↓
Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations	↑↑	↑	↗	↘	↑↑
Volume (vph)	366	154	40	85	357
Turn Type			Perm	Prot	
Protected Phases	4	2		1	6
Permitted Phases			2		
Detector Phases	4	2	2	1	6
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	28.4	20.1	20.1	12.0	20.1
Total Split (s)	32.0	22.0	22.0	16.0	38.0
Total Split (%)	45.7%	31.4%	31.4%	22.9%	54.3%
Yellow Time (s)	3.9	3.6	3.6	3.0	3.6
All-Red Time (s)	1.5	1.5	1.5	1.0	1.5
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	Ped	C-Min	C-Min	Min	C-Min
Act Effct Green (s)	24.4	25.7	25.7	7.9	37.6
Actuated g/C Ratio	0.35	0.37	0.37	0.11	0.54
v/c Ratio	0.43	0.28	0.09	0.53	0.21
Control Delay	17.4	17.8	5.8	20.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	17.8	5.8	20.6	3.2
LOS	B	B	A	C	A
Approach Delay	17.4	15.1			6.8
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 70  
 Actuated Cycle Length 70  
 Offset: 29 (41%), Referenced to phase 2 NBT and 6:SBT, Start of FDW or yellow  
 Natural Cycle 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.53  
 Intersection Signal Delay: 12.7  
 Intersection Capacity Utilization 44.8%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 618 Corson & El Molino

↘ φ1	↑ φ2	↗ φ4
16 s	22 s	32 s
↓ φ5		
38 s		

Timings

631. Walnut & El Molino

7/19/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	12	325	44	631	9	140	6	360
Turn Type	custom		custom		Perm		Perm	
Protected Phases		2		2		4		4
Permitted Phases	6		6		4		4	
Detector Phases	6	2	6	2	4	4	4	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (s)	29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None	None
Act Effect Green (s)	31.7	31.7	31.7	31.7		20.3		20.3
Actuated g/C Ratio	0.53	0.53	0.53	0.53		0.34		0.34
v/c Ratio	0.09	0.23	0.11	0.42		0.36		0.89
Control Delay	10.0	7.9	8.1	8.6		10.1		21.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	10.0	7.9	8.1	8.6		10.1		21.1
LOS	A	A	A	A		B		C
Approach Delay		8.0		8.6		10.1		21.1
Approach LOS		A		A		B		C

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 50 (83%), Referenced to phase 2:EBWB and 6:EBWBL, Start of FDW or yellow  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 12.0  
 Intersection Capacity Utilization: 58.9%  
 Analysis Period (min): 15  
 Intersection LOS: B  
 ICU Level of Service: B

Splits and Phases. 631: Walnut & El Molino

α2	α4
29 s	31 s
α5	
29 s	

PM

	→	↑	↗	↘	↓
Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations	↑↑	↑	↗	↘	↑↑
Volume (vph)	650	427	93	34	222
Turn Type			Perm	Prot	
Protected Phases	4	2		1	6
Permitted Phases			2		
Detector Phases	4	2	2	1	6
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	28.4	20.1	20.1	12.0	20.1
Total Split (s)	29.0	23.0	23.0	13.0	36.0
Total Split (%)	44.6%	35.4%	35.4%	20.0%	55.4%
Yellow Time (s)	3.9	3.6	3.6	3.0	3.6
All-Red Time (s)	1.5	1.5	1.5	1.0	1.5
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	Ped	C-Min	C-Min	Min	C-Min
Act Effct Green (s)	24.4	22.3	22.3	6.3	32.6
Actuated g/C Ratio	0.38	0.34	0.34	0.10	0.50
v/c Ratio	0.64	0.73	0.17	0.22	0.14
Control Delay	18.9	27.2	6.3	20.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	27.2	6.3	20.0	3.9
LOS	B	C	A	B	A
Approach Delay	18.9	23.5			6.0
Approach LOS	B	C			A

Intersection Summary

Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 44 (68%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio 0.73  
 Intersection Signal Delay: 18.3  
 Intersection Capacity Utilization 59.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 618: Corson #1 & El Molino

