

Appendix R

Alternatives

Appendix R.1

Alternatives Transportation Memorandum

MEMORANDUM

TO: Stephanie Eyestone-Jones & Brad Napientek, Eyestone Environmental

FROM: Sarah M. Drobis, P.E., and Emily Wong, P.E.

DATE: January 14, 2025

RE: Transportation Analysis of Project Alternatives for the
Radford Studio Center Project
Studio City, California

Ref: J1982

This memorandum presents the findings of the California Environmental Quality Act (CEQA) analysis of the alternatives (Alternatives) to the proposed Radford Studio Center Project (Project), which includes, among other things, the proposed Radford Studio Center Specific Plan (Specific Plan) located at 4024, 4064, and 4200 North Radford Avenue (Project Site) in the *Sherman Oaks-Studio City-Toluca Lake-Cahuenga Pass Community Plan* (Los Angeles Department of City Planning [LADCP], Amended 2016) area of the City of Los Angeles, California (City). The analysis of Alternatives is based on the City's *Transportation Assessment Guidelines* (Los Angeles Department of Transportation [LADOT], August 2022) (TAG) addressing the CEQA guidelines and thresholds.

This CEQA analysis of Alternatives was prepared consistent with the methodology, assumptions, and analysis presented in *Transportation Assessment for the Radford Studio Center Project, Studio City, California* (Gibson Transportation Consulting Inc., July 2024, Revised December 2024) (Transportation Assessment), where applicable. The Transportation Assessment was reviewed and approved by LADOT via an inter-departmental memorandum to LADCP on August 9, 2024.

PROJECT BACKGROUND

The Project Site is comprised of the North Lot (4200 North Radford Avenue) and the South Lot (4024 and 4064 North Radford Avenue). The North and South Lots are currently improved with multiple buildings totaling approximately 1,179,110 square feet (sf), including 359,730 sf of sound stages, 255,510 sf of production support, 450,060 sf of production office, and 113,810 sf of general office.

As detailed in Table 1, the proposed Specific Plan would allow the construction of up to approximately 2,200,000 sf of sound stage, production support, production office, general office, and retail uses within the Project Site upon buildout of the Project, as well as associated ingress/egress, circulation, parking, landscaping, and open space improvements. The Specific Plan would permit up to approximately 1,667,010 sf of new floor area, the retention of approximately 532,990 sf of existing uses, and the demolition of up to approximately 646,120 sf of existing uses. As set forth in the Specific Plan, the Project would consist of approximately 550,000 sf of sound stages, 300,000 sf of production support, 725,000 sf of production office, 700,000 sf of general office, and 25,000 sf of retail space.

There are currently approximately 3,095 parking spaces located in multiple above-grade parking structures and surface parking lots throughout the Project Site. With the Project, a total of approximately 6,050 parking spaces would be provided, including approximately 2,170 existing parking spaces that will remain, within a combination of above-grade parking structures, subterranean structures, and/or surface parking lots. The Project would also provide bicycle parking spaces, including short-term and long-term spaces, in accordance with the City Municipal Code. The on-site parking facilities would serve the parking needs for Project employees, staff, visitors, audiences, etc.

Mobility Hubs would be located on-site, currently proposed as one in the northern portion of the North Lot and one in the southern portion of the South Lot, subject to operational needs. The Mobility Hub within the North Lot would be constructed after completion of the Radford Mobility Connector, a new multi-modal bridge that would extend Radford Avenue north across the Tujunga Wash to Moorpark Street (no through access for vehicles would be permitted north or south along Radford Avenue). The Mobility Hubs would support first-mile/last-mile connections; encourage employee use of public transit, carpooling, vanpooling, and biking/scooter to work; and support other transportation demand management (TDM) strategies. The Mobility Hubs would provide an off-street space for Project-related passenger pick-up/drop-off and the temporary parking of buses, carpools, vanpools, shuttles, ride-share, taxi, and other commercial and non-commercial vehicles. The Mobility Hubs would include space to accommodate support uses, storage, maintenance, staging facilities, bike share, and ridership amenities.

The Project is anticipated to be completed as early as Year 2028. However, the Project Applicant is seeking a Development Agreement with a term of 20 years, which could extend the full buildout year to approximately Year 2045.

Access and Circulation

Vehicular access to the Project Site would continue to be provided along Radford Avenue via the existing ingress/egress driveways at the southwestern portion of the South Lot, which provides access to the Radford Gate, and at the northwestern portion of the South Lot, which provides direct access to the existing Sater parking structure. Vehicular access from Colfax Avenue via the existing ingress/egress driveway (the Colfax Gate) would be located in the southeastern portion of the South Lot. Additional vehicular access from Ventura Boulevard would be provided via a former ingress/egress driveway at Carpenter Avenue (the Carpenter Gate) that would be restored as part of the Project.

The Project is also proposing the Radford Mobility Connector. Removable bollards, fire access gates, planters, and/or other traffic calming measures would be installed to prevent cut-through vehicular traffic by prohibiting access from Moorpark Street south to Ventura Boulevard. The Radford Mobility Connector would provide a pedestrian and bicycle connection to the Tujunga Wash and include new studio-related vehicle access, as well as ramps and/or stairs to provide direct access to the Los Angeles River trail system Along Radford Avenue, enhanced sidewalks and a landscaped setback are proposed, and a Class IV bikeway (from Hoffman Street to the Radford Mobility Connector).

Two additional existing ingress/egress driveways located in the northwestern and southwestern portions of the North Lot along Radford Avenue would be for limited access only, consistent with

existing conditions. Two loading/service access areas would also be located along the southern boundary of the Project Site accessed from the adjacent public alley.

Pedestrian and bicycle access would be provided at the same primary access points, including at the Radford Gate, Sater parking structure, Carpenter Gate, and Colfax Gate. Additional access points along Radford Avenue and two pedestrian access points along the alley would also be available. All access points would be controlled with gates and/or staffed guard houses.

The existing bridge internally connecting the North Lot to the South Lot across the Los Angeles River would be maintained and widened. Internal circulation routes would be renovated and, where required, newly introduced throughout the Project Site to facilitate access to all buildings, parking areas, and basecamp areas. Parking for production vehicles would be provided adjacent to sound stages to accommodate loading/unloading activities and vehicle storage in or near basecamp areas.

CEQA Analysis Methodology

The Transportation Assessment analyzed the potential significant impacts for the Project according to the CEQA thresholds identified in the TAG. The three thresholds considered are:

- Threshold T-1: Conflicting with Plans, Programs, Ordinances, or Policies
- Threshold T-2.1: Causing Substantial Vehicle Miles Traveled
- Threshold T-3: Substantially Increasing Hazards Due to a Geometric Design Feature or Incompatible Use
 - Freeway Safety Analysis

Consistent with the analysis in the Transportation Assessment, the vehicle miles traveled (VMT) evaluation under Threshold T-2.1 utilized LADOT's *City of Los Angeles VMT Calculator Version 1.4* (June 2022) (VMT Calculator) to evaluate the Project VMT for comparison to the VMT impact criteria. The VMT Calculator does not include sound stage and production-related uses as built-in land use options. Therefore, the VMT Calculator's custom land use feature was utilized to represent the Project's total floor area for sound stages, production support, production office, and general office uses. The VMT Calculator's Custom Land Use feature requires inputs for total daily trip generation, total employees, and trip production and attraction characteristics. While *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers [ITE], 2021) includes detailed data to estimate trips for general office uses, the daily trip estimates for the sound stages, production support, and production offices were calculated using trip rates based on empirical studies at other studios in the City, which have been used in a variety of recent transportation analyses for production studio developments in the City, as detailed the Transportation Assessment. The Project's retail uses were separately input into the VMT Calculator and were entirely considered as high-turnover restaurant uses to provide a conservative analysis.

CEQA Analysis Results

As detailed in the Transportation Assessment and summarized in Table 2, the Project is estimated to generate 958 net new morning peak hour trips (758 inbound, 200 outbound) and 924 net new afternoon peak hour trips (258 inbound, 666 outbound).

The Project was found to be consistent with all plans, programs, ordinances, and policies listed in TAG Table 2.1-1. The Project, therefore, would have less than significant impacts with regard to Threshold T-1 and no mitigation measures were required. The Project would similarly have a less than significant cumulative impact with regard to Threshold T-1.

As summarized in Table 3, the Project would generate approximately 55,610 daily work VMT and an average work VMT per employee of 6.2, which would not exceed the work VMT impact threshold of 11.6 for the South Valley APC. Therefore, the Project would result in a less than significant impact with regards to Threshold T-2.1. The Project would also result in a less than significant cumulative impact with regard to Threshold T-2.1. Nonetheless, the Project would implement a series of TDM measures that would exceed the requirements established in the current TDM Ordinance. These same TDM measures would be applied to the Alternatives as applicable.

The Project would not result in hazards related to geometric design and would have a less than significant impact with regard to Threshold T-3, and no mitigation measures were required. The Project would similarly have a less than significant cumulative impact with regard to Threshold T-3.

The Project would generate more than 25 peak hour trips to the following freeway off-ramp locations:

- US 101 Northbound Off-Ramp to Laurel Canyon Boulevard (morning peak hour)
- US 101 Southbound Off-Ramp to Laurel Canyon Boulevard (morning and afternoon peak hours)
- SR 170 Southbound Off-Ramp to Riverside Drive (morning peak hour)
- SR 134 Westbound Off-Ramp to Lankershim Boulevard (morning peak hour)

The addition of Project trips would not result in queues at any of the above freeway off-ramps to exceed the ramp storage length or add 50 or more feet to any queue that extends into the freeway mainline under Future Conditions in Year 2028 and Year 2045. Therefore, the Project would not result in an adverse safety condition and no corrective measures were required.

PROJECT ALTERNATIVES

Five Alternatives to the Project were identified for analysis in the Project's environmental documentation. Each Alternative was analyzed to compare potential transportation impacts to the Project:

- Alternative 1: No Project / No Build Alternative
- Alternative 2: Existing Zoning Alternative
- Alternative 3: Reduced Density Alternative
- Alternative 4: Reduced Excavation / Grading Alternative
- Alternative 5: Residential Mixed-Use Alternative

Table 1 provides a land use summary of each Alternative. Each Alternative, with exception of Alternative 1 (No Project/No Build Alternative), is conceived as a pedestrian- and transit-oriented development that emphasizes accessibility by all travel modes, like the Project, and is consistent with the intent of the *Mobility Plan 2035: An Element of the General Plan* (LADCP, January 2016) (Mobility Plan) standards. Vehicular access for Alternatives 2 through 5 would be consistent with the Project, though parking space distribution within the Project Site would vary in some Alternatives when compared to the Project.

Each Alternative was analyzed consistent with the Project analysis from the Transportation Assessment for each of the CEQA thresholds. For the VMT analysis, as with the Project, the TDM measures classified as Project Design Features were incorporated into the analysis of each Alternative. The detailed VMT output reports for each Alternative are provided in Attachment A. The queue reports for the freeway safety analysis are provided in Attachment B.

ALTERNATIVE 1: NO PROJECT / NO BUILD ALTERNATIVE

Alternative 1 would not change the Project Site from the existing condition and, therefore, would have no transportation impacts under any of the CEQA thresholds.

ALTERNATIVE 2: EXISTING ZONING ALTERNATIVE

Development Program

Alternative 2 would include development as allowed under the existing zoning and land use regulations for the Project Site. As detailed in Table 1, development under Alternative 2 would occur within the South Lot and building heights would be increased within certain areas of the South Lot. Alternative 2 would include the construction of approximately 1,820,875 sf of new development, demolition of approximately 599,985 sf of existing studio-related uses, and the retention of approximately 579,125 sf of existing studio-related uses. Thus, Alternative 2 would include a total of 2,400,000 sf of development, comprised of approximately 450,000 sf of sound stages, 360,000 sf of production support uses, 840,000 sf of production office uses, 720,000 sf of general office uses, and 30,000 sf of retail uses. Approximately 6,050 total parking spaces would be provided throughout the Project Site. Under Alternative 2, access to the Project Site would be consistent with the Project.

Trip Generation

As summarized in Table 2 and detailed in Table 4, Alternative 2 would generate 1,109 net new morning peak hour trips (857 inbound, 252 outbound) and 1,063 net new afternoon peak hour trips (317 inbound, 746 outbound).

Threshold T-1 – Consistency Analysis

Alternative 2 is similar to the Project and would provide the same basic Project Site plan and mix of land uses as the Project. Alternative 2 would be similarly consistent with the Project with regard

to each of the plans, programs, ordinances, and policies identified in Table 2.1-1 of the TAG. Alternative 2 would not result in a less than significant impact and would not require any mitigation measures under Threshold T-1.

Threshold T-2.1 – VMT Analysis

The calculations of the daily trip and total employee inputs for the VMT analyses of studio-related uses for each Alternative are provided in Attachment A. As shown therein, the studio-related uses in Alternative 2 are estimated to generate 18,303 daily trips prior to the trip reductions the VMT Calculator applies, along with 9,480 employees. The non-studio-related use, 30,000 sf of retail, was directly input into the VMT Calculator.

Table 3 summarizes the results of the VMT Calculator analysis for Alternative 2. As shown therein, Alternative 2 would have a greater VMT impact than the Project and would generate approximately 60,046 daily work VMT and an average work VMT per employee of 6.3, which does not exceed the impact threshold of 11.6. Therefore, as with the Project, Alternative 2 would result in a less than significant VMT impact, and no mitigation measures would be required. Alternative 2 would result in a less than significant cumulative impact under Threshold T-2.1.

Threshold T-3 – Hazards Analysis

Alternative 2 would have the same access and circulation plan as the Project. Alternative 2 would include a larger development than the Project and would generate more vehicular, pedestrian, bicycle, and transit trips than the Project. However, Threshold T-3 primarily focuses on the physical configuration of the access points, which would be the same between Alternative 2 and the Project. Therefore, similar to the Project, Alternative 2 would not result in any hazards from the design or operation of the access points and therefore would have less than significant impacts. Alternative 2 would similarly have a less than significant cumulative impact under Threshold T-3.

Freeway Safety Analysis. As detailed in Table 2, with its increased floor area, Alternative 2 would generate more inbound peak hour trips than the Project and would similarly add more than 25 peak hour trips to the following four freeway off-ramps:

- US 101 Northbound Off-Ramp to Laurel Canyon Boulevard
- US 101 Southbound Off-Ramp to Laurel Canyon Boulevard
- SR 170 Southbound Off-Ramp to Riverside Drive
- SR 134 Westbound Off-Ramp to Lankershim Boulevard

Therefore, further queue analyses were conducted for the anticipated Project buildout year of 2028 and the long-term buildout year of 2045. As detailed in Tables 5 and 6, similar to the Project, none of the four analyzed off-ramps would have queues that would both exceed the ramp storage length and include Alternative 2 related vehicles that would add 50 or more feet to any queue during any of the analyzed peak hours compared to Future without Project Condition (Year 2028 and Year 2045). Thus, consistent with the Project, Alternative 2 would not be subject to a speed differential analysis and would result in a less than significant safety impact, and no mitigation is required.

ALTERNATIVE 3: REDUCED DENSITY ALTERNATIVE

Development Program

Alternative 3 would include the same land use mix as the Project's conceptual development program with a 25% reduction in total development. As such, Alternative 3 would include the construction of approximately 1,117,010 sf of new development, demolition of approximately 595,049 sf of existing studio-related uses, and retention of approximately 584,061 sf of existing studio-related uses. Thus, Alternative 3 would include a total of approximately 1,650,000 sf of development consisting of approximately 340,000 sf of sound stage, 240,000 sf of production support uses, 540,000 sf of production office uses, 515,000 sf of general office uses, and 15,000 sf of retail uses. Approximately 4,525 total parking spaces would be provided throughout the Project Site. Under Alternative 3, access to the Project Site would be consistent with the Project.

Trip Generation

As summarized in Table 2 and detailed in Table 7, Alternative 3 would generate 557 net new morning peak hour trips (463 inbound, 94 outbound) and 521 net new afternoon peak hour trips (121 inbound, 400 outbound).

Threshold T-1 – Consistency Analysis

Alternative 3 is similar to the Project but with 25% less density overall. Because Alternative 3 would provide the same basic Project Site plan and mix of land uses as the Project, it would be similarly consistent with the Project with regard to each of the plans, programs, ordinances, and policies identified in Table 2.1-1 of the TAG. Similar to the Project, Alternative 3 would result in a less than significant impact and would not require any mitigation measures under Threshold T-1.

Threshold T-2.1 – VMT Analysis

The calculations of the daily trip and total employee inputs for the VMT analyses of studio-related uses for each Alternative are provided in Attachment A. The studio-related uses in Alternative 3 are estimated to generate 14,354 daily trips prior to the trip reductions the VMT Calculator applies, along with 6,604 employees. The non-studio-related use, 15,000 sf of retail, was directly input into the VMT Calculator.

Table 3 summarizes the results of the VMT Calculator analysis for Alternative 3. Although Alternative 3 would generate lower total work VMT than the Project, Alternative 3 would generate greater work VMT per employee as compared to the Project. As shown in Table 3, Alternative 3 would generate approximately 46,793 daily work VMT and an average work VMT per employee of 7.0, which does not exceed the impact threshold of 11.6. Therefore, consistent with the Project, Alternative 3 would result in a less than significant VMT impact, and no mitigation measures would be required. Alternative 3 would also result in a less than significant cumulative impact under Threshold T-2.1.

Threshold T-3 – Hazards Analysis

Alternative 3 would have the same access and circulation plan as the Project. Because Alternative 3 would include 25% less development than the Project, it would generate fewer vehicular, pedestrian, bicycle, and transit trips than the Project. Nonetheless, Threshold T-3 primarily focuses on the physical configuration of the access points, which would be the same between Alternative 3 and the Project. Therefore, similar to the Project, Alternative 3 would not result in any hazards from the design or operation of access points and would result in a less than significant impact. Alternative 3 would similarly result in a less than significant cumulative impact under Threshold T-3.

Freeway Safety Analysis. As detailed in Table 2, with its reduced floor area, Alternative 3 would generate fewer peak hour trips than the Project. Therefore, Alternative 3 would add fewer vehicles to the freeway off-ramp queues than the Project. Thus, similar to the Project, Alternative 3 would not be subject to a speed differential analysis and would result in a less than significant safety impact, and no mitigation is required.

ALTERNATIVE 4: REDUCED EXCAVATION/GRADING ALTERNATIVE

Development Program

Alternative 4 would include the same development program and general layout as the Project. However, all new parking within the South Lot would be located in at-grade surface lots and above-ground structures. Alternative 4 would include the same demolition and similar retention of existing uses as the Project. Thus, Alternative 4 would include 2,200,000 sf of development consisting of 450,000 sf of sound stages, 300,000 sf of production support, 725,000 sf of production office, 700,000 sf of general office, and 25,000 sf of retail space. Under Alternative 4, access to the Project Site would be consistent with the Project. Also consistent with the Project, a total of approximately 6,050 parking spaces would be provided within a combination of above-grade parking structures and surface parking lots.

Trip Generation

As summarized in Table 2, the peak hour trips generated by Alternative 4 would be the same as the Project. As such, Alternative 4 would generate 958 net new morning peak hour trips (758 inbound, 200 outbound) and 924 net new afternoon peak hour trips (258 inbound, 666 outbound).

Threshold T-1 – Consistency Analysis

Alternative 4 is similar to the Project and would include the same basic Project Site plan and mix of land uses. As such, Alternative 4 would be similarly consistent with the Project with regard to each of the plans, programs, ordinances, and policies identified in Table 2.1-1 of the TAG. Alternative 4 would result in a less than significant impact and would not require any mitigation measures under Threshold T-1.

Threshold T-2.1 – VMT Analysis

As previously detailed, Alternative 4 would include the same mix of land uses as the Project. As such, Alternative 4 would have the same VMT results as the Project and the studio-related uses are estimated to generate 16,981 daily trips prior to the trip reductions the VMT Calculator applies, along with 8,820 employees. The non-studio-related use, 25,000 sf of retail, was directly input into the VMT Calculator.

Table 3 summarizes the results of the VMT Calculator analysis for Alternative 4. As shown therein, Alternative 4 would have the same VMT impact as the Project. Alternative 4 would generate approximately 55,610 daily work VMT and an average work VMT per employee of 6.2, which would not exceed the impact threshold of 11.6. Therefore, as with the Project, Alternative 4 would result in a less than significant VMT impact, and no mitigation measures would be required. Alternative 4 would also result in a less than significant cumulative impact under Threshold T-2.1.

Threshold T-3 – Hazards Analysis

Alternative 4 would have the same access plan as the Project. Because Alternative 4 would include the same development program as the Project, it would generate the same vehicular, pedestrian, bicycle, and transit trips as the Project. Therefore, the potential operational impacts of Alternative 4 under Threshold T-3 would be the same as those of the Project. Nonetheless, Threshold T-3 primarily deals with the physical configuration of the access points, which would be the same between Alternative 4 and the Project. Therefore, similar to the Project, Alternative 4 would not result in any hazards from the design or operation of access points and would result in a less than significant impact. Alternative 4 would similarly result in a less than significant cumulative impact under Threshold T-3.

Freeway Safety Analysis. As detailed in Table 2, Alternative 4 would have the same land use program as the Project and would generate the same number of peak hour trips as the Project. Therefore, similar to the Project, none of the four analyzed off-ramps would have queues that would both exceed the ramp storage length and include Alternative 4 related vehicles that would add 50 or more feet to any queue during any of the analyzed peak hours compared to Future without Project Condition (Year 2028 and Year 2045). Thus, consistent with the Project, Alternative 4 would not be subject to a speed differential analysis and would result in a less than significant safety impact, and no mitigation is required.

ALTERNATIVE 5: RESIDENTIAL MIXED-USE ALTERNATIVE

Development Program

Alternative 5 would include a mixed-use development with studio, residential, and commercial uses. Alternative 5 would include the construction of approximately 1,934,875 sf of new development, demolition of approximately 646,120 sf of existing studio-related uses, and retention of approximately 532,990 sf of existing studio-related uses. As such, Alternative 5 would provide a total of approximately 2,514,000 sf of development consisting of approximately 750,000 sf of residential uses (743 dwelling units), 379,000 sf of sound stages, 300,000 sf of production support uses, 575,000 sf of production office uses, 450,000 sf of general office uses, and 60,000 sf of

retail uses. Approximately 5,856 total parking spaces would be provided throughout the Project Site. Under Alternative 5, access to the Project Site would be consistent with the Project.

Trip Generation

The peak hour trip generation estimates for the proposed residential uses under Alternative 5 were developed using published rates from *Trip Generation Manual, 11th Edition* for ITE Land Use Code 221 (Multi-Family Housing Mid-Rise).

As summarized in Table 2 and detailed in Table 8, Alternative 5 would generate 962 net new morning peak hour trips (590 inbound, 372 outbound) and 940 net new afternoon peak hour trips (389 inbound, 551 outbound).

Threshold T-1 – Consistency Analysis

Alternative 5 would be similar to the Project but would introduce residential uses on the site. Alternative 5 would support plans, programs, ordinances, and policies of the Mobility Plan and *Sherman Oaks-Studio City-Toluca Lake-Cahuenga Pass Community Plan* that recommend locating land use mix within proximity of each other (e.g., housing, jobs, and destinations).

Alternative 5 proposes a mixed-use development with high-density, multi-family residential located near multiple transit services. Alternative 5 would not displace any existing housing and would include a mix of market rate and affordable housing units. Alternative 5 would provide a similar mix of land uses as the Project with the addition of residential uses, and it would be similarly consistent as the Project with regard to each of the plans, programs, ordinances, and policies identified in Table 2.1-1 of the TAG. Thus, Alternative 5 would result in a less than significant impact and would not require any mitigation measures under Threshold T-1.

Threshold T-2.1 – VMT Analysis

The calculations of the daily trip and total employee inputs for the VMT analyses of studio-related uses for each Alternative are provided in Attachment A. The studio-related uses in Alternative 5 are estimated to generate 15,160 daily trips prior to the trip adjustments the VMT Calculator applies, along with 6,822 non-retail employees. The non-studio-related uses, including 60,000 sf retail and 743 residential units, were directly input into the VMT Calculator.

Table 3 summarizes the results of the VMT Calculator analysis for Alternative 5. As shown therein, Alternative 5 would have a greater VMT impact than the Project and would generate a greater work VMT per employee than the Project. Alternative 5 would generate approximately 48,979 daily work VMT and an average work VMT per employee of 6.9, which does not exceed the impact threshold of 11.6. The residential uses of Alternative 5 would generate approximately 11,953 daily household VMT and average household VMT per capita of 7.1, which does not exceed the impact threshold of 9.4. Therefore, as with the Project, Alternative 5 would result in a less than significant VMT impact, and no mitigation measures would be required. Alternative 5 would result in a less than significant cumulative impact under Threshold T-2.1.

Threshold T-3 – Hazards Analysis

Alternative 5 would have the same access plan as the Project. Alternative 5 would generate more trips than the Project on a daily basis and during the peak hours and, therefore, the general access points would be required to accommodate more traffic under Alternative 5 than under the Project. Additionally, the residential uses would result in a higher population during more hours of the day, including early mornings and late evenings, increasing pedestrian, bicycle, and transit activity in the vicinity compared to the Project. Therefore, the potential operational impacts of Alternative 5 under Threshold T-3 would be greater than those of the Project. Nonetheless, Threshold T-3 primarily deals with the physical configuration of the access points, which would be similar between Alternative 5 and the Project. Therefore, like the Project, Alternative 5 would not result in any hazards from the design or operation of access points and would result in a less than significant impact. Alternative 5 would similarly result in a less than significant cumulative impact under Threshold T-3.

Freeway Safety Analysis. As detailed in Table 2, Alternative 5 would generate fewer inbound morning peak hour trips and more inbound afternoon peak hour trips than the Project. As such, Alternative 5 would add more than 25 peak hour trips to the following four freeway off-ramps:

- US 101 Northbound Off-Ramp to Laurel Canyon Boulevard
- US 101 Southbound Off-Ramp to Laurel Canyon Boulevard
- SR 170 Southbound Off-Ramp to Riverside Drive
- SR 134 Westbound Off-Ramp to Lankershim Boulevard

Therefore, further queue analyses were conducted for the anticipated Project buildout year of 2028 and the long-term buildout year of 2045. As detailed in Tables 9 and 10, similar to the Project, none of the four analyzed off-ramps would have queues that would both exceed the ramp storage length and include Alternative 5 related vehicles that would add 50 or more feet to any queue during any of the analyzed peak hours compared to Future without Project Condition (Year 2028 and Year 2045). Thus, consistent with the Project, Alternative 5 would neither be subject to a speed differential analysis and would result in a less than significant safety impact, and no mitigation is required.

SUMMARY AND CONCLUSION

As detailed above, each Alternative would result in less-than-significant impacts under each CEQA threshold. None of the Alternatives would conflict with applicable programs, plans, ordinances, or policies related to the circulation system and would result in a less than significant impact under Threshold T-1¹. The Alternatives would result in less than significant impacts with respect to VMT. The Alternatives would not result in any hazards from the design or operation of access points, and would result in less than significant Project-level and cumulative impacts under Threshold T-3. The Alternatives would result in less than significant Project-level and cumulative impacts.

¹ For Threshold T-1, the determination whether an Alternative had a greater, equal, or lesser impact than the Project was made qualitatively.

**TABLE 1
ALTERNATIVES SUMMARY**

Land Use	Existing Uses	Project [a]	Alternative 1: No Project / No Build Alternative	Alternative 2: Existing Zoning Alternative	Alternative 3: Reduced Density Alternative	Alternative 4: Reduced Excavation / Grading Alternative	Alternative 5: Residential Mixed-Use Alternative
Sound Stages	359,730 sf	450,000 sf	359,730 sf	450,000 sf	340,000 sf	450,000 sf	379,000 sf
Production Support	255,510 sf	300,000 sf	255,510 sf	360,000 sf	240,000 sf	300,000 sf	300,000 sf
Production Office	450,060 sf	725,000 sf	450,060 sf	840,000 sf	540,000 sf	725,000 sf	575,000 sf
General Office	113,810 sf	700,000 sf	113,810 sf	720,000 sf	515,000 sf	700,000 sf	450,000 sf
Retail	-	25,000 sf	-	30,000 sf	15,000 sf	25,000 sf	60,000 sf
Residential	-	-	-	-	-	-	743 du [b]
Total Development	1,179,110 sf	2,200,000 sf	1,179,110 sf	2,400,000 sf	1,650,000 sf	2,200,000 sf	2,514,000 sf

Notes

All land use sizes shown in square feet (sf) measured as described in the Radford Studios Center Specific Plan.

[a] Permitted development for individual land uses varies from these values as described in Chapter 1 of the TA. Overall site-wide permitted development is 2,200,000 sf.

[b] The multi-family residential uses account for 750,000 sf of the total Alternative 5 development.

**TABLE 2
ALTERNATIVES SUMMARY**

Alternative	Net New Trip Generation Estimates					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
<u>Project</u> 450,000 sf sound stages, 300,000 sf production support, 725,000 sf production office, 700,000 sf general office, and 25,000 sf retail	758	200	958	258	666	924
<u>Alternative 1 - No Project</u> Existing uses to remain	N/A	N/A	N/A	N/A	N/A	N/A
<u>Alternative 2 - Existing Zoning</u> 450,000 sf sound stages, 360,000 sf production support, 840,000 sf production office, 720,000 sf general office, and 30,000 sf retail	857	252	1,109	317	746	1,063
<i>Difference</i>	+99	+52	+151	+59	+80	+139
<u>Alternative 3 - Reduced Density</u> 340,000 sf sound stages, 240,000 sf production support, 540,000 sf production office, 515,000 sf general office, and 15,000 sf retail	463	94	557	121	400	521
<i>Difference</i>	(295)	(106)	(401)	(137)	(266)	(403)
<u>Alternative 4 - Reduced Excavation/Grading</u> 450,000 sf sound stages, 300,000 sf production support, 725,000 sf production office, 700,000 sf general office, and 25,000 sf retail	758	200	958	258	666	924
<i>Difference</i>	0	0	0	0	0	0
<u>Alternative 5 - Residential/Mixed-Use</u> 379,000 sf sound stages, 300,000 sf production support, 575,000 sf production office, 450,000 sf general office, 60,000 sf retail, and 743 residential dwelling units	590	372	962	389	551	940
<i>Difference</i>	(168)	+172	+4	+131	(115)	+16

**TABLE 3
ALTERNATIVES VMT ANALYSIS SUMMARY**

Project Information [a]						
Address Area Planning Commission Travel Behavior Zone Maximum VMT Reduction [b]	4200 N. Radford Avenue South Valley Compact Infill 40%					
VMT Analysis [a]	Project	Alternative 1 - No Project / No Build Alternative	Alternative 2 - Existing Zoning Alternative	Alternative 3 - Reduced Density Alternative	Alternative 4 - Reduced Excavation / Grading Alternative	Alternative 5 - Mixed-Use Alternative
Land Uses						
Sound Stages	450,000 sf	359,730 sf	450,000 sf	340,000 sf	450,000 sf	379,000 sf
Production Support	300,000 sf	255,510 sf	360,000 sf	240,000 sf	300,000 sf	300,000 sf
Production Office	725,000 sf	450,060 sf	840,000 sf	540,000 sf	725,000 sf	575,000 sf
General Office	700,000 sf	113,810 sf	720,000 sf	515,000 sf	700,000 sf	450,000 sf
Retail	25,000 sf	-	30,000 sf	15,000 sf	25,000 sf	60,000 sf
Residential	-	-	-	-	-	743 du
Residential Population	-	-	-	-	-	1,674
Employee Population	8,920	-	9,600	6,664	8,920	7,062
Total Daily Trips [c][d]	16,435	-	17,933	13,447	16,435	20,433
Total VMT [c]	109,996	-	119,921	90,211	109,996	136,045
Residential VMT						
Total Household VMT [c][e]	-	-	-	-	-	11,953
Household VMT per Capita	-	-	-	-	-	7.1
Impact Threshold	9.4	-	9.4	9.4	9.4	9.4
Significant Impact	NO	-	NO	NO	NO	NO
Work VMT						
Total Work VMT [c][f]	55,610	-	60,046	46,793	55,610	48,979
Work VMT per Employee	6.2	-	6.3	7.0	6.2	6.9
Impact Threshold	11.6	-	11.6	11.6	11.6	11.6
Significant Impact	NO	-	NO	NO	NO	NO

Notes:

[a] Project Analysis is from LADOT VMT Calculator Version 1.4 (June 2023) output reports provided in Attachment A.

[b] The maximum allowable VMT reduction is based on the Project's designated TBZ.

[c] The Project design features considered in the analysis include:

1. Bicycle parking per LAMC requirements; and
2. Promotions & marketing of alternative transportation options and choices.

[d] The total daily trips include daily trips generated by the studio-related uses, as detailed in Table A-1 provided in Attachment A. The VMT Calculator applies various trip reductions to the gross vehicle trip estimates to account for alternative travel modes (transit, bicycling, walking) and internal capture between Project uses.

[e] Household VMT per Capita is based on the "home-based production" trip types.

[f] Work VMT per Employee is based on the "home-based work attraction" trip types.

**TABLE 4
TRIP GENERATION
ALTERNATIVE 2**

Land Use	ITE Land Use [a]	Rate	Morning Peak Hour			Afternoon Peak Hour			
			In	Out	Total	In	Out	Total	
<u>Trip Generation Rates</u>									
Sound Stage	[b]	per ksf	63%	37%	0.20	40%	60%	0.43	
Production Support	[b]	per ksf	65%	35%	0.61	45%	55%	0.57	
Production Office	[b]	per ksf	62%	38%	0.66	45%	55%	0.63	
General Office Building	710 [c]	per ksf	88%	12%	1.52	17%	83%	1.44	
High-Turnover (Sit-Down) Restaurant	932	per ksf	55%	45%	9.57	61%	39%	9.05	
<u>Alternative 2</u>									
Sound Stage	[b]	450.00 ksf	57	33	90	78	116	194	
Production Support	[b]	360.00 ksf	143	77	220	92	113	205	
Production Office	[b]	840.00 ksf	343	211	554	238	291	529	
General Office	710	720.00 ksf	804	110	914	145	710	855	
Transit/Walk-In Reduction [d] 10%			(80)	(11)	(91)	(15)	(71)	(86)	
Retail [e]	932	30.00 ksf	158	129	287	166	106	272	
Internal Capture Reduction [f] 50%			(79)	(65)	(144)	(83)	(53)	(136)	
Transit/Walk-In Reduction [d] 10%			(8)	(6)	(14)	(8)	(5)	(13)	
Pass-by Reduction [g] 20%			(14)	(12)	(26)	(15)	(10)	(25)	
Total - Alternative 2			2,400.00 ksf	1,324	466	1,790	598	1,197	1,795
<u>Existing Uses</u>									
Sound Stage	[b]	359.73 ksf	45	27	72	62	93	155	
Production Support	[b]	255.51 ksf	101	55	156	66	80	146	
Production Office	[b]	450.06 ksf	184	113	297	128	156	284	
General Office	710	113.81 ksf	152	21	173	28	136	164	
Transit/Walk-In Reduction [d] 10%			(15)	(2)	(17)	(3)	(14)	(17)	
Total - Existing Uses			1,179.11 ksf	467	214	681	281	451	732
Total - Net New Alternative 2				857	252	1,109	317	746	1,063

Notes:

ksf = 1,000 square feet.

[a] Source: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, 2021, unless as noted.

[b] Trip generation rates for sound stages, production support, and production office uses are based on empirical data from other studios in Los Angeles and have been used to estimate studio-related trips for several transportation impact studies, including *NBC Universal Evolution Plan Alternative 10 Transportation Analysis* (Gibson Transportation Consulting [GTC], 2012) and *Transportation Study for the Paramount Pictures Master Plan* (GTC, 2015).

[c] Trip generation rate for the Project based on the best-fit curve formula listed in *Trip Generation, 11th Edition* for the General Office Building land use.

Morning Peak Hour - $\ln(T) = 0.86 \ln(X) + 1.16$ $T = \text{Average Vehicle Trips}$ $X = \text{Gross Floor Area (ksf)}$

Afternoon Peak Hour - $\ln(T) = 0.83 \ln(X) + 1.29$

Trip generation rate for the existing uses based on the average rate from ITE for the General Office Building land use.

[d] The Project Site is located within walking distance from numerous Metro and LADOT DASH bus stops, and therefore a 10% reduction is applied to account for transit usage and walking visitor arrivals from the surrounding neighborhoods and adjacent commercial developments.

[e] The Project's retail use could include restaurant uses. As such, for the purposes of providing a more conservative trip generation analysis, the trips generated by the retail use are based on published rates for the "high-turnover restaurant" land use (ITE Land Use Code 932).

[f] The Project's retail use is anticipated to primarily support the studio and the proposed studio uses on site; however, this use would also be accessible to the general public. Therefore, an internal capture adjustment was applied to account for trips made by studio employees to the retail use without using an off-site road system.

[g] Pass-by reductions account for Project trips made as an intermediate stop on the way from an origin to a primary trip destination without route diversion.

**TABLE 5
FREEWAY OFF-RAMP QUEUING SAFETY ANALYSIS (YEAR 2028)
ALTERNATIVE 2**

Off-ramp	Ramp Storage Length Capacity (ft) [a]	Peak Hour	95th Percentile Queue (ft)		Exceeds Ramp Storage [b]	Project Adds 50 Feet [c]	Requires Speed Analysis [d]
			Future without Project Conditions (Year 2028)	Future with Project Conditions (Year 2028)			
US 101 Northbound Off-ramp to Laurel Canyon Boulevard	935	A.M.	253	283	NO	NO	NO
US 101 Southbound Off-ramp to Laurel Canyon Boulevard	1,265	A.M.	218	273	NO	YES	NO
		P.M.	310	273	NO	NO	NO
SR 170 Southbound Off-ramp to Riverside Drive	815	A.M.	11	161	NO	YES	NO
SR 134 Westbound Off-ramp to Lankershim Boulevard	830	A.M.	298	295	NO	NO	NO

Notes:

Ramp storage length and 95th percentile queue reported in feet.

