

**MID-CITY RAPID BUS PROJECT
ADDENDUM TO THE
FINAL MITIGATED NEGATIVE
DECLARATION**

FEBRUARY 2, 2012



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**MID-CITY RAPID BUS PROJECT
ADDENDUM
TO THE
FINAL MITIGATED NEGATIVE DECLARATION
(SCH #2008091021)**

INTRODUCTION

The San Diego Association of Governments (SANDAG) proposes three modifications to the plans for implementation of the Mid-City Rapid Bus Project (herein referred to as the Project). This project was described in the *Mid-City Rapid Bus Project Final Initial Study/Mitigated Negative Declaration* (Final IS/MND) adopted by SANDAG on November 7, 2008. The Final IS/MND, in its entirety, is hereby incorporated by reference into this environmental document pursuant to Section 15150 of the California Environmental Quality Act (CEQA) Guidelines. The purpose of this Addendum is to provide environmental clearance of the proposed Project modifications under CEQA (California Public Resources Code Section 21000 et. seq.). This Addendum describes the Project, summarizes existing CEQA documentation, describes the proposed modifications, provides appropriate CEQA documentation for the Project modifications, evaluates Project-specific environmental impacts, and makes a determination that an addendum is the appropriate level of CEQA documentation for the proposed Project modifications.

PROJECT DESCRIPTION

This Project is located in the mid-city area within the City of San Diego. The Project includes a new 10-mile-long, limited-stop, rapid bus route between downtown and San Diego State University, primarily on existing public right-of-way, which follows an existing bus route. The rapid bus route will replace the existing Metropolitan Transit System (MTS) Route 15, which follows a similar alignment. Improvements to support the rapid bus route are focused within segments of the Park Boulevard and El Cajon Boulevard corridors, and include transit priority measures and new enhanced rapid bus stations at ten major intersections. The Project also includes deployment of visually distinctive buses, improvements for pedestrian safety, and several street system modifications to improve local traffic flow.

While the number of through automobile lanes in the street rights-of-way would not change with implementation of the Project, the Project does include several modifications to lane configurations and movements. Transit vehicles in the segment of Park Boulevard between University Avenue and El Cajon Boulevard would operate along the center of the roadway in bus-only designated transit lanes. Raised medians would separate these transit lanes from the general automobile lanes at the two stations north of University Avenue and at Howard Street. The median would be raised and landscaped at these locations. Outside the stations, the medians would generally be designated by striping. In the El Cajon Boulevard segment, no through transit lanes would be added; buses would travel in the outside lanes and boarding would occur at extended street curbs at the street edge.

PROPOSED MODIFICATIONS TO THE MID-CITY RAPID BUS PROJECT

This Addendum to the Final IS/MND addresses three modifications to the Project: relocation of the El Cajon Boulevard at 43rd Street Bus Rapid Transit Station (El Cajon/43rd Street Station) from the southeast corner of El Cajon Boulevard and Fairmount Avenue to the southwest corner of El Cajon Boulevard and 43rd Street; relocation of the Euclid Avenue Station from the originally proposed northeast corner of El Cajon Boulevard and 47th Street to the northwest corner of El Cajon Boulevard and Winona Avenue, and directly east of Winona Avenue on the southern side of El Cajon Boulevard; and changes to the sidewalk and lane markings in the Park Boulevard segment to retain more on-street parking. Figures 1, 2, and 3 show the revised configuration of the bus stations at each location.

El Cajon Boulevard and 43rd Street Station

As shown in Figure 1, SANDAG is proposing to move the El Cajon/43rd Street Station one-half block westerly of the originally proposed location. The previous location on the east side of the block would conflict with right-turning movements, unless Fairmount Avenue was converted to one-way northbound. Locating the station on the western half of the block gives the bus more length to merge back into a through-lane on El Cajon Boulevard and to avoid right-turn conflicts. This revised location is shown in Figure 1. It will require closure of one of two driveways at the U-Haul property. However, this driveway is not currently in use.

El Cajon Boulevard at Winona Avenue

Based on requests from the community and as shown in Figure 2, the station on the north side of El Cajon Boulevard at Euclid Avenue and 47th Street is now proposed to be relocated to the northwest corner of El Cajon Boulevard and Winona Avenue, and the southern side of El Cajon Boulevard directly east of Winona Avenue. This change is proposed to avoid impacts to the terrazzo paving located at the original station location, and would avoid a station location at the nearside of an intersection, which would slow down bus movements.

Park Boulevard

As a result of community input regarding the desire to retain more street parking on Park Boulevard, the Project now includes a narrowing of the sidewalk in front of the senior towers on the east side of Park Boulevard north of University Avenue, and also on the west side of Park Boulevard between Polk and Centre Streets. These changes reduce the loss of parking on Park Boulevard to seven spaces. The addition of 23 spaces on the side streets is still included in the Project design, resulting in a net gain of parking.

ENVIRONMENTAL ANALYSIS

As described in the Final IS/MND, the Project would have no impact related to Agricultural Resources, Biological Resources, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Recreation. Impacts of the Project on Aesthetics, Geology and Soils, Hydrology and Water Quality, and Utilities and Service Systems were considered less than significant. Based on an evaluation of the proposed project modifications and the previous Final IS/MND, these topical areas do not require further evaluation. Therefore, these topical areas are not discussed further in this Addendum.

Impacts of the Project on Air Quality, Hazards and Hazardous Materials, and Noise were considered less than significant with mitigation. Implementation of the mitigation measures identified in the Final IS/MND would reduce these potentially significant impacts to below a level of significance. These mitigation measures, as applicable, would be incorporated into the proposed Project, as modified. No changes related to impacts as described in the Final IS/MND have been identified for those issue areas above with the proposed Project revisions. Therefore, the Project would not result in any new or more severe impacts to these topical areas than those already determined in the Final IS/MND.

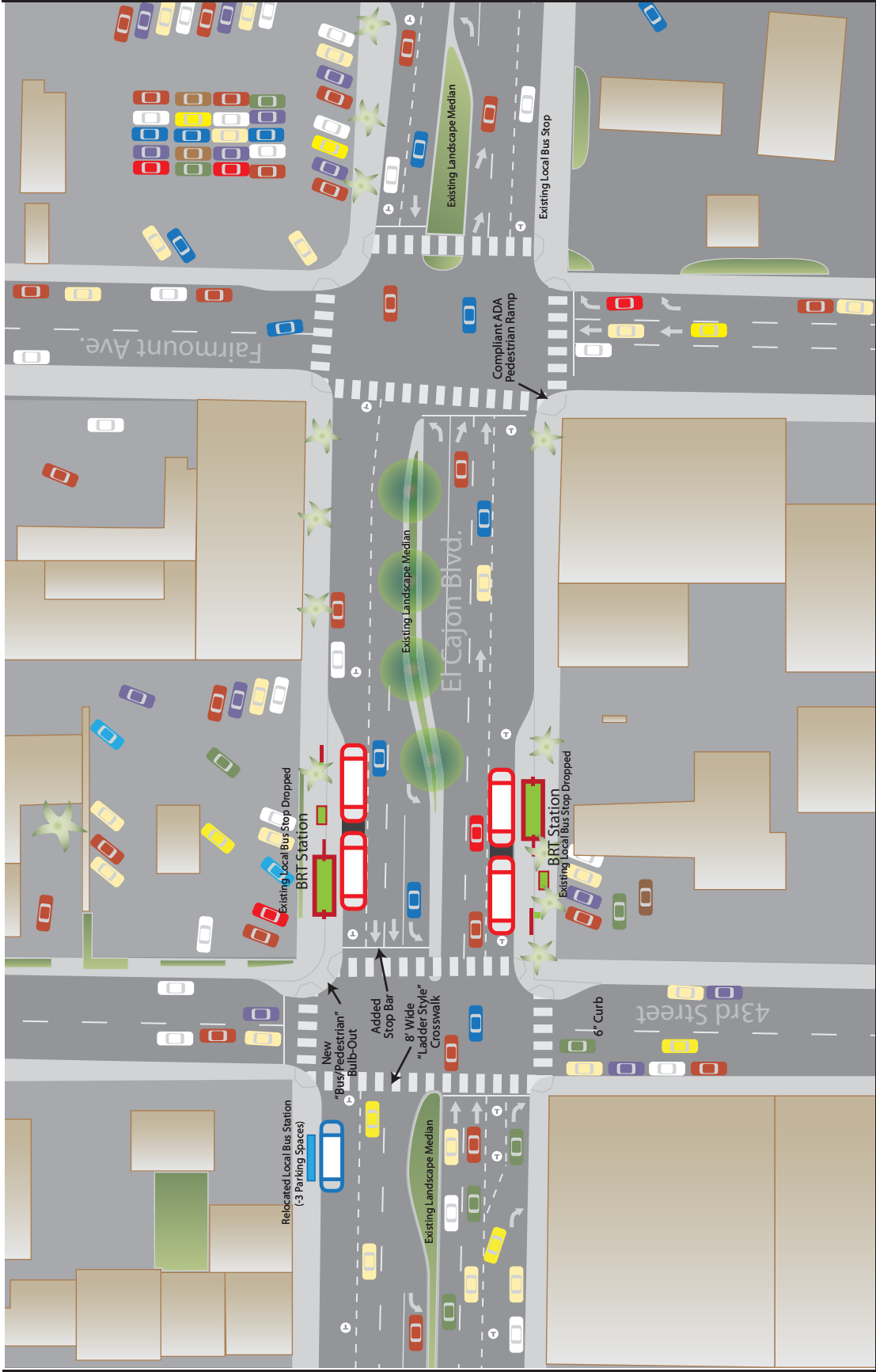
APPROPRIATE CEQA DOCUMENTATION FOR THE PROPOSED MODIFICATIONS

In accordance with Section 15164(b) of the CEQA Guidelines, "An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent Environmental Impact Report (EIR) or negative declaration have occurred." Specifically, these conditions include:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

-
- c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

In order to utilize an addendum as the appropriate CEQA document for the proposed modifications to the Project, SANDAG, as the lead agency, must make a finding that changes to the Final IS/MND are necessary, and that the Project would not result in any new significant or substantially more severe environmental effects than those previously identified in the Final IS/MND.



