ATTACHMENT G
Non-CEQA Transportation Analysis

FEHR PEERS

Draft Memorandum

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Subject: CCA Oakland Campus Project – Non CEQA Elements

WC19-3574

This memorandum summarizes our traffic analysis, site plan assessment, collision analysis, and a transportation and parking demand management plan for the proposed mixed-use development (hereby referred to as the project) at the current California College of the Arts (CCA) campus located at the southeast corner of the Broadway/Clifton Street intersection in Oakland, California. The project site is shown in **Figure 1** (all figures and attachments are included at the end of the memorandum).

This analysis examines the project's proposed site plan, provided in **Attachment A**, to develop the CCA Oakland campus property with the following key initial plan elements:

- Construction of 462 residential units focused in two building complexes, one located along the site's eastern edge and one at the corner of Clifton Street and Broadway; and

- Construction of 16,945 square feet of office space and 1,408 square feet of ground floor café/retail space fronting Broadway

- Total of 272 off-street parking spaces, with 255 dedicated to residents and 17 dedicated to employees.

Traffic Analysis

This section evaluates how project traffic may affect the neighboring intersections along the Broadway corridor.

Project Travel Characteristics

The amount of traffic associated with the project considers:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site.
2. **Trip Distribution and Assignment** – The *direction and amount* of vehicle trips added to roadways as they approach and depart the project site is projected.

The proposed project trip generation and trip distribution forms the basis for evaluating potential project effects on the surrounding roadway network.

Trip Generation

Trip generation for the proposed project was estimated using the *Trip Generation Manual, 10th Edition* (2017) published by the ITE, as presented in **Table 1**. The proposed project's on-site residential, office, and retail uses are expected to generate 2,076 vehicle trips, including 163 morning and 157 evening peak hour trips on a typical weekday. The number of vehicle trips generated by existing CCA uses to be removed was estimated through site observations of travel to and from on-site parking lots. These observations identified approximately 100 daily vehicle trips, including 14 morning and 10 evening peak hour trips on a typical weekday. The net new trips forecast to be generated by the proposed project include 1,976 daily vehicle trips, including 149 morning and 147 evening peak hour trips on a typical weekday.

The project described above and evaluated in Table 1 is the project as proposed and evaluated in the environmental documentation. However, we understand that the project applicant is considering several potential development options which include varying levels of residential and office land uses. The options under consideration would all have similar transportation outcomes. The detailed intersection analysis presented herein evaluates the development option which would represent the "worst case" from a trip generation and intersection operations perspective. That option would entail an alternative including 300 residential units, 70,000 square feet of office space and 1,408 square feet of ground floor commercial. **Table 2** presents the results of the trip generation analysis prepared for that "worst case" option.

Table 1: Project Trip Generation – CEQA Analysis

Use	Setting/ Location	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise)[1]	Dense Multi-Use Urban	462 Occupied Dwelling Units	1,770	35	96	131	79	47	126
Office[2]	General Urban/ Suburban	16,945 sq. ft.	170	17	3	20	3	16	19
Café/Retail[3]	General Urban/ Suburban	1,408 sq. ft.	160	8	6	14	9	5	14
Café/Retail (Internalization – 15%)			-24	-1	-1	-2	-1	-1	-2
Project Trip Generation			*2,076*	*59*	*104*	*163*	*90*	*67*	*157*
CCA Campus	Urban	Existing to be removed	100	12	2	14	2	8	10
Existing CCA Campus Trip Generation:			*-100*	*-12*	*-2*	*-14*	*-2*	*-8*	*-10*
Net New Trips:			**1,976**	**47**	**102**	**149**	**88**	**59**	**147**

Notes:
1. Land use category 221 – Multifamily Housing (Mid-Rise) in a Dense Multi-Use Urban Setting
2. Land use category 710 – General Office Building in a General Urban/Suburban Setting
3. Land Use Category 932 - High Turnover (Sit Down) Restaurant in a General Urban/Suburban Setting

Source: *Trip Generation Manual* (10th Edition), ITE, 2017; Fehr & Peers, 2020.

As presented in Table 2, the "worst case" option would generate 1,966 daily vehicle trips, including 179 morning and 174 evening peak hour trips on a typical weekday. The net new trips forecast to be generated by this option include 1,866 daily vehicle trips, including 165 morning and 164 evening peak hour trips on a typical weekday. The transportation analysis summarized in this memorandum is based on this "worst case" trip generation. However, it should be noted that the options under consideration have similar trip generation characteristics and would result in similar transportation outcomes and recommendations.

Table 2: Project Trip Generation (Worst Case Option)

Use	Setting/ Location	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise)[1]	Dense Multi-Use Urban	300 Occupied Dwelling Units	1,150	23	63	86	51	30	81
Office[2]	General Urban/ Suburban	70,000 sq. ft.	680	70	11	81	13	68	81
Café/Retail[3]	General Urban/ Suburban	1,408 sq. ft.	160	8	6	14	9	5	14
Café/Retail (Internalization – 15%)			-24	-1	-1	-2	-1	-1	-2
Project Trip Generation			1,966	100	79	179	72	102	174
CCA Campus	Urban	Existing to be removed	100	12	2	14	2	8	10
Existing CCA Campus Trip Generation:			*-100*	*-12*	*-2*	*-14*	*-2*	*-8*	*-10*
Net New Trips:			**1,866**	**88**	**77**	**165**	**70**	**94**	**164**

Notes:
1. Land use category 221 – Multifamily Housing (Mid-Rise) in a Dense Multi-Use Urban Setting
2. Land use category 710 – General Office Building in a General Urban/Suburban Setting
3. Land Use Category 932 - High Turnover (Sit Down) Restaurant in a General Urban/Suburban Setting

Source: *Trip Generation Manual* (10th Edition), ITE, 2017; Fehr & Peers, 2020.

Trip Distribution

Trip distribution for proposed project was estimated by isolating a transportation analysis zone with the proposed project land-use and conducting a select-link analysis using the Alameda County Travel Demand Model. Trip distribution plots based on this tool are provided in **Attachment B**. The expected trip assignment for the proposed project is presented on **Figure 2**.

Selection of Study Intersections

Study Intersections are defined within the City of Oakland's *Transportation Impact Review Guidelines* for Land Use Development Projects (2017) as:

- All intersection(s) of streets adjacent to the project site;
- All signalized intersections(s), all-way stop-controlled intersection(s) or roundabouts where 100 or more peak hour trips are added by the project;
- All signalized intersection(s) with 50 or more project-related peak hour trips AND existing LOS D-E-F; and
- Side-street stop-controlled intersection(s) where 50 or more peak hour trips are added by the project to any individual movement other than the major-street through movement.

The following intersections satisfy the above criteria:

1. Broadway/Broadway Terrace [Adjacent]
2. Broadway/Clifton Street [Adjacent]
3. Broadway/College Avenue [Adjacent]
4. Broadway/Coronado Avenue [100 Trips Added]
5. Broadway/51st Street/Pleasant Valley Avenue [100 Trips Added]
6. Clifton Street/Project Driveway [Adjacent]

Project Impact Assessment

We evaluated traffic operations at the study intersections along the Broadway corridor for the following scenarios:

- Existing No Project Condition – Existing conditions based on multimodal traffic counts collected on Tuesday, January 29, 2019 (**Figures 3 and 4**).
- Existing Plus Project Condition – Existing conditions traffic plus net new traffic generated by the Project (**Figure 5**);
- Cumulative No Project Condition – Cumulative year conditions based on forecast traffic growth using the Alameda County Travel Demand Model (**Figure 6**); and

- Cumulative Plus Project Condition – Cumulative traffic volumes plus traffic generated by the Project (**Figure 7**).

The Cumulative conditions analysis reflects overall increases in population and employment growth across the City and region per current projections.

Analysis Tools

The traffic operations analysis uses the Synchro/SimTraffic 10.0 software, based on the procedures outlined in the Transportation Research Board's *Highway Capacity Manual*, *6th Edition*. Intersection operation inputs include vehicle, bicycle, and pedestrian volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors.

Intersection operations are described using the term "Level of Service" (LOS). LOS is a quantitative measure of the average delay experienced by a driver at the intersection. It ranges from LOS A, with no congestion and little delay, to LOS F, with excessive congestion and delay. **Tables 3** and **4** provide descriptions of various LOS and the corresponding ranges of delay.

Intersection Level of Service

Table 5 shows that the addition of project traffic would worsen vehicle delays at the study intersections. The intersection of *Broadway/51st Street* serves as a downstream bottleneck for vehicles traveling southbound along the Broadway corridor, causing upstream queueing impacts at the intersection of *Broadway/Broadway Terrance* in the morning peak hour in both the Existing and Cumulative scenarios. The intersection of *Broadway/51st Street* also becomes a downstream bottleneck in the evening peak hour in the Cumulative scenario due to the projected growth in vehicle volumes; the intersection lacks the capacity to serve the projected demand.

The intersection of *Broadway/51st Street* also serves as an upstream bottleneck for vehicles traveling northbound along the Broadway corridor in the evening peak hour. This intersection currently operates independently and is not coordinated with any of the other intersections along the corridor. Simulation results are provided in **Attachment C**.

> **Consultant Recommendation 1**: Traffic signals at the four signalized study intersections along the Broadway corridor should be interconnected to provide coordination in the southbound direction during the morning peak period and in the northbound direction during the evening peak period.

Table 3: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
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 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 unacceptable with 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: *Highway Capacity Manual, 6th Edition.*

Table 4: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	< 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual, 6th Edition.*

Table 5: Intersection Level of Service Results

	Intersection	Control	Peak Hour	Existing No Project		Existing Plus Project		Cumulative No Project		Cumulative Plus Project	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Broadway/ Broadway Terrace	Signal	AM PM	13.7 8.7	B A	19.6 13.3	B B	**85.3** **72.6**	**F** **E**	**91.4** **76.4**	**F** **E**
2	Broadway/ Clifton Street	SSSC[1]	AM PM	5 (19) 8 (27)	A (C) A (D)	5.6 (24.1) 8.6 (26.1)	A (C) A (D)	10 (26) 17 (26)	B (D) C (D)	**12.7 (37.8)** **18.9 (52.2)**	**B (E)** **C (F)**
3	Broadway/ College Ave	Signal	AM PM	12.6 17.3	B B	13.7 17.6	B B	20.0 37.0	B D	22.2 39.0	C D
4	Broadway/ Coronado Ave	Signal	AM PM	12.2 21.8	B C	14.8 23.1	B C	20.3 40.8	C D	22.0 42.6	C D
5	Broadway/ 51st St	Signal	AM PM	43.2 51.3	D D	46.3 **62.0**	D **E**	**58.2** **89.9**	**E** **F**	**65.4** **91.9**	**E** **F**
6	Clifton Street/ Project Driveway	SSSC[1]	AM PM	-	-	7.9 (19.0) **23.3 (40.8)**	A (C) **B (E)**	**-**	**-**	**64.4 (>99)** **87.8 (>99)**	**F (F)** **F (F)**

Notes:

1. SSSC = side street stop-controlled intersection; average delay or LOS is followed by the delay or LOS for the worst movement in parentheses.

Source: Fehr & Peers, 2020.

Vehicle Queuing at Clifton Street

The addition of project traffic would substantially increase queuing on the westbound approach at the intersection of *Broadway/Clifton Street*, as presented in **Table 6**. The finding above is contingent upon vehicles obeying the existing "KEEP CLEAR" striping on Broadway at the Clifton Street intersections to allow left turn movements out. Observations have found that this striping is not always followed.

Table 6: Queuing Results – Clifton Street (westbound)

	Intersection	Control	Peak Hour	Existing No Project		Existing Plus Project		Cumulative No Project		Cumulative Plus Project	
				Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.
2	Broadway/ Clifton Street	SSSC[1]	AM PM	50 25	75 75	51 48	65 65	50 50	75 75	55 53	76 58

Notes:

1. SSSC = side street stop-controlled intersection;
2. Queue lengths are measured in feet. The average vehicle occupies 25' feet in queue.

Source: Fehr & Peers, 2020.

Consultant Recommendation 2: Construct a raised median on Broadway between College Avenue and Broadway Terrance. Left turns into and out of Clifton Street at the intersection of *Broadway/Clifton Street* would be prohibited with this installation.

On-street parking on the east side of Broadway between College Avenue and Clifton Street should be removed and converted to additional queue storage for the northbound right-turn pocket at the intersection of *Broadway/Broadway Terrace* and into the project site. Paint "KEEP CLEAR" pavement markings at the intersection of Broadway/Clifton Street in the right-turn pocket.

Implementation of Recommendations

Implementation of the above recommendation in the existing scenario would improve the project site access, as presented in **Table 7**, and minimize queuing along the westbound approach at the intersection of *Broadway/Clifton Street*, as presented in **Table 9**.

Table 7: Mitigated Intersection Level of Service Results – Existing Conditions

Intersection		Control	Peak Hour	Existing No Project		Existing Plus Project		Existing Plus Project Plus Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	Broadway/ Broadway Terrace	Signal	AM PM	13.7 8.7	B A	19.6 13.3	B B	12.1 8.3	B A
2	Broadway/ Clifton Street	SSSC[1]	AM PM	5 (19) 8 (27)	A (C) A (D)	5.6 (9.4) 8.6 (26.1)	A (C) A (D)	3.7 (7.1) 4.9 (12)	A (C) A (B)
3	Broadway/ College Ave	Signal	AM PM	12.6 17.3	B B	13.7 17.6	B B	10.4 13.5	B B
4	Broadway/ Coronado Ave	Signal	AM PM	12.2 21.8	B C	14.8 23.1	B C	7.8 17	D B
5	Broadway/ 51st St	Signal	AM PM	43.2 51.3	D D	46.3 **62.0**	D **E**	32.7 43.4	C D
6	Clifton Street/ Project Driveway	SSSC[1]	AM PM	-	-	7.9 (19.0) **23.3 (40.8)**	A (C) **B (E)**	2.1 (6.4) 5.4 (10.5)	A (A) A (B)

Notes:

1. SSSC = side street stop-controlled intersection; average delay or LOS is followed by the delay or LOS for the worst movement in parentheses.

Source: Fehr & Peers, 2020.

Implementation of the recommendations would similarly not mitigate the failing operating conditions with the project in the cumulative scenario due to capacity limitations at the intersection

of *Broadway/51st Street*, as presented in **Table 8**. This finding is consistent with the results of the Shops at the Ridge EIR analysis (i.e. cumulative LOS F/significant and unavoidable).

Table 8: Mitigated Intersection Level of Service Results – Cumulative Conditions

Intersection		Control	Peak Hour	Cumulative No Project		Cumulative Plus Project		Cumulative Plus Project Plus Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	Broadway/ Broadway Terrace	Signal	AM PM	**85.3** **72.6**	**F** **E**	**89.8** **76.8**	**F** **E**	**67.9** **56.0**	**E** **E**
2	Broadway/ Clifton Street	SSSC[1]	AM PM	10 (26) 17 (26)	B (D) C (D)	**14 (48)** **18 (44)**	**B (E)** **C (E)**	8.6 (11.8) 10.6 (22.3)	A (B) B (C)
3	Broadway/ College Ave	Signal	AM PM	20.0 37.0	B D	22.3 36.5	C D	19.0 43.9	B D
4	Broadway/ Coronado Ave	Signal	AM PM	20.3 40.8	C D	23.2 40.7	C D	16.0 26.6	B C
5	Broadway/ 51st St	Signal	AM PM	**58.2** **89.9**	**E** **F**	**66.0** **91.4**	**E** **F**	**71.3** **82.0**	**E** **F**
6	Clifton Street/ Project Driveway	SSSC[1]	AM PM	-	-	**64.4 (>99)** **87.8 (>99)**	**F (F)** **F (F)**	3.8 (10.6) **17.5 (36.1**)	A (B) **C (E)**

Notes:

1. SSSC = side street stop-controlled intersection; average delay or LOS is followed by the delay or LOS for the worst movement in parentheses.

Source: Fehr & Peers, 2020.

Table 9: Mitigated Queuing Results – Clifton Street (westbound)

Intersection		Control	Peak Hour	Existing Plus Project		Existing Plus Project Plus Mitigation		Cumulative Plus Project		Cumulative Plus Project Plus Mitigation	
				Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.
2	Broadway/ Clifton Street	SSSC[1]	AM PM	51 48	65 65	43 42	66 57	55 53	76 58	46 47	69 60

Notes:

1. SSSC = side street stop-controlled intersection;
2. Queue lengths are measured in feet. The average vehicle occupies 25' feet in queue.

Source: Fehr & Peers, 2020.

Collision History

Collision data, for the five years between January 01, 2011 and December 31, 2015, was downloaded from the Transportation Injury Management System (TIMS) database. **Table 10** summarizes the collision data by type and location, and **Table 11** summarizes the collision data by severity.

Table 10: Collision History by Severity

Location		Collision Severity			
		Fatal	Injured (severely)	Injured (visible)	Injured (complained of pain)
Intersection					
1	Broadway/Broadway Terrace	0	0	0	1
2	Broadway/Clifton Street	0	1	0	0
3	Broadway/College Ave	0	0	0	2
4	Broadway/Coronado Ave	0	0	0	0
5	Broadway/51st St	0	0	0	8
Roadway Segment					
6	Broadway from Broadway Tr to Clinton S	0	0	0	0
7	Broadway from Clifton St to College Ave	0	0	0	0
8	Broadway from College Ave to Coronado Ave	0	0	1	0
9	Broadway from Coronado Ave to 51st St	0	0	2	0
	Total Collisions:	**0**	**1**	**3**	**11**

Source: Transportation Injury Management System, 2011-2015; Fehr & Peers, 2020.

Table 10 shows fifteen collisions reported during the five-year timeframe at the study roadway segments and intersections. Four of the fifteen collisions involved bicycles and/or pedestrians, with three of them being bicycle collisions (See Table 11). Eighty percent of the collisions occurred at intersections, with the *Broadway/51st Street* and *Broadway/College Avenue* intersections being the top two collision prone locations. Of the fifteen collisions, approximately 60 percent of the collisions were either broadside or rear end collisions.

Table 11: Collision History by Type

Location		Collision Type							
		Head-On	Side-swipe	Rear End	Broad-side	Hit Object	Over-turned	Vehicle/ Pedestrian	Other
Intersection									
1	Broadway/Broadway Terrace	0	0	1	0	0	0	0	0
2	Broadway/Clifton Street	0	0	0	1	0	0	0	0
3	Broadway/College Ave	0	0	1	1	0	0	0	0
4	Broadway/Coronado Ave	0	0	0	0	0	0	0	0
5	Broadway/51st St	0	0	4	1	1	0	1	1
Roadway Segment									
6	Broadway from Broadway Tr to Clinton S	0	0	0	0	0	0	0	0
7	Broadway from Clifton St to College Ave	0	0	0	0	0	0	0	0
8	Broadway from College Ave to Coronado Ave	0	1	0	0	0	0	0	0
9	Broadway from Coronado Ave to 51st St	0	0	0	0	0	0	0	2
Total Collisions:		**0**	**1**	**6**	**3**	**1**	**0**	**1**	**3**

Source: Transportation Injury Management System, 2011-2015; Fehr & Peers, 2020.

The following collision trends were noted:

- Motor vehicle collisions resulting from complex design geometry at the intersection of Broadway/ Broadway Terrace;
- Motor vehicle rear end collisions at the Broadway/51st Avenue intersection;
- Motor vehicle collisions resulting from unsafe speeds at the Broadway/Broadway Terrace intersection;
- Motor vehicle collisions resulting from improper turning at the Broadway/College Avenue intersection;
- Motor vehicle collisions resulting from unsafe speeds at the Broadway/51st Street intersection;
- Pedestrian-involved collisions on the College Avenue roadway segment; and
- Bicycle-involved collisions resulting from bicycles travelling the wrong way.

Predictive Crash Frequency

The *Highway Safety Manual* (HSM, 2010) provides a methodology to predict the number of collisions for intersections and street segments based on roadway and intersection characteristics, such as vehicle and pedestrian volumes, number of lanes, signal phasing, on-street parking, and number of driveways. **Table 12** presents the predicted collision frequencies for the five intersections and identified segments using the HSM Predictive Method for Urban and Suburban Arterials and compares predicted and reported collision frequencies; refer to **Attachment D**.

Since the data was collected between 2011 and 2015, the City of Oakland has made improvements to the study intersections along Broadway. To maintain a direct comparison between the reported and predicted collision frequencies, this analysis assumes uses the intersection geometry and control type from 2015.

Table 12: Predicted Collision Frequencies vs Actual

	Location	Type[1]	AADT[2] (major)	AADT[2] (minor)	Total Collisions (Actual)	Collisions per year (Actual)	Predicted Collision Frequency	Difference[3]
Intersection								
1	Broadway/Broadway Terrace	3-leg SG	16,400	7,300	1	0.2	1.4	-1.2
2	Broadway/Clifton Street	3-leg ST	16,600	500	1	0.2	0.4	-0.2
3	Broadway/College Ave	3-leg SG	22,400	7,300	2	0.4	1.1	-0.7
4	Broadway/Coronado Ave	4-leg ST	20,000	1.400	0	0	0.9	-0.9
5	Broadway/51st St	4-leg SG	20,000	20,700	8	1.6	3.8	-2.2
Roadway Segment								
8	Broadway from College Ave to Coronado Ave	4D	22,400		1	0.2	0.1	+0.1
9	Broadway from Coronado Ave to 51st St	4D	20,000		2	0.4	0.2	+0.2

Notes:
1. SG = 3 signalized intersection; ST = unsignalized intersection; 4D = 4-lane divided arterial.
2. Average annual daily traffic (AADT) was estimated using the existing PM peak hour counts collected in 2019 multiplied by ten.
3. Negative values indicate that the actual collision frequency is less than the predicted collision frequency for a typical intersection with similar attributes. Positive values indicate that the actual collision frequency is greater than the predicted collision frequency for a typical intersection with similar attributes.

Source: Fehr & Peers, 2020.

HSM Countermeasures

Table 13 presents potential countermeasures from the HSM that could address some of the issues identified.

Table 13: Potential Countermeasures for Consideration

Countermeasure	CMF Value
Provide a southbound left-turn pocket at the intersection of Broadway/Broadway Terrace.	0.91
Eliminate left turn movements at the intersection of Broadway/Clifton Avenue *(See Consultant Recommendation 2)*	0.49
Install red light cameras at the intersection of Broadway/51st Street	0.84

Source: Highway Safety Manual, 2010; Fehr & Peers, 2020.

Each countermeasure provides a multiplicative crash-modification factor (CMF) that provides an estimated reduction in collisions per year.

Consultant Recommendation 3: Construct a southbound left-turn pocket at the intersection of *Broadway/Broadway Terrace* while maintaining the existing vehicle and bicycle lanes. This can be accomplished by removing on-street parking and realigning the existing through lanes.

Consultant Recommendation 4: At the intersection of *Broadway/College Avenue,* modify the College Avenue approach to align orthogonally with Broadway and relocate the crosswalk to improve pedestrian visibility. Realigning the intersection will also slow vehicle turning speeds.

Site Analysis

This section provides a review of site access, circulation, and parking based on the project's conceptual site plan (Attachment A).

Site Access and Circulation

Vehicular

Vehicular access to and from the site would be provided by three driveways on Clifton Street, accessed via an existing unsignalized intersection at Broadway. The unsignalized intersection of *Broadway/Clifton Street* is located between the closely spaced signalized intersections of *Broadway/Broadway Terrace* and *Broadway/College Avenue*. Freeway access is provided via Broadway and 51st Street.

The westernmost project driveway, located approximately 185 feet west of Broadway, would provide vehicular access into (outbound movements would not be allowed) the main building's parking garage; the driveway also forms an internal loop with the center driveway – creating a one-way passenger loading zone for passenger pickup/drop-off (for TNCs and other users) and moving vans. Vehicles may exit from the center driveway but may not enter. The easternmost driveway would provide vehicular access into and out of the eastern building's parking garage.

> **Consultant Recommendation 5**: The final site plan should retain three driveways and designate curb space for loading for passenger loading and/or commercial vehicles along the internal loop formed by the westernmost and center project driveways. As shown on the conceptual site plan, the delineation of inbound and outbound movements from the garage versus pick-up and drop-off activity is not well defined. This area should be designed and defined to adequately segregate garage movements from pick-up and drop-off activities.
>
> The westernmost driveway as shown is located approximately 185 feet west of Broadway. Queuing calculations, presented in a previous section of this report, find that this location is adequately spaced, provided that certain mitigation measures are provided (turn restrictions and signal interconnect).

Pedestrian

Pedestrian access to the project site is provided by sidewalks along the project frontage on Broadway and Clifton Street. The preliminary site plan shows pedestrian site access points from both Broadway and Clifton Street. Pedestrian facilities around the site are shown on **Figure 8**.

> **Consultant Recommendation 6**: Along the project frontage, curb extensions should be constructed at the intersection of *Broadway/Clifton Street* and *Broadway/College Avenue*.

Bicycle

Bicycle access to the site is provided by Class II bike lanes on Broadway that extend from 25th Street in the south to the freeway overpass prior to the Caldecott Tunnel. Broadway between 25th Street and West Grand Avenue is a Class III bicycle route. The preliminary site plan shows bicycle site access points from both Broadway and Clifton Street. The proposed project also includes 460 bicycle parking spaces. The nearest bike share (Ford Go Bike) station is located on the corner of Broadway and Coronado Avenue. Existing and planned bicycle facilities are presented in **Figure 9**.

Transit

Local and regional transit access to the project site is provided by the Alameda-Contra Costa Transit District (AC Transit) bus service and Bay Area Rapid Transit (BART) train service. AC transit provides local service to the area via routes 51A and 851 and regional service to San Francisco via routes CB and V. The bus stop nearest to the project site is located at the intersections of *Broadway/College Avenue*, as shown on **Figure 10**. Local school bus services are also provided by AC Transit (Lines 605, 660, 662, 682, and 696).

> **Consultant Recommendation 7**: Additional transit amenities are required at the bus stop located along the project frontage, including the construction of a bus boarding island, bus shelter, and concrete bus pad at the intersection of *Broadway/College Avenue*.

The Rockridge BART Station is located approximately 0.5 miles northeast of the project site. AC Transit bus routes 51A and 851 provide service between the Rockridge BART Station and the project site.

Emergency Vehicle Access

Factors such as number of access points, roadway width, and proximity to fire stations determine whether a project provides sufficient emergency access. The main project building is contiguous to Broadway and Clifton Street. Access to the eastern building is provided via Clifton Street and a fire

access road which runs along its eastern boundary. Emergency vehicle access to the interior of the site is available via the main north-south promenade if necessary.