[a] Storage length capacity is the distance from the freeway mainline gore point to the terminus of the off-ramp, expressed in feet.

[b] Based on Future with Project Conditions (Year 2028) queue.

[c] The difference in queue length between Future with Project and without Project Conditions.

[d] Speed differential analysis is required if the ramp storage length is exceeded and the Project adds 50 or more feet to the queue length.

TABLE 6
FREEWAY OFF-RAMP QUEUING SAFETY ANALYSIS (YEAR 2045)
ALTERNATIVE 2

Off-ramp	Ramp Storage Length Capacity (ft) [a]	Peak Hour	95th Percentile Queue (ft)		Exceeds Ramp Storage [b]	Project Adds 50 Feet [c]	Requires Speed Analysis [d]
			Future without Project Conditions (Year 2045)	Future with Project Conditions (Year 2045)			
US 101 Northbound Off-ramp to Laurel Canyon Boulevard	935	A.M.	278	308	NO	NO	NO
US 101 Southbound Off-ramp to Laurel Canyon Boulevard	1,265	A.M.	235	295	NO	YES	NO
		P.M.	343	475	NO	YES	NO
SR 170 Southbound Off-ramp to Riverside Drive	815	A.M.	13	173	NO	YES	NO
SR 134 Westbound Off-ramp to Lankershim Boulevard	830	A.M.	303	323	NO	NO	NO

Notes:

Ramp storage length and 95th percentile queue reported in feet.

[a] Storage length capacity is the distance from the freeway mainline gore point to the terminus of the off-ramp, expressed in feet.

[b] Based on Future with Project Conditions (Year 2045) queue.

[c] The difference in queue length between Future with Project and without Project Conditions.

[d] Speed differential analysis is required if the ramp storage length is exceeded and the Project adds 50 or more feet to the queue length.

**TABLE 7
TRIP GENERATION
ALTERNATIVE 3**

Land Use	ITE Land Use [a]	Rate	Morning Peak Hour			Afternoon Peak Hour			
			In	Out	Total	In	Out	Total	
<u>Trip Generation Rates</u>									
Sound Stage	[b]	per ksf	63%	37%	0.20	40%	60%	0.43	
Production Support	[b]	per ksf	65%	35%	0.61	45%	55%	0.57	
Production Office	[b]	per ksf	62%	38%	0.66	45%	55%	0.63	
General Office Building	710 [c]	per ksf	88%	12%	1.52	17%	83%	1.44	
High-Turnover (Sit-Down) Restaurant	932	per ksf	55%	45%	9.57	61%	39%	9.05	
<u>Alternative 3</u>									
Sound Stage	[b]	340.00 ksf	43	25	68	58	88	146	
Production Support	[b]	240.00 ksf	95	51	146	62	75	137	
Production Office	[b]	540.00 ksf	221	135	356	153	187	340	
General Office	710	515.00 ksf	603	82	685	110	537	647	
Transit/Walk-In Reduction [d] 10%			(60)	(8)	(68)	(11)	(54)	(65)	
Retail [e]	932	15.00 ksf	79	65	144	83	53	136	
Internal Capture Reduction [f] 50%			(40)	(33)	(73)	(42)	(27)	(69)	
Transit/Walk-In Reduction [d] 10%			(4)	(3)	(7)	(4)	(3)	(7)	
Pass-by Reduction [g] 20%			(7)	(6)	(13)	(7)	(5)	(12)	
Total - Alternative 3			1,650.00 ksf	930	308	1,238	402	851	1,253
<u>Existing Uses</u>									
Sound Stage	[b]	359.73 ksf	45	27	72	62	93	155	
Production Support	[b]	255.51 ksf	101	55	156	66	80	146	
Production Office	[b]	450.06 ksf	184	113	297	128	156	284	
General Office	710	113.81 ksf	152	21	173	28	136	164	
Transit/Walk-In Reduction [d] 10%			(15)	(2)	(17)	(3)	(14)	(17)	
Total - Existing Uses			1,179.11 ksf	467	214	681	281	451	732
Total - Net New Alternative 3				463	94	557	121	400	521

Notes:

ksf = 1,000 square feet.

[a] Source: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, 2021, unless as noted.

[b] Trip generation rates for sound stages, production support, and production office uses are based on empirical data from other studios in Los Angeles and have been used to estimate studio-related trips for several transportation impact studies, including *NBC Universal Evolution Plan Alternative 10 Transportation Analysis* (Gibson Transportation Consulting [GTC], 2012) and *Transportation Study for the Paramount Pictures Master Plan* (GTC, 2015).

[c] Trip generation rate for the Project based on the best-fit curve formula listed in *Trip Generation, 11th Edition* for the General Office Building land use.

Morning Peak Hour - $\ln(T) = 0.86 \ln(X) + 1.16$ $T = \text{Average Vehicle Trips}$ $X = \text{Gross Floor Area (ksf)}$

Afternoon Peak Hour - $\ln(T) = 0.83 \ln(X) + 1.29$

Trip generation rate for the existing uses based on the average rate from ITE for the General Office Building land use.

[d] The Project Site is located within walking distance from numerous Metro and LADOT DASH bus stops, and therefore a 10% reduction is applied to account for transit usage and walking visitor arrivals from the surrounding neighborhoods and adjacent commercial developments.

[e] The Project's retail use could include restaurant uses. As such, for the purposes of providing a more conservative trip generation analysis, the trips generated by the retail use are based on published rates for the "high-turnover restaurant" land use (ITE Land Use Code 932).

[f] The Project's retail use is anticipated to primarily support the studio and the proposed studio uses on site; however, this use would also be accessible to the general public. Therefore, an internal capture adjustment was applied to account for trips made by studio employees to the retail use without using an off-site road system.

[g] Pass-by reductions account for Project trips made as an intermediate stop on the way from an origin to a primary trip destination without route diversion.

**TABLE 8
TRIP GENERATION
ALTERNATIVE 5**

Land Use	ITE Land Use [a]	Rate	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
<u>Trip Generation Rates</u>								
Sound Stage	[b]	per ksf	63%	37%	0.20	40%	60%	0.43
Production Support	[b]	per ksf	65%	35%	0.61	45%	55%	0.57
Production Office	[b]	per ksf	62%	38%	0.66	45%	55%	0.63
General Office Building	710 [c]	per ksf	88%	12%	1.52	17%	83%	1.44
High-Turnover (Sit-Down) Restaurant	932	per ksf	55%	45%	9.57	61%	39%	9.05
Multifamily Housing (Mid-Rise)	221	per du	23%	77%	0.37	61%	39%	0.39
<u>Alternative 5</u>								
Sound Stage	[b]	379.00 ksf	48	28	76	65	98	163
Production Support	[b]	300.00 ksf	119	64	183	77	94	171
Production Office	[b]	575.00 ksf	236	144	380	163	199	362
General Office	710	450.00 ksf	537	73	610	98	481	579
Transit/Walk-In Reduction [d] 10%			(54)	(7)	(61)	(10)	(48)	(58)
Retail [e]	932	60.00 ksf	316	258	574	331	212	543
Internal Capture Reduction [f] 50%			(158)	(129)	(287)	(166)	(106)	(272)
Transit/Walk-In Reduction [d] 10%			(16)	(13)	(29)	(17)	(11)	(28)
Pass-by Reduction [g] 20%			(28)	(23)	(51)	(30)	(19)	(49)
Residential	221	743 du [h]	63	212	275	177	113	290
Transit/Walk-In Reduction [d] 10%			(6)	(21)	(27)	(18)	(11)	(29)
Total - Alternative 5		2,514.00 ksf	1,057	586	1,643	670	1,002	1,672
<u>Existing Uses</u>								
Sound Stage	[b]	359.73 ksf	45	27	72	62	93	155
Production Support	[b]	255.51 ksf	101	55	156	66	80	146
Production Office	[b]	450.06 ksf	184	113	297	128	156	284
General Office	710	113.81 ksf	152	21	173	28	136	164
Transit/Walk-In Reduction [d] 10%			(15)	(2)	(17)	(3)	(14)	(17)
Total - Existing Uses		1,179.11 ksf	467	214	681	281	451	732
Total - Net New Alternative 5			590	372	962	389	551	940

Notes:

ksf = 1,000 square feet.

[a] Source: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, 2021, unless as noted.

[b] Trip generation rates for sound stages, production support, and production office uses are based on empirical data from other studies in Los Angeles and have been used to estimate studio-related trips for several transportation impact studies, including *NBC Universal Evolution Plan Alternative 10 Transportation Analysis* (Gibson Transportation Consulting [GTC], 2012) and *Transportation Study for the Paramount Pictures Master Plan* (GTC, 2015).

[c] Trip generation rate for the Project based on the best-fit curve formula listed in *Trip Generation, 11th Edition* for the General Office Building land use.

$$\begin{aligned} \text{Morning Peak Hour - } & \ln(T) = 0.86 \ln(X) + 1.16 & T = \text{Average Vehicle Trips} & X = \text{Gross Floor Area (ksf)} \\ \text{Afternoon Peak Hour - } & \ln(T) = 0.83 \ln(X) + 1.29 \end{aligned}$$

Trip generation rate for the existing uses based on the average rate from ITE for the General Office Building land use.

[d] The Project Site is located within walking distance from numerous Metro and LADOT DASH bus stops, and therefore a 10% reduction is applied to account for transit usage and walking visitor arrivals from the surrounding neighborhoods and adjacent commercial developments.

[e] The Project's retail use could include restaurant uses. As such, for the purposes of providing a more conservative trip generation analysis, the trips generated by the retail use are based on published rates for the "high-turnover restaurant" land use (ITE Land Use Code 932).

[f] The Project's retail use is anticipated to primarily support the studio and the proposed studio uses on site; however, this use would also be accessible to the general public. Therefore, an internal capture adjustment was applied to account for trips made by studio employees to the retail use without using an off-site road system.

[g] Pass-by reductions account for Project trips made as an intermediate stop on the way from an origin to a primary trip destination without route diversion.

[h] The multi-family residential uses account for 750,000 sf of the total Alternative 5 development.

**TABLE 9
FREEWAY OFF-RAMP QUEUING SAFETY ANALYSIS (YEAR 2028)
ALTERNATIVE 5**

Off-ramp	Ramp Storage Length Capacity (ft) [a]	Peak Hour	95th Percentile Queue (ft)		Exceeds Ramp Storage [b]	Project Adds 50 Feet [c]	Requires Speed Analysis [d]
			Future without Project Conditions (Year 2028)	Future with Project Conditions (Year 2028)			
US 101 Northbound Off-ramp to Laurel Canyon Boulevard	935	A.M.	253	268	NO	NO	NO
US 101 Southbound Off-ramp to Laurel Canyon Boulevard	1,265	A.M.	218	248	NO	NO	NO
		P.M.	310	340	NO	NO	NO
SR 170 Southbound Off-ramp to Riverside Drive	815	A.M.	11	155	NO	YES	NO
SR 134 Westbound Off-ramp to Lankershim Boulevard	830	A.M.	298	288	NO	NO	NO

Notes:

Ramp storage length and 95th percentile queue reported in feet.

[a] Storage length capacity is the distance from the freeway mainline gore point to the terminus of the off-ramp, expressed in feet.

[b] Based on Future with Project Conditions (Year 2028) queue.

[c] The difference in queue length between Future with Project and without Project Conditions.

[d] Speed differential analysis is required if the ramp storage length is exceeded and the Project adds 50 or more feet to the queue length.

**TABLE 10
FREEWAY OFF-RAMP QUEUING SAFETY ANALYSIS (YEAR 2045)
ALTERNATIVE 5**

Off-ramp	Ramp Storage Length Capacity (ft) [a]	Peak Hour	95th Percentile Queue (ft)		Exceeds Ramp Storage [b]	Project Adds 50 Feet [c]	Requires Speed Analysis [d]
			Future without Project Conditions (Year 2045)	Future with Project Conditions (Year 2045)			
US 101 Northbound Off-ramp to Laurel Canyon Boulevard	935	A.M.	278	295	NO	NO	NO
US 101 Southbound Off-ramp to Laurel Canyon Boulevard	1,265	A.M.	235	268	NO	NO	NO
		P.M.	343	478	NO	YES	NO
SR 170 Southbound Off-ramp to Riverside Drive	815	A.M.	13	164	NO	YES	NO
SR 134 Westbound Off-ramp to Lankershim Boulevard	830	A.M.	303	32	NO	NO	NO

Notes:

Ramp storage length and 95th percentile queue reported in feet.

[a] Storage length capacity is the distance from the freeway mainline gore point to the terminus of the off-ramp, expressed in feet.

[b] Based on Future with Project Conditions (Year 2045) queue.

[c] The difference in queue length between Future with Project and without Project Conditions.

[d] Speed differential analysis is required if the ramp storage length is exceeded and the Project adds 50 or more feet to the queue length.

Attachment A
VMT Analysis Worksheets

TABLE A-1
CUSTOM LAND USE DEVELOPMENT - DAILY TRIP ESTIMATES
RADFORD STUDIO CENTER PROJECT - ALTERNATIVES

Land Use	Daily Vehicle Trip Rates [a]	Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
		Floor Area	Daily Vehicle Trips	Floor Area	Daily Vehicle Trips	Floor Area	Daily Vehicle Trips	Floor Area	Daily Vehicle Trips	Floor Area	Daily Vehicle Trips	Floor Area	Daily Vehicle Trips
Sound Stages	5.91	450,000 sf	2,660	359,730 sf	2,126	450,000 sf	2,660	340,000 sf	2,009	450,000 sf	2,660	379,000 sf	2,240
Production Support	4.14	300,000 sf	1,242	255,510 sf	1,058	360,000 sf	1,490	240,000 sf	994	300,000 sf	1,242	300,000 sf	1,242
Production Office	9.34	725,000 sf	6,772	450,060 sf	4,204	840,000 sf	7,846	540,000 sf	5,044	725,000 sf	6,772	575,000 sf	5,371
General Office [b]	10.84	700,000 sf	6,307	113,810 sf	6,307	720,000 sf	6,307	515,000 sf	6,307	700,000 sf	6,307	450,000 sf	6,307
Total		2,175,000 sf	16,981	1,179,110 sf	13,695	2,370,000 sf	18,303	1,635,000 sf	14,354	2,175,000 sf	16,981	1,704,000 sf	15,160

Notes:

The daily trip generation characteristics and patterns of studio-related uses are similar in scope and behavior to the general office land use. Thus, the VMT Calculator's custom land use feature was used to estimate VMT per employee for the Project. The custom land use inputs include total daily trips and total employees as well as trip purpose assumptions, which were matched to those of the VMT Calculator's general office land use.

[a] Trip generation rates for sound stages, production support, and production office uses are based on empirical data from other studios in Los Angeles and have been used to estimate studio-related trips for several transportation studies, including *NBC Universal Evolution Plan Alternative 10 Transportation Analysis* (Gibson Transportation Consulting, 2012) and *Transportation Study for the Paramount Pictures Master Plan* (Gibson Transportation Consulting, 2015).

[b] Trip generation rate for the Project based on the best-fit curve formula listed in *Trip Generation, 11th Edition* for the General Office Building land use.

$$\text{Daily} - \ln(T) = 0.87 \ln(X) + 3.05 \quad T = \text{Average Vehicle Trips} \quad X = \text{Gross Floor Area (ksf)}$$

Trip generation rate for the existing uses based on the average rate from ITE for the General Office Building land use.

**TABLE A-2
CUSTOM LAND USE DEVELOPMENT - EMPLOYEE PROJECTIONS
RADFORD STUDIO CENTER PROJECT - ALTERNATIVES**

Land Use	Employee Generation Rate (per 1,000 sf) [a]	Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
		Floor Area	Employees	Floor Area	Employees	Floor Area	Employees	Floor Area	Employees	Floor Area	Employees	Floor Area	Employees
Sound Stages [b]	5.6	450,000 sf	2,520	359,730 sf	2,014	450,000 sf	2,520	340,000 sf	1,904	450,000 sf	2,520	379,000 sf	2,122
Production Support	2.0	300,000 sf	600	255,510 sf	511	360,000 sf	720	240,000 sf	480	300,000 sf	600	300,000 sf	600
Production Office	4.0	725,000 sf	2,900	450,060 sf	1,800	840,000 sf	3,360	540,000 sf	2,160	725,000 sf	2,900	575,000 sf	2,300
General Office	4.0	700,000 sf	2,800	113,810 sf	455	720,000 sf	2,880	515,000 sf	2,060	700,000 sf	2,800	450,000 sf	1,800
Total		2,175,000 sf	8,820	1,179,110 sf	4,780	2,370,000 sf	9,480	1,635,000 sf	6,604	2,175,000 sf	8,820	1,704,000 sf	6,822

Notes:

Values presented are approximate and reflect rounding in some cases.

[a] Except for sound stages, employee generation rates from *City of Los Angeles VMT Calculator Documentation, Version 1.3* (Los Angeles Department of Transportation and Los Angeles Department of City Planning, May 2020) for general retail (production support) and general office (production and general office) land uses.

[b] Rounded rate assumes 100 employee for a typical 18,000 sf sound stage as a scalable density, as assumed in *Manhattan Beach Studios* (June 2021).

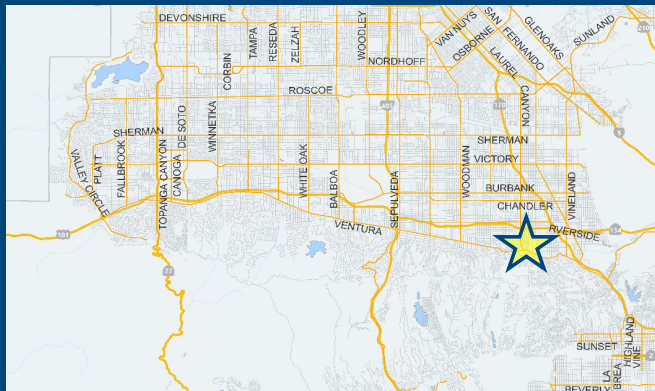
CITY OF LOS ANGELES VMT CALCULATOR Version 1.4



Project Screening Criteria: Is this project required to conduct a vehicle miles traveled analysis?

Project Information

Project: Radford Studio Center Project
Scenario: Alt 2 - Custom Studio & Office Land Use [WWW](#)
Address: 4200 N RADFORD AVE, 91604 [Q](#)



Is the project replacing an existing number of residential units with a smaller number of residential units AND is located within one-half mile of a fixed-rail or fixed-guideway transit station?

☒ Yes ☐ No

Existing Land Use

Land Use Type	Value	Unit	
Office General Office	285	ksf	✗
(custom) Studio, Production & Office Daily	8622	Trips	
(custom) Studio, Production & Office HBW-At	52	Percent	
(custom) Studio, Production & Office HBO-At	24	Percent	
(custom) Studio, Production & Office NHB-Att	12	Percent	
(custom) Studio, Production & Office HBW-Pr	0	Percent	
(custom) Studio, Production & Office HBO-Pr	0	Percent	
(custom) Studio, Production & Office NHB-Pr	12	Percent	
(custom) Studio, Production & Office Daily	0	Residents	
(custom) Studio, Production & Office Daily	4781	Employees	
(custom) Studio, Production & Office Daily	Non-Retai	Retail/Non-R	

☒ Click here to add a single custom land use type (will be included in the above list)

Proposed Project Land Use

Land Use Type	Value	Unit	
Retail High-Turnover Sit-Down Restaurant	25	ksf	+
Retail High-Turnover Sit-Down Restaurant	30	ksf	
Office General Office	0.001	ksf	
(custom) Studio, Production & Office Daily	18303	Trips	
(custom) Studio, Production & Office HBW-At	52	Percent	
(custom) Studio, Production & Office HBO-At	24	Percent	
(custom) Studio, Production & Office NHB-Att	12	Percent	
(custom) Studio, Production & Office HBW-Pr	0	Percent	
(custom) Studio, Production & Office HBO-Pr	0	Percent	
(custom) Studio, Production & Office NHB-Pr	12	Percent	
(custom) Studio, Production & Office Daily	0	Residents	
(custom) Studio, Production & Office Daily	9480	Employees	
(custom) Studio, Production & Office Daily	Non-Retai	Retail/Non-R	

☒ Click here to add a single custom land use type (will be included in the above list)

Project Screening Summary

Existing Land Use	Proposed Project
7,783 Daily Vehicle Trips	18,799 Daily Vehicle Trips
52,567 Daily VMT	125,703 Daily VMT

Tier 1 Screening Criteria

Project will have less residential units compared to existing residential units & is within one-half mile of a fixed-rail station. ☐

Tier 2 Screening Criteria

The net increase in daily trips < 250 trips **11,016**
Net Daily Trips

The net increase in daily VMT ≤ 0 **73,136**
Net Daily VMT

The proposed project consists of only retail land uses ≤ 50,000 square feet total. **30.000**
ksf

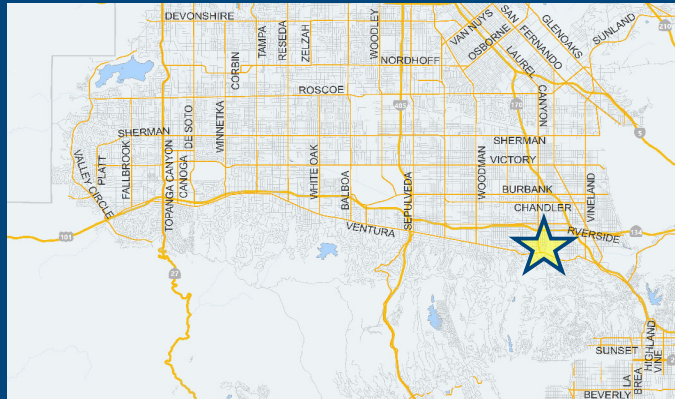
The proposed project is required to perform VMT analysis.

CITY OF LOS ANGELES VMT CALCULATOR Version 1.4



Project Information

Project: Radford Studio Center Project
Scenario: Alt 2 - Custom Studio & Office Land Use
Address: 4200 N RADFORD AVE, 91604



Proposed Project Land Use Type	Value	Unit
Retail High-Turnover Sit-Down Restaurant	30	ksf
Office General Office	0.001	ksf
(custom) Studio, Production & Office Daily	18303	Trips
(custom) Studio, Production & Office HBW-At	52	Percent
(custom) Studio, Production & Office HBO-Att	24	Percent
(custom) Studio, Production & Office NHB-Att	12	Percent
(custom) Studio, Production & Office HBW-Pr	0	Percent
(custom) Studio, Production & Office HBO-Pr	0	Percent
(custom) Studio, Production & Office NHB-Pr	12	Percent
(custom) Studio, Production & Office Daily	0	Residents
(custom) Studio, Production & Office Daily	9480	Employees
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-Retail

TDM Strategies

Select each section to show individual strategies
Use ☒ to denote if the TDM strategy is part of the proposed project or is a mitigation strategy

Max Home Based TDM Achieved? ☒ Proposed Project **No** ☒ With Mitigation **No**
Max Work Based TDM Achieved? ☒ Proposed Project **No** ☒ With Mitigation **No**

A **Parking**

Reduce Parking Supply

☒ Proposed Prj ☐ Mitigation

100 city code parking provision for the project site

74 actual parking provision for the project site

Unbundle Parking

☒ Proposed Prj ☐ Mitigation

175 monthly parking cost (dollar) for the project site

Parking Cash-Out

☒ Proposed Prj ☐ Mitigation

50 percent of employees eligible

Price Workplace Parking

☒ Proposed Prj ☐ Mitigation

6.00 daily parking charge (dollar)

50 percent of employees subject to priced parking

Residential Area Parking Permits

☒ Proposed Prj ☐ Mitigation

200 cost (dollar) of annual permit

B **Transit**

C **Education & Encouragement**

D **Commute Trip Reductions**

E **Shared Mobility**

F **Bicycle Infrastructure**

G **Neighborhood Enhancement**

Analysis Results

Proposed Project	With Mitigation
17,933 Daily Vehicle Trips	17,933 Daily Vehicle Trips
119,921 Daily VMT	119,921 Daily VMT
0.0 Household VMT per Capita	0.0 Household VMT per Capita
6.3 Work VMT per Employee	6.3 Work VMT per Employee

Significant VMT Impact?	
Household: No Threshold = 9.4 15% Below APC	Household: No Threshold = 9.4 15% Below APC
Work: No Threshold = 11.6 15% Below APC	Work: No Threshold = 11.6 15% Below APC

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Project Information			
Land Use Type		Value	Units
Housing	Single Family	0	DU
	Multi Family	0	DU
	Townhouse	0	DU
	Hotel	0	Rooms
	Motel	0	Rooms
Affordable Housing	Family	0	DU
	Senior	0	DU
	Special Needs	0	DU
	Permanent Supportive	0	DU
Retail	General Retail	0.000	ksf
	Furniture Store	0.000	ksf
	Pharmacy/Drugstore	0.000	ksf
	Supermarket	0.000	ksf
	Bank	0.000	ksf
	Health Club	0.000	ksf
	High-Turnover Sit-Down Restaurant	30.000	ksf
	Fast-Food Restaurant	0.000	ksf
	Quality Restaurant	0.000	ksf
	Auto Repair	0.000	ksf
	Home Improvement	0.000	ksf
	Free-Standing Discount	0.000	ksf
	Movie Theater	0	Seats
Office	General Office	0.001	ksf
	Medical Office	0.000	ksf
Industrial	Light Industrial	0.000	ksf
	Manufacturing	0.000	ksf
	Warehousing/Self-Storage	0.000	ksf
School	University	0	Students
	High School	0	Students
	Middle School	0	Students
	Elementary	0	Students
	Private School (K-12)	0	Students
Other	Studio, Production & Office	18303	Trips

Project and Analysis Overview

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Analysis Results			
Total Employees: 9,600			
Total Population: 0			
Proposed Project		With Mitigation	
17,933	Daily Vehicle Trips	17,933	Daily Vehicle Trips
119,921	Daily VMT	119,921	Daily VMT
0	Household VMT per Capita	0	Household VMT per Capita
6.3	Work VMT per Employee	6.3	Work VMT per Employee
Significant VMT Impact?			
APC: South Valley			
Impact Threshold: 15% Below APC Average			
Household = 9.4			
Work = 11.6			
Proposed Project		With Mitigation	
VMT Threshold	Impact	VMT Threshold	Impact
Household > 9.4	No	Household > 9.4	No
Work > 11.6	No	Work > 11.6	No

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs				
Strategy Type		Description	Proposed Project	Mitigations
Parking	Reduce parking supply	City code parking provision (spaces)	0	0
		Actual parking provision (spaces)	0	0
	Unbundle parking	Monthly cost for parking (\$)	\$0	\$0
	Parking cash-out	Employees eligible (%)	0%	0%
	Price workplace parking	Daily parking charge (\$)	\$0.00	\$0.00
		Employees subject to priced parking (%)	0%	0%
	Residential area parking permits	Cost of annual permit (\$)	\$0	\$0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Transit	Reduce transit headways	Reduction in headways (increase in frequency) (%)	0%	0%
		Existing transit mode share (as a percent of total daily trips) (%)	0%	0%
		Lines within project site improved (<50%, >=50%)	0	0
	Implement neighborhood shuttle	Degree of implementation (low, medium, high)	0	0
		Employees and residents eligible (%)	0%	0%
	Transit subsidies	Employees and residents eligible (%)	0%	0%
		Amount of transit subsidy per passenger (daily equivalent) (\$)	\$0.00	\$0.00
Education & Encouragement	Voluntary travel behavior change program	Employees and residents participating (%)	0%	0%
	Promotions and marketing	Employees and residents participating (%)	100%	100%
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Commute Trip Reductions	Required commute trip reduction program	Employees participating (%)	0%	0%
	Alternative Work Schedules and Telecommute	Employees participating (%)	0%	0%
		Type of program	0	0
		Degree of implementation (low, medium, high)	0	0
	Employer sponsored vanpool or shuttle	Employees eligible (%)	0%	0%
		Employer size (small, medium, large)	0	0
	Ride-share program	Employees eligible (%)	0%	0%
Shared Mobility	Car share	Car share project setting (Urban, Suburban, All Other)	0	0
	Bike share	Within 600 feet of existing bike share station - OR- implementing new bike share station (Yes/No)	0	0
	School carpool program	Level of implementation (Low, Medium, High)	0	0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Bicycle Infrastructure	Implement/Improve on-street bicycle facility	Provide bicycle facility along site (Yes/No)	0	0
	Include Bike parking per LAMC	Meets City Bike Parking Code (Yes/No)	Yes	Yes
	Include secure bike parking and showers	Includes indoor bike parking/lockers, showers, & repair station (Yes/No)	0	0
Neighborhood Enhancement	Traffic calming improvements	Streets with traffic calming improvements (%)	0%	0%
		Intersections with traffic calming improvements (%)	0%	0%
	Pedestrian network improvements	Included (within project and connecting off-site/within project only)	0	0

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024
 Project Name: Radford Studio Center Project
 Project Scenario: Alt 2 - Custom Studio & Office Land Use
 Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Parking	Reduce parking supply	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Parking sections 1 - 5
	Unbundle parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Parking cash-out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Price workplace parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Residential area parking permits	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Transit	Reduce transit headways	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Transit sections 1 - 3
	Implement neighborhood shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Transit subsidies	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Education & Encouragement	Voluntary travel behavior change program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Education & Encouragement sections 1 - 2
	Promotions and marketing	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	0%	
Commute Trip Reductions	Required commute trip reduction program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Commute Trip Reductions sections 1 - 4
	Alternative Work Schedules and Telecommute Program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Employer sponsored vanpool or shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Ride-share program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Shared Mobility	Car-share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Shared Mobility sections 1 - 3
	Bike share	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	School carpool program	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 2 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy, Cont.

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Bicycle Infrastructure	Implement/ Improve on-street bicycle facility	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Bicycle Infrastructure sections 1 - 3
	Include Bike parking per LAMC	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
	Include secure bike parking and showers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Neighborhood Enhancement	Traffic calming improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Neighborhood Enhancement sections 1 - 2
	Pedestrian network improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Final Combined & Maximum TDM Effect

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction	
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated
COMBINED TOTAL		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	1%
MAX. TDM EFFECT		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

$$= \text{Minimum}(X\%, 1 - [(1-A) * (1-B) \dots])$$

where X%=

PLACE	urban	75%
TYPE	compact infill	40%
MAX:	suburban center	20%
	suburban	15%

Note: $(1 - [(1-A) * (1-B) \dots])$ reflects the dampened combined effectiveness of TDM Strategies (e.g., A, B, ...). See the TDM Strategy Appendix (*Transportation Assessment Guidelines Attachment G*) for further discussion of dampening.

CITY OF LOS ANGELES VMT CALCULATOR

Report 4: MXD Methodology

Date: July 29, 2024

Project Name: Radford Studio Center Project
Project Scenario: Alt 2 - Custom Studio & Office Land Use
Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

MXD Methodology - Project Without TDM

	Unadjusted Trips	MXD Adjustment	MXD Trips	Average Trip Length	Unadjusted VMT	MXD VMT
Home Based Work Production	0	0.0%	0	10.1	0	0
Home Based Other Production	0	0.0%	0	6.7	0	0
Non-Home Based Other Production	2,752	-2.2%	2,692	7.7	21,190	20,728
Home-Based Work Attraction	9,692	-11.0%	8,622	7.3	70,752	62,941
Home-Based Other Attraction	5,668	-15.4%	4,793	5.4	30,607	25,882
Non-Home Based Other Attraction	2,752	-2.2%	2,692	6.0	16,512	16,152

MXD Methodology with TDM Measures

	Proposed Project			Project with Mitigation Measures		
	TDM Adjustment	Project Trips	Project VMT	TDM Adjustment	Mitigated Trips	Mitigated VMT
Home Based Work Production	-4.6%	0	0	-4.6%	0	0
Home Based Other Production	-4.6%	0	0	-4.6%	0	0
Non-Home Based Other Production	-4.6%	2,568	19,775	-4.6%	2,568	19,775
Home-Based Work Attraction	-4.6%	8,225	60,046	-4.6%	8,225	60,046
Home-Based Other Attraction	-4.6%	4,572	24,691	-4.6%	4,572	24,691
Non-Home Based Other Attraction	-4.6%	2,568	15,409	-4.6%	2,568	15,409

MXD VMT Methodology Per Capita & Per Employee

Total Population: 0

Total Employees: 9,600

APC: South Valley

	Proposed Project	Project with Mitigation Measures
Total Home Based Production VMT	0	0
Total Home Based Work Attraction VMT	60,046	60,046
Total Home Based VMT Per Capita	0.0	0.0
Total Work Based VMT Per Employee	6.3	6.3

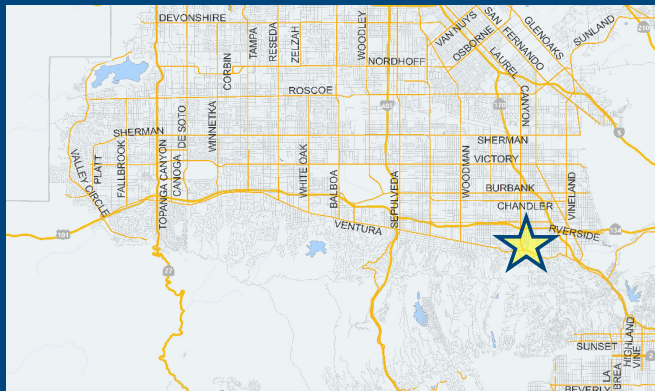
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Project Screening Criteria: Is this project required to conduct a vehicle miles traveled analysis?

Project Information

Project: Radford Studio Center Project
Scenario: Alt 3 - Custom Studio & Office Land Use [www](#)
Address: 4200 N RADFORD AVE, 91604 [Q](#)



Is the project replacing an existing number of residential units with a smaller number of residential units AND is located within one-half mile of a fixed-rail or fixed-guideway transit station?

☒ Yes ☐ No

Existing Land Use

Land Use Type	Value	Unit	
Office General Office	285	ksf	✗
(custom) Studio, Production & Office Daily	8622	Trips	
(custom) Studio, Production & Office HBW-At	52	Percent	
(custom) Studio, Production & Office HBO-At	24	Percent	
(custom) Studio, Production & Office NHB-Att	12	Percent	
(custom) Studio, Production & Office HBW-Pr	0	Percent	
(custom) Studio, Production & Office HBO-Pr	0	Percent	
(custom) Studio, Production & Office NHB-Pr	12	Percent	
(custom) Studio, Production & Office Daily	0	Residents	
(custom) Studio, Production & Office Daily	4781	Employees	
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-R	

☒ Click here to add a single custom land use type (will be included in the above list)

Proposed Project Land Use

Land Use Type	Value	Unit	
Retail High-Turnover Sit-Down Restaurant	30	ksf	+
Retail High-Turnover Sit-Down Restaurant	15	ksf	
Office General Office	0.001	ksf	
(custom) Studio, Production & Office Daily	14354	Trips	
(custom) Studio, Production & Office HBW-At	52	Percent	
(custom) Studio, Production & Office HBO-At	24	Percent	
(custom) Studio, Production & Office NHB-Att	12	Percent	
(custom) Studio, Production & Office HBW-Pr	0	Percent	
(custom) Studio, Production & Office HBO-Pr	0	Percent	
(custom) Studio, Production & Office NHB-Pr	12	Percent	
(custom) Studio, Production & Office Daily	0	Residents	
(custom) Studio, Production & Office Daily	6604	Employees	
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-R	

☒ Click here to add a single custom land use type (will be included in the above list)

Project Screening Summary

Existing Land Use	Proposed Project
7,783 Daily Vehicle Trips	14,095 Daily Vehicle Trips
52,567 Daily VMT	94,561 Daily VMT

Tier 1 Screening Criteria

Project will have less residential units compared to existing residential units & is within one-half mile of a fixed-rail station. ☐

Tier 2 Screening Criteria

The net increase in daily trips < 250 trips **6,312**
Net Daily Trips

The net increase in daily VMT ≤ 0 **41,994**
Net Daily VMT

The proposed project consists of only retail land uses ≤ 50,000 square feet total. **15,000**
ksf

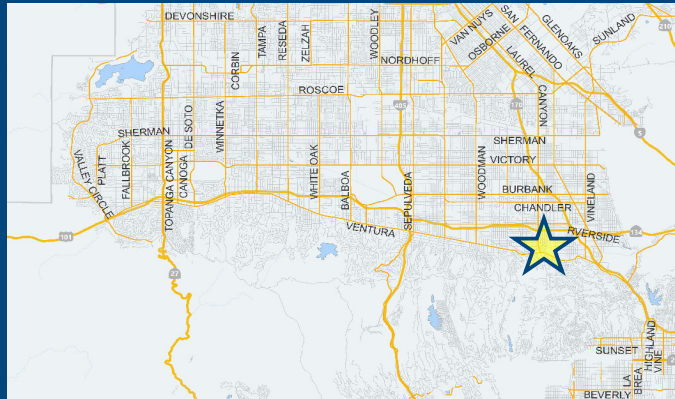
The proposed project is required to perform VMT analysis.