All corners shall receive:

1. ADA compliant pedestrian ramps (8% ramp with 1/2" beveled lip at bottom)
2. ADA compliant audible pedestrian crossing system with count-down crossing LED
3. ADA pole mounted actuators at each ramp
4. Realigned "Ladder Style" white or yellow zebra stripe crosswalk markings
5. Offset white or yellow stop bar held back 4' from the crosswalk

Figure 1
43rd Street Station

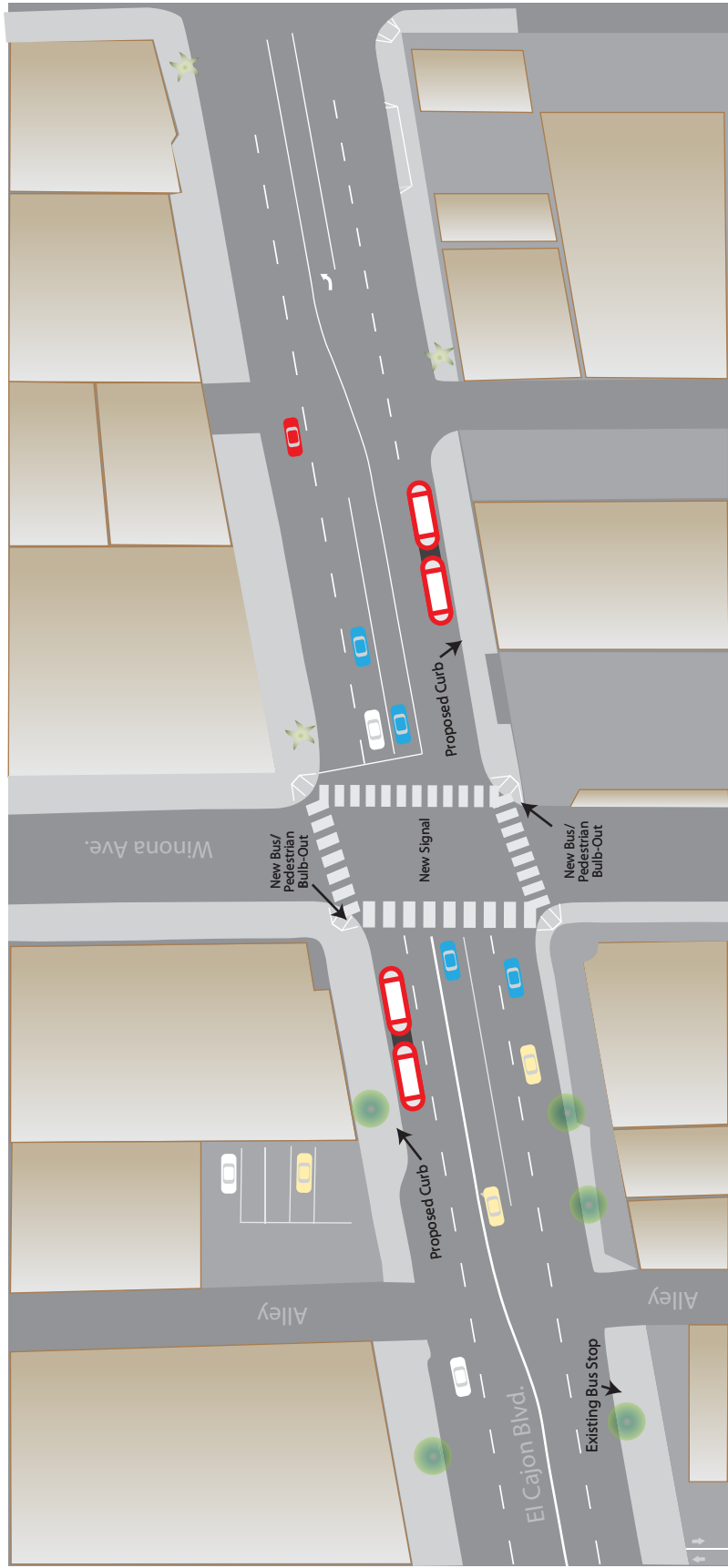


Figure 2
Winona Avenue Station

As described in the Final IS/MND, impacts to traffic were considered less than significant and impacts to cultural resources were considered less than significant with mitigation incorporated. These two topical areas are evaluated further in this environmental document to determine if the Project modifications described previously will result in any new or more significant impacts than those previously determined in the Final IS/MND. Based on the analysis below, the proposed Project revisions would not result in new significant impacts or substantially increase impacts related to these resources.

Cultural Resources

As of October 2010, the El Cajon/43rd Street Station and the El Cajon/Euclid Avenue Station were relocated to address community comments and concerns regarding the proposed Project. Specifically, the relocation of the El Cajon/Euclid Avenue Station to El Cajon Boulevard and Winona Avenue would allow SANDAG to avoid and retain a sidewalk design located between Euclid Avenue and 47th Street on the north side of El Cajon Boulevard.

As described in the Final IS/MND, a records search was conducted at the South Coastal Information Center (SCIC) on August 20, 2007, and the San Diego Museum of Man on September 10, 2007, to identify previous cultural resource investigations and archaeological resources within and in the vicinity of the Project area. No cultural resources were located within the Project area. The historic address database located at the SCIC identified 24 historic addresses within a one-mile radius of the Project area. Only one, the Georgia Street Bridge, is located within or immediately adjacent to the Project area.

A historic and archaeological survey was conducted on October 2, 2007, along the Project corridor to identify potential impacts to historic and archaeological resources. The entire Project alignment was surveyed, with special attention given to each bus stop identified in the Project design. The sidewalk design identified as a concern to the local community located between Euclid Avenue and 47th Street is now outside of current relocation of this bus station. On May 12, 2011, an additional historical resource survey was conducted at the new Winona Avenue location, and no potential historic resources were identified in the Project area. This survey is described in the Historic Resources Field Evaluation and Summary Letter included in the Appendix of this environmental document.

Additionally, no historical or archaeological resources were identified at the El Cajon/43rd Street Station. As such, no historical or archaeological resources will be affected by the proposed Project changes at the El Cajon/43rd Street Station or the El Cajon/Winona Avenue Station. The proposed Project modifications would avoid impacts to the terrazzo paving and would retain the sidewalk design located between Euclid Avenue and 47th Street on the north side of El Cajon Boulevard. The proposed Project modifications do not result in any new or more severe impacts than those previously identified in the Final IS/MND. No major revisions would be required to the Final IS/MND as a result of the proposed modifications. Therefore, the Final IS/MND remains adequate as added, and complete for this topical area.

Traffic

An updated Traffic Memorandum was prepared by KOA Corporation on November 22, 2011, to address final design of the proposed bus stations. The memorandum is included in the Appendix of this environmental document. This memorandum addresses bus bulb-out design along El Cajon Boulevard and includes the revised bus stop locations at El Cajon/43rd Street and El Cajon/Winona Avenue. Tables 1 through 5, below, summarize the results of the traffic analysis at these two bus stop locations. As can be seen in these tables, the A.M. and P.M. peak-hour traffic delays change slightly (-0.1 to +0.3 seconds). With Project implementation as revised, traffic at both bus stop locations would remain at acceptable levels (Level of Service [LOS] D or better); therefore, no significant traffic impacts would occur.

**Table 1
Existing Intersection Conditions for El Cajon Boulevard**

Intersection	Delay (seconds)	LOS	Delay (seconds)	LOS
	A.M. Peak-Hour		P.M. Peak-Hour	
El Cajon Boulevard/43rd Street	17.0	B	28.2	C
El Cajon Boulevard/Winona Avenue	5.6	A	8.7	A

**Table 2
Near-Term (2010) Morning Peak-Hour
Intersection Conditions for El Cajon Boulevard**

Intersection	Without Project		With Project		Change in Delay (seconds)
	Delay (seconds)	LOS	Delay (seconds)	LOS	
El Cajon Boulevard/43rd Street	19.8	B	19.7	B	-0.1
El Cajon Boulevard/Winona Avenue	5.6	A	5.80	B	0.2

**Table 3
Near-Term (2010) Evening Peak-Hour
Intersection Conditions for El Cajon Boulevard**

Intersection	Without Project		With Project		Change in Delay (seconds)
	Delay (seconds)	LOS	Delay (seconds)	LOS	
El Cajon Boulevard/43rd Street	30.1	C	30.4	C	0.3
El Cajon Boulevard/Winona Avenue	8.9	A	9.0	C	0.1

Table 4
Horizon Year (2030) Morning Peak-Hour
Intersection Conditions for El Cajon Boulevard

Intersection	Without Project		With Project		Change in Delay (seconds)
	Delay (seconds)	LOS	Delay (seconds)	LOS	
El Cajon Boulevard/43rd Street	20.3	C	20.0	B	-0.3
El Cajon Boulevard/Winona Avenue	5.8	C	6.1	B	0.3

Table 5
Horizon Year (2030) Evening Peak-Hour
Intersection Conditions for El Cajon Boulevard

Intersection	Without Project		With Project		Change in Delay (seconds)
	Delay (seconds)	LOS	Delay (seconds)	LOS	
El Cajon Boulevard/43rd Street	31.1	C	32.4	C	1.3
El Cajon Boulevard/Winona Avenue	9.4	A	9.5	C	0.3

In addition, as proposed in the Final IS/MND, six parking spaces were proposed to be lost at the El Cajon/43rd Street Station. With the relocation of the station at El Cajon/43rd Street, only three parking spaces will be lost, thereby preserving an additional three parking spaces with the revised Project design. The proposed Project modifications will provide additional parking spaces and reduce the number of lost parking spaces previously identified in the Final IS/MND. Therefore, no new or more severe impacts have been identified as a result of the proposed Project modifications.

Based on the analysis presented above, the proposed Project modifications will not result in any new or more severe impacts than those previously identified in the Final IS/MND. The proposed Project modifications will lessen the number of parking stalls lost by preserving three additional parking spaces. No major revisions would be required to the Final IS/MND. Therefore, the Final IS/MND as addended remains complete for this topical area.

DETERMINATION OF APPROPRIATE CEQA DOCUMENTATION

In accordance with Section 15164(b) of the CEQA Guidelines, "An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR or negative declaration have occurred." Specifically, these conditions are as follows:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

To use an addendum as the appropriate CEQA document for the proposed modifications to the Project, SANDAG, as the lead agency, must make a finding that changes to the Final IS/MND are necessary and that the Project would not result in any new significant or more severe environmental effects than that previously identified in the Final IS/MND and Addendum. The following discussion lists the appropriate subsections of Sections 15162 and 15164 of the State CEQA Guidelines and provides justification for SANDAG to make a determination that an addendum is the appropriate CEQA document for the Project, based on the environmental analysis above.

Section 15162 – Subsequent EIRs and Negative Declarations

- (a) When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one of more of the following:
- (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

SANDAG proposes to modify the Project, as described in this Addendum to the adopted Final IS/MND. Specifically, SANDAG proposes to relocate the El Cajon Boulevard at 43rd Street Station from the southeast corner of El Cajon Boulevard and Fairmount Avenue to the southwest corner of El Cajon Boulevard and 43rd Street, and relocate the El Cajon Boulevard at Euclid Avenue/47th Street Station from the originally proposed northeast corner of El Cajon Boulevard and 47th Street to Winona Avenue. As discussed above in the Environmental Analysis section of this Addendum, no new or more severe significant environmental effects would occur.

- (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

The new station locations would occur in the same general area as previously identified in the Final IS/MND, and would not extend into areas that were not previously evaluated for environmental effects. No major revisions to the Final IS/MND are required, and the proposed modifications would not result in new significant environmental effects.

- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - (A) The project will have one or more significant environmental effects not discussed in the previous EIR or negative declaration.

No new significant environmental effects were identified compared to those identified in the adopted Final IS/MND.

- (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR.

Potentially significant impacts associated with the proposed Project revisions would remain the same as disclosed in the adopted Final IS/MND. No new significant impacts were identified with the proposed Project revisions. All impacts would be mitigated to less-than-significant levels through the implementation of proposed mitigation measures identified in the Final IS/MND. Implementation of the proposed modifications, therefore, would not substantially increase the severity of previously identified impacts.

- (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

No mitigation measures or evaluated alternatives were previously found to be infeasible in the adopted Final IS/MND.

- (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Impacts have been avoided to the extent feasible. No other mitigation measures or feasible alternatives have been identified that would substantially reduce impacts.

- (b) If changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subsection (a). Otherwise, the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

Subsequent to adoption of the Final IS/MND in November 2008, revisions were made to the two bus stop locations, as described herein. These revisions are the subject of this Addendum to the Final IS/MND. Based on the analysis in this document, the proposed modifications would not result in new or more severe significant environmental effects. None of the conditions listed under subsection (a) would occur that would require preparation of a subsequent EIR or MND.

- (c) Once a project has been approved, the lead agency's role in project approval is completed, unless further discretionary approval on that project is required. Information appearing after an approval does not require reopening of that approval. If after the project is approved, any of the conditions described in subsection (a) occurs, a subsequent EIR or negative declaration shall only be prepared by the public agency which grants the next discretionary approval for the project, if any. In this situation no other Responsible Agency shall grant an approval for the project until the subsequent EIR has been certified or subsequent negative declaration adopted.

None of the conditions listed in subsection (a) would occur due to the proposed modifications. No subsequent negative declaration is required.

Section 15164 – Addendum to an EIR or Negative Declaration

- (a) The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary, but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

This section of the State CEQA Guidelines does not apply, as an EIR was not prepared for the proposed Project.

- (b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

Minor additions to the adopted Final IS/MND are necessary; however, none of the conditions described in Section 15162 calling for preparation of a subsequent EIR would occur as a result of the proposed Project modifications. Therefore, an addendum to the adopted Final IS/MND is the appropriate CEQA document for the proposed Project modifications.

- (c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

This Addendum will be attached to the Final IS/MND and maintained in the administrative record files at SANDAG.

- (d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

SANDAG will consider this Addendum with the Final IS/MND prior to making a decision on the proposed Project modifications.

- (e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's required findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

This document provides substantial evidence for SANDAG records to support the preparation of this Addendum for the proposed Project modifications.

CONCLUSION

This Addendum was prepared in accordance with the provisions of the State CEQA Guidelines, and it documents that none of the conditions or circumstances that would require preparation of a subsequent EIR or MND, pursuant to Sections 15162 and 15164 of the State CEQA Guidelines, exist in connection with the proposed Project modifications. No major revisions would be required to the Final IS/MND as a result of the proposed modifications. No new or more severe significant environmental impacts have been identified. Therefore, preparation of a subsequent MND or EIR is not required. No additional environmental analysis or review is required for the proposed Project. This document will be maintained in the administrative record files at SANDAG offices.

APPENDIX A



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May 18, 2011

Miriam Kirshner
SANDAG
401 B Street, Suite 800
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Subject: Historic Resources and Field Evaluation Summary Letter for the Mid-City Rapid Bus Addendum #2

Dear Ms. Kirshner:

Architectural historian Trina Meiser conducted a field review of the proposed new bus stop location at the intersection of Winona Avenue and El Cajon Boulevard on Thursday, May 12, 2011. All four corners of the intersection were assessed, with special attention given to the proposed new location, as shown in Figure 2 of the Mid-City Rapid Bus Addendum.

The historic assessment of the proposed new bus stop location confirms that there are no potential historical resources within the proposed project area.

Sincerely,



Jessica Fernandes
Project Manager

APPENDIX B

MEMORANDUM

To: Patricia McColl, David Evans & Associates
From: Arnold Torma, TE, KOA Corporation
Re: Mid City Rapid Bus Project: Bus Stop Analysis

Background

Previously, KOA Corporation performed a Traffic Impact Study for the Transit Signal Priority of the Mid-City Bus Rapid Transit (BRT). The Traffic Impact Study, completed in 2008, included the implementation of transit signal priority (TSP) along the project corridor and analyzed the impacts of this type of priority to the traffic signal operations in the future. The study followed work done in 2004 to analyze the affects of a lane reduction along the corridor for an exclusive bus lane.

The Mid City BRT project is now in the final design phase and the current design includes a number of locations where with bus bulb-out stations. These stations will effectively construct the transit station in the existing parking lane area and bring the location where the bus stops into the through lane. Therefore, as the bus stops to pick up and drop off passengers, the bus will briefly block through traffic behind it. Typically, the dwell time for the bus would be 15 – 45 seconds. Based on this planned operation, SANDAG asked KOA to research and evaluate the implementation of bus bulb-outs along El Cajon Boulevard for the project. The bus bulb-out locations were evaluated in August 2010.

Since then, a new far-side bus bulb-out location has been added to the project at the intersection of El Cajon Boulevard and Winona Avenue. New traffic counts were commissioned at this location. This memo documents the effects to traffic operations of the bus bulb-out at the new location of El Cajon Boulevard and Winona Avenue and summarizes the bus bulb-out analysis along the corridor.

The Project

The project proposes to implement bus bulb-outs at eight (8) intersections along the El Cajon Boulevard corridor. The effects to traffic operations of the bus bulb-out locations were previously analyzed. A bus bulb-out location location has been added to the project at El Cajon Boulevard and Winona Avenue. The bulb-outs will be implemented either at “near-side” or “far-side” locations. The bulb-outs will replace either an existing bus stop area or a wide travel lane with parking. In this second scenario the bulb-out will transform the right curb lane, which was originally wide enough for both the bus to stop and a vehicle to pass, into a narrower lane that will not be able to accommodate both.

Common reasons for installing bus bulbs include:

- High transit ridership in a corridor,
- Re-entry problems for buses during peak vehicular times,
- The need for segregating transit and pedestrian activities on crowded sidewalks, and

- The need for transit amenities at bus stop locations that may be too small to accommodate additional street furniture.

The following outlines the details of the previously proposed bulb-out plans along the El Cajon corridor:

- El Cajon / Texas – Implement two far-side bus bulb-outs, both will replace the existing parking lane (8') with the bulb-out. The adjacent travel lane will be 12'.
- El Cajon / 30th – Implement two far-side bus bulb-outs, both will replace the existing parking lane (8') with the bulb-out. The adjacent travel lane will be 12'.
- El Cajon / 35th – Implement two far-side bus bulb-outs, both will replace the existing parking lane (8') with the bulb-out. The adjacent travel lane will be 12'.
- El Cajon / 43rd-Fairmont – Implement a westbound near-side bus bulb-out at 43rd Street that will replace the existing parking lane (8') with the bulb-out, and an eastbound far-side bus bulb-out at 43rd Street that will replace the existing parking lane (8') with the bulb-out. The travel lanes adjacent to the bulb-outs will be 12'.
- El Cajon / 54th-Collwood – Implement a westbound far-side bus bulb-out which will replace the existing parking lane (8') with the bulb-out. Implement a new eastbound far-side bus stop that will improve existing curb radius at the corner and widen the existing sidewalk. The travel lanes adjacent to the bulb-outs will be 12'.
- El Cajon / College – Implement a westbound far-side bus bulb-out that will replace a the existing parking lane (8') with the bulb-out. Implement a northbound far-side bus bulb-out that will require the acquisition of right-of-way. The travel lanes adjacent to the bulb-outs will be 12'.

The following outlines the details of the newly added bulb-out plans along the El Cajon corridor:

- El Cajon / Winona – Implement two far-side bus bulb-outs that will replace the existing parking lane (8') with the bulb-out on the southern side of the street. Whereas bus stop exists currently on the northern side with no parking allowed. The adjacent travel lane will be 12'.



Typical Far-side Bulb-out Layout (El Cajon Boulevard at Texas Street)

Document Research

Several reports have evaluated bus operations in recent years. These reports were reviewed for pertinent information regarding bus bulb operations. The *TCRP Report 65 – Evaluation of Bus Bulbs*, published by the Transportation Research Board specifically analyzes the implementation of bus bulb-outs in a before and after study. The goal of the study was to analyze the operations at both far-side and nearside bus stops and to determine effects of bus bay conversions on buses and other vehicles. The study concluded that converting bus bays to bus bulb-outs actually improves both bus and vehicle speeds in the corridor. However, the data collection for this comparative study is flawed rendering the results of the study inconclusive. The study noted that the majority of buses observed during the “before” (bus bay configuration) study either completely or partially stopped in the outside lane instead of pulling into the bus bay. Field observation and transit agency representatives concluded this behavior was partly the result of bus drivers wary of the re-entry problem to get back into the through lanes. Therefore the compared “after” study showed results of adding a bus bulb-out with both study conditions blocking the through traffic. Based on this and other research documents, there were no definitive results that would directly correlate to the planned bus-bulb outs along the El Cajon Boulevard corridor. The research did conclude however that although there was queuing experienced at far-side bulb-outs, the queues were generally short and on average only one to two vehicles.

Analysis Methodology

Based on the research, there was no definitive analysis methodology to quantitatively evaluate the implementation of the bus bulb-outs. The methodology used for this analysis builds on traffic signal operations model developed for the Traffic Impact Study (2008). Unlike the current conditions, when a passenger car can pass the stopped bus in the same wide curb- side travel lane, the implementation of the bus bulb-outs will eliminate that ability. This will effectively eliminate the use of one through lane at intersections when a bus is making a stop at either the near or far-side of the intersection at the proposed bulb-outs.

At intersections where bulb-outs are planned built at the far side of the intersection, the intersection was analyzed with the curb side through lane on the upstream side being eliminated because of the bus blocking the movement. The elimination of this lane may affect the level of service and delay at the intersection due to the temporary reduction of capacity. An assumption was made that the reduction in capacity would occur only during the first 20 seconds of the signal cycle length when the bus arrives at the station and will block the platoon of vehicles that arrives with the bus. After that initial time, the platoon is assumed to be more scattered and the cars would be able to change lanes, due to availability of gap, causing less impact on the intersection performance. This impact of the intersection due to the bus blockage was taken into account as incremental delay and was added to the total delay of the intersection when the intersection is not impacted by the bus blockage. Also this blockage would occur only for those cycles which have the bus arriving during that cycle, which is based on their headway. The proposed headway of the bus is six (6) times in each direction per hour during the peak periods. So the delay for the intersections was calculated based on the weighted average of the delays for cycles

when the bus is not present and when it is present. The analysis also incorporates the transit signal priority planned for the intersections.

