

STAFF REPORT

SUBJECT: Regional Transportation Plan - Intersection Analysis

MEETING DATE: April 5, 2007

AGENDA ITEM: 6

STAFF CONTACT: Andrew Orfila, Michael Powers

RECOMMENDATION:

- A. Review and comment on forecast intersection analysis.
- B. Consider incorporation of intersection, or other system-wide improvements, to remedy forecasted deficiencies.
- C. Receive status report on update to RTP.

SUMMARY

SBCAG's Vision 2030 Regional Transportation Plan (RTP) contains performance measures to evaluate how the County's regional roadway network will perform in the future. The TTAC has reviewed portions of the draft Vision 2030 RTP, which contains specific performance measures for congestion at roadways and intersections using the Congestion Management Program (CMP) level of service (LOS) criteria. Using the CMP criteria for "deficient" intersections (criteria = intersection operating at LOS E or worse), staff has identified 13 intersections of regional significance that are forecast to exceed the LOS E standard during the P.M. peak hour by 2030.

This staff report summarizes the future conditions at these locations and recommends potential capacity-increasing measures to improve operations. It should be noted that the SBCAG staff recommendations are not binding, and should not be seen by the local agencies as requirements under the Congestion Management Program or specific mitigation measures under CEQA. This report simply identifies the deficiencies, using the CMP criteria, and notes *potential* capacity-increasing fixes. As noted in the CMP deficiency plan process, the local agency ultimately decides the site-specific improvements once the deficiency is identified.

Some of the staff recommendations for the intersection improvements are planned projects that are already contained in General Plans, mitigation measures that have been identified for development projects, and "conceptual" plans contained in Caltrans Transportation Concept Reports. Others were developed by SBCAG staff considering specific critical turning

Member Agencies

Buellton ■ Carpinteria ■ Goleta ■ Guadalupe ■ Lompoc ■ Santa Barbara ■ Santa Maria ■ Solvang ■ Santa Barbara County

movements that are forecast to be constrained. Based on the results of this analysis, the local agencies are encouraged to consider including intersection improvement projects or system-wide improvements in their capital improvement plans to address these forecast deficiencies. Since many of these improvements are due to growth in the area, local agencies are also encouraged to examine the land use-transportation connection as a means of addressing the consequences of growth.

DISCUSSION

Within the draft Vision 2030 RTP, Chapter 6, there are 13 intersections identified that are forecast to be “deficient” (LOS E or worse) under the CMP criteria for the Year 2030 Planned scenario. Staff has put together this report which identifies where these deficiencies are located and potential improvement projects to alleviate future congestion at these locations. The goal of this process is for TTAC to consider the viability of pursuing projects to improve operations at these locations or to address these potential problem areas with system-wide improvements. Since many of these improvements are due to growth in the area, local agencies are also encouraged to examine the land use-transportation connection as a means of addressing the consequences of growth. The intersection deficiencies and potential intersection improvements are summarized by region below. The LOS calculation worksheets are attached for reference.

Santa Maria

There are two locations within the City of Santa Maria that are forecast to operate at LOS E-F in the Year 2030. These are summarized in Table 1.