CITY OF LOS ANGELES VMT CALCULATOR Version 1.4



Project Information

Project: Radford Studio Center Project
Scenario: Alt 3 - Custom Studio & Office Land Use
Address: 4200 N RADFORD AVE, 91604



Proposed Project Land Use Type	Value	Unit
Retail High-Turnover Sit-Down Restaurant	15	ksf
Office General Office	0.001	ksf
(custom) Studio, Production & Office Daily	14354	Trips
(custom) Studio, Production & Office HBW-At	52	Percent
(custom) Studio, Production & Office HBO-Att	24	Percent
(custom) Studio, Production & Office NHB-Att	12	Percent
(custom) Studio, Production & Office HBW-Pr	0	Percent
(custom) Studio, Production & Office HBO-Pr	0	Percent
(custom) Studio, Production & Office NHB-Pr	12	Percent
(custom) Studio, Production & Office Daily	0	Residents
(custom) Studio, Production & Office Daily	6604	Employees
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-Retail

TDM Strategies

Select each section to show individual strategies
Use ☒ to denote if the TDM strategy is part of the proposed project or is a mitigation strategy

Max Home Based TDM Achieved? Proposed Project **No** With Mitigation **No**
Max Work Based TDM Achieved? Proposed Project **No** With Mitigation **No**

A **Parking**

Reduce Parking Supply

☐ Proposed Prj ☐ Mitigation

city code parking provision for the project site

☐ Proposed Prj ☐ Mitigation

actual parking provision for the project site

Unbundle Parking

☐ Proposed Prj ☐ Mitigation

monthly parking cost (dollar) for the project site

Parking Cash-Out

☐ Proposed Prj ☐ Mitigation

percent of employees eligible

Price Workplace Parking

☐ Proposed Prj ☐ Mitigation

daily parking charge (dollar)

☐ Proposed Prj ☐ Mitigation

percent of employees subject to priced parking

Residential Area Parking Permits

☐ Proposed Prj ☐ Mitigation

cost (dollar) of annual permit

B **Transit**

C **Education & Encouragement**

D **Commute Trip Reductions**

E **Shared Mobility**

F **Bicycle Infrastructure**

G **Neighborhood Enhancement**

Analysis Results

Proposed Project	With Mitigation
13,447 Daily Vehicle Trips	13,447 Daily Vehicle Trips
90,211 Daily VMT	90,211 Daily VMT
0.0 Household VMT per Capita	0.0 Household VMT per Capita
7.0 Work VMT per Employee	7.0 Work VMT per Employee

Significant VMT Impact?

Household: No Threshold = 9.4 15% Below APC	Household: No Threshold = 9.4 15% Below APC
Work: No Threshold = 11.6 15% Below APC	Work: No Threshold = 11.6 15% Below APC

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Project Information			
Land Use Type		Value	Units
Housing	Single Family	0	DU
	Multi Family	0	DU
	Townhouse	0	DU
	Hotel	0	Rooms
	Motel	0	Rooms
Affordable Housing	Family	0	DU
	Senior	0	DU
	Special Needs	0	DU
	Permanent Supportive	0	DU
Retail	General Retail	0.000	ksf
	Furniture Store	0.000	ksf
	Pharmacy/Drugstore	0.000	ksf
	Supermarket	0.000	ksf
	Bank	0.000	ksf
	Health Club	0.000	ksf
	High-Turnover Sit-Down Restaurant	15.000	ksf
	Fast-Food Restaurant	0.000	ksf
	Quality Restaurant	0.000	ksf
	Auto Repair	0.000	ksf
	Home Improvement	0.000	ksf
	Free-Standing Discount	0.000	ksf
	Movie Theater	0	Seats
Office	General Office	0.001	ksf
	Medical Office	0.000	ksf
Industrial	Light Industrial	0.000	ksf
	Manufacturing	0.000	ksf
	Warehousing/Self-Storage	0.000	ksf
School	University	0	Students
	High School	0	Students
	Middle School	0	Students
	Elementary	0	Students
	Private School (K-12)	0	Students
Other	Studio, Production & Office	14354	Trips

Project and Analysis Overview

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Analysis Results			
Total Employees: 6,664			
Total Population: 0			
Proposed Project		With Mitigation	
13,447	Daily Vehicle Trips	13,447	Daily Vehicle Trips
90,211	Daily VMT	90,211	Daily VMT
0	Household VMT per Capita	0	Household VMT per Capita
7	Work VMT per Employee	7	Work VMT per Employee
Significant VMT Impact?			
APC: South Valley			
Impact Threshold: 15% Below APC Average			
Household = 9.4			
Work = 11.6			
Proposed Project		With Mitigation	
VMT Threshold	Impact	VMT Threshold	Impact
Household > 9.4	No	Household > 9.4	No
Work > 11.6	No	Work > 11.6	No

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs				
Strategy Type		Description	Proposed Project	Mitigations
Parking	Reduce parking supply	City code parking provision (spaces)	0	0
		Actual parking provision (spaces)	0	0
	Unbundle parking	Monthly cost for parking (\$)	\$0	\$0
	Parking cash-out	Employees eligible (%)	0%	0%
	Price workplace parking	Daily parking charge (\$)	\$0.00	\$0.00
		Employees subject to priced parking (%)	0%	0%
	Residential area parking permits	Cost of annual permit (\$)	\$0	\$0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Transit	Reduce transit headways	Reduction in headways (increase in frequency) (%)	0%	0%
		Existing transit mode share (as a percent of total daily trips) (%)	0%	0%
		Lines within project site improved (<50%, >=50%)	0	0
	Implement neighborhood shuttle	Degree of implementation (low, medium, high)	0	0
		Employees and residents eligible (%)	0%	0%
	Transit subsidies	Employees and residents eligible (%)	0%	0%
		Amount of transit subsidy per passenger (daily equivalent) (\$)	\$0.00	\$0.00
Education & Encouragement	Voluntary travel behavior change program	Employees and residents participating (%)	0%	0%
	Promotions and marketing	Employees and residents participating (%)	100%	100%
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Commute Trip Reductions	Required commute trip reduction program	Employees participating (%)	0%	0%
	Alternative Work Schedules and Telecommute	Employees participating (%)	0%	0%
		Type of program	0	0
		Degree of implementation (low, medium, high)	0	0
	Employer sponsored vanpool or shuttle	Employees eligible (%)	0%	0%
		Employer size (small, medium, large)	0	0
	Ride-share program	Employees eligible (%)	0%	0%
Shared Mobility	Car share	Car share project setting (Urban, Suburban, All Other)	0	0
	Bike share	Within 600 feet of existing bike share station - OR- implementing new bike share station (Yes/No)	0	0
	School carpool program	Level of implementation (Low, Medium, High)	0	0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Bicycle Infrastructure	Implement/Improve on-street bicycle facility	Provide bicycle facility along site (Yes/No)	0	0
	Include Bike parking per LAMC	Meets City Bike Parking Code (Yes/No)	Yes	Yes
	Include secure bike parking and showers	Includes indoor bike parking/lockers, showers, & repair station (Yes/No)	0	0
Neighborhood Enhancement	Traffic calming improvements	Streets with traffic calming improvements (%)	0%	0%
		Intersections with traffic calming improvements (%)	0%	0%
	Pedestrian network improvements	Included (within project and connecting off-site/within project only)	0	0

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024
 Project Name: Radford Studio Center Project
 Project Scenario: Alt 3 - Custom Studio & Office Land Use
 Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Parking	Reduce parking supply	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Parking sections 1 - 5
	Unbundle parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Parking cash-out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Price workplace parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Residential area parking permits	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Transit	Reduce transit headways	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Transit sections 1 - 3
	Implement neighborhood shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Transit subsidies	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Education & Encouragement	Voluntary travel behavior change program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Education & Encouragement sections 1 - 2
	Promotions and marketing	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	0%	
Commute Trip Reductions	Required commute trip reduction program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Commute Trip Reductions sections 1 - 4
	Alternative Work Schedules and Telecommute Program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Employer sponsored vanpool or shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Ride-share program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Shared Mobility	Car-share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Shared Mobility sections 1 - 3
	Bike share	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	School carpool program	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 3 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy, Cont.

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Bicycle Infrastructure	Implement/ Improve on-street bicycle facility	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Bicycle Infrastructure sections 1 - 3
	Include Bike parking per LAMC	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
	Include secure bike parking and showers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Neighborhood Enhancement	Traffic calming improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Neighborhood Enhancement sections 1 - 2
	Pedestrian network improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Final Combined & Maximum TDM Effect

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction	
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated
COMBINED TOTAL		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	1%
MAX. TDM EFFECT		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

$$= \text{Minimum } (X\%, 1 - [(1-A) * (1-B) \dots])$$

where X%=

PLACE	urban	75%
TYPE	compact infill	40%
MAX:	suburban center	20%
	suburban	15%

Note: $(1 - [(1-A) * (1-B) \dots])$ reflects the dampened combined effectiveness of TDM Strategies (e.g., A, B, ...). See the TDM Strategy Appendix (*Transportation Assessment Guidelines Attachment G*) for further discussion of dampening.

CITY OF LOS ANGELES VMT CALCULATOR

Report 4: MXD Methodology

Date: July 29, 2024

Project Name: Radford Studio Center Project
Project Scenario: Alt 3 - Custom Studio & Office Land Use
Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

MXD Methodology - Project Without TDM

	Unadjusted Trips	MXD Adjustment	MXD Trips	Average Trip Length	Unadjusted VMT	MXD VMT
Home Based Work Production	0	0.0%	0	10.1	0	0
Home Based Other Production	0	0.0%	0	6.7	0	0
Non-Home Based Other Production	2,000	-2.1%	1,959	7.7	15,400	15,084
Home-Based Work Attraction	7,551	-11.0%	6,719	7.3	55,122	49,049
Home-Based Other Attraction	4,083	-15.3%	3,457	5.4	22,048	18,668
Non-Home Based Other Attraction	2,000	-2.0%	1,960	6.0	12,000	11,760

MXD Methodology with TDM Measures

	Proposed Project			Project with Mitigation Measures		
	TDM Adjustment	Project Trips	Project VMT	TDM Adjustment	Mitigated Trips	Mitigated VMT
Home Based Work Production	-4.6%	0	0	-4.6%	0	0
Home Based Other Production	-4.6%	0	0	-4.6%	0	0
Non-Home Based Other Production	-4.6%	1,869	14,390	-4.6%	1,869	14,390
Home-Based Work Attraction	-4.6%	6,410	46,793	-4.6%	6,410	46,793
Home-Based Other Attraction	-4.6%	3,298	17,809	-4.6%	3,298	17,809
Non-Home Based Other Attraction	-4.6%	1,870	11,219	-4.6%	1,870	11,219

MXD VMT Methodology Per Capita & Per Employee

Total Population: 0

Total Employees: 6,664

APC: South Valley

	Proposed Project	Project with Mitigation Measures
Total Home Based Production VMT	0	0
Total Home Based Work Attraction VMT	46,793	46,793
Total Home Based VMT Per Capita	0.0	0.0
Total Work Based VMT Per Employee	7.0	7.0

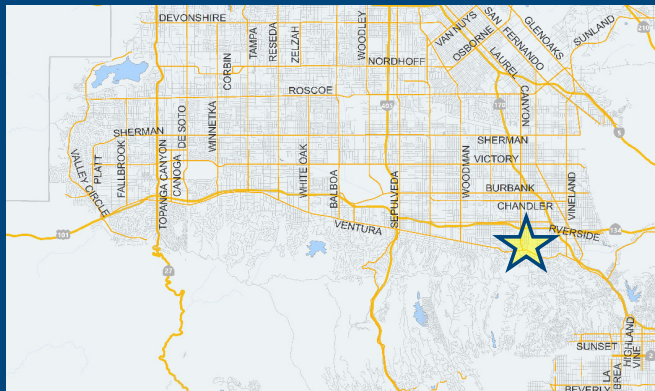
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Project Screening Criteria: Is this project required to conduct a vehicle miles traveled analysis?

Project Information

Project: Radford Studio Center Project
 Scenario: Alt 5 - Custom Studio & Office Land Use
 Address: 4200 N RADFORD AVE, 91604



Is the project replacing an existing number of residential units with a smaller number of residential units AND is located within one-half mile of a fixed-rail or fixed-guideway transit station?

☒ Yes ☐ No

Existing Land Use

Land Use Type	Value	Unit
Office General Office	285	ksf
(custom) Studio, Production & Office Daily	8622	Trips
(custom) Studio, Production & Office HBW-At	52	Percent
(custom) Studio, Production & Office HBO-At	24	Percent
(custom) Studio, Production & Office NHB-Att	12	Percent
(custom) Studio, Production & Office HBW-Pr	0	Percent
(custom) Studio, Production & Office HBO-Pr	0	Percent
(custom) Studio, Production & Office NHB-Pr	12	Percent
(custom) Studio, Production & Office Daily	0	Residents
(custom) Studio, Production & Office Daily	4781	Employees
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-R

☒ Click here to add a single custom land use type (will be included in the above list)

Proposed Project Land Use

Land Use Type	Value	Unit
Housing Multi-Family	743	DU
Housing Multi-Family	743	DU
Retail High-Turnover Sit-Down Restaurant	60	ksf
Office General Office	0.001	ksf
(custom) Studio, Production & Office Daily	15160	Trips
(custom) Studio, Production & Office HBW-At	52	Percent
(custom) Studio, Production & Office HBO-At	24	Percent
(custom) Studio, Production & Office NHB-Att	12	Percent
(custom) Studio, Production & Office HBW-Pr	0	Percent
(custom) Studio, Production & Office HBO-Pr	0	Percent
(custom) Studio, Production & Office NHB-Pr	12	Percent
(custom) Studio, Production & Office Daily	0	Residents
(custom) Studio, Production & Office Daily	6822	Employees
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non

☒ Click here to add a single custom land use type (will be included in the above list)

Project Screening Summary

Existing Land Use	Proposed Project
7,783 Daily Vehicle Trips	21,418 Daily Vehicle Trips
52,567 Daily VMT	142,606 Daily VMT

Tier 1 Screening Criteria

Project will have less residential units compared to existing residential units & is within one-half mile of a fixed-rail station. ☐

Tier 2 Screening Criteria

The net increase in daily trips < 250 trips **13,635**
Net Daily Trips

The net increase in daily VMT ≤ 0 **90,039**
Net Daily VMT

The proposed project consists of only retail land uses ≤ 50,000 square feet total. **60,000**
ksf

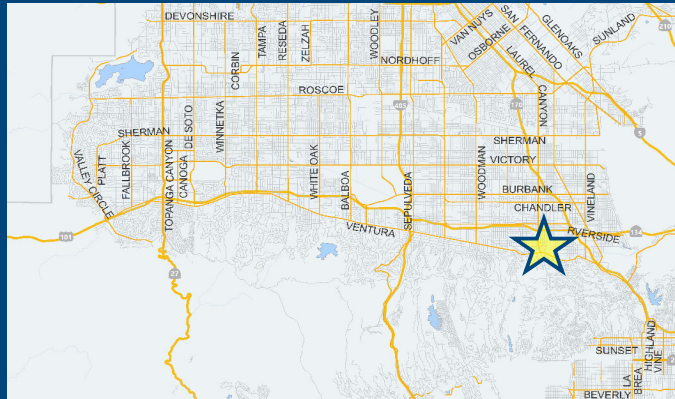
The proposed project is required to perform VMT analysis.

CITY OF LOS ANGELES VMT CALCULATOR Version 1.4



Project Information

Project: Radford Studio Center Project
Scenario: Alt 5 - Custom Studio & Office Land Use
Address: 4200 N RADFORD AVE, 91604



TDM Strategies

Select each section to show individual strategies

Use ☒ to denote if the TDM strategy is part of the proposed project or is a mitigation strategy

Max Home Based TDM Achieved?

Proposed Project

No

With Mitigation

No

Max Work Based TDM Achieved?

No

No

A

Parking

Reduce Parking Supply

100

city code parking provision for the project site

☐ Proposed Prj ☐ Mitigation

74

actual parking provision for the project site

Unbundle Parking

☐ Proposed Prj ☐ Mitigation

175

monthly parking cost (dollar) for the project site

Parking Cash-Out

☐ Proposed Prj ☐ Mitigation

50

percent of employees eligible

Price Workplace Parking

6.00

daily parking charge (dollar)

☐ Proposed Prj ☐ Mitigation

50

percent of employees subject to priced parking

Residential Area Parking

Permits

☐ Proposed Prj ☐ Mitigation

200

cost (dollar) of annual permit

B

Transit

C

Education & Encouragement

D

Commute Trip Reductions

E

Shared Mobility

F

Bicycle Infrastructure

G

Neighborhood Enhancement

Analysis Results

Proposed Project

20,433

Daily Vehicle Trips

136,045

Daily VMT

7.1

Household VMT per Capita

6.9

Work VMT per Employee

With Mitigation

20,433

Daily Vehicle Trips

136,045

Daily VMT

7.1

Household VMT per Capita

6.9

Work VMT per Employee

Significant VMT Impact?

Household: No

Threshold = 9.4
15% Below APC

Household: No

Threshold = 9.4
15% Below APC

Work: No

Threshold = 11.6
15% Below APC

Work: No

Threshold = 11.6
15% Below APC

Proposed Project Land Use Type	Value	Unit
Housing Multi-Family	743	DU
Retail High-Turnover Sit-Down Restaurant	60	ksf
Office General Office	0.001	ksf
(custom) Studio, Production & Office Daily	15160	Trips
(custom) Studio, Production & Office HBW-At	52	Percent
(custom) Studio, Production & Office HBO-Att	24	Percent
(custom) Studio, Production & Office NHB-Att	12	Percent
(custom) Studio, Production & Office HBW-Pr	0	Percent
(custom) Studio, Production & Office HBO-Pr	0	Percent
(custom) Studio, Production & Office NHB-Pr	12	Percent
(custom) Studio, Production & Office Daily	0	Residents
(custom) Studio, Production & Office Daily	6822	Employees
(custom) Studio, Production & Office Daily	Non-Retail	Retail/Non-Retail

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Project Information			
Land Use Type		Value	Units
Housing	Single Family	0	DU
	Multi Family	743	DU
	Townhouse	0	DU
	Hotel	0	Rooms
	Motel	0	Rooms
Affordable Housing	Family	0	DU
	Senior	0	DU
	Special Needs	0	DU
	Permanent Supportive	0	DU
Retail	General Retail	0.000	ksf
	Furniture Store	0.000	ksf
	Pharmacy/Drugstore	0.000	ksf
	Supermarket	0.000	ksf
	Bank	0.000	ksf
	Health Club	0.000	ksf
	High-Turnover Sit-Down Restaurant	60.000	ksf
	Fast-Food Restaurant	0.000	ksf
	Quality Restaurant	0.000	ksf
	Auto Repair	0.000	ksf
	Home Improvement	0.000	ksf
	Free-Standing Discount	0.000	ksf
	Movie Theater	0	Seats
Office	General Office	0.001	ksf
	Medical Office	0.000	ksf
Industrial	Light Industrial	0.000	ksf
	Manufacturing	0.000	ksf
	Warehousing/Self-Storage	0.000	ksf
School	University	0	Students
	High School	0	Students
	Middle School	0	Students
	Elementary	0	Students
	Private School (K-12)	0	Students
Other	Studio, Production & Office	15160	Trips

Project and Analysis Overview

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

Analysis Results			
Total Employees: 7,062			
Total Population: 1,674			
Proposed Project		With Mitigation	
20,433	Daily Vehicle Trips	20,433	Daily Vehicle Trips
136,045	Daily VMT	136,045	Daily VMT
7.1	Household VMT per Capita	7.1	Household VMT per Capita
6.9	Work VMT per Employee	6.9	Work VMT per Employee
Significant VMT Impact?			
APC: South Valley			
Impact Threshold: 15% Below APC Average			
Household = 9.4			
Work = 11.6			
Proposed Project		With Mitigation	
VMT Threshold	Impact	VMT Threshold	Impact
Household > 9.4	No	Household > 9.4	No
Work > 11.6	No	Work > 11.6	No

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs				
Strategy Type		Description	Proposed Project	Mitigations
Parking	Reduce parking supply	City code parking provision (spaces)	0	0
		Actual parking provision (spaces)	0	0
	Unbundle parking	Monthly cost for parking (\$)	\$0	\$0
	Parking cash-out	Employees eligible (%)	0%	0%
	Price workplace parking	Daily parking charge (\$)	\$0.00	\$0.00
		Employees subject to priced parking (%)	0%	0%
	Residential area parking permits	Cost of annual permit (\$)	\$0	\$0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Transit	Reduce transit headways	Reduction in headways (increase in frequency) (%)	0%	0%
		Existing transit mode share (as a percent of total daily trips) (%)	0%	0%
		Lines within project site improved (<50%, >=50%)	0	0
	Implement neighborhood shuttle	Degree of implementation (low, medium, high)	0	0
		Employees and residents eligible (%)	0%	0%
	Transit subsidies	Employees and residents eligible (%)	0%	0%
		Amount of transit subsidy per passenger (daily equivalent) (\$)	\$0.00	\$0.00
Education & Encouragement	Voluntary travel behavior change program	Employees and residents participating (%)	0%	0%
	Promotions and marketing	Employees and residents participating (%)	100%	100%
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Commute Trip Reductions	Required commute trip reduction program	Employees participating (%)	0%	0%
	Alternative Work Schedules and Telecommute	Employees participating (%)	0%	0%
		Type of program	0	0
		Degree of implementation (low, medium, high)	0	0
	Employer sponsored vanpool or shuttle	Employees eligible (%)	0%	0%
		Employer size (small, medium, large)	0	0
	Ride-share program	Employees eligible (%)	0%	0%
Shared Mobility	Car share	Car share project setting (Urban, Suburban, All Other)	0	0
	Bike share	Within 600 feet of existing bike share station - OR- implementing new bike share station (Yes/No)	0	0
	School carpool program	Level of implementation (Low, Medium, High)	0	0
(cont. on following page)				

CITY OF LOS ANGELES VMT CALCULATOR

Report 2: TDM Inputs

Date: July 29, 2024

Project Name: Radford Studio Center Project

Project Scenario: Alt 5 - Custom Studio & Office Land Use

Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Strategy Inputs, Cont.				
Strategy Type		Description	Proposed Project	Mitigations
Bicycle Infrastructure	Implement/Improve on-street bicycle facility	Provide bicycle facility along site (Yes/No)	0	0
	Include Bike parking per LAMC	Meets City Bike Parking Code (Yes/No)	Yes	Yes
	Include secure bike parking and showers	Includes indoor bike parking/lockers, showers, & repair station (Yes/No)	0	0
Neighborhood Enhancement	Traffic calming improvements	Streets with traffic calming improvements (%)	0%	0%
		Intersections with traffic calming improvements (%)	0%	0%
	Pedestrian network improvements	Included (within project and connecting off-site/within project only)	0	0

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024
 Project Name: Radford Studio Center Project
 Project Scenario: Alt 5 - Custom Studio & Office Land Use
 Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Parking	Reduce parking supply	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Parking sections 1 - 5
	Unbundle parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Parking cash-out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Price workplace parking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Residential area parking permits	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Transit	Reduce transit headways	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Transit sections 1 - 3
	Implement neighborhood shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Transit subsidies	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Education & Encouragement	Voluntary travel behavior change program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Education & Encouragement sections 1 - 2
	Promotions and marketing	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	0%	
Commute Trip Reductions	Required commute trip reduction program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	TDM Strategy Appendix, Commute Trip Reductions sections 1 - 4
	Alternative Work Schedules and Telecommute Program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Employer sponsored vanpool or shuttle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Ride-share program	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Shared Mobility	Car-share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Shared Mobility sections 1 - 3
	Bike share	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	School carpool program	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: July 29, 2024

Project Name: Radford Studio Center Project
Project Scenario: Alt 5 - Custom Studio & Office Land Use
Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

TDM Adjustments by Trip Purpose & Strategy, Cont.

Place type: Compact Infill

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction		Source
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Bicycle Infrastructure	Implement/ Improve on-street bicycle facility	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Bicycle Infrastructure sections 1 - 3
	Include Bike parking per LAMC	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
	Include secure bike parking and showers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Neighborhood Enhancement	Traffic calming improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TDM Strategy Appendix, Neighborhood Enhancement sections 1 - 2
	Pedestrian network improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Final Combined & Maximum TDM Effect

		Home Based Work Production		Home Based Work Attraction		Home Based Other Production		Home Based Other Attraction		Non-Home Based Other Production		Non-Home Based Other Attraction	
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated
COMBINED TOTAL		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	1%
MAX. TDM EFFECT		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

$$= \text{Minimum}(X\%, 1 - [(1-A) * (1-B) \dots])$$

where X%=

PLACE	urban	75%
TYPE	compact infill	40%
MAX:	suburban center	20%
	suburban	15%

Note: $(1 - [(1-A) * (1-B) \dots])$ reflects the dampened combined effectiveness of TDM Strategies (e.g., A, B, ...). See the TDM Strategy Appendix (*Transportation Assessment Guidelines Attachment G*) for further discussion of dampening.

CITY OF LOS ANGELES VMT CALCULATOR

Report 4: MXD Methodology

Date: July 29, 2024

Project Name: Radford Studio Center Project
Project Scenario: Alt 5 - Custom Studio & Office Land Use
Project Address: 4200 N RADFORD AVE, 91604



Version 1.4

MXD Methodology - Project Without TDM

	Unadjusted Trips	MXD Adjustment	MXD Trips	Average Trip Length	Unadjusted VMT	MXD VMT
Home Based Work Production	666	-56.2%	292	10.1	6,727	2,949
Home Based Other Production	1,844	-22.5%	1,430	6.7	12,355	9,581
Non-Home Based Other Production	3,792	-2.3%	3,704	7.7	29,198	28,521
Home-Based Work Attraction	8,231	-14.6%	7,033	7.3	60,086	51,341
Home-Based Other Attraction	7,068	-16.5%	5,900	5.4	38,167	31,860
Non-Home Based Other Attraction	3,139	-2.5%	3,059	6.0	18,834	18,354

MXD Methodology with TDM Measures

	<i>Proposed Project</i>			<i>Project with Mitigation Measures</i>		
	TDM Adjustment	Project Trips	Project VMT	TDM Adjustment	Mitigated Trips	Mitigated VMT
Home Based Work Production	-4.6%	279	2,813	-4.6%	279	2,813
Home Based Other Production	-4.6%	1,364	9,140	-4.6%	1,364	9,140
Non-Home Based Other Production	-4.6%	3,534	27,209	-4.6%	3,534	27,209
Home-Based Work Attraction	-4.6%	6,709	48,979	-4.6%	6,709	48,979
Home-Based Other Attraction	-4.6%	5,629	30,394	-4.6%	5,629	30,394
Non-Home Based Other Attraction	-4.6%	2,918	17,510	-4.6%	2,918	17,510

MXD VMT Methodology Per Capita & Per Employee

Total Population: 1,674

Total Employees: 7,062

APC: South Valley

	<i>Proposed Project</i>	<i>Project with Mitigation Measures</i>
<i>Total Home Based Production VMT</i>	11,953	11,953
<i>Total Home Based Work Attraction VMT</i>	48,979	48,979
<i>Total Home Based VMT Per Capita</i>	7.1	7.1
<i>Total Work Based VMT Per Employee</i>	6.9	6.9

Attachment B
Freeway Safety Analysis

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	867	9	750	30	233	221	215
v/c Ratio	0.45	0.03	0.39	0.11	0.65	0.52	0.44
Control Delay	12.8	13.9	14.6	0.9	33.3	14.8	6.6
Queue Delay	1.1	0.0	0.5	0.2	0.6	0.6	0.0
Total Delay	13.9	13.9	15.2	1.1	33.8	15.4	6.6
Queue Length 50th (ft)	90	3	170	0	93	35	0
Queue Length 95th (ft)	213	m8	216	0	161	96	49
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1943	266	1943	267	432	482	546
Starvation Cap Reductn	0	0	720	0	0	0	0
Spillback Cap Reductn	784	0	0	63	41	73	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.03	0.61	0.15	0.60	0.54	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	330
Future Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.90	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1656		1681	1506	1504
Flt Permitted		1.00		0.26	1.00			0.83		0.95	0.98	1.00
Satd. Flow (perm)		3538		486	3539			1391		1681	1506	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	865	2	9	750	0	8	0	22	303	7	359
RTOR Reduction (vph)	0	0	0	0	0	0	0	29	0	0	101	169
Lane Group Flow (vph)	0	867	0	9	750	0	0	1	0	233	120	46
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.8		34.8	34.8			3.2		15.0	15.0	15.0
Effective Green, g (s)		34.8		34.8	34.8			3.2		15.0	15.0	15.0
Actuated g/C Ratio		0.50		0.50	0.50			0.05		0.21	0.21	0.21
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1758		241	1759			63		360	322	322
v/s Ratio Prot		c0.25			0.21					c0.14	0.08	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.49		0.04	0.43			0.02		0.65	0.37	0.14
Uniform Delay, d1		11.7		9.0	11.2			31.9		25.1	23.5	22.3
Progression Factor		1.00		1.11	1.28			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.2	0.7			0.1		4.0	0.7	0.2
Delay (s)		12.7		10.2	15.1			32.0		29.1	24.2	22.5
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		12.7			15.0			32.0			25.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			53.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	290	287	240	518	682	1564	395
v/c Ratio	0.79	0.81	0.47	0.81	0.29	0.73	0.59
Control Delay	49.4	51.5	7.2	69.9	3.6	24.8	25.5
Queue Delay	45.9	56.1	0.0	4.2	0.1	0.0	0.0
Total Delay	95.3	107.6	7.2	74.1	3.7	24.8	25.5
Queue Length 50th (ft)	160	162	0	160	31	280	178
Queue Length 95th (ft)	#273	#290	60	m#213	m39	339	280
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	405	389	544	675	2369	2154	671
Starvation Cap Reductn	0	0	0	95	538	0	0
Spillback Cap Reductn	133	127	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	1.10	0.44	0.89	0.37	0.73	0.59

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	504	2	246	477	627	0	0	1439	363
Future Volume (vph)	0	0	0	504	2	246	477	627	0	0	1439	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1599	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1599	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	548	2	267	518	682	0	0	1564	395
RTOR Reduction (vph)	0	0	0	0	4	188	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	290	283	52	518	682	0	0	1564	395
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.6	19.6	19.6	16.8	60.3			38.2	38.2
Effective Green, g (s)				19.6	19.6	19.6	16.8	60.3			38.2	38.2
Actuated g/C Ratio				0.22	0.22	0.22	0.19	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				366	348	327	640	2371			2158	671
v/s Ratio Prot							c0.15	0.19			c0.31	
v/s Ratio Perm				0.17	0.18	0.03						0.25
v/c Ratio				0.79	0.81	0.16	0.81	0.29			0.72	0.59
Uniform Delay, d1				33.3	33.5	28.5	35.1	6.1			21.5	19.9
Progression Factor				1.00	1.00	1.00	1.72	0.51			1.00	1.00
Incremental Delay, d2				11.2	13.5	0.2	6.8	0.3			2.2	3.8
Delay (s)				44.4	47.0	28.8	67.1	3.4			23.7	23.6
Level of Service				D	D	C	E	A			C	C
Approach Delay (s)		0.0			40.7			30.9			23.7	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.4									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			106.1%								G	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	504	2	246	477	627	0	0	1439	363
Future Volume (veh/h)	0	0	0	504	2	246	477	627	0	0	1439	363
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				632	0	179	518	682	0	0	1564	395
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				740	0	329	589	2416	0	0	2301	714
Arrive On Green				0.21	0.00	0.21	0.34	1.00	0.00	0.00	0.45	0.45
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				632	0	179	518	682	0	0	1564	395
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				15.4	0.0	9.1	12.7	0.0	0.0	0.0	21.8	16.4
Cycle Q Clear(g_c), s				15.4	0.0	9.1	12.7	0.0	0.0	0.0	21.8	16.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				740	0	329	589	2416	0	0	2301	714
V/C Ratio(X)				0.85	0.00	0.54	0.88	0.28	0.00	0.00	0.68	0.55
Avail Cap(c_a), veh/h				859	0	382	680	2416	0	0	2301	714
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	0.28	0.28
Uniform Delay (d), s/veh				34.3	0.0	31.8	28.8	0.0	0.0	0.0	19.6	18.1
Incr Delay (d2), s/veh				7.5	0.0	1.4	10.4	0.3	0.0	0.0	0.5	0.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				11.3	0.0	6.1	8.4	0.2	0.0	0.0	10.6	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				41.8	0.0	33.2	39.2	0.3	0.0	0.0	20.0	19.0
LnGrp LOS				D	A	C	D	A	A	A	C	B
Approach Vol, veh/h					811			1200			1959	
Approach Delay, s/veh					39.9			17.1			19.8	
Approach LOS					D			B			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.6	45.4		24.0		66.0						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	35.2		* 22		58.2						
Max Q Clear Time (g_c+I1), s	14.7	23.8		17.4		2.0						
Green Ext Time (p_c), s	0.6	8.4		1.3		5.3						

Intersection Summary

HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	153	275	266	1047	602	563	1554
v/c Ratio	0.42	0.86	0.82	0.47	0.88	0.92	0.66
Control Delay	33.7	60.6	54.0	11.5	29.4	54.9	11.6
Queue Delay	0.6	15.7	0.0	0.0	0.0	1.7	29.7
Total Delay	34.3	76.3	54.0	11.5	29.4	56.6	41.3
Queue Length 50th (ft)	77	162	148	163	336	181	228
Queue Length 95th (ft)	137	#305	#272	187	#528	#286	299
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2209	687	611	2365
Starvation Cap Reductn	0	0	0	0	0	11	891
Spillback Cap Reductn	65	56	0	50	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.96	0.76	0.48	0.88	0.94	1.05

Intersection Summary

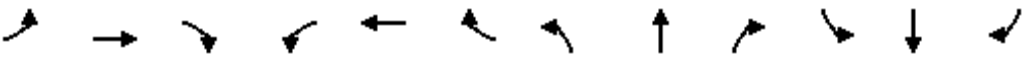
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	11	471	0	0	0	0	963	554	518	1430	0
Future Volume (vph)	156	11	471	0	0	0	0	963	554	518	1430	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1463	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1463	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	12	512	0	0	0	0	1047	602	563	1554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	153	275	266	0	0	0	0	1047	602	563	1554	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	19.6	19.6	19.6					39.1	39.1	16.0	60.1	
Effective Green, g (s)	19.6	19.6	19.6					39.1	39.1	16.0	60.1	
Actuated g/C Ratio	0.22	0.22	0.22					0.43	0.43	0.18	0.67	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	366	318	327					2209	687	610	2363	
v/s Ratio Prot								0.21		c0.16	0.44	
v/s Ratio Perm	0.09	0.19	0.18						c0.38			
v/c Ratio	0.42	0.86	0.81					0.47	0.88	0.92	0.66	
Uniform Delay, d1	30.3	33.9	33.5					18.1	23.2	36.4	8.9	
Progression Factor	1.00	1.00	1.00					0.60	0.72	1.02	1.13	
Incremental Delay, d2	0.8	20.9	14.3					0.5	10.6	14.6	1.0	
Delay (s)	31.1	54.8	47.7					11.4	27.4	51.8	11.0	
Level of Service	C	D	D					B	C	D	B	
Approach Delay (s)		46.9			0.0			17.2			21.8	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.0									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			90.0									Sum of lost time (s) 15.3
Intersection Capacity Utilization			106.1%									ICU Level of Service G
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	11	471	0	0	0	0	963	554	518	1430	0
Future Volume (veh/h)	156	11	471	0	0	0	0	963	554	518	1430	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	117	0	576				0	1047	602	563	1554	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	371	0	661				0	2323	721	576	2406	0
Arrive On Green	0.21	0.00	0.21				0.00	0.45	0.45	0.33	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	117	0	576				0	1047	602	563	1554	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.0	0.0	15.8				0.0	12.7	30.0	14.5	0.0	0.0
Cycle Q Clear(g_c), s	5.0	0.0	15.8				0.0	12.7	30.0	14.5	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	371	0	661				0	2323	721	576	2406	0
V/C Ratio(X)	0.32	0.00	0.87				0.00	0.45	0.83	0.98	0.65	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2323	721	576	2406	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.60	0.60	0.00
Uniform Delay (d), s/veh	30.2	0.0	34.5				0.0	16.8	21.6	29.8	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	10.3				0.0	0.6	11.0	23.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.7	0.0	10.9				0.0	8.3	18.2	9.7	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	0.0	44.7				0.0	17.5	32.6	53.4	0.8	0.0
LnGrp LOS	C	A	D				A	B	C	D	A	A
Approach Vol, veh/h	693						1649			2117		
Approach Delay, s/veh	42.3						23.0			14.8		
Approach LOS	D						C			B		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.0	46.0		24.0		66.0						
Change Period (Y+Rc), s	* 5	* 5.1		* 5.2		* 5.1						
Max Green Setting (Gmax), s	* 15	* 39		* 21		* 59						
Max Q Clear Time (g_c+I1), s	16.5	32.0		17.8		2.0						
Green Ext Time (p_c), s	0.0	4.6		0.9		18.9						
Intersection Summary												
HCM 6th Ctrl Delay	22.1											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	889	5	784	15	253	241	237
v/c Ratio	0.44	0.02	0.39	0.05	0.64	0.49	0.44
Control Delay	11.5	11.0	11.9	0.3	31.5	9.8	6.1
Queue Delay	1.0	0.0	0.3	0.1	0.7	0.6	0.0
Total Delay	12.5	11.0	12.3	0.4	32.1	10.4	6.1
Queue Length 50th (ft)	100	1	128	0	100	19	0
Queue Length 95th (ft)	226	m5	245	0	171	79	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	267	2016	302	466	545	587
Starvation Cap Reductn	0	0	618	0	0	0	0
Spillback Cap Reductn	800	0	0	90	54	101	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.02	0.56	0.07	0.61	0.54	0.40

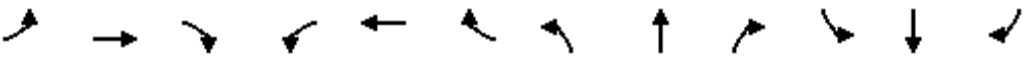
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	389
Future Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	389
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3536		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.25	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3536		470	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	884	5	5	784	0	0	0	15	301	7	423
RTOR Reduction (vph)	0	1	0	0	0	0	0	15	0	0	142	181
Lane Group Flow (vph)	0	889	0	5	784	0	0	0	0	253	99	56
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1768		235	1769			36		393	347	352
v/s Ratio Prot		c0.25			0.22			c0.00		c0.15	0.07	
v/s Ratio Perm				0.01								0.04
v/c Ratio		0.50		0.02	0.44			0.01		0.64	0.28	0.16
Uniform Delay, d1		11.7		8.8	11.2			33.4		24.2	22.0	21.3
Progression Factor		1.00		0.98	1.16			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.1	0.7			0.1		3.6	0.5	0.2
Delay (s)		12.7		8.8	13.7			33.5		27.8	22.4	21.5
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		12.7			13.7			33.5			24.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	409	396	378	526	1209	1026	184
v/c Ratio	0.83	0.78	0.75	0.82	0.57	0.62	0.28
Control Delay	44.8	33.7	32.0	43.8	14.1	27.2	7.2
Queue Delay	3.0	2.2	0.0	2.6	3.5	1.3	0.0
Total Delay	47.8	35.9	32.0	46.4	17.6	28.6	7.2
Queue Length 50th (ft)	218	171	152	138	233	185	12
Queue Length 95th (ft)	#363	292	264	m#198	334	233	59
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	536	546	538	675	2103	1658	650
Starvation Cap Reductn	0	0	0	69	777	0	0
Spillback Cap Reductn	58	62	0	0	0	400	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.82	0.70	0.87	0.91	0.82	0.28