The following tables show the comparison between project scenario (which includes the bus bulb-out and a bus stopping) with the without-project scenario (which includes no buses stopping in the through lane). The “with project” conditions also include the implementation of the transit signal priority, which extends the green time for the major movement and, therefore, shows a decrease in delay under the build conditions.

**Table 1
AM Peak Hour
Traffic Signal Operations**

Intersection	Existing Conditions		Near-term Conditions						Horizon Year Conditions					
			Without Project		With Project		Delay Change	Significant	Without Project		With Project		Delay Change	Significant
	Delay	LOS	Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
AM Peak Hour														
1. El Cajon Blvd / College Ave	41.2	D	41.6	D	42.9	D	1.3	No	43.7	D	45.1	D	1.4	No
2. El Cajon Blvd / 54th St	34.7	C	35.6	D	37.1	D	1.5	No	35.9	D	37.5	D	1.6	No
3. El Cajon Blvd / Winona Ave	5.6	A	5.6	A	5.8	B	0.2	No	5.8	C	6.1	B	0.3	No
7. El Cajon Blvd / Fairmont Ave	30.2	C	31.5	C	29.9	C	-1.6	No	31.4	C	30.2	C	-1.2	No
8. El Cajon Blvd / 43rd Ave	17.0	B	19.8	B	19.7	B	-0.1	No	20.3	C	20.0	B	-0.3	No
13. El Cajon Blvd / 35th St	14.6	B	14.6	B	14.2	B	-0.4	No	20.0	B	17.9	B	-2.1	No
17. El Cajon Blvd / 30th St	32.0	C	32.6	C	31.5	C	-1.1	No	33.9	C	33.6	C	-0.3	No
18. El Cajon Blvd / Texas St	42.8	D	43.9	D	42.4	D	-1.5	No	44.9	D	44.3	D	-0.6	No

Project = Bus-bulb out stations and bus stopping in travel lane and transit signal priority.

BOLD = Additional intersection delay is significant, per City of San Diego Significance Thresholds.

**Table 2
PM Peak Hour
Traffic Signal Operations**

Intersection	Existing Conditions		Near-term Conditions						Horizon Year Conditions					
			Without Project		With Project		Delay Change	Significant	Without Project		With Project		Delay Change	Significant
	Delay	LOS	Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
PM Peak Hour														
1. El Cajon Blvd / College Ave	44.6	D	64.5	E	64.9	E	0.4	No	85.8	F	86.5	F	0.7	No
2. El Cajon Blvd / 54th St	43.4	D	50.4	D	54.4	D	4.0	No	56.8	E	58.3	E	1.5	No
3. El Cajon Blvd / Winona Ave	8.7	A	8.9	A	9.0	C	0.1	No	9.4	A	9.5	C	0.1	No
7. El Cajon Blvd / Fairmont Ave	16.4	B	16.3	B	17.4	B	1.1	No	17.2	B	19.0	B	1.8	No
8. El Cajon Blvd / 43rd Ave	28.2	C	30.1	C	30.4	C	0.3	No	31.1	C	32.4	C	1.3	No
13. El Cajon Blvd / 35th St	19.9	B	20.7	C	21.2	C	0.5	No	22.0	C	22.4	C	0.4	No
17. El Cajon Blvd / 30th St	41.9	D	43.8	D	42.6	D	-1.2	No	46.1	D	45.0	D	-1.1	No
18. El Cajon Blvd / Texas St	48.0	D	49.7	D	51.0	D	1.3	No	52.0	D	54.2	D	2.2	No

Project = Bus-bulb out stations and bus stopping in travel lane and transit signal priority.

BOLD = Additional intersection delay is significant, per City of San Diego Significance Thresholds.

Conclusions

Based on the analysis, all of the affected signalized intersections operate with acceptable conditions except for the intersections of El Cajon Boulevard at 54th Street and El Cajon Boulevard at College Avenue, both during the PM Peak hour in the horizon year. However, the project does not contribute over the regionally acceptable range for significance (2 seconds for LOS E) at either of these

intersections. Further, Winona Avenue and El Cajon Boulevard will operate at a level of service C or better with the project. Therefore, the project including the bus bulb-outs causes no significant impacts to traffic signal operations. Based on the results of both the document research and this analysis, we conclude that the proposed bus bulbs would have a minimal effect on traffic at the corridor intersections.

Attachments:

- Probability Worksheets
- Intersection Delay Calculation Worksheets

Prepared By:

Seth Torma, AICP, KOA Corporation

ATTACHMENTS

1: El Cajon Blvd & College Ave

NT AM with TSP (>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗		↖ ↗	↖ ↗		↖ ↗		↖ ↗		↖ ↗	↖ ↗	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.969			0.948			0.850			0.850		
Flt Protected	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	3433	3430	0	3433	3355	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	3433	3430	0	3433	3355	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)	26			67			52			96		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	183	285	75	81	358	189	177	682	63	108	193	91
Lane Group Flow (vph)	193	379	0	85	576	0	186	718	66	114	203	96
Turn Type	Prot		Prot		Prot		Prot		Perm		Perm	
Protected Phases	5	2	1		6	3		8	7		4	
Permitted Phases									8		4	
Total Split (s)	29.0	52.0	0.0	18.0	41.0	0.0	16.0	54.0	54.0	16.0	54.0	54.0
Act Effct Green (s)	12.6	65.6	10.4		63.4	21.7		34.4	34.4	13.5	26.3	26.3
Actuated g/C Ratio	0.09	0.47	0.07		0.45	0.16		0.25	0.25	0.10	0.19	0.19
v/c Ratio	0.62	0.23	0.33		0.37	0.68		0.82	0.15	0.67	0.31	0.26
Control Delay	70.3	22.1	65.3		24.2	69.6		58.4	14.2	79.4	47.9	8.7
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	22.1	65.3		24.2	69.6		58.4	14.2	79.4	47.9	8.7
LOS	E	C	E		C	E		E	B	E	D	A
Approach Delay	38.4			29.5			57.6			47.5		
Approach LOS	D			C			E			D		

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 126 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 44.7

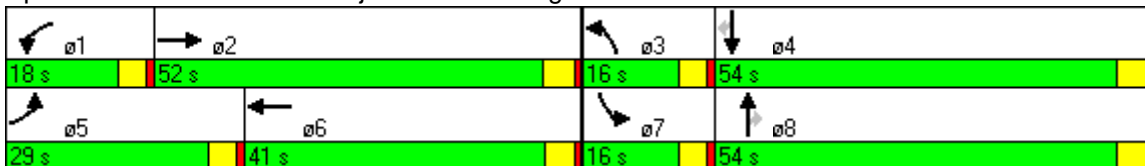
Intersection LOS: D

Intersection Capacity Utilization 62.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

NT AM with TSP (<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.60	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.969			0.948				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2124	3430	0	3433	3355	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2124	3430	0	3433	3355	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)		26			67				52			96
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	183	285	75	81	358	189	177	682	63	108	193	91
Lane Group Flow (vph)	193	379	0	85	576	0	186	718	66	114	203	96
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	29.0	52.0	0.0	18.0	41.0	0.0	16.0	54.0	54.0	16.0	54.0	54.0
Act Effct Green (s)	17.1	65.6		10.4	58.9		21.7	34.4	34.4	13.5	26.3	26.3
Actuated g/C Ratio	0.12	0.47		0.07	0.42		0.16	0.25	0.25	0.10	0.19	0.19
v/c Ratio	0.75	0.23		0.33	0.40		0.68	0.82	0.15	0.67	0.31	0.26
Control Delay	76.3	22.1		65.3	27.5		69.6	58.4	14.2	79.4	47.9	8.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	22.1		65.3	27.5		69.6	58.4	14.2	79.4	47.9	8.7
LOS	E	C		E	C		E	E	B	E	D	A
Approach Delay		40.4			32.3			57.6			47.5	
Approach LOS		D			C			E			D	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 126 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 45.8

Intersection LOS: D

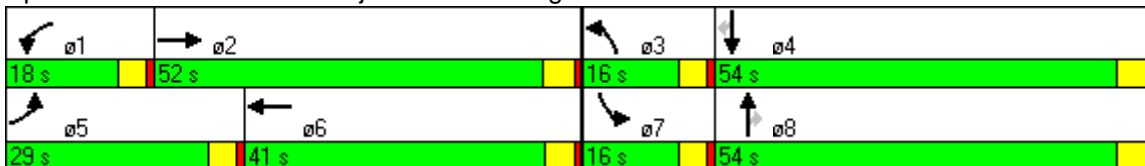
Intersection Capacity Utilization 62.4%

ICU Level of Service B

Analysis Period (min) 15

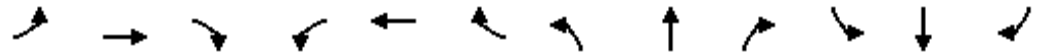
* User Entered Value

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

NT PM with TSP(>20sec)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖↗	↕		↖	↕↕	↗	↖	↕↕	↗
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.980			0.971			0.850			0.850		
Flt Protected	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (prot)	3433	3468	0	3433	3437	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (perm)	3433	3468	0	3433	3437	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)	14			22			115			125		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	228	756	118	213	555	133	241	460	109	432	674	155
Lane Group Flow (vph)	240	920	0	224	724	0	254	484	115	455	709	163
Turn Type	Prot		Prot		Prot		Perm		Prot		Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8		4	
Total Split (s)	25.0	38.0	0.0	15.0	28.0	0.0	16.0	37.2	37.2	29.8	51.0	51.0
Act Effct Green (s)	13.1	42.5		13.0	42.4		12.0	22.7	22.7	25.8	36.5	36.5
Actuated g/C Ratio	0.11	0.35		0.11	0.35		0.10	0.19	0.19	0.22	0.30	0.30
v/c Ratio	0.64	0.74		0.60	0.59		1.44	0.72	0.29	1.19	0.66	0.29
Control Delay	59.0	39.0		57.7	34.2		263.9	52.0	8.8	151.7	39.3	9.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	39.0		57.7	34.2		263.9	52.0	8.8	151.7	39.3	9.8
LOS	E	D		E	C		F	D	A	F	D	A
Approach Delay	43.2		39.8		109.3		74.2					
Approach LOS	D		D		F		E					

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 82 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.44

Intersection Signal Delay: 65.2

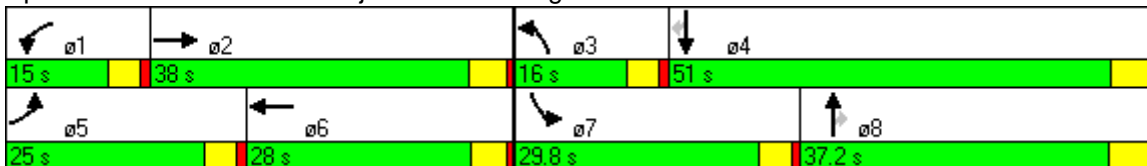
Intersection LOS: E

Intersection Capacity Utilization 83.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