The fire station most likely to serve the site is Oakland Fire Station No. 8 located on 51st Street, 0.7 miles from the project site. Emergency vehicles would travel along 51st Street and Broadway to access the project site.

> **Consultant Recommendation 8**: The final site plan should ensure adequate clearance and roadway widths are provided for emergency vehicles access throughout the project site.

Off-Street Parking

The project proposes to provide 272 vehicular parking spaces, 255 for residents and 17 for employees. Of the residential spaces, 220 spaces would be in Building A and 35 in Building B. The proposed vehicular parking supply for the project was evaluated based on available parking demand at similar developments. The proposed parking supply was also compared to the City of Oakland Municipal Code requirements.

Estimated Vehicle Parking Demand

The estimated peak parking demand was predicted using the *Parking Generation Manual*, 5th *Edition* (2019), published by the Institute of Transportation Engineers (ITE), as presented in **Table 14**.

Table 14: Estimated Peak Parking Demand

Use	Size	Parking Spaces
Residential[1]	462 Dwelling Units	465
Office[2]	16,945 sq. feet	40
Retail/Cafe[3]	1,408 sq. feet	13
	Parking Demand:	**518 spaces**

Notes:
1. Land use category 221 – Multifamily Housing (Mid-Rise) in a Dense Multi-Use Urban Setting; P = 1.04 * (X) – 15.22; X = Dwelling Units
2. Land use category 710 – General Office Building in a General Urban/Suburban Setting; P = 2.39 * (X); X = 1000 sq. ft. GFA
3. Land use category 932 – High Turnover (Sit-Down) Restaurant in a General Urban/Suburban Setting; P = 9.44 * (X); X = 1,000 square feet

Source: *Parking Generation Manual* (5th Edition), ITE, 2019; Fehr & Peers, 2020.

Based on the ITE methodology and statistics the residential portion of the project is expected to generate demand for approximately 465 spaces (approximately 1.0 vehicle per household). Compared to automobile ownership statistics from the American Community Survey for the census tract[1], this is significantly lower than the local average (approximately 1.9 vehicles per household). The entirety of the project is expected to generate demand for approximately 518 spaces.

Parking demand data in the *Parking Generation Manual*, *5th Edition* was largely collected prior to the introduction of Transportation Networking Companies (TNC). With the proliferation of TNC and fleet services, ownership of vehicles will likely decrease in areas that can support alternatives such as walking, biking, and transit for some trip purposes. MTC's Vital Signs, which monitors key trends in the Bay Area, shows that land-use density decreases the need to own a vehicle. Permitted off-street parking reductions are discussed further in the next section.

Municipal Code (Vehicle Parking)

Chapter 17.116 of the City of Oakland's Municipal Code provides off-street parking requirements based on zoning. The project site, currently zoned RM-3 (Residential - Mixed Housing), is required to provide one parking space for each dwelling unit, one parking space for each six hundred square feet of floor area on the ground floor of a building for the commercial uses, and one parking space for each one thousand square feet of floor area not on the ground floor of a building for the commercial uses. As presented in **Table 15**, the project is required to provide 490 parking spaces.

[1] Automobile ownership for the project Census Tract (4042) was taken from the American Community Survey (2016) – <1% of households have no vehicle, 28% have one, 53% have two, and 18% have three+ vehicles.

Table 15: Municipal Code Off-Street Vehicular Parking Requirements

Use	Size	Base Parking Requirement	Number of Spaces	
			Base Requirement	35% Reduction[1]
Residential	462 Dwelling Units	1 space per Dwelling Unit	462	301
Office (Ground Floor)	10,330 sq. feet	1 space per 600 sq. feet	18	12
Office (Above Ground Floor)	6,615	1 space per 1,000 sq. feet	7	5
Commercial Use (Ground Floor)	1,408 sq. feet	1 space per 600 sq. feet	3	2
		Off-Street Parking Requirement:	**490 spaces**	**320 spaces**

Notes:
1. Off-street parking requirement may be reduced with a conditional use permit if the development is located in a commercial corridor zone by up to fifty percent.

Source: City of Oakland Municipal Code; Fehr & Peers, 2020.

If the development incorporates parking demand management measures (Subsection 17.116.110.C), the Code allows for reductions of up to 50% in the parking requirement. The parking reduction percentages for the demand management measures described below can be added together to create a greater parking reduction:

1. Affordable housing units that have a base parking minimum of three-quarter space per dwelling unit or more may provide:
    a. One-half (1/2) space per affordable housing unit if within a Transit Accessible Area; and
    b. Three-quarters (3/4) space per affordable housing unit if not within a Transit Accessible Area.
2. A project that is within a Transit Accessible Area receives a thirty percent (30%) reduction in the parking requirement. This reduction cannot be applied to the parking ratio for affordable housing that already receives a reduction above.
3. On-site public or private car share spaces[2] reduces the requirement by twenty percent (20%).
4. Off-site public or private car share spaces[2] reduces the requirement by ten percent (10%).

[2] The project is required to provide three (3) car-share parking spaces that will be counted towards the minimum required parking spaces. The car-share space can be privately operated and maintained by the property owner or provided to a public car-share organization that is accessible to both non-residents and resident subscribers. If off-site, the car-share spaces must be within 600 feet of the building site.

5. The provision of month transit passes (placed on a Regional Transit Connection Clipper Card) to each dwelling unit in an amount equal to either one-half the price of an Adult 31-Day AC Transit Pass or an AC Transit EasyPass, reduces the requirement by ten percent (10%).
6. Subsection 17.117.150 allows a reduction in the total number of off-street automobile parking spaces at the ratio of one automobile space for six bicycle spaces provided in excess of the bicycle parking requirements. (up to 5%).

The project is located directly adjacent to a high-quality transit corridor (Route 51A operates along the Broadway/College Avenue corridors with 10 to 15-minute peak headways during both the morning and afternoon peak commute periods), and therefore is located within a Transit Accessible Area (30% reduction). The project also provided enough excess bicycle parking to satisfy an additional 5% reduction in the vehicular parking supply. With these reductions the project is required to provide at minimum 301 residential and 19 commercial parking spaces.

Municipal Code (Bicycle Parking)

Chapter 17.117 of the City of Oakland's Municipal Code provides bicycle parking requirements for new developments based on zoning. The project (zone RM-3) is required to provide one long-term bicycle space for each four dwelling units and one short-term bicycle space for each twenty dwelling units, one long-term bicycle space for each 12,000 square feet of floor area and one short-term bicycle space for each 2,000 square feet of floor area reserved for a limited service café and one long-term bicycle space for each 10,000 square feet of floor area and one short-term bicycle space for each 20,000 square feet of floor area reserved for office.

The project (462 dwelling units) is required to provide 116 long-term bicycle spaces and 24 short-term bicycle spaces for the residential units, two long-term bicycle spaces and two short-term bicycle spaces for the limited service café (minimum requirement), and two long-term bicycle spaces and two short-term bicycle spaces for the office minimum requirement). In total the development is required to provide 148 bicycle parking spaces - 120 long-term and 28 short-term.

Since the project proposes to provide a total of 460 bicycle parking spaces, the municipal code requirements for quantity of bicycle parking are met as long as the breakdown of long-term and short-term spaces meet the requirements described previously.

The project will also provide an excess of 312 bicycle parking spaces; therefore, the project is allowed to reduce the vehicular parking space requirement by 5%.

On-Street Parking

Most streets in the project vicinity provide on-street parking on both sides of the roadway. **Figure 11** summarizes the parking conditions on the major streets in the vicinity of the site.

Metered parking is available on Broadway, between Coronado Avenue and Broadway Terrace, and College Avenue. Unmetered parking is available on Clifton Street, Broadway Terrace, other portions of Broadway, and various local streets.

Transportation Demand Management Plan

Per the City of Oakland Standard Conditions of Approval, all land use projects that generate more than 50 net new morning or evening peak hour vehicle trips must prepare a Transportation and Parking Demand Management (TDM) Plan. The following TDM Strategies are required under the *Transportation Impact Review Guidelines* (City of Oakland, 2017):

- Improvements to the existing bus stop located along the project frontage at the intersection of *Broadway/College Avenue*, including:
    - Construction of a bus boarding island with a concrete bus pad to allow buses to stop and board passengers without ever leading the travel lane. The existing bicycle lane would be relocated behind the boarding island.
    - Installation of a bus shelter to include benches, trash receptacles, and real-time transit information.

  The consultant recommends moving the bus stop to the stop bar once the project is constructed; the project will remove the existing driveway on Broadway.
- Installation of amenities consistent with the *Oakland Walks! Pedestrian Plan Update* (City of Oakland, 2017) including pedestrian-scale lighting, trees along the roadway, and public art.
- Construction of new sidewalks, curb ramps, curb, and gutter along the project frontage. Curb extensions should be constructed along the project frontage when feasible; construct curb extensions at the intersection of *Broadway/Clifton Street* and *Broadway/College Avenue*.
- Paving and restriping of roadway to midpoint of street sections adjacent to the project and to accommodate any improvements to improvement safety and site access for vehicles, bicycles, and pedestrians.
- Pedestrian crossing improvements at the intersection of *Broadway/College Avenue*, including:

  - Construction of curb extension at the crosswalk located along the project frontage;
  - Construction of raised median on Broadway between College Avenue and Broadway Terrace;
  - Realignment of the College Avenue approach to align orthogonally with Broadway and relocating the crosswalk to improve pedestrian visibility.
- Signal upgrades to the intersection of *Broadway/College Avenue* (assuming the signal infrastructure is older than 15 years), which could include upgrading existing signal equipment and poles to current standards; and
- Trenching and placement of conduit for providing traffic signal interconnect along Broadway if not already constructed.

In addition, the consultant recommends the following TDM measures:

- Inclusion of shower and locker facilities for employees who walk or bike to work;
- Free designated parking spaces for on-site car-sharing programs and/or car-sharing memberships for employees or tenants;
- Direct on-site sale of transit passes purchased and sold at a bulk rate (through programs such as AC Transit Easy Pass) and/or provision of a transit subsidy to residents;
- Distribution of information concerning alternative transportation options to residents and employees; and
- Unbundled parking for residents to separate the cost to rent a parking space from the cost to rent an apartment.

Projects that generate 100 or more net new morning or evening peak hour vehicle trips are required to submit an annual compliance report for the first five years following completion of the project. The annual report shall document the status and effectiveness of the TDM program, including the actual vehicle trip reduction achieved by the project during operation.

Potential Traffic Diversions onto Residential Streets Due to Broadway/Clifton Turn Restrictions

The project proposes to take all vehicular access from the Broadway and Clifton Street intersection, which provides access challenges due to the configuration of Broadway. Due to existing inadequate intersection spacing and other geometric issues, turn restrictions are proposed at the Broadway/Clifton intersection (Consultant Recommendation 2). If implemented, these turn restrictions will only allow access to Clifton Street via right turns in and right turns out. The restrictions would create the potential for traffic diversions onto neighborhood streets, namely

Thomas Avenue, Monroe Avenue, Manila Avenue, and Bryant Avenue. To evaluate these potential diversions, the following analysis was conducted:

- Weekday morning and evening peak hour turning movement counts were assembled for the Thomas Avenue/Broadway Terrace, Thomas Avenue/Monroe Avenue, Broadway/Monroe Avenue/Manila Avenue, Manila Avenue/Bryant Avenue and Bryant Avenue/College Avenue intersections. Intersection movement counts were collected using StreetLight Data, with data from Fall 2019 being used as the basis of the counts (current manual turning movement counts were not collected due to the on-going Covid-19 pandemic).
- Potential travel diversions onto local area streets as a result of the turn restrictions at Broadway/Clifton Street were estimated. The anticipated project trip distribution from was used to estimate potential trip diversions onto local area streets along with vehicular travel time runs conducted on potential routes of travel.
- Existing peak hour levels of service at the five intersections listed above were calculated using the methodology set forth in the Transportation Research Board's Highway Capacity Manual.

Potential Traffic Diversions

Table 16 presents the estimated weekday morning and evening peak hour traffic that may choose to divert onto Thomas Avenue, Monroe Avenue, Manila Avenue, and Bryant Avenue. Estimates were developed by calculating travel times on alternative routes from the Broadway/Broadway Terrace intersection to where project trips are likely to be distributed. As an example, trips that want to turn left out of the project site and travel south on Broadway would have options to complete their trip with this turn being prohibited. Options for restricted outbound left turn movements include:

- Turn right onto Broadway Terrace, left on Thomas Avenue, left on Monroe Avenue, and left back onto Broadway.
- Turn right onto Broadway, left onto Manila Avenue, left onto Bryant Avenue, left onto College Avenue, and back onto Broadway.
- Trips heading toward SR-24, 51st Street, and the City of Berkeley are considered unlikely to use Thomas Avenue or Monroe Avenue, and instead could travel eastbound down Broadway before turning onto left onto Manila Avenue, depending on their ultimate destination. Many of these trips would choose to continue to travel northbound down Broadway to complete their trip via SR-24.
- Trips destined for northbound College Avenue would likely use Broadway to Manila Avenue before turning right onto College Avenue.

Options for restricted inbound left turn movements include:

- Most inbound left turn movements would adjust their paths of travel to arrive from the south on Broadway. As the majority of vehicle trips generated by the project are expected to be residents who would be knowledgeable of turn restrictions, this is considered to be the most likely outcome.
- Trips arriving from the east on Broadway could choose to make a legal u-turn at the Broadway/51st Street intersection to complete their right turn movement into the project site. This would be the quickest path of travel for a restricted inbound left turn movement.

Table 16 presents the maximum anticipated weekday peak hour diversions of traffic onto local neighborhood streets associated with the left turn restrictions.

Table 16: Weekday Peak Hour Potential Neighborhood Traffic Diversions

Roadway	Morning Peak Hour	Evening Peak Hour
Thomas Avenue	30	40
Monroe Avenue	30	40
Manila Avenue	50	60
Bryant Avenue	40	50

Source: Fehr & Peers, 2020.

Intersection Levels of Service

Table 17 summarizes morning and evening peak hour vehicle delay for existing conditions and existing plus project reflecting the maximum anticipated trip diversions for the five intersections mentioned above. The roadway operations analysis indicates that the proposed project is unlikely to degrade intersection operations or contribute to an increase in vehicle delays. All intersections are expected to function at Levels of Service A or B which is indicative of traffic conditions with low levels of vehicle delay.

Table 17: Weekday Peak Hour LOS with Potential Trip Diversions (Due to Left Turn Restrictions at Broadway/Clifton)

Intersection		Control	AM Peak Hour				PM Peak Hour			
			Existing without Project		Existing with Project Mitigation		Existing without Project		Existing with Project Mitigation	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Thomas Avenue/Broadway Terrace	SSSC	1.3 (12.7)	A (B)	1.6 (13)	A (B)	0.8 (11.6)	A (B)	1.1 (12.4)	A (B)
2	Thomas Avenue/Monroe Avenue	SSSC	1.7 (9.5)	A (A)	2.6 (9.9)	A (A)	1.5 (10.5)	A (B)	2.5(11)	A (B)
3	Broadway/Manila Avenue	Signal	8.8	A	9.3	A	10.6	B	11	B
4	Bryant Avenue/Manila Avenue	SSSC	3.2 (9.4)	A (A)	3.5 (9.5)	A (A)	2.4 (9.8)	A(A)	2.5 (10.1)	A (B)
5	Bryant Avenue/College Avenue	SSSC	1.5 (14.4)	A (B)	2.2 (15.5)	A (C)	0.9 (14)	A (B)	1.7 (17.5)	A(C)

Notes:
SSSC = side street stop-controlled intersection; average delay or LOS is followed by the delay or LOS for the worst movement in parentheses. Delay reported in seconds per vehicle.
Source: Fehr & Peers, 2020.

Alameda County Transportation Commission Roadway Analysis

A separate analysis of regional roadway was prepared to comply with the requirements of the Alameda County Transportation Commission (Alameda CTC). The Alameda CTC requires the analysis of project impacts to Metropolitan Transportation System (MTS) roadways identified in the congestion management plan (CMP) for development projects that would generate more than 100 PM peak hour trips. As shown in earlier sections, the proposed project would generate more than 100 PM peak hour trips.

This section outlines this roadway analysis, which considers the potential effect of the project on freeways, major arterials, and other major roadways as designated by Alameda CTC. Main items of discussion include the geographic scope of the Alameda CTC roadway analysis, the analysis method, and the results for 2020 and 2040.

Alameda CTC Roadway Analysis Study Area

The following freeway and surface street segments in Oakland were included in this analysis:

1. SR-13 from south of the SR-24 interchange to the I-580 interchange (6 segments)
2. SR-24 from east of the I-580 interchange to west of Broadway (4 segments)
3. Broadway from east of 27th Street to west of Keith Avenue (5 segments)
4. Claremont Avenue from north of Telegraph Avenue to South of College Avenue (5 segments)
5. Grand Avenue from east of MacArthur Boulevard to west of Oakland Avenue (4 segments)

Traffic Forecasts

The Alameda Countywide Travel Demand Model was used to forecast 2020 and 2040 traffic volumes on the MTS roadway system. The forecasts for the MTS system differ from the intersection forecasts previously discussed in the following aspects:

- Regional model may not include some minor streets, potentially overstating traffic volumes on the roadways included in the model.
- The MTS roadway analysis reports the outputs of the Alameda CTC model directly on a roadway segment level and the analysis does not consider the added capacity from turn pockets at intersections.

The results of the Alameda CTC model were used to forecast the No Project condition for 2020 and 2040. Project trips were distributed to the MTS roadway segments (including both freeways and surface streets) identified above using the project trip distribution presented in earlier sections. The distribution of project trips onto the MTS segments results in the Project volumes for 2020 and 2040.

Analysis Method

Operations of the MTS freeway and surface street segments were assessed based on volume-to-capacity (V/C) ratios. For freeway segments, a per-lane capacity of 2,000 vehicles per hour was used. For surface streets, a per-lane capacity of 800 vehicles per hour was used. These capacities do not reflect additional capacity provided at intersections through turn pockets. Roadway segments with a V/C ratio greater than 1.0 are assigned LOS F.

Performance Criteria

Alameda CTC strives to maintain the performance of the MTS roadway network. Performance issues related to Alameda CTC policy may arise if the project results in the following:

- The addition of project traffic causes a segment's operation to degrade to LOS F.
- The addition of project trips causes the V/C ratio to increase by 0.02 or more on a segment that already operates at LOS F without the project traffic.

Analysis Results

The MTS PM Peak Hour roadway segment analysis under 2020 and 2040 conditions are provided in **Attachment E**.

Results of the 2020 analysis indicate that the proposed project would not degrade roadway segments to unacceptable levels, nor do any of the roadway segments operate below a LOS E.

In 2040, the addition of project trips would not degrade roadway segments to unacceptable levels. SR-13 southbound between Broadway Terrace and Moraga Avenue is projected to operate at a LOS F. However, project trips would only result in a 0.0012 increase in the V/C ratio on that segment, well below the 0.02 threshold. The 2040 roadway segment analysis indicates that the proposed project would not result in any policy violations on the roadway segments analyzed.

Conclusions

This completes our traffic analysis, site plan assessment, collision analysis, and a transportation and parking demand management plan for the proposed mixed-use development at the current California College of the Arts (CCA) campus located at the southeast corner of the Broadway/Clifton Street intersection in Oakland, California. Please call Bill at (510) 834-3200 with questions.

Attachments:

Figure 1	Project Site Vicinity
Figure 2	Project Trip Assignment
Figure 3	Existing Conditions Peak Hour Intersection Traffic Volumes
Figure 4	Existing Peak Hour Bicycle and Pedestrian Volumes
Figure 5	Existing with Project Conditions Peak Hour Intersection Traffic Volumes
Figure 6	Cumulative without Conditions Peak Hour Intersection Traffic Volumes
Figure 7	Cumulative with Project Conditions Peak Hour Intersection Traffic Volumes

Project Site # Study Intersection

Figure 1

Transportation Study Area

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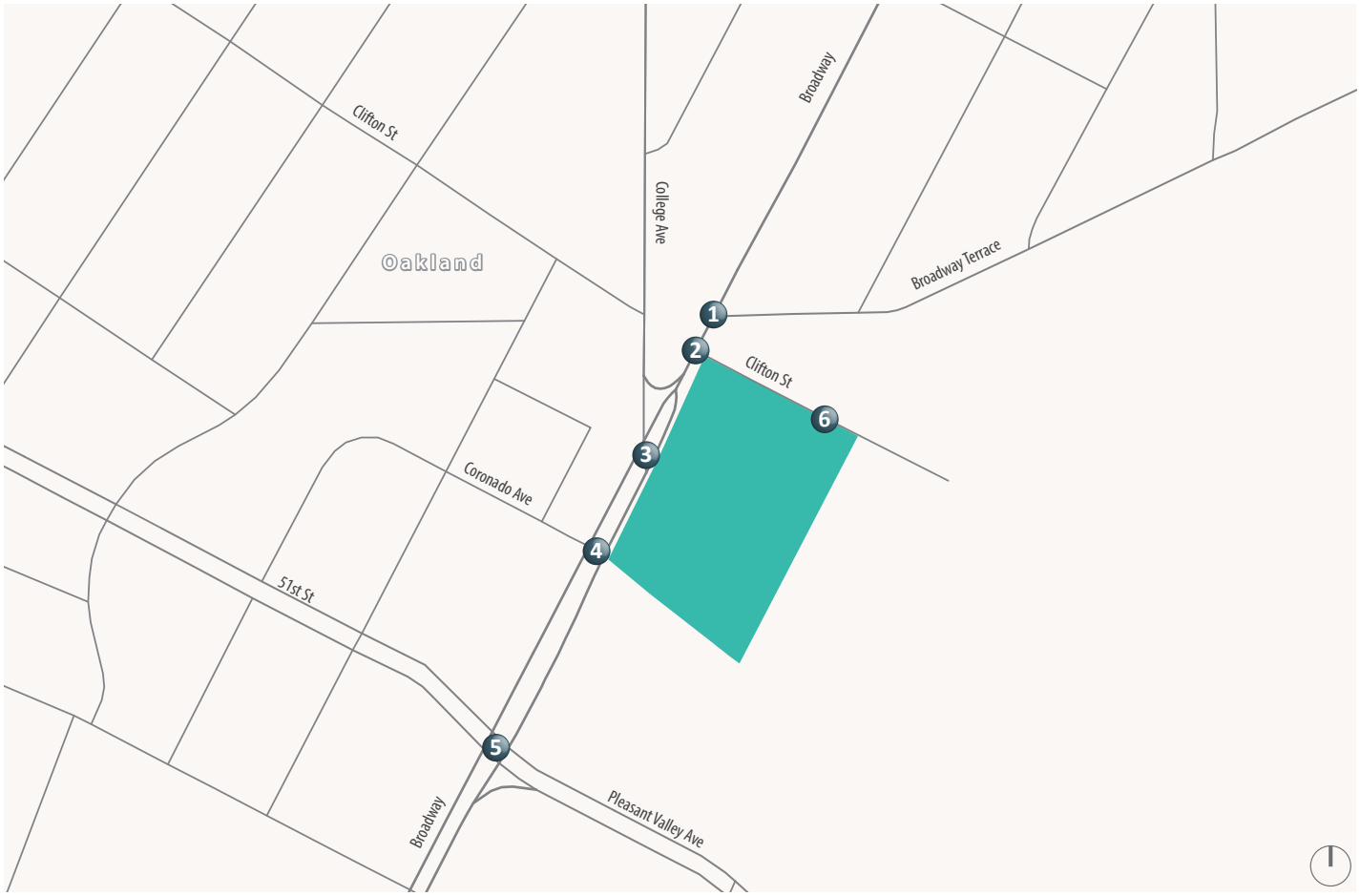
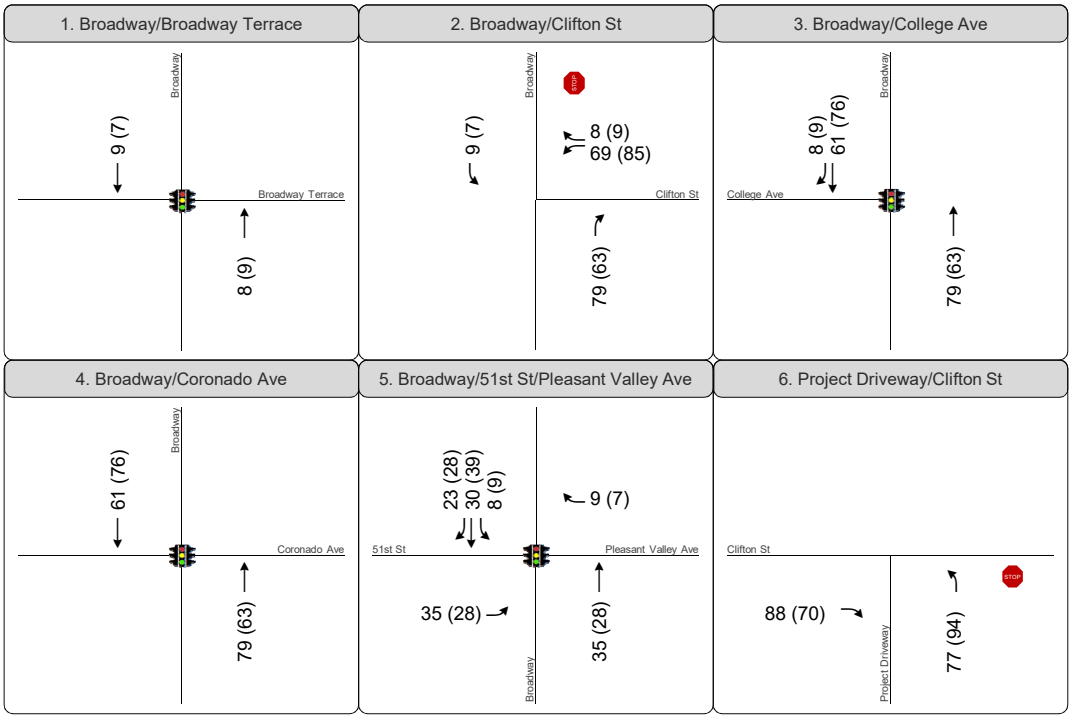




XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

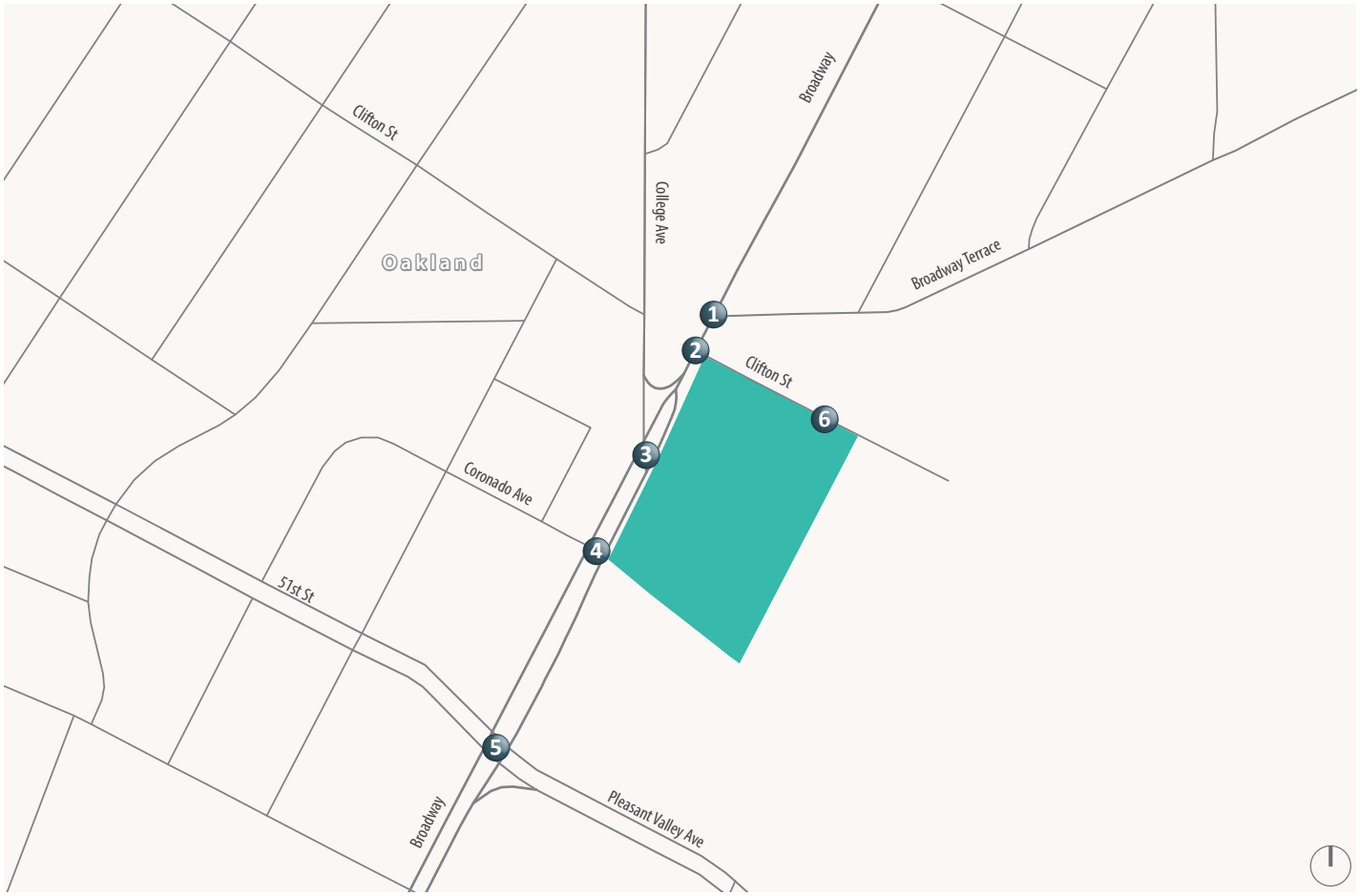
Stop Sign

Project Site

Study Intersection

Figure 2

Project Trip Assignment



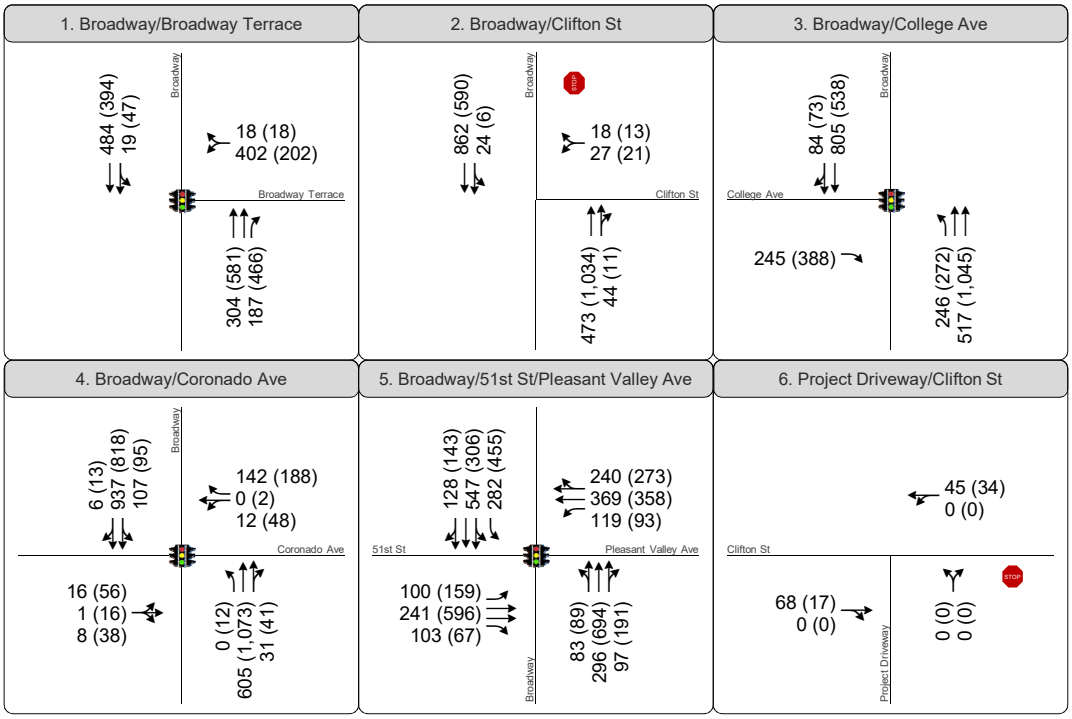
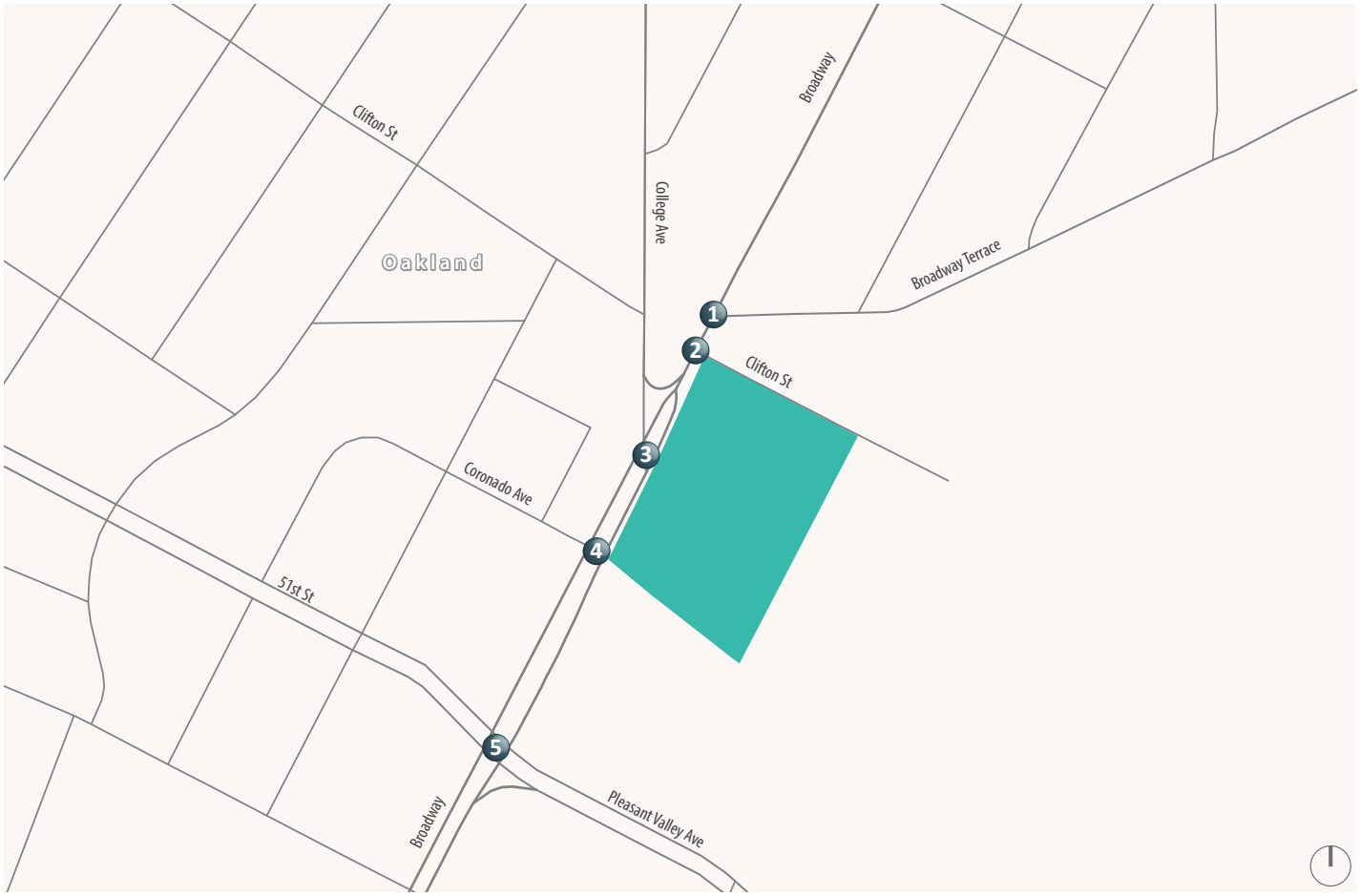


Figure 3

Existing Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls



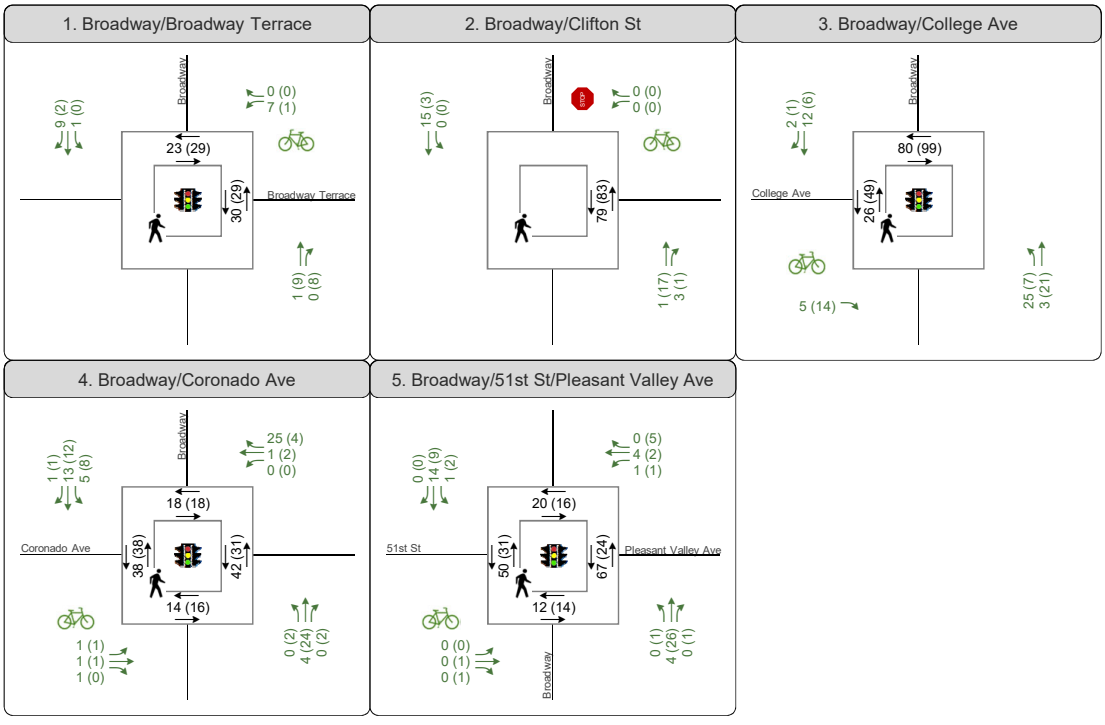
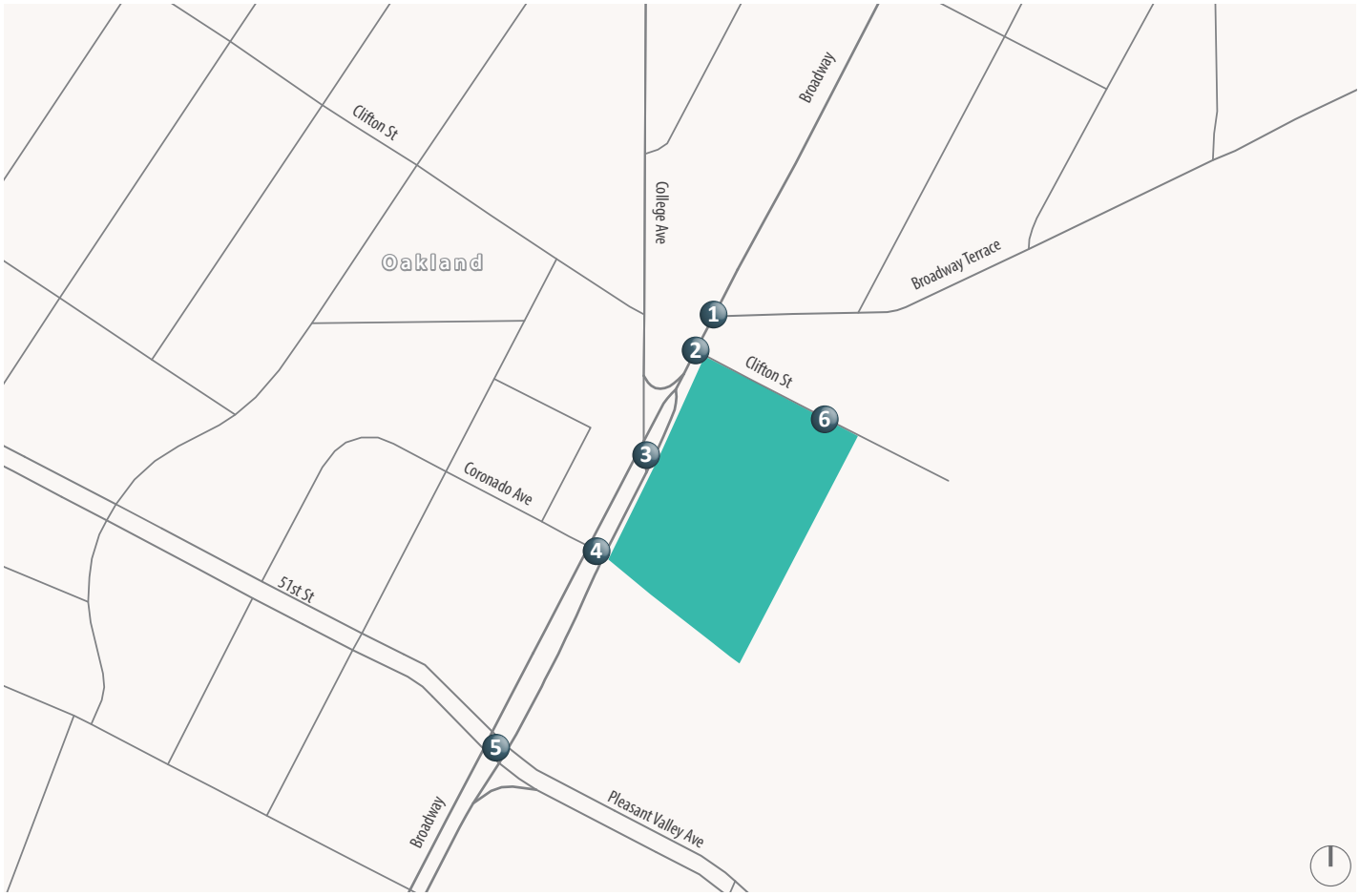


Figure 4

Existing Peak Hour Bicycle and Pedestrian Volumes



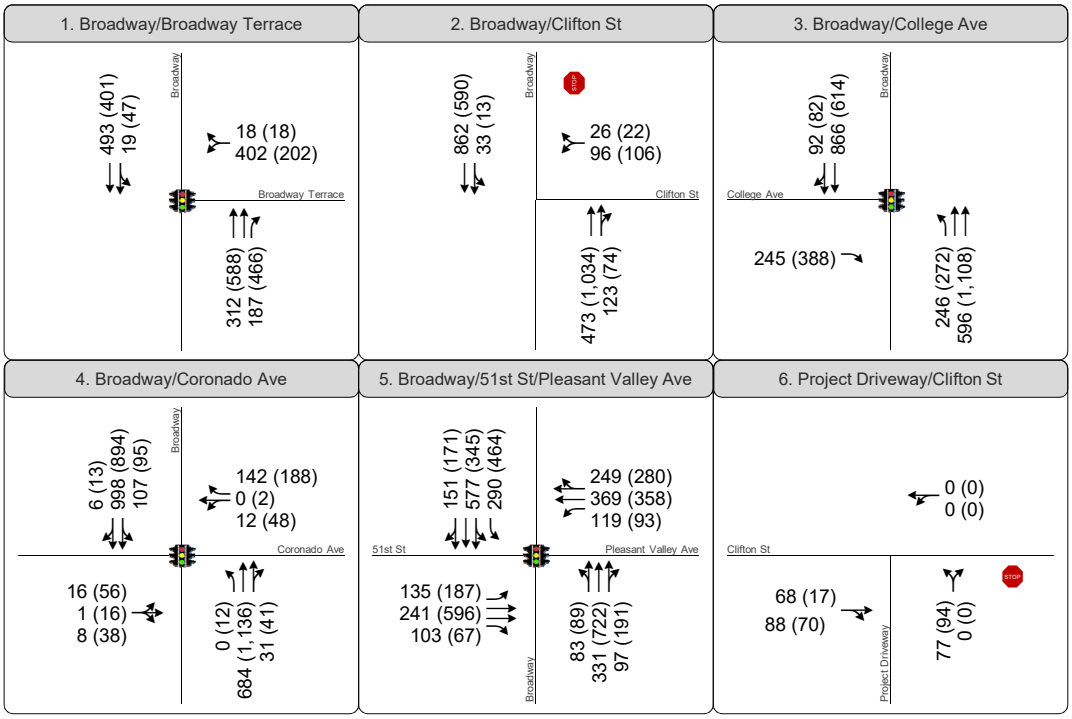
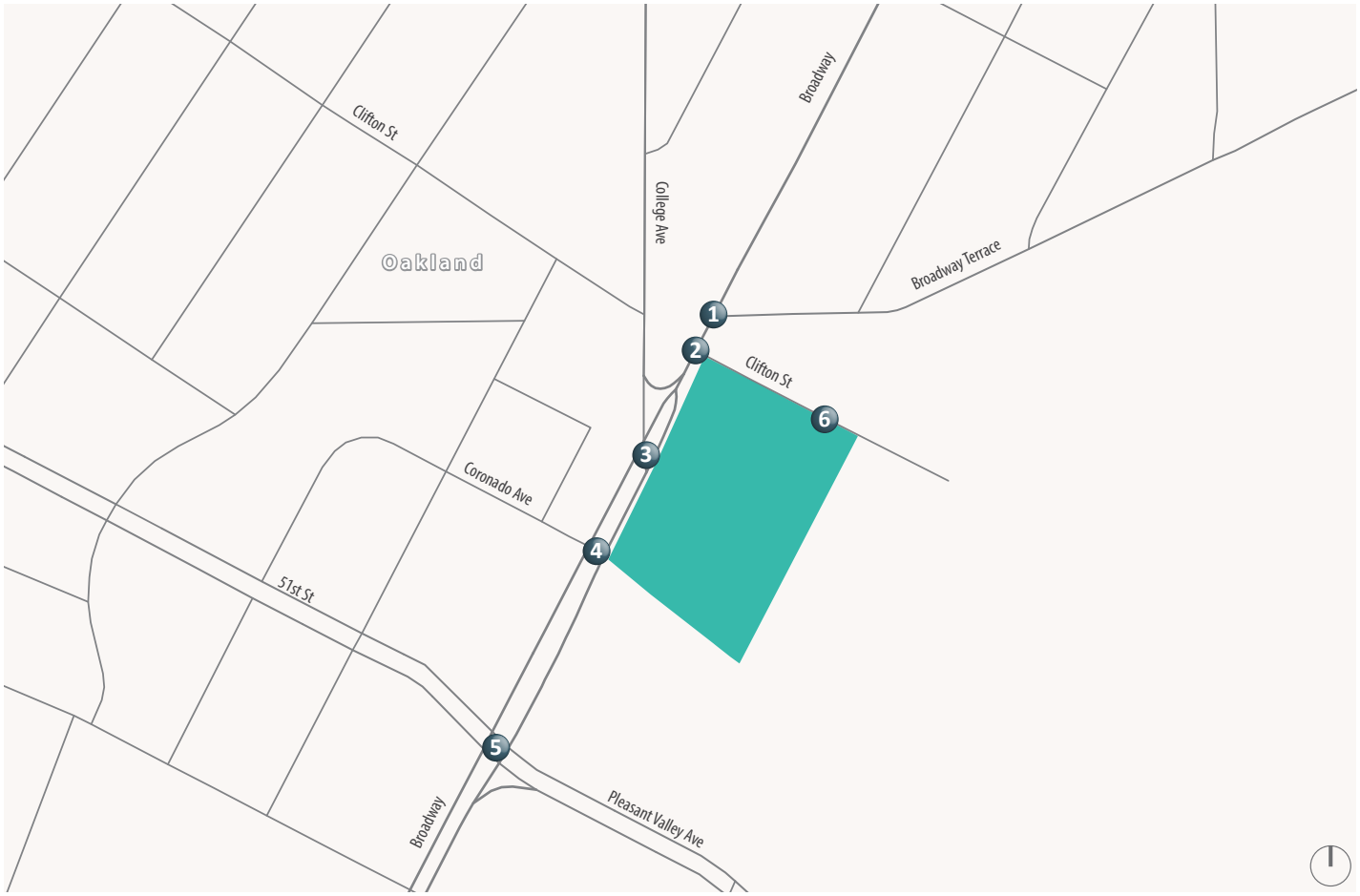


Figure 5

Existing with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls



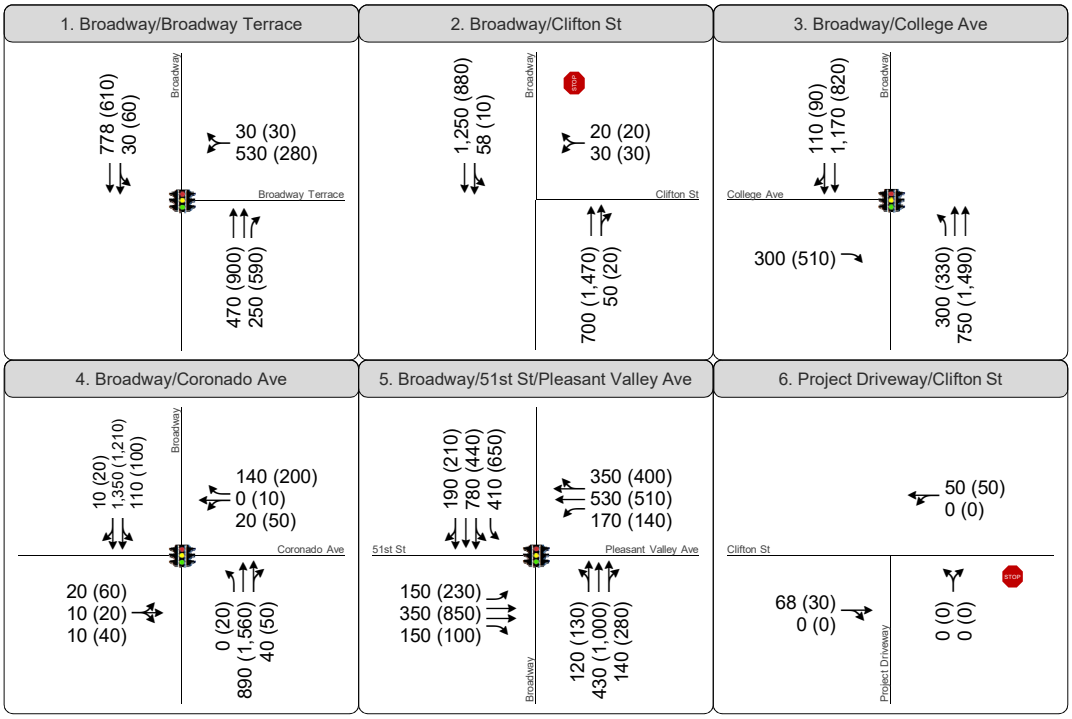


Figure 6

Cumulative without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

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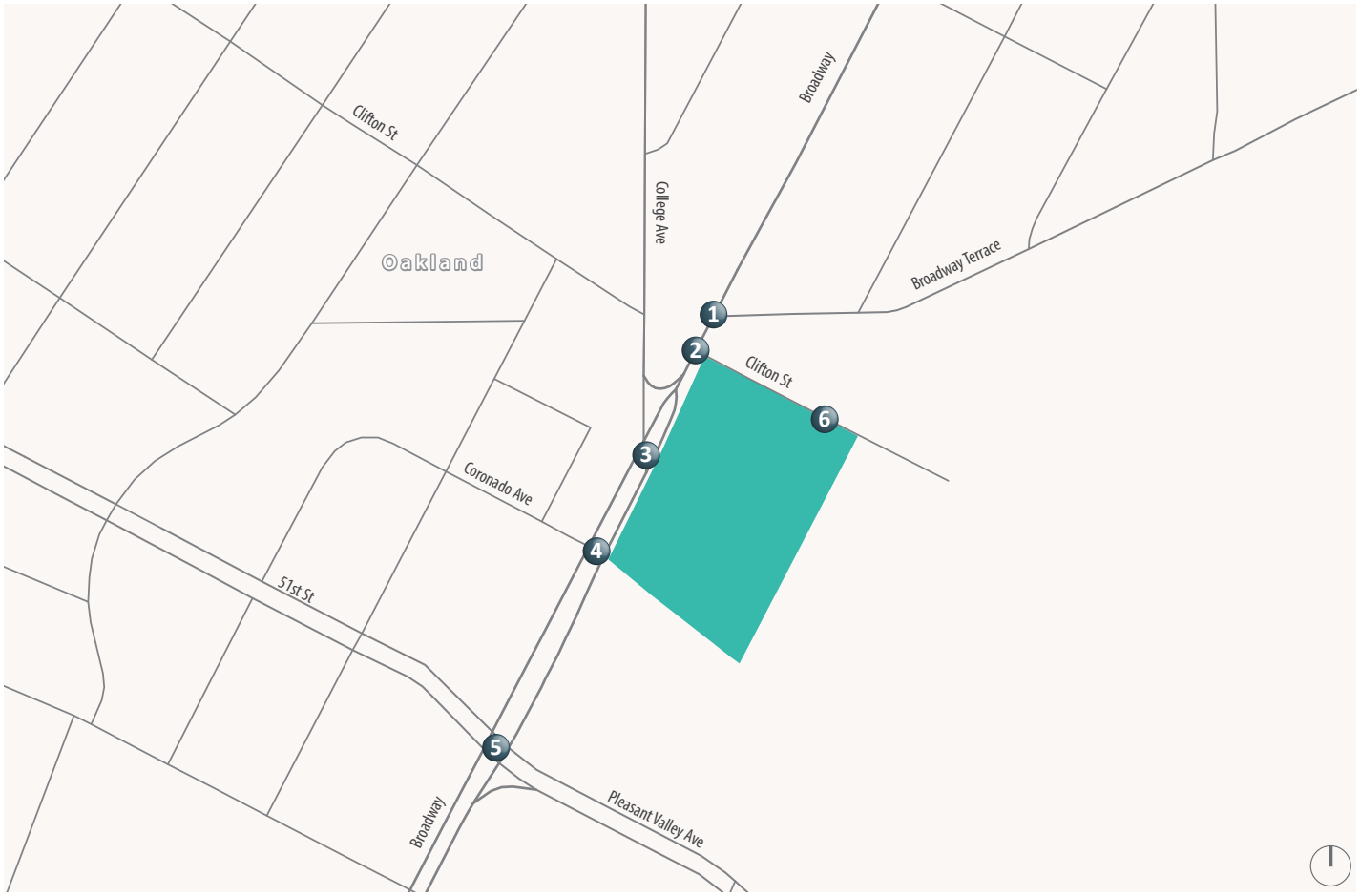