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	561	0	527	484	1112	0	1	943	169
Future Volume (vph)	0	0	0	561	0	527	484	1112	0	1	943	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1531	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1531	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	610	0	573	526	1209	0	1	1025	184
RTOR Reduction (vph)	0	0	0	0	61	61	0	0	0	0	0	100
Lane Group Flow (vph)	0	0	0	409	335	317	526	1209	0	0	1026	84
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				26.4	26.4	26.4	16.9	53.5			31.3	31.3
Effective Green, g (s)				26.4	26.4	26.4	16.9	53.5			31.3	31.3
Actuated g/C Ratio				0.29	0.29	0.29	0.19	0.59			0.35	0.35
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				493	449	441	644	2103			1660	550
v/s Ratio Prot							c0.15	c0.34				
v/s Ratio Perm				c0.24	0.22	0.21					0.21	0.05
v/c Ratio				0.83	0.75	0.72	0.82	0.57			0.62	0.15
Uniform Delay, d1				29.7	28.8	28.5	35.1	11.2			24.4	20.2
Progression Factor				1.00	1.00	1.00	0.97	1.10			1.00	1.00
Incremental Delay, d2				11.1	6.7	5.6	6.9	1.0			1.7	0.6
Delay (s)				40.8	35.4	34.0	40.8	13.3			26.1	20.8
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			36.8			21.7			25.3	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.1									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			90.0									
Sum of lost time (s)											15.4	
Intersection Capacity Utilization			82.3%									
ICU Level of Service											E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	561	0	527	484	1112	0	1	943	169
Future Volume (veh/h)	0	0	0	561	0	527	484	1112	0	1	943	169
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				788	0	382	526	1209	0	1	1025	184
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				993	0	442	616	2164	0	40	1846	589
Arrive On Green				0.28	0.00	0.28	0.06	0.20	0.00	0.37	0.37	0.37
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				788	0	382	526	1209	0	386	640	184
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				18.4	0.0	20.6	13.6	27.6	0.0	0.0	14.7	7.4
Cycle Q Clear(g_c), s				18.4	0.0	20.6	13.6	27.6	0.0	14.7	14.7	7.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				993	0	442	616	2164	0	735	1152	589
V/C Ratio(X)				0.79	0.00	0.86	0.85	0.56	0.00	0.53	0.56	0.31
Avail Cap(c_a), veh/h				1136	0	505	680	2164	0	735	1152	589
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.84	0.84	0.00	0.50	0.50	0.50
Uniform Delay (d), s/veh				30.1	0.0	30.8	41.2	25.1	0.0	22.4	22.4	20.1
Incr Delay (d2), s/veh				3.5	0.0	13.2	8.2	0.9	0.0	1.3	1.0	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.4	0.0	13.8	10.9	18.6	0.0	9.3	7.9	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.6	0.0	44.1	49.4	25.9	0.0	23.7	23.4	20.8
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1170			1735			1210	
Approach Delay, s/veh					37.0			33.1			23.1	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.4	38.3		30.4		59.6						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	28.2		* 29		51.2						
Max Q Clear Time (g_c+I1), s	15.6	16.7		22.6		29.6						
Green Ext Time (p_c), s	0.5	5.5		2.5		9.1						
Intersection Summary												
HCM 6th Ctrl Delay				31.2								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	322	320	1391	718	298	1308
v/c Ratio	0.84	0.82	0.80	0.44	0.56	0.79	0.56
Control Delay	53.8	42.9	41.0	8.0	2.2	36.6	17.0
Queue Delay	0.0	0.3	0.0	0.1	0.2	0.0	49.6
Total Delay	53.8	43.1	41.0	8.0	2.4	36.6	66.6
Queue Length 50th (ft)	183	147	138	84	12	95	394
Queue Length 95th (ft)	#324	#292	#272	m95	m19	m#150	445
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	410	415	422	3134	1285	379	2320
Starvation Cap Reductn	0	0	0	0	124	0	1234
Spillback Cap Reductn	0	5	0	340	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.79	0.76	0.50	0.62	0.79	1.20

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	22	535	0	0	0	1	1279	661	274	1203	0
Future Volume (vph)	333	22	535	0	0	0	1	1279	661	274	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.16	1.00	
Satd. Flow (perm)	1681	1480	1504					4778	1583	578	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	24	582	0	0	0	1	1390	718	298	1308	0
RTOR Reduction (vph)	0	55	55	0	0	0	0	0	247	0	0	0
Lane Group Flow (vph)	326	267	265	0	0	0	0	1391	471	298	1308	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.7	20.7	20.7					59.0	59.0	59.0	59.0	
Effective Green, g (s)	20.7	20.7	20.7					59.0	59.0	59.0	59.0	
Actuated g/C Ratio	0.23	0.23	0.23					0.66	0.66	0.66	0.66	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	386	340	345					3132	1037	378	2320	
v/s Ratio Prot											0.37	
v/s Ratio Perm	c0.19	0.18	0.18					0.29	0.30	c0.52		
v/c Ratio	0.84	0.78	0.77					0.44	0.45	0.79	0.56	
Uniform Delay, d1	33.1	32.5	32.4					7.5	7.6	11.0	8.5	
Progression Factor	1.00	1.00	1.00					0.99	2.13	1.85	1.82	
Incremental Delay, d2	15.4	11.2	9.8					0.2	0.7	11.6	0.7	
Delay (s)	48.6	43.8	42.2					7.7	16.9	32.1	16.2	
Level of Service	D	D	D					A	B	C	B	
Approach Delay (s)		44.9			0.0			10.8			19.1	
Approach LOS		D			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			20.7									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			102.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	22	535	0	0	0	1	1279	661	274	1203	0
Future Volume (veh/h)	333	22	535	0	0	0	1	1279	661	274	1203	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	249	0	719				1	1390	718	298	1308	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	435	0	774				40	3185	1017	349	2279	0
Arrive On Green	0.24	0.00	0.24				0.64	0.64	0.64	0.43	0.43	0.00
Sat Flow, veh/h	1781	0	3170				0	4967	1585	376	3647	0
Grp Volume(v), veh/h	249	0	719				524	867	718	298	1308	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	188	1777	0
Q Serve(g_s), s	11.1	0.0	20.0				0.0	12.6	26.7	45.2	25.1	0.0
Cycle Q Clear(g_c), s	11.1	0.0	20.0				12.5	12.6	26.7	57.7	25.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	435	0	774				1239	1987	1017	349	2279	0
V/C Ratio(X)	0.57	0.00	0.93				0.42	0.44	0.71	0.86	0.57	0.00
Avail Cap(c_a), veh/h	435	0	775				1239	1987	1017	349	2279	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.68	0.68	0.00
Uniform Delay (d), s/veh	29.9	0.0	33.2				8.0	8.0	10.6	40.2	16.4	0.0
Incr Delay (d2), s/veh	1.8	0.0	17.4				1.1	0.7	4.1	16.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	0.0	13.9				8.2	6.7	13.7	7.0	15.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	50.7				9.1	8.7	14.7	56.8	17.1	0.0
LnGrp LOS	C	A	D				A	A	B	E	B	A
Approach Vol, veh/h	968						2109			1606		
Approach Delay, s/veh	45.8						10.9			24.4		
Approach LOS	D						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	62.8			27.2			62.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 58			* 22			* 58					
Max Q Clear Time (g_c+I1), s	28.7			22.0			59.7					
Green Ext Time (p_c), s	15.8			0.0			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	22.7											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	947	10	818	33	251	241	231
v/c Ratio	0.49	0.04	0.43	0.12	0.67	0.56	0.45
Control Delay	13.6	13.6	14.1	1.0	33.9	16.8	6.5
Queue Delay	2.3	0.0	0.5	0.4	1.3	1.1	0.0
Total Delay	15.9	13.6	14.7	1.3	35.2	17.9	6.5
Queue Length 50th (ft)	108	3	215	0	98	45	0
Queue Length 95th (ft)	239	m9	m233	0	173	114	51
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1917	226	1917	265	432	479	558
Starvation Cap Reductn	0	0	638	0	0	0	0
Spillback Cap Reductn	800	0	0	83	62	89	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.04	0.64	0.18	0.68	0.62	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	354
Future Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.90	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1657		1681	1508	1504
Flt Permitted		1.00		0.22	1.00			0.82		0.95	0.98	1.00
Satd. Flow (perm)		3538		419	3539			1374		1681	1508	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	945	2	10	818	0	9	0	24	330	8	385
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	96	180
Lane Group Flow (vph)	0	947	0	10	818	0	0	2	0	251	145	51
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.3		34.3	34.3			3.2		15.5	15.5	15.5
Effective Green, g (s)		34.3		34.3	34.3			3.2		15.5	15.5	15.5
Actuated g/C Ratio		0.49		0.49	0.49			0.05		0.22	0.22	0.22
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1733		205	1734			62		372	333	333
v/s Ratio Prot		c0.27			0.23					c0.15	0.10	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.55		0.05	0.47			0.02		0.67	0.44	0.15
Uniform Delay, d1		12.4		9.3	11.8			31.9		24.9	23.5	22.0
Progression Factor		1.00		1.07	1.18			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.4	0.8			0.2		4.8	0.9	0.2
Delay (s)		13.7		10.3	14.7			32.1		29.7	24.4	22.2
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		13.7			14.6			32.1			25.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	313	308	263	563	738	1695	432
v/c Ratio	0.83	0.85	0.50	0.84	0.31	0.82	0.67
Control Delay	52.2	54.7	8.5	39.2	5.6	28.3	28.7
Queue Delay	58.5	58.4	0.0	1.9	0.5	1.0	0.0
Total Delay	110.7	113.0	8.5	41.1	6.0	29.3	28.7
Queue Length 50th (ft)	174	178	8	137	35	319	204
Queue Length 95th (ft)	#305	#320	73	m#232	m76	384	316
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	409	392	551	690	2345	2079	647
Starvation Cap Reductn	0	0	0	45	1074	0	0
Spillback Cap Reductn	167	159	0	0	0	170	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.32	0.48	0.87	0.58	0.89	0.67

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	543	2	269	518	679	0	0	1559	397
Future Volume (vph)	0	0	0	543	2	269	518	679	0	0	1559	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1599	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1599	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	590	2	292	563	738	0	0	1695	432
RTOR Reduction (vph)	0	0	0	0	4	190	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	313	304	73	563	738	0	0	1695	432
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				20.3	20.3	20.3	17.5	59.6			36.8	36.8
Effective Green, g (s)				20.3	20.3	20.3	17.5	59.6			36.8	36.8
Actuated g/C Ratio				0.23	0.23	0.23	0.19	0.66			0.41	0.41
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				379	360	339	667	2343			2079	647
v/s Ratio Prot							c0.16	0.21			c0.33	
v/s Ratio Perm				0.19	0.19	0.05						0.27
v/c Ratio				0.83	0.84	0.22	0.84	0.31			0.82	0.67
Uniform Delay, d1				33.2	33.3	28.4	34.9	6.5			23.6	21.6
Progression Factor				1.00	1.00	1.00	0.79	0.77			1.00	1.00
Incremental Delay, d2				13.7	16.4	0.3	8.4	0.3			3.7	5.4
Delay (s)				46.8	49.7	28.7	36.1	5.3			27.2	27.0
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)		0.0			42.4			18.6			27.2	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.7									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			114.0%								H	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	543	2	269	518	679	0	0	1559	397
Future Volume (veh/h)	0	0	0	543	2	269	518	679	0	0	1559	397
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				682	0	195	563	738	0	0	1695	432
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				783	0	349	629	2373	0	0	2180	677
Arrive On Green				0.22	0.00	0.22	0.36	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				682	0	195	563	738	0	0	1695	432
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				16.6	0.0	9.8	13.8	0.0	0.0	0.0	25.6	19.3
Cycle Q Clear(g_c), s				16.6	0.0	9.8	13.8	0.0	0.0	0.0	25.6	19.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				783	0	349	629	2373	0	0	2180	677
V/C Ratio(X)				0.87	0.00	0.56	0.90	0.31	0.00	0.00	0.78	0.64
Avail Cap(c_a), veh/h				867	0	386	695	2373	0	0	2180	677
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.00	0.18	0.18
Uniform Delay (d), s/veh				33.9	0.0	31.2	27.8	0.0	0.0	0.0	22.1	20.3
Incr Delay (d2), s/veh				8.9	0.0	1.5	11.7	0.3	0.0	0.0	0.5	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.3	0.0	6.6	8.9	0.2	0.0	0.0	11.7	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				42.8	0.0	32.7	39.5	0.3	0.0	0.0	22.6	21.2
LnGrp LOS				D	A	C	D	A	A	A	C	C
Approach Vol, veh/h					877			1301			2127	
Approach Delay, s/veh					40.5			17.3			22.3	
Approach LOS					D			B			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.7	43.2		25.1		64.9						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	34.6		* 22		58.0						
Max Q Clear Time (g_c+I1), s	15.8	27.6		18.6		2.0						
Green Ext Time (p_c), s	0.5	5.8		1.2		5.9						

Intersection Summary

HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	294	285	1135	654	616	1675
v/c Ratio	0.44	0.90	0.85	0.52	0.96	1.01	0.72
Control Delay	34.0	64.8	57.2	8.5	34.0	64.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	16.2	48.3
Total Delay	34.0	64.8	57.2	8.5	34.0	80.4	62.3
Queue Length 50th (ft)	85	176	162	73	149	~154	276
Queue Length 95th (ft)	148	#334	#301	105	m#548	m#275	347
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2177	678	610	2341
Starvation Cap Reductn	0	0	0	0	0	29	914
Spillback Cap Reductn	0	0	0	76	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.86	0.81	0.54	0.96	1.06	1.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	11	504	0	0	0	0	1044	602	567	1541	0
Future Volume (vph)	170	11	504	0	0	0	0	1044	602	567	1541	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1463	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1463	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	12	548	0	0	0	0	1135	654	616	1675	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	166	294	285	0	0	0	0	1135	654	616	1675	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	20.2	20.2	20.2					38.5	38.5	16.0	59.5	
Effective Green, g (s)	20.2	20.2	20.2					38.5	38.5	16.0	59.5	
Actuated g/C Ratio	0.22	0.22	0.22					0.43	0.43	0.18	0.66	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	377	328	337					2175	677	610	2339	
v/s Ratio Prot								0.22		c0.18	0.47	
v/s Ratio Perm	0.10	0.20	0.19						c0.41			
v/c Ratio	0.44	0.90	0.85					0.52	0.97	1.01	0.72	
Uniform Delay, d1	30.0	33.9	33.4					19.0	25.1	37.0	9.8	
Progression Factor	1.00	1.00	1.00					0.41	0.43	0.87	1.26	
Incremental Delay, d2	0.8	25.3	17.4					0.5	19.7	29.9	1.1	
Delay (s)	30.9	59.2	50.8					8.3	30.4	62.3	13.4	
Level of Service	C	E	D					A	C	E	B	
Approach Delay (s)		49.7			0.0			16.4			26.6	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.4									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			114.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	11	504	0	0	0	0	1044	602	567	1541	0
Future Volume (veh/h)	170	11	504	0	0	0	0	1044	602	567	1541	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	127	0	618				0	1135	654	616	1675	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	390	0	694				0	2139	664	660	2369	0
Arrive On Green	0.22	0.00	0.22				0.00	0.42	0.42	0.38	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	127	0	618				0	1135	654	616	1675	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.4	0.0	17.0				0.0	14.9	36.7	15.4	0.0	0.0
Cycle Q Clear(g_c), s	5.4	0.0	17.0				0.0	14.9	36.7	15.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	390	0	694				0	2139	664	660	2369	0
V/C Ratio(X)	0.33	0.00	0.89				0.00	0.53	0.98	0.93	0.71	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2139	664	660	2369	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.47	0.47	0.00
Uniform Delay (d), s/veh	29.6	0.0	34.1				0.0	19.5	25.9	27.2	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	12.5				0.0	0.9	31.5	11.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	0.0	11.8				0.0	9.7	25.6	8.4	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	0.0	46.6				0.0	20.5	57.3	38.8	0.9	0.0
LnGrp LOS	C	A	D				A	C	E	D	A	A
Approach Vol, veh/h	745						1789			2291		
Approach Delay, s/veh	43.8						34.0			11.1		
Approach LOS	D						C			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	22.3	42.8	24.9		65.1							
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.2		* 5.1							
Max Green Setting (Gmax), s	* 16	* 38	* 21		* 59							
Max Q Clear Time (g_c+I1), s	17.4	38.7	19.0		2.0							
Green Ext Time (p_c), s	0.0	0.0	0.7		21.7							
Intersection Summary												
HCM 6th Ctrl Delay	24.6											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	971	7	855	16	275	262	258
v/c Ratio	0.48	0.03	0.42	0.05	0.70	0.52	0.47
Control Delay	11.7	11.0	12.7	0.3	34.3	10.3	6.3
Queue Delay	1.9	0.0	0.4	0.2	2.1	1.2	0.0
Total Delay	13.5	11.0	13.0	0.5	36.4	11.6	6.3
Queue Length 50th (ft)	117	1	236	0	107	21	0
Queue Length 95th (ft)	247	m6	278	0	190	86	53
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	232	2016	293	441	538	585
Starvation Cap Reductn	0	0	580	0	0	0	0
Spillback Cap Reductn	841	0	0	113	72	123	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.03	0.60	0.09	0.75	0.63	0.44

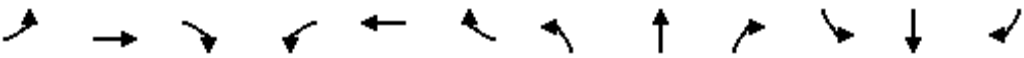
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	423
Future Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3535		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.22	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3535		409	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	964	7	7	855	0	0	0	16	327	8	460
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	155	198
Lane Group Flow (vph)	0	971	0	7	855	0	0	0	0	275	107	60
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1767		204	1769			36		393	347	352
v/s Ratio Prot		c0.27			0.24			c0.00		c0.16	0.07	
v/s Ratio Perm				0.02								0.04
v/c Ratio		0.55		0.03	0.48			0.01		0.70	0.31	0.17
Uniform Delay, d1		12.1		8.9	11.5			33.4		24.5	22.1	21.4
Progression Factor		1.00		1.02	1.22			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.3	0.8			0.1		5.4	0.5	0.2
Delay (s)		13.3		9.3	14.9			33.5		29.9	22.6	21.6
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		13.3			14.9			33.5			24.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			60.0%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	449	431	407	565	1308	1114	201
v/c Ratio	0.87	0.82	0.78	0.85	0.64	0.71	0.32
Control Delay	48.5	36.7	34.0	45.0	14.5	30.0	8.4
Queue Delay	5.2	3.3	0.0	5.1	13.2	5.4	0.0
Total Delay	53.7	39.9	34.0	50.1	27.7	35.4	8.4
Queue Length 50th (ft)	247	197	172	153	275	206	19
Queue Length 95th (ft)	#420	#367	#322	m#223	m368	258	70
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	537	547	539	682	2059	1573	624
Starvation Cap Reductn	0	0	0	72	751	0	0
Spillback Cap Reductn	49	54	0	0	0	394	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.87	0.76	0.93	1.00	0.94	0.32

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	608	0	576	520	1203	0	1	1024	185
Future Volume (vph)	0	0	0	608	0	576	520	1203	0	1	1024	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1528	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1528	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	661	0	626	565	1308	0	1	1113	201
RTOR Reduction (vph)	0	0	0	0	60	60	0	0	0	0	0	103
Lane Group Flow (vph)	0	0	0	449	371	347	565	1308	0	0	1114	98
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				27.6	27.6	27.6	17.4	52.3			29.6	29.6
Effective Green, g (s)				27.6	27.6	27.6	17.4	52.3			29.6	29.6
Actuated g/C Ratio				0.31	0.31	0.31	0.19	0.58			0.33	0.33
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				515	468	461	663	2056			1570	520
v/s Ratio Prot							c0.16	0.37				
v/s Ratio Perm				c0.27	0.24	0.23					c0.23	0.06
v/c Ratio				0.87	0.79	0.75	0.85	0.64			0.71	0.19
Uniform Delay, d1				29.5	28.6	28.1	35.1	12.5			26.4	21.6
Progression Factor				1.00	1.00	1.00	0.95	1.01			1.00	1.00
Incremental Delay, d2				15.0	9.0	6.9	8.7	1.3			2.7	0.8
Delay (s)				44.5	37.6	35.0	42.0	14.0			29.2	22.4
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			39.2			22.4			28.1	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.9									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			88.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰↱	↰	↰↱	↰↱			↰↱↱	↰
Traffic Volume (veh/h)	0	0	0	608	0	576	520	1203	0	1	1024	185
Future Volume (veh/h)	0	0	0	608	0	576	520	1203	0	1	1024	185
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				856	0	417	565	1308	0	1	1113	201
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				1054	0	469	650	2104	0	40	1713	547
Arrive On Green				0.30	0.00	0.30	0.06	0.20	0.00	0.34	0.34	0.34
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				856	0	417	565	1308	0	419	695	201
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1868	1549	1585
Q Serve(g_s), s				20.0	0.0	22.6	14.6	30.3	0.0	0.0	17.0	8.6
Cycle Q Clear(g_c), s				20.0	0.0	22.6	14.6	30.3	0.0	17.0	17.0	8.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1054	0	469	650	2104	0	685	1069	547
V/C Ratio(X)				0.81	0.00	0.89	0.87	0.62	0.00	0.61	0.65	0.37
Avail Cap(c_a), veh/h				1136	0	505	687	2104	0	685	1069	547
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.80	0.80	0.00	0.36	0.36	0.36
Uniform Delay (d), s/veh				29.4	0.0	30.3	41.1	27.0	0.0	24.9	24.9	22.1
Incr Delay (d2), s/veh				4.3	0.0	16.8	9.2	1.1	0.0	1.5	1.1	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.3	0.0	15.3	11.6	20.2	0.0	10.1	8.5	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.7	0.0	47.0	50.3	28.1	0.0	26.4	26.0	22.8
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1273			1873			1315	
Approach Delay, s/veh					38.1			34.8			25.6	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	22.2	35.8		31.9		58.1						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	28.0		* 29		51.2						
Max Q Clear Time (g_c+I1), s	16.6	19.0		24.6		32.3						
Green Ext Time (p_c), s	0.3	5.0		2.0		9.3						
Intersection Summary												
HCM 6th Ctrl Delay				33.0								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	356	351	348	1497	776	326	1414
v/c Ratio	0.92	0.91	0.89	0.48	0.60	0.99	0.61
Control Delay	64.8	56.9	53.7	6.8	2.0	68.5	18.6
Queue Delay	0.0	0.8	0.0	0.1	0.3	0.0	49.7
Total Delay	64.8	57.8	53.7	6.9	2.2	68.5	68.2
Queue Length 50th (ft)	208	180	169	87	11	105	423
Queue Length 95th (ft)	#378	#359	#336	m95	m16	m#173	500
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	391	396	3130	1304	328	2317
Starvation Cap Reductn	0	0	0	0	134	0	1258
Spillback Cap Reductn	0	4	0	413	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.91	0.88	0.55	0.66	0.99	1.34

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Traffic Volume (vph)	364	24	582	0	0	0	1	1376	714	300	1301	0
Future Volume (vph)	364	24	582	0	0	0	1	1376	714	300	1301	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.14	1.00	
Satd. Flow (perm)	1681	1480	1504					4778	1583	503	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	396	26	633	0	0	0	1	1496	776	326	1414	0
RTOR Reduction (vph)	0	46	46	0	0	0	0	0	268	0	0	0
Lane Group Flow (vph)	356	305	302	0	0	0	0	1497	508	326	1414	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Effective Green, g (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	342	347					3126	1035	329	2316	
v/s Ratio Prot											0.40	
v/s Ratio Perm	c0.21	0.21	0.20					0.31	0.32	c0.65		
v/c Ratio	0.92	0.89	0.87					0.48	0.49	0.99	0.61	
Uniform Delay, d1	33.8	33.5	33.3					7.8	7.9	15.3	8.9	
Progression Factor	1.00	1.00	1.00					0.83	2.12	1.90	1.94	
Incremental Delay, d2	26.0	23.9	20.1					0.2	0.6	37.5	0.8	
Delay (s)	59.7	57.4	53.4					6.7	17.4	66.6	18.1	
Level of Service	E	E	D					A	B	E	B	
Approach Delay (s)		56.9			0.0			10.4			27.2	
Approach LOS		E			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.8		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)					10.3		
Intersection Capacity Utilization			109.6%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	24	582	0	0	0	1	1376	714	300	1301	0
Future Volume (veh/h)	364	24	582	0	0	0	1	1376	714	300	1301	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	0	782				1	1496	776	326	1414	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	416	0	740				40	3239	1034	320	2318	0
Arrive On Green	0.23	0.00	0.23				0.65	0.65	0.65	0.44	0.44	0.00
Sat Flow, veh/h	1781	0	3170				0	4967	1585	319	3647	0
Grp Volume(v), veh/h	273	0	782				563	934	776	326	1414	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	160	1777	0
Q Serve(g_s), s	12.5	0.0	21.0				0.0	13.5	30.0	45.2	27.5	0.0
Cycle Q Clear(g_c), s	12.5	0.0	21.0				13.5	13.5	30.0	58.7	27.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	416	0	740				1259	2020	1034	320	2318	0
V/C Ratio(X)	0.66	0.00	1.06				0.45	0.46	0.75	1.02	0.61	0.00
Avail Cap(c_a), veh/h	416	0	740				1259	2020	1034	320	2318	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.57	0.57	0.00
Uniform Delay (d), s/veh	31.2	0.0	34.5				7.8	7.8	10.7	43.4	16.5	0.0
Incr Delay (d2), s/veh	3.7	0.0	49.2				1.2	0.8	5.0	42.4	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.3	0.0	19.0				8.5	7.1	15.1	8.6	16.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.0	83.7				8.9	8.6	15.7	85.8	17.2	0.0
LnGrp LOS	C	A	F				A	A	B	F	B	A
Approach Vol, veh/h	1055						2273			1740		
Approach Delay, s/veh	71.1						11.1			30.1		
Approach LOS	E						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	63.8			26.2			63.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 59			* 21			* 59					
Max Q Clear Time (g_c+I1), s	32.0			23.0			60.7					
Green Ext Time (p_c), s	16.5			0.0			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	30.1											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	867	9	750	30	233	221	215
v/c Ratio	0.45	0.03	0.39	0.11	0.65	0.52	0.44
Control Delay	12.8	13.9	14.6	0.9	33.3	14.8	6.6
Queue Delay	1.1	0.0	0.5	0.2	0.6	0.6	0.0
Total Delay	13.9	13.9	15.2	1.1	33.8	15.4	6.6
Queue Length 50th (ft)	90	3	170	0	93	35	0
Queue Length 95th (ft)	213	m8	216	0	161	96	49
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1943	266	1943	267	432	482	546
Starvation Cap Reductn	0	0	720	0	0	0	0
Spillback Cap Reductn	784	0	0	63	41	73	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.03	0.61	0.15	0.60	0.54	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	330
Future Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.90	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1656		1681	1506	1504
Flt Permitted		1.00		0.26	1.00			0.83		0.95	0.98	1.00
Satd. Flow (perm)		3538		486	3539			1391		1681	1506	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	865	2	9	750	0	8	0	22	303	7	359
RTOR Reduction (vph)	0	0	0	0	0	0	0	29	0	0	101	169
Lane Group Flow (vph)	0	867	0	9	750	0	0	1	0	233	120	46
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.8		34.8	34.8			3.2		15.0	15.0	15.0
Effective Green, g (s)		34.8		34.8	34.8			3.2		15.0	15.0	15.0
Actuated g/C Ratio		0.50		0.50	0.50			0.05		0.21	0.21	0.21
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1758		241	1759			63		360	322	322
v/s Ratio Prot		c0.25			0.21					c0.14	0.08	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.49		0.04	0.43			0.02		0.65	0.37	0.14
Uniform Delay, d1		11.7		9.0	11.2			31.9		25.1	23.5	22.3
Progression Factor		1.00		1.11	1.28			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.2	0.7			0.1		4.0	0.7	0.2
Delay (s)		12.7		10.2	15.1			32.0		29.1	24.2	22.5
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		12.7			15.0			32.0			25.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			53.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	290	287	240	518	682	1564	395
v/c Ratio	0.79	0.81	0.47	0.81	0.29	0.73	0.59
Control Delay	49.4	51.5	7.2	38.5	5.5	24.8	25.5
Queue Delay	58.5	58.5	0.0	1.1	0.4	0.2	0.0
Total Delay	107.9	110.0	7.2	39.6	5.9	24.9	25.5
Queue Length 50th (ft)	160	162	0	124	62	280	178
Queue Length 95th (ft)	#273	#290	60	m#189	m108	339	280
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	405	389	544	675	2369	2154	671
Starvation Cap Reductn	0	0	0	43	1102	0	0
Spillback Cap Reductn	147	140	0	0	0	106	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.15	0.44	0.82	0.54	0.76	0.59

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	504	2	246	477	627	0	0	1439	363
Future Volume (vph)	0	0	0	504	2	246	477	627	0	0	1439	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1599	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1599	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	548	2	267	518	682	0	0	1564	395
RTOR Reduction (vph)	0	0	0	0	4	188	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	290	283	52	518	682	0	0	1564	395
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.6	19.6	19.6	16.8	60.3			38.2	38.2
Effective Green, g (s)				19.6	19.6	19.6	16.8	60.3			38.2	38.2
Actuated g/C Ratio				0.22	0.22	0.22	0.19	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				366	348	327	640	2371			2158	671
v/s Ratio Prot							c0.15	0.19			c0.31	
v/s Ratio Perm				0.17	0.18	0.03						0.25
v/c Ratio				0.79	0.81	0.16	0.81	0.29			0.72	0.59
Uniform Delay, d1				33.3	33.5	28.5	35.1	6.1			21.5	19.9
Progression Factor				1.00	1.00	1.00	0.81	0.81			1.00	1.00
Incremental Delay, d2				11.2	13.5	0.2	6.8	0.3			2.2	3.8
Delay (s)				44.4	47.0	28.8	35.3	5.2			23.7	23.6
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)		0.0			40.7			18.2			23.7	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.5									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			90.0									
Sum of lost time (s)											15.4	
Intersection Capacity Utilization			106.1%									
ICU Level of Service											G	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	504	2	246	477	627	0	0	1439	363
Future Volume (veh/h)	0	0	0	504	2	246	477	627	0	0	1439	363
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				632	0	179	518	682	0	0	1564	395
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				740	0	329	589	2416	0	0	2301	714
Arrive On Green				0.21	0.00	0.21	0.34	1.00	0.00	0.00	0.45	0.45
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				632	0	179	518	682	0	0	1564	395
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				15.4	0.0	9.1	12.7	0.0	0.0	0.0	21.8	16.4
Cycle Q Clear(g_c), s				15.4	0.0	9.1	12.7	0.0	0.0	0.0	21.8	16.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				740	0	329	589	2416	0	0	2301	714
V/C Ratio(X)				0.85	0.00	0.54	0.88	0.28	0.00	0.00	0.68	0.55
Avail Cap(c_a), veh/h				859	0	382	680	2416	0	0	2301	714
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	0.28	0.28
Uniform Delay (d), s/veh				34.3	0.0	31.8	28.8	0.0	0.0	0.0	19.6	18.1
Incr Delay (d2), s/veh				7.5	0.0	1.4	10.4	0.3	0.0	0.0	0.5	0.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				11.3	0.0	6.1	8.4	0.2	0.0	0.0	10.6	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				41.8	0.0	33.2	39.2	0.3	0.0	0.0	20.0	19.0
LnGrp LOS				D	A	C	D	A	A	A	C	B
Approach Vol, veh/h					811			1200			1959	
Approach Delay, s/veh					39.9			17.1			19.8	
Approach LOS					D			B			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.6	45.4		24.0		66.0						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	35.2		* 22		58.2						
Max Q Clear Time (g_c+I1), s	14.7	23.8		17.4		2.0						
Green Ext Time (p_c), s	0.6	8.4		1.3		5.3						

Intersection Summary

HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	153	275	266	1047	602	563	1554
v/c Ratio	0.42	0.86	0.82	0.47	0.87	0.94	0.66
Control Delay	33.7	60.6	54.0	7.8	21.8	51.6	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.1	41.3
Total Delay	33.7	60.6	54.0	7.9	21.8	52.7	53.4
Queue Length 50th (ft)	77	162	148	58	141	131	242
Queue Length 95th (ft)	137	#305	#272	87	#503	#265	312
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2223	692	602	2365
Starvation Cap Reductn	0	0	0	0	0	6	930
Spillback Cap Reductn	0	0	0	83	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.81	0.76	0.49	0.87	0.94	1.08

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	11	471	0	0	0	0	963	554	518	1430	0
Future Volume (vph)	156	11	471	0	0	0	0	963	554	518	1430	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1463	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1463	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	12	512	0	0	0	0	1047	602	563	1554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	153	275	266	0	0	0	0	1047	602	563	1554	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	19.6	19.6	19.6					39.3	39.3	15.8	60.1	
Effective Green, g (s)	19.6	19.6	19.6					39.3	39.3	15.8	60.1	
Actuated g/C Ratio	0.22	0.22	0.22					0.44	0.44	0.18	0.67	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	366	318	327					2220	691	602	2363	
v/s Ratio Prot								0.21		c0.16	0.44	
v/s Ratio Perm	0.09	0.19	0.18						c0.38			
v/c Ratio	0.42	0.86	0.81					0.47	0.87	0.94	0.66	
Uniform Delay, d1	30.3	33.9	33.5					18.0	23.0	36.6	8.9	
Progression Factor	1.00	1.00	1.00					0.40	0.41	0.85	1.18	
Incremental Delay, d2	0.8	20.9	14.3					0.5	10.2	16.5	1.0	
Delay (s)	31.1	54.8	47.7					7.7	19.7	47.6	11.5	
Level of Service	C	D	D					A	B	D	B	
Approach Delay (s)		46.9			0.0			12.1			21.1	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			21.8									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			90.0									Sum of lost time (s) 15.3
Intersection Capacity Utilization			106.1%									ICU Level of Service G
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	11	471	0	0	0	0	963	554	518	1430	0
Future Volume (veh/h)	156	11	471	0	0	0	0	963	554	518	1430	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	117	0	576				0	1047	602	563	1554	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	371	0	661				0	2126	660	705	2406	0
Arrive On Green	0.21	0.00	0.21				0.00	0.42	0.42	0.41	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	117	0	576				0	1047	602	563	1554	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.0	0.0	15.8				0.0	13.5	32.2	12.9	0.0	0.0
Cycle Q Clear(g_c), s	5.0	0.0	15.8				0.0	13.5	32.2	12.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	371	0	661				0	2126	660	705	2406	0
V/C Ratio(X)	0.32	0.00	0.87				0.00	0.49	0.91	0.80	0.65	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2196	682	705	2406	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.60	0.60	0.00
Uniform Delay (d), s/veh	30.2	0.0	34.5				0.0	19.3	24.7	25.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	10.3				0.0	0.8	19.1	4.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.7	0.0	10.9				0.0	8.9	20.9	7.1	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	0.0	44.7				0.0	20.1	43.8	29.0	0.8	0.0
LnGrp LOS	C	A	D				A	C	D	C	A	A
Approach Vol, veh/h	693						1649			2117		
Approach Delay, s/veh	42.3						28.7			8.3		
Approach LOS	D						C			A		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	23.5	42.6		24.0		66.0						
Change Period (Y+Rc), s	* 5.1	* 5.1		* 5.2		* 5.1						
Max Green Setting (Gmax), s	* 15	* 39		* 21		* 59						
Max Q Clear Time (g_c+I1), s	14.9	34.2		17.8		2.0						
Green Ext Time (p_c), s	0.0	3.3		0.9		18.9						
Intersection Summary												
HCM 6th Ctrl Delay	21.2											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	889	5	784	15	253	241	237
v/c Ratio	0.44	0.02	0.39	0.05	0.64	0.49	0.44
Control Delay	11.5	11.0	11.9	0.3	31.5	9.8	6.1
Queue Delay	1.0	0.0	0.3	0.1	0.7	0.6	0.0
Total Delay	12.5	11.0	12.3	0.4	32.1	10.4	6.1
Queue Length 50th (ft)	100	1	128	0	100	19	0
Queue Length 95th (ft)	226	m5	245	0	171	79	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	267	2016	302	466	545	587
Starvation Cap Reductn	0	0	618	0	0	0	0
Spillback Cap Reductn	800	0	0	90	54	101	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.02	0.56	0.07	0.61	0.54	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	389
Future Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	389
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3536		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.25	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3536		470	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	884	5	5	784	0	0	0	15	301	7	423
RTOR Reduction (vph)	0	1	0	0	0	0	0	15	0	0	142	181
Lane Group Flow (vph)	0	889	0	5	784	0	0	0	0	253	99	56
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1768		235	1769			36		393	347	352
v/s Ratio Prot		c0.25			0.22			c0.00		c0.15	0.07	
v/s Ratio Perm				0.01								0.04
v/c Ratio		0.50		0.02	0.44			0.01		0.64	0.28	0.16
Uniform Delay, d1		11.7		8.8	11.2			33.4		24.2	22.0	21.3
Progression Factor		1.00		0.98	1.16			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.1	0.7			0.1		3.6	0.5	0.2
Delay (s)		12.7		8.8	13.7			33.5		27.8	22.4	21.5
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		12.7			13.7			33.5			24.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	409	396	378	526	1209	1026	184
v/c Ratio	0.83	0.78	0.75	0.82	0.57	0.62	0.28
Control Delay	44.8	33.7	32.0	43.7	14.1	27.2	7.2
Queue Delay	3.0	2.2	0.0	2.6	3.5	1.3	0.0
Total Delay	47.8	35.9	32.0	46.3	17.6	28.6	7.2
Queue Length 50th (ft)	218	171	152	138	233	185	12
Queue Length 95th (ft)	#363	292	264	m#198	334	233	59
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	536	546	538	675	2103	1658	650
Starvation Cap Reductn	0	0	0	69	777	0	0
Spillback Cap Reductn	58	62	0	0	0	400	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.82	0.70	0.87	0.91	0.82	0.28