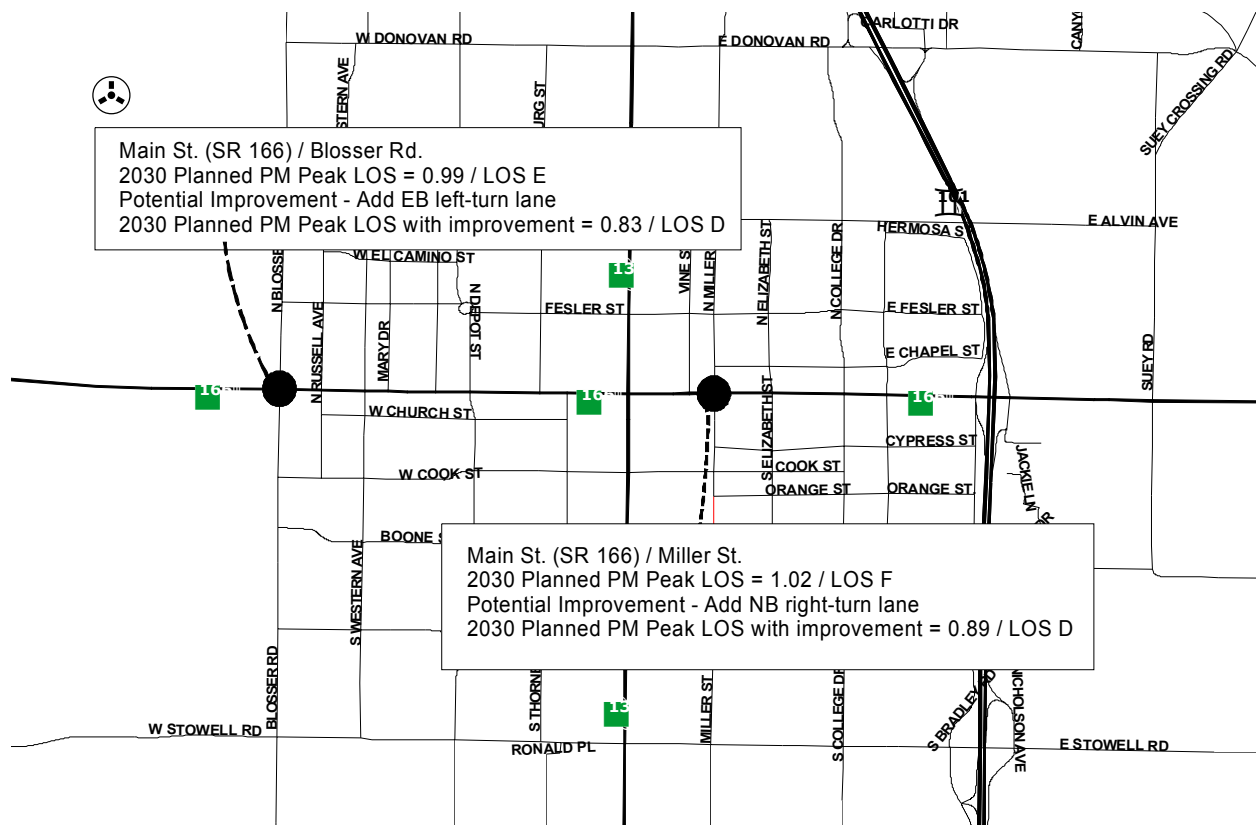
Table 1
Year 2030 P.M. Peak Hour Planned LOS in Santa Maria
With Potential Capacity Improvements

Intersection	Existing LOS	Year 2030 Planned LOS	Improvement	Year 2030 Planned LOS With Improvement
Main St.-SR 166 / Blosser Rd.	0.69 / LOS B	0.99 / LOS E	Add EB left	0.83 / LOS D
Main St.-SR 166 / Miller St.	0.80 / LOS C	1.02 / LOS F	Add NB right	0.89 / LOS D

Main Street-SR 166 / Blosser Road: This location currently operates at LOS B during the P.M. peak hour. Mainline volumes on Main Street-SR 166 east and west of Blosser Road are forecast to increase approximately 60% under the Year 2030 Planned scenario when compared with existing conditions, and there will be over 500 eastbound left-turns at this intersection. This high volume would warrant an additional left-turn lane, which would require some widening on the west leg of the intersection. With the additional eastbound left-turn lane, the intersection would operate at LOS D (0.83 V/C). Widening Route 135 would reduce mainline north-south volumes on Blosser Road, and would further improve LOS at this intersection. A project to widen Route 135 is contained in the RTP illustrative project list (CT-IL-6).