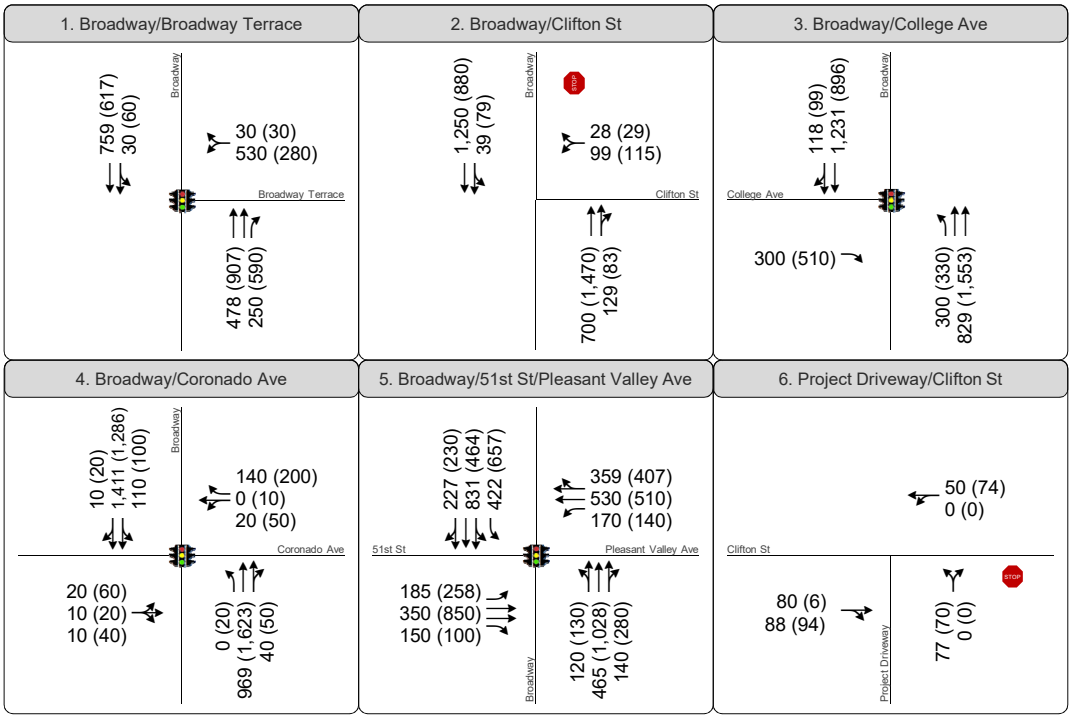
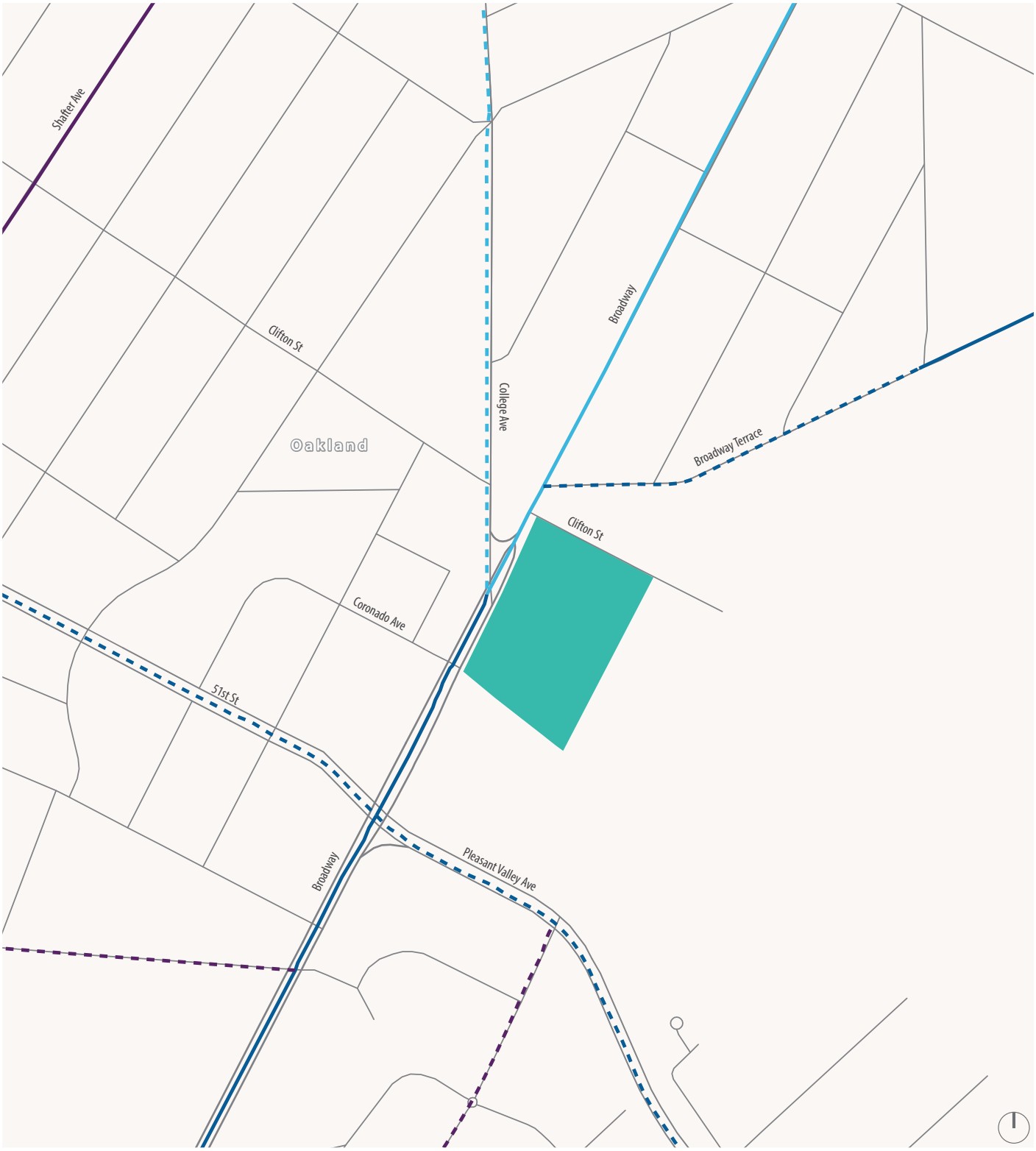


Figure 7

Cumulative with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

Figure 8

Pedestrian Facilities



Source: Oakland Bicycle Master Plan

Project Site

Existing	***Proposed***	
		Bike Path
		Protected Bike Lane
		Buffered Bike lane
		Bike Lane
		Neighborhood Bike Route
		Bike Route

Figure 9

Existing and Planned Bicycle Facilities

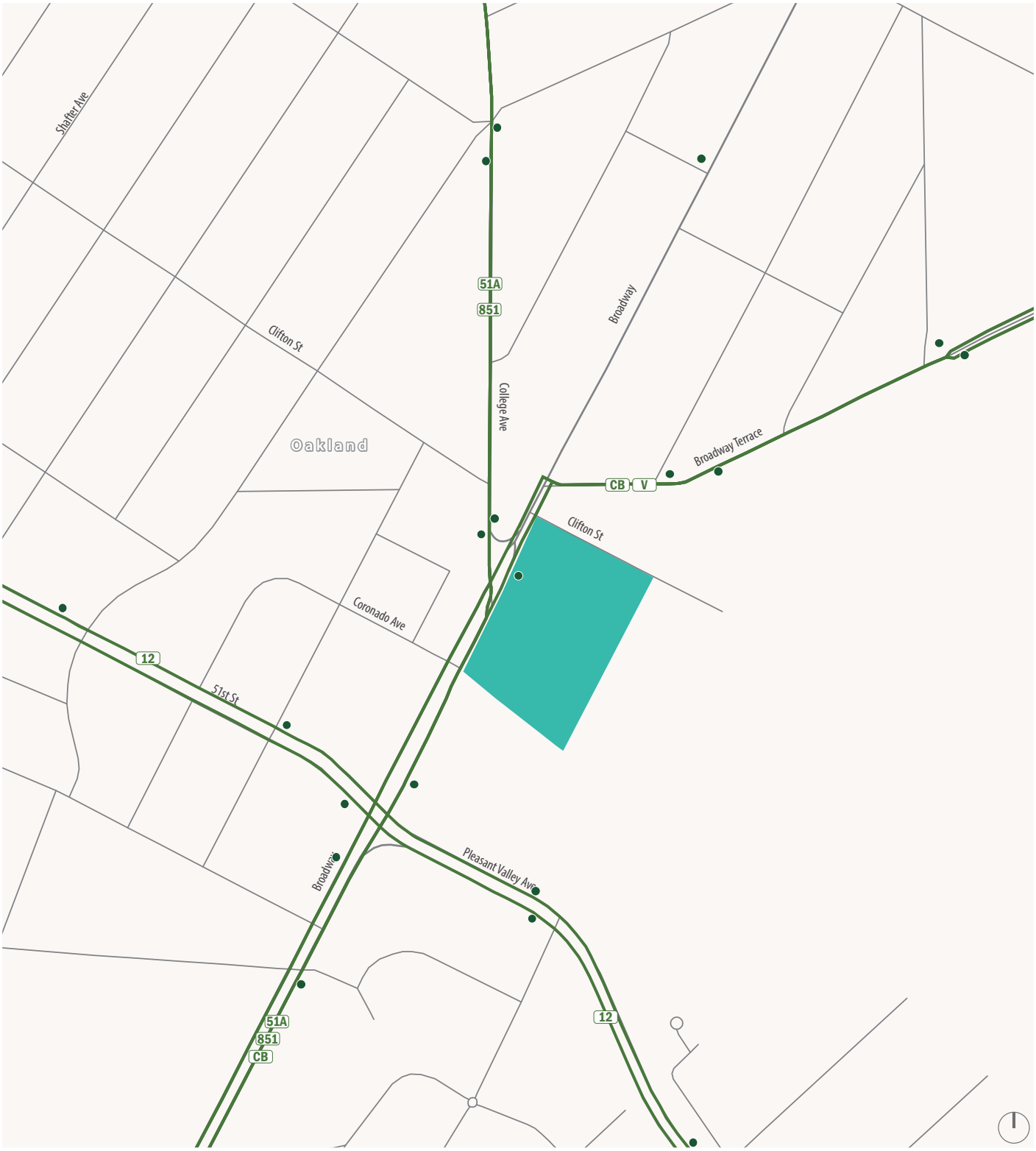


Figure 10

Existing Transit Service Near Site

Figure 11

Parking Conditions on Major Streets

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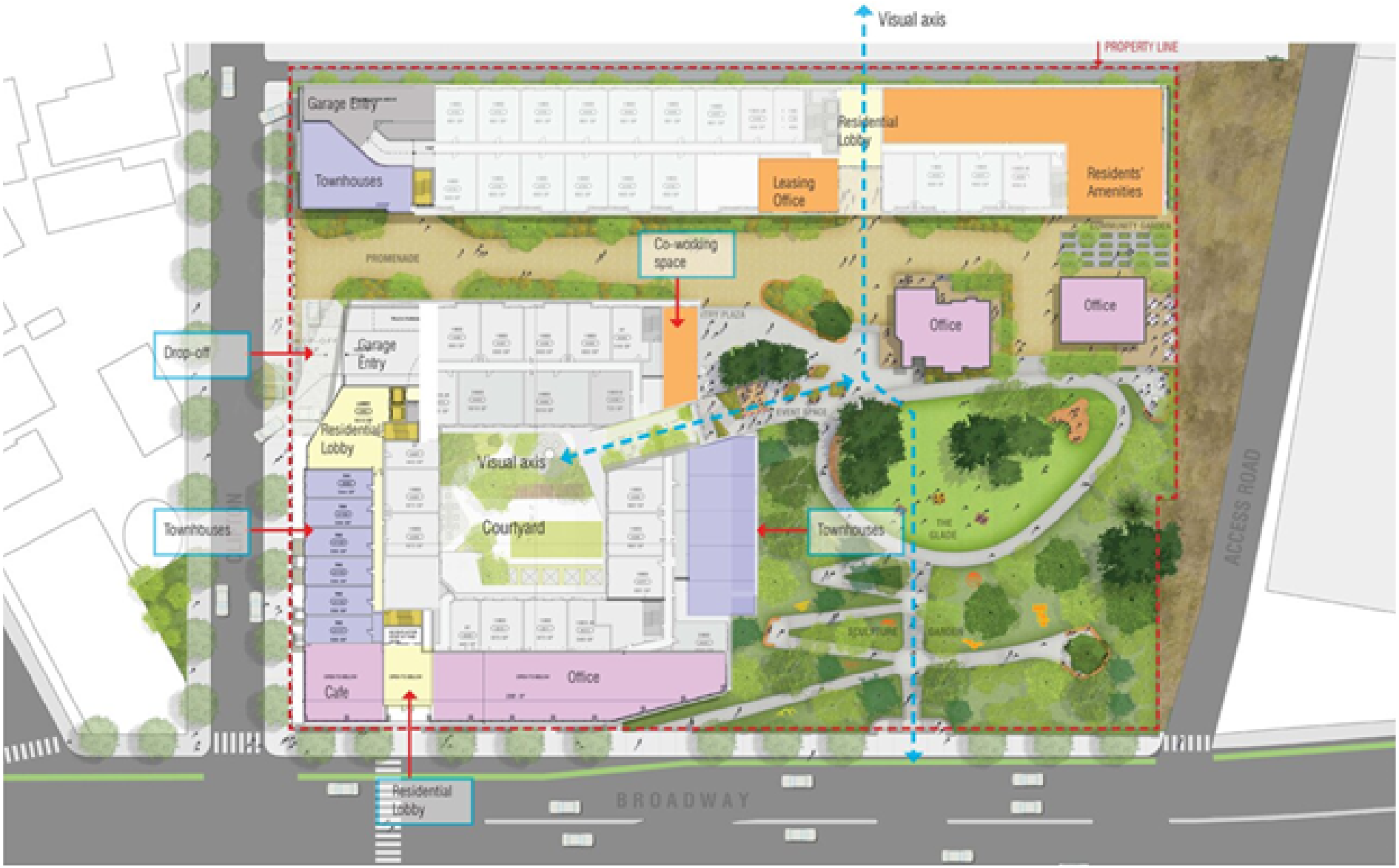
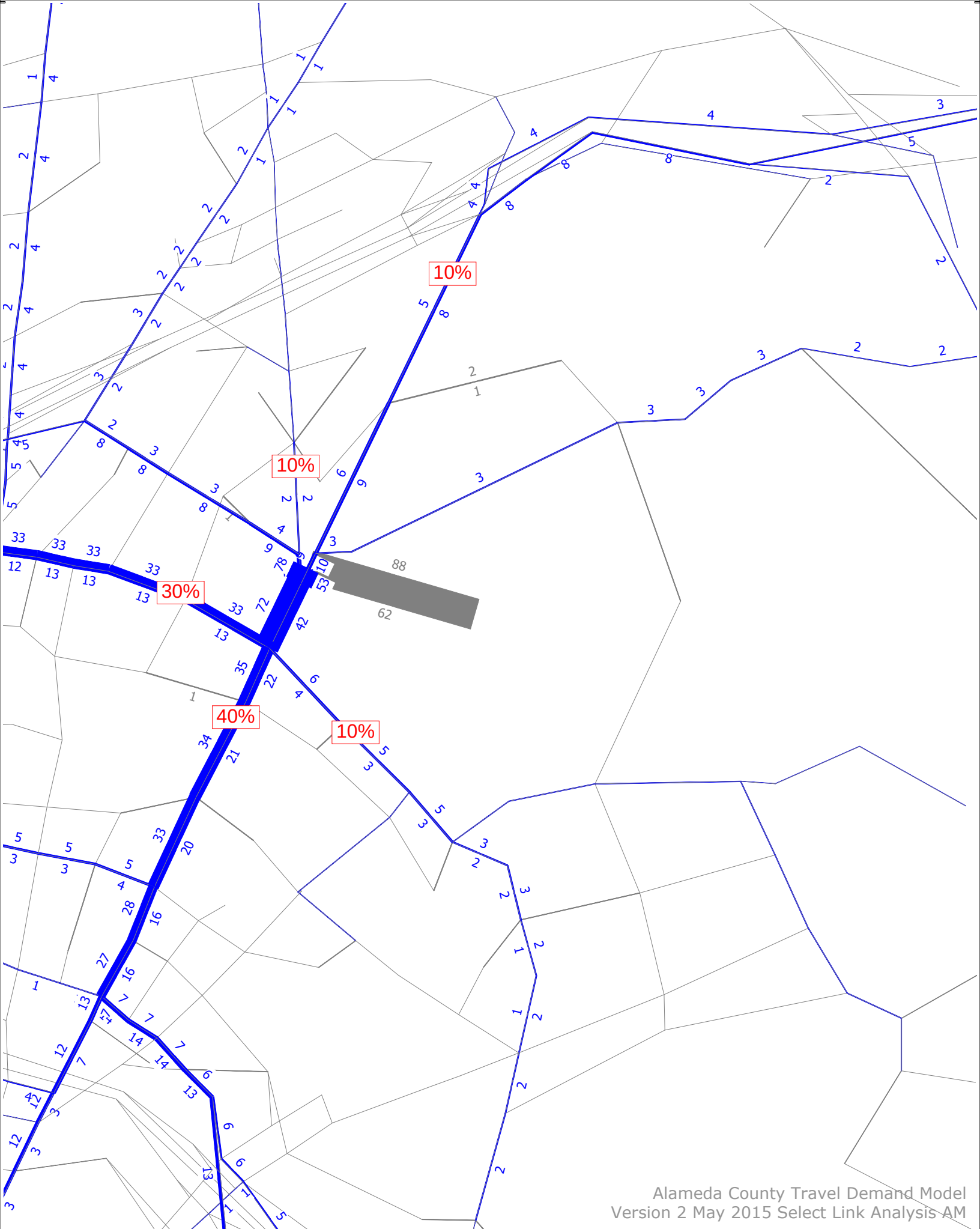
Attachment A –
CCA Oakland Conceptual Site Plan



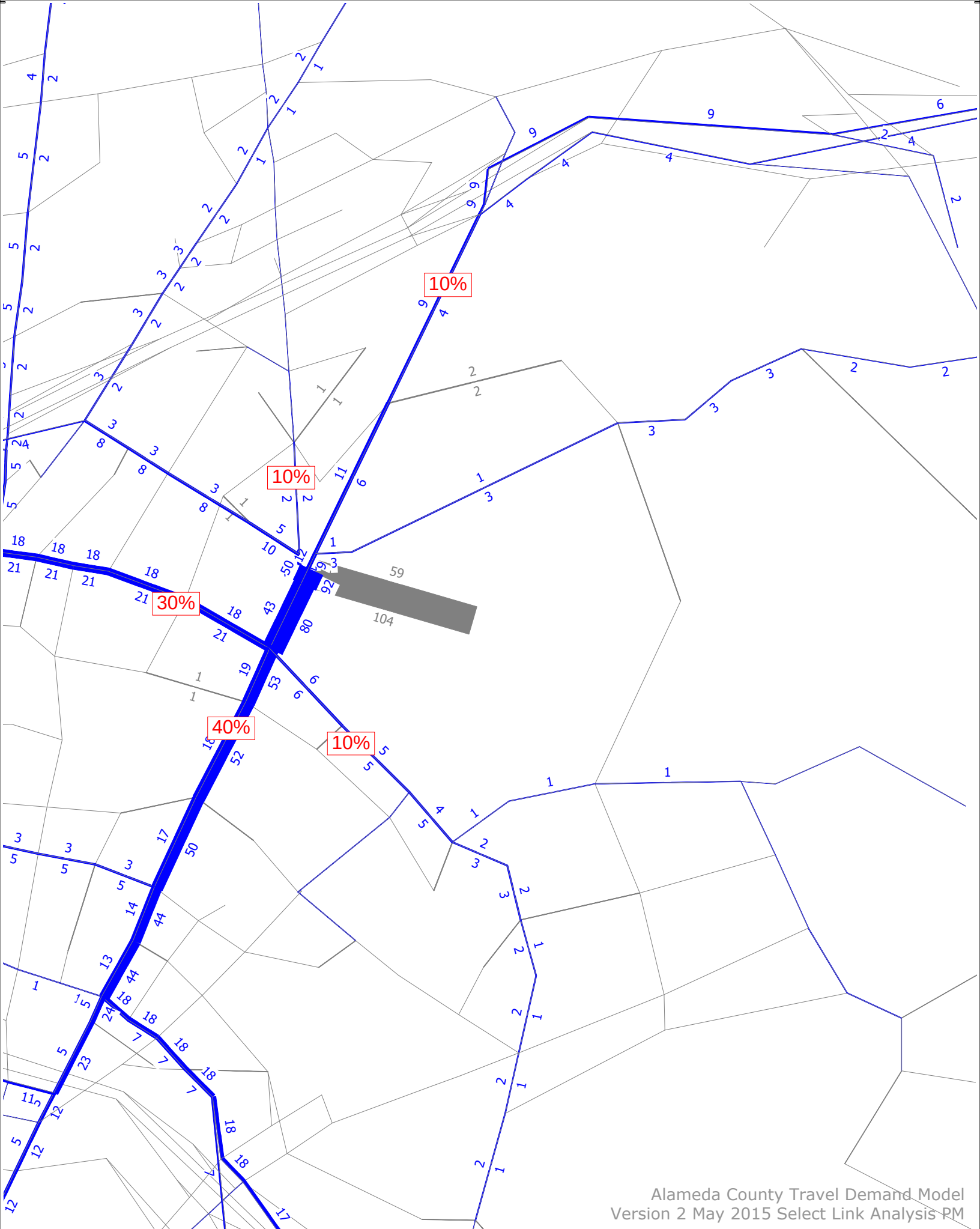
Attachment A

Site Plan

Attachment B –
Project Trip Distribution



Alameda County Travel Demand Model
Version 2 May 2015 Select Link Analysis AM



Alameda County Travel Demand Model
Version 2 May 2015 Select Link Analysis PM

Attachment C –
Traffic Simulation Results

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing No Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	304	326	107.3%	10.7	0.8	B
	Right Turn	187	189	101.1%	3.5	0.3	A
	Subtotal	491	515	104.9%	8.1	0.8	A
SB	Left Turn	19	21	109.5%	13.0	6.5	B
	Through	484	472	97.6%	10.1	3.1	B
	Right Turn						
	Subtotal	503	493	98.0%	10.3	3.2	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	402	412	102.4%	24.2	13.0	C
	Through						
	Right Turn	18	21	115.0%	24.3	11.2	C
	Subtotal	420	433	103.0%	24.2	12.8	C
Total		1,414	1,441	101.9%	13.7	5.3	B