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	561	0	527	484	1112	0	1	943	169
Future Volume (vph)	0	0	0	561	0	527	484	1112	0	1	943	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1531	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1531	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	610	0	573	526	1209	0	1	1025	184
RTOR Reduction (vph)	0	0	0	0	61	61	0	0	0	0	0	100
Lane Group Flow (vph)	0	0	0	409	335	317	526	1209	0	0	1026	84
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				26.4	26.4	26.4	16.9	53.5			31.3	31.3
Effective Green, g (s)				26.4	26.4	26.4	16.9	53.5			31.3	31.3
Actuated g/C Ratio				0.29	0.29	0.29	0.19	0.59			0.35	0.35
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				493	449	441	644	2103			1660	550
v/s Ratio Prot							c0.15	c0.34				
v/s Ratio Perm				c0.24	0.22	0.21					0.21	0.05
v/c Ratio				0.83	0.75	0.72	0.82	0.57			0.62	0.15
Uniform Delay, d1				29.7	28.8	28.5	35.1	11.2			24.4	20.2
Progression Factor				1.00	1.00	1.00	0.96	1.10			1.00	1.00
Incremental Delay, d2				11.1	6.7	5.6	6.9	1.0			1.7	0.6
Delay (s)				40.8	35.4	34.0	40.7	13.3			26.1	20.8
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			36.8			21.6			25.3	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.1									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			82.3%								E	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	561	0	527	484	1112	0	1	943	169
Future Volume (veh/h)	0	0	0	561	0	527	484	1112	0	1	943	169
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				788	0	382	526	1209	0	1	1025	184
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				993	0	442	616	2164	0	40	1846	589
Arrive On Green				0.28	0.00	0.28	0.06	0.20	0.00	0.37	0.37	0.37
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				788	0	382	526	1209	0	386	640	184
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				18.4	0.0	20.6	13.6	27.6	0.0	0.0	14.7	7.4
Cycle Q Clear(g_c), s				18.4	0.0	20.6	13.6	27.6	0.0	14.7	14.7	7.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				993	0	442	616	2164	0	735	1152	589
V/C Ratio(X)				0.79	0.00	0.86	0.85	0.56	0.00	0.53	0.56	0.31
Avail Cap(c_a), veh/h				1136	0	505	680	2164	0	735	1152	589
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.84	0.84	0.00	0.50	0.50	0.50
Uniform Delay (d), s/veh				30.1	0.0	30.8	41.2	25.1	0.0	22.4	22.4	20.1
Incr Delay (d2), s/veh				3.5	0.0	13.2	8.2	0.9	0.0	1.3	1.0	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.4	0.0	13.8	10.9	18.6	0.0	9.3	7.9	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.6	0.0	44.1	49.4	25.9	0.0	23.7	23.4	20.8
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1170			1735			1210	
Approach Delay, s/veh					37.0			33.1			23.1	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.4	38.3		30.4		59.6						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	28.2		* 29		51.2						
Max Q Clear Time (g_c+I1), s	15.6	16.7		22.6		29.6						
Green Ext Time (p_c), s	0.5	5.5		2.5		9.1						

Intersection Summary

HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	322	320	1391	718	298	1308
v/c Ratio	0.84	0.82	0.80	0.44	0.56	0.79	0.56
Control Delay	53.8	42.9	41.0	8.0	2.2	36.6	17.0
Queue Delay	0.0	0.3	0.0	0.1	0.2	0.0	49.6
Total Delay	53.8	43.1	41.0	8.0	2.4	36.6	66.6
Queue Length 50th (ft)	183	147	138	84	12	95	394
Queue Length 95th (ft)	#324	#292	#272	m95	m19	m#150	445
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	410	415	422	3134	1285	379	2320
Starvation Cap Reductn	0	0	0	0	124	0	1234
Spillback Cap Reductn	0	5	0	340	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.79	0.76	0.50	0.62	0.79	1.20

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	22	535	0	0	0	1	1279	661	274	1203	0
Future Volume (vph)	333	22	535	0	0	0	1	1279	661	274	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.16	1.00	
Satd. Flow (perm)	1681	1480	1504					4778	1583	578	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	24	582	0	0	0	1	1390	718	298	1308	0
RTOR Reduction (vph)	0	55	55	0	0	0	0	0	247	0	0	0
Lane Group Flow (vph)	326	267	265	0	0	0	0	1391	471	298	1308	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.7	20.7	20.7					59.0	59.0	59.0	59.0	
Effective Green, g (s)	20.7	20.7	20.7					59.0	59.0	59.0	59.0	
Actuated g/C Ratio	0.23	0.23	0.23					0.66	0.66	0.66	0.66	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	386	340	345					3132	1037	378	2320	
v/s Ratio Prot											0.37	
v/s Ratio Perm	c0.19	0.18	0.18					0.29	0.30	c0.52		
v/c Ratio	0.84	0.78	0.77					0.44	0.45	0.79	0.56	
Uniform Delay, d1	33.1	32.5	32.4					7.5	7.6	11.0	8.5	
Progression Factor	1.00	1.00	1.00					0.99	2.14	1.85	1.82	
Incremental Delay, d2	15.4	11.2	9.8					0.2	0.7	11.6	0.7	
Delay (s)	48.6	43.8	42.2					7.7	16.9	32.1	16.2	
Level of Service	D	D	D					A	B	C	B	
Approach Delay (s)		44.9			0.0			10.8			19.1	
Approach LOS		D			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			20.7									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			102.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	22	535	0	0	0	1	1279	661	274	1203	0
Future Volume (veh/h)	333	22	535	0	0	0	1	1279	661	274	1203	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	249	0	719				1	1390	718	298	1308	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	435	0	774				40	3185	1017	349	2279	0
Arrive On Green	0.24	0.00	0.24				0.64	0.64	0.64	0.43	0.43	0.00
Sat Flow, veh/h	1781	0	3170				0	4967	1585	376	3647	0
Grp Volume(v), veh/h	249	0	719				524	867	718	298	1308	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	188	1777	0
Q Serve(g_s), s	11.1	0.0	20.0				0.0	12.6	26.7	45.2	25.1	0.0
Cycle Q Clear(g_c), s	11.1	0.0	20.0				12.5	12.6	26.7	57.7	25.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	435	0	774				1239	1987	1017	349	2279	0
V/C Ratio(X)	0.57	0.00	0.93				0.42	0.44	0.71	0.86	0.57	0.00
Avail Cap(c_a), veh/h	435	0	775				1239	1987	1017	349	2279	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.68	0.68	0.00
Uniform Delay (d), s/veh	29.9	0.0	33.2				8.0	8.0	10.6	40.2	16.4	0.0
Incr Delay (d2), s/veh	1.8	0.0	17.4				1.1	0.7	4.1	16.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	0.0	13.9				8.2	6.7	13.7	7.0	15.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	50.7				9.1	8.7	14.7	56.8	17.1	0.0
LnGrp LOS	C	A	D				A	A	B	E	B	A
Approach Vol, veh/h	968						2109			1606		
Approach Delay, s/veh	45.8						10.9			24.4		
Approach LOS	D						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	62.8			27.2			62.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 58			* 22			* 58					
Max Q Clear Time (g_c+I1), s	28.7			22.0			59.7					
Green Ext Time (p_c), s	15.8			0.0			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	22.7											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	947	10	818	33	251	241	231
v/c Ratio	0.49	0.04	0.43	0.12	0.67	0.56	0.45
Control Delay	13.6	13.6	14.1	1.0	33.9	16.8	6.5
Queue Delay	2.3	0.0	0.5	0.4	1.3	1.1	0.0
Total Delay	15.9	13.6	14.7	1.3	35.2	17.9	6.5
Queue Length 50th (ft)	108	3	215	0	98	45	0
Queue Length 95th (ft)	239	m9	m233	0	173	114	51
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1917	226	1917	265	432	479	558
Starvation Cap Reductn	0	0	638	0	0	0	0
Spillback Cap Reductn	800	0	0	83	62	89	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.04	0.64	0.18	0.68	0.62	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	354
Future Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.90	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1657		1681	1508	1504
Flt Permitted		1.00		0.22	1.00			0.82		0.95	0.98	1.00
Satd. Flow (perm)		3538		419	3539			1374		1681	1508	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	945	2	10	818	0	9	0	24	330	8	385
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	96	180
Lane Group Flow (vph)	0	947	0	10	818	0	0	2	0	251	145	51
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.3		34.3	34.3			3.2		15.5	15.5	15.5
Effective Green, g (s)		34.3		34.3	34.3			3.2		15.5	15.5	15.5
Actuated g/C Ratio		0.49		0.49	0.49			0.05		0.22	0.22	0.22
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1733		205	1734			62		372	333	333
v/s Ratio Prot		c0.27			0.23					c0.15	0.10	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.55		0.05	0.47			0.02		0.67	0.44	0.15
Uniform Delay, d1		12.4		9.3	11.8			31.9		24.9	23.5	22.0
Progression Factor		1.00		1.07	1.18			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.4	0.8			0.2		4.8	0.9	0.2
Delay (s)		13.7		10.3	14.7			32.1		29.7	24.4	22.2
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		13.7			14.6			32.1			25.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	313	308	263	563	738	1695	432
v/c Ratio	0.83	0.85	0.50	0.84	0.31	0.82	0.67
Control Delay	52.2	54.7	8.5	39.0	5.6	28.3	28.7
Queue Delay	58.5	58.4	0.0	1.9	0.5	1.0	0.0
Total Delay	110.7	113.0	8.5	40.9	6.1	29.3	28.7
Queue Length 50th (ft)	174	178	8	137	34	319	204
Queue Length 95th (ft)	#305	#320	73	m#232	m76	384	316
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	409	392	551	690	2345	2079	647
Starvation Cap Reductn	0	0	0	45	1074	0	0
Spillback Cap Reductn	167	159	0	0	0	170	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.32	0.48	0.87	0.58	0.89	0.67

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	543	2	269	518	679	0	0	1559	397
Future Volume (vph)	0	0	0	543	2	269	518	679	0	0	1559	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1599	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1599	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	590	2	292	563	738	0	0	1695	432
RTOR Reduction (vph)	0	0	0	0	4	190	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	313	304	73	563	738	0	0	1695	432
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				20.3	20.3	20.3	17.5	59.6			36.8	36.8
Effective Green, g (s)				20.3	20.3	20.3	17.5	59.6			36.8	36.8
Actuated g/C Ratio				0.23	0.23	0.23	0.19	0.66			0.41	0.41
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				379	360	339	667	2343			2079	647
v/s Ratio Prot							c0.16	0.21			c0.33	
v/s Ratio Perm				0.19	0.19	0.05						0.27
v/c Ratio				0.83	0.84	0.22	0.84	0.31			0.82	0.67
Uniform Delay, d1				33.2	33.3	28.4	34.9	6.5			23.6	21.6
Progression Factor				1.00	1.00	1.00	0.79	0.77			1.00	1.00
Incremental Delay, d2				13.7	16.4	0.3	8.4	0.3			3.7	5.4
Delay (s)				46.8	49.7	28.7	35.9	5.3			27.2	27.0
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)		0.0			42.4			18.6			27.2	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.7									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			114.0%									
ICU Level of Service											H	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	543	2	269	518	679	0	0	1559	397
Future Volume (veh/h)	0	0	0	543	2	269	518	679	0	0	1559	397
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				682	0	195	563	738	0	0	1695	432
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				783	0	349	629	2373	0	0	2180	677
Arrive On Green				0.22	0.00	0.22	0.36	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				682	0	195	563	738	0	0	1695	432
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				16.6	0.0	9.8	13.8	0.0	0.0	0.0	25.6	19.3
Cycle Q Clear(g_c), s				16.6	0.0	9.8	13.8	0.0	0.0	0.0	25.6	19.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				783	0	349	629	2373	0	0	2180	677
V/C Ratio(X)				0.87	0.00	0.56	0.90	0.31	0.00	0.00	0.78	0.64
Avail Cap(c_a), veh/h				867	0	386	695	2373	0	0	2180	677
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.00	0.18	0.18
Uniform Delay (d), s/veh				33.9	0.0	31.2	27.8	0.0	0.0	0.0	22.1	20.3
Incr Delay (d2), s/veh				8.9	0.0	1.5	11.7	0.3	0.0	0.0	0.5	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.3	0.0	6.6	8.9	0.2	0.0	0.0	11.7	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				42.8	0.0	32.7	39.5	0.3	0.0	0.0	22.6	21.2
LnGrp LOS				D	A	C	D	A	A	A	C	C
Approach Vol, veh/h					877			1301			2127	
Approach Delay, s/veh					40.5			17.3			22.3	
Approach LOS					D			B			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.7	43.2		25.1		64.9						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	34.6		* 22		58.0						
Max Q Clear Time (g_c+I1), s	15.8	27.6		18.6		2.0						
Green Ext Time (p_c), s	0.5	5.8		1.2		5.9						

Intersection Summary

HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	294	285	1135	654	616	1675
v/c Ratio	0.44	0.90	0.85	0.52	0.96	1.01	0.72
Control Delay	34.0	64.8	57.2	8.3	34.1	64.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	16.2	48.3
Total Delay	34.0	64.8	57.2	8.4	34.1	80.4	62.3
Queue Length 50th (ft)	85	176	162	74	156	~154	276
Queue Length 95th (ft)	148	#334	#301	105	m#548	m#275	347
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2177	678	610	2341
Starvation Cap Reductn	0	0	0	0	0	29	914
Spillback Cap Reductn	0	0	0	76	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.86	0.81	0.54	0.96	1.06	1.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	11	504	0	0	0	0	1044	602	567	1541	0
Future Volume (vph)	170	11	504	0	0	0	0	1044	602	567	1541	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1463	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1463	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	12	548	0	0	0	0	1135	654	616	1675	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	166	294	285	0	0	0	0	1135	654	616	1675	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	20.2	20.2	20.2					38.5	38.5	16.0	59.5	
Effective Green, g (s)	20.2	20.2	20.2					38.5	38.5	16.0	59.5	
Actuated g/C Ratio	0.22	0.22	0.22					0.43	0.43	0.18	0.66	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	377	328	337					2175	677	610	2339	
v/s Ratio Prot								0.22		c0.18	0.47	
v/s Ratio Perm	0.10	0.20	0.19						c0.41			
v/c Ratio	0.44	0.90	0.85					0.52	0.97	1.01	0.72	
Uniform Delay, d1	30.0	33.9	33.4					19.0	25.1	37.0	9.8	
Progression Factor	1.00	1.00	1.00					0.40	0.43	0.87	1.26	
Incremental Delay, d2	0.8	25.3	17.4					0.5	19.7	29.9	1.1	
Delay (s)	30.9	59.2	50.8					8.2	30.4	62.3	13.4	
Level of Service	C	E	D					A	C	E	B	
Approach Delay (s)		49.7			0.0			16.3			26.6	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.3									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			114.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	11	504	0	0	0	0	1044	602	567	1541	0
Future Volume (veh/h)	170	11	504	0	0	0	0	1044	602	567	1541	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	127	0	618				0	1135	654	616	1675	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	390	0	694				0	2139	664	660	2369	0
Arrive On Green	0.22	0.00	0.22				0.00	0.42	0.42	0.38	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	127	0	618				0	1135	654	616	1675	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.4	0.0	17.0				0.0	14.9	36.7	15.4	0.0	0.0
Cycle Q Clear(g_c), s	5.4	0.0	17.0				0.0	14.9	36.7	15.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	390	0	694				0	2139	664	660	2369	0
V/C Ratio(X)	0.33	0.00	0.89				0.00	0.53	0.98	0.93	0.71	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2139	664	660	2369	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.47	0.47	0.00
Uniform Delay (d), s/veh	29.6	0.0	34.1				0.0	19.5	25.9	27.2	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	12.5				0.0	0.9	31.5	11.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	0.0	11.8				0.0	9.7	25.6	8.4	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	0.0	46.6				0.0	20.5	57.3	38.8	0.9	0.0
LnGrp LOS	C	A	D				A	C	E	D	A	A
Approach Vol, veh/h	745						1789			2291		
Approach Delay, s/veh	43.8						34.0			11.1		
Approach LOS	D						C			B		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	22.3	42.8		24.9		65.1						
Change Period (Y+Rc), s	* 5.1	* 5.1		* 5.2		* 5.1						
Max Green Setting (Gmax), s	* 16	* 38		* 21		* 59						
Max Q Clear Time (g_c+I1), s	17.4	38.7		19.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.7		21.7						
Intersection Summary												
HCM 6th Ctrl Delay	24.6											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	971	7	855	16	275	262	258
v/c Ratio	0.48	0.03	0.42	0.05	0.70	0.52	0.47
Control Delay	11.7	11.0	12.7	0.3	34.3	10.3	6.3
Queue Delay	1.9	0.0	0.4	0.2	2.1	1.2	0.0
Total Delay	13.5	11.0	13.0	0.5	36.4	11.6	6.3
Queue Length 50th (ft)	117	1	236	0	107	21	0
Queue Length 95th (ft)	247	m6	278	0	190	86	53
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	232	2016	293	441	538	585
Starvation Cap Reductn	0	0	580	0	0	0	0
Spillback Cap Reductn	841	0	0	113	72	123	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.03	0.60	0.09	0.75	0.63	0.44

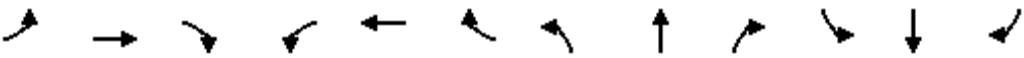
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	423
Future Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3535		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.22	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3535		409	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	964	7	7	855	0	0	0	16	327	8	460
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	155	198
Lane Group Flow (vph)	0	971	0	7	855	0	0	0	0	275	107	60
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1767		204	1769			36		393	347	352
v/s Ratio Prot		c0.27			0.24			c0.00		c0.16	0.07	
v/s Ratio Perm				0.02								0.04
v/c Ratio		0.55		0.03	0.48			0.01		0.70	0.31	0.17
Uniform Delay, d1		12.1		8.9	11.5			33.4		24.5	22.1	21.4
Progression Factor		1.00		1.02	1.22			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.3	0.8			0.1		5.4	0.5	0.2
Delay (s)		13.3		9.3	14.9			33.5		29.9	22.6	21.6
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		13.3			14.9			33.5			24.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			60.0%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	449	431	407	565	1308	1114	201
v/c Ratio	0.87	0.82	0.78	0.85	0.64	0.71	0.32
Control Delay	48.5	36.7	34.0	45.0	14.5	30.0	8.4
Queue Delay	5.2	3.3	0.0	5.1	13.2	5.4	0.0
Total Delay	53.7	39.9	34.0	50.1	27.7	35.4	8.4
Queue Length 50th (ft)	247	197	172	153	275	206	19
Queue Length 95th (ft)	#420	#367	#322	m#223	m368	258	70
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	537	547	539	682	2059	1573	624
Starvation Cap Reductn	0	0	0	72	751	0	0
Spillback Cap Reductn	49	54	0	0	0	394	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.87	0.76	0.93	1.00	0.94	0.32

Intersection Summary

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

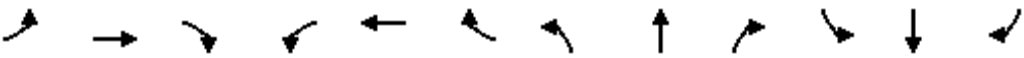
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	608	0	576	520	1203	0	1	1024	185
Future Volume (vph)	0	0	0	608	0	576	520	1203	0	1	1024	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1528	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1528	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	661	0	626	565	1308	0	1	1113	201
RTOR Reduction (vph)	0	0	0	0	60	60	0	0	0	0	0	103
Lane Group Flow (vph)	0	0	0	449	371	347	565	1308	0	0	1114	98
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				27.6	27.6	27.6	17.4	52.3			29.6	29.6
Effective Green, g (s)				27.6	27.6	27.6	17.4	52.3			29.6	29.6
Actuated g/C Ratio				0.31	0.31	0.31	0.19	0.58			0.33	0.33
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				515	468	461	663	2056			1570	520
v/s Ratio Prot							c0.16	0.37				
v/s Ratio Perm				c0.27	0.24	0.23					c0.23	0.06
v/c Ratio				0.87	0.79	0.75	0.85	0.64			0.71	0.19
Uniform Delay, d1				29.5	28.6	28.1	35.1	12.5			26.4	21.6
Progression Factor				1.00	1.00	1.00	0.95	1.01			1.00	1.00
Incremental Delay, d2				15.0	9.0	6.9	8.7	1.3			2.7	0.8
Delay (s)				44.5	37.6	35.0	41.9	13.9			29.2	22.4
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			39.2			22.4			28.1	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.9									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			90.0									
Sum of lost time (s)											15.4	
Intersection Capacity Utilization			88.2%									
ICU Level of Service											E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	608	0	576	520	1203	0	1	1024	185
Future Volume (veh/h)	0	0	0	608	0	576	520	1203	0	1	1024	185
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				856	0	417	565	1308	0	1	1113	201
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				1054	0	469	650	2104	0	40	1713	547
Arrive On Green				0.30	0.00	0.30	0.06	0.20	0.00	0.34	0.34	0.34
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				856	0	417	565	1308	0	419	695	201
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1868	1549	1585
Q Serve(g_s), s				20.0	0.0	22.6	14.6	30.3	0.0	0.0	17.0	8.6
Cycle Q Clear(g_c), s				20.0	0.0	22.6	14.6	30.3	0.0	17.0	17.0	8.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1054	0	469	650	2104	0	685	1069	547
V/C Ratio(X)				0.81	0.00	0.89	0.87	0.62	0.00	0.61	0.65	0.37
Avail Cap(c_a), veh/h				1136	0	505	687	2104	0	685	1069	547
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.80	0.80	0.00	0.36	0.36	0.36
Uniform Delay (d), s/veh				29.4	0.0	30.3	41.1	27.0	0.0	24.9	24.9	22.1
Incr Delay (d2), s/veh				4.3	0.0	16.8	9.2	1.1	0.0	1.5	1.1	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.3	0.0	15.3	11.6	20.2	0.0	10.1	8.5	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.7	0.0	47.0	50.3	28.1	0.0	26.4	26.0	22.8
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1273			1873			1315	
Approach Delay, s/veh					38.1			34.8			25.6	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	22.2	35.8		31.9		58.1						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 18	28.0		* 29		51.2						
Max Q Clear Time (g_c+I1), s	16.6	19.0		24.6		32.3						
Green Ext Time (p_c), s	0.3	5.0		2.0		9.3						
Intersection Summary												
HCM 6th Ctrl Delay				33.0								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	356	351	348	1497	776	326	1414
v/c Ratio	0.92	0.91	0.89	0.48	0.60	0.99	0.61
Control Delay	64.8	56.9	53.7	6.8	2.0	68.5	18.6
Queue Delay	0.0	0.8	0.0	0.1	0.3	0.0	49.7
Total Delay	64.8	57.8	53.7	6.9	2.2	68.5	68.2
Queue Length 50th (ft)	208	180	169	87	11	105	423
Queue Length 95th (ft)	#378	#359	#336	m95	m16	m#173	500
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	391	396	3130	1304	328	2317
Starvation Cap Reductn	0	0	0	0	134	0	1258
Spillback Cap Reductn	0	4	0	413	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.91	0.88	0.55	0.66	0.99	1.34

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	24	582	0	0	0	1	1376	714	300	1301	0
Future Volume (vph)	364	24	582	0	0	0	1	1376	714	300	1301	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.14	1.00	
Satd. Flow (perm)	1681	1480	1504					4778	1583	503	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	396	26	633	0	0	0	1	1496	776	326	1414	0
RTOR Reduction (vph)	0	46	46	0	0	0	0	0	268	0	0	0
Lane Group Flow (vph)	356	305	302	0	0	0	0	1497	508	326	1414	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Effective Green, g (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	342	347					3126	1035	329	2316	
v/s Ratio Prot											0.40	
v/s Ratio Perm	c0.21	0.21	0.20					0.31	0.32	c0.65		
v/c Ratio	0.92	0.89	0.87					0.48	0.49	0.99	0.61	
Uniform Delay, d1	33.8	33.5	33.3					7.8	7.9	15.3	8.9	
Progression Factor	1.00	1.00	1.00					0.83	2.12	1.90	1.94	
Incremental Delay, d2	26.0	23.9	20.1					0.2	0.6	37.5	0.8	
Delay (s)	59.7	57.4	53.4					6.7	17.4	66.6	18.1	
Level of Service	E	E	D					A	B	E	B	
Approach Delay (s)		56.9			0.0			10.4			27.2	
Approach LOS		E			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.8									
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			109.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	24	582	0	0	0	1	1376	714	300	1301	0
Future Volume (veh/h)	364	24	582	0	0	0	1	1376	714	300	1301	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	0	782				1	1496	776	326	1414	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	416	0	740				40	3239	1034	320	2318	0
Arrive On Green	0.23	0.00	0.23				0.65	0.65	0.65	0.44	0.44	0.00
Sat Flow, veh/h	1781	0	3170				0	4967	1585	319	3647	0
Grp Volume(v), veh/h	273	0	782				563	934	776	326	1414	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	160	1777	0
Q Serve(g_s), s	12.5	0.0	21.0				0.0	13.5	30.0	45.2	27.5	0.0
Cycle Q Clear(g_c), s	12.5	0.0	21.0				13.5	13.5	30.0	58.7	27.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	416	0	740				1259	2020	1034	320	2318	0
V/C Ratio(X)	0.66	0.00	1.06				0.45	0.46	0.75	1.02	0.61	0.00
Avail Cap(c_a), veh/h	416	0	740				1259	2020	1034	320	2318	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.57	0.57	0.00
Uniform Delay (d), s/veh	31.2	0.0	34.5				7.8	7.8	10.7	43.4	16.5	0.0
Incr Delay (d2), s/veh	3.7	0.0	49.2				1.2	0.8	5.0	42.4	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.3	0.0	19.0				8.5	7.1	15.1	8.6	16.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.0	83.7				8.9	8.6	15.7	85.8	17.2	0.0
LnGrp LOS	C	A	F				A	A	B	F	B	A
Approach Vol, veh/h	1055						2273			1740		
Approach Delay, s/veh	71.1						11.1			30.1		
Approach LOS	E						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	63.8			26.2			63.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 59			* 21			* 59					
Max Q Clear Time (g_c+I1), s	32.0			23.0			60.7					
Green Ext Time (p_c), s	16.5			0.0			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	30.1											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	867	9	750	30	221	212	200
v/c Ratio	0.44	0.03	0.38	0.11	0.64	0.55	0.43
Control Delay	12.2	13.5	14.5	0.9	33.9	19.0	6.9
Queue Delay	1.0	0.0	0.5	0.2	0.6	0.7	0.0
Total Delay	13.3	13.5	15.0	1.0	34.5	19.7	6.9
Queue Length 50th (ft)	87	3	163	0	89	47	0
Queue Length 95th (ft)	208	m8	215	0	155	112	48
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1976	274	1976	268	408	439	516
Starvation Cap Reductn	0	0	744	0	0	0	0
Spillback Cap Reductn	792	0	0	62	38	62	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.03	0.61	0.15	0.60	0.56	0.39

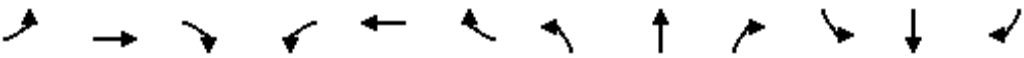
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	297
Future Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.91	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1656		1681	1518	1504
Flt Permitted		1.00		0.26	1.00			0.83		0.95	0.98	1.00
Satd. Flow (perm)		3538		491	3539			1396		1681	1518	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	865	2	9	750	0	8	0	22	303	7	323
RTOR Reduction (vph)	0	0	0	0	0	0	0	29	0	0	75	159
Lane Group Flow (vph)	0	867	0	9	750	0	0	1	0	221	137	41
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.4		35.4	35.4			3.2		14.4	14.4	14.4
Effective Green, g (s)		35.4		35.4	35.4			3.2		14.4	14.4	14.4
Actuated g/C Ratio		0.51		0.51	0.51			0.05		0.21	0.21	0.21
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1789		248	1789			63		345	312	309
v/s Ratio Prot		c0.25			0.21					c0.13	0.09	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.48		0.04	0.42			0.02		0.64	0.44	0.13
Uniform Delay, d1		11.3		8.7	10.9			31.9		25.4	24.3	22.7
Progression Factor		1.00		1.13	1.33			1.00		1.00	1.00	1.00
Incremental Delay, d2		0.9		0.2	0.6			0.1		4.0	1.0	0.2
Delay (s)		12.3		10.0	15.0			32.0		29.5	25.3	22.9
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		12.3			15.0			32.0			26.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			52.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	271	270	240	530	704	1524	395
v/c Ratio	0.76	0.78	0.47	0.80	0.30	0.71	0.59
Control Delay	46.9	48.8	7.3	36.9	5.5	24.7	26.0
Queue Delay	38.2	50.4	0.0	1.1	0.4	0.2	0.0
Total Delay	85.1	99.2	7.3	38.0	5.9	24.9	26.0
Queue Length 50th (ft)	147	150	0	123	65	275	182
Queue Length 95th (ft)	237	#253	60	188	107	334	285
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	405	389	544	713	2386	2143	667
Starvation Cap Reductn	0	0	0	55	1079	0	0
Spillback Cap Reductn	144	138	0	0	0	102	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.08	0.44	0.81	0.54	0.75	0.59

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	471	2	246	488	648	0	0	1402	363
Future Volume (vph)	0	0	0	471	2	246	488	648	0	0	1402	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.98	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1598	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1598	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	512	2	267	530	704	0	0	1524	395
RTOR Reduction (vph)	0	0	0	0	5	189	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	271	265	51	530	704	0	0	1524	395
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.2	19.2	19.2	17.5	60.7			37.9	37.9
Effective Green, g (s)				19.2	19.2	19.2	17.5	60.7			37.9	37.9
Actuated g/C Ratio				0.21	0.21	0.21	0.19	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				358	340	320	667	2386			2141	666
v/s Ratio Prot							c0.15	0.20			c0.30	
v/s Ratio Perm				0.16	0.17	0.03						0.25
v/c Ratio				0.76	0.78	0.16	0.79	0.30			0.71	0.59
Uniform Delay, d1				33.2	33.4	28.8	34.5	6.0			21.5	20.1
Progression Factor				1.00	1.00	1.00	0.82	0.82			1.00	1.00
Incremental Delay, d2				8.8	11.0	0.2	5.9	0.3			2.0	3.9
Delay (s)				42.1	44.4	29.1	34.0	5.2			23.6	24.0
Level of Service				D	D	C	C	A			C	C
Approach Delay (s)		0.0			38.9			17.6			23.7	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.8									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			102.8%								G	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	471	2	246	488	648	0	0	1402	363
Future Volume (veh/h)	0	0	0	471	2	246	488	648	0	0	1402	363
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				596	0	179	530	704	0	0	1524	395
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				710	0	316	604	2447	0	0	2323	721
Arrive On Green				0.20	0.00	0.20	0.35	1.00	0.00	0.00	0.46	0.46
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				596	0	179	530	704	0	0	1524	395
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				14.5	0.0	9.2	13.0	0.0	0.0	0.0	20.9	16.3
Cycle Q Clear(g_c), s				14.5	0.0	9.2	13.0	0.0	0.0	0.0	20.9	16.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				710	0	316	604	2447	0	0	2323	721
V/C Ratio(X)				0.84	0.00	0.57	0.88	0.29	0.00	0.00	0.66	0.55
Avail Cap(c_a), veh/h				859	0	382	718	2447	0	0	2323	721
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	0.28	0.28
Uniform Delay (d), s/veh				34.7	0.0	32.5	28.4	0.0	0.0	0.0	19.1	17.8
Incr Delay (d2), s/veh				6.4	0.0	1.6	9.5	0.3	0.0	0.0	0.4	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				10.7	0.0	6.2	8.4	0.2	0.0	0.0	10.1	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				41.0	0.0	34.1	37.9	0.3	0.0	0.0	19.5	18.6
LnGrp LOS				D	A	C	D	A	A	A	B	B
Approach Vol, veh/h					775			1234			1919	
Approach Delay, s/veh					39.4			16.4			19.3	
Approach LOS					D			B			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.0	45.8		23.2		66.8						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 19	34.2		* 22		58.2						
Max Q Clear Time (g_c+I1), s	15.0	22.9		16.5		2.0						
Green Ext Time (p_c), s	0.8	8.2		1.4		5.5						

Intersection Summary

HCM 6th Ctrl Delay 22.4

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	153	245	243	1080	610	563	1479
v/c Ratio	0.44	0.81	0.78	0.48	0.86	0.94	0.62
Control Delay	34.6	54.2	51.3	7.9	21.5	52.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.1	22.7
Total Delay	34.6	54.2	51.3	7.9	21.5	53.6	34.3
Queue Length 50th (ft)	77	141	133	65	140	128	230
Queue Length 95th (ft)	137	#257	#238	97	#512	#263	302
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	342	350	2273	707	602	2399
Starvation Cap Reductn	0	0	0	0	0	6	969
Spillback Cap Reductn	0	0	0	79	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.72	0.69	0.49	0.86	0.94	1.03

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	11	422	0	0	0	0	994	561	518	1361	0
Future Volume (vph)	156	11	422	0	0	0	0	994	561	518	1361	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1466	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1466	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	12	459	0	0	0	0	1080	610	563	1479	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	153	245	243	0	0	0	0	1080	610	563	1479	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	18.7	18.7	18.7					40.2	40.2	15.8	61.0	
Effective Green, g (s)	18.7	18.7	18.7					40.2	40.2	15.8	61.0	
Actuated g/C Ratio	0.21	0.21	0.21					0.45	0.45	0.18	0.68	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	304	312					2271	707	602	2398	
v/s Ratio Prot								0.21		c0.16	0.42	
v/s Ratio Perm	0.09	0.17	0.16						c0.39			
v/c Ratio	0.44	0.81	0.78					0.48	0.86	0.94	0.62	
Uniform Delay, d1	31.1	33.9	33.7					17.5	22.4	36.6	8.0	
Progression Factor	1.00	1.00	1.00					0.41	0.42	0.86	1.24	
Incremental Delay, d2	0.9	14.4	11.6					0.5	9.7	17.0	0.8	
Delay (s)	32.0	48.3	45.3					7.7	19.0	48.5	10.8	
Level of Service	C	D	D					A	B	D	B	
Approach Delay (s)		43.3			0.0			11.8			21.2	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.8									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			102.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	11	422	0	0	0	0	994	561	518	1361	0
Future Volume (veh/h)	156	11	422	0	0	0	0	994	561	518	1361	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	117	0	523				0	1080	610	563	1479	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	346	0	616				0	2140	664	745	2457	0
Arrive On Green	0.19	0.00	0.19				0.00	0.42	0.42	0.43	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	117	0	523				0	1080	610	563	1479	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.1	0.0	14.3				0.0	14.0	32.7	12.4	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	14.3				0.0	14.0	32.7	12.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	346	0	616				0	2140	664	745	2457	0
V/C Ratio(X)	0.34	0.00	0.85				0.00	0.50	0.92	0.76	0.60	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2196	682	745	2457	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	31.3	0.0	35.0				0.0	19.3	24.7	23.6	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	8.0				0.0	0.9	19.8	2.8	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	0.0	9.9				0.0	9.2	21.3	6.7	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	43.0				0.0	20.1	44.5	26.4	0.7	0.0
LnGrp LOS	C	A	D				A	C	D	C	A	A
Approach Vol, veh/h	640						1690			2042		
Approach Delay, s/veh	40.9						28.9			7.8		
Approach LOS	D						C			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	24.5	42.8	22.7		67.3							
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.2		* 5.1							
Max Green Setting (Gmax), s	* 15	* 39	* 21		* 59							
Max Q Clear Time (g_c+I1), s	14.4	34.7	16.3		2.0							
Green Ext Time (p_c), s	0.2	3.0	1.2		17.2							