Main Street-SR 166 / Miller Street: This location currently operates at LOS C (0.80 V/C) during the P.M. peak hour. P.M. peak hour volumes on the northbound approach are forecast to increase approximately 40% under the 2030 Planned scenario. There will be over 400 northbound right-turns at this location, which warrants the addition of a right-turn lane. With the additional northbound right-turn lane, the intersection would operate at LOS D (0.89 V/C). As mentioned above, there is an illustrative project that would widen Route 135 in the area. Similar to Blosser Road, the widening project would divert some mainline north-south volumes to Route 135 and reduce volumes on Miller Street, resulting in improved LOS at the Main Street-SR 166/Miller Street intersection. The deficient intersections and potential improvement projects in the City of Santa Maria are illustrated on Figure 1.

Figure 1
Deficient Intersections and Potential Improvements – Santa Maria



Lompoc Valley

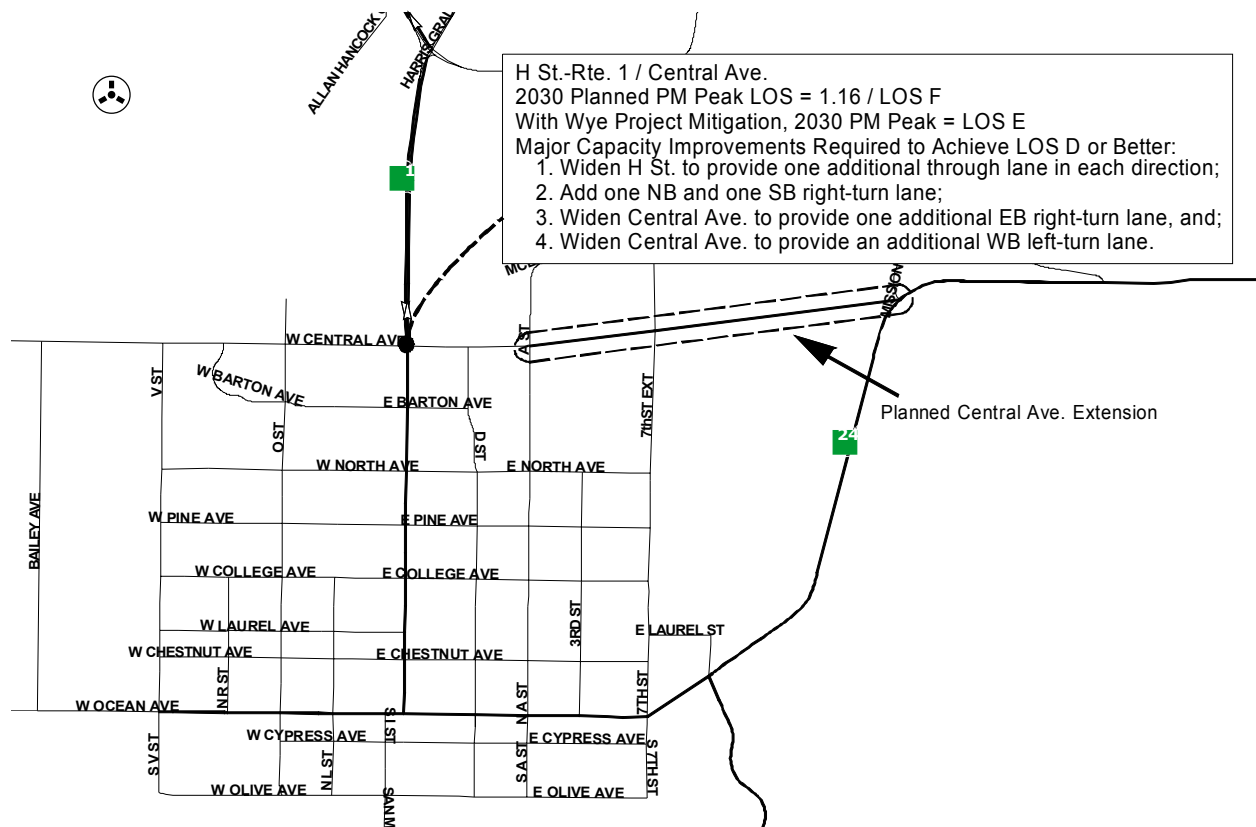
The SBCAG travel model forecasts heavy increases to the north-south mainline volumes on H Street-State Route 1 by the Year 2030. This, in combination with heavy increases to Central Avenue as a result of the planned Central Avenue extension, results in a LOS F during the P.M. peak hour at the H Street-Route 1/Central Avenue intersection under the Year 2030 Planned scenario. Improvements that will be provided to mitigate impacts of the Wye project (dual northbound and southbound left-turn lanes) would improve operations to LOS E (Wye Specific Plan EIR, SAIC, May 2004).