↘ α1	↑ α2	↗ α4
13 s	23 s	29 s
↓ α5		
36 s		

Timings  
631: Walnut & El Molino

7/19/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	46	641	50	679	8	294	5	187
Turn Type	custom		custom		Perm		Perm	
Protected Phases		2		2		4		4
Permitted Phases	6		6		4		4	
Detector Phases	6	2	6	2	4	4	4	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (s)	31.0	31.0	31.0	31.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%	51.7%	51.7%	48.3%	48.3%	48.3%	48.3%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	33.4	33.4	33.4	33.4		18.6		18.6
Actuated g/C Ratio	0.56	0.56	0.56	0.56		0.31		0.31
v/c Ratio	0.20	0.38	0.17	0.44		0.70		0.50
Control Delay	7.2	5.6	15.8	13.1		22.3		14.4
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	7.2	5.6	15.8	13.1		22.3		14.4
LOS	A	A	B	B		C		B
Approach Delay		5.7		13.3		22.3		14.4
Approach LOS		A		B		C		B

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 9 (15%), Referenced to phase 2:EBWB and 6:EBWBL, Start of FDW or yellow  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 12.5  
 Intersection Capacity Utilization 59.7%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 631: Walnut & El Molino

ø2				ø4			
31 s				29 s			
ø6							
31 s							

AM + Proj

	→	↑	↗	↘	↓
Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations	↑↑	↑	↗	↘	↑↑
Volume (vph)	368	154	40	85	358
Turn Type			Perm	Prot	
Protected Phases	4	2		1	6
Permitted Phases			2		
Detector Phases	4	2	2	1	6
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	28.4	20.1	20.1	12.0	20.1
Total Split (s)	32.0	22.0	22.0	16.0	38.0
Total Split (%)	45.7%	31.4%	31.4%	22.9%	54.3%
Yellow Time (s)	3.9	3.6	3.6	3.0	3.6
All-Red Time (s)	1.5	1.5	1.5	1.0	1.5
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	Ped	C-Min	C-Min	Min	C-Min
Act Effct Green (s)	24.4	25.8	25.8	7.8	37.6
Actuated g/C Ratio	0.35	0.37	0.37	0.11	0.54
v/c Ratio	0.43	0.28	0.09	0.54	0.21
Control Delay	17.4	17.8	5.8	20.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	17.8	5.8	20.8	3.2
LOS	B	B	A	C	A
Approach Delay	17.4	15.0			6.8
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 29 (41%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.54  
 Intersection Signal Delay: 12.7  
 Intersection Capacity Utilization: 44.8%  
 Analysis Period (min): 15  
 Intersection LOS: B  
 ICU Level of Service: A

Splits and Phases: 618: Corson & El Molino

↘ φ1	↑ φ2	↗ φ4
16 s	22 s	32 s
↓ φ6		
38 s		

Timings  
631: Walnut & El Molino

7/19/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	12	327	47	640	9	140	6	360
Turn Type	custom		custom		Perm		Perm	
Protected Phases		2		2		4		4
Permitted Phases	6		6		4		4	
Detector Phases	6	2	6	2	4	4	4	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (s)	29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	31.7	31.7	31.7	31.7		20.3		20.3
Actuated g/C Ratio	0.53	0.53	0.53	0.53		0.34		0.34
v/c Ratio	0.09	0.24	0.12	0.42		0.36		0.89
Control Delay	10.0	7.9	8.1	8.6		10.1		21.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	10.0	7.9	8.1	8.6		10.1		21.1
LOS	A	A	A	A		B		C
Approach Delay		8.0		8.6		10.1		21.1
Approach LOS		A		A		B		C

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 50 (83%), Referenced to phase 2-EBWB and 6-EBWBL, Start of FDW or yellow  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 12.0  
 Intersection Capacity Utilization 59.1%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 631 Walnut & El Molino