NT PM with TSP(<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖↗	↕		↖	↕↕	↗	↖	↕↕	↗
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.60	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.980				0.971				0.850		0.850	
Flt Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	2124	3468	0	3433	3437	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950				0.950				0.950		0.950	
Satd. Flow (perm)	2124	3468	0	3433	3437	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)	14				22				115		125	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	228	756	118	213	555	133	241	460	109	432	674	155
Lane Group Flow (vph)	240	920	0	224	724	0	254	484	115	455	709	163
Turn Type	Prot				Prot				Perm		Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8		4	
Total Split (s)	25.0	38.0	0.0	15.0	28.0	0.0	16.0	37.2	37.2	29.8	51.0	51.0
Act Effct Green (s)	18.1	42.5		13.0	37.4		12.0	22.7	22.7	25.8	36.5	36.5
Actuated g/C Ratio	0.15	0.35		0.11	0.31		0.10	0.19	0.19	0.22	0.30	0.30
v/c Ratio	0.75	0.74		0.60	0.67		1.44	0.72	0.29	1.19	0.66	0.29
Control Delay	62.7	39.0		57.7	40.0		263.9	52.0	8.8	151.7	39.3	9.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	39.0		57.7	40.0		263.9	52.0	8.8	151.7	39.3	9.8
LOS	E	D		E	D		F	D	A	F	D	A
Approach Delay	43.9				44.2				109.3		74.2	
Approach LOS	D				D				F		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 82 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.44

Intersection Signal Delay: 66.4

Intersection LOS: E

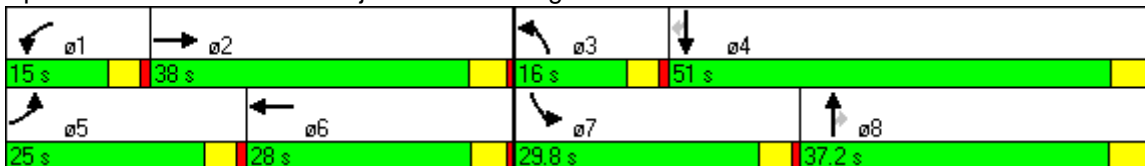
Intersection Capacity Utilization 83.0%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

LT AM with TSP(>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.969			0.944			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3429	0	3433	3341	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3429	0	3433	3341	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)		25			88				44			135
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	263	302	78	85	379	228	188	828	67	122	253	128
Lane Group Flow (vph)	277	400	0	89	639	0	198	872	71	128	266	135
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	29.0	53.4	0.0	17.0	41.4	0.0	18.0	49.9	49.9	19.7	51.6	51.6
Act Effct Green (s)	15.7	59.7		10.5	54.5		21.8	39.8	39.8	14.0	32.1	32.1
Actuated g/C Ratio	0.11	0.43		0.08	0.39		0.16	0.28	0.28	0.10	0.23	0.23
v/c Ratio	0.72	0.27		0.35	0.47		0.72	0.87	0.15	0.72	0.33	0.29
Control Delay	70.8	26.3		65.5	30.6		72.1	57.2	16.4	83.2	43.9	6.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	26.3		65.5	30.6		72.1	57.2	16.4	83.2	43.9	6.8
LOS	E	C		E	C		E	E	B	F	D	A
Approach Delay	44.5			34.8			57.2			44.0		
Approach LOS	D			C			E			D		

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 126 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 46.8

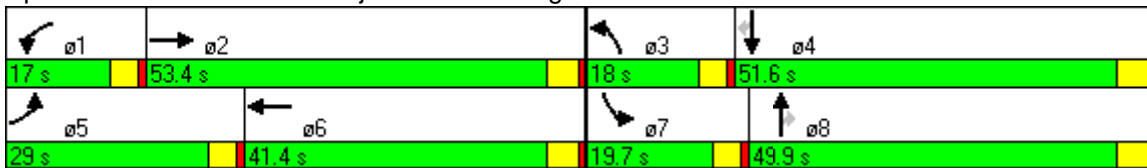
Intersection LOS: D

Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

LT AM with TSP(<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.60	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.969			0.944			0.850			0.850		
Flt Protected	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (prot)	2124	3430	0	3433	3341	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (perm)	2124	3430	0	3433	3341	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)	25		88		44		135					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	263	302	78	85	379	228	188	828	67	122	253	128
Lane Group Flow (vph)	277	400	0	89	639	0	198	872	71	128	266	135
Turn Type	Prot		Prot		Prot		Perm		Prot		Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8				4	
Total Split (s)	29.0	53.4	0.0	17.0	41.4	0.0	18.0	49.9	49.9	19.7	51.6	51.6
Act Effct Green (s)	21.8	59.7		10.5	48.4		21.8	39.8	39.8	14.0	32.1	32.1
Actuated g/C Ratio	0.16	0.43		0.08	0.35		0.16	0.28	0.28	0.10	0.23	0.23
v/c Ratio	0.84	0.27		0.35	0.53		0.72	0.87	0.15	0.72	0.33	0.29
Control Delay	78.7	26.3		65.5	35.3		72.1	57.2	16.4	83.2	43.9	6.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	26.3		65.5	35.3		72.1	57.2	16.4	83.2	43.9	6.8
LOS	E	C		E	D		E	E	B	F	D	A
Approach Delay	47.8		39.0		57.2		44.0					
Approach LOS	D		D		E		D					

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 126 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 48.6

Intersection LOS: D

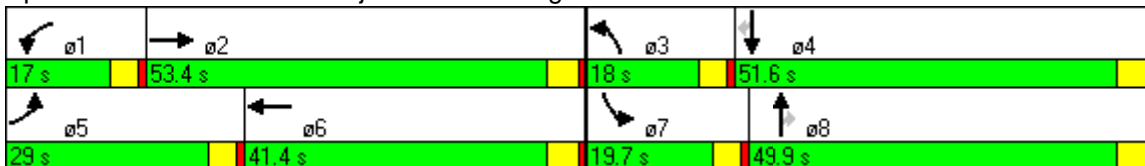
Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

LT PM with TSP (>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗		↖ ↗	↖ ↗		↖	↖ ↗	↖	↖	↖ ↗	↖
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.980				0.968				0.850		0.850	
Flt Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	3433	3468	0	3433	3426	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950				0.950				0.950		0.950	
Satd. Flow (perm)	3433	3468	0	3433	3426	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)	15				26				114		162	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	324	802	125	227	589	161	255	611	116	492	851	255
Lane Group Flow (vph)	341	976	0	239	789	0	268	643	122	518	896	268
Turn Type	Prot				Prot				Prot		Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8		4	
Total Split (s)	25.0	39.0	0.0	15.0	29.0	0.0	15.0	40.0	40.0	26.0	51.0	51.0
Act Effct Green (s)	16.4	41.3		12.8	37.8		11.0	27.8	27.8	22.0	38.8	38.8
Actuated g/C Ratio	0.14	0.34		0.11	0.32		0.09	0.23	0.23	0.18	0.32	0.32
v/c Ratio	0.73	0.81		0.65	0.72		1.65	0.78	0.27	1.59	0.78	0.43
Control Delay	58.8	42.6		60.1	41.0		354.5	50.2	8.8	314.7	41.8	13.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	42.6		60.1	41.0		354.5	50.2	8.8	314.7	41.8	13.8
LOS	E	D		E	D		F	D	A	F	D	B
Approach Delay	46.8				45.5				124.3		121.4	
Approach LOS	D				D				F		F	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 82 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.65

Intersection Signal Delay: 87.1

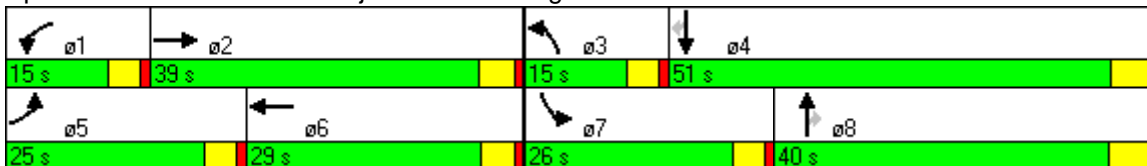
Intersection LOS: F

Intersection Capacity Utilization 92.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: El Cajon Blvd & College Ave



1: El Cajon Blvd & College Ave

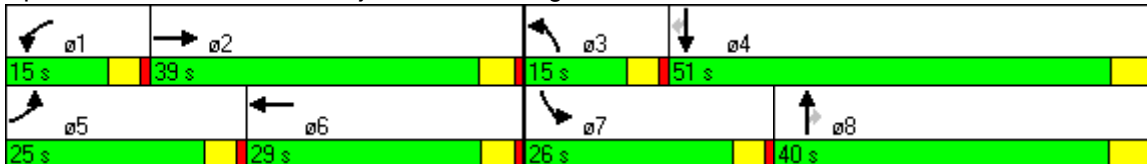
LT PM with TSP (<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖↗	↕		↖	↕↕	↗	↖	↕↕	↗
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.60	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2124	3468	0	3433	3426	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2124	3468	0	3433	3426	0	1770	3539	1583	1770	3539	1583
Satd. Flow (RTOR)		15			26				114			162
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	324	802	125	227	589	161	255	611	116	492	851	255
Lane Group Flow (vph)	341	976	0	239	789	0	268	643	122	518	896	268
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	25.0	39.0	0.0	15.0	29.0	0.0	15.0	40.0	40.0	26.0	51.0	51.0
Act Effct Green (s)	23.9	41.3		12.8	30.3		11.0	27.8	27.8	22.0	38.8	38.8
Actuated g/C Ratio	0.20	0.34		0.11	0.25		0.09	0.23	0.23	0.18	0.32	0.32
v/c Ratio	0.80	0.81		0.65	0.89		1.65	0.78	0.27	1.59	0.78	0.43
Control Delay	61.0	42.6		60.1	56.5		354.5	50.2	8.8	314.7	41.8	13.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	42.6		60.1	56.5		354.5	50.2	8.8	314.7	41.8	13.8
LOS	E	D		E	E		F	D	A	F	D	B
Approach Delay		47.4			57.4			124.3			121.4	
Approach LOS		D			E			F			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 82 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.65
 Intersection Signal Delay: 89.7
 Intersection LOS: F
 Intersection Capacity Utilization 92.0%
 ICU Level of Service F
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 1: El Cajon Blvd & College Ave



2: El Cajon Blvd & Collwood Blvd

NT AM with TSP (>20sec)