Major capacity improvements would be required to improve operations at the intersection to LOS D or better:

- Widen H Street to provide one additional through lane and right-turn lanes on both the north and southbound approaches, and;
- Widen Central Avenue to add an additional eastbound right-turn lane and a westbound left-turn lane.

Implementation of these improvements would provide LOS D (0.87 V/C) under the 2030 Planned scenario. However, this may involve major purchases of right-of-way for widening the north, east and westbound approaches.

Figure 2
H Street-Route 1 / Central Avenue Intersection



Santa Ynez Valley

Major growth in mainline east-west volumes on Route 246 contribute to LOS F operations at the Route 246/Alamo Pintado Road intersection (1.11 V/C) in Solvang during the P.M. peak hour under the Year 2030 Planned scenario. There will be over 2,100 P.M. peak hour trips on the two-lane segment of Route 246 converging at this intersection. Widening Route 246 to a 4-lane

facility would improve the LOS to D (0.84 V/C). However, this may likely involve major right-of-way purchases and extensive environmental review. It should be noted that the “Ultimate Transportation Corridor” listed in the Transportation Concept Report, State Route 246 (Caltrans, May 2004) is either a 4-lane Route 246 or Route 246 Bypass.

Given the heavy traffic volume increases forecasted on Route 246 in the Santa Ynez Valley, SBCAG is proposing the preparation of a Route 246 Corridor Study to address future congestion issues. This multi-agency study could be considered for inclusion in SBCAG’s FY 2008-09 Overall Work Program.

South Coast

Goleta

There are four intersections in Goleta that are forecast to operate at LOS E during the P.M. peak hour under Year 2030 Planned conditions. LOS for the deficient intersections and the changes with the recommended improvements are outlined in Table 2.

**Table 2
Year 2030 P.M. Peak Hour Planned LOS in Goleta
With Potential Capacity Improvements**

Intersection	Existing LOS	Year 2030 Planned LOS	Improvement	Year 2030 Planned LOS With Improvement
Hollister Ave./Storke Rd.	0.79 / LOS C	0.95 / LOS E	None ^a	0.95 / LOS E
Fairview Ave./Calle Real	0.81 / LOS D	0.91 / LOS E	Add NB left and right-turn lanes ^b	0.81 / LOS D
Fairview Ave./ 101 NB Ramps	0.61 / LOS B	0.94 / LOS E	Add WB through lane and EB left-turn lane ^b	0.72 / LOS C
Hollister Ave./ Patterson Ave.	0.69 / LOS B	0.92 / LOS E	Add NB right-turn lane	0.89 / LOS D

^a Intersection at “planned capacity” according to the City’s General Plan.

^b Source: City of Goleta General Plan Final Traffic Forecast Report, Dowling Assoc., Inc., August 2006.

Hollister Avenue / Storke Road: The intersection is forecast to operate at LOS E (0.95 V/C) during the P.M. peak hour under Year 2030 Planned conditions. It should be noted that the Planned scenario assumes completion of the Ellwood Station Overcrossing project, which diverts some north-south traffic volumes away from the Storke Road over-crossing. Capacity increasing improvements identified in the Goleta Transportation Improvement Program (Santa Barbara County, August 1997), such as widening Hollister Avenue west of the intersection to provide three westbound through lanes, or triple eastbound left-turn lanes would improve LOS at the intersection to D or better.¹ However, the City of Goleta has recently designated this

¹ Goleta Transportation Improvement Program, Santa Barbara County Department of Public Works Transportation Division, August 1997.

intersection to be at “planned capacity” in its General Plan, which limits any lane additions or widening at this location. Therefore, any measures taken to improve LOS at the intersection will likely arise out of either City’s deficiency plan process (which requires a deficiency plan to be prepared for intersections that are operating below LOS D) or the CMP Deficiency Plan process and would likely involve implementation of system-wide transit or TDM projects. This intersection will continue to be closely monitored by SBCAG as part of the CMP.

