

## Project Description

The project alternatives analysis includes an alignment segment where reducing the number of vehicular travel lanes on 5<sup>th</sup> Avenue, through Downtown San Diego, from three lanes to two lanes would be necessary to accommodate the design option that best meets the evaluation criteria for this segment of the 5<sup>th</sup> Avenue alignment. The project alternatives analysis also includes an alignment segment where a buffered bike lane on both directions was proposed along the Robinson Avenue alignment between 10<sup>th</sup> Avenue and Park Boulevard with roundabouts at the intersections is considered the best design option along this segment of the Robinson alignment. These two segments are the subject of this preliminary capacity analysis for the purpose of identifying any potential issues, which may be caused by the project, early on in the process.

## Preliminary Capacity Analysis

This preliminary capacity analysis is to evaluate intersections within the project area where lane removal may affect vehicular capacity. This analysis used available data from multiple sources and newly commissioned counts. The study area was selected based on one of more or the following criteria:

- The segment analysis, during the Tier II analysis, showed potential congestion
- Field observations indicated the potential for traffic congestion
- Potential reduction in the center median lane may result on vehicular congestion.

The results only represent the direct impacts of the project under existing conditions. Based on the results of this analysis, all intersections were found to operate at an acceptable level of service therefore no direct impacts would occur under existing conditions due to the implementation of the project.

The study area is shown in Figure 1. The locations analyzed are listed below.

### Intersections

1. Fifth Avenue & Washington Street
2. Fifth Avenue & University Avenue
3. Fifth Avenue & Robinson Avenue
4. Fifth Avenue & I-5 SB On-Ramp
5. Fifth Avenue & Cedar Street
6. Fifth Avenue & Beech Street
7. Fifth Avenue & Ash Street
8. Fifth Avenue & A Street
9. Fifth Avenue & B Street
10. Fifth Avenue & C Street
11. Robinson Avenue & Richmond Street

Figure 2 shows the existing roadways configuration. Figure 3 shows the proposed roadways configuration.

## Study Scenarios

The following scenarios are addressed in this analysis.

- Existing Conditions
- Existing Conditions with Project

The future conditions were not analyzed for the purpose of this preliminary planning and design phase of the project but will be analyzed at a later date during the engineering and environmental phase of the project. The purpose of this preliminary capacity analysis is to identify any potential issues, which may be caused by the project, early on in the process. A complete traffic impact study including existing and future conditions will be conducted once the preferred alternative is selected.