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	473	494	104.5%	6.6	1.3	A
	Right Turn	44	51	115.2%	4.1	1.1	A
	Subtotal	517	545	105.4%	6.4	1.2	A
SB	Left Turn	24	23	95.0%	5.5	3.4	A
	Through	862	861	99.8%	2.8	1.0	A
	Right Turn						
	Subtotal	886	883	99.7%	2.9	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	27	25	93.3%	18.6	7.4	C
	Through						
	Right Turn	18	20	113.3%	10.7	8.5	B
	Subtotal	45	46	101.3%	15.4	8.1	C
Total		1,448	1,474	101.8%	4.6	0.8	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	246	249	101.2%	14.7	1.8	B
	Through	517	546	105.6%	10.2	1.4	B
	Right Turn						
	Subtotal	763	795	104.2%	11.6	1.2	B
SB	Left Turn						
	Through	805	799	99.3%	13.4	3.2	B
	Right Turn	84	88	104.4%	2.9	0.8	A
	Subtotal	889	887	99.7%	12.4	3.0	B
EB	Left Turn						
	Through						
	Right Turn	245	241	98.4%	16.5	2.7	B
	Subtotal	245	241	98.4%	16.5	2.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,897	1,923	101.4%	12.6	1.5	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	605	632	104.4%	7.4	1.5	A
	Right Turn	31	32	101.9%	8.1	5.6	A
	Subtotal	636	663	104.3%	7.4	1.5	A
SB	Left Turn	107	106	98.8%	26.8	8.2	C
	Through	937	929	99.1%	14.0	2.7	B
	Right Turn	6	7	115.0%	8.6	9.4	A
	Subtotal	1,050	1,041	99.2%	15.3	2.9	B
EB	Left Turn	16	18	111.9%	26.3	8.0	C
	Through	1	1	140.0%	8.6	16.7	A
	Right Turn	8	10	118.8%	20.0	21.6	B
	Subtotal	25	29	115.2%	21.4	7.9	C
WB	Left Turn	12	11	90.8%	26.4	17.2	C
	Through						
	Right Turn	142	149	104.6%	9.1	2.2	A
	Subtotal	154	159	103.5%	10.2	2.3	B
Total		1,865	1,893	101.5%	12.2	1.6	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing No Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	83	83	100.5%	45.5	5.3	D
	Through	296	307	103.6%	46.8	5.5	D
	Right Turn	97	100	103.2%	3.2	0.5	A
	Subtotal	476	490	103.0%	38.0	3.2	D
SB	Left Turn	282	277	98.1%	45.6	7.1	D
	Through	547	529	96.7%	43.0	2.7	D
	Right Turn	128	128	99.8%	27.8	9.1	C
	Subtotal	957	934	97.6%	41.4	1.8	D
EB	Left Turn	100	110	109.9%	72.8	5.4	E
	Through	241	239	99.3%	42.5	4.6	D
	Right Turn	103	104	101.1%	9.0	4.4	A
	Subtotal	444	453	102.1%	43.5	4.2	D
WB	Left Turn	119	117	98.6%	76.3	7.3	E
	Through	369	379	102.7%	47.3	5.4	D
	Right Turn	240	246	102.4%	35.8	4.5	D
	Subtotal	728	742	101.9%	48.4	3.3	D
Total		2,605	2,619	100.5%	43.2	1.5	D

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	58	116	132	73	106
Average Queue (ft)	28	33	55	36	35
95th Queue (ft)	55	95	127	79	90
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	2	0	1	8	7
Queuing Penalty (veh)	1	1	3	36	32
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing No Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	581	575	99.0%	7.7	1.0	A
	Right Turn	466	475	101.9%	3.9	0.3	A
	Subtotal	1,047	1,050	100.3%	6.0	0.6	A
SB	Left Turn	47	46	97.9%	20.8	10.4	C
	Through	394	394	100.0%	10.3	7.7	B
	Right Turn						
	Subtotal	441	440	99.8%	11.5	7.8	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	202	204	101.0%	16.8	3.0	B
	Through						
	Right Turn	18	20	110.0%	16.6	7.2	B
	Subtotal	220	224	101.7%	16.7	3.1	B
Total		1,708	1,714	100.3%	8.7	2.3	A

Intersection 2 **Broadway/Clifton** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,034	1,037	100.3%	9.4	1.1	A
	Right Turn	11	12	110.0%	5.8	5.0	A
	Subtotal	1,045	1,049	100.4%	9.4	1.1	A
SB	Left Turn	6	5	81.7%	8.8	8.5	A
	Through	590	593	100.4%	4.2	3.9	A
	Right Turn						
	Subtotal	596	597	100.2%	4.2	3.9	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	21	22	102.9%	24.0	11.0	C
	Through						
	Right Turn	13	12	89.2%	26.8	36.0	D
	Subtotal	34	33	97.6%	24.5	12.8	C
Total		1,675	1,680	100.3%	8.0	1.5	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	272	280	102.8%	21.2	2.7	C
	Through	1,045	1,049	100.4%	13.8	2.1	B
	Right Turn						
	Subtotal	1,317	1,329	100.9%	15.3	1.9	B
SB	Left Turn						
	Through	538	544	101.0%	20.8	9.6	C
	Right Turn	73	72	98.6%	3.5	2.2	A
	Subtotal	611	616	100.7%	19.0	9.2	B
EB	Left Turn						
	Through						
	Right Turn	388	385	99.1%	22.0	3.8	C
	Subtotal	388	385	99.1%	22.0	3.8	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,316	2,329	100.6%	17.3	2.3	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	12	103.3%	78.4	26.4	E
	Through	1,073	1,092	101.8%	17.4	4.2	B
	Right Turn	41	40	98.5%	18.3	8.4	B
	Subtotal	1,126	1,145	101.7%	18.0	4.1	B
SB	Left Turn	95	96	101.2%	56.8	16.2	E
	Through	818	822	100.5%	20.1	3.2	C
	Right Turn	13	12	90.8%	12.3	12.0	B
	Subtotal	926	930	100.5%	23.9	4.0	C
EB	Left Turn	56	54	96.1%	38.9	10.4	D
	Through	16	15	95.0%	35.0	13.2	D
	Right Turn	38	43	112.4%	23.8	11.7	C
	Subtotal	110	112	101.5%	33.2	8.2	C
WB	Left Turn	48	52	109.2%	27.3	6.5	C
	Through	2	3	125.0%	12.1	18.1	B
	Right Turn	188	182	96.6%	27.3	15.2	C
	Subtotal	238	237	99.4%	26.9	11.9	C
Total		2,400	2,423	101.0%	21.8	3.8	C

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing No Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	89	87	97.9%	67.5	7.5	E
	Through	694	702	101.1%	65.7	9.6	E
	Right Turn	191	190	99.4%	23.1	13.4	C
	Subtotal	974	979	100.5%	58.0	8.9	E
SB	Left Turn	455	469	103.0%	47.6	2.9	D
	Through	306	307	100.5%	47.1	1.7	D
	Right Turn	143	144	100.8%	25.1	8.4	C
	Subtotal	904	920	101.8%	43.5	2.5	D
EB	Left Turn	159	161	101.0%	100.1	14.9	F
	Through	596	587	98.5%	44.4	3.6	D
	Right Turn	67	67	99.7%	22.4	11.8	C
	Subtotal	822	815	99.1%	54.9	4.8	D
WB	Left Turn	93	88	95.1%	71.4	10.7	E
	Through	358	359	100.2%	49.2	5.9	D
	Right Turn	273	276	101.1%	35.8	11.5	D
	Subtotal	724	723	99.9%	46.7	6.4	D
Total		3,424	3,437	100.4%	51.3	3.6	D

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	54	139	155	78	100
Average Queue (ft)	25	94	117	27	31
95th Queue (ft)	54	159	161	76	87
Link Distance (ft)	54	122	122	49	49
Upstream Blk Time (%)	3	4	8	7	8
Queuing Penalty (veh)	1	23	41	22	23
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	312	307	98.5%	10.1	1.5	B
	Right Turn	187	188	100.6%	3.5	0.5	A
	Subtotal	499	496	99.3%	7.6	1.0	A
SB	Left Turn	19	18	96.8%	17.8	11.4	B
	Through	493	477	96.8%	13.6	6.7	B
	Right Turn						
	Subtotal	512	496	96.8%	13.7	6.8	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	402	400	99.4%	39.9	41.6	D
	Through						
	Right Turn	18	19	107.8%	36.7	47.5	D
	Subtotal	420	419	99.8%	39.8	41.8	D
Total		1,431	1,410	98.5%	19.6	14.7	B

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	473	468	98.9%	5.5	1.2	A
	Right Turn	123	122	98.8%	3.1	1.2	A
	Subtotal	596	589	98.9%	5.0	1.2	A
SB	Left Turn	33	33	98.5%	6.7	3.6	A
	Through	862	844	97.9%	3.6	1.9	A
	Right Turn						
	Subtotal	895	877	98.0%	3.7	2.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	96	91	94.5%	24.1	9.4	C
	Through						
	Right Turn	26	30	115.8%	12.7	6.3	B
	Subtotal	122	121	99.0%	21.2	8.3	C
Total		1,613	1,587	98.4%	5.6	1.8	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	246	245	99.7%	19.8	2.2	B
	Through	596	591	99.1%	9.5	1.7	A
	Right Turn						
	Subtotal	842	836	99.3%	12.4	1.2	B
SB	Left Turn						
	Through	866	852	98.3%	14.6	3.8	B
	Right Turn	92	83	90.4%	3.3	1.2	A
	Subtotal	958	935	97.6%	13.5	3.5	B
EB	Left Turn						
	Through						
	Right Turn	245	246	100.4%	19.2	2.6	B
	Subtotal	245	246	100.4%	19.2	2.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,045	2,017	98.6%	13.7	1.9	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	684	683	99.9%	9.3	3.0	A
	Right Turn	31	35	111.3%	8.0	4.3	A
	Subtotal	715	718	100.4%	9.3	3.0	A
SB	Left Turn	107	102	94.9%	31.8	11.5	C
	Through	998	992	99.4%	17.2	4.4	B
	Right Turn	6	7	111.7%	17.8	15.5	B
	Subtotal	1,111	1,100	99.0%	18.4	4.6	B
EB	Left Turn	16	13	82.5%	31.0	13.1	C
	Through	1	1	120.0%	13.0	19.4	B
	Right Turn	8	10	121.3%	16.5	9.3	B
	Subtotal	25	24	96.4%	24.4	7.5	C
WB	Left Turn	12	12	98.3%	29.1	15.9	C
	Through						
	Right Turn	142	142	100.3%	8.8	1.8	A
	Subtotal	154	154	100.1%	9.9	2.0	A
Total		2,005	1,996	99.6%	14.8	3.1	B

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	83	82	98.8%	53.0	9.1	D
	Through	331	335	101.3%	57.3	6.1	E
	Right Turn	97	93	96.1%	14.4	6.6	B
	Subtotal	511	510	99.9%	48.2	5.7	D
SB	Left Turn	290	283	97.7%	52.3	4.9	D
	Through	577	561	97.2%	44.0	1.8	D
	Right Turn	151	152	100.9%	31.8	6.5	C
	Subtotal	1,018	997	97.9%	44.4	1.9	D
EB	Left Turn	135	133	98.7%	71.3	8.4	E
	Through	241	249	103.4%	40.2	6.2	D
	Right Turn	103	106	102.4%	9.5	3.2	A
	Subtotal	479	488	101.9%	42.3	4.5	D
WB	Left Turn	119	119	100.0%	69.8	10.5	E
	Through	369	371	100.6%	49.3	4.1	D
	Right Turn	249	249	100.0%	42.3	9.2	D
	Subtotal	737	739	100.3%	50.0	4.6	D
Total		2,745	2,734	99.6%	46.3	1.2	D

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	77	80	103.6%	19.0	20.6	C
	Through						
	Right Turn						
	Subtotal	77	80	103.6%	19.0	20.6	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	68	64	93.7%	0.4	0.2	A
	Right Turn	88	91	103.2%	0.2	0.1	A
	Subtotal	156	155	99.0%	0.3	0.1	A
WB	Left Turn						
	Through	45	41	90.9%	11.5	9.3	B
	Right Turn						
	Subtotal	45	41	90.9%	11.5	9.3	B
Total		278	275	99.0%	7.9	7.4	A

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	65	122	138	84	67
Average Queue (ft)	51	30	40	49	36
95th Queue (ft)	66	93	114	82	77
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	25	0	1	13	8
Queuing Penalty (veh)	30	0	2	58	33
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	590	484	82.1%	8.1	1.9	A
	Right Turn	466	387	83.1%	3.8	0.3	A
	Subtotal	1,056	872	82.5%	6.1	1.1	A
SB	Left Turn	47	45	94.9%	29.0	26.8	C
	Through	401	395	98.4%	18.3	17.4	B
	Right Turn						
	Subtotal	448	439	98.1%	19.3	18.0	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	202	191	94.6%	33.5	18.9	C
	Through						
	Right Turn	18	19	105.0%	20.8	17.8	C
	Subtotal	220	210	95.5%	32.4	18.7	C
Total		1,724	1,521	88.2%	13.3	7.2	B

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,034	848	82.0%	7.4	1.4	A
	Right Turn	74	57	76.9%	5.7	1.8	A
	Subtotal	1,108	905	81.6%	7.3	1.3	A
SB	Left Turn	13	13	99.2%	7.0	4.5	A
	Through	590	573	97.1%	7.1	5.8	A
	Right Turn						
	Subtotal	603	586	97.2%	7.2	5.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	106	109	102.5%	26.1	7.1	D
	Through						
	Right Turn	22	23	105.5%	20.9	11.8	C
	Subtotal	128	132	103.0%	25.0	6.8	D
Total		1,839	1,622	88.2%	8.6	2.7	A

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	272	225	82.5%	17.6	2.8	B
	Through	1,108	906	81.7%	9.7	1.7	A
	Right Turn						
	Subtotal	1,380	1,130	81.9%	11.3	1.5	B
SB	Left Turn						
	Through	614	603	98.2%	26.4	14.7	C
	Right Turn	82	79	96.8%	6.3	4.4	A
	Subtotal	696	682	98.0%	24.4	14.1	C
EB	Left Turn						
	Through						
	Right Turn	388	388	99.9%	25.3	3.9	C
	Subtotal	388	388	99.9%	25.3	3.9	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,464	2,200	89.3%	17.6	4.3	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	8	66.7%	29.8	24.5	C
	Through	1,136	881	77.6%	12.0	2.3	B
	Right Turn	41	32	78.5%	13.2	6.1	B
	Subtotal	1,189	922	77.5%	12.2	2.1	B
SB	Left Turn	95	94	99.1%	59.8	20.7	E
	Through	894	881	98.5%	21.4	7.4	C
	Right Turn	13	14	108.5%	15.7	10.6	B
	Subtotal	1,002	989	98.7%	25.0	7.7	C
EB	Left Turn	56	58	102.7%	34.3	6.2	C
	Through	16	16	101.9%	31.4	18.8	C
	Right Turn	38	35	91.3%	23.9	7.6	C
	Subtotal	110	109	98.6%	30.4	5.3	C
WB	Left Turn	48	49	102.5%	29.5	8.1	C
	Through	2	2	100.0%	11.7	15.2	B
	Right Turn	188	192	102.2%	13.7	3.2	B
	Subtotal	238	243	102.2%	17.6	2.3	B
Total		2,539	2,262	89.1%	23.1	3.8	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	89	57	64.0%	95.3	12.0	F
	Through	722	468	64.8%	106.4	4.3	F
	Right Turn	191	120	62.6%	79.5	14.2	E
	Subtotal	1,002	645	64.3%	100.2	5.1	F
SB	Left Turn	464	450	97.0%	46.5	3.3	D
	Through	345	337	97.5%	45.6	4.0	D
	Right Turn	171	172	100.6%	28.9	5.1	C
	Subtotal	980	959	97.8%	43.1	2.6	D
EB	Left Turn	187	185	98.7%	110.5	24.9	F
	Through	596	606	101.6%	42.3	4.6	D
	Right Turn	67	65	97.2%	25.0	7.6	C
	Subtotal	850	855	100.6%	55.9	7.3	E
WB	Left Turn	93	92	98.6%	78.6	12.1	E
	Through	358	360	100.6%	55.9	9.6	E
	Right Turn	280	268	95.7%	57.6	19.9	E
	Subtotal	731	720	98.5%	59.8	13.0	E
Total		3,563	3,178	89.2%	62.0	5.0	E

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	94	99	105.6%	40.8	41.7	E
	Through						
	Right Turn						
	Subtotal	94	99	105.6%	40.8	41.7	E
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	17	14	84.7%	0.3	0.2	A
	Right Turn	70	55	78.9%	0.2	0.1	A
	Subtotal	87	70	80.0%	0.2	0.1	A
WB	Left Turn						
	Through	34	34	99.1%	14.6	19.5	B
	Right Turn						
	Subtotal	34	34	99.1%	14.6	19.5	B
Total		215	203	94.2%	23.3	24.9	C

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	65	137	150	61	129
Average Queue (ft)	53	84	102	46	46
95th Queue (ft)	61	148	168	82	97
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	62	2	5	35	33
Queuing Penalty (veh)	80	13	27	108	100
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	470	468	99.7%	10.3	1.5	B
	Right Turn	250	251	100.4%	3.7	0.3	A
	Subtotal	720	719	99.9%	8.0	1.0	A
SB	Left Turn	30	23	76.0%	56.7	17.0	E
	Through	778	573	73.6%	58.2	5.7	E
	Right Turn						
	Subtotal	808	596	73.7%	58.1	5.3	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	530	297	56.1%	312.3	32.8	F
	Through						
	Right Turn	30	18	60.7%	320.1	49.6	F
	Subtotal	560	315	56.3%	313.0	31.5	F
Total		2,088	1,630	78.1%	85.3	6.5	F

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	700	697	99.5%	8.9	1.3	A
	Right Turn	50	48	95.2%	6.1	2.8	A
	Subtotal	750	744	99.3%	8.6	1.4	A
SB	Left Turn	58	37	63.6%	10.3	2.8	B
	Through	1,250	833	66.6%	11.0	1.9	B
	Right Turn						
	Subtotal	1,308	870	66.5%	11.0	1.8	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	30	99.7%	25.9	12.8	D
	Through						
	Right Turn	20	22	109.5%	23.1	13.6	C
	Subtotal	50	52	103.6%	24.1	8.9	C
Total		2,108	1,666	79.0%	10.3	1.6	B

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	300	299	99.6%	17.5	3.9	B
	Through	750	745	99.4%	10.8	2.4	B
	Right Turn						
	Subtotal	1,050	1,044	99.4%	12.7	2.0	B
SB	Left Turn						
	Through	1,170	789	67.5%	31.0	4.6	C
	Right Turn	110	74	67.2%	7.7	4.5	A
	Subtotal	1,280	863	67.4%	29.0	4.4	C
EB	Left Turn						
	Through						
	Right Turn	300	297	99.0%	18.9	3.6	B
	Subtotal	300	297	99.0%	18.9	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,630	2,204	83.8%	20.0	2.0	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	890	891	100.2%	11.1	2.6	B
	Right Turn	40	41	103.3%	9.8	5.0	A
	Subtotal	930	933	100.3%	11.0	2.7	B
SB	Left Turn	110	82	74.6%	48.0	4.0	D
	Through	1,350	997	73.8%	26.3	2.6	C
	Right Turn	10	8	77.0%	32.4	28.2	C
	Subtotal	1,470	1,087	73.9%	28.0	2.2	C
EB	Left Turn	20	20	99.0%	41.7	16.0	D
	Through	10	10	97.0%	47.7	27.7	D
	Right Turn	10	10	102.0%	30.7	26.7	C
	Subtotal	40	40	99.3%	39.7	15.3	D
WB	Left Turn	20	20	101.5%	38.0	12.3	D
	Through						
	Right Turn	140	134	95.8%	13.9	4.1	B
	Subtotal	160	154	96.5%	16.9	3.4	B
Total		2,600	2,213	85.1%	20.3	1.7	C

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative No Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	120	125	104.3%	68.3	15.5	E
	Through	430	445	103.6%	75.4	20.2	E
	Right Turn	140	138	98.6%	42.2	23.3	D
	Subtotal	690	709	102.7%	67.6	19.7	E
SB	Left Turn	410	303	73.9%	54.7	3.4	D
	Through	780	556	71.3%	42.9	3.6	D
	Right Turn	190	144	76.0%	27.5	4.8	C
	Subtotal	1,380	1,003	72.7%	44.3	2.3	D
EB	Left Turn	150	151	100.7%	77.7	11.5	E
	Through	350	352	100.5%	44.4	5.6	D
	Right Turn	150	149	99.4%	17.6	5.9	B
	Subtotal	650	652	100.3%	46.0	5.0	D
WB	Left Turn	170	167	98.2%	90.9	9.2	F
	Through	530	525	99.0%	67.1	8.3	E
	Right Turn	350	340	97.2%	73.2	10.4	E
	Subtotal	1,050	1,032	98.3%	73.1	7.4	E
Total		3,770	3,396	90.1%	58.2	5.2	E

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	59	131	155	86	125
Average Queue (ft)	33	78	95	59	66
95th Queue (ft)	61	148	166	71	98
Link Distance (ft)	54	122	122	49	49
Upstream Blk Time (%)	7	3	5	50	49
Queuing Penalty (veh)	4	10	19	330	323
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	900	707	78.6%	10.1	1.1	B
	Right Turn	590	460	78.0%	4.2	0.2	A
	Subtotal	1,490	1,168	78.4%	7.8	0.5	A
SB	Left Turn	60	37	61.2%	89.7	15.9	F
	Through	610	351	57.6%	86.4	14.7	F
	Right Turn						
	Subtotal	670	388	57.9%	86.7	13.6	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	280	182	64.9%	399.6	51.5	F
	Through						
	Right Turn	30	20	65.0%	408.7	85.3	F
	Subtotal	310	201	64.9%	402.7	51.3	F
Total		2,470	1,757	71.1%	72.6	3.9	E

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,470	1,149	78.1%	14.2	1.1	B
	Right Turn	20	15	74.0%	7.7	5.7	A
	Subtotal	1,490	1,164	78.1%	14.1	1.1	B
SB	Left Turn	10	5	50.0%	4.4	9.6	A
	Through	880	528	60.0%	23.8	5.2	C
	Right Turn						
	Subtotal	890	533	59.9%	23.7	5.2	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	29	97.7%	25.5	9.1	D
	Through						
	Right Turn	20	20	97.5%	23.6	19.2	C
	Subtotal	50	49	97.6%	24.9	9.4	C
Total		2,430	1,745	71.8%	16.9	1.5	C

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	258	78.2%	18.1	4.0	B
	Through	1,490	1,164	78.1%	22.0	3.1	C
	Right Turn						
	Subtotal	1,820	1,422	78.1%	21.3	2.5	C
SB	Left Turn						
	Through	820	504	61.4%	66.1	10.8	E
	Right Turn	90	53	58.6%	19.1	7.8	B
	Subtotal	910	556	61.1%	61.7	10.5	E
EB	Left Turn						
	Through						
	Right Turn	510	502	98.3%	58.8	26.9	E
	Subtotal	510	502	98.3%	58.8	26.9	E
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,240	2,480	76.5%	37.0	6.9	D

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	15	72.5%	86.5	20.4	F
	Through	1,560	1,165	74.7%	36.6	3.9	D
	Right Turn	50	34	68.0%	43.9	7.1	D
	Subtotal	1,630	1,214	74.5%	37.3	4.0	D
SB	Left Turn	100	77	77.4%	72.9	18.5	E
	Through	1,210	911	75.3%	34.1	3.9	C
	Right Turn	20	18	88.0%	29.5	13.0	C
	Subtotal	1,330	1,006	75.7%	36.9	4.3	D
EB	Left Turn	60	61	101.2%	112.0	72.6	F
	Through	20	19	93.5%	93.6	51.3	F
	Right Turn	40	39	96.3%	83.3	60.0	F
	Subtotal	120	118	98.3%	97.8	56.9	F
WB	Left Turn	50	46	92.0%	38.7	7.8	D
	Through	10	9	92.0%	30.6	22.0	C
	Right Turn	200	198	98.9%	47.1	14.2	D
	Subtotal	260	253	97.3%	45.4	11.8	D
Total		3,340	2,591	77.6%	40.8	5.3	D

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative No Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	130	94	72.2%	101.9	9.0	F
	Through	1,000	704	70.4%	102.9	3.9	F
	Right Turn	280	198	70.7%	65.8	14.2	E
	Subtotal	1,410	996	70.6%	95.0	4.8	F
SB	Left Turn	650	508	78.2%	46.9	2.7	D
	Through	440	331	75.1%	44.7	5.1	D
	Right Turn	210	158	75.4%	28.8	5.3	C
	Subtotal	1,300	997	76.7%	43.4	2.7	D
EB	Left Turn	230	162	70.6%	221.3	59.1	F
	Through	850	694	81.6%	74.8	5.8	E
	Right Turn	100	80	79.5%	49.5	12.4	D
	Subtotal	1,180	936	79.3%	97.7	10.8	F
WB	Left Turn	140	121	86.3%	178.2	43.7	F
	Through	510	449	88.0%	107.1	13.4	F
	Right Turn	400	336	84.1%	139.0	21.0	F
	Subtotal	1,050	906	86.3%	129.4	9.9	F
Total		4,940	3,834	77.6%	89.9	3.2	F

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	57	160	168	78	118
Average Queue (ft)	33	126	136	58	64
95th Queue (ft)	62	146	158	68	93
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	10	17	20	62	67
Queuing Penalty (veh)	5	127	146	274	299
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	478	478	100.0%	10.4	1.3	B
	Right Turn	250	248	99.4%	3.7	0.4	A
	Subtotal	728	726	99.8%	8.0	0.9	A
SB	Left Turn	30	18	59.0%	91.6	59.4	F
	Through	759	485	63.9%	74.1	9.9	E
	Right Turn						
	Subtotal	789	503	63.7%	74.5	10.2	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	530	268	50.5%	334.2	53.4	F
	Through						
	Right Turn	30	15	50.0%	346.2	129.0	F
	Subtotal	560	283	50.5%	335.1	52.8	F
Total		2,077	1,512	72.8%	91.4	6.2	F

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	700	697	99.5%	9.1	1.6	A
	Right Turn	129	123	95.0%	5.8	1.8	A
	Subtotal	829	819	98.8%	8.5	1.6	A
SB	Left Turn	39	22	57.2%	15.9	8.2	C
	Through	1,250	731	58.4%	13.4	1.8	B
	Right Turn						
	Subtotal	1,289	753	58.4%	13.4	1.8	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	99	98	98.5%	37.8	10.4	E
	Through						
	Right Turn	28	30	105.7%	28.0	8.5	D
	Subtotal	127	127	100.1%	35.7	10.7	E
Total		2,245	1,699	75.7%	12.7	1.4	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	300	316	105.4%	19.3	2.4	B
	Through	829	820	98.9%	11.4	1.6	B
	Right Turn						
	Subtotal	1,129	1,136	100.6%	13.6	1.5	B
SB	Left Turn						
	Through	1,231	757	61.5%	35.6	4.8	D
	Right Turn	118	73	61.7%	12.0	6.0	B
	Subtotal	1,349	830	61.5%	33.6	4.8	C
EB	Left Turn						
	Through						
	Right Turn	300	301	100.3%	23.3	3.6	C
	Subtotal	300	301	100.3%	23.3	3.6	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,778	2,267	81.6%	22.2	1.3	C