Fairview Avenue / Calle Real: The Fairview Avenue / Calle Real intersection is currently operating at LOS D (0.81 V/C) and is forecast to degrade to LOS E by the Year 2030 under the Planned scenario. Given the existing deficiency (according to City LOS standards) and projected growth in the area, it is likely that this intersection will hit LOS E before the Year 2030.

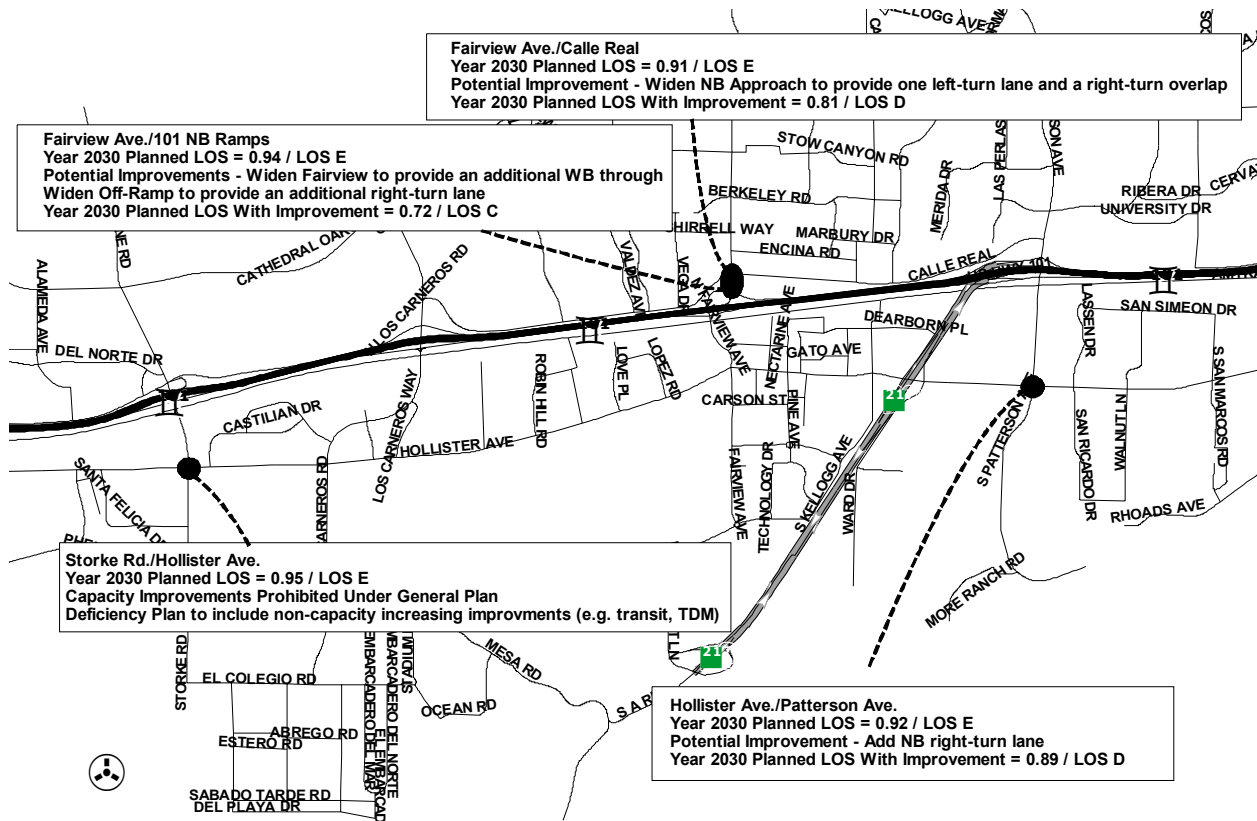
A deficiency plan was prepared for this intersection in 2005, but was not adopted, due to the fact that the deficiency finding was based on erroneous count data. The major improvement that would have been implemented from that plan was widening Fairview Avenue south of Calle Real to provide additional capacity, and to re-stripe the northbound approach to provide one left-turn lane, one left-through lane, one through lane and one right-turn lane (with an overlap). This improvement is also identified in the City of Goleta’s General Plan Traffic Forecast Report (Dowling Associates, Inc., August 2006) to mitigate a deficiency Goleta staff have identified in the Year 2030. When applied to the SBCAG forecasted Year 2030 P.M. peak hour volumes under the Planned scenario, these improvements would yield a LOS D (0.81 V/C).