29 s				31 s			
29 s							

Timings

618 Corson #1 & El Molino

PM + Proj

7/19/2017

	→	↑	↗	↘	↓
Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations	↑↑	↑	↗	↘	↑↑
Volume (vph)	656	427	93	34	225
Turn Type			Perm	Prot	
Protected Phases	4	2		1	6
Permitted Phases			2		
Detector Phases	4	2	2	1	6
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	28.4	20.1	20.1	12.0	20.1
Total Split (s)	29.0	23.0	23.0	13.0	36.0
Total Split (%)	44.6%	35.4%	35.4%	20.0%	55.4%
Yellow Time (s)	3.9	3.6	3.6	3.0	3.6
All-Red Time (s)	1.5	1.5	1.5	1.0	1.5
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	Ped	C-Min	C-Min	Min	C-Min
Act Effct Green (s)	24.5	22.2	22.2	6.3	32.5
Actuated g/C Ratio	0.38	0.34	0.34	0.10	0.50
v/c Ratio	0.64	0.73	0.17	0.22	0.14
Control Delay	18.9	27.5	6.4	19.9	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	27.5	6.4	19.9	3.9
LOS	B	C	A	B	A
Approach Delay	18.9	23.7			6.0
Approach LOS	B	C			A

Intersection Summary

Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 44 (68%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 18.4  
 Intersection Capacity Utilization: 59.4%  
 Analysis Period (min): 15  
 Intersection LOS: B  
 ICU Level of Service: B

Splits and Phases 618: Corson #1 & El Molino

↘ φ1	↑ φ2	↗ φ4
13 s	23 s	29 s
↓ φ6		
36 s		

Timings

631. Walnut & El Molino

7/19/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	46	647	53	688	8	294	5	187
Turn Type	custom		custom		Perm		Perm	
Protected Phases		2		2		4		4
Permitted Phases	6		6		4		4	
Detector Phases	6	2	6	2	4	4	4	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (s)	31.0	31.0	31.0	31.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%	51.7%	51.7%	48.3%	48.3%	48.3%	48.3%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	33.1	33.1	33.1	33.1		18.9		18.9
Actuated g/C Ratio	0.55	0.55	0.55	0.55		0.32		0.32
v/c Ratio	0.20	0.38	0.19	0.45		0.70		0.49
Control Delay	7.5	5.8	16.2	13.3		21.7		14.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	7.5	5.8	16.2	13.3		21.7		14.2
LOS	A	A	B	B		C		B
Approach Delay		5.9		13.5		21.7		14.2
Approach LOS		A		B		C		B

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length 60  
 Offset: 9 (15%), Referenced to phase 2:EBWB and 6:EBWBL, Start of FDW or yellow  
 Natural Cycle 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio 0.70  
 Intersection Signal Delay: 12.5  
 Intersection Capacity Utilization 60.2%  
 Analysis Period (min) 15

Intersection LOS B  
 ICU Level of Service B

Splits and Phases 631 Walnut & El Molino

ø2				ø4			
31 s				29 s			
ø6							
31 s							



Appendix:  
PEQI/BEQI Worksheets

City of Pasadena  
 Department of Transportation  
 Bicycle Environmental Quality Index  
 Calculation Summary