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	969	977	100.8%	11.5	2.3	B
	Right Turn	40	41	102.8%	10.9	5.0	B
	Subtotal	1,009	1,018	100.9%	11.5	2.4	B
SB	Left Turn	110	77	69.9%	65.8	12.8	E
	Through	1,411	978	69.3%	29.5	3.8	C
	Right Turn	10	7	71.0%	16.6	24.1	B
	Subtotal	1,531	1,062	69.4%	32.4	3.6	C
EB	Left Turn	20	20	97.5%	46.1	25.5	D
	Through	10	9	94.0%	33.1	25.3	C
	Right Turn	10	9	93.0%	22.2	22.0	C
	Subtotal	40	38	95.5%	44.2	18.7	D
WB	Left Turn	20	20	100.5%	31.9	15.0	C
	Through						
	Right Turn	140	144	103.1%	16.2	7.8	B
	Subtotal	160	164	102.8%	18.2	7.3	B
Total		2,740	2,283	83.3%	22.0	2.0	C

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	120	119	99.1%	71.4	18.4	E
	Through	465	467	100.5%	82.7	16.4	F
	Right Turn	140	142	101.4%	43.2	17.1	D
	Subtotal	725	728	100.4%	73.2	16.4	E
SB	Left Turn	418	287	68.7%	53.3	3.9	D
	Through	810	552	68.2%	44.6	3.3	D
	Right Turn	213	148	69.5%	29.5	9.9	C
	Subtotal	1,441	987	68.5%	45.0	3.2	D
EB	Left Turn	185	195	105.4%	84.3	14.4	F
	Through	350	346	98.7%	41.3	5.1	D
	Right Turn	150	148	98.3%	14.9	7.4	B
	Subtotal	685	688	100.4%	48.5	7.3	D
WB	Left Turn	170	173	101.6%	113.8	16.1	F
	Through	530	528	99.5%	79.8	18.1	E
	Right Turn	359	361	100.6%	89.3	23.0	F
	Subtotal	1,059	1,062	100.3%	88.7	17.0	F
Total		3,910	3,465	88.6%	65.4	5.0	E

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	77	76	98.1%	182.5	113.8	F
	Through						
	Right Turn						
	Subtotal	77	76	98.1%	182.5	113.8	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	80	66	82.6%	0.3	0.1	A
	Right Turn	88	79	90.0%	0.2	0.1	A
	Subtotal	168	145	86.5%	0.2	0.1	A
WB	Left Turn						
	Through	50	53	105.0%	35.4	27.5	E
	Right Turn						
	Subtotal	50	53	105.0%	35.4	27.5	E
Total		295	273	92.6%	64.4	42.8	F

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	76	126	177	94	127
Average Queue (ft)	55	85	97	59	66
95th Queue (ft)	66	157	183	72	98
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	66	5	8	60	57
Queuing Penalty (veh)	84	20	32	385	370
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	907	667	73.6%	9.8	0.4	A
	Right Turn	590	444	75.2%	4.2	0.3	A
	Subtotal	1,497	1,111	74.2%	7.7	0.3	A
SB	Left Turn	60	33	54.7%	102.8	20.1	F
	Through	620	318	51.3%	110.3	17.0	F
	Right Turn						
	Subtotal	680	351	51.6%	109.4	16.8	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	280	168	60.0%	425.1	47.1	F
	Through						
	Right Turn	30	16	52.0%	424.9	133.2	F
	Subtotal	310	184	59.2%	426.9	50.9	F
Total		2,487	1,646	66.2%	76.4	3.2	E

Intersection 2 **Broadway/Clifton** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,470	1,084	73.7%	15.1	1.9	C
	Right Turn	112	87	77.3%	9.3	2.3	A
	Subtotal	1,582	1,171	74.0%	14.6	1.8	B
SB	Left Turn	20	13	63.0%	20.3	11.1	C
	Through	880	475	53.9%	22.9	3.4	C
	Right Turn						
	Subtotal	900	487	54.1%	22.8	3.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	86	97.3%	52.2	14.7	F
	Through						
	Right Turn	27	27	100.4%	46.1	13.2	E
	Subtotal	115	113	98.0%	51.0	13.2	F
Total		2,597	1,771	68.2%	18.9	1.3	C

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	244	73.9%	16.1	3.1	B
	Through	1,582	1,172	74.1%	22.8	1.5	C
	Right Turn						
	Subtotal	1,912	1,416	74.0%	21.7	1.1	C
SB	Left Turn						
	Through	871	508	58.3%	59.7	8.6	E
	Right Turn	97	53	54.9%	18.4	8.4	B
	Subtotal	968	561	57.9%	55.6	8.0	E
EB	Left Turn						
	Through						
	Right Turn	510	510	100.0%	67.6	44.7	E
	Subtotal	510	510	100.0%	67.6	44.7	E
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,390	2,487	73.4%	39.0	10.7	D

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	13	64.5%	71.9	28.7	E
	Through	1,652	1,160	70.2%	38.9	4.4	D
	Right Turn	50	33	65.0%	51.4	9.0	D
	Subtotal	1,722	1,206	70.0%	39.7	4.3	D
SB	Left Turn	100	68	68.3%	62.3	20.0	E
	Through	1,261	930	73.8%	35.3	5.1	D
	Right Turn	20	16	82.0%	26.6	11.0	C
	Subtotal	1,381	1,015	73.5%	36.9	5.1	D
EB	Left Turn	60	58	96.0%	112.0	86.0	F
	Through	20	21	104.0%	105.2	111.2	F
	Right Turn	40	40	99.5%	119.7	85.4	F
	Subtotal	120	118	98.5%	114.5	91.7	F
WB	Left Turn	50	49	97.0%	42.3	21.5	D
	Through	10	9	86.0%	53.5	40.4	D
	Right Turn	200	199	99.7%	49.2	12.4	D
	Subtotal	260	257	98.7%	48.0	12.2	D
Total		3,483	2,596	74.5%	42.6	6.3	D

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	130	85	65.2%	101.1	9.9	F
	Through	1,041	704	67.6%	105.6	5.1	F
	Right Turn	280	195	69.6%	63.8	13.0	E
	Subtotal	1,451	984	67.8%	97.1	5.3	F
SB	Left Turn	657	485	73.9%	47.3	4.8	D
	Through	464	350	75.5%	45.5	4.4	D
	Right Turn	230	178	77.5%	30.9	5.3	C
	Subtotal	1,351	1,014	75.0%	43.8	3.4	D
EB	Left Turn	271	152	56.2%	267.4	38.7	F
	Through	850	633	74.5%	76.5	5.3	E
	Right Turn	100	78	77.7%	43.6	12.0	D
	Subtotal	1,221	863	70.7%	106.5	7.5	F
WB	Left Turn	140	113	80.4%	182.9	48.0	F
	Through	510	432	84.7%	100.5	16.2	F
	Right Turn	410	341	83.2%	150.7	20.5	F
	Subtotal	1,060	886	83.6%	130.7	10.4	F
Total		5,083	3,746	73.7%	91.9	3.6	F

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	65	64	99.1%	211.0	145.7	F
	Through						
	Right Turn						
	Subtotal	65	64	99.1%	211.0	145.7	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn	102	78	76.7%	0.3	0.4	A
	Subtotal	102	78	76.7%	0.3	0.4	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		167	143	85.4%	87.8	61.0	F

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (ft)	58	148	153	128	110
Average Queue (ft)	53	124	139	59	62
95th Queue (ft)	61	133	157	81	84
Link Distance (ft)	53	122	122	49	49
Upstream Blk Time (%)	72	13	17	68	75
Queuing Penalty (veh)	82	99	136	305	339
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project Plus Mitigation**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	408	398	97.6%	10.4	1.7	B
	Right Turn	187	186	99.4%	2.6	0.3	A
	Subtotal	595	584	98.2%	8.0	1.3	A
SB	Left Turn	19	19	100.0%	10.4	6.1	B
	Through	460	456	99.1%	7.4	1.4	A
	Right Turn						
	Subtotal	479	475	99.1%	7.5	1.3	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	402	397	98.8%	22.6	5.0	C
	Through						
	Right Turn	18	16	87.8%	17.5	10.1	B
	Subtotal	420	413	98.3%	22.5	4.9	C
Total		1,494	1,472	98.5%	12.1	1.8	B

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	473	463	97.8%	7.1	1.7	A
	Right Turn	156	154	98.8%	4.4	1.1	A
	Subtotal	629	617	98.1%	6.5	1.5	A
SB	Left Turn						
	Through	862	853	99.0%	1.0	0.1	A
	Right Turn						
	Subtotal	862	853	99.0%	1.0	0.1	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	122	121	98.8%	6.7	1.9	A
	Subtotal	122	121	98.8%	6.7	1.9	A
Total		1,613	1,591	98.6%	3.7	0.7	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	246	239	97.3%	18.3	2.1	B
	Through	629	617	98.0%	9.8	0.7	A
	Right Turn						
	Subtotal	875	856	97.8%	12.2	0.7	B
SB	Left Turn						
	Through	778	768	98.7%	6.2	0.8	A
	Right Turn	84	86	102.3%	2.0	0.2	A
	Subtotal	862	854	99.0%	5.8	0.7	A
EB	Left Turn						
	Through						
	Right Turn	245	241	98.5%	20.4	1.7	C
	Subtotal	245	241	98.5%	20.4	1.7	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,982	1,951	98.4%	10.4	0.4	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	717	698	97.4%	4.0	0.8	A
	Right Turn	31	29	93.5%	2.7	1.5	A
	Subtotal	748	727	97.2%	3.9	0.8	A
SB	Left Turn	107	103	96.4%	21.8	7.6	C
	Through	910	899	98.8%	7.5	1.2	A
	Right Turn	6	7	113.3%	3.7	3.4	A
	Subtotal	1,023	1,009	98.6%	9.0	2.1	A
EB	Left Turn	16	17	103.8%	42.4	14.3	D
	Through	1	1	50.0%	12.7	27.4	B
	Right Turn	8	9	113.8%	13.6	12.3	B
	Subtotal	25	26	104.8%	36.0	16.8	D
WB	Left Turn	12	13	111.7%	38.2	25.5	D
	Through						
	Right Turn	142	142	100.3%	12.1	4.9	B
	Subtotal	154	156	101.2%	14.0	4.5	B
Total		1,950	1,918	98.4%	7.8	1.2	A

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project Plus Mitigation**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	83	83	100.5%	45.1	4.2	D
	Through	331	330	99.8%	43.8	5.4	D
	Right Turn	97	99	101.9%	8.0	5.1	A
	Subtotal	511	513	100.3%	36.8	4.8	D
SB	Left Turn	282	284	100.7%	26.5	3.6	C
	Through	520	518	99.7%	27.3	2.9	C
	Right Turn	128	123	95.9%	20.9	9.0	C
	Subtotal	930	925	99.4%	26.3	2.3	C
EB	Left Turn	168	157	93.2%	63.9	12.8	E
	Through	241	233	96.6%	28.4	5.5	C
	Right Turn	103	99	95.8%	6.1	2.5	A
	Subtotal	512	488	95.3%	35.2	5.8	D
WB	Left Turn	119	110	92.4%	53.6	4.4	D
	Through	369	374	101.3%	36.1	3.2	D
	Right Turn	249	242	97.1%	28.5	8.1	C
	Subtotal	737	726	98.5%	36.3	3.6	D
Total		2,690	2,651	98.5%	32.7	2.2	C

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	77	78	101.3%	6.4	2.4	A
	Through						
	Right Turn						
	Subtotal	77	78	101.3%	6.4	2.4	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	68	65	95.3%	0.4	0.2	A
	Right Turn	88	89	101.6%	0.2	0.1	A
	Subtotal	156	154	98.8%	0.2	0.1	A
WB	Left Turn						
	Through	45	42	94.2%	0.4	0.3	A
	Right Turn						
	Subtotal	45	42	94.2%	0.4	0.3	A
Total		278	275	98.8%	2.1	0.8	A

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	66	137	138	57	57
Average Queue (ft)	43	51	71	9	9
95th Queue (ft)	64	123	153	41	38
Link Distance (ft)	55	126	126	44	44
Upstream Blk Time (%)	5	1	2	1	1
Queuing Penalty (veh)	6	3	6	3	6
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project Plus Mitigation**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	696	682	98.0%	5.8	0.9	A
	Right Turn	466	470	100.8%	2.7	0.3	A
	Subtotal	1,162	1,152	99.1%	4.5	0.6	A
SB	Left Turn	47	49	103.8%	22.4	4.9	C
	Through	388	389	100.2%	7.5	1.8	A
	Right Turn						
	Subtotal	435	438	100.6%	9.1	2.1	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	202	205	101.2%	25.5	3.1	C
	Through						
	Right Turn	18	17	95.6%	22.2	9.4	C
	Subtotal	220	222	100.8%	25.1	3.2	C
Total		1,817	1,811	99.7%	8.3	1.0	A

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,034	1,023	99.0%	6.1	1.1	A
	Right Turn	87	86	98.3%	5.0	1.8	A
	Subtotal	1,121	1,109	98.9%	6.0	1.1	A
SB	Left Turn						
	Through	590	592	100.3%	1.4	0.4	A
	Right Turn						
	Subtotal	590	592	100.3%	1.4	0.4	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	128	127	99.2%	11.9	3.2	B
	Subtotal	128	127	99.2%	11.9	3.2	B
Total		1,839	1,828	99.4%	4.9	0.8	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	272	273	100.4%	16.7	2.7	B
	Through	1,121	1,104	98.5%	11.1	2.0	B
	Right Turn						
	Subtotal	1,393	1,377	98.9%	12.1	1.9	B
SB	Left Turn						
	Through	517	513	99.1%	13.5	3.4	B
	Right Turn	73	77	105.6%	2.6	1.0	A
	Subtotal	590	590	99.9%	12.1	3.1	B
EB	Left Turn						
	Through						
	Right Turn	388	389	100.1%	20.6	4.9	C
	Subtotal	388	389	100.1%	20.6	4.9	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,371	2,355	99.3%	13.5	2.3	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	12	101.7%	73.5	15.8	E
	Through	1,149	1,131	98.5%	6.0	1.4	A
	Right Turn	41	46	112.9%	6.6	3.7	A
	Subtotal	1,202	1,190	99.0%	6.8	1.7	A
SB	Left Turn	95	99	104.4%	58.7	20.8	E
	Through	797	785	98.5%	13.9	3.1	B
	Right Turn	13	13	99.2%	9.6	9.5	A
	Subtotal	905	897	99.1%	18.7	4.7	B
EB	Left Turn	56	57	102.3%	60.3	17.2	E
	Through	16	16	100.0%	64.4	18.2	E
	Right Turn	38	40	104.7%	33.6	15.6	C
	Subtotal	110	113	102.8%	52.8	15.4	D
WB	Left Turn	48	46	94.8%	48.2	10.9	D
	Through	2	2	95.0%	39.2	46.3	D
	Right Turn	188	187	99.3%	37.5	10.3	D
	Subtotal	238	234	98.3%	40.1	8.8	D
Total		2,455	2,434	99.1%	17.0	2.9	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Existing Plus Project Plus Mitigation**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	89	81	91.1%	58.7	7.2	E
	Through	722	716	99.2%	52.6	4.7	D
	Right Turn	191	183	95.8%	17.2	4.6	B
	Subtotal	1,002	980	97.8%	46.8	4.7	D
SB	Left Turn	455	456	100.2%	32.3	1.3	C
	Through	285	286	100.5%	32.0	2.8	C
	Right Turn	143	141	98.5%	20.4	3.0	C
	Subtotal	883	883	100.0%	30.2	1.2	C
EB	Left Turn	200	196	97.8%	84.2	9.4	F
	Through	596	593	99.6%	40.9	3.3	D
	Right Turn	67	71	106.1%	21.2	4.8	C
	Subtotal	863	860	99.7%	48.8	2.8	D
WB	Left Turn	93	90	96.8%	66.6	9.2	E
	Through	358	362	101.1%	50.0	8.8	D
	Right Turn	280	283	101.0%	44.0	17.4	D
	Subtotal	731	735	100.5%	49.8	11.2	D
Total		3,479	3,458	99.4%	43.4	3.0	D

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	94	94	100.0%	10.5	10.2	B
	Through						
	Right Turn						
	Subtotal	94	94	100.0%	10.5	10.2	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	17	16	95.9%	0.2	0.1	A
	Right Turn	70	70	99.3%	0.1	0.1	A
	Subtotal	87	86	98.6%	0.2	0.1	A
WB	Left Turn						
	Through	34	34	101.2%	2.8	4.9	A
	Right Turn						
	Subtotal	34	34	101.2%	2.8	4.9	A
Total		215	214	99.6%	5.4	6.3	A

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	57	129	148	58	84
Average Queue (ft)	42	73	91	12	26
95th Queue (ft)	62	146	171	44	70
Link Distance (ft)	55	126	126	44	44
Upstream Blk Time (%)	7	1	3	1	3
Queuing Penalty (veh)	9	6	16	4	8
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project Plus Mitigation**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	577	548	95.0%	13.9	1.4	B
	Right Turn	250	251	100.2%	3.7	0.6	A
	Subtotal	827	799	96.6%	10.5	1.0	B
SB	Left Turn	30	25	84.3%	36.9	6.8	D
	Through	720	719	99.9%	27.1	6.8	C
	Right Turn						
	Subtotal	750	745	99.3%	27.4	6.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	530	369	69.7%	283.3	49.3	F
	Through						
	Right Turn	30	20	67.3%	270.4	63.5	F
	Subtotal	560	390	69.6%	283.0	47.0	F
Total		2,137	1,933	90.4%	67.9	3.6	E

Intersection 2 **Broadway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	700	672	96.0%	11.8	3.1	B
	Right Turn	168	166	98.7%	7.5	3.4	A
	Subtotal	868	838	96.5%	11.0	3.1	B
SB	Left Turn						
	Through	1,250	1,087	87.0%	6.3	1.5	A
	Right Turn						
	Subtotal	1,250	1,087	87.0%	6.3	1.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	127	126	99.3%	10.8	3.8	B
	Subtotal	127	126	99.3%	10.8	3.8	B
Total		2,245	2,051	91.3%	8.6	1.8	A

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	300	290	96.8%	18.6	2.2	B
	Through	868	837	96.4%	14.4	3.7	B
	Right Turn						
	Subtotal	1,168	1,127	96.5%	15.5	2.6	B
SB	Left Turn						
	Through	1,140	987	86.6%	23.4	3.1	C
	Right Turn	110	97	88.5%	6.3	1.6	A
	Subtotal	1,250	1,084	86.7%	22.0	3.0	C
EB	Left Turn						
	Through						
	Right Turn	300	298	99.4%	22.1	3.0	C
	Subtotal	300	298	99.4%	22.1	3.0	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,718	2,510	92.3%	19.0	2.0	B

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,008	962	95.4%	8.9	1.6	A
	Right Turn	40	39	97.3%	8.1	2.4	A
	Subtotal	1,048	1,001	95.5%	8.9	1.7	A
SB	Left Turn	110	101	91.7%	43.1	10.0	D
	Through	1,320	1,174	88.9%	18.0	1.4	B
	Right Turn	10	10	102.0%	11.3	3.6	B
	Subtotal	1,440	1,285	89.2%	19.8	1.4	B
EB	Left Turn	20	17	85.5%	45.1	15.5	D
	Through	10	11	112.0%	38.6	19.5	D
	Right Turn	10	10	103.0%	36.1	20.0	D
	Subtotal	40	39	96.5%	39.6	11.1	D
WB	Left Turn	20	19	93.5%	51.1	18.4	D
	Through						
	Right Turn	140	146	104.3%	18.5	5.1	B
	Subtotal	160	165	102.9%	22.0	4.8	C
Total		2,688	2,489	92.6%	16.0	1.1	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project Plus Mitigation**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	120	114	94.8%	110.3	18.9	F
	Through	465	432	93.0%	128.7	10.4	F
	Right Turn	140	124	88.6%	84.3	17.3	F
	Subtotal	725	670	92.4%	117.4	13.1	F
SB	Left Turn	410	369	90.1%	37.3	4.6	D
	Through	750	674	89.9%	33.5	1.8	C
	Right Turn	190	175	91.9%	19.3	5.7	B
	Subtotal	1,350	1,218	90.2%	32.5	1.8	C
EB	Left Turn	224	216	96.5%	127.5	46.5	F
	Through	350	357	101.9%	34.8	3.7	C
	Right Turn	150	157	104.4%	13.9	4.2	B
	Subtotal	724	730	100.8%	59.0	14.2	E
WB	Left Turn	170	169	99.3%	78.3	10.7	E
	Through	530	525	99.0%	92.2	13.1	F
	Right Turn	359	349	97.3%	109.1	14.0	F
	Subtotal	1,059	1,043	98.5%	95.6	11.5	F
Total		3,858	3,661	94.9%	71.3	5.8	E

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	77	75	97.9%	10.6	6.4	B
	Through						
	Right Turn						
	Subtotal	77	75	97.9%	10.6	6.4	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	80	81	101.5%	0.4	0.2	A
	Right Turn	88	86	98.0%	0.5	0.7	A
	Subtotal	168	167	99.6%	0.4	0.4	A
WB	Left Turn						
	Through	50	52	103.6%	2.4	1.5	A
	Right Turn						
	Subtotal	50	52	103.6%	2.4	1.5	A
Total		295	295	99.9%	3.8	2.2	A

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	69	146	177	105	98
Average Queue (ft)	46	101	111	64	62
95th Queue (ft)	68	160	170	86	79
Link Distance (ft)	55	126	126	44	44
Upstream Blk Time (%)	18	4	6	36	40
Queuing Penalty (veh)	23	20	28	228	249
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project Plus Mitigation**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Broadway/Broadway Terrace** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,024	876	85.6%	7.3	0.6	A
	Right Turn	590	496	84.1%	3.1	0.2	A
	Subtotal	1,614	1,373	85.0%	5.8	0.4	A
SB	Left Turn	60	51	84.2%	99.4	16.1	F
	Through	600	495	82.5%	60.7	9.9	E
	Right Turn						
	Subtotal	660	546	82.7%	64.5	9.5	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	280	127	45.3%	472.7	79.2	F
	Through						
	Right Turn	30	14	45.3%	502.1	155.0	F
	Subtotal	310	141	45.3%	472.4	80.1	F
Total		2,584	2,059	79.7%	56.0	5.3	E

Intersection 2 **Broadway/Clifton** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,470	1,236	84.0%	7.4	1.1	A
	Right Turn	100	90	89.9%	5.6	0.6	A
	Subtotal	1,570	1,325	84.4%	7.3	1.1	A
SB	Left Turn						
	Through	880	623	70.7%	15.4	2.4	C
	Right Turn						
	Subtotal	880	623	70.7%	15.4	2.4	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	144	137	95.0%	22.3	7.2	C
	Subtotal	144	137	95.0%	22.3	7.2	C
Total		2,594	2,085	80.4%	10.6	1.0	B

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project Plus Mitigation**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Broadway/College Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	279	84.6%	18.3	1.8	B
	Through	1,570	1,325	84.4%	10.3	2.9	B
	Right Turn						
	Subtotal	1,900	1,604	84.4%	11.7	2.4	B
SB	Left Turn						
	Through	790	558	70.6%	49.9	7.1	D
	Right Turn	90	65	72.3%	12.3	7.4	B
	Subtotal	880	623	70.8%	46.0	6.5	D
EB	Left Turn						
	Through						
	Right Turn	510	489	95.9%	150.9	54.8	F
	Subtotal	510	489	95.9%	150.9	54.8	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,290	2,716	82.6%	43.9	9.3	D

Intersection 4 **Broadway/Coronado Ave** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	16	79.0%	43.0	8.0	D
	Through	1,640	1,344	82.0%	17.4	4.1	B
	Right Turn	50	45	89.2%	21.5	6.2	C
	Subtotal	1,710	1,404	82.1%	17.8	4.1	B
SB	Left Turn	100	82	81.6%	105.0	36.4	F
	Through	1,180	950	80.5%	33.2	3.2	C
	Right Turn	20	16	78.5%	28.7	6.1	C
	Subtotal	1,300	1,047	80.5%	39.6	4.5	D
EB	Left Turn	60	62	103.5%	28.6	10.7	C
	Through	20	21	103.5%	25.3	9.8	C
	Right Turn	40	40	100.3%	21.3	3.4	C
	Subtotal	120	123	102.4%	25.2	5.6	C
WB	Left Turn	50	48	96.4%	24.6	6.0	C
	Through	10	10	104.0%	27.8	11.8	C
	Right Turn	200	196	98.2%	22.0	6.3	C
	Subtotal	260	255	98.1%	22.6	5.4	C
Total		3,390	2,829	83.5%	26.6	2.3	C

SimTraffic Post-Processor **CCA Campus Reuse**
Average Results from 10 Runs **Cumulative Plus Project Plus Mitigation**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Broadway/51st St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	130	104	80.2%	84.0	9.5	F
	Through	1,028	852	82.9%	84.1	2.4	F
	Right Turn	280	224	80.1%	53.6	4.9	D
	Subtotal	1,438	1,180	82.1%	78.4	1.8	E
SB	Left Turn	650	531	81.6%	34.8	1.7	C
	Through	410	328	80.1%	33.7	3.5	C
	Right Turn	210	173	82.1%	20.9	5.2	C
	Subtotal	1,270	1,032	81.2%	32.2	1.3	C
EB	Left Turn	275	200	72.7%	182.7	19.3	F
	Through	850	656	77.1%	81.3	1.8	F
	Right Turn	100	77	77.0%	54.4	10.5	D
	Subtotal	1,225	933	76.1%	102.1	5.2	F
WB	Left Turn	140	123	87.9%	141.9	28.2	F
	Through	510	442	86.6%	118.7	9.4	F
	Right Turn	407	349	85.7%	123.4	9.6	F
	Subtotal	1,057	914	86.5%	124.3	7.3	F
Total		4,990	4,058	81.3%	82.0	2.1	F

Intersection 6 **Project Driveway/Clifton St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	94	89	94.8%	36.1	32.3	E
	Through						
	Right Turn						
	Subtotal	94	89	94.8%	36.1	32.3	E
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	30	27	91.0%	0.2	0.1	A
	Right Turn	70	63	89.7%	0.1	0.0	A
	Subtotal	100	90	90.1%	0.1	0.0	A
WB	Left Turn						
	Through	50	48	95.4%	16.6	15.2	C
	Right Turn						
	Subtotal	50	48	95.4%	16.6	15.2	C
Total		244	227	93.0%	17.5	14.4	C