	↙	→	↘	↙	←	↘	↙	↑	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↘	↙	↑↑	↘	↙↘	↑↘		↘	↑↑	↘
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.988			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3497	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	3497	0	1770	3539	1583
Satd. Flow (RTOR)			112			295			6			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	80	303	106	54	384	280	140	586	52	122	264	129
Lane Group Flow (vph)	84	319	112	57	404	295	147	672	0	128	278	136
Turn Type	Prot	Perm		Prot	Perm		Prot			Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	22.6	58.0	58.0	20.9	56.3	56.3	18.8	39.3	0.0	21.8	42.3	42.3
Act Effct Green (s)	10.8	71.0	71.0	9.0	67.1	67.1	10.2	32.3		13.8	35.9	35.9
Actuated g/C Ratio	0.08	0.51	0.51	0.06	0.48	0.48	0.07	0.23		0.10	0.26	0.26
v/c Ratio	0.61	0.18	0.13	0.50	0.24	0.32	0.59	0.83		0.74	0.31	0.27
Control Delay	80.8	21.3	4.5	77.8	23.7	3.8	72.3	60.0		84.9	42.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	80.8	21.3	4.5	77.8	23.7	3.8	72.3	60.0		84.9	42.1	7.1
LOS	F	C	A	E	C	A	E	E		F	D	A
Approach Delay	27.4				20.0				62.2		43.5	
Approach LOS	C				C				E		D	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 118 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 39.4

Intersection LOS: D

Intersection Capacity Utilization 53.6%

ICU Level of Service A

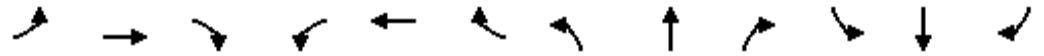
Analysis Period (min) 15

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

NT AM with TSP (<20sec)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↘	↙	↑↑	↘	↙↘	↑↘		↙	↑↑	↘
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.75	1.00	1.00	*0.75	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.988			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	2794	1583	1770	2794	1583	3433	3497	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	2794	1583	1770	2794	1583	3433	3497	0	1770	3539	1583
Satd. Flow (RTOR)			112			295			6			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	80	303	106	54	384	280	140	586	52	122	264	129
Lane Group Flow (vph)	84	319	112	57	404	295	147	672	0	128	278	136
Turn Type	Prot	Perm		Prot	Perm		Prot			Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	22.6	58.0	58.0	20.9	56.3	56.3	18.8	39.3	0.0	21.8	42.3	42.3
Act Effct Green (s)	10.8	71.0	71.0	9.0	67.1	67.1	10.2	32.3		13.8	35.9	35.9
Actuated g/C Ratio	0.08	0.51	0.51	0.06	0.48	0.48	0.07	0.23		0.10	0.26	0.26
v/c Ratio	0.61	0.23	0.13	0.50	0.30	0.32	0.59	0.83		0.74	0.31	0.27
Control Delay	80.8	22.1	4.5	77.8	24.9	3.8	72.3	60.0		84.9	42.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	80.8	22.1	4.5	77.8	24.9	3.8	72.3	60.0		84.9	42.1	7.1
LOS	F	C	A	E	C	A	E	E		F	D	A
Approach Delay	27.9				20.7				62.2		43.5	
Approach LOS	C				C				E		D	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 118 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 39.7 Intersection LOS: D
 Intersection Capacity Utilization 53.6% ICU Level of Service A
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

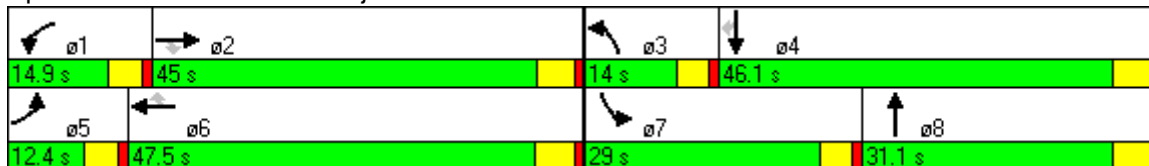
NT PM with TSP(>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.965			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3415	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	3415	0	1770	3539	1583
Satd. Flow (RTOR)			227			193			31			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	180	778	338	164	542	183	226	420	127	451	877	140
Lane Group Flow (vph)	189	819	356	173	571	193	238	576	0	475	923	147
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	12.4	45.0	45.0	14.9	47.5	47.5	14.0	31.1	0.0	29.0	46.1	46.1
Act Effct Green (s)	10.9	41.0	41.0	13.4	43.5	43.5	9.9	24.6		25.0	39.7	39.7
Actuated g/C Ratio	0.09	0.34	0.34	0.11	0.36	0.36	0.08	0.20		0.21	0.33	0.33
v/c Ratio	1.17	0.68	0.52	0.87	0.45	0.28	0.84	0.80		1.29	0.79	0.24
Control Delay	172.4	37.2	13.8	91.5	30.4	4.7	79.4	51.5		187.4	41.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	172.4	37.2	13.8	91.5	30.4	4.7	79.4	51.5		187.4	41.8	8.3
LOS	F	D	B	F	C	A	E	D		F	D	A
Approach Delay	49.9			36.4			59.6			83.4		
Approach LOS	D			D			E			F		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 33 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 60.0 Intersection LOS: E
 Intersection Capacity Utilization 84.6% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

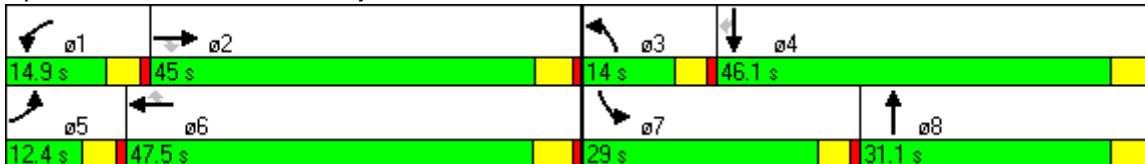
NT PM with TSP(<20sec)

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↘	↖	↑↑	↘	↖↘	↑↘		↖	↑↑	↘
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.75	1.00	1.00	*0.75	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.965				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	2794	1583	1770	2794	1583	3433	3415	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	2794	1583	1770	2794	1583	3433	3415	0	1770	3539	1583
Satd. Flow (RTOR)			190			172		31				120
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	180	778	338	164	542	183	226	420	127	451	877	140
Lane Group Flow (vph)	189	819	356	173	571	193	238	576	0	475	923	147
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	12.4	45.0	45.0	14.9	47.5	47.5	14.0	31.1	0.0	29.0	46.1	46.1
Act Effct Green (s)	10.9	41.0	41.0	13.4	43.5	43.5	9.9	24.6		25.0	39.7	39.7
Actuated g/C Ratio	0.09	0.34	0.34	0.11	0.36	0.36	0.08	0.20		0.21	0.33	0.33
v/c Ratio	1.17	0.86	0.53	0.87	0.56	0.28	0.84	0.80		1.29	0.79	0.24
Control Delay	172.4	47.2	17.4	91.5	33.3	6.5	79.4	51.5		187.4	41.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	172.4	47.2	17.4	91.5	33.3	6.5	79.4	51.5		187.4	41.8	8.3
LOS	F	D	B	F	C	A	E	D		F	D	A
Approach Delay		56.8			38.5			59.6			83.4	
Approach LOS		E			D			E			F	

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 33 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 62.4	Intersection LOS: E
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	
* User Entered Value	

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

LT AM with TSP(>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.986			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3490	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	3490	0	1770	3539	1583
Satd. Flow (RTOR)			118			314			7			141
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	84	333	112	58	409	298	150	624	65	128	279	134
Lane Group Flow (vph)	88	351	118	61	431	314	158	725	0	135	294	141
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6					4	
Total Split (s)	22.6	56.7	56.7	20.9	55.0	55.0	21.0	38.4	0.0	24.0	41.4	41.4
Act Effct Green (s)	11.1	68.2	68.2	9.3	64.3	64.3	10.6	34.1		14.6	38.1	38.1
Actuated g/C Ratio	0.08	0.49	0.49	0.07	0.46	0.46	0.08	0.24		0.10	0.27	0.27
v/c Ratio	0.63	0.20	0.14	0.52	0.27	0.35	0.61	0.85		0.73	0.31	0.26
Control Delay	81.2	23.1	4.7	78.2	25.6	4.0	72.5	60.1		82.6	40.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	81.2	23.1	4.7	78.2	25.6	4.0	72.5	60.1		82.6	40.7	6.9
LOS	F	C	A	E	C	A	E	E		F	D	A
Approach Delay	28.3				21.2		62.4				42.3	
Approach LOS	C				C		E				D	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 118 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 39.8

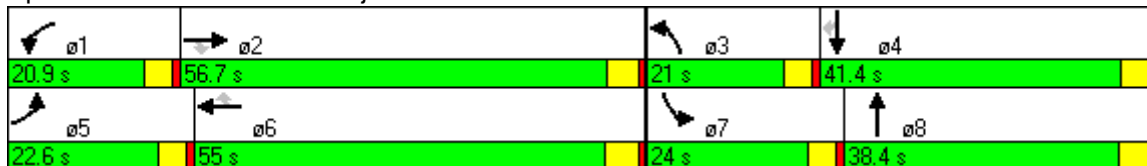
Intersection LOS: D

Intersection Capacity Utilization 56.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

LT AM with TSP(<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.75	1.00	1.00	*0.75	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	2794	1583	1770	2794	1583	3433	3490	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	2794	1583	1770	2794	1583	3433	3490	0	1770	3539	1583
Satd. Flow (RTOR)			118			314		7				141
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	84	333	112	58	409	298	150	624	65	128	279	134
Lane Group Flow (vph)	88	351	118	61	431	314	158	725	0	135	294	141
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	22.6	56.7	56.7	20.9	55.0	55.0	21.0	38.4	0.0	24.0	41.4	41.4
Act Effct Green (s)	11.1	68.2	68.2	9.3	64.3	64.3	10.6	34.1		14.6	38.1	38.1
Actuated g/C Ratio	0.08	0.49	0.49	0.07	0.46	0.46	0.08	0.24		0.10	0.27	0.27
v/c Ratio	0.63	0.26	0.14	0.52	0.34	0.35	0.61	0.85		0.73	0.31	0.26
Control Delay	81.2	24.0	4.7	78.2	27.0	4.0	72.5	60.1		82.6	40.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	81.2	24.0	4.7	78.2	27.0	4.0	72.5	60.1		82.6	40.7	6.9
LOS	F	C	A	E	C	A	E	E		F	D	A
Approach Delay		29.0			21.9			62.4			42.3	
Approach LOS		C			C			E			D	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 118 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

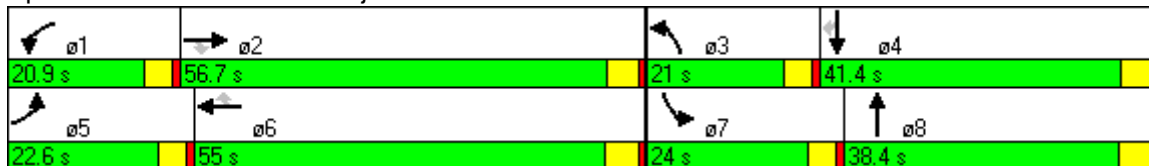
Intersection Signal Delay: 40.1 Intersection LOS: D