Fairview Avenue / U.S. 101 NB Ramps: This intersection is currently operating at LOS B (0.61 V/C) and is forecast to operate at LOS E (0.94 V/C) during the P.M. peak hour under Year 2030 Planned conditions. The improvement identified in the City’s General Plan traffic analysis is the addition of a westbound through-lane to the off-ramp and an eastbound left-turn lane on Fairview Avenue. Implementation of this improvement would result in a LOS C (0.72 V/C) at the intersection.

Hollister Avenue / Patterson Avenue: This intersection is currently operating at LOS B (0.69 V/C) and is forecast to degrade to LOS E (0.94 V/C) by the Year 2030 during the P.M. peak hour under Planned project conditions. The General Plan traffic analysis includes the addition of a westbound right-turn lane and overlap phase; however this improvement would only marginally improve the LOS at the intersection. Widening the NB approach to provide a right-turn lane would improve the intersection operation to LOS D (0.89 V/C). It should be noted that the poor LOS at this intersection can be mostly attributed to heavy southbound lefts from Patterson Avenue (over 750 vph) and eastbound through volumes on Hollister Avenue (approximately 1,200 vph in two lanes).

The intersection LOS with the potential improvements are illustrated in Figure 3.

Figure 3
Deficient Intersections and Potential Improvements – Goleta



Santa Barbara

There are five intersections within Santa Barbara that are forecast to operate at LOS E-F during the P.M. peak hour for the Year 2030 Planned scenario. It is worth noting that three of the intersections are located in close proximity to each other along the Castillo Street corridor, adjacent to U.S. 101 and Montecito Street. Table 3 summarizes the LOS for each of the Santa Barbara intersections and the staff recommendations for improvements.

Table 3
Year 2030 P.M. Peak Hour Planned LOS in Santa Barbara
With Potential Capacity Improvements

Intersection	Existing LOS	Year 2030 Planned LOS	Improvement	Year 2030 Planned LOS With Improvement
Mission St./ 101 SB Ramps	1.13 / LOS F	1.19 / LOS F	Widen and re-stripe SB approach ^a	1.01 / LOS F
Castillo St. / Montecito St.	0.79 / LOS C	0.92 / LOS E	Re-stripe WB approach	0.86 / LOS D
Castillo St. / 101 SB Ramps	0.62 / LOS B	0.92 / LOS E	Widen NB approach to provide a right-turn lane	0.89 / LOS D
Castillo St. / 101 NB Ramps	0.76 / LOS C	1.01 / LOS F	Widen on-ramp to two lanes, re-stripe NB approach to provide dual left-turn lanes	0.77 / LOS C
Garden St. / 101 NB Ramps	0.79 / LOS C	0.97 / LOS E	Widen on-ramp to provide receiving lane for SB free-right turns	0.87 / LOS D

^a Source: Santa Barbara Cottage Hospital Modernization and Seismic Compliance Plan Traffic Analysis, LSA Associates, Inc., March 2005.