Segment Hudson Avenue  
 Limits between Locust St and Walnut St

Indicator Category	Score Weight	Indicator Response	Northbound (East side)	Indicator Response	Southbound (West side)	
			Surveyed Response Category Score		Surveyed Response Category Score	
<b>Street design</b>						
Presence of a Marked Area for Bicycle Traffic	2 05	None	4	None	4	
Width of Bike Lane	2 05	None	0	None	0	
Bicycle Lane Markings	2 05	None	4	None	4	
Connectivity of Bicycle Lanes	2 05	No	13	No	13	
Pavement Type/Condition	2 05	Smooth Surface	40	Smooth Surface	40	
Street Slope	2 05	< 5%	27	< 5%	27	
Driveway Cuts	2 05	None	27	Few (Less than Five)	16	
Presence of Trees	2 05	Continuously Lined	29	Sporadically Lined	22	
			<b>144</b>		<b>126</b>	
<b>Vehicle Traffic</b>						
Posted Speed Limit	1 39	25	29	25	29	
Traffic Volume - Avg # of Vehicles Per Day	1 39	1,000 - 5,000	19	1,000 - 5,000	19	
Percentage of Heavy Vehicles	1 39	Less than 5%	36	Less than 5%	36	
Parallel Parking Adjacent to Bicycle Lane/Route	1 39	TPP 7 ft - 9 ft	22	TPP 7 ft - 9 ft	22	
Traffic Calming Features Streets	1 39	0 TCF	11	0 TCF	11	
Number of Lanes	1 39	No Lanes	40	No Lanes	40	
			<b>157</b>		<b>157</b>	
<b>Safety/Other</b>						
Presence of Bicycle Lane Signs	0 42	No	15	No	15	
Bicycle/Pedestrian Scale Lighting	0 42	No	15	No	15	
			<b>30</b>		<b>30</b>	
<b>Land Use</b>						
Bicycle Parking	0 66	No	12	No	12	
Retail Use	0 66	0	14	0	14	
Line of Site	0 66	Clear Line of Sight	36	Clear Line of Sight	36	
			<b>62</b>		<b>62</b>	
<b>Domain Summary</b>						
	Score Weight		Min Score	Category Score	Min Score	Category Score
Street design	2 05		62	144	62	126
Vehicle Traffic	1 39		59	157	59	157
Safety/Other	0 42		30	30	30	30
Land Use	0 66		33	62	33	62
	<b>4 52</b>		<b>184</b>	<b>393</b>	<b>184</b>	<b>375</b>
			<b>BEQI Score<sup>1</sup> 46</b>		<b>BEQI Score<sup>1</sup> 42</b>	
			Northbound (East side)		Southbound (West side)	

<sup>1</sup> BEQI calculation did not consider intersection indicators

City of Pasadena  
 Department of Transportation  
 Pedestrian Environmental Quality Index  
 Calculation Summary  
 -- Segment --

Segment Hudson Avenue  
 Limits between Locust Street and Walnut Street

Indicator Category	Score Weight	Indicator Response	Northbound (East side)	Indicator Response	Southbound (West side)
			Surveyed Response Category Score		Surveyed Response Category Score
<b>Traffic</b>					
Number of Lanes	0.64	Shared/Pedestrian-only street	20	Shared/Pedestrian-only street	20
Posted Speed Limit	0.64	25 mph or none posted	4	25 mph or none posted	4
Traffic Volume <sup>1</sup>	0.64	1,000-6,000 V/D	11	1,000-6,000 V/D	11
Street Traffic Calming Features (TCFs)	0.64	None	0	None	0
			<b>35</b>		<b>35</b>
<b>Street design</b>					
Width of Sidewalk	1.35	12 ft or more	22	12 ft or more	22
Width of Throughway	1.35	4-6 ft	13	4-6 ft	13
Large SW Obstructions	1.35	None	22	None	22
Sidewalk Impediments	1.35	None	24	None	24
Trees	1.35	Continuous	9	Sporadic	7
Driveway Cuts	1.35	None	15	1 to 5	7
Presence of Buffer	1.35	Parallel parking	11	Parallel parking	11
Planters/Gardens	1.35	Yes	4	Yes	4
Public Seating	1.35	No	0	No	0
			<b>120</b>		<b>110</b>
<b>Land Use</b>					
Public Art/ Historic Sites	0.15	No	0	No	0
Retail Use/Public Places	0.15	None	0	None	0
			<b>0</b>		<b>0</b>
<b>Perceived Safety</b>					
Lighting	0.34	None	0	None	0
Illegal Graffiti	0.34	No	2	No	2
Litter	0.34	No	11	No	11
Empty Spaces	0.34	No	4	Yes	0
			<b>17</b>		<b>13</b>
<b>Domain Summary</b>					
	Score Weight		Category Score		Category Score
Traffic	0.64	Traffic	35	Traffic	35
Street Design	1.35	Street Design	120	Street Design	110
Land Use	0.15	Land Use	0	Land Use	0
Safety	0.34	Safety	17	Safety	13
	<b>2.48</b>		<b>172</b>		<b>158</b>
			PEQI Score 69 Northbound (East side)	PEQI Score 64 Southbound (West side)	

<sup>1</sup>Traffic volumes are based on segment volumes, not directional traffic volumes