Figure I – Study Area

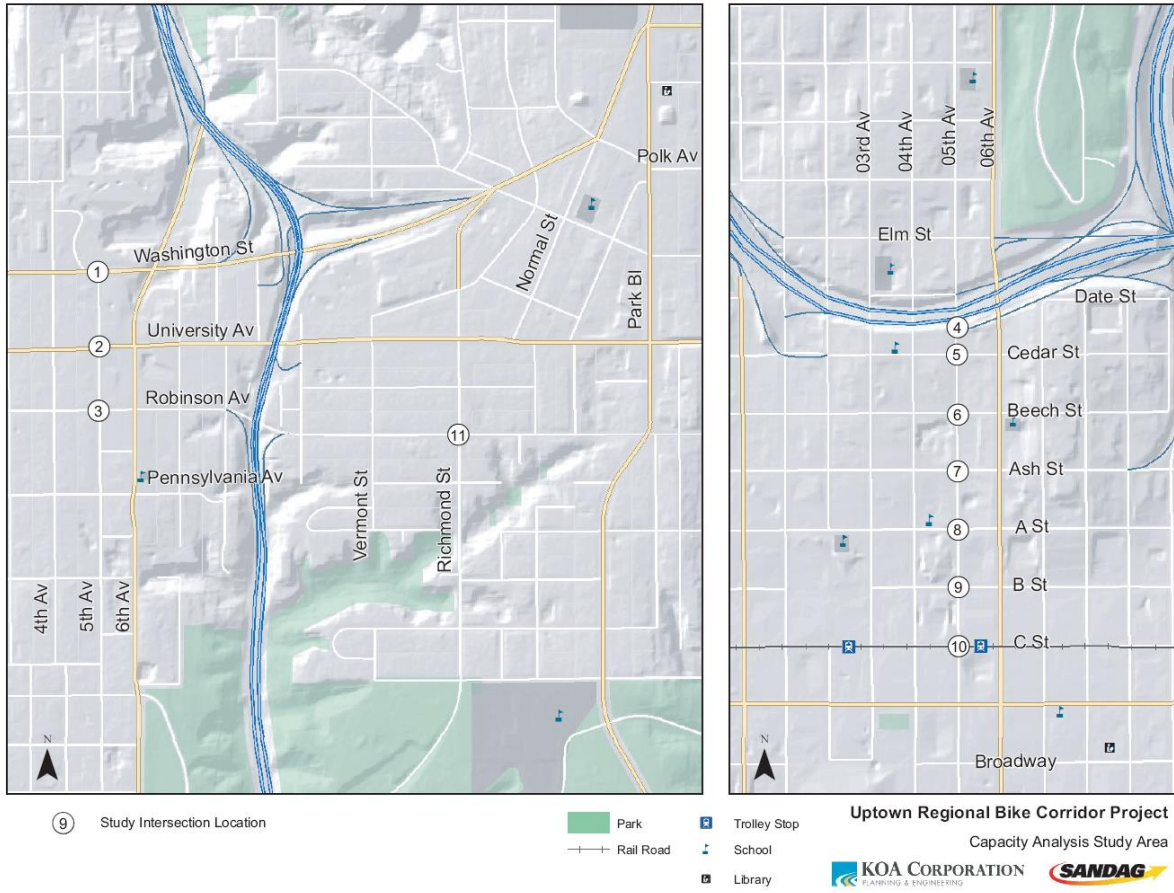


Figure 2 – Existing Roadway Configuration