Intersection: 2: Broadway & Clifton St

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	60	126	142	68	100
Average Queue (ft)	47	94	110	57	59
95th Queue (ft)	67	148	161	65	72
Link Distance (ft)	55	126	126	44	44
Upstream Blk Time (%)	22	2	4	47	60
Queuing Penalty (veh)	33	15	28	207	264
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	140	460	10	10	40
Future Vol, veh/h	30	140	460	10	10	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	151	495	11	11	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	506	0	-	0	716	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1059	-	-	-	397	570
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1059	-	-	-	384	570
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1059	-	-	-	520
HCM Lane V/C Ratio	0.03	-	-	-	0.103
HCM Control Delay (s)	8.5	0	-	-	12.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	60	40	10	110	20	20
Future Vol, veh/h	60	40	10	110	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	43	11	118	22	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	108	0	227	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1483	-	761	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1483	-	755	971
Mov Cap-2 Maneuver	-	-	-	-	755	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	849	-	-	1483	-
HCM Lane V/C Ratio	0.051	-	-	0.007	-
HCM Control Delay (s)	9.5	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	40	30	60	40	30	60	250	10	50	630	60
Future Volume (veh/h)	80	40	30	60	40	30	60	250	10	50	630	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	86	43	32	65	43	32	65	269	11	54	677	65
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	79	48	207	96	56	463	1177	48	813	1108	106
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	778	539	327	645	659	386	715	1777	73	1095	1674	161
Grp Volume(v), veh/h	161	0	0	140	0	0	65	0	280	54	0	742
Grp Sat Flow(s),veh/h/ln	1645	0	0	1690	0	0	715	0	1850	1095	0	1834
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	2.7	0.0	2.8	1.0	0.0	10.7
Cycle Q Clear(g_c), s	4.0	0.0	0.0	3.4	0.0	0.0	13.4	0.0	2.8	3.8	0.0	10.7
Prop In Lane	0.53		0.20	0.46		0.23	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	358	0	0	359	0	0	463	0	1225	813	0	1215
V/C Ratio(X)	0.45	0.00	0.00	0.39	0.00	0.00	0.14	0.00	0.23	0.07	0.00	0.61
Avail Cap(c_a), veh/h	1156	0	0	1172	0	0	463	0	1225	813	0	1215
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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	0.0	18.5	0.0	0.0	8.3	0.0	3.1	3.9	0.0	4.5
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.4	0.2	0.0	2.3
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	2.0	0.0	0.0	1.7	0.0	0.0	0.6	0.0	1.5	0.3	0.0	6.1
LnGrp Delay(d),s/veh	19.7	0.0	0.0	19.2	0.0	0.0	8.9	0.0	3.6	4.1	0.0	6.8
LnGrp LOS	B			B			A		A	A		A
Approach Vol, veh/h		161			140			345			796	
Approach Delay, s/veh		19.7			19.2			4.6			6.6	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		10.8		36.0		10.8
Change Period (Y+Rc), s		5.0		4.0		5.0		4.0
Max Green Setting (Gmax), s		31.0		32.0		31.0		32.0
Max Q Clear Time (g_c+I1), s		15.4		6.0		12.7		5.4
Green Ext Time (p_c), s		1.9		0.9		5.4		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	10	40	120	10	70
Future Vol, veh/h	80	10	40	120	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	11	43	129	11	75

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	97	0	307	92
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1496	-	685	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1496	-	664	965
Mov Cap-2 Maneuver	-	-	-	-	664	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1496	-
HCM Lane V/C Ratio	0.094	-	-	0.029	-
HCM Control Delay (s)	9.4	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	20	280	30	50	330
Future Vol, veh/h	30	20	280	30	50	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	22	301	32	54	355

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	780	317	0	0	333	0
Stage 1	317	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	364	724	-	-	1226	-
Stage 1	738	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	724	-	-	1226	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	599	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	435	1226	-
HCM Lane V/C Ratio	-	-	0.124	0.044	-
HCM Control Delay (s)	-	-	14.4	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	530	160	10	10	20
Future Vol, veh/h	30	530	160	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	570	172	11	11	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	183	0	-	0	812	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	634	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1392	-	-	-	348	865
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	529	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1392	-	-	-	336	865
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	824	-
Stage 2	-	-	-	-	529	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1392	-	-	-	567
HCM Lane V/C Ratio	0.023	-	-	-	0.057
HCM Control Delay (s)	7.6	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	180	20	10	90	30	10
Future Vol, veh/h	180	20	10	90	30	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	194	22	11	97	32	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	324	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	119	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1354	-	670	836
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1354	-	664	836
Mov Cap-2 Maneuver	-	-	-	-	664	-
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	700	-	-	1354	-
HCM Lane V/C Ratio	0.061	-	-	0.008	-
HCM Control Delay (s)	10.5	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	40	20	30	80	10	10	630	10	150	380	70
Future Volume (veh/h)	160	40	20	30	80	10	10	630	10	150	380	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	172	43	22	32	86	11	11	677	11	161	409	75
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	342	66	29	143	285	32	572	1122	18	433	941	173
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1053	319	140	259	1373	152	908	1828	30	751	1532	281
Grp Volume(v), veh/h	237	0	0	129	0	0	11	0	688	161	0	484
Grp Sat Flow(s),veh/h/ln	1512	0	0	1784	0	0	908	0	1858	751	0	1813
Q Serve(g_s), s	4.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	11.5	8.4	0.0	7.1
Cycle Q Clear(g_c), s	7.1	0.0	0.0	3.0	0.0	0.0	7.4	0.0	11.5	19.9	0.0	7.1
Prop In Lane	0.73		0.09	0.25		0.09	1.00		0.02	1.00		0.15
Lane Grp Cap(c), veh/h	437	0	0	460	0	0	572	0	1140	433	0	1113
V/C Ratio(X)	0.54	0.00	0.00	0.28	0.00	0.00	0.02	0.00	0.60	0.37	0.00	0.43
Avail Cap(c_a), veh/h	1031	0	0	1172	0	0	572	0	1140	433	0	1113
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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	0.0	17.0	0.0	0.0	7.1	0.0	6.0	12.1	0.0	5.1
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	2.4	2.4	0.0	1.2
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	3.2	0.0	0.0	1.5	0.0	0.0	0.1	0.0	6.5	2.0	0.0	3.9
LnGrp Delay(d),s/veh	19.5	0.0	0.0	17.4	0.0	0.0	7.1	0.0	8.3	14.5	0.0	6.4
LnGrp LOS	B			B			A		A	B		A
Approach Vol, veh/h		237			129			699			645	
Approach Delay, s/veh		19.5			17.4			8.3			8.4	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		14.5		36.0		14.5
Change Period (Y+Rc), s		5.0		4.0		5.0		4.0
Max Green Setting (Gmax), s		31.0		32.0		31.0		32.0
Max Q Clear Time (g_c+I1), s		13.5		9.1		21.9		5.0
Green Ext Time (p_c), s		4.6		1.4		2.9		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	10.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	10	20	140	10	70
Future Vol, veh/h	150	10	20	140	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	161	11	22	151	11	75

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	172	0	362	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	195	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1405	-	637	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1405	-	626	877
Mov Cap-2 Maneuver	-	-	-	-	626	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	835	-	-	1405	-
HCM Lane V/C Ratio	0.103	-	-	0.015	-
HCM Control Delay (s)	9.8	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	20	420	40	40	340
Future Vol, veh/h	10	20	420	40	40	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	452	43	43	366

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	926	474	0	0	495	0
Stage 1	474	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	298	590	-	-	1069	-
Stage 1	626	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	283	590	-	-	1069	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	609	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	433	1069	-
HCM Lane V/C Ratio	-	-	0.074	0.04	-
HCM Control Delay (s)	-	-	14	8.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	140	460	10	10	40
Future Vol, veh/h	60	140	460	10	10	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	151	495	11	11	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	506	0	-	0	782	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	281	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1059	-	-	-	363	570
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1059	-	-	-	339	570
Mov Cap-2 Maneuver	-	-	-	-	339	-
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1059	-	-	-	502
HCM Lane V/C Ratio	0.061	-	-	-	0.107
HCM Control Delay (s)	8.6	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	60	40	10	110	50	20
Future Vol, veh/h	60	40	10	110	50	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	43	11	118	54	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	108	0	227	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1483	-	761	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1483	-	755	971
Mov Cap-2 Maneuver	-	-	-	-	755	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	806	-	-	1483	-
HCM Lane V/C Ratio	0.093	-	-	0.007	-
HCM Control Delay (s)	9.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	40	30	90	40	30	100	260	10	50	630	60
Future Volume (veh/h)	80	40	30	90	40	30	100	260	10	50	630	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	86	43	32	97	43	32	108	280	11	54	677	65
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	85	51	248	77	47	456	1170	46	795	1100	106
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	784	561	334	843	505	308	715	1780	70	1084	1674	161
Grp Volume(v), veh/h	161	0	0	172	0	0	108	0	291	54	0	742
Grp Sat Flow(s),veh/h/ln	1679	0	0	1656	0	0	715	0	1850	1084	0	1834
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	0.0	4.8	0.0	3.0	1.0	0.0	11.0
Cycle Q Clear(g_c), s	3.9	0.0	0.0	4.3	0.0	0.0	15.8	0.0	3.0	4.0	0.0	11.0
Prop In Lane	0.53		0.20	0.56		0.19	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	373	0	0	371	0	0	456	0	1216	795	0	1205
V/C Ratio(X)	0.43	0.00	0.00	0.46	0.00	0.00	0.24	0.00	0.24	0.07	0.00	0.62
Avail Cap(c_a), veh/h	1153	0	0	1146	0	0	456	0	1216	795	0	1205
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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.6	0.0	0.0	18.7	0.0	0.0	9.2	0.0	3.3	4.1	0.0	4.7
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.9	0.0	0.0	1.2	0.0	0.5	0.2	0.0	2.4
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	2.0	0.0	0.0	2.2	0.0	0.0	1.1	0.0	1.7	0.3	0.0	6.1
LnGrp Delay(d),s/veh	19.4	0.0	0.0	19.6	0.0	0.0	10.4	0.0	3.8	4.3	0.0	7.0
LnGrp LOS	B			B			B		A	A		A
Approach Vol, veh/h		161			172			399			796	
Approach Delay, s/veh		19.4			19.6			5.6			6.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		11.2		36.0		11.2
Change Period (Y+Rc), s		5.0		4.0		5.0		4.0
Max Green Setting (Gmax), s		31.0		32.0		31.0		32.0
Max Q Clear Time (g_c+I1), s		17.8		5.9		13.0		6.3
Green Ext Time (p_c), s		2.1		0.9		5.4		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	10	70	130	10	70
Future Vol, veh/h	80	10	70	130	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	11	75	140	11	75

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	97	0	382	92
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1496	-	620	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	759	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1496	-	587	965
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	718	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	893	-	-	1496	-
HCM Lane V/C Ratio	0.096	-	-	0.05	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	30	280	30	50	330
Future Vol, veh/h	50	30	280	30	50	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	32	301	32	54	355

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	780	317	0	0	333	0
Stage 1	317	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	364	724	-	-	1226	-
Stage 1	738	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	724	-	-	1226	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	599	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	428	1226	-
HCM Lane V/C Ratio	-	-	0.201	0.044	-
HCM Control Delay (s)	-	-	15.5	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	530	160	10	10	20
Future Vol, veh/h	70	530	160	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	570	172	11	11	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	183	0	-	0	898	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	720	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1392	-	-	-	310	865
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1392	-	-	-	286	865
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1392	-	-	-	516
HCM Lane V/C Ratio	0.054	-	-	-	0.063
HCM Control Delay (s)	7.7	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	180	20	10	90	70	10
Future Vol, veh/h	180	20	10	90	70	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	194	22	11	97	75	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	324	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	119	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1354	-	670	836
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1354	-	664	836
Mov Cap-2 Maneuver	-	-	-	-	664	-
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	682	-	-	1354	-
HCM Lane V/C Ratio	0.126	-	-	0.008	-
HCM Control Delay (s)	11	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	30	60	60	60	40	130	640	20	150	380	70
Future Volume (veh/h)	140	30	60	60	60	40	130	640	20	150	380	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	151	32	65	65	65	43	140	688	22	161	409	75
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	300	57	86	196	170	89	571	1100	35	416	939	172
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	887	270	411	469	811	423	908	1795	57	736	1532	281
Grp Volume(v), veh/h	248	0	0	173	0	0	140	0	710	161	0	484
Grp Sat Flow(s),veh/h/ln	1568	0	0	1703	0	0	908	0	1853	736	0	1813
Q Serve(g_s), s	2.8	0.0	0.0	0.0	0.0	0.0	4.9	0.0	12.2	8.9	0.0	7.1
Cycle Q Clear(g_c), s	7.1	0.0	0.0	4.3	0.0	0.0	12.0	0.0	12.2	21.1	0.0	7.1
Prop In Lane	0.61		0.26	0.38		0.25	1.00		0.03	1.00		0.15
Lane Grp Cap(c), veh/h	443	0	0	454	0	0	571	0	1135	416	0	1111
V/C Ratio(X)	0.56	0.00	0.00	0.38	0.00	0.00	0.25	0.00	0.63	0.39	0.00	0.44
Avail Cap(c_a), veh/h	1039	0	0	1106	0	0	571	0	1135	416	0	1111
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	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.4	0.0	0.0	17.5	0.0	0.0	8.3	0.0	6.2	12.8	0.0	5.2
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.5	0.0	0.0	1.0	0.0	2.6	2.7	0.0	1.2
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	3.3	0.0	0.0	2.2	0.0	0.0	1.4	0.0	6.9	2.1	0.0	3.9
LnGrp Delay(d),s/veh	19.5	0.0	0.0	18.0	0.0	0.0	9.4	0.0	8.8	15.5	0.0	6.4
LnGrp LOS	B			B			A		A	B		A
Approach Vol, veh/h		248			173			850			645	
Approach Delay, s/veh		19.5			18.0			8.9			8.7	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		14.6		36.0		14.6
Change Period (Y+Rc), s		5.0		4.0		5.0		4.0
Max Green Setting (Gmax), s		31.0		32.0		31.0		32.0
Max Q Clear Time (g_c+I1), s		14.2		9.1		23.1		6.3
Green Ext Time (p_c), s		5.5		1.5		2.7		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	10	60	200	10	70
Future Vol, veh/h	160	10	60	200	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	172	11	65	215	11	75

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	183	0	523	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1392	-	514	865
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	717	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1392	-	487	865
Mov Cap-2 Maneuver	-	-	-	-	487	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	679	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	788	-	-	1392	-
HCM Lane V/C Ratio	0.109	-	-	0.046	-
HCM Control Delay (s)	10.1	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	30	420	40	40	340
Future Vol, veh/h	40	30	420	40	40	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	32	452	43	43	366

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	926	474	0	0	495	0
Stage 1	474	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	298	590	-	-	1069	-
Stage 1	626	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	283	590	-	-	1069	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	609	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.5	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	364	1069	-
HCM Lane V/C Ratio	-	-	0.207	0.04	-
HCM Control Delay (s)	-	-	17.5	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Attachment D –
Urban and Suburban Predictive Method Collision Worksheets

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	KKD	Roadway	1
Agency or Company	OSU	Roadway Section	Broadway(College Av/ Coronado Av)
Date Performed	03/25/10	Jurisdiction	Oakland, CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4D
Length of segment, L (mi)		--	0.06
AADT (veh/day)	$AADT_{MAX}$ = 66,000 (veh/day)	--	22,400
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.22
Median width (ft) - for divided only		15	10
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	2
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	10
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	6
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.16	1.01	1.01	0.91	1.00	1.07

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-12.34	1.36	1.32	0.216	1.000	0.216	1.07	1.00	0.232
Fatal and Injury (FI)	-12.76	1.28	1.31	0.064	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.279	0.060	1.07	1.00	0.065
Property Damage Only (PDO)	-12.81	1.38	1.34	0.165	$(5)_{TOTAL}-(5)_{FI}$ = 0.721	0.156	1.07	1.00	0.168

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.065	1.000	0.168	0.232
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.832	0.054	0.662	0.111	0.165
Head-on collision	0.020	0.001	0.007	0.001	0.002
Angle collision	0.040	0.003	0.036	0.006	0.009
Sideswipe, same direction	0.050	0.003	0.223	0.037	0.041
Sideswipe, opposite direction	0.010	0.001	0.001	0.000	0.001
Other multiple-vehicle collision	0.048	0.003	0.071	0.012	0.015

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.05	0.47	0.86	0.043	1.000	0.043	1.07	1.00	0.046
Fatal and Injury (FI)	-8.71	0.66	0.28	0.007	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.173	0.007	1.07	1.00	0.008
Property Damage Only (PDO)	-5.04	0.45	1.06	0.035	$(5)_{TOTAL}-(5)_{FI}$ = 0.827	0.035	1.07	1.00	0.038

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.008	1.000	0.038	0.046
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.063	0.002	0.002
Collision with fixed object	0.500	0.004	0.813	0.031	0.035
Collision with other object	0.028	0.000	0.016	0.001	0.001
Other single-vehicle collision	0.471	0.004	0.108	0.004	0.008

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	0	0.033	1.106	0.000	--
Minor commercial	2	0.011	1.106	0.034	
Major industrial/institutional	0	0.036	1.106	0.000	
Minor industrial/institutional	0	0.005	1.106	0.000	
Major residential	0	0.018	1.106	0.000	
Minor residential	0	0.003	1.106	0.000	
Other	0	0.005	1.106	0.000	
Total	--	--	--	0.034	1.39

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.034	1.000	0.034	1.07	1.00	0.037
Fatal and injury (FI)	--	0.284	0.010	1.07	1.00	0.010
Property damage only (PDO)	--	0.716	0.025	1.07	1.00	0.026

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.232	0.046	0.037	0.315	0.067	1.00	0.021
Fatal and injury (FI)	--	--	--	--	--	1.00	0.021

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.232	0.046	0.037	0.315	0.013	1.00	0.004
Fatal and injury (FI)	--	--	--	--	--	1.00	0.004

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.054	0.111	0.165
Head-on collisions (from Worksheet 1D)	0.001	0.001	0.002
Angle collisions (from Worksheet 1D)	0.003	0.006	0.009
Sideswipe, same direction (from Worksheet 1D)	0.003	0.037	0.041
Sideswipe, opposite direction (from Worksheet 1D)	0.001	0.000	0.001
Driveway-related collisions (from Worksheet 1H)	0.010	0.026	0.037
Other multiple-vehicle collision (from Worksheet 1D)	0.003	0.012	0.015
Subtotal	0.075	0.194	0.269
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.002	0.002
Collision with fixed object (from Worksheet 1F)	0.004	0.031	0.035
Collision with other object (from Worksheet 1F)	0.000	0.001	0.001
Other single-vehicle collision (from Worksheet 1F)	0.004	0.004	0.008
Collision with pedestrian (from Worksheet 1I)	0.021	0.000	0.021
Collision with bicycle (from Worksheet 1J)	0.004	0.000	0.004
Subtotal	0.033	0.038	0.071
Total	0.108	0.232	0.340

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.3	0.06	5.7
Fatal and injury (FI)	0.1	0.06	1.8
Property damage only (PDO)	0.2	0.06	3.9

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	KKD	Roadway	2
Agency or Company	OSU	Roadway Section	Broadway (Coronado Av to Pleasant Valley Av)
Date Performed	03/25/10	Jurisdiction	Oakland, CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4D
Length of segment, L (mi)		--	0.09
AADT (veh/day)	$AADT_{MAX}$ = 66,000 (veh/day)	--	20,000
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.44
Median width (ft) - for divided only		15	10
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	2
Minor commercial driveways (number)		--	1
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	10
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	5
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.31	1.01	1.01	0.91	1.00	1.23

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-12.34	1.36	1.32	0.278	1.000	0.278	1.23	1.00	0.341
Fatal and Injury (FI)	-12.76	1.28	1.31	0.083	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.281	0.078	1.23	1.00	0.096
Property Damage Only (PDO)	-12.81	1.38	1.34	0.212	$(5)_{TOTAL}-(5)_{FI}$ = 0.719	0.200	1.23	1.00	0.245

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.096	1.000	0.245	0.341
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.832	0.080	0.662	0.162	0.242
Head-on collision	0.020	0.002	0.007	0.002	0.004
Angle collision	0.040	0.004	0.036	0.009	0.013
Sideswipe, same direction	0.050	0.005	0.223	0.055	0.059
Sideswipe, opposite direction	0.010	0.001	0.001	0.000	0.001
Other multiple-vehicle collision	0.048	0.005	0.071	0.017	0.022

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.05	0.47	0.86	0.061	1.000	0.061	1.23	1.00	0.074
Fatal and Injury (FI)	-8.71	0.66	0.28	0.010	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.169	0.010	1.23	1.00	0.013
Property Damage Only (PDO)	-5.04	0.45	1.06	0.050	$(5)_{TOTAL}-(5)_{FI}$ = 0.831	0.050	1.23	1.00	0.062

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.013	1.000	0.062	0.074
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.063	0.004	0.004
Collision with fixed object	0.500	0.006	0.813	0.050	0.056
Collision with other object	0.028	0.000	0.016	0.001	0.001
Other single-vehicle collision	0.471	0.006	0.108	0.007	0.013

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.033	1.106	0.091	--
Minor commercial	1	0.011	1.106	0.015	
Major industrial/institutional	0	0.036	1.106	0.000	
Minor industrial/institutional	0	0.005	1.106	0.000	
Major residential	0	0.018	1.106	0.000	
Minor residential	0	0.003	1.106	0.000	
Other	0	0.005	1.106	0.000	
Total	--	--	--	0.106	1.39

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.106	1.000	0.106	1.23	1.00	0.130
Fatal and injury (FI)	--	0.284	0.030	1.23	1.00	0.037
Property damage only (PDO)	--	0.716	0.076	1.23	1.00	0.093

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.341	0.074	0.130	0.545	0.067	1.00	0.037
Fatal and injury (FI)	--	--	--	--	--	1.00	0.037

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.341	0.074	0.130	0.545	0.013	1.00	0.007
Fatal and injury (FI)	--	--	--	--	--	1.00	0.007

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.080	0.162	0.242
Head-on collisions (from Worksheet 1D)	0.002	0.002	0.004
Angle collisions (from Worksheet 1D)	0.004	0.009	0.013
Sideswipe, same direction (from Worksheet 1D)	0.005	0.055	0.059
Sideswipe, opposite direction (from Worksheet 1D)	0.001	0.000	0.001
Driveway-related collisions (from Worksheet 1H)	0.037	0.093	0.130
Other multiple-vehicle collision (from Worksheet 1D)	0.005	0.017	0.022
Subtotal	0.133	0.338	0.471
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.004	0.004
Collision with fixed object (from Worksheet 1F)	0.006	0.050	0.056
Collision with other object (from Worksheet 1F)	0.000	0.001	0.001
Other single-vehicle collision (from Worksheet 1F)	0.006	0.007	0.013
Collision with pedestrian (from Worksheet 1I)	0.037	0.000	0.037
Collision with bicycle (from Worksheet 1J)	0.007	0.000	0.007
Subtotal	0.056	0.062	0.118
Total	0.189	0.400	0.588

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.6	0.09	6.5
Fatal and injury (FI)	0.2	0.09	2.1
Property damage only (PDO)	0.4	0.09	4.4

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	KKD	Roadway	1
Agency or Company	OSU	Intersection	Broadway/Broadway Terrace
Date Performed	03/25/10	Jurisdiction	Oakland,CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 58,100 (veh/day)	--	16,400
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 16,400 (veh/day)	--	7,300
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	2
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			8,000
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft) of the intersection		0	3
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.86	0.88	1.00	1.00	0.91	1.00	0.69

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-12.13	1.11	0.26	0.33	2.600	1.000	2.600	0.69	1.00	1.799
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	0.845	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.341	0.885	0.69	1.00	0.613
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	1.636	$(5)_{TOTAL}-(5)_{FI}$ = 0.659	1.715	0.69	1.00	1.187

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.613	1.000	1.187	1.799
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.549	0.336	0.546	0.648	0.984
Head-on collision	0.038	0.023	0.020	0.024	0.047
Angle collision	0.280	0.172	0.204	0.242	0.414
Sideswipe	0.076	0.047	0.032	0.038	0.085
Other multiple-vehicle collision	0.057	0.035	0.198	0.235	0.270

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.250	1.000	0.250	0.69	1.00	0.173
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.075	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.307	0.077	0.69	1.00	0.053
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.169	$(5)_{TOTAL}-(5)_{FI}$ = 0.693	0.173	0.69	1.00	0.120

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.053	1.000	0.120	0.173
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.003	0.000	0.000
Collision with fixed object	0.653	0.035	0.895	0.107	0.142
Collision with other object	0.091	0.005	0.069	0.008	0.013
Other single-vehicle collision	0.045	0.002	0.018	0.002	0.005
Single-vehicle noncollision	0.209	0.011	0.014	0.002	0.013

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.35	1.12	6.27

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.116	6.27	1.00	0.727
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.727

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	1.799	0.173	1.972	0.011	1.00	0.022
Fatal and injury (FI)	--	--	--	--	1.00	0.022

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.336	0.648	0.984
Head-on collisions (from Worksheet 2D)	0.023	0.024	0.047
Angle collisions (from Worksheet 2D)	0.172	0.242	0.414
Sideswipe (from Worksheet 2D)	0.047	0.038	0.085
Other multiple-vehicle collision (from Worksheet 2D)	0.035	0.235	0.270
Subtotal	0.613	1.187	1.799
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.035	0.107	0.142
Collision with other object (from Worksheet 2F)	0.005	0.008	0.013
Other single-vehicle collision (from Worksheet 2F)	0.002	0.002	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.011	0.002	0.013
Collision with pedestrian (from Worksheet 2G or 2I)	0.727	0.000	0.727
Collision with bicycle (from Worksheet 2J)	0.022	0.000	0.022
Subtotal	0.801	0.120	0.921
Total	1.414	1.307	2.721

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	2.7
Fatal and injury (FI)	1.4
Property damage only (PDO)	1.3

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	KKD	Roadway	2
Agency or Company	OSU	Intersection	Broadway/Clifton St
Date Performed	03/25/10	Jurisdiction	Oakland,CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 45,700 (veh/day)	--	16,600
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 9,300 (veh/day)	--	500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	3
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	0.91	1.00	0.91

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	0.974	1.000	0.974	0.91	1.00	0.886
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.417	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.420	0.409	0.91	1.00	0.372
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.577	$(5)_{TOTAL}-(5)_{FI}$ = 0.580	0.565	0.91	1.00	0.514