Intersection Summary

HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	889	5	784	15	253	242	237
v/c Ratio	0.44	0.02	0.39	0.05	0.64	0.49	0.44
Control Delay	11.5	11.0	11.9	0.3	31.5	9.8	6.1
Queue Delay	1.0	0.0	0.3	0.1	0.7	0.7	0.0
Total Delay	12.5	11.0	12.3	0.4	32.1	10.5	6.1
Queue Length 50th (ft)	100	1	128	0	100	19	0
Queue Length 95th (ft)	226	m5	245	0	171	79	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	267	2016	302	466	545	587
Starvation Cap Reductn	0	0	618	0	0	0	0
Spillback Cap Reductn	800	0	0	90	54	101	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.02	0.56	0.07	0.61	0.55	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	390
Future Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3536		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.25	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3536		470	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	884	5	5	784	0	0	0	15	301	7	424
RTOR Reduction (vph)	0	1	0	0	0	0	0	15	0	0	143	181
Lane Group Flow (vph)	0	889	0	5	784	0	0	0	0	253	99	56
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1768		235	1769			36		393	347	352
v/s Ratio Prot		c0.25			0.22			c0.00		c0.15	0.07	
v/s Ratio Perm				0.01								0.04
v/c Ratio		0.50		0.02	0.44			0.01		0.64	0.28	0.16
Uniform Delay, d1		11.7		8.8	11.2			33.4		24.2	22.0	21.3
Progression Factor		1.00		0.98	1.16			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.1	0.7			0.1		3.6	0.5	0.2
Delay (s)		12.7		8.8	13.7			33.5		27.8	22.4	21.5
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		12.7			13.7			33.5			24.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.9%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	409	397	378	488	1179	1040	184
v/c Ratio	0.83	0.78	0.75	0.80	0.56	0.61	0.28
Control Delay	44.8	33.8	32.0	44.7	13.1	26.4	6.9
Queue Delay	3.7	2.7	0.0	1.5	2.9	1.3	0.0
Total Delay	48.5	36.6	32.0	46.2	16.0	27.7	6.9
Queue Length 50th (ft)	217	171	152	128	221	185	12
Queue Length 95th (ft)	#363	293	264	m#186	318	232	58
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	536	546	538	637	2103	1709	665
Starvation Cap Reductn	0	0	0	48	782	0	0
Spillback Cap Reductn	66	70	0	0	0	426	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.83	0.70	0.83	0.89	0.81	0.28

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	562	0	527	449	1085	0	1	956	169
Future Volume (vph)	0	0	0	562	0	527	449	1085	0	1	956	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1531	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1531	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	611	0	573	488	1179	0	1	1039	184
RTOR Reduction (vph)	0	0	0	0	61	61	0	0	0	0	0	99
Lane Group Flow (vph)	0	0	0	409	336	317	488	1179	0	0	1040	85
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				26.4	26.4	26.4	16.0	53.5			32.2	32.2
Effective Green, g (s)				26.4	26.4	26.4	16.0	53.5			32.2	32.2
Actuated g/C Ratio				0.29	0.29	0.29	0.18	0.59			0.36	0.36
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				493	449	441	610	2103			1708	566
v/s Ratio Prot							c0.14	0.33				
v/s Ratio Perm				c0.24	0.22	0.21					c0.22	0.05
v/c Ratio				0.83	0.75	0.72	0.80	0.56			0.61	0.15
Uniform Delay, d1				29.7	28.8	28.5	35.5	11.1			23.7	19.6
Progression Factor				1.00	1.00	1.00	0.98	1.03			1.00	1.00
Incremental Delay, d2				11.1	6.7	5.6	6.6	1.0			1.6	0.6
Delay (s)				40.8	35.5	34.0	41.3	12.4			25.4	20.2
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			36.9			20.9			24.6	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			81.8%								D	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	562	0	527	449	1085	0	1	956	169
Future Volume (veh/h)	0	0	0	562	0	527	449	1085	0	1	956	169
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				789	0	382	488	1179	0	1	1039	184
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				993	0	442	577	2164	0	40	1903	607
Arrive On Green				0.28	0.00	0.28	0.06	0.20	0.00	0.38	0.38	0.38
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				789	0	382	488	1179	0	391	649	184
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				18.5	0.0	20.6	12.6	26.8	0.0	0.0	14.7	7.3
Cycle Q Clear(g_c), s				18.5	0.0	20.6	12.6	26.8	0.0	14.7	14.7	7.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				993	0	442	577	2164	0	756	1187	607
V/C Ratio(X)				0.79	0.00	0.86	0.85	0.54	0.00	0.52	0.55	0.30
Avail Cap(c_a), veh/h				1136	0	505	641	2164	0	756	1187	607
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.50	0.50	0.50
Uniform Delay (d), s/veh				30.1	0.0	30.8	41.4	24.8	0.0	21.7	21.7	19.4
Incr Delay (d2), s/veh				3.5	0.0	13.2	8.1	0.8	0.0	1.3	0.9	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.4	0.0	13.8	10.3	18.2	0.0	9.3	7.8	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.6	0.0	44.0	49.5	25.6	0.0	22.9	22.6	20.0
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1171			1667			1224	
Approach Delay, s/veh					37.0			32.6			22.3	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.3	39.3		30.4		59.6						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 17	29.2		* 29		51.2						
Max Q Clear Time (g_c+I1), s	14.6	16.7		22.6		28.8						
Green Ext Time (p_c), s	0.4	5.8		2.5		9.0						
Intersection Summary												
HCM 6th Ctrl Delay				30.8								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	329	315	1324	693	298	1324
v/c Ratio	0.83	0.83	0.78	0.43	0.55	0.73	0.58
Control Delay	51.0	44.1	39.4	8.2	2.3	31.9	17.6
Queue Delay	0.0	0.2	0.0	0.0	0.2	0.0	49.6
Total Delay	51.0	44.3	39.4	8.2	2.5	31.9	67.2
Queue Length 50th (ft)	181	152	135	81	13	95	413
Queue Length 95th (ft)	#314	#300	#263	m91	m18	m#141	466
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	426	425	432	3108	1272	409	2304
Starvation Cap Reductn	0	0	0	0	123	0	1213
Spillback Cap Reductn	0	4	0	321	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.78	0.73	0.48	0.60	0.73	1.21

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	22	537	0	0	0	1	1217	638	274	1218	0
Future Volume (vph)	333	22	537	0	0	0	1	1217	638	274	1218	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1479	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.17	1.00	
Satd. Flow (perm)	1681	1479	1504					4778	1583	628	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	24	584	0	0	0	1	1323	693	298	1324	0
RTOR Reduction (vph)	0	51	51	0	0	0	0	0	242	0	0	0
Lane Group Flow (vph)	326	278	264	0	0	0	0	1324	451	298	1324	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	21.1	21.1	21.1					58.6	58.6	58.6	58.6	
Effective Green, g (s)	21.1	21.1	21.1					58.6	58.6	58.6	58.6	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	394	346	352					3111	1030	408	2304	
v/s Ratio Prot											0.37	
v/s Ratio Perm	c0.19	0.19	0.18					0.28	0.28	c0.47		
v/c Ratio	0.83	0.80	0.75					0.43	0.44	0.73	0.57	
Uniform Delay, d1	32.7	32.5	32.0					7.6	7.7	10.4	8.8	
Progression Factor	1.00	1.00	1.00					1.00	2.22	1.82	1.80	
Incremental Delay, d2	13.3	12.6	8.5					0.2	0.6	8.3	0.8	
Delay (s)	46.0	45.1	40.5					7.8	17.6	27.3	16.5	
Level of Service	D	D	D					A	B	C	B	
Approach Delay (s)		43.9			0.0			11.2			18.5	
Approach LOS		D			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			20.7									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			101.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	22	537	0	0	0	1	1217	638	274	1218	0
Future Volume (veh/h)	333	22	537	0	0	0	1	1217	638	274	1218	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	249	0	721				1	1323	693	298	1324	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	442	0	787				40	3166	1010	368	2265	0
Arrive On Green	0.25	0.00	0.25				0.64	0.64	0.64	0.43	0.43	0.00
Sat Flow, veh/h	1781	0	3170				0	4966	1585	411	3647	0
Grp Volume(v), veh/h	249	0	721				498	826	693	298	1324	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	206	1777	0
Q Serve(g_s), s	11.0	0.0	19.9				0.0	11.9	25.4	45.5	25.6	0.0
Cycle Q Clear(g_c), s	11.0	0.0	19.9				11.9	11.9	25.4	57.4	25.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	442	0	787				1231	1974	1010	368	2265	0
V/C Ratio(X)	0.56	0.00	0.92				0.40	0.42	0.69	0.81	0.58	0.00
Avail Cap(c_a), veh/h	451	0	803				1231	1974	1010	368	2265	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.69	0.69	0.00
Uniform Delay (d), s/veh	29.6	0.0	32.9				8.1	8.1	10.5	38.6	16.7	0.0
Incr Delay (d2), s/veh	1.5	0.0	15.0				1.0	0.7	3.8	12.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.1	0.0	13.6				7.8	6.4	13.2	6.8	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	0.0	48.0				9.1	8.7	14.3	51.1	17.5	0.0
LnGrp LOS	C	A	D				A	A	B	D	B	A
Approach Vol, veh/h	970						2017			1622		
Approach Delay, s/veh	43.6						10.7			23.6		
Approach LOS	D						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	62.5			27.5			62.5					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 57			* 23			* 57					
Max Q Clear Time (g_c+I1), s	27.4			21.9			59.4					
Green Ext Time (p_c), s	15.0			0.4			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	22.2											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	947	10	818	33	238	229	220
v/c Ratio	0.49	0.04	0.42	0.12	0.66	0.58	0.44
Control Delay	13.3	13.6	14.0	0.9	33.5	20.1	6.5
Queue Delay	2.2	0.0	0.6	0.3	1.1	1.0	0.0
Total Delay	15.5	13.6	14.6	1.3	34.6	21.2	6.5
Queue Length 50th (ft)	102	3	187	0	95	56	0
Queue Length 95th (ft)	239	m9	m233	0	164	123	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1938	231	1938	267	432	457	550
Starvation Cap Reductn	0	0	678	0	0	0	0
Spillback Cap Reductn	812	0	0	80	62	81	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.04	0.65	0.18	0.64	0.61	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	321
Future Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.92	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1657		1681	1521	1504
Flt Permitted		1.00		0.23	1.00			0.82		0.95	0.98	1.00
Satd. Flow (perm)		3538		423	3539			1382		1681	1521	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	945	2	10	818	0	9	0	24	330	8	349
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	70	173
Lane Group Flow (vph)	0	947	0	10	818	0	0	2	0	238	159	47
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.7		34.7	34.7			3.2		15.1	15.1	15.1
Effective Green, g (s)		34.7		34.7	34.7			3.2		15.1	15.1	15.1
Actuated g/C Ratio		0.50		0.50	0.50			0.05		0.22	0.22	0.22
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1753		209	1754			63		362	328	324
v/s Ratio Prot		c0.27			0.23					c0.14	0.10	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.54		0.05	0.47			0.02		0.66	0.49	0.15
Uniform Delay, d1		12.2		9.1	11.6			31.9		25.1	24.0	22.2
Progression Factor		1.00		1.07	1.18			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.4	0.7			0.2		4.3	1.1	0.2
Delay (s)		13.4		10.1	14.5			32.1		29.4	25.2	22.4
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		13.4			14.4			32.1			25.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			54.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	294	291	263	575	761	1654	432
v/c Ratio	0.82	0.84	0.52	0.84	0.32	0.78	0.66
Control Delay	53.0	55.3	9.3	38.8	5.0	26.7	27.9
Queue Delay	58.1	57.8	0.0	2.0	0.5	0.6	0.0
Total Delay	111.0	113.1	9.3	40.9	5.5	27.3	27.9
Queue Length 50th (ft)	165	168	10	141	34	304	201
Queue Length 95th (ft)	#291	#306	77	#234	42	366	313
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	386	372	531	713	2385	2111	657
Starvation Cap Reductn	0	0	0	53	1078	0	0
Spillback Cap Reductn	139	132	0	0	0	168	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	1.21	0.50	0.87	0.58	0.85	0.66

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	510	2	269	529	700	0	0	1522	397
Future Volume (vph)	0	0	0	510	2	269	529	700	0	0	1522	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1598	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1598	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	554	2	292	575	761	0	0	1654	432
RTOR Reduction (vph)	0	0	0	0	5	190	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	294	286	73	575	761	0	0	1654	432
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.2	19.2	19.2	18.0	60.7			37.4	37.4
Effective Green, g (s)				19.2	19.2	19.2	18.0	60.7			37.4	37.4
Actuated g/C Ratio				0.21	0.21	0.21	0.20	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				358	340	320	686	2386			2113	657
v/s Ratio Prot							c0.17	0.22			c0.33	
v/s Ratio Perm				0.17	0.18	0.05						0.27
v/c Ratio				0.82	0.84	0.23	0.84	0.32			0.78	0.66
Uniform Delay, d1				33.8	33.9	29.3	34.6	6.1			22.8	21.1
Progression Factor				1.00	1.00	1.00	0.81	0.73			1.00	1.00
Incremental Delay, d2				14.0	16.9	0.4	7.8	0.3			3.0	5.1
Delay (s)				47.8	50.9	29.6	35.7	4.8			25.8	26.2
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)		0.0			43.2			18.1			25.9	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.9									
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			110.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	510	2	269	529	700	0	0	1522	397
Future Volume (veh/h)	0	0	0	510	2	269	529	700	0	0	1522	397
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				646	0	195	575	761	0	0	1654	432
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				744	0	331	642	2413	0	0	2217	688
Arrive On Green				0.21	0.00	0.21	0.37	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				646	0	195	575	761	0	0	1654	432
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				15.8	0.0	10.0	14.1	0.0	0.0	0.0	24.4	19.1
Cycle Q Clear(g_c), s				15.8	0.0	10.0	14.1	0.0	0.0	0.0	24.4	19.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				744	0	331	642	2413	0	0	2217	688
V/C Ratio(X)				0.87	0.00	0.59	0.90	0.32	0.00	0.00	0.75	0.63
Avail Cap(c_a), veh/h				819	0	365	718	2413	0	0	2217	688
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.00	0.18	0.18
Uniform Delay (d), s/veh				34.4	0.0	32.1	27.4	0.0	0.0	0.0	21.3	19.8
Incr Delay (d2), s/veh				9.2	0.0	2.1	11.3	0.3	0.0	0.0	0.4	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				11.8	0.0	6.8	8.9	0.2	0.0	0.0	11.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				43.6	0.0	34.2	38.7	0.3	0.0	0.0	21.7	20.6
LnGrp LOS				D	A	C	D	A	A	A	C	C
Approach Vol, veh/h					841			1336			2086	
Approach Delay, s/veh					41.5			16.8			21.5	
Approach LOS					D			B			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	22.0	43.9		24.1		65.9						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 19	35.2		* 21		59.2						
Max Q Clear Time (g_c+I1), s	16.1	26.4		17.8		2.0						
Green Ext Time (p_c), s	0.6	7.0		1.0		6.1						

Intersection Summary

HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	264	262	1168	662	616	1600
v/c Ratio	0.46	0.85	0.82	0.52	0.95	1.01	0.67
Control Delay	34.9	58.4	54.6	8.5	32.5	64.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	15.5	37.7
Total Delay	34.9	58.4	54.6	8.5	32.5	79.6	49.7
Queue Length 50th (ft)	85	154	146	80	153	~151	244
Queue Length 95th (ft)	148	#287	#266	113	m#560	m#288	318
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2232	694	610	2379
Starvation Cap Reductn	0	0	0	0	0	28	890
Spillback Cap Reductn	0	0	0	67	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.77	0.75	0.54	0.95	1.06	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	11	455	0	0	0	0	1075	609	567	1472	0
Future Volume (vph)	170	11	455	0	0	0	0	1075	609	567	1472	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1465	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1465	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	12	495	0	0	0	0	1168	662	616	1600	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	166	264	262	0	0	0	0	1168	662	616	1600	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	19.2	19.2	19.2					39.5	39.5	16.0	60.5	
Effective Green, g (s)	19.2	19.2	19.2					39.5	39.5	16.0	60.5	
Actuated g/C Ratio	0.21	0.21	0.21					0.44	0.44	0.18	0.67	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	358	312	320					2231	694	610	2378	
v/s Ratio Prot								0.23		c0.18	0.45	
v/s Ratio Perm	0.10	0.18	0.17						c0.42			
v/c Ratio	0.46	0.85	0.82					0.52	0.95	1.01	0.67	
Uniform Delay, d1	30.9	34.0	33.7					18.4	24.4	37.0	8.8	
Progression Factor	1.00	1.00	1.00					0.42	0.43	0.85	1.18	
Incremental Delay, d2	1.0	18.6	14.9					0.5	17.8	30.8	0.9	
Delay (s)	31.9	52.6	48.7					8.2	28.4	62.1	11.3	
Level of Service	C	D	D					A	C	E	B	
Approach Delay (s)		46.1			0.0			15.5			25.4	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.6									
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			110.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	11	455	0	0	0	0	1075	609	567	1472	0
Future Volume (veh/h)	170	11	455	0	0	0	0	1075	609	567	1472	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	127	0	565				0	1168	662	616	1600	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	366	0	652				0	2139	664	706	2416	0
Arrive On Green	0.21	0.00	0.21				0.00	0.42	0.42	0.41	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	127	0	565				0	1168	662	616	1600	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.5	0.0	15.5				0.0	15.5	37.5	14.7	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	15.5				0.0	15.5	37.5	14.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	366	0	652				0	2139	664	706	2416	0
V/C Ratio(X)	0.35	0.00	0.87				0.00	0.55	1.00	0.87	0.66	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2139	664	706	2416	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.52	0.52	0.00
Uniform Delay (d), s/veh	30.6	0.0	34.5				0.0	19.7	26.1	25.5	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	9.7				0.0	1.0	34.2	6.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	10.7				0.0	10.0	26.5	7.7	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	0.0	44.3				0.0	20.7	60.3	32.1	0.8	0.0
LnGrp LOS	C	A	D				A	C	E	C	A	A
Approach Vol, veh/h	692						1830			2216		
Approach Delay, s/veh	41.9						35.0			9.5		
Approach LOS	D						D			A		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	23.5	42.8		23.7		66.3						
Change Period (Y+Rc), s	* 5.1	* 5.1		* 5.2		* 5.1						
Max Green Setting (Gmax), s	* 16	* 38		* 21		* 59						
Max Q Clear Time (g_c+I1), s	16.7	39.5		17.5		2.0						
Green Ext Time (p_c), s	0.0	0.0		1.0		19.9						
Intersection Summary												
HCM 6th Ctrl Delay	24.1											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	971	7	855	16	275	263	258
v/c Ratio	0.48	0.03	0.42	0.05	0.70	0.52	0.47
Control Delay	11.7	11.0	12.7	0.3	34.3	10.3	6.3
Queue Delay	1.9	0.0	0.4	0.2	2.1	1.3	0.0
Total Delay	13.5	11.0	13.0	0.5	36.4	11.6	6.3
Queue Length 50th (ft)	117	1	236	0	107	21	0
Queue Length 95th (ft)	247	m6	278	0	190	86	53
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	232	2016	293	441	539	585
Starvation Cap Reductn	0	0	580	0	0	0	0
Spillback Cap Reductn	841	0	0	113	72	123	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.03	0.60	0.09	0.75	0.63	0.44

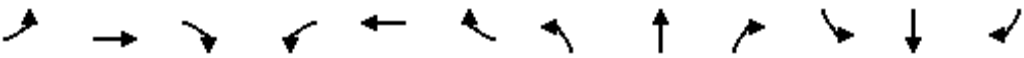
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	424
Future Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3535		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.22	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3535		409	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	964	7	7	855	0	0	0	16	327	8	461
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	155	198
Lane Group Flow (vph)	0	971	0	7	855	0	0	0	0	275	108	60
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1767		204	1769			36		393	347	352
v/s Ratio Prot		c0.27			0.24			c0.00		c0.16	0.07	
v/s Ratio Perm				0.02								0.04
v/c Ratio		0.55		0.03	0.48			0.01		0.70	0.31	0.17
Uniform Delay, d1		12.1		8.9	11.5			33.4		24.5	22.1	21.4
Progression Factor		1.00		1.02	1.22			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.3	0.8			0.1		5.4	0.5	0.2
Delay (s)		13.3		9.3	14.9			33.5		29.9	22.6	21.6
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		13.3			14.9			33.5			24.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			60.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	450	431	407	527	1278	1128	201
v/c Ratio	0.86	0.80	0.77	0.84	0.63	0.71	0.32
Control Delay	45.9	34.9	32.4	45.0	15.9	29.9	8.5
Queue Delay	3.6	2.4	0.0	2.7	13.9	5.6	0.0
Total Delay	49.5	37.3	32.4	47.7	29.8	35.5	8.5
Queue Length 50th (ft)	244	193	169	143	268	210	19
Queue Length 95th (ft)	#410	#356	#290	m#208	m359	262	70
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	554	562	553	647	2032	1585	627
Starvation Cap Reductn	0	0	0	51	757	0	0
Spillback Cap Reductn	49	54	0	0	0	395	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.74	0.88	1.00	0.95	0.32

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	609	0	576	485	1176	0	1	1037	185
Future Volume (vph)	0	0	0	609	0	576	485	1176	0	1	1037	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1528	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1528	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	662	0	626	527	1278	0	1	1127	201
RTOR Reduction (vph)	0	0	0	0	59	59	0	0	0	0	0	102
Lane Group Flow (vph)	0	0	0	450	372	348	527	1278	0	0	1128	99
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				28.2	28.2	28.2	16.5	51.7			29.9	29.9
Effective Green, g (s)				28.2	28.2	28.2	16.5	51.7			29.9	29.9
Actuated g/C Ratio				0.31	0.31	0.31	0.18	0.57			0.33	0.33
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				526	478	471	629	2032			1586	525
v/s Ratio Prot							c0.15	0.36				
v/s Ratio Perm				c0.27	0.24	0.23					c0.24	0.06
v/c Ratio				0.86	0.78	0.74	0.84	0.63			0.71	0.19
Uniform Delay, d1				29.0	28.1	27.6	35.5	12.8			26.3	21.4
Progression Factor				1.00	1.00	1.00	0.95	1.10			1.00	1.00
Incremental Delay, d2				12.9	7.8	6.0	8.1	1.3			2.7	0.8
Delay (s)				41.8	35.9	33.6	41.7	15.2			29.0	22.2
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			37.2			23.0			28.0	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.6									
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			87.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	609	0	576	485	1176	0	1	1037	185
Future Volume (veh/h)	0	0	0	609	0	576	485	1176	0	1	1037	185
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				857	0	417	527	1278	0	1	1127	201
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				1066	0	474	611	2092	0	40	1753	559
Arrive On Green				0.30	0.00	0.30	0.06	0.19	0.00	0.35	0.35	0.35
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				857	0	417	527	1278	0	424	704	201
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				20.0	0.0	22.5	13.6	29.6	0.0	0.0	17.1	8.5
Cycle Q Clear(g_c), s				20.0	0.0	22.5	13.6	29.6	0.0	17.1	17.1	8.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1066	0	474	611	2092	0	700	1093	559
V/C Ratio(X)				0.80	0.00	0.88	0.86	0.61	0.00	0.61	0.64	0.36
Avail Cap(c_a), veh/h				1176	0	523	649	2092	0	700	1093	559
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.82	0.82	0.00	0.36	0.36	0.36
Uniform Delay (d), s/veh				29.1	0.0	30.0	41.3	26.8	0.0	24.4	24.4	21.6
Incr Delay (d2), s/veh				3.8	0.0	14.8	9.3	1.1	0.0	1.4	1.1	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.2	0.0	15.0	11.0	19.8	0.0	10.1	8.5	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.9	0.0	44.8	50.6	27.9	0.0	25.8	25.4	22.2
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1274			1805			1329	
Approach Delay, s/veh					36.8			34.5			25.1	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.2	36.6		32.2		57.8						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 17	28.0		* 30		50.2						
Max Q Clear Time (g_c+I1), s	15.6	19.1		24.5		31.6						
Green Ext Time (p_c), s	0.3	5.0		2.4		9.0						
Intersection Summary												
HCM 6th Ctrl Delay				32.3								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	356	352	349	1429	751	326	1430
v/c Ratio	0.92	0.91	0.89	0.46	0.58	0.91	0.62
Control Delay	64.8	58.5	54.6	7.7	1.9	49.6	19.2
Queue Delay	0.0	0.9	0.0	0.1	0.3	0.0	49.6
Total Delay	64.8	59.4	54.6	7.8	2.2	49.6	68.8
Queue Length 50th (ft)	208	182	171	83	10	104	435
Queue Length 95th (ft)	#378	#362	#340	m91	m16	m#164	498
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	389	395	3127	1295	359	2317
Starvation Cap Reductn	0	0	0	0	132	0	1236
Spillback Cap Reductn	0	4	0	416	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.91	0.88	0.53	0.65	0.91	1.32

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	24	584	0	0	0	1	1314	691	300	1316	0
Future Volume (vph)	364	24	584	0	0	0	1	1314	691	300	1316	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.15	1.00	
Satd. Flow (perm)	1681	1480	1504					4777	1583	550	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	396	26	635	0	0	0	1	1428	751	326	1430	0
RTOR Reduction (vph)	0	45	45	0	0	0	0	0	260	0	0	0
Lane Group Flow (vph)	356	307	304	0	0	0	0	1429	491	326	1430	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Effective Green, g (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	342	347					3126	1035	359	2316	
v/s Ratio Prot											0.40	
v/s Ratio Perm	c0.21	0.21	0.20					0.30	0.31	c0.59		
v/c Ratio	0.92	0.90	0.88					0.46	0.47	0.91	0.62	
Uniform Delay, d1	33.8	33.6	33.4					7.7	7.8	13.2	9.0	
Progression Factor	1.00	1.00	1.00					0.97	2.11	1.92	1.99	
Incremental Delay, d2	26.0	24.9	21.2					0.2	0.6	21.3	0.8	
Delay (s)	59.7	58.5	54.6					7.6	17.0	46.7	18.8	
Level of Service	E	E	D					A	B	D	B	
Approach Delay (s)		57.6			0.0			10.8			24.0	
Approach LOS		E			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.4									
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			108.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	24	584	0	0	0	1	1314	691	300	1316	0
Future Volume (veh/h)	364	24	584	0	0	0	1	1314	691	300	1316	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	0	784				1	1428	751	326	1430	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	416	0	740				40	3239	1034	339	2318	0
Arrive On Green	0.23	0.00	0.23				0.65	0.65	0.65	0.44	0.44	0.00
Sat Flow, veh/h	1781	0	3170				0	4966	1585	350	3647	0
Grp Volume(v), veh/h	273	0	784				538	891	751	326	1430	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	175	1777	0
Q Serve(g_s), s	12.5	0.0	21.0				0.0	12.6	28.2	46.1	27.9	0.0
Cycle Q Clear(g_c), s	12.5	0.0	21.0				12.6	12.6	28.2	58.7	27.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	416	0	740				1259	2020	1034	339	2318	0
V/C Ratio(X)	0.66	0.00	1.06				0.43	0.44	0.73	0.96	0.62	0.00
Avail Cap(c_a), veh/h	416	0	740				1259	2020	1034	339	2318	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.58	0.58	0.00
Uniform Delay (d), s/veh	31.2	0.0	34.5				7.6	7.6	10.3	42.0	16.7	0.0
Incr Delay (d2), s/veh	3.7	0.0	50.1				1.1	0.7	4.5	28.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.3	0.0	19.1				8.1	6.6	14.2	7.9	16.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.0	84.6				8.7	8.3	14.8	70.8	17.4	0.0
LnGrp LOS	C	A	F				A	A	B	E	B	A
Approach Vol, veh/h	1057						2180			1756		
Approach Delay, s/veh	71.8						10.7			27.3		
Approach LOS	E						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	63.8			26.2			63.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 59			* 21			* 59					
Max Q Clear Time (g_c+I1), s	30.2			23.0			60.7					
Green Ext Time (p_c), s	16.3			0.0			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	29.5											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	867	9	750	30	221	212	200
v/c Ratio	0.44	0.03	0.38	0.11	0.64	0.55	0.43
Control Delay	12.2	13.5	14.5	0.9	33.9	19.0	6.9
Queue Delay	1.0	0.0	0.5	0.2	0.6	0.7	0.0
Total Delay	13.3	13.5	15.0	1.0	34.5	19.7	6.9
Queue Length 50th (ft)	87	3	163	0	89	47	0
Queue Length 95th (ft)	208	m8	215	0	155	112	48
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1976	274	1976	268	408	439	516
Starvation Cap Reductn	0	0	744	0	0	0	0
Spillback Cap Reductn	792	0	0	62	38	62	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.03	0.61	0.15	0.60	0.56	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	297
Future Volume (vph)	0	796	2	8	690	0	7	0	20	279	6	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.91	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1656		1681	1518	1504
Flt Permitted		1.00		0.26	1.00			0.83		0.95	0.98	1.00
Satd. Flow (perm)		3538		491	3539			1396		1681	1518	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	865	2	9	750	0	8	0	22	303	7	323
RTOR Reduction (vph)	0	0	0	0	0	0	0	29	0	0	75	159
Lane Group Flow (vph)	0	867	0	9	750	0	0	1	0	221	137	41
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.4		35.4	35.4			3.2		14.4	14.4	14.4
Effective Green, g (s)		35.4		35.4	35.4			3.2		14.4	14.4	14.4
Actuated g/C Ratio		0.51		0.51	0.51			0.05		0.21	0.21	0.21
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1789		248	1789			63		345	312	309
v/s Ratio Prot		c0.25			0.21					c0.13	0.09	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.48		0.04	0.42			0.02		0.64	0.44	0.13
Uniform Delay, d1		11.3		8.7	10.9			31.9		25.4	24.3	22.7
Progression Factor		1.00		1.13	1.33			1.00		1.00	1.00	1.00
Incremental Delay, d2		0.9		0.2	0.6			0.1		4.0	1.0	0.2
Delay (s)		12.3		10.0	15.0			32.0		29.5	25.3	22.9
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		12.3			15.0			32.0			26.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			52.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	271	270	240	530	704	1524	395
v/c Ratio	0.76	0.78	0.47	0.80	0.30	0.71	0.59
Control Delay	46.9	48.8	7.3	36.4	5.6	24.7	26.0
Queue Delay	38.2	50.4	0.0	1.1	0.4	0.2	0.0
Total Delay	85.1	99.2	7.3	37.5	6.0	24.9	26.0
Queue Length 50th (ft)	147	150	0	124	65	275	182
Queue Length 95th (ft)	237	#253	60	188	108	334	285
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	405	389	544	713	2386	2143	667
Starvation Cap Reductn	0	0	0	55	1079	0	0
Spillback Cap Reductn	144	138	0	0	0	102	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.08	0.44	0.81	0.54	0.75	0.59

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	471	2	246	488	648	0	0	1402	363
Future Volume (vph)	0	0	0	471	2	246	488	648	0	0	1402	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.98	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1598	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1598	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	512	2	267	530	704	0	0	1524	395
RTOR Reduction (vph)	0	0	0	0	5	189	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	271	265	51	530	704	0	0	1524	395
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.2	19.2	19.2	17.5	60.7			37.9	37.9
Effective Green, g (s)				19.2	19.2	19.2	17.5	60.7			37.9	37.9
Actuated g/C Ratio				0.21	0.21	0.21	0.19	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				358	340	320	667	2386			2141	666
v/s Ratio Prot							c0.15	0.20			c0.30	
v/s Ratio Perm				0.16	0.17	0.03						0.25
v/c Ratio				0.76	0.78	0.16	0.79	0.30			0.71	0.59
Uniform Delay, d1				33.2	33.4	28.8	34.5	6.0			21.5	20.1
Progression Factor				1.00	1.00	1.00	0.80	0.83			1.00	1.00
Incremental Delay, d2				8.8	11.0	0.2	5.9	0.3			2.0	3.9
Delay (s)				42.1	44.4	29.1	33.5	5.2			23.6	24.0
Level of Service				D	D	C	C	A			C	C
Approach Delay (s)		0.0			38.9			17.4			23.7	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.7				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			15.4		
Intersection Capacity Utilization			102.8%				ICU Level of Service			G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	471	2	246	488	648	0	0	1402	363
Future Volume (veh/h)	0	0	0	471	2	246	488	648	0	0	1402	363
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				596	0	179	530	704	0	0	1524	395
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				710	0	316	604	2447	0	0	2323	721
Arrive On Green				0.20	0.00	0.20	0.35	1.00	0.00	0.00	0.46	0.46
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				596	0	179	530	704	0	0	1524	395
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				14.5	0.0	9.2	13.0	0.0	0.0	0.0	20.9	16.3
Cycle Q Clear(g_c), s				14.5	0.0	9.2	13.0	0.0	0.0	0.0	20.9	16.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				710	0	316	604	2447	0	0	2323	721
V/C Ratio(X)				0.84	0.00	0.57	0.88	0.29	0.00	0.00	0.66	0.55
Avail Cap(c_a), veh/h				859	0	382	718	2447	0	0	2323	721
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	0.28	0.28
Uniform Delay (d), s/veh				34.7	0.0	32.5	28.4	0.0	0.0	0.0	19.1	17.8
Incr Delay (d2), s/veh				6.4	0.0	1.6	9.5	0.3	0.0	0.0	0.4	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				10.7	0.0	6.2	8.4	0.2	0.0	0.0	10.1	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				41.0	0.0	34.1	37.9	0.3	0.0	0.0	19.5	18.6
LnGrp LOS				D	A	C	D	A	A	A	B	B
Approach Vol, veh/h					775			1234			1919	
Approach Delay, s/veh					39.4			16.4			19.3	
Approach LOS					D			B			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.0	45.8		23.2		66.8						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 19	34.2		* 22		58.2						
Max Q Clear Time (g_c+I1), s	15.0	22.9		16.5		2.0						
Green Ext Time (p_c), s	0.8	8.2		1.4		5.5						

Intersection Summary

HCM 6th Ctrl Delay 22.4

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	153	245	243	1080	610	563	1479
v/c Ratio	0.44	0.81	0.78	0.48	0.86	0.94	0.62
Control Delay	34.6	54.2	51.3	7.8	21.7	52.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.1	22.7
Total Delay	34.6	54.2	51.3	7.9	21.7	53.6	34.3
Queue Length 50th (ft)	77	141	133	65	146	128	230
Queue Length 95th (ft)	137	#257	#238	94	#512	#263	302
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	342	350	2273	707	602	2399
Starvation Cap Reductn	0	0	0	0	0	6	969
Spillback Cap Reductn	0	0	0	80	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.72	0.69	0.49	0.86	0.94	1.03

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	11	422	0	0	0	0	994	561	518	1361	0
Future Volume (vph)	156	11	422	0	0	0	0	994	561	518	1361	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1466	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1466	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	12	459	0	0	0	0	1080	610	563	1479	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	153	245	243	0	0	0	0	1080	610	563	1479	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	18.7	18.7	18.7					40.2	40.2	15.8	61.0	
Effective Green, g (s)	18.7	18.7	18.7					40.2	40.2	15.8	61.0	
Actuated g/C Ratio	0.21	0.21	0.21					0.45	0.45	0.18	0.68	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	304	312					2271	707	602	2398	
v/s Ratio Prot								0.21		c0.16	0.42	
v/s Ratio Perm	0.09	0.17	0.16						c0.39			
v/c Ratio	0.44	0.81	0.78					0.48	0.86	0.94	0.62	
Uniform Delay, d1	31.1	33.9	33.7					17.5	22.4	36.6	8.0	
Progression Factor	1.00	1.00	1.00					0.41	0.42	0.86	1.24	
Incremental Delay, d2	0.9	14.4	11.6					0.5	9.7	17.0	0.8	
Delay (s)	32.0	48.3	45.3					7.7	19.2	48.5	10.8	
Level of Service	C	D	D					A	B	D	B	
Approach Delay (s)		43.3			0.0			11.8			21.2	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.8									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0									Sum of lost time (s) 15.3
Intersection Capacity Utilization			102.8%									ICU Level of Service G
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	11	422	0	0	0	0	994	561	518	1361	0
Future Volume (veh/h)	156	11	422	0	0	0	0	994	561	518	1361	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	117	0	523				0	1080	610	563	1479	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	346	0	616				0	2140	664	745	2457	0
Arrive On Green	0.19	0.00	0.19				0.00	0.42	0.42	0.43	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	117	0	523				0	1080	610	563	1479	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.1	0.0	14.3				0.0	14.0	32.7	12.4	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	14.3				0.0	14.0	32.7	12.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	346	0	616				0	2140	664	745	2457	0
V/C Ratio(X)	0.34	0.00	0.85				0.00	0.50	0.92	0.76	0.60	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2196	682	745	2457	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	31.3	0.0	35.0				0.0	19.3	24.7	23.6	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	8.0				0.0	0.9	19.8	2.8	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	0.0	9.9				0.0	9.2	21.3	6.7	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	43.0				0.0	20.1	44.5	26.4	0.7	0.0
LnGrp LOS	C	A	D				A	C	D	C	A	A
Approach Vol, veh/h	640						1690			2042		
Approach Delay, s/veh	40.9						28.9			7.8		
Approach LOS	D						C			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	24.5	42.8	22.7		67.3							
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.2		* 5.1							
Max Green Setting (Gmax), s	* 15	* 39	* 21		* 59							
Max Q Clear Time (g_c+I1), s	14.4	34.7	16.3		2.0							
Green Ext Time (p_c), s	0.2	3.0	1.2		17.2							
Intersection Summary												
HCM 6th Ctrl Delay	20.8											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	889	5	784	15	253	242	237
v/c Ratio	0.44	0.02	0.39	0.05	0.64	0.49	0.44
Control Delay	11.5	11.0	11.9	0.3	31.5	9.8	6.1
Queue Delay	1.0	0.0	0.3	0.1	0.7	0.7	0.0
Total Delay	12.5	11.0	12.3	0.4	32.1	10.5	6.1
Queue Length 50th (ft)	100	1	128	0	100	19	0
Queue Length 95th (ft)	226	m5	245	0	171	79	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	267	2016	302	466	545	587
Starvation Cap Reductn	0	0	618	0	0	0	0
Spillback Cap Reductn	800	0	0	90	54	101	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.02	0.56	0.07	0.61	0.55	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	390
Future Volume (vph)	0	813	5	5	721	0	0	0	14	277	6	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3536		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.25	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3536		470	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	884	5	5	784	0	0	0	15	301	7	424
RTOR Reduction (vph)	0	1	0	0	0	0	0	15	0	0	143	181
Lane Group Flow (vph)	0	889	0	5	784	0	0	0	0	253	99	56
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1768		235	1769			36		393	347	352
v/s Ratio Prot		c0.25			0.22			c0.00		c0.15	0.07	
v/s Ratio Perm				0.01								0.04
v/c Ratio		0.50		0.02	0.44			0.01		0.64	0.28	0.16
Uniform Delay, d1		11.7		8.8	11.2			33.4		24.2	22.0	21.3
Progression Factor		1.00		0.98	1.16			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.0		0.1	0.7			0.1		3.6	0.5	0.2
Delay (s)		12.7		8.8	13.7			33.5		27.8	22.4	21.5
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		12.7			13.7			33.5			24.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	409	397	378	488	1179	1040	184
v/c Ratio	0.83	0.78	0.75	0.80	0.56	0.61	0.28
Control Delay	44.8	33.8	32.0	44.6	13.2	26.4	6.9
Queue Delay	3.7	2.7	0.0	1.5	2.9	1.3	0.0
Total Delay	48.5	36.6	32.0	46.0	16.0	27.7	6.9
Queue Length 50th (ft)	217	171	152	128	221	185	12
Queue Length 95th (ft)	#363	293	264	m#186	318	232	58
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	536	546	538	637	2103	1709	665
Starvation Cap Reductn	0	0	0	48	782	0	0
Spillback Cap Reductn	66	70	0	0	0	426	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.83	0.70	0.83	0.89	0.81	0.28