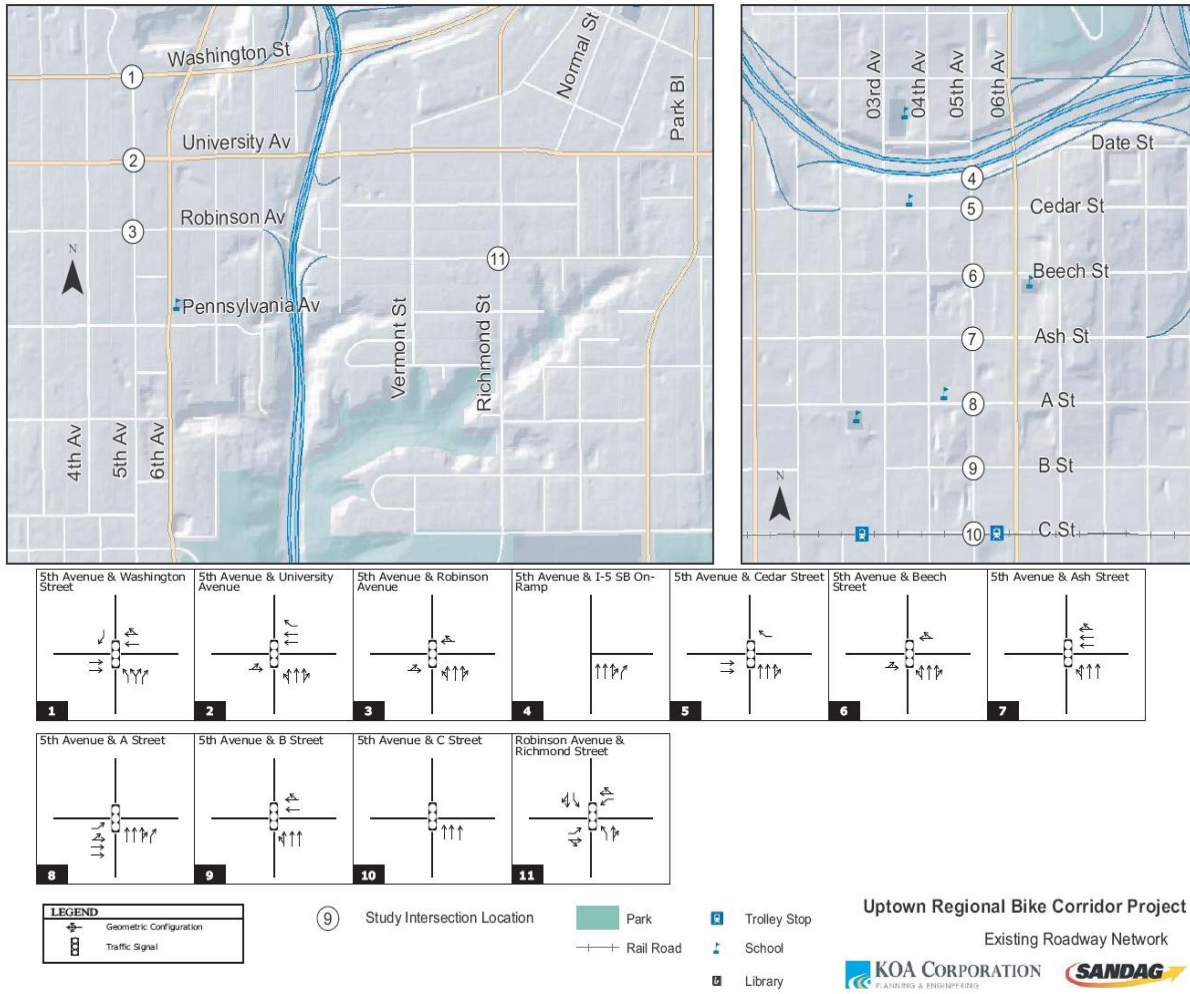
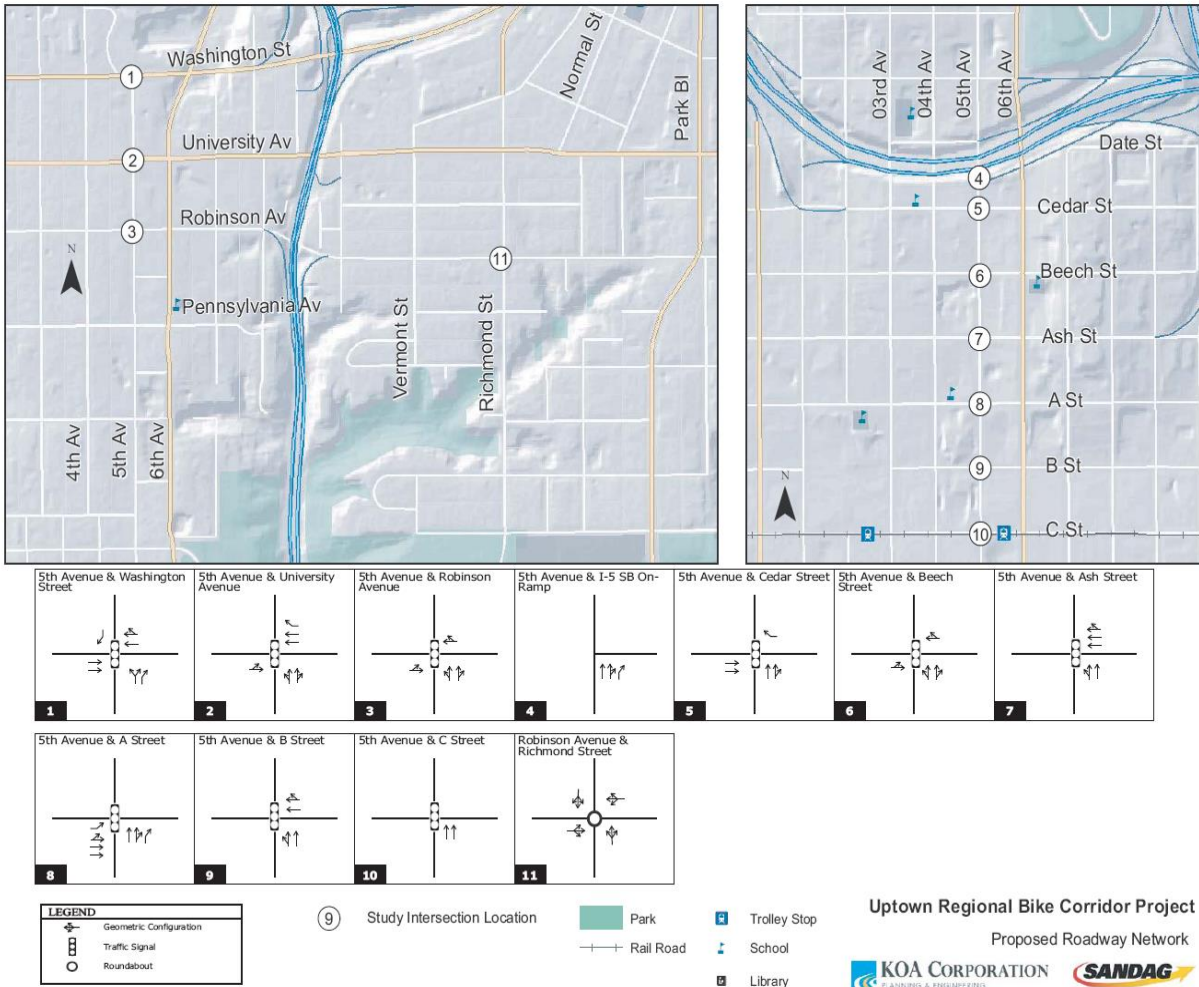