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.372	1.000	0.514	0.886
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.157	0.440	0.226	0.383
Head-on collision	0.045	0.017	0.023	0.012	0.029
Angle collision	0.343	0.128	0.262	0.135	0.262
Sideswipe	0.126	0.047	0.040	0.021	0.067
Other multiple-vehicle collision	0.065	0.024	0.235	0.121	0.145

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.124	1.000	0.124	0.91	1.00	0.113
Fatal and Injury (FI)	--	--	--	--	0.039	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.322	0.040	0.91	1.00	0.036
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.081	$(5)_{TOTAL}-(5)_{FI}$ = 0.678	0.084	0.91	1.00	0.077

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.036	1.000	0.077	0.113
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.028	0.834	0.064	0.092
Collision with other object	0.090	0.003	0.092	0.007	0.010
Other single-vehicle collision	0.039	0.001	0.023	0.002	0.003
Single-vehicle noncollision	0.105	0.004	0.030	0.002	0.006

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.886	0.113	0.999	0.021	1.00	0.021
Fatal and injury (FI)	--	--	--	--	1.00	0.021

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.886	0.113	0.999	0.016	1.00	0.016
Fatal and injury (FI)	--	--	--	--	1.00	0.016

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.157	0.226	0.383
Head-on collisions (from Worksheet 2D)	0.017	0.012	0.029
Angle collisions (from Worksheet 2D)	0.128	0.135	0.262
Sideswipe (from Worksheet 2D)	0.047	0.021	0.067
Other multiple-vehicle collision (from Worksheet 2D)	0.024	0.121	0.145
Subtotal	0.372	0.514	0.886
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.028	0.064	0.092
Collision with other object (from Worksheet 2F)	0.003	0.007	0.010
Other single-vehicle collision (from Worksheet 2F)	0.001	0.002	0.003
Single-vehicle noncollision (from Worksheet 2F)	0.004	0.002	0.006
Collision with pedestrian (from Worksheet 2G or 2I)	0.021	0.000	0.021
Collision with bicycle (from Worksheet 2J)	0.016	0.000	0.016
Subtotal	0.073	0.077	0.150
Total	0.445	0.591	1.036

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	1.0
Fatal and injury (FI)	0.4
Property damage only (PDO)	0.6

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	KKD	Roadway	3
Agency or Company	OSU	Intersection	Broadway/College Av
Date Performed	03/25/10	Jurisdiction	Oakland,CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 58,100 (veh/day)	--	22,400
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 16,400 (veh/day)	--	7,300
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	1
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	1
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.93	0.99	1.00	0.98	0.91	1.00	0.82

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-12.13	1.11	0.26	0.33	3.675	1.000	3.675	0.82	1.00	3.020
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	1.161	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.332	1.221	0.82	1.00	1.003
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	2.335	$(5)_{TOTAL}-(5)_{FI}$ = 0.668	2.454	0.82	1.00	2.017

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.003	1.000	2.017	3.020
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.549	0.551	0.546	1.101	1.652
Head-on collision	0.038	0.038	0.020	0.040	0.078
Angle collision	0.280	0.281	0.204	0.411	0.692
Sideswipe	0.076	0.076	0.032	0.065	0.141
Other multiple-vehicle collision	0.057	0.057	0.198	0.399	0.456

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.285	1.000	0.285	0.82	1.00	0.234
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.081	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.295	0.084	0.82	1.00	0.069
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.195	$(5)_{TOTAL}-(5)_{FI}$ = 0.705	0.201	0.82	1.00	0.165

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.069	1.000	0.165	0.234
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.003	0.000	0.001
Collision with fixed object	0.653	0.045	0.895	0.148	0.193
Collision with other object	0.091	0.006	0.069	0.011	0.018
Other single-vehicle collision	0.045	0.003	0.018	0.003	0.006
Single-vehicle noncollision	0.209	0.014	0.014	0.002	0.017

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.004	1.00	1.00	0.004
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.004

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	3.020	0.234	3.254	0.011	1.00	0.036
Fatal and injury (FI)	--	--	--	--	1.00	0.036

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.551	1.101	1.652
Head-on collisions (from Worksheet 2D)	0.038	0.040	0.078
Angle collisions (from Worksheet 2D)	0.281	0.411	0.692
Sideswipe (from Worksheet 2D)	0.076	0.065	0.141
Other multiple-vehicle collision (from Worksheet 2D)	0.057	0.399	0.456
Subtotal	1.003	2.017	3.020
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.045	0.148	0.193
Collision with other object (from Worksheet 2F)	0.006	0.011	0.018
Other single-vehicle collision (from Worksheet 2F)	0.003	0.003	0.006
Single-vehicle noncollision (from Worksheet 2F)	0.014	0.002	0.017
Collision with pedestrian (from Worksheet 2G or 2I)	0.004	0.000	0.004
Collision with bicycle (from Worksheet 2J)	0.036	0.000	0.036
Subtotal	0.109	0.165	0.274
Total	1.112	2.182	3.293

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	3.3
Fatal and injury (FI)	1.1
Property damage only (PDO)	2.2

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	KKD	Roadway	4
Agency or Company	OSU	Intersection	Broadway/Coronado Ave
Date Performed	03/25/10	Jurisdiction	Oakland,CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 46,800 (veh/day)	--	20,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 5,900 (veh/day)	--	1,400
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	1
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	1
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	3
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	1.00	1.00	1.00	0.91	1.00	0.67

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-8.90	0.82	0.25	0.40	2.806	1.000	2.806	0.67	1.00	1.870
Fatal and Injury (FI)	-11.13	0.93	0.28	0.48	1.115	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.391	1.097	0.67	1.00	0.731
Property Damage Only (PDO)	-8.74	0.77	0.23	0.40	1.736	$(5)_{TOTAL}-(5)_{FI}$ = 0.609	1.709	0.67	1.00	1.139

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.731	1.000	1.139	1.870
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.338	0.247	0.374	0.426	0.673
Head-on collision	0.041	0.030	0.030	0.034	0.064
Angle collision	0.440	0.322	0.335	0.382	0.703
Sideswipe	0.121	0.088	0.044	0.050	0.139
Other multiple-vehicle collision	0.060	0.044	0.217	0.247	0.291

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-5.33	0.33	0.12	0.65	0.303	1.000	0.303	0.67	1.00	0.202
Fatal and Injury (FI)	--	--	--	--	0.085	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.310	0.094	0.67	1.00	0.063
Property Damage Only (PDO)	-7.04	0.36	0.25	0.54	0.189	$(5)_{TOTAL}-(5)_{FI}$ = 0.690	0.209	0.67	1.00	0.140

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.063	1.000	0.140	0.202
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.026	0.004	0.004
Collision with fixed object	0.679	0.043	0.847	0.118	0.161
Collision with other object	0.089	0.006	0.070	0.010	0.015
Other single-vehicle collision	0.051	0.003	0.007	0.001	0.004
Single-vehicle noncollision	0.179	0.011	0.049	0.007	0.018

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	1.870	0.202	2.073	0.022	1.00	0.046
Fatal and injury (FI)	--	--	--	--	1.00	0.046

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	1.870	0.202	2.073	0.018	1.00	0.037
Fatal and injury (FI)	--	--	--	--	1.00	0.037

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.247	0.426	0.673
Head-on collisions (from Worksheet 2D)	0.030	0.034	0.064
Angle collisions (from Worksheet 2D)	0.322	0.382	0.703
Sideswipe (from Worksheet 2D)	0.088	0.050	0.139
Other multiple-vehicle collision (from Worksheet 2D)	0.044	0.247	0.291
Subtotal	0.731	1.139	1.870
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.004	0.004
Collision with fixed object (from Worksheet 2F)	0.043	0.118	0.161
Collision with other object (from Worksheet 2F)	0.006	0.010	0.015
Other single-vehicle collision (from Worksheet 2F)	0.003	0.001	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.011	0.007	0.018
Collision with pedestrian (from Worksheet 2G or 2I)	0.046	0.000	0.046
Collision with bicycle (from Worksheet 2J)	0.037	0.000	0.037
Subtotal	0.146	0.140	0.285
Total	0.877	1.279	2.156

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	2.2
Fatal and injury (FI)	0.9
Property damage only (PDO)	1.3

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	KKD	Roadway	5
Agency or Company	OSU	Intersection	Broadway/Pleasant Valley Av
Date Performed	03/25/10	Jurisdiction	Oakland, CA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	20,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	20,700
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			8,000
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	7
Number of bus stops within 300 m (1,000 ft) of the intersection		0	3
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.94	1.00	1.00	0.91	1.00	0.56

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	6.636	1.000	6.636	0.56	1.00	3.749
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	2.080	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.324	2.152	0.56	1.00	1.216
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	4.335	$(5)_{TOTAL}-(5)_{FI}$ = 0.676	4.484	0.56	1.00	2.533

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.216	1.000	2.533	3.749
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.547	0.483	1.224	1.771
Head-on collision	0.049	0.060	0.030	0.076	0.136
Angle collision	0.347	0.422	0.244	0.618	1.040
Sideswipe	0.099	0.120	0.032	0.081	0.201
Other multiple-vehicle collision	0.055	0.067	0.211	0.535	0.601

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.453	1.000	0.453	0.56	1.00	0.256
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.121	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.273	0.124	0.56	1.00	0.070
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.323	$(5)_{TOTAL}-(5)_{FI}$ = 0.727	0.329	0.56	1.00	0.186

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.070	1.000	0.186	0.256
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.052	0.870	0.162	0.214
Collision with other object	0.072	0.005	0.070	0.013	0.018
Other single-vehicle collision	0.040	0.003	0.023	0.004	0.007
Single-vehicle noncollision	0.141	0.010	0.034	0.006	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.35	1.12	6.27

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.386	6.27	1.00	2.424
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	2.424

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	3.749	0.256	4.005	0.015	1.00	0.060
Fatal and injury (FI)	--	--	--	--	1.00	0.060

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.547	1.224	1.771
Head-on collisions (from Worksheet 2D)	0.060	0.076	0.136
Angle collisions (from Worksheet 2D)	0.422	0.618	1.040
Sideswipe (from Worksheet 2D)	0.120	0.081	0.201
Other multiple-vehicle collision (from Worksheet 2D)	0.067	0.535	0.601
Subtotal	1.216	2.533	3.749
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.052	0.162	0.214
Collision with other object (from Worksheet 2F)	0.005	0.013	0.018
Other single-vehicle collision (from Worksheet 2F)	0.003	0.004	0.007
Single-vehicle noncollision (from Worksheet 2F)	0.010	0.006	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	2.424	0.000	2.424
Collision with bicycle (from Worksheet 2J)	0.060	0.000	0.060
Subtotal	2.554	0.186	2.740
Total	3.769	2.719	6.489

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.5
Fatal and injury (FI)	3.8
Property damage only (PDO)	2.7

Attachment E –
MTS Roadway Segment Analysis

CCA Oakland
Alameda CTC Roadway System Analysis Summary - 2020 PM

Link Location	Segment Limits		A node	B node	# Lanes	Model Volume	Project Trips	No Project Volume	With Project Volume	% Increase	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C≥2%
Freeway Segments																
SR-13 Southbound																
Between	SR 24 Interchange	Broadway Terrace	27994	27985	3	4,195	5	4,195	4,200	0.12%	0.70	0.70	C	C	No	-
Between	Broadway Terrace	Moraga Avenue	27984	27983	2	3,589	5	3,589	3,594	0.14%	0.90	0.90	D	D	No	-
Between	Moraga Avenue	Park Blvd	28006	28004	2	3,218	4	3,218	3,222	0.12%	0.80	0.81	D	D	No	-
Between	Park Blvd	Joaquin Miller Road	28030	28029	2	3,342	4	3,342	3,346	0.12%	0.84	0.84	D	D	No	-
Between	Joaquin Miller Road	Mountain Blvd	28145	28152	2	3,080	4	3,080	3,084	0.13%	0.77	0.77	D	D	No	-
Between	Mountain Blvd	I-580	28129	28137	2	3,026	4	3,026	3,030	0.13%	0.76	0.76	D	D	No	-
SR-13 Northbound																
Between	I-580	Mountain Blvd	28138	28130	2	3,470	4	3,470	3,474	0.12%	0.87	0.87	D	D	No	-
Between	Mountain Blvd	Joaquin Miller Road	28153	28044	2	3,412	4	3,412	3,416	0.12%	0.85	0.85	D	D	No	-
Between	Joaquin Miller Road	Park Blvd	28028	28031	2	3,633	4	3,633	3,637	0.11%	0.91	0.91	E	E	No	-
Between	Park Blvd	Moraga Avenue	28033	28005	2	3,248	5	3,248	3,253	0.15%	0.81	0.81	D	D	No	-
Between	Moraga Avenue	Broadway Terrace	28007	28010	2	3,451	5	3,451	3,456	0.14%	0.86	0.86	D	D	No	-
Between	Broadway Terrace	SR 24 Interchange	28011	28012	3	3,667	5	3,667	3,672	0.14%	0.61	0.61	C	C	No	-
SR-24 Eastbound																
Between	I-580 Interchange	51st Street/MLK Blvd	27706	27680	4	6,700	15	6,700	6,715	0.22%	0.84	0.84	D	D	No	-
Between	51st Street/MLK Blvd	Claremont Avenue	27680	27674	4	5,842	4	5,842	5,846	0.07%	0.73	0.73	C	C	No	-
Between	Claremont Avenue	Broadway	27674	27672	4	7,420	4	7,420	7,424	0.05%	0.93	0.93	E	E	No	-
Between	Broadway	SR-13 Interchange	27996	27993	5	7,892	4	7,892	7,896	0.05%	0.79	0.79	D	D	No	-
SR-24 Westbound																
Between	SR-13 Interchange	Broadway	27987	27995	5	3,748	10	3,748	3,758	0.27%	0.37	0.38	B	B	No	-
Between	Broadway	Claremont Avenue	27673	27675	4	3,473	8	3,473	3,481	0.23%	0.43	0.44	B	B	No	-
Between	Claremont Avenue	51st Street/MLK Blvd	27675	27681	4	2,954	8	2,954	2,962	0.27%	0.37	0.37	B	B	No	-
Between	51st Street/MLK Blvd	I-580 Interchange	27681	27705	4	3,898	40	3,898	3,938	1.03%	0.49	0.49	B	B	No	-
Arterials																
Broadway Eastbound																
Between	27th Street	W MacArthur Blvd	33256	27914	3	661	10	661	671	1.51%	0.28	0.28	A	A	No	-
Between	W MacArthur Blvd	40th Street	33215	27923	3	614	20	614	634	3.25%	0.26	0.26	A	A	No	-
Between	40th Street	51st Street	33201	27925	3	976	25	976	1,001	2.56%	0.41	0.42	B	B	No	-
Between	51st Street	College Avenue	27925	27988	3	658	30	658	688	4.56%	0.27	0.29	A	A	No	-
Between	College Avenue	Keith Avenue	27462	12076	2	233	10	233	243	4.30%	0.15	0.15	A	A	No	-
Broadway Westbound																
Between	Keith Avenue	College Avenue	12076	27462	2	439	50	439	489	11.38%	0.27	0.31	A	A	No	-
Between	College Avenue	51st Street	27988	27925	3	503	40	503	543	7.96%	0.21	0.23	A	A	No	-
Between	51st Street	40th Street	27925	33201	3	294	35	294	329	11.89%	0.12	0.14	A	A	No	-
Between	40th Street	W MacArthur Blvd	27923	33215	3	388	30	388	418	7.73%	0.16	0.17	A	A	No	-
Between	W MacArthur Blvd	27th Street	27914	33256	3	482	15	482	497	3.11%	0.20	0.21	A	A	No	-
Claremont Avenue Northbound																
Between	Telegraph Avenue	Clifton Street/SR-24 Off-Ramp	33546	27677	2	164	17	164	181	10.39%	0.10	0.11	A	A	No	-
Between	Clifton Street	Hudson Street/SR-24 On-Ramp	27677	27676	2	963	13	963	976	1.35%	0.60	0.61	C	C	No	-
Between	Hudson Street/SR-24 On-Ramp	Forest Street	27676	27667	2	917	13	917	930	1.42%	0.57	0.58	B	B	No	-
Between	Forest Street	Chabot Road	33238	30179	2	1,161	10	1,161	1,171	0.86%	0.73	0.73	C	C	No	-
Between	Chabot Road	College Avenue	33242	27666	2	905	10	905	915	1.10%	0.57	0.57	B	B	No	-
Claremont Avenue Southbound																
Between	College Avenue	Chabot Road	27666	33242	2	786	24	786	810	3.05%	0.49	0.51	B	B	No	-
Between	Chabot Road	Forest Street	30179	33238	2	975	28	975	1,003	2.87%	0.61	0.63	C	C	No	-
Between	Forest Street	Hudson Street/SR-24 On-Ramp	27667	27676	2	1,232	28	1,232	1,260	2.27%	0.77	0.79	D	D	No	-
Between	Hudson Street/SR-24 On-Ramp	Clifton Street	27676	27677	2	334	11	334	345	3.29%	0.21	0.22	A	A	No	-
Between	Clifton Street/SR-24 Off-Ramp	Telegraph Avenue	27677	33546	2	317	10	317	327	3.16%	0.20	0.20	A	A	No	-
Grand Avenue Eastbound																
Between	MacArthur Blvd	Lake Park Avenue	27900	27966	2	788	7	788	795	0.89%	0.49	0.50	B	B	No	-
Between	Lake Park Avenue	Mandana Avenue	27966	12073	2	393	7	393	400	1.78%	0.25	0.25	A	A	No	-
Between	Mandana Avenue	Sunny Slope Avenue	12073	33265	2	399	7	399	406	1.75%	0.25	0.25	A	A	No	-
Between	Sunny Slope Avenue	Oakland Avenue	33265	33249	2	405	7	405	412	1.73%	0.25	0.26	A	A	No	-
Grand Avenue Westbound																
Between	Oakland Avenue	Sunny Slope Avenue	33249	33265	2	698	12	698	710	1.72%	0.44	0.44	B	B	No	-
Between	Sunny Slope Avenue	Mandana Avenue	33265	12073	2	430	12	430	442	2.79%	0.27	0.28	A	A	No	-
Between	Mandana Avenue	Lake Park Avenue	12073	27966	2	395	10	395	405	2.53%	0.25	0.25	A	A	No	-

CCA Oakland
Alameda CTC Roadway System Analysis Summary - 2020 PM

Link Location	Segment Limits		A node	B node	# Lanes	Model Volume	Project Trips	No Project Volume	With Project Volume	% Increase	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C≥2%
Between	Lake Park Avenue	MacArthur Blvd	27966	27900	2	397	10	397	407	2.52%	0.25	0.25	A	A	No	-

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Alameda CTC Roadway System Analysis Summary - 2040 PM

Link Location	Segment Limits		A node	B node	# Lanes	Model Volume	Project Trips	No Project Volume	With Project Volume	% Increase	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C≥2%
Freeway Segments																
SR-13 Southbound																
Between	SR 24 Interchange	Broadway Terrace	27994	27985	3	4,689	5	4,689	4,694	0.11%	0.78	0.78	D	D	No	-
Between	Broadway Terrace	Moraga Avenue	27984	27983	2	4,079	5	4,079	4,084	0.12%	1.02	1.02	F	F	-	No
Between	Moraga Avenue	Park Blvd	28006	28004	2	3,538	4	3,538	3,542	0.11%	0.88	0.89	D	D	No	-
Between	Park Blvd	Joaquin Miller Road	28030	28029	2	3,806	4	3,806	3,810	0.11%	0.95	0.95	E	E	No	-
Between	Joaquin Miller Road	Mountain Blvd	28145	28152	2	3,526	4	3,526	3,530	0.11%	0.88	0.88	D	D	No	-
Between	Mountain Blvd	I-580	28129	28137	2	3,530	4	3,530	3,534	0.11%	0.88	0.88	D	D	No	-
SR-13 Northbound																
Between	I-580	Mountain Blvd	28138	28130	2	3,750	4	3,750	3,754	0.11%	0.94	0.94	E	E	No	-
Between	Mountain Blvd	Joaquin Miller Road	28153	28044	2	3,713	4	3,713	3,717	0.11%	0.93	0.93	E	E	No	-
Between	Joaquin Miller Road	Park Blvd	28028	28031	2	3,926	4	3,926	3,930	0.10%	0.98	0.98	E	E	No	-
Between	Park Blvd	Moraga Avenue	28033	28005	2	3,616	5	3,616	3,621	0.14%	0.90	0.91	D	E	No	-
Between	Moraga Avenue	Broadway Terrace	28007	28010	2	3,832	5	3,832	3,837	0.13%	0.96	0.96	E	E	No	-
Between	Broadway Terrace	SR 24 Interchange	28011	28012	3	4,095	5	4,095	4,100	0.12%	0.68	0.68	C	C	No	-
SR-24 Eastbound																
Between	I-580 Interchange	51st Street/MLK Blvd	27706	27680	4	7,109	15	7,109	7,124	0.21%	0.89	0.89	D	D	No	-
Between	51st Street/MLK Blvd	Claremont Avenue	27680	27674	4	6,298	4	6,298	6,302	0.06%	0.79	0.79	D	D	No	-
Between	Claremont Avenue	Broadway	27674	27672	4	7,911	4	7,911	7,915	0.05%	0.99	0.99	E	E	No	-
Between	Broadway	SR-13 Interchange	27996	27993	5	8,425	4	8,425	8,429	0.05%	0.84	0.84	D	D	No	-
SR-24 Westbound																
Between	SR-13 Interchange	Broadway	27987	27995	5	4,206	10	4,206	4,216	0.24%	0.42	0.42	B	B	No	-
Between	Broadway	Claremont Avenue	27673	27675	4	3,915	8	3,915	3,923	0.20%	0.49	0.49	B	B	No	-
Between	Claremont Avenue	51st Street/MLK Blvd	27675	27681	4	3,142	8	3,142	3,150	0.25%	0.39	0.39	B	B	No	-
Between	51st Street/MLK Blvd	I-580 Interchange	27681	27705	4	4,124	40	4,124	4,164	0.97%	0.52	0.52	B	B	No	-
Arterials																
Broadway Eastbound																
Between	27th Street	W MacArthur Blvd	33256	27914	3	696	10	696	706	1.44%	0.29	0.29	A	A	No	-
Between	W MacArthur Blvd	40th Street	33215	27923	3	731	20	731	751	2.73%	0.30	0.31	A	A	No	-
Between	40th Street	51st Street	33201	27925	3	1,066	25	1,066	1,091	2.35%	0.44	0.45	B	B	No	-
Between	51st Street	College Avenue	27925	27988	3	744	30	744	774	4.03%	0.31	0.32	A	A	No	-
Between	College Avenue	SR-24 On-Ramp	27462	12076	2	257	10	257	267	3.89%	0.16	0.17	A	A	No	-
Broadway Westbound																
Between	SR-24 Off-Ramp	College Avenue	12076	27462	2	446	50	446	496	11.20%	0.28	0.31	A	A	No	-
Between	College Avenue	51st Street	27988	27925	3	532	40	532	572	7.52%	0.22	0.24	A	A	No	-
Between	51st Street	40th Street	27925	33201	3	315	35	315	350	11.12%	0.13	0.15	A	A	No	-
Between	40th Street	W MacArthur Blvd	27923	33215	3	620	30	620	650	4.84%	0.26	0.27	A	A	No	-
Between	W MacArthur Blvd	27th Street	27914	33256	3	599	15	599	614	2.51%	0.25	0.26	A	A	No	-
Claremont Avenue Northbound																
Between	Telegraph Avenue	Clifton Street/SR-24 Off-F	33546	27677	2	199	17	199	216	8.53%	0.12	0.14	A	A	No	-
Between	Clifton Street	Hudson Street/SR-24 On-	27677	27676	2	1,075	13	1,075	1,088	1.21%	0.67	0.68	C	C	No	-
Between	Hudson Street/SR-24 C	Forest Street	27676	27667	2	1,001	13	1,001	1,014	1.30%	0.63	0.63	C	C	No	-
Between	Forest Street	Chabot Road	33238	30179	2	1,321	10	1,321	1,331	0.76%	0.83	0.83	D	D	No	-
Between	Chabot Road	College Avenue	33242	27666	2	1,064	10	1,064	1,074	0.94%	0.66	0.67	C	C	No	-
Claremont Avenue Southbound																
Between	College Avenue	Chabot Road	27666	33242	2	805	24	805	829	2.98%	0.50	0.52	B	B	No	-
Between	Chabot Road	Forest Street	30179	33238	2	1,028	28	1,028	1,056	2.72%	0.64	0.66	C	C	No	-
Between	Forest Street	Hudson Street/SR-24 On-	27667	27676	2	1,298	28	1,298	1,326	2.16%	0.81	0.83	D	D	No	-
Between	Hudson Street/SR-24 C	Clifton Street	27676	27677	2	390	11	390	401	2.82%	0.24	0.25	A	A	No	-
Between	Clifton Street/SR-24 Of	Telegraph Avenue	27677	33546	2	351	10	351	361	2.85%	0.22	0.23	A	A	No	-
Grand Avenue Eastbound																
Between	MacArthur Blvd	Lake Park Avenue	27900	27966	2	886	7	886	893	0.79%	0.55	0.56	B	B	No	-
Between	Lake Park Avenue	Mandana Avenue	27966	12073	2	405	7	405	412	1.73%	0.25	0.26	A	A	No	-
Between	Mandana Avenue	Sunny Slope Avenue	12073	33265	2	411	7	411	418	1.70%	0.26	0.26	A	A	No	-
Between	Sunny Slope Avenue	Oakland Avenue	33265	33249	2	412	7	412	419	1.70%	0.26	0.26	A	A	No	-
Grand Avenue Westbound																
Between	Oakland Avenue	Sunny Slope Avenue	33249	33265	2	893	12	893	905	1.34%	0.56	0.57	B	B	No	-
Between	Sunny Slope Avenue	Mandana Avenue	33265	12073	2	492	12	492	504	2.44%	0.31	0.31	A	A	No	-
Between	Mandana Avenue	Lake Park Avenue	12073	27966	2	451	10	451	461	2.22%	0.28	0.29	A	A	No	-

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Link Location	Segment Limits		A node	B node	# Lanes	Model Volume	Project Trips	No Project Volume	With Project Volume	% Increase	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C≥2%
Between	Lake Park Avenue	MacArthur Blvd	27966	27900	2	441	10	441	451	2.27%	0.28	0.28	A	A	No	-

Fehr & Peers, 2018.