Mission Street / 101 SB Ramps: The intersection is currently operating at LOS F (1.13 V/C). Through the annual CMP monitoring process, the intersection was identified as deficient in 1997, and the City and SBCAG adopted a Deficiency Plan here in 1999. Capacity improvements here would prove difficult and expensive, given the proximity to the Highway 101 and Union Pacific railroad over-crossings, so the City chose to pursue system-wide improvements. Therefore, the Deficiency Plan included a new transit service (the Cross-Town Shuttle) and a bicycle lane connection between Modoc Road and Castillo Street. The Cross-Town Shuttle service provides a link for residents in the Westside area of the City to employment and commercial centers downtown and in the Milpas Street area. The service has been operational since 2000. Funds for the bicycle lane project are expected to be available within the next year, with construction proceeding shortly thereafter.

Since a deficiency plan has been adopted for this location, there would be no requirement for the City to improve operations at the intersection through the CMP process. However, the City is still examining system-wide improvements to address congestion issues. Traffic studies recently completed for Upper State Street and Cottage Hospital included a provision to study a potential U.S. 101 over-crossing between the Las Positas Road and Mission Street interchanges, most likely at Junipero Road. A new vehicle over-crossing would likely reduce mainline through volumes on Mission Street. Also, the Cottage Hospital project included a mitigation measure to widen and re-stripe the southbound off-ramp with dual left-turn lanes and a shared through-right lane. This improvement would only marginally improve LOS at the intersection, as shown in Table 3.

Castillo Street / Montecito Street: This location is currently operating at LOS C (0.79 V/C) during the P.M. peak hour and is forecast to degrade to LOS E (0.92 V/C) under the Year 2030 Planned scenario. Mainline through volumes on Castillo Street are forecast to increase approximately 40%. Widening the westbound approach and re-striping to provide one left-turn lane, one through lane and one shared through-right lane would improve the LOS to D (0.86 V/C).