Figure 3 – Proposed Roadway Configuration





### Vehicular Traffic Analysis

Peak period turning movement traffic volumes and 24-hour daily traffic volumes were analyzed. Figure 4 shows the existing traffic conditions for intersections. Figure 5 shows the existing plus project traffic conditions for intersections. Appendix A contains the traffic analysis methodologies and concepts used in this analysis.

**Figure 4 – Existing Traffic Conditions**

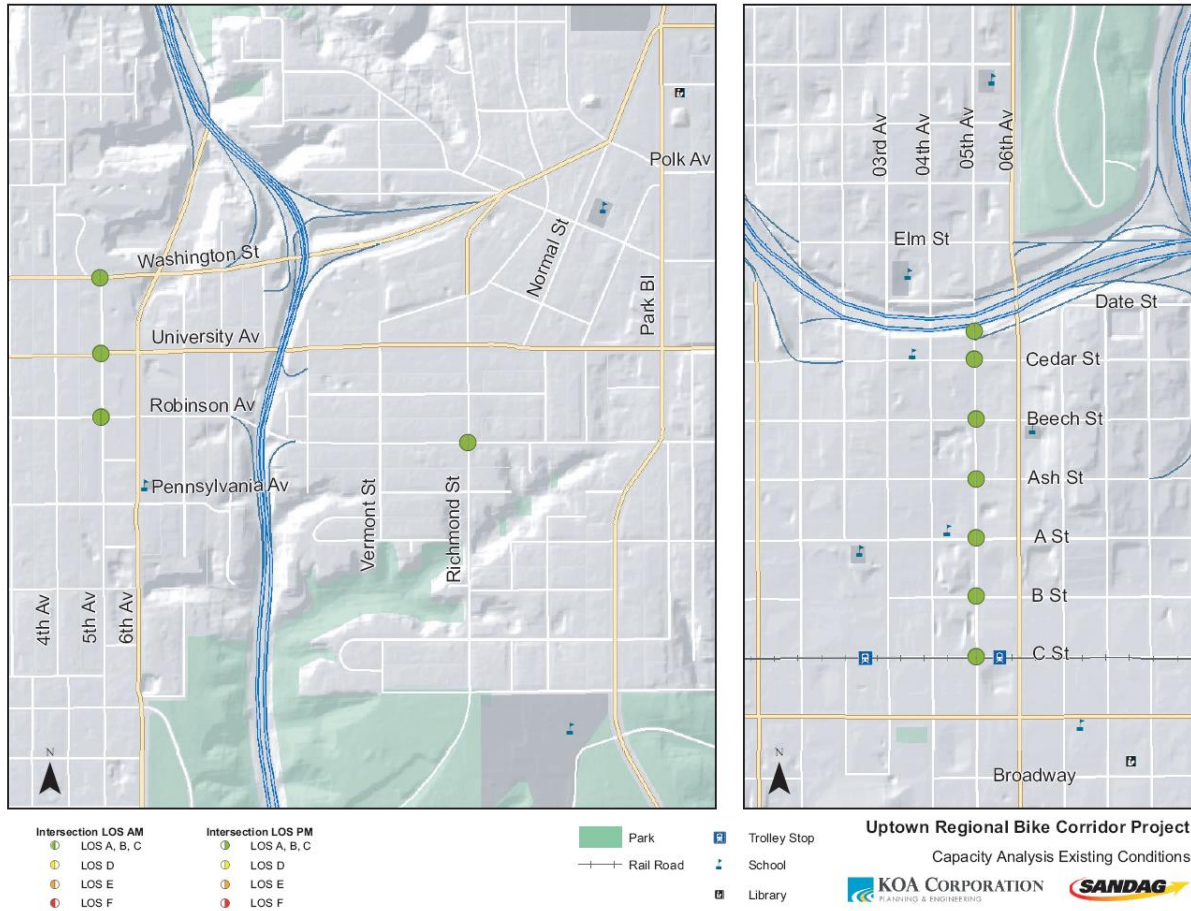