Intersection Capacity Utilization 56.0% ICU Level of Service B

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

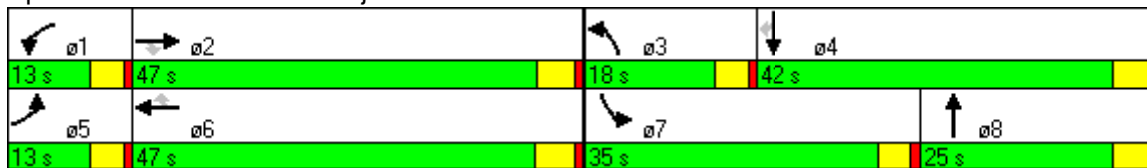
LT PM with TSP (>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.965			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3415	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	3415	0	1770	3539	1583
Satd. Flow (RTOR)			246			203			30			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	188	832	360	185	588	193	241	445	138	479	934	147
Lane Group Flow (vph)	198	876	379	195	619	203	254	613	0	504	983	155
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6					4	
Total Split (s)	13.0	47.0	47.0	13.0	47.0	47.0	18.0	25.0	0.0	35.0	42.0	42.0
Act Effct Green (s)	9.0	33.5	33.5	9.0	33.5	33.5	11.8	21.1		31.1	40.4	40.4
Actuated g/C Ratio	0.08	0.30	0.30	0.08	0.30	0.30	0.11	0.19		0.28	0.36	0.36
v/c Ratio	1.38	0.82	0.58	1.35	0.58	0.33	0.70	0.91		1.01	0.76	0.24
Control Delay	243.9	42.6	14.6	236.1	34.7	5.2	58.9	61.3		84.6	37.0	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	243.9	42.6	14.6	236.1	34.7	5.2	58.9	61.3		84.6	37.0	10.2
LOS	F	D	B	F	C	A	E	E		F	D	B
Approach Delay	62.7				67.4		60.6				49.1	
Approach LOS	E				E		E				D	

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 110.7	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.38	
Intersection Signal Delay: 58.8	Intersection LOS: E
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



2: El Cajon Blvd & Collwood Blvd

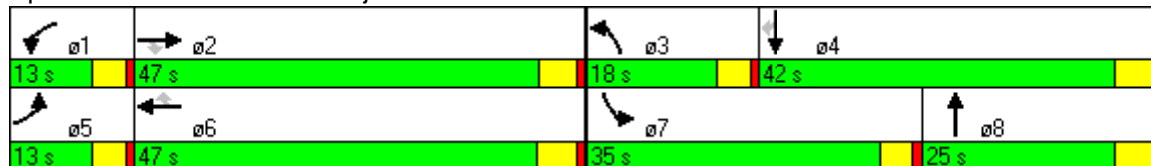
LT PM with TSP (<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.75	1.00	1.00	*0.75	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850			0.850			0.965			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	2794	1583	1770	2794	1583	3433	3415	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	2794	1583	1770	2794	1583	3433	3415	0	1770	3539	1583
Satd. Flow (RTOR)			194			165			30			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	188	832	360	185	588	193	241	445	138	479	934	147
Lane Group Flow (vph)	198	876	379	195	619	203	254	613	0	504	983	155
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6					4	
Total Split (s)	13.0	47.0	47.0	13.0	47.0	47.0	18.0	25.0	0.0	35.0	42.0	42.0
Act Effct Green (s)	9.0	40.3	40.3	9.0	40.3	40.3	12.2	21.0		31.0	39.9	39.9
Actuated g/C Ratio	0.08	0.34	0.34	0.08	0.34	0.34	0.10	0.18		0.26	0.34	0.34
v/c Ratio	1.46	0.91	0.56	1.43	0.65	0.31	0.71	0.96		1.08	0.82	0.25
Control Delay	279.8	51.6	18.0	271.3	36.0	8.0	62.8	74.0		105.8	43.0	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	279.8	51.6	18.0	271.3	36.0	8.0	62.8	74.0		105.8	43.0	10.8
LOS	F	D	B	F	D	A	E	E		F	D	B
Approach Delay	73.9				75.5		70.7				59.2	
Approach LOS	E				E		E				E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 117.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.46
 Intersection Signal Delay: 68.8 Intersection LOS: E
 Intersection Capacity Utilization 89.8% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 2: El Cajon Blvd & Collwood Blvd



3: El Cajon Blvd & Euclid Ave

NT AM with TSP (>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.981			0.986			0.974			0.949		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3472	0	1770	3490	0	1770	1814	0	1770	1768	0
Flt Permitted	0.950			0.950			0.680			0.411		
Satd. Flow (perm)	1770	3472	0	1770	3490	0	1267	1814	0	766	1768	0
Satd. Flow (RTOR)	30			21			15			36		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	37	449	65	46	643	67	100	218	46	40	75	39
Lane Group Flow (vph)	39	541	0	48	748	0	105	277	0	42	120	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Total Split (s)	12.0	36.0	0.0	12.0	36.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Act Effct Green (s)	6.9	37.1		7.0	37.3		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.10	0.53		0.10	0.53		0.26	0.26		0.26	0.26	
v/c Ratio	0.22	0.29		0.27	0.40		0.32	0.58		0.21	0.25	
Control Delay	30.7	12.7		32.9	11.3		24.4	27.1		23.8	16.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.7	12.7		32.9	11.3		24.4	27.1		23.8	16.5	
LOS	C			C			C			C		B
Approach Delay	14.0			12.6			26.4			18.4		
Approach LOS	B			B			C			B		

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 40 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 57.5%

ICU Level of Service B

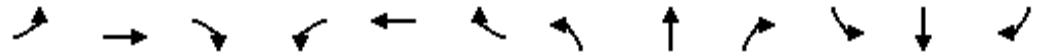
Analysis Period (min) 15

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

NT AM with TSP (<20sec)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.70	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.981				0.986				0.974		0.949	
Flt Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1770	2558	0	1770	1837	0	1770	1814	0	1770	1768	0
Flt Permitted	0.950				0.950				0.680		0.411	
Satd. Flow (perm)	1770	2558	0	1770	1837	0	1267	1814	0	766	1768	0
Satd. Flow (RTOR)	20				10				15		36	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	37	449	65	46	643	67	100	218	46	40	75	39
Lane Group Flow (vph)	39	541	0	48	748	0	105	277	0	42	120	0
Turn Type	Prot				Prot				Perm		Perm	
Protected Phases	5	2			1	6			8			4
Permitted Phases									8			4
Total Split (s)	12.0	36.0	0.0	12.0	36.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Act Effct Green (s)	6.9	37.1			7.0	37.3			18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.10	0.53			0.10	0.53			0.26	0.26	0.26	0.26
v/c Ratio	0.22	0.40			0.27	0.76			0.32	0.58	0.21	0.25
Control Delay	30.6	15.0			32.9	21.7			24.4	27.1	23.8	16.5
Queue Delay	0.0	0.0			0.0	0.0			0.0	0.0	0.0	0.0
Total Delay	30.6	15.0			32.9	21.7			24.4	27.1	23.8	16.5
LOS	C				C	C			C	C	C	B
Approach Delay	16.0				22.3				26.4		18.4	
Approach LOS	B				C				C		B	

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 40 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 20.9

Intersection LOS: C

Intersection Capacity Utilization 67.5%

ICU Level of Service C

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

NT PM with TSP(>20sec)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.984			0.940			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3483	0	1770	3483	0	1770	1751	0	1770	1818	0
Flt Permitted	0.950			0.950			0.279			0.279		
Satd. Flow (perm)	1770	3483	0	1770	3483	0	520	1751	0	520	1818	0
Satd. Flow (RTOR)		17			18			26			7	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	34	1085	131	75	715	86	108	172	113	92	239	46
Lane Group Flow (vph)	36	1280	0	79	844	0	114	300	0	97	300	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Total Split (s)	15.6	69.0	0.0	19.1	72.5	0.0	31.9	31.9	0.0	31.9	31.9	0.0
Act Effct Green (s)	7.7	72.1		10.1	76.5		27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.06	0.60		0.08	0.64		0.23	0.23		0.23	0.23	
v/c Ratio	0.32	0.61		0.53	0.38		0.94	0.70		0.80	0.70	
Control Delay	55.6	22.1		64.9	11.5		114.5	48.5		86.8	51.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.6	22.2		64.9	11.5		114.5	48.5		86.8	51.2	
LOS	E	C		E	B		F	D		F	D	
Approach Delay		23.1			16.1			66.6			59.9	
Approach LOS		C			B			E			E	

Intersection Summary






















Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 31.7 Intersection LOS: C
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

NT PM with TSP(<20sec)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 										
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.82	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.984			0.984			0.940			0.976		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3006	0	1770	1833	0	1770	1751	0	1770	1818	0
Flt Permitted	0.950			0.950			0.279			0.279		
Satd. Flow (perm)	1770	3006	0	1770	1833	0	520	1751	0	520	1818	0
Satd. Flow (RTOR)	14			8			26			7		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	34	1085	131	75	715	86	108	172	113	92	239	46
Lane Group Flow (vph)	36	1280	0	79	844	0	114	300	0	97	300	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Total Split (s)	15.6	69.0	0.0	19.1	72.5	0.0	31.9	31.9	0.0	31.9	31.9	0.0
Act Effct Green (s)	7.7	72.1		10.1	76.5		27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.06	0.60		0.08	0.64		0.23	0.23		0.23	0.23	
v/c Ratio	0.32	0.71		0.53	0.72		0.94	0.70		0.80	0.70	
Control Delay	55.6	25.2		64.9	20.3		114.5	48.5		86.8	51.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.6	25.2		64.9	20.3		114.5	48.5		86.8	51.2	
LOS	E	C		E	C		F	D		F	D	
Approach Delay	26.1			24.1			66.6			59.9		
Approach LOS	C			C			E			E		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	
* User Entered Value	

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

LT AM with TSP(>20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.981			0.986			0.974			0.949		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3472	0	1770	3490	0	1770	1814	0	1770	1768	0
Flt Permitted	0.950			0.950			0.676			0.379		
Satd. Flow (perm)	1770	3472	0	1770	3490	0	1259	1814	0	706	1768	0
Satd. Flow (RTOR)	30			20			15			35		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	39	489	70	49	683	70	107	232	49	42	80	41
Lane Group Flow (vph)	41	589	0	52	793	0	113	296	0	44	127	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Total Split (s)	12.0	36.0	0.0	12.0	36.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Act Effct Green (s)	6.9	37.1		7.1	37.3		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.10	0.53		0.10	0.53		0.26	0.26		0.26	0.26	
v/c Ratio	0.23	0.32		0.29	0.42		0.35	0.62		0.24	0.26	
Control Delay	30.6	13.1		33.3	11.6		25.0	28.3		24.8	17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.6	13.1		33.3	11.6		25.0	28.3		24.8	17.0	
LOS	C			C			C			C		B
Approach Delay	14.3			12.9			27.4			19.0		
Approach LOS	B			B			C			B		

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 40 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 16.7