Intersection Summary

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

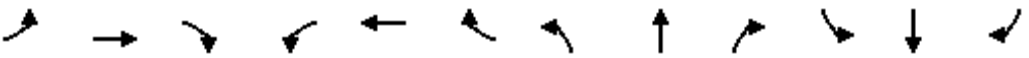
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	562	0	527	449	1085	0	1	956	169
Future Volume (vph)	0	0	0	562	0	527	449	1085	0	1	956	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1531	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1531	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	611	0	573	488	1179	0	1	1039	184
RTOR Reduction (vph)	0	0	0	0	61	61	0	0	0	0	0	99
Lane Group Flow (vph)	0	0	0	409	336	317	488	1179	0	0	1040	85
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				26.4	26.4	26.4	16.0	53.5			32.2	32.2
Effective Green, g (s)				26.4	26.4	26.4	16.0	53.5			32.2	32.2
Actuated g/C Ratio				0.29	0.29	0.29	0.18	0.59			0.36	0.36
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				493	449	441	610	2103			1708	566
v/s Ratio Prot							c0.14	0.33				
v/s Ratio Perm				c0.24	0.22	0.21					c0.22	0.05
v/c Ratio				0.83	0.75	0.72	0.80	0.56			0.61	0.15
Uniform Delay, d1				29.7	28.8	28.5	35.5	11.1			23.7	19.6
Progression Factor				1.00	1.00	1.00	0.98	1.03			1.00	1.00
Incremental Delay, d2				11.1	6.7	5.6	6.6	1.0			1.6	0.6
Delay (s)				40.8	35.5	34.0	41.2	12.4			25.4	20.2
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			36.9			20.8			24.6	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			81.8%								D	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	562	0	527	449	1085	0	1	956	169
Future Volume (veh/h)	0	0	0	562	0	527	449	1085	0	1	956	169
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				789	0	382	488	1179	0	1	1039	184
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				993	0	442	577	2164	0	40	1903	607
Arrive On Green				0.28	0.00	0.28	0.06	0.20	0.00	0.38	0.38	0.38
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				789	0	382	488	1179	0	391	649	184
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				18.5	0.0	20.6	12.6	26.8	0.0	0.0	14.7	7.3
Cycle Q Clear(g_c), s				18.5	0.0	20.6	12.6	26.8	0.0	14.7	14.7	7.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				993	0	442	577	2164	0	756	1187	607
V/C Ratio(X)				0.79	0.00	0.86	0.85	0.54	0.00	0.52	0.55	0.30
Avail Cap(c_a), veh/h				1136	0	505	641	2164	0	756	1187	607
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.50	0.50	0.50
Uniform Delay (d), s/veh				30.1	0.0	30.8	41.4	24.8	0.0	21.7	21.7	19.4
Incr Delay (d2), s/veh				3.5	0.0	13.2	8.1	0.8	0.0	1.3	0.9	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.4	0.0	13.8	10.3	18.2	0.0	9.3	7.8	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.6	0.0	44.0	49.5	25.6	0.0	22.9	22.6	20.0
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1171			1667			1224	
Approach Delay, s/veh					37.0			32.6			22.3	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.3	39.3		30.4		59.6						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 17	29.2		* 29		51.2						
Max Q Clear Time (g_c+I1), s	14.6	16.7		22.6		28.8						
Green Ext Time (p_c), s	0.4	5.8		2.5		9.0						
Intersection Summary												
HCM 6th Ctrl Delay				30.8								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	329	315	1324	693	298	1324
v/c Ratio	0.83	0.83	0.78	0.43	0.55	0.73	0.58
Control Delay	51.0	44.1	39.4	8.2	2.3	31.9	17.6
Queue Delay	0.0	0.2	0.0	0.0	0.2	0.0	49.6
Total Delay	51.0	44.3	39.4	8.2	2.5	31.9	67.2
Queue Length 50th (ft)	181	152	135	81	13	95	413
Queue Length 95th (ft)	#314	#300	#263	m91	m18	m#141	466
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	426	425	432	3108	1272	409	2304
Starvation Cap Reductn	0	0	0	0	123	0	1213
Spillback Cap Reductn	0	4	0	321	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.78	0.73	0.48	0.60	0.73	1.21

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	22	537	0	0	0	1	1217	638	274	1218	0
Future Volume (vph)	333	22	537	0	0	0	1	1217	638	274	1218	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1479	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.17	1.00	
Satd. Flow (perm)	1681	1479	1504					4778	1583	628	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	24	584	0	0	0	1	1323	693	298	1324	0
RTOR Reduction (vph)	0	51	51	0	0	0	0	0	242	0	0	0
Lane Group Flow (vph)	326	278	264	0	0	0	0	1324	451	298	1324	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	21.1	21.1	21.1					58.6	58.6	58.6	58.6	
Effective Green, g (s)	21.1	21.1	21.1					58.6	58.6	58.6	58.6	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	394	346	352					3111	1030	408	2304	
v/s Ratio Prot											0.37	
v/s Ratio Perm	c0.19	0.19	0.18					0.28	0.28	c0.47		
v/c Ratio	0.83	0.80	0.75					0.43	0.44	0.73	0.57	
Uniform Delay, d1	32.7	32.5	32.0					7.6	7.7	10.4	8.8	
Progression Factor	1.00	1.00	1.00					1.01	2.23	1.82	1.80	
Incremental Delay, d2	13.3	12.6	8.5					0.2	0.6	8.3	0.8	
Delay (s)	46.0	45.1	40.5					7.8	17.7	27.3	16.5	
Level of Service	D	D	D					A	B	C	B	
Approach Delay (s)		43.9			0.0			11.2			18.5	
Approach LOS		D			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			20.7									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			101.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	22	537	0	0	0	1	1217	638	274	1218	0
Future Volume (veh/h)	333	22	537	0	0	0	1	1217	638	274	1218	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	249	0	721				1	1323	693	298	1324	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	442	0	787				40	3166	1010	368	2265	0
Arrive On Green	0.25	0.00	0.25				0.64	0.64	0.64	0.43	0.43	0.00
Sat Flow, veh/h	1781	0	3170				0	4966	1585	411	3647	0
Grp Volume(v), veh/h	249	0	721				498	826	693	298	1324	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	206	1777	0
Q Serve(g_s), s	11.0	0.0	19.9				0.0	11.9	25.4	45.5	25.6	0.0
Cycle Q Clear(g_c), s	11.0	0.0	19.9				11.9	11.9	25.4	57.4	25.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	442	0	787				1231	1974	1010	368	2265	0
V/C Ratio(X)	0.56	0.00	0.92				0.40	0.42	0.69	0.81	0.58	0.00
Avail Cap(c_a), veh/h	451	0	803				1231	1974	1010	368	2265	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.69	0.69	0.00
Uniform Delay (d), s/veh	29.6	0.0	32.9				8.1	8.1	10.5	38.6	16.7	0.0
Incr Delay (d2), s/veh	1.5	0.0	15.0				1.0	0.7	3.8	12.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.1	0.0	13.6				7.8	6.4	13.2	6.8	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	0.0	48.0				9.1	8.7	14.3	51.1	17.5	0.0
LnGrp LOS	C	A	D				A	A	B	D	B	A
Approach Vol, veh/h	970						2017			1622		
Approach Delay, s/veh	43.6						10.7			23.6		
Approach LOS	D						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	62.5			27.5			62.5					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 57			* 23			* 57					
Max Q Clear Time (g_c+I1), s	27.4			21.9			59.4					
Green Ext Time (p_c), s	15.0			0.4			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	22.2											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	947	10	818	33	238	229	220
v/c Ratio	0.49	0.04	0.42	0.12	0.66	0.58	0.44
Control Delay	13.3	13.6	14.0	0.9	33.5	20.1	6.5
Queue Delay	2.2	0.0	0.6	0.3	1.1	1.0	0.0
Total Delay	15.5	13.6	14.6	1.3	34.6	21.2	6.5
Queue Length 50th (ft)	102	3	187	0	95	56	0
Queue Length 95th (ft)	239	m9	m233	0	164	123	50
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	1938	231	1938	267	432	457	550
Starvation Cap Reductn	0	0	678	0	0	0	0
Spillback Cap Reductn	812	0	0	80	62	81	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.04	0.65	0.18	0.64	0.61	0.40

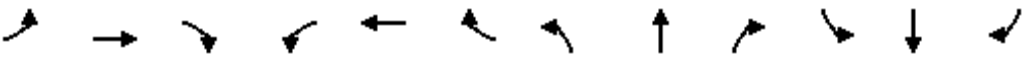
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑		↑	↑	↑
Traffic Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	321
Future Volume (vph)	0	869	2	9	753	0	8	0	22	304	7	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.90		1.00	0.92	0.85
Flt Protected		1.00		0.95	1.00			0.99		0.95	0.98	1.00
Satd. Flow (prot)		3538		1770	3539			1657		1681	1521	1504
Flt Permitted		1.00		0.23	1.00			0.82		0.95	0.98	1.00
Satd. Flow (perm)		3538		423	3539			1382		1681	1521	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	945	2	10	818	0	9	0	24	330	8	349
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	70	173
Lane Group Flow (vph)	0	947	0	10	818	0	0	2	0	238	159	47
Turn Type		NA		Perm	NA		Perm	NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		34.7		34.7	34.7			3.2		15.1	15.1	15.1
Effective Green, g (s)		34.7		34.7	34.7			3.2		15.1	15.1	15.1
Actuated g/C Ratio		0.50		0.50	0.50			0.05		0.22	0.22	0.22
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1753		209	1754			63		362	328	324
v/s Ratio Prot		c0.27			0.23					c0.14	0.10	
v/s Ratio Perm				0.02				c0.00				0.03
v/c Ratio		0.54		0.05	0.47			0.02		0.66	0.49	0.15
Uniform Delay, d1		12.2		9.1	11.6			31.9		25.1	24.0	22.2
Progression Factor		1.00		1.07	1.18			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.4	0.7			0.2		4.3	1.1	0.2
Delay (s)		13.4		10.1	14.5			32.1		29.4	25.2	22.4
Level of Service		B		B	B			C		C	C	C
Approach Delay (s)		13.4			14.4			32.1			25.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			54.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	294	291	263	575	761	1654	432
v/c Ratio	0.82	0.84	0.52	0.84	0.32	0.78	0.66
Control Delay	53.0	55.3	9.3	38.7	5.0	26.7	27.9
Queue Delay	58.1	57.8	0.0	2.0	0.5	0.6	0.0
Total Delay	111.0	113.1	9.3	40.7	5.5	27.3	27.9
Queue Length 50th (ft)	165	168	10	135	34	304	201
Queue Length 95th (ft)	#291	#306	77	#234	42	366	313
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	386	372	531	713	2385	2111	657
Starvation Cap Reductn	0	0	0	53	1078	0	0
Spillback Cap Reductn	139	132	0	0	0	168	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	1.21	0.50	0.87	0.58	0.85	0.66

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (vph)	0	0	0	510	2	269	529	700	0	0	1522	397
Future Volume (vph)	0	0	0	510	2	269	529	700	0	0	1522	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1598	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1598	1504	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	554	2	292	575	761	0	0	1654	432
RTOR Reduction (vph)	0	0	0	0	5	190	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	294	286	73	575	761	0	0	1654	432
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4						2
Actuated Green, G (s)				19.2	19.2	19.2	18.0	60.7			37.4	37.4
Effective Green, g (s)				19.2	19.2	19.2	18.0	60.7			37.4	37.4
Actuated g/C Ratio				0.21	0.21	0.21	0.20	0.67			0.42	0.42
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				358	340	320	686	2386			2113	657
v/s Ratio Prot							c0.17	0.22			c0.33	
v/s Ratio Perm				0.17	0.18	0.05						0.27
v/c Ratio				0.82	0.84	0.23	0.84	0.32			0.78	0.66
Uniform Delay, d1				33.8	33.9	29.3	34.6	6.1			22.8	21.1
Progression Factor				1.00	1.00	1.00	0.80	0.74			1.00	1.00
Incremental Delay, d2				14.0	16.9	0.4	7.8	0.3			3.0	5.1
Delay (s)				47.8	50.9	29.6	35.5	4.8			25.8	26.2
Level of Service				D	D	C	D	A			C	C
Approach Delay (s)		0.0			43.2			18.0			25.9	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.9									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			110.8%								H	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	510	2	269	529	700	0	0	1522	397
Future Volume (veh/h)	0	0	0	510	2	269	529	700	0	0	1522	397
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				646	0	195	575	761	0	0	1654	432
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				744	0	331	642	2413	0	0	2217	688
Arrive On Green				0.21	0.00	0.21	0.37	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				646	0	195	575	761	0	0	1654	432
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				15.8	0.0	10.0	14.1	0.0	0.0	0.0	24.4	19.1
Cycle Q Clear(g_c), s				15.8	0.0	10.0	14.1	0.0	0.0	0.0	24.4	19.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				744	0	331	642	2413	0	0	2217	688
V/C Ratio(X)				0.87	0.00	0.59	0.90	0.32	0.00	0.00	0.75	0.63
Avail Cap(c_a), veh/h				819	0	365	718	2413	0	0	2217	688
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.00	0.18	0.18
Uniform Delay (d), s/veh				34.4	0.0	32.1	27.4	0.0	0.0	0.0	21.3	19.8
Incr Delay (d2), s/veh				9.2	0.0	2.1	11.3	0.3	0.0	0.0	0.4	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				11.8	0.0	6.8	8.9	0.2	0.0	0.0	11.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				43.6	0.0	34.2	38.7	0.3	0.0	0.0	21.7	20.6
LnGrp LOS				D	A	C	D	A	A	A	C	C
Approach Vol, veh/h					841			1336			2086	
Approach Delay, s/veh					41.5			16.8			21.5	
Approach LOS					D			B			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	22.0	43.9		24.1		65.9						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 19	35.2		* 21		59.2						
Max Q Clear Time (g_c+I1), s	16.1	26.4		17.8		2.0						
Green Ext Time (p_c), s	0.6	7.0		1.0		6.1						
Intersection Summary												
HCM 6th Ctrl Delay				24.0								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	264	262	1168	662	616	1600
v/c Ratio	0.46	0.85	0.82	0.52	0.95	1.01	0.67
Control Delay	34.9	58.4	54.6	8.3	32.5	64.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	15.5	37.7
Total Delay	34.9	58.4	54.6	8.4	32.5	79.6	49.7
Queue Length 50th (ft)	85	154	146	82	175	~151	244
Queue Length 95th (ft)	148	#287	#266	113	m#560	m#288	318
Internal Link Dist (ft)		370		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	341	350	2232	694	610	2379
Starvation Cap Reductn	0	0	0	0	0	28	890
Spillback Cap Reductn	0	0	0	67	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.77	0.75	0.54	0.95	1.06	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	11	455	0	0	0	0	1075	609	567	1472	0
Future Volume (vph)	170	11	455	0	0	0	0	1075	609	567	1472	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1465	1504					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1465	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	12	495	0	0	0	0	1168	662	616	1600	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	166	264	262	0	0	0	0	1168	662	616	1600	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	19.2	19.2	19.2					39.5	39.5	16.0	60.5	
Effective Green, g (s)	19.2	19.2	19.2					39.5	39.5	16.0	60.5	
Actuated g/C Ratio	0.21	0.21	0.21					0.44	0.44	0.18	0.67	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.0	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	358	312	320					2231	694	610	2378	
v/s Ratio Prot								0.23		c0.18	0.45	
v/s Ratio Perm	0.10	0.18	0.17						c0.42			
v/c Ratio	0.46	0.85	0.82					0.52	0.95	1.01	0.67	
Uniform Delay, d1	30.9	34.0	33.7					18.4	24.4	37.0	8.8	
Progression Factor	1.00	1.00	1.00					0.41	0.43	0.85	1.18	
Incremental Delay, d2	1.0	18.6	14.9					0.5	17.8	30.8	0.9	
Delay (s)	31.9	52.6	48.7					8.1	28.4	62.1	11.3	
Level of Service	C	D	D					A	C	E	B	
Approach Delay (s)		46.1			0.0			15.5			25.4	
Approach LOS		D			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.6									
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			110.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	11	455	0	0	0	0	1075	609	567	1472	0
Future Volume (veh/h)	170	11	455	0	0	0	0	1075	609	567	1472	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	127	0	565				0	1168	662	616	1600	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	366	0	652				0	2139	664	706	2416	0
Arrive On Green	0.21	0.00	0.21				0.00	0.42	0.42	0.41	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	127	0	565				0	1168	662	616	1600	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	5.5	0.0	15.5				0.0	15.5	37.5	14.7	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	15.5				0.0	15.5	37.5	14.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	366	0	652				0	2139	664	706	2416	0
V/C Ratio(X)	0.35	0.00	0.87				0.00	0.55	1.00	0.87	0.66	0.00
Avail Cap(c_a), veh/h	416	0	740				0	2139	664	706	2416	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.52	0.52	0.00
Uniform Delay (d), s/veh	30.6	0.0	34.5				0.0	19.7	26.1	25.5	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	9.7				0.0	1.0	34.2	6.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	10.7				0.0	10.0	26.5	7.7	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	0.0	44.3				0.0	20.7	60.3	32.1	0.8	0.0
LnGrp LOS	C	A	D				A	C	E	C	A	A
Approach Vol, veh/h	692						1830			2216		
Approach Delay, s/veh	41.9						35.0			9.5		
Approach LOS	D						D			A		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	23.5	42.8		23.7		66.3						
Change Period (Y+Rc), s	* 5.1	* 5.1		* 5.2		* 5.1						
Max Green Setting (Gmax), s	* 16	* 38		* 21		* 59						
Max Q Clear Time (g_c+I1), s	16.7	39.5		17.5		2.0						
Green Ext Time (p_c), s	0.0	0.0		1.0		19.9						
Intersection Summary												
HCM 6th Ctrl Delay	24.1											
HCM 6th LOS	C											
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024



Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	971	7	855	16	275	263	258
v/c Ratio	0.48	0.03	0.42	0.05	0.70	0.52	0.47
Control Delay	11.7	11.0	12.7	0.3	34.3	10.3	6.3
Queue Delay	1.9	0.0	0.4	0.2	2.1	1.3	0.0
Total Delay	13.5	11.0	13.0	0.5	36.4	11.6	6.3
Queue Length 50th (ft)	117	1	236	0	107	21	0
Queue Length 95th (ft)	247	m6	278	0	190	86	53
Internal Link Dist (ft)	2214		245	105		344	
Turn Bay Length (ft)		25			140		150
Base Capacity (vph)	2015	232	2016	293	441	539	585
Starvation Cap Reductn	0	0	580	0	0	0	0
Spillback Cap Reductn	841	0	0	113	72	123	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.03	0.60	0.09	0.75	0.63	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Riverside Drive & SR 170 Southbound Off-Ramp

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑↓		↑	↑↓	↑
Traffic Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	424
Future Volume (vph)	0	887	6	6	787	0	0	0	15	301	7	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Lane Util. Factor		0.95		1.00	0.95			1.00		0.95	0.91	0.95
Frt		1.00		1.00	1.00			0.86		1.00	0.88	0.85
Flt Protected		1.00		0.95	1.00			1.00		0.95	0.99	1.00
Satd. Flow (prot)		3535		1770	3539			1611		1681	1484	1504
Flt Permitted		1.00		0.22	1.00			1.00		0.95	0.99	1.00
Satd. Flow (perm)		3535		409	3539			1611		1681	1484	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	964	7	7	855	0	0	0	16	327	8	461
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	155	198
Lane Group Flow (vph)	0	971	0	7	855	0	0	0	0	275	108	60
Turn Type		NA		Perm	NA			NA		Split	NA	Perm
Protected Phases		6			2			4		3	3	
Permitted Phases				2			4					3
Actuated Green, G (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Effective Green, g (s)		35.0		35.0	35.0			1.6		16.4	16.4	16.4
Actuated g/C Ratio		0.50		0.50	0.50			0.02		0.23	0.23	0.23
Clearance Time (s)		4.9		4.9	4.9			6.1		6.0	6.0	6.0
Vehicle Extension (s)		3.8		2.4	2.4			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		1767		204	1769			36		393	347	352
v/s Ratio Prot		c0.27			0.24			c0.00		c0.16	0.07	
v/s Ratio Perm				0.02								0.04
v/c Ratio		0.55		0.03	0.48			0.01		0.70	0.31	0.17
Uniform Delay, d1		12.1		8.9	11.5			33.4		24.5	22.1	21.4
Progression Factor		1.00		1.02	1.22			1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2		0.3	0.8			0.1		5.4	0.5	0.2
Delay (s)		13.3		9.3	14.9			33.5		29.9	22.6	21.6
Level of Service		B		A	B			C		C	C	C
Approach Delay (s)		13.3			14.9			33.5			24.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			60.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Queues

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	450	431	407	527	1278	1128	201
v/c Ratio	0.86	0.80	0.77	0.84	0.63	0.71	0.32
Control Delay	45.9	34.9	32.4	45.0	15.9	29.9	8.5
Queue Delay	3.6	2.4	0.0	2.7	13.9	5.6	0.0
Total Delay	49.5	37.3	32.4	47.6	29.8	35.5	8.5
Queue Length 50th (ft)	244	193	169	143	269	210	19
Queue Length 95th (ft)	#410	#356	#290	m#208	m359	262	70
Internal Link Dist (ft)		367			198	969	
Turn Bay Length (ft)	220		220				110
Base Capacity (vph)	554	562	553	647	2032	1585	627
Starvation Cap Reductn	0	0	0	51	757	0	0
Spillback Cap Reductn	49	54	0	0	0	395	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.74	0.88	1.00	0.95	0.32

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	609	0	576	485	1176	0	1	1037	185
Future Volume (vph)	0	0	0	609	0	576	485	1176	0	1	1037	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.91	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1528	1504	3433	3539			5085	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			0.94	1.00
Satd. Flow (perm)				1681	1528	1504	3433	3539			4776	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	662	0	626	527	1278	0	1	1127	201
RTOR Reduction (vph)	0	0	0	0	59	59	0	0	0	0	0	102
Lane Group Flow (vph)	0	0	0	450	372	348	527	1278	0	0	1128	99
Turn Type				Perm	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases					4		1	6			2	
Permitted Phases				4		4				2		2
Actuated Green, G (s)				28.2	28.2	28.2	16.5	51.7			29.9	29.9
Effective Green, g (s)				28.2	28.2	28.2	16.5	51.7			29.9	29.9
Actuated g/C Ratio				0.31	0.31	0.31	0.18	0.57			0.33	0.33
Clearance Time (s)				5.3	5.3	5.3	5.3	4.8			4.8	4.8
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				526	478	471	629	2032			1586	525
v/s Ratio Prot							c0.15	0.36				
v/s Ratio Perm				c0.27	0.24	0.23					c0.24	0.06
v/c Ratio				0.86	0.78	0.74	0.84	0.63			0.71	0.19
Uniform Delay, d1				29.0	28.1	27.6	35.5	12.8			26.3	21.4
Progression Factor				1.00	1.00	1.00	0.95	1.09			1.00	1.00
Incremental Delay, d2				12.9	7.8	6.0	8.1	1.3			2.7	0.8
Delay (s)				41.8	35.9	33.6	41.7	15.2			29.0	22.2
Level of Service				D	D	C	D	B			C	C
Approach Delay (s)		0.0			37.2			22.9			28.0	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.6									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			90.0								15.4	
Intersection Capacity Utilization			87.7%								E	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

6: Laurel Canyon Boulevard & US 101 Northbound Ramps

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	609	0	576	485	1176	0	1	1037	185
Future Volume (veh/h)	0	0	0	609	0	576	485	1176	0	1	1037	185
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h				857	0	417	527	1278	0	1	1127	201
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	2	2	2
Cap, veh/h				1066	0	474	611	2092	0	40	1753	559
Arrive On Green				0.30	0.00	0.30	0.06	0.19	0.00	0.35	0.35	0.35
Sat Flow, veh/h				3563	0	1585	3456	3647	0	1	4966	1585
Grp Volume(v), veh/h				857	0	417	527	1278	0	424	704	201
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	1869	1549	1585
Q Serve(g_s), s				20.0	0.0	22.5	13.6	29.6	0.0	0.0	17.1	8.5
Cycle Q Clear(g_c), s				20.0	0.0	22.5	13.6	29.6	0.0	17.1	17.1	8.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1066	0	474	611	2092	0	700	1093	559
V/C Ratio(X)				0.80	0.00	0.88	0.86	0.61	0.00	0.61	0.64	0.36
Avail Cap(c_a), veh/h				1176	0	523	649	2092	0	700	1093	559
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.82	0.82	0.00	0.36	0.36	0.36
Uniform Delay (d), s/veh				29.1	0.0	30.0	41.3	26.8	0.0	24.4	24.4	21.6
Incr Delay (d2), s/veh				3.8	0.0	14.8	9.3	1.1	0.0	1.4	1.1	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.2	0.0	15.0	11.0	19.8	0.0	10.1	8.5	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.9	0.0	44.8	50.6	27.9	0.0	25.8	25.4	22.2
LnGrp LOS				C	A	D	D	C	A	C	C	C
Approach Vol, veh/h					1274			1805			1329	
Approach Delay, s/veh					36.8			34.5			25.1	
Approach LOS					D			C			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.2	36.6		32.2		57.8						
Change Period (Y+Rc), s	* 5.3	4.8		* 5.3		4.8						
Max Green Setting (Gmax), s	* 17	28.0		* 30		50.2						
Max Q Clear Time (g_c+I1), s	15.6	19.1		24.5		31.6						
Green Ext Time (p_c), s	0.3	5.0		2.4		9.0						
Intersection Summary												
HCM 6th Ctrl Delay				32.3								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	356	352	349	1429	751	326	1430
v/c Ratio	0.92	0.91	0.89	0.46	0.58	0.91	0.62
Control Delay	64.8	58.5	54.6	7.7	1.9	49.6	19.2
Queue Delay	0.0	0.9	0.0	0.1	0.3	0.0	49.6
Total Delay	64.8	59.4	54.6	7.8	2.2	49.6	68.8
Queue Length 50th (ft)	208	182	171	83	10	104	435
Queue Length 95th (ft)	#378	#362	#340	m91	m16	m#164	498
Internal Link Dist (ft)		155		137			198
Turn Bay Length (ft)	335		335		120		
Base Capacity (vph)	392	389	395	3127	1295	359	2317
Starvation Cap Reductn	0	0	0	0	132	0	1236
Spillback Cap Reductn	0	4	0	415	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.91	0.88	0.53	0.65	0.91	1.32

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	24	584	0	0	0	1	1314	691	300	1316	0
Future Volume (vph)	364	24	584	0	0	0	1	1314	691	300	1316	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1480	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					0.94	1.00	0.15	1.00	
Satd. Flow (perm)	1681	1480	1504					4777	1583	550	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	396	26	635	0	0	0	1	1428	751	326	1430	0
RTOR Reduction (vph)	0	45	45	0	0	0	0	0	260	0	0	0
Lane Group Flow (vph)	356	307	304	0	0	0	0	1429	491	326	1430	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Effective Green, g (s)	20.8	20.8	20.8					58.9	58.9	58.9	58.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.65	0.65	0.65	0.65	
Clearance Time (s)	5.2	5.2	5.2					5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	342	347					3126	1035	359	2316	
v/s Ratio Prot											0.40	
v/s Ratio Perm	c0.21	0.21	0.20					0.30	0.31	c0.59		
v/c Ratio	0.92	0.90	0.88					0.46	0.47	0.91	0.62	
Uniform Delay, d1	33.8	33.6	33.4					7.7	7.8	13.2	9.0	
Progression Factor	1.00	1.00	1.00					0.97	2.12	1.92	1.99	
Incremental Delay, d2	26.0	24.9	21.2					0.2	0.6	21.3	0.8	
Delay (s)	59.7	58.5	54.6					7.6	17.1	46.7	18.8	
Level of Service	E	E	D					A	B	D	B	
Approach Delay (s)		57.6			0.0			10.9			24.0	
Approach LOS		E			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.4									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			90.0								10.3	
Intersection Capacity Utilization			108.7%									ICU Level of Service G
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: US 101 Southbound Ramps & Laurel Canyon Boulevard

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	24	584	0	0	0	1	1314	691	300	1316	0
Future Volume (veh/h)	364	24	584	0	0	0	1	1314	691	300	1316	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	0	784				1	1428	751	326	1430	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	0
Cap, veh/h	416	0	740				40	3239	1034	339	2318	0
Arrive On Green	0.23	0.00	0.23				0.65	0.65	0.65	0.44	0.44	0.00
Sat Flow, veh/h	1781	0	3170				0	4966	1585	350	3647	0
Grp Volume(v), veh/h	273	0	784				538	891	751	326	1430	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1869	1549	1585	175	1777	0
Q Serve(g_s), s	12.5	0.0	21.0				0.0	12.6	28.2	46.1	27.9	0.0
Cycle Q Clear(g_c), s	12.5	0.0	21.0				12.6	12.6	28.2	58.7	27.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	416	0	740				1259	2020	1034	339	2318	0
V/C Ratio(X)	0.66	0.00	1.06				0.43	0.44	0.73	0.96	0.62	0.00
Avail Cap(c_a), veh/h	416	0	740				1259	2020	1034	339	2318	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	0.58	0.58	0.00
Uniform Delay (d), s/veh	31.2	0.0	34.5				7.6	7.6	10.3	42.0	16.7	0.0
Incr Delay (d2), s/veh	3.7	0.0	50.1				1.1	0.7	4.5	28.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.3	0.0	19.1				8.1	6.6	14.2	7.9	16.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.0	84.6				8.7	8.3	14.8	70.8	17.4	0.0
LnGrp LOS	C	A	F				A	A	B	E	B	A
Approach Vol, veh/h	1057						2180			1756		
Approach Delay, s/veh	71.8						10.7			27.3		
Approach LOS	E						B			C		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	63.8			26.2			63.8					
Change Period (Y+Rc), s	* 5.1			* 5.2			* 5.1					
Max Green Setting (Gmax), s	* 59			* 21			* 59					
Max Q Clear Time (g_c+I1), s	30.2			23.0			60.7					
Green Ext Time (p_c), s	16.3			0.0			0.0					

Intersection Summary

HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix R.2

Alternatives Air Quality Calculations

Radford Alternatives

Alternative 2 Operations - Winter

Existing Regional Emissions (Buildout Year)							Existing Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	29	<1	33	< 0.005	<1	<1	Area	0.2	32.6	0.0	0.0
Energy	<1	5	5	<1	<1	<1	Energy	5.5	4.6	0.4	0.4
Mobile	22	16	155	<1	38	10					
Emergency Generator	<1	10	2	<1	<1	<1	Emergency Generator	10.2	2.2	0.7	0.7
Charbroiler	3	<1	<1	<1	4	2	Charbroiler	0.0	0.0	4.4	2.5
Onsite Trucks	<1	<1	5	<1	1	<1	Onsite Trucks	0.9	5.3	1.1	0.3
Total	55	32	200	1	44	14	Total	16.8	44.7	6.6	3.9
Project Regional Emissions (Buildout Year)							Project Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	59	<1	65	<1	<1	<1	Area	0.4	64.8	0.0	0.0
Energy	<1	4	3	<1	<1	<1	Energy	3.3	2.8	0.3	0.3
Mobile	52	33	378	<1	86	22					
Emergency Generator	<1	10	4	<1	<1	<1	Emergency Generator	10.2	4.0	0.7	0.7
Charbroiler	3	<1	<1	<1	7	4	Charbroiler	0.0	0.0	6.6	3.8
Onsite Trucks	<1	2	14	<1	3	<1	Onsite Trucks	2.1	14.1	2.6	0.7
Total	115	49	464	2	96	28	Total	16.1	85.6	10.2	5.5
Incremental Regional Emissions (Project Less Existing)							Incremental Localized Emissions (Project Less Existing)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	30	<1	32	<1	<1	<1	Area	0.2	32.2	0.0	0.0
Energy	<1	<1	<1	<1	<1	<1	Energy	-2.2	-1.8	-0.1	-0.1
Mobile	29	17	223	<1	48	12					
Emergency Generator	<1	<1	2	<1	<1	<1	Emergency Generator	0.0	1.8	0.0	0.0
Charbroiler	<1	<1	<1	<1	2.3	1	Charbroiler	0.0	0.0	2.3	1.3
Onsite Trucks	<1	1	9	<1	1.5	<1	Onsite Trucks	1.3	8.8	1.5	0.4
Total	60	17	265	<1	52	14	Total	-0.7	41.0	3.7	1.6
Threshold	55	55	550	150	150	55	Threshold	144	1434	4	2
Difference	5	(38)	(285)	(149)	(98)	(41)	Difference	(145)	(1393)	(0.3)	(0.4)
Impact	Yes	No	No	No	No	No	Impact	No	No	No	No

Alternative 2 Operations - Summer

Existing Regional Emissions (Buildout Year)							Existing Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	29	<1	33	<1	<1	<1	Area	0.2	32.6	0.0	0.0
Energy	<1	5	5	<1	<1	<1	Energy	5.5	4.6	0.4	0.4
Mobile	23	14	165	<1	38	10					
Emergency Generator	<1	10	2	<1	<1	<1	Emergency Generator	10.2	2.2	0.7	0.7
Charbroiler	3	<1	<1	<1	4	2	Charbroiler	0.0	0.0	4.4	2.5
Onsite Trucks	<1	<1	5	<1	1	<1	Onsite Trucks	0.9	5.3	1.1	0.3
Total	56	31	210	1	44	14	Total	16.8	44.7	6.6	3.9
Project Regional Emissions (Buildout Year)							Project Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	59	<1	65	< 0.005	<1	<1	Area	0.4	64.8	0.1	0.0
Energy	<1	4	3	<1	<1	<1	Energy	3.7	3.1	0.3	0.3
Mobile	52	33	378	<1	86	22					
Emergency Generator	<1	10	4	<1	<1	<1	Emergency Generator	10.2	4.0	0.7	0.7
Charbroiler	3	<1	<1	<1	7	4	Charbroiler	0.0	0.0	6.6	3.8
Onsite Trucks	<1	2	14	<1	3	<1	Onsite Trucks	2.1	14.1	2.6	0.7
Total	115	49	464	2	96	28	Total	16.5	86.0	10.3	5.5
Incremental Regional Emissions (Project Less Existing)							Incremental Localized Emissions (Project Less Existing)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	30	<1	32	<1	<1	<1	Area	0.2	32.2	0.0	0.0
Energy	<1	<1	<1	<1	<1	<1	Energy	-1.8	-1.5	-0.1	-0.1
Mobile	29	18	213	<1	48	12					
Emergency Generator	<1	<1	2	<1	<1	<1	Emergency Generator	0.0	1.8	0.0	0.0
Charbroiler	<1	<1	<1	<1	2.3	1	Charbroiler	0.0	0.0	2.3	1.3
Onsite Trucks	<1	1	9	<1	1.5	<1	Onsite Trucks	1.3	8.8	1.5	0.4
Total	60	18	254	<1	52	14	Total	-0.3	41.3	3.7	1.6
Threshold	55	55	550	150	150	55	Threshold	144	1434	4	2
Difference	5	(37)	(296)	(149)	(98)	(41)	Difference	(145)	(1393)	(0.3)	(0.4)
Impact	Yes	No	No	No	No	No	Impact	No	No	No	No

Radford Alternatives

Alternative 5 Operations - Winter

Existing Regional Emissions (Buildout Year)							Existing Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	29	<1	33	< 0.005	<1	<1	Area	0.2	32.6	0.0	0.0
Energy	<1	5	5	<1	<1	<1	Energy	5.5	4.6	0.4	0.4
Mobile	22	16	155	<1	38	10					
Emergency Generator	<1	10	2	<1	<1	<1	Emergency Generator	10.2	2.2	0.7	0.7
Charbroiler	3	<1	<1	<1	4	2	Charbroiler	0.0	0.0	4.4	2.5
Onsite Trucks	<1	<1	5	<1	1	<1	Onsite Trucks	0.9	5.3	1.1	0.3
Total	55	32	200	1	44	14	Total	16.8	44.7	6.6	3.9
Project Regional Emissions (Buildout Year)							Project Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	61	<1	65	< 0.005	<1	<1	Area	0.4	64.8	0.1	0.0
Energy	<1	4	4	<1	<1	<1	Energy	3.3	2.8	0.3	0.3
Mobile	58	40	403	<1	97	25					
Emergency Generator	<1	10	4	<1	<1	<1	Emergency Generator	10.2	4.0	0.7	0.7
Charbroiler	3	<1	<1	<1	7	4	Charbroiler	0.0	0.0	6.6	3.8
Onsite Trucks	<1	2	14	<1	3	<1	Onsite Trucks	2.1	14.1	2.6	0.7
Total	124	57	489	2	107	31	Total	16.1	85.6	10.3	5.6
Incremental Regional Emissions (Project Less Existing)							Incremental Localized Emissions (Project Less Existing)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	32	<1	32	<1	<1	<1	Area	0.2	32.2	0.0	0.0
Energy	<1	<1	<1	<1	<1	<1	Energy	-2.2	-1.8	-0.1	-0.1
Mobile	36	25	248	<1	60	15					
Emergency Generator	<1	<1	2	<1	<1	<1	Emergency Generator	0.0	1.8	0.0	0.0
Charbroiler	<1	<1	<1	<1	2.3	1	Charbroiler	0.0	0.0	2.3	1.3
Onsite Trucks	<1	1	9	<1	1.5	<1	Onsite Trucks	1.3	8.8	1.5	0.4
Total	68	25	290	<1	63	17	Total	-0.7	41.0	3.7	1.6
Threshold	55	55	550	150	150	55	Threshold	144	1434	4	2
Difference	13	(30)	(260)	(149)	(87)	(38)	Difference	(145)	(1393)	(0.3)	(0.4)
Impact	Yes	No	No	No	No	No	Impact	No	No	No	No