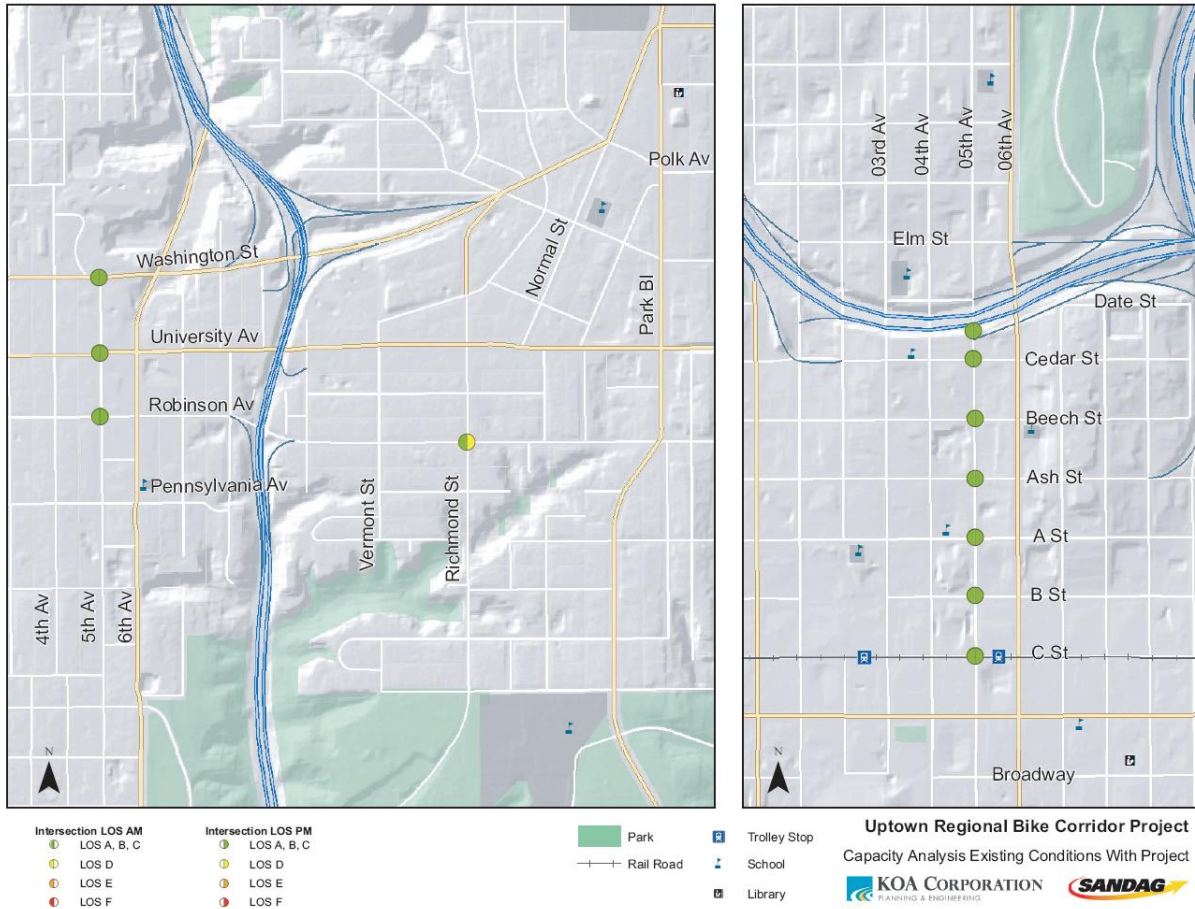


Figure 5 – Existing plus Project Traffic Conditions



**Intersection Analysis**

The effect of the proposed project segments on the study area circulation network for existing conditions was evaluated. Tables 1 summarizes the results of the intersection analysis. As shown on Table 2, all intersections in the study area operate at an acceptable LOS D or better under both existing and existing with project scenarios.