Intersection LOS: B

Intersection Capacity Utilization 59.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

LT AM with TSP(<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.70	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.986			0.974			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	2558	0	1770	1837	0	1770	1814	0	1770	1768	0
Flt Permitted	0.950			0.950			0.676			0.379		
Satd. Flow (perm)	1770	2558	0	1770	1837	0	1259	1814	0	706	1768	0
Satd. Flow (RTOR)		20			10			15			35	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	39	489	70	49	683	70	107	232	49	42	80	41
Lane Group Flow (vph)	41	589	0	52	793	0	113	296	0	44	127	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Total Split (s)	12.0	36.0	0.0	12.0	36.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Act Effct Green (s)	6.9	37.1		7.1	37.3		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.10	0.53		0.10	0.53		0.26	0.26		0.26	0.26	
v/c Ratio	0.23	0.43		0.29	0.81		0.35	0.62		0.24	0.26	
Control Delay	30.5	15.8		33.3	24.3		25.0	28.3		24.8	17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.5	15.8		33.3	24.3		25.0	28.3		24.8	17.0	
LOS	C	B		C	C		C	C		C	B	
Approach Delay		16.7			24.8			27.4			19.0	
Approach LOS		B			C			C			B	

Intersection Summary

























Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 40 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 22.4 Intersection LOS: C
 Intersection Capacity Utilization 70.9% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 3: El Cajon Blvd & Euclid Ave



3: El Cajon Blvd & Euclid Ave

LT PM with TSP (>20sec)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.984			0.984			0.941			0.976		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3483	0	1770	3483	0	1770	1753	0	1770	1818	0
Flt Permitted	0.950			0.950			0.243			0.243		
Satd. Flow (perm)	1770	3483	0	1770	3483	0	453	1753	0	453	1818	0
Satd. Flow (RTOR)	17			18			25			8		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	37	1158	140	80	771	91	115	184	120	97	255	49
Lane Group Flow (vph)	39	1366	0	84	908	0	121	320	0	102	320	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Total Split (s)	15.6	69.0	0.0	19.1	72.5	0.0	31.9	31.9	0.0	31.9	31.9	0.0
Act Effct Green (s)	7.9	71.8		10.4	76.4		27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.07	0.60		0.09	0.64		0.23	0.23		0.23	0.23	
v/c Ratio	0.34	0.65		0.55	0.41		1.15	0.75		0.97	0.75	
Control Delay	55.3	22.8		65.2	11.9		177.0	51.5		127.8	53.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.3	22.8		65.2	11.9		177.0	51.5		127.8	53.6	
LOS	E	C		E	B		F	D		F	D	
Approach Delay	23.7			16.4			86.0			71.6		
Approach LOS	C			B			F			E		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 36.1	Intersection LOS: D
Intersection Capacity Utilization 77.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: El Cajon Blvd & Euclid Ave

3: El Cajon Blvd & Euclid Ave

LT PM with TSP (<20sec)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	*0.82	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.984			0.984			0.941			0.976		
Flt Protected	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (prot)	1770	3006	0	1770	1833	0	1770	1753	0	1770	1818	0
Flt Permitted	0.950		0.950		0.243		0.243		0.243			
Satd. Flow (perm)	1770	3006	0	1770	1833	0	453	1753	0	453	1818	0
Satd. Flow (RTOR)	14			8			25			8		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	37	1158	140	80	771	91	115	184	120	97	255	49
Lane Group Flow (vph)	39	1366	0	84	908	0	121	320	0	102	320	0
Turn Type	Prot		Prot		Perm		Perm		Perm			
Protected Phases	5	2	1		6	8		8		4		
Permitted Phases							8		4			
Total Split (s)	15.6	69.0	0.0	19.1	72.5	0.0	31.9	31.9	0.0	31.9	31.9	0.0
Act Effct Green (s)	7.9	71.8		10.4	76.4		27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.07	0.60		0.09	0.64		0.23	0.23		0.23	0.23	
v/c Ratio	0.34	0.76		0.55	0.78		1.15	0.75		0.97	0.75	
Control Delay	55.3	26.6		65.2	23.0		177.0	51.5		127.8	53.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.3	26.6		65.2	23.0		177.0	51.5		127.8	53.6	
LOS	E	C		E	C		F	D		F	D	
Approach Delay	27.4		26.5		86.0		71.6					
Approach LOS	C		C		F		E					

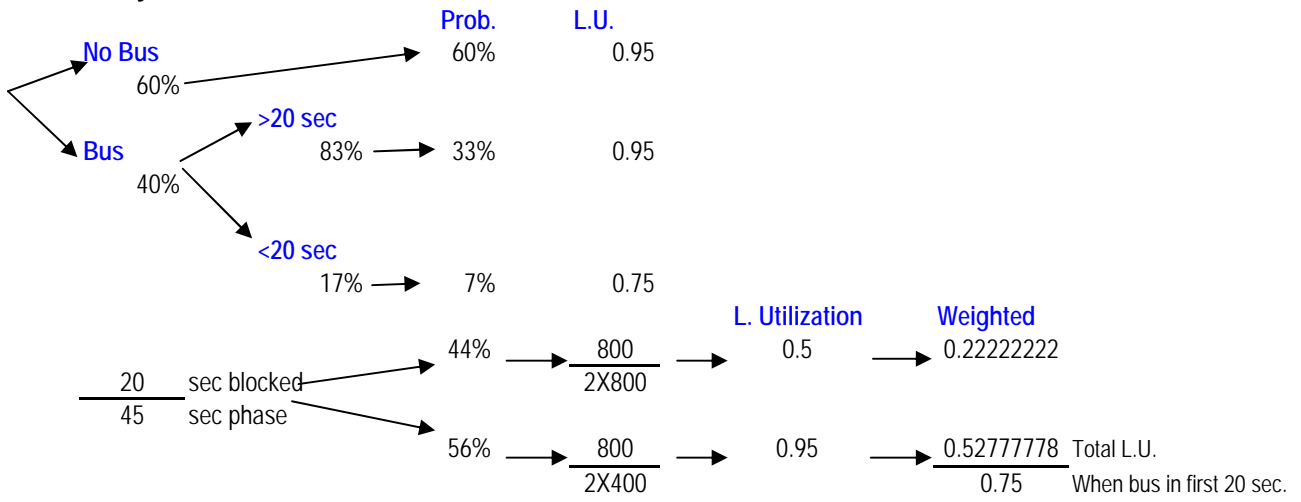
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 40.8
 Intersection LOS: D
 Intersection Capacity Utilization 87.2%
 ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value

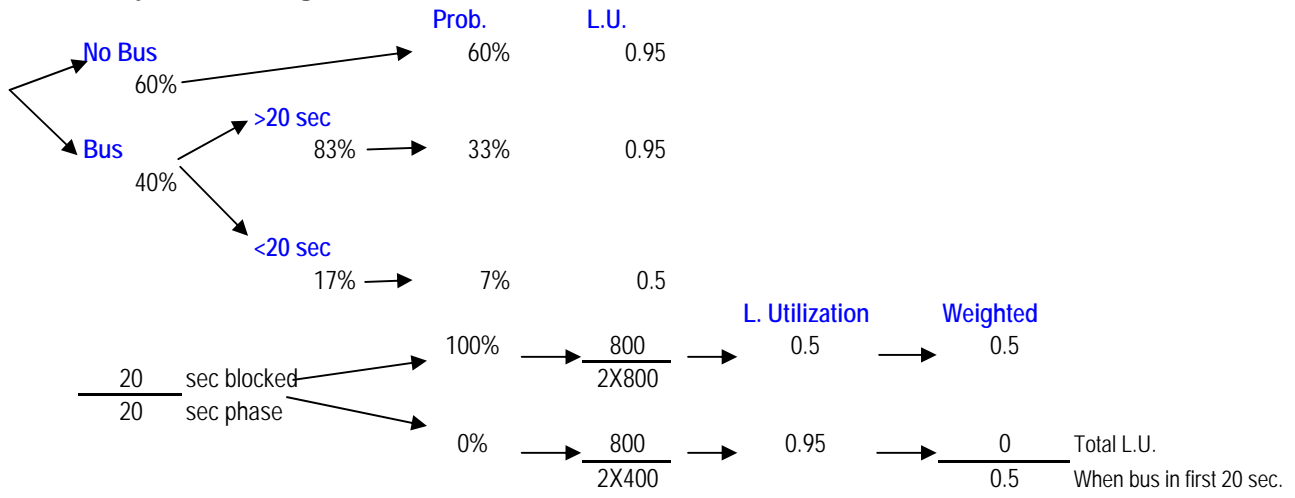
Splits and Phases: 3: El Cajon Blvd & Euclid Ave



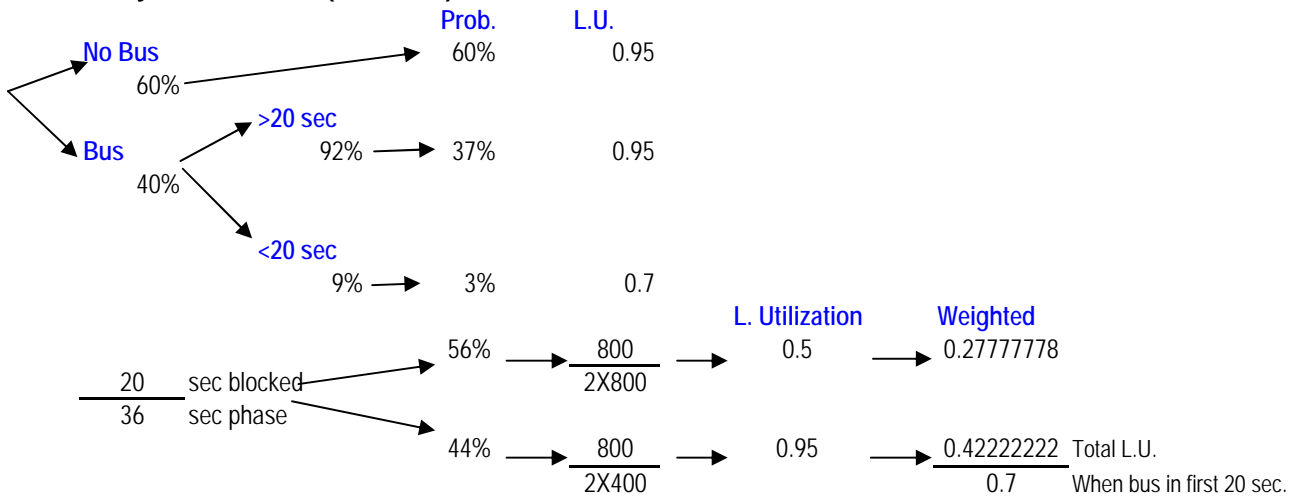
Probability Tree - 54th Street



Probability Tree - College Avenue



Probability Tree - Euclid (AM Peak)



Probability Tree - Euclid (PM Peak)