Alternative 5 Operations - Summer

Existing Regional Emissions (Buildout Year)							Existing Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	29	<1	33	<1	<1	<1	Area	0.2	32.6	0.0	0.0
Energy	<1	5	5	<1	<1	<1	Energy	5.5	4.6	0.4	0.4
Mobile	23	14	165	<1	38	10					
Emergency Generator	<1	10	2	<1	<1	<1	Emergency Generator	10.2	2.2	0.7	0.7
Charbroiler	3	<1	<1	<1	4	2	Charbroiler	0.0	0.0	4.4	2.5
Onsite Trucks	<1	<1	5	<1	1	<1	Onsite Trucks	0.9	5.3	1.1	0.3
Total	56	31	210	1	44	14	Total	16.8	44.7	6.6	3.9
Project Regional Emissions (Buildout Year)							Project Localized Emissions (Buildout Year)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	61	<1	65	< 0.005	<1	<1	Area	0.4	64.8	0.1	0.0
Energy	<1	4	4	<1	<1	<1	Energy	4.3	3.6	0.3	0.3
Mobile	59	37	430	1	97	25					
Emergency Generator	<1	10	4	<1	<1	<1	Emergency Generator	10.2	4.0	0.7	0.7
Charbroiler	3	<1	<1	<1	7	4	Charbroiler	0.0	0.0	6.6	3.8
Onsite Trucks	<1	2	14	<1	3	<1	Onsite Trucks	2.1	14.1	2.6	0.7
Total	124	54	516	2	107	31	Total	17.1	86.4	10.3	5.6
Incremental Regional Emissions (Project Less Existing)							Incremental Localized Emissions (Project Less Existing)				
	ROG	NOx	CO	SO2	PM10	PM2.5		NOx	CO	PM10	PM2.5
Area	32	<1	32	<1	<1	<1	Area	0.2	32.2	0.0	0.0
Energy	<1	<1	<1	<1	<1	<1	Energy	-1.2	-1.0	-0.1	-0.1
Mobile	36	23	265	<1	60	15					
Emergency Generator	<1	<1	2	<1	<1	<1	Emergency Generator	0.0	1.8	0.0	0.0
Charbroiler	<1	<1	<1	<1	2.3	1	Charbroiler	0.0	0.0	2.3	1.3
Onsite Trucks	<1	1	9	<1	1.5	<1	Onsite Trucks	1.3	8.8	1.5	0.4
Total	69	23	307	<1	63	17	Total	0.3	41.7	3.7	1.6
Threshold	55	55	550	150	150	55	Threshold	144	1434	4	2
Difference	14	(32)	(243)	(149)	(87)	(38)	Difference	(144)	(1392)	(0.3)	(0.4)
Impact	Yes	No	No	No	No	No	Impact	No	No	No	No

Radford - Operations - Alt 2 Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	Radford - Operations - Alt 2
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	23.8
Location	34.14481004698251, -118.39119273923936
County	Los Angeles-South Coast
City	Los Angeles
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	3832
EDFZ	16
Electric Utility	Los Angeles Department of Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Office Building	1,560	1000sqft	35.8	1,560,000	10,000	—	—	—
Industrial Park	450	1000sqft	10.3	450,000	10,000	—	—	—

High Turnover (Sit Down Restaurant)	30.0	1000sqft	0.69	30,000	500	—	—	—
Enclosed Parking with Elevator	5,775	Space	52.0	2,310,000	500	—	—	—
Strip Mall	360	1000sqft	8.26	360,000	500	—	—	—
Parking Lot	275	Space	1.03	0.00	500	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Water	W-7	Adopt a Water Conservation Strategy
Waste	S-1/S-2	Implement Waste Reduction Plan

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	116	111	36.6	446	0.92	0.87	85.0	85.9	0.82	21.6	22.4	170,036
Mit.	116	111	36.6	446	0.92	0.87	85.0	85.9	0.82	21.6	22.4	164,774
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	115	110	39.6	422	0.88	0.87	85.0	85.9	0.82	21.6	22.4	166,090
Mit.	115	110	39.6	422	0.88	0.87	85.0	85.9	0.82	21.6	22.4	160,828
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	123	117	40.2	484	0.90	0.95	83.8	84.7	0.88	21.3	22.2	167,503
Mit.	123	117	40.2	484	0.90	0.95	83.8	84.7	0.88	21.3	22.2	162,241
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	22.4	21.3	7.34	88.2	0.16	0.17	15.3	15.5	0.16	3.88	4.04	27,732
Mit.	22.4	21.3	7.34	88.2	0.16	0.17	15.3	15.5	0.16	3.88	4.04	26,861
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	56.2	51.7	32.6	378	0.90	0.55	85.0	85.6	0.51	21.6	22.1	93,263
Area	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,668
Water	—	—	—	—	—	—	—	—	—	—	—	6,544
Waste	—	—	—	—	—	—	—	—	—	—	—	5,174
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	116	111	36.6	446	0.92	0.87	85.0	85.9	0.82	21.6	22.4	170,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	55.7	51.1	35.6	354	0.86	0.55	85.0	85.6	0.51	21.6	22.1	89,317
Area	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,668
Water	—	—	—	—	—	—	—	—	—	—	—	6,544

Waste	—	—	—	—	—	—	—	—	—	—	—	5,174
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	115	110	39.6	422	0.88	0.87	85.0	85.9	0.82	21.6	22.4	166,090
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	55.2	50.6	35.8	362	0.87	0.55	83.8	84.3	0.51	21.3	21.8	90,434
Area	67.0	66.0	0.77	118	0.01	0.12	—	0.12	0.09	—	0.09	445
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,736
Water	—	—	—	—	—	—	—	—	—	—	—	6,544
Waste	—	—	—	—	—	—	—	—	—	—	—	5,174
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	123	117	40.2	484	0.90	0.95	83.8	84.7	0.88	21.3	22.2	167,503
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	10.1	9.24	6.53	66.1	0.16	0.10	15.3	15.4	0.09	3.88	3.98	14,972
Area	12.2	12.0	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Energy	0.07	0.04	0.67	0.56	< 0.005	0.05	—	0.05	0.05	—	0.05	10,718
Water	—	—	—	—	—	—	—	—	—	—	—	1,083
Waste	—	—	—	—	—	—	—	—	—	—	—	857
Refrig.	—	—	—	—	—	—	—	—	—	—	—	28.2
Total	22.4	21.3	7.34	88.2	0.16	0.17	15.3	15.5	0.16	3.88	4.04	27,732

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	56.2	51.7	32.6	378	0.90	0.55	85.0	85.6	0.51	21.6	22.1	93,263
Area	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217

Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,668
Water	—	—	—	—	—	—	—	—	—	—	—	5,235
Waste	—	—	—	—	—	—	—	—	—	—	—	1,221
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	116	111	36.6	446	0.92	0.87	85.0	85.9	0.82	21.6	22.4	164,774
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	55.7	51.1	35.6	354	0.86	0.55	85.0	85.6	0.51	21.6	22.1	89,317
Area	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,668
Water	—	—	—	—	—	—	—	—	—	—	—	5,235
Waste	—	—	—	—	—	—	—	—	—	—	—	1,221
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	115	110	39.6	422	0.88	0.87	85.0	85.9	0.82	21.6	22.4	160,828
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	55.2	50.6	35.8	362	0.87	0.55	83.8	84.3	0.51	21.3	21.8	90,434
Area	67.0	66.0	0.77	118	0.01	0.12	—	0.12	0.09	—	0.09	445
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	64,736
Water	—	—	—	—	—	—	—	—	—	—	—	5,235
Waste	—	—	—	—	—	—	—	—	—	—	—	1,221
Refrig.	—	—	—	—	—	—	—	—	—	—	—	170
Total	123	117	40.2	484	0.90	0.95	83.8	84.7	0.88	21.3	22.2	162,241
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	10.1	9.24	6.53	66.1	0.16	0.10	15.3	15.4	0.09	3.88	3.98	14,972
Area	12.2	12.0	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Energy	0.07	0.04	0.67	0.56	< 0.005	0.05	—	0.05	0.05	—	0.05	10,718
Water	—	—	—	—	—	—	—	—	—	—	—	867
Waste	—	—	—	—	—	—	—	—	—	—	—	202

Refrig.	—	—	—	—	—	—	—	—	—	—	—	28.2
Total	22.4	21.3	7.34	88.2	0.16	0.17	15.3	15.5	0.16	3.88	4.04	26,861

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	36,040
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	8,281
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,330
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	9,351
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	5,228

Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Total	—	—	—	—	—	—	—	—	—	—	—	60,273
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	36,040
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	8,281
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,330
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	9,351
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	5,228
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Total	—	—	—	—	—	—	—	—	—	—	—	60,273
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	5,978
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,371
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	220
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	1,548
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	866
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	7.13
Total	—	—	—	—	—	—	—	—	—	—	—	9,990

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	36,040
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	8,281
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,330
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	9,351
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	5,228
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Total	—	—	—	—	—	—	—	—	—	—	—	60,273
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	36,040
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	8,281
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,330
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	9,351

Strip Mall	—	—	—	—	—	—	—	—	—	—	—	5,228
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Total	—	—	—	—	—	—	—	—	—	—	—	60,273
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	5,978
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,371
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	220
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	1,548
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	866
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	7.13
Total	—	—	—	—	—	—	—	—	—	—	—	9,990

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443

High Turnover (Sit Down Restaurant)	0.10	0.05	0.95	0.80	0.01	0.07	—	0.07	0.07	—	0.07	1,134
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	4,395
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.10	0.05	0.95	0.80	0.01	0.07	—	0.07	0.07	—	0.07	1,134
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	4,395
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.03	0.01	0.26	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	278
Industrial Park	0.02	0.01	0.22	0.18	< 0.005	0.02	—	0.02	0.02	—	0.02	239

High Turnover (Sit Down Restaurant)	0.02	0.01	0.17	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	188
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	23.2
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.07	0.04	0.67	0.56	< 0.005	0.05	—	0.05	0.05	—	0.05	728

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.10	0.05	0.95	0.80	0.01	0.07	—	0.07	0.07	—	0.07	1,134
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	4,395
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.10	0.05	0.95	0.80	0.01	0.07	—	0.07	0.07	—	0.07	1,134
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	4,395
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.03	0.01	0.26	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	278
Industrial Park	0.02	0.01	0.22	0.18	< 0.005	0.02	—	0.02	0.02	—	0.02	239
High Turnover (Sit Down Restaurant)	0.02	0.01	0.17	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	188
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	23.2
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.07	0.04	0.67	0.56	< 0.005	0.05	—	0.05	0.05	—	0.05	728

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	47.7	47.7	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.42	6.42	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	47.7	47.7	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.42	6.42	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	8.71	8.71	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.17	1.17	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	2.35	2.17	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Total	12.2	12.0	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	47.7	47.7	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.42	6.42	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	47.7	47.7	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.42	6.42	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	59.3	58.9	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	8.71	8.71	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.17	1.17	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	2.35	2.17	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Total	12.2	12.0	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	4,350
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,633
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.04
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	418
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	6,544
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	4,350
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,633
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.04
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	418
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.04

Total	—	—	—	—	—	—	—	—	—	—	—	6,544
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	720
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	270
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	23.7
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.01
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	69.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	1,083

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3,480
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,306
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	114

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.03
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	335
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	5,235
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3,480
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,306
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	114
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.03
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	335
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	5,235
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	576
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	216
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	18.9

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.01
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	55.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	867

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,736
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,052
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	673
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	713
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5,174
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,736
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,052
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	673
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	713
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5,174
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	453
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	174
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	111
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	118
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	857

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	646
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	248
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	159
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	168
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1,221
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	646
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	248
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	159
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	168
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	1,221
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	107
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	41.1
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	26.3
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	27.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	202

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3.79
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	117

High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	46.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.24
Total	—	—	—	—	—	—	—	—	—	—	—	170
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3.79
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	117
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	46.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.24
Total	—	—	—	—	—	—	—	—	—	—	—	170
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.63
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	19.4
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	7.76
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.37
Total	—	—	—	—	—	—	—	—	—	—	—	28.2

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3.79
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	117
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	46.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.24
Total	—	—	—	—	—	—	—	—	—	—	—	170
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3.79
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	117
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	46.9
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	2.24
Total	—	—	—	—	—	—	—	—	—	—	—	170
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.63
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	19.4

High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	7.76
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.37
Total	—	—	—	—	—	—	—	—	—	—	—	28.2

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	17,933	17,933	17,933	6,545,545	119,921	119,921	119,921	43,771,165

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	17,933	17,933	17,933	6,545,545	119,921	119,921	119,921	43,771,165

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	3,701,881	1,211,320	138,531

5.10.3. Landscape Equipment

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	9.00	1.00	1,248	1.13	0.91
Other Lawn & Garden Equipment	Gasoline 4-Stroke	2.00	9.00	4,160	6.09	0.58
Leaf Blowers/Vacuums	Gasoline 2-Stroke	4.00	4.00	3,744	1.79	0.94
Leaf Blowers/Vacuums	Electric	9.00	3.00	6,552	1.79	0.94
Lawn Mowers	Gasoline 4-Stroke	4.00	0.40	384	3.86	0.36
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	6.00	0.30	384	1.13	0.91
Chainsaws	Gasoline 2-Stroke	6.00	0.20	192	1.86	0.70
Other Lawn & Garden Equipment	Gasoline 4-Stroke	4.00	2.00	1,664	6.09	0.58

5.10.4. Landscape Equipment - Mitigated

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	9.00	1.00	1,248	1.13	0.91
Other Lawn & Garden Equipment	Gasoline 4-Stroke	2.00	9.00	4,160	6.09	0.58
Leaf Blowers/Vacuums	Gasoline 2-Stroke	4.00	4.00	3,744	1.79	0.94
Leaf Blowers/Vacuums	Electric	9.00	3.00	6,552	1.79	0.94
Lawn Mowers	Gasoline 4-Stroke	4.00	0.40	384	3.86	0.36
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	6.00	0.30	384	1.13	0.91
Chainsaws	Gasoline 2-Stroke	6.00	0.20	192	1.86	0.70
Other Lawn & Garden Equipment	Gasoline 4-Stroke	4.00	2.00	1,664	6.09	0.58

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	32,851,338	397	0.0489	0.0069	5,221,412
Industrial Park	7,550,914	397	0.0489	0.0069	4,488,923
High Turnover (Sit Down Restaurant)	1,213,203	397	0.0489	0.0069	3,528,584
Enclosed Parking with Elevator	8,527,207	397	0.0489	0.0069	0.00
Strip Mall	4,766,934	397	0.0489	0.0069	436,176
Parking Lot	39,267	397	0.0489	0.0069	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	32,851,338	397	0.0489	0.0069	5,221,412
Industrial Park	7,550,914	397	0.0489	0.0069	4,488,923
High Turnover (Sit Down Restaurant)	1,213,203	397	0.0489	0.0069	3,528,584
Enclosed Parking with Elevator	8,527,207	397	0.0489	0.0069	0.00
Strip Mall	4,766,934	397	0.0489	0.0069	436,176
Parking Lot	39,267	397	0.0489	0.0069	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	277,264,647	140,246
Industrial Park	104,062,500	140,246
High Turnover (Sit Down Restaurant)	9,106,011	7,012

Enclosed Parking with Elevator	0.00	7,012
Strip Mall	26,666,108	7,012
Parking Lot	0.00	7,012

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	221,811,718	112,197
Industrial Park	83,250,000	112,197
High Turnover (Sit Down Restaurant)	7,284,809	5,610
Enclosed Parking with Elevator	0.00	5,610
Strip Mall	21,332,886	5,610
Parking Lot	0.00	5,610

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	1,451	—
Industrial Park	558	—
High Turnover (Sit Down Restaurant)	357	—
Enclosed Parking with Elevator	0.00	—
Strip Mall	378	—
Parking Lot	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	342	—

Industrial Park	132	—
High Turnover (Sit Down Restaurant)	84.3	—
Enclosed Parking with Elevator	0.00	—
Strip Mall	89.2	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Strip Mall	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Strip Mall	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	12.0	annual days of extreme heat
Extreme Precipitation	6.95	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.68	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	74.1
AQ-PM	59.9
AQ-DPM	34.1
Drinking Water	83.1
Lead Risk Housing	24.7
Pesticides	0.00
Toxic Releases	67.4
Traffic	68.4
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	41.1
Impaired Water Bodies	58.7
Solid Waste	22.1
Sensitive Population	—
Asthma	7.66
Cardio-vascular	17.6
Low Birth Weights	37.0

Socioeconomic Factor Indicators	—
Education	30.0
Housing	71.9
Linguistic	4.59
Poverty	17.7
Unemployment	63.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	78.63467214
Employed	50.78916977
Median HI	62.22250738
Education	—
Bachelor's or higher	89.24675991
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	54.54895419
Active commuting	20.5825741
Social	—
2-parent households	49.82676761
Voting	61.58090594
Neighborhood	—
Alcohol availability	19.18388297
Park access	81.35506224
Retail density	69.0619787

Supermarket access	58.7065315
Tree canopy	68.90799435
Housing	—
Homeownership	29.23136148
Housing habitability	34.73630181
Low-inc homeowner severe housing cost burden	38.53458232
Low-inc renter severe housing cost burden	14.14089568
Uncrowded housing	78.31387142
Health Outcomes	—
Insured adults	70.06287694
Arthritis	38.0
Asthma ER Admissions	88.7
High Blood Pressure	44.4
Cancer (excluding skin)	12.2
Asthma	76.7
Coronary Heart Disease	43.7
Chronic Obstructive Pulmonary Disease	68.2
Diagnosed Diabetes	80.8
Life Expectancy at Birth	19.4
Cognitively Disabled	85.7
Physically Disabled	88.8
Heart Attack ER Admissions	72.8
Mental Health Not Good	80.9
Chronic Kidney Disease	64.9
Obesity	71.5
Pedestrian Injuries	55.9
Physical Health Not Good	77.4
Stroke	58.2

Health Risk Behaviors	—
Binge Drinking	29.5
Current Smoker	81.1
No Leisure Time for Physical Activity	90.8
Climate Change Exposures	—
Wildfire Risk	0.2
SLR Inundation Area	0.0
Children	50.1
Elderly	21.7
English Speaking	98.1
Foreign-born	27.1
Outdoor Workers	93.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	33.0
Traffic Density	83.2
Traffic Access	61.4
Other Indices	—
Hardship	30.1
Other Decision Support	—
2016 Voting	59.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	27.0
Healthy Places Index Score for Project Location (b)	73.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	See Assumptions
Construction: Off-Road Equipment	See Assumptions
Construction: Trips and VMT	See Assumptions
Construction: On-Road Fugitive Dust	See Assumptions
Land Use	See Project Description
Operations: Energy Use	Adjustment for MBS energy usage. All-Electric
Operations: Consumer Products	Adjustment for SCAQMD jurisdiction
Characteristics: Utility Information	SB100 Adjustment. Year 2028
Operations: Hearths	No wood fireplaces and stoves

Radford - Operations - Alt 5 Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Radford - Operations - Alt 5
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	23.8
Location	34.14481004698251, -118.39119273923936
County	Los Angeles-South Coast
City	Los Angeles
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	3832
EDFZ	16
Electric Utility	Los Angeles Department of Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Office Building	1,025	1000sqft	23.5	1,025,000	10,000	—	—	—
Industrial Park	379	1000sqft	8.70	379,000	10,000	—	—	—

High Turnover (Sit Down Restaurant)	60.0	1000sqft	2.00	60,000	500	—	—	—
Enclosed Parking with Elevator	5,210	Space	46.9	1,613,761	500	—	—	—
Strip Mall	300	1000sqft	6.89	300,000	500	—	—	—
Parking Lot	275	Space	1.03	0.00	500	—	—	—
Apartments Mid Rise	743	Dwelling Unit	19.6	750,000	10,000	—	1,674	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Water	W-7	Adopt a Water Conservation Strategy
Waste	S-1/S-2	Implement Waste Reduction Plan

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	126	120	41.7	498	1.05	0.99	96.5	97.5	0.94	24.5	25.4	167,565
Mit.	126	120	41.7	498	1.05	0.99	96.5	97.5	0.94	24.5	25.4	162,369
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	125	119	45.1	471	1.00	0.99	96.5	97.5	0.94	24.5	25.4	163,089
Mit.	125	119	45.1	471	1.00	0.99	96.5	97.5	0.94	24.5	25.4	157,893

% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	132	126	45.7	533	1.02	1.07	95.0	96.1	1.00	24.1	25.1	164,651
Mit.	132	126	45.7	533	1.02	1.07	95.0	96.1	1.00	24.1	25.1	159,456
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	24.1	23.0	8.34	97.3	0.19	0.20	17.3	17.5	0.18	4.41	4.59	27,260
Mit.	24.1	23.0	8.34	97.3	0.19	0.20	17.3	17.5	0.18	4.41	4.59	26,400
% Reduced	—	—	—	—	—	—	—	—	—	—	—	3%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	63.9	58.8	37.0	430	1.02	0.62	96.5	97.1	0.58	24.5	25.1	105,819
Area	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,610
Water	—	—	—	—	—	—	—	—	—	—	—	5,303
Waste	—	—	—	—	—	—	—	—	—	—	—	5,412
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	126	120	41.7	498	1.05	0.99	96.5	97.5	0.94	24.5	25.4	167,565
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	63.3	58.2	40.4	403	0.98	0.62	96.5	97.1	0.58	24.5	25.1	101,343
Area	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,610

Water	—	—	—	—	—	—	—	—	—	—	—	5,303
Waste	—	—	—	—	—	—	—	—	—	—	—	5,412
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	125	119	45.1	471	1.00	0.99	96.5	97.5	0.94	24.5	25.4	163,089
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	62.8	57.7	40.7	411	0.99	0.62	95.0	95.6	0.58	24.1	24.7	102,610
Area	68.9	67.9	0.77	118	0.01	0.12	—	0.12	0.09	—	0.09	445
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,678
Water	—	—	—	—	—	—	—	—	—	—	—	5,303
Waste	—	—	—	—	—	—	—	—	—	—	—	5,412
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	132	126	45.7	533	1.02	1.07	95.0	96.1	1.00	24.1	25.1	164,651
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	11.5	10.5	7.42	75.1	0.18	0.11	17.3	17.5	0.11	4.41	4.51	16,988
Area	12.6	12.4	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Energy	0.09	0.04	0.78	0.65	< 0.005	0.06	—	0.06	0.06	—	0.06	8,390
Water	—	—	—	—	—	—	—	—	—	—	—	878
Waste	—	—	—	—	—	—	—	—	—	—	—	896
Refrig.	—	—	—	—	—	—	—	—	—	—	—	33.5
Total	24.1	23.0	8.34	97.3	0.19	0.20	17.3	17.5	0.18	4.41	4.59	27,260

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	63.9	58.8	37.0	430	1.02	0.62	96.5	97.1	0.58	24.5	25.1	105,819

Area	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,610
Water	—	—	—	—	—	—	—	—	—	—	—	4,243
Waste	—	—	—	—	—	—	—	—	—	—	—	1,277
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	126	120	41.7	498	1.05	0.99	96.5	97.5	0.94	24.5	25.4	162,369
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	63.3	58.2	40.4	403	0.98	0.62	96.5	97.1	0.58	24.5	25.1	101,343
Area	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,610
Water	—	—	—	—	—	—	—	—	—	—	—	4,243
Waste	—	—	—	—	—	—	—	—	—	—	—	1,277
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	125	119	45.1	471	1.00	0.99	96.5	97.5	0.94	24.5	25.4	157,893
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	62.8	57.7	40.7	411	0.99	0.62	95.0	95.6	0.58	24.1	24.7	102,610
Area	68.9	67.9	0.77	118	0.01	0.12	—	0.12	0.09	—	0.09	445
Energy	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	50,678
Water	—	—	—	—	—	—	—	—	—	—	—	4,243
Waste	—	—	—	—	—	—	—	—	—	—	—	1,277
Refrig.	—	—	—	—	—	—	—	—	—	—	—	202
Total	132	126	45.7	533	1.02	1.07	95.0	96.1	1.00	24.1	25.1	159,456
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	11.5	10.5	7.42	75.1	0.18	0.11	17.3	17.5	0.11	4.41	4.51	16,988
Area	12.6	12.4	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Energy	0.09	0.04	0.78	0.65	< 0.005	0.06	—	0.06	0.06	—	0.06	8,390
Water	—	—	—	—	—	—	—	—	—	—	—	702

Waste	—	—	—	—	—	—	—	—	—	—	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	33.5
Total	24.1	23.0	8.34	97.3	0.19	0.20	17.3	17.5	0.18	4.41	4.59	26,400

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	23,011
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	6,832
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	2,143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	6,533

Strip Mall	—	—	—	—	—	—	—	—	—	—	—	4,286
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	2,675
Total	—	—	—	—	—	—	—	—	—	—	—	45,523
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	23,011
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	6,832
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	2,143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	6,533
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	4,286
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	2,675
Total	—	—	—	—	—	—	—	—	—	—	—	45,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3,821
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,131
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	355

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	1,082
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	710
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	7.13
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	443
Total	—	—	—	—	—	—	—	—	—	—	—	7,548

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	23,011
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	6,832
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	2,143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	6,533
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	4,286
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	2,675
Total	—	—	—	—	—	—	—	—	—	—	—	45,523
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	23,011
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	6,832
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	2,143
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	6,533
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	4,286
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	43.1
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	2,675
Total	—	—	—	—	—	—	—	—	—	—	—	45,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	3,821
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,131
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	355
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	1,082
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	710
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	7.13
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	443
Total	—	—	—	—	—	—	—	—	—	—	—	7,548

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.17	0.08	1.53	1.28	0.01	0.12	—	0.12	0.12	—	0.12	1,827
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	5,087
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.17	0.08	1.53	1.28	0.01	0.12	—	0.12	0.12	—	0.12	1,827

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.03	0.01	0.26	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	278
Industrial Park	0.02	0.01	0.22	0.18	< 0.005	0.02	—	0.02	0.02	—	0.02	239
High Turnover (Sit Down Restaurant)	0.03	0.02	0.28	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	302
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	23.2
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.09	0.04	0.78	0.65	< 0.005	0.06	—	0.06	0.06	—	0.06	842

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.17	0.08	1.53	1.28	0.01	0.12	—	0.12	0.12	—	0.12	1,827
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	5,087
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.15	0.08	1.40	1.18	0.01	0.11	—	0.11	0.11	—	0.11	1,678
Industrial Park	0.13	0.07	1.21	1.01	0.01	0.09	—	0.09	0.09	—	0.09	1,443
High Turnover (Sit Down Restaurant)	0.17	0.08	1.53	1.28	0.01	0.12	—	0.12	0.12	—	0.12	1,827
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	140
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00

Total	0.47	0.23	4.25	3.57	0.03	0.32	—	0.32	0.32	—	0.32	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.03	0.01	0.26	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	278
Industrial Park	0.02	0.01	0.22	0.18	< 0.005	0.02	—	0.02	0.02	—	0.02	239
High Turnover (Sit Down Restaurant)	0.03	0.02	0.28	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	302
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Strip Mall	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	23.2
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Apartments Mid Rise	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.09	0.04	0.78	0.65	< 0.005	0.06	—	0.06	0.06	—	0.06	842

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	49.9	49.9	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.06	6.06	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	49.9	49.9	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.06	6.06	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	9.11	9.11	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.11	1.11	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	2.35	2.17	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Total	12.6	12.4	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	49.9	49.9	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	6.06	6.06	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	49.9	49.9	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	6.06	6.06	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	5.17	4.78	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Total	61.2	60.8	0.42	64.8	< 0.005	0.05	—	0.05	0.03	—	0.03	217
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	9.11	9.11	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.11	1.11	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	2.35	2.17	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7
Total	12.6	12.4	0.14	21.6	< 0.005	0.02	—	0.02	0.02	—	0.02	73.7

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,858
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,376
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	286
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.04
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	349
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.04
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	435
Total	—	—	—	—	—	—	—	—	—	—	—	5,303
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,858
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,376
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	286
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.04
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	349
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.04

Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	435
Total	—	—	—	—	—	—	—	—	—	—	—	5,303
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	473
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	228
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	47.3
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.01
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	57.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.01
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	72.1
Total	—	—	—	—	—	—	—	—	—	—	—	878

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,287
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,100

High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	229
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.03
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	279
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.03
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	348
Total	—	—	—	—	—	—	—	—	—	—	—	4,243
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2,287
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	1,100
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	229
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.03
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	279
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.03
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	348
Total	—	—	—	—	—	—	—	—	—	—	—	4,243
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	379

Industrial Park	—	—	—	—	—	—	—	—	—	—	—	182
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	37.8
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.01
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	46.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.01
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	57.7
Total	—	—	—	—	—	—	—	—	—	—	—	702

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1,797
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	886
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,346
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00

Strip Mall	—	—	—	—	—	—	—	—	—	—	—	594
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	789
Total	—	—	—	—	—	—	—	—	—	—	—	5,412
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1,797
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	886
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,346
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	594
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	789
Total	—	—	—	—	—	—	—	—	—	—	—	5,412
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	298
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	147
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	223

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	98.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	131
Total	—	—	—	—	—	—	—	—	—	—	—	896

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	424
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	209
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	318
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	140
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	186
Total	—	—	—	—	—	—	—	—	—	—	—	1,277
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	424
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	209
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	318
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	140
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	186
Total	—	—	—	—	—	—	—	—	—	—	—	1,277
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	70.2
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	34.6
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	52.6
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	23.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	30.8
Total	—	—	—	—	—	—	—	—	—	—	—	211

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.49
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	98.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	93.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.87
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	5.37
Total	—	—	—	—	—	—	—	—	—	—	—	202
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.49
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	98.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	93.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.87

Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	5.37
Total	—	—	—	—	—	—	—	—	—	—	—	202
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.41
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	16.3
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	15.5
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.31
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	0.89
Total	—	—	—	—	—	—	—	—	—	—	—	33.5

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.49
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	98.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	93.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.87

Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	5.37
Total	—	—	—	—	—	—	—	—	—	—	—	202
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.49
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	98.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	93.8
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.87
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	5.37
Total	—	—	—	—	—	—	—	—	—	—	—	202
Annual	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.41
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	16.3
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	15.5
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	0.31
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	0.89
Total	—	—	—	—	—	—	—	—	—	—	—	33.5

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	20,433	20,433	20,433	7,458,045	136,045	136,045	136,045	49,656,425

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	20,433	20,433	20,433	7,458,045	136,045	136,045	136,045	49,656,425

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
1518750	506,250	2,737,914	892,213	125,241

5.10.3. Landscape Equipment

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	9.00	1.00	1,248	1.13	0.91
Other Lawn & Garden Equipment	Gasoline 4-Stroke	2.00	9.00	4,160	6.09	0.58
Leaf Blowers/Vacuums	Gasoline 2-Stroke	4.00	4.00	3,744	1.79	0.94
Leaf Blowers/Vacuums	Electric	9.00	3.00	6,552	1.79	0.94
Lawn Mowers	Gasoline 4-Stroke	4.00	0.40	384	3.86	0.36
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	6.00	0.30	384	1.13	0.91
Chainsaws	Gasoline 2-Stroke	6.00	0.20	192	1.86	0.70
Other Lawn & Garden Equipment	Gasoline 4-Stroke	4.00	2.00	1,664	6.09	0.58

5.10.4. Landscape Equipment - Mitigated

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	9.00	1.00	1,248	1.13	0.91
Other Lawn & Garden Equipment	Gasoline 4-Stroke	2.00	9.00	4,160	6.09	0.58
Leaf Blowers/Vacuums	Gasoline 2-Stroke	4.00	4.00	3,744	1.79	0.94
Leaf Blowers/Vacuums	Electric	9.00	3.00	6,552	1.79	0.94
Lawn Mowers	Gasoline 4-Stroke	4.00	0.40	384	3.86	0.36
Trimmers/Edgers/Brush Cutters	Gasoline 2-Stroke	6.00	0.30	384	1.13	0.91

Chainsaws	Gasoline 2-Stroke	6.00	0.20	192	1.86	0.70
Other Lawn & Garden Equipment	Gasoline 4-Stroke	4.00	2.00	1,664	6.09	0.58

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	20,970,192	397	0.0489	0.0069	5,221,412
Industrial Park	6,229,965	397	0.0489	0.0069	4,488,923
High Turnover (Sit Down Restaurant)	1,954,205	397	0.0489	0.0069	5,683,778
Enclosed Parking with Elevator	5,957,088	397	0.0489	0.0069	0.00
Strip Mall	3,908,122	397	0.0489	0.0069	436,176
Parking Lot	39,267	397	0.0489	0.0069	0.00
Apartments Mid Rise	2,439,636	397	0.0489	0.0069	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	20,970,192	397	0.0489	0.0069	5,221,412
Industrial Park	6,229,965	397	0.0489	0.0069	4,488,923
High Turnover (Sit Down Restaurant)	1,954,205	397	0.0489	0.0069	5,683,778
Enclosed Parking with Elevator	5,957,088	397	0.0489	0.0069	0.00
Strip Mall	3,908,122	397	0.0489	0.0069	436,176
Parking Lot	39,267	397	0.0489	0.0069	0.00

Apartments Mid Rise	2,439,636	397	0.0489	0.0069	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	182,177,092	140,246
Industrial Park	87,643,750	140,246
High Turnover (Sit Down Restaurant)	18,212,023	7,012
Enclosed Parking with Elevator	0.00	7,012
Strip Mall	22,221,756	7,012
Parking Lot	0.00	7,012
Apartments Mid Rise	27,694,433	171,412

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	145,741,673	112,197
Industrial Park	70,115,000	112,197
High Turnover (Sit Down Restaurant)	14,569,618	5,610
Enclosed Parking with Elevator	0.00	5,610
Strip Mall	17,777,405	5,610
Parking Lot	0.00	5,610
Apartments Mid Rise	22,155,547	137,129

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Office Building	953	—
Industrial Park	470	—
High Turnover (Sit Down Restaurant)	714	—
Enclosed Parking with Elevator	0.00	—
Strip Mall	315	—
Parking Lot	0.00	—
Apartments Mid Rise	418	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	225	—
Industrial Park	111	—
High Turnover (Sit Down Restaurant)	169	—
Enclosed Parking with Elevator	0.00	—
Strip Mall	74.3	—
Parking Lot	0.00	—
Apartments Mid Rise	98.7	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Strip Mall	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Strip Mall	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	12.0	annual days of extreme heat
Extreme Precipitation	6.95	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.68	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A

Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	74.1
AQ-PM	59.9
AQ-DPM	34.1
Drinking Water	83.1
Lead Risk Housing	24.7
Pesticides	0.00
Toxic Releases	67.4
Traffic	68.4
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	41.1
Impaired Water Bodies	58.7
Solid Waste	22.1
Sensitive Population	—
Asthma	7.66
Cardio-vascular	17.6
Low Birth Weights	37.0
Socioeconomic Factor Indicators	—
Education	30.0
Housing	71.9
Linguistic	4.59
Poverty	17.7
Unemployment	63.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	78.63467214
Employed	50.78916977
Median HI	62.22250738
Education	—
Bachelor's or higher	89.24675991
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	54.54895419
Active commuting	20.5825741
Social	—
2-parent households	49.82676761
Voting	61.58090594
Neighborhood	—
Alcohol availability	19.18388297
Park access	81.35506224
Retail density	69.0619787
Supermarket access	58.7065315
Tree canopy	68.90799435
Housing	—
Homeownership	29.23136148
Housing habitability	34.73630181
Low-inc homeowner severe housing cost burden	38.53458232
Low-inc renter severe housing cost burden	14.14089568

Uncrowded housing	78.31387142
Health Outcomes	—
Insured adults	70.06287694
Arthritis	38.0
Asthma ER Admissions	88.7
High Blood Pressure	44.4
Cancer (excluding skin)	12.2
Asthma	76.7
Coronary Heart Disease	43.7
Chronic Obstructive Pulmonary Disease	68.2
Diagnosed Diabetes	80.8
Life Expectancy at Birth	19.4
Cognitively Disabled	85.7
Physically Disabled	88.8
Heart Attack ER Admissions	72.8
Mental Health Not Good	80.9
Chronic Kidney Disease	64.9
Obesity	71.5
Pedestrian Injuries	55.9
Physical Health Not Good	77.4
Stroke	58.2
Health Risk Behaviors	—
Binge Drinking	29.5
Current Smoker	81.1
No Leisure Time for Physical Activity	90.8
Climate Change Exposures	—
Wildfire Risk	0.2
SLR Inundation Area	0.0

Children	50.1
Elderly	21.7
English Speaking	98.1
Foreign-born	27.1
Outdoor Workers	93.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	33.0
Traffic Density	83.2
Traffic Access	61.4
Other Indices	—
Hardship	30.1
Other Decision Support	—
2016 Voting	59.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	27.0
Healthy Places Index Score for Project Location (b)	73.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	See Assumptions
Construction: Off-Road Equipment	See Assumptions
Construction: Trips and VMT	See Assumptions
Construction: On-Road Fugitive Dust	See Assumptions
Land Use	See Project Description
Operations: Energy Use	Adjustment for MBS energy usage. All-Electric
Operations: Consumer Products	Adjustment for SCAQMD jurisdiction
Characteristics: Utility Information	SB100 Adjustment. Year 2028
Operations: Hearths	No wood fireplaces and stoves