**Table I –Existing Intersection Conditions**

Intersection	Existing Conditions		Existing Conditions With Project <sup>2</sup>		Δ Delay	Significant
	Delay	LOS	Delay	LOS		
<b>AM Peak Hour</b>						
1. Fifth Avenue & Washington Street	14.4	B	15.3	B	0.9	No
2. Fifth Avenue & University Avenue	12.3	B	13.0	B	0.7	No
3. Fifth Avenue & Robinson Avenue	10.8	B	11.8	B	1.0	No
4. Fifth Avenue & I-5 SB On-Ramp	0.0	A	0.0	A	0.0	No
5. Fifth Avenue & Cedar Street	12.8	B	13.3	B	0.5	No
6. Fifth Avenue & Beech Street	10.6	B	11.3	B	0.7	No
7. Fifth Avenue & Ash Street	11.6	B	11.3	B	-0.3	No
8. Fifth Avenue & A Street	15.7	B	16.6	B	0.9	No
9. Fifth Avenue & B Street	12.0	B	13.1	B	1.1	No
10. Fifth Avenue & C Street	3.5	A	3.5	A	0.0	No
11. Robinson Avenue & Richmond Street <sup>1</sup>	6.3	A	54.2%	A	N/A	No
<b>PM Peak Hour</b>						
1. Fifth Avenue & Washington Street	15.2	B	19.9	B	4.7	No
2. Fifth Avenue & University Avenue	25.1	C	28.8	C	3.7	No
3. Fifth Avenue & Robinson Avenue	14.7	B	19.1	B	4.4	No
4. Fifth Avenue & I-5 SB On-Ramp	0.0	A	0.6	A	0.6	No
5. Fifth Avenue & Cedar Street	13.3	B	14.5	B	1.2	No
6. Fifth Avenue & Beech	11.5	B	11.8	B	0.3	No
7. Fifth Avenue & Ash Street	11.7	B	14.1	B	2.4	No
8. Fifth Avenue & A Street	15.2	B	16.6	B	1.4	No
9. Fifth Avenue & B Street	14.0	B	14.3	B	0.3	No
10. Fifth Avenue & C Street	3.6	A	3.9	A	0.3	No
11. Robinson Avenue & Richmond Street <sup>1</sup>	7.0	A	78.8%	D	N/A	No
Notes:						
<sup>1</sup> Intersection Capacity Utilization reported under Existing Conditions With Project						
<sup>2</sup> Geometry change only for With Project conditions, Baseline Conditions do not change						

**Appendix A**  
**Traffic Analysis Methodology**



A brief overview of traffic analysis methodologies and concepts used in this analysis is presented in this section. Street system operating conditions are typically described in terms of “level of service.” Level of service is a report-card scale used to indicate the traffic flow on roadway segments and at intersections. Level of service (LOS) ranges from LOS A (free flow, little congestion) to LOS F (forced flow, extreme congestion).

**Intersection Capacity**

The analysis of peak hour intersection performance was conducted using the Synchro analysis software program, which uses methodologies defined in the 2000 Highway Capacity Manual (HCM) to calculate results. LOS for intersections is determined by control delay. Control delay is defined as the total elapsed time from when a vehicle stops at the end of a queue to the time the vehicle departs from the stop line. The total elapsed time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position; including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue. The HCM LOS for the range of delay by seconds for unsignalized and signalized intersections is described in Table I.

Table I  
Unsignalized and Signalized Intersection Level of Service (HCM 2000)

Level of Service	Unsignalized	Signalized
	Average Control Delay (seconds/vehicle)	Average Control Delay (seconds/vehicle)
A	0-10	0-10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	>50	> 80

Source: Highway Capacity Manual 2000.

**Signalized Intersections**

The HCM analysis methodology for evaluating signalized intersections is based on the “operational analysis” procedure. This technique uses 1,900 passenger cars per hour of green per lane (pcphgpl) as the maximum saturation flow of a single lane at an intersection. This saturation flow rate is adjusted to account for lane width, on-street parking, conflicting pedestrian flow, traffic composition, (e.g., the percentage of vehicles that are trucks) and shared lane movements (e.g., through and right-turn movements from the same lane). Average control delay is calculated by taking a volume-weighted average of all the delays for all vehicles entering the intersection.

**Level of Service (LOS) Definitions**

The concept of LOS is defined as a qualitative measure describing operational conditions within a traffic stream, and the motorist's and/or passengers' perception of operations. A LOS definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort, convenience, and safety. Levels of service for freeway segments can generally be categorized as shown in the table above.