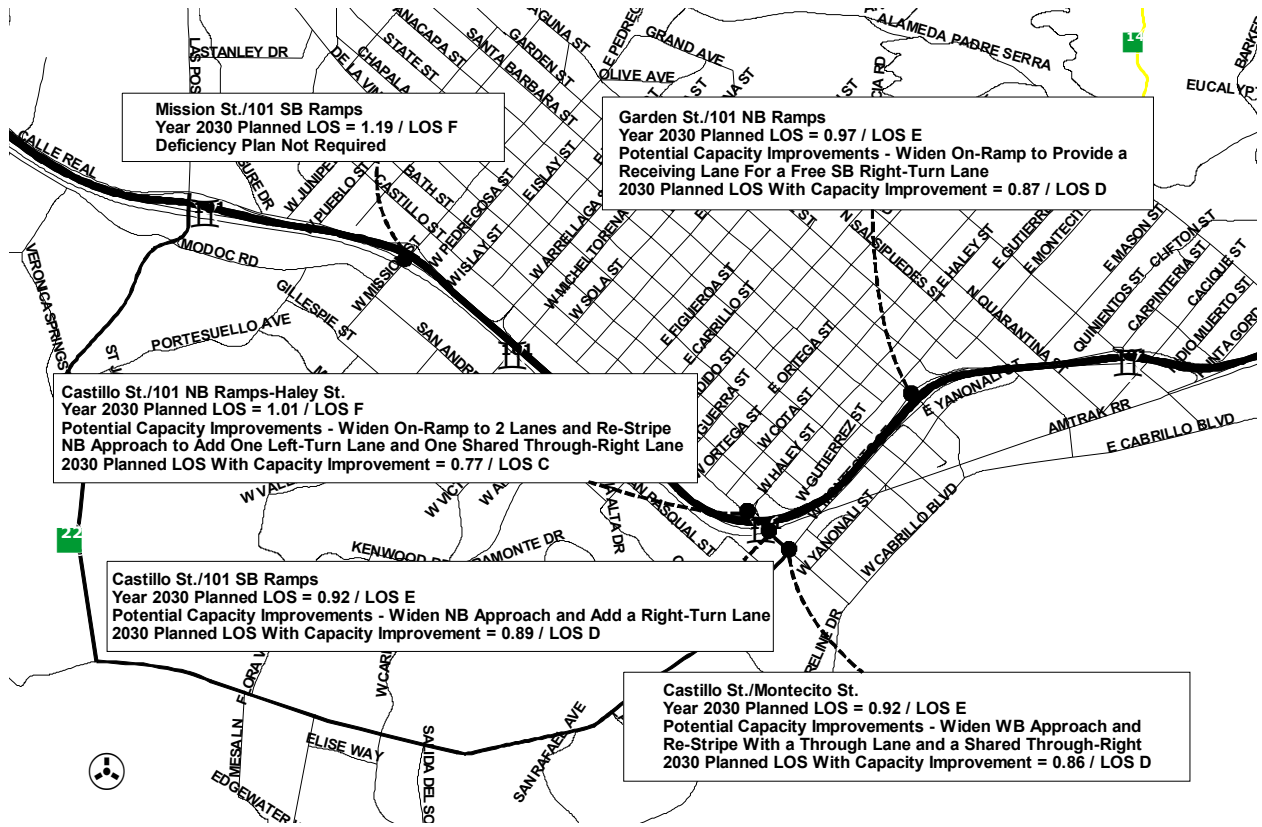
Castillo Street / U.S. 101 SB Ramps: This location currently operates at LOS B (0.62 V/C) during the P.M. peak hour and is forecast to degrade to LOS E (0.92 V/C) under the Year 2030 Planned scenario. This is primarily due to heavy volumes using the two-lane off-ramp (490 left-turns and 760 right-turns). Adding additional capacity to the off-ramp would significantly improve the LOS, but would likely be expensive. Widening the NB approach and adding a right-turn lane would improve the LOS to D (0.89 V/C). This improvement may also prove to be expensive. The Castillo Street interchange is similar to the Mission Street interchange, where there are significant constraints to widening and capacity improvements due to the 101 overcrossing.

Castillo Street / U.S. 101 NB Ramps-Haley Street: This location currently operates at LOS C (0.76 V/C) and is forecast to degrade to LOS F (1.01 V/C) under Year 2030 Planned conditions. The deficiency is primarily caused by increases to the northbound left-turns (770 PHT in one lane under the Year 2030 Planned scenario). The NB left movement contributes to 48% of the total capacity. A dual left-turn lane is more than warranted at this location, but there is currently only one receiving lane at the on-ramp. Widening the NB on-ramp to provide an additional lane and re-striping the NB approach to contain one left-turn lane and one shared left-through lane would improve the LOS to C (0.77 V/C) under the Year 2030 Planned scenario.

Garden Street / U.S. 101 NB Ramps: This intersection is currently operating at LOS C (0.79 V/C) and is forecast to degrade to LOS E (0.97 V/C) during the P.M. peak hour by the Year 2030 under Planned conditions. The southbound right-turns will account for 46% of the total capacity. Widening the on-ramp to provide an exclusive receiving lane for southbound right-turns would allow for a free-turn for southbound right turns. The provision of a free-right turn lane for the southbound vehicles accessing the on-ramp would improve the intersection LOS to D (0.87 V/C).

The intersection LOS with the potential improvements are illustrated in Figure 4.

Figure 4
Deficient Intersections and Potential Improvements – Santa Barbara



ATTACHMENT

ICU CALCULATION WORKSHEETS

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 SR 246/Alamo Pintado

Cycle (sec): 100 Critical Vol./Cap. (X): 1.105
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F

Street Name: Alamo Pintado Rd SR 246

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected

Rights: Include Ovl Include Ovl

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 1 0 0 1 0 1 0 1 0 1 0 1

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Volume Module:

Base Vol: 56 143 35 241 6 320 336 689 31 27 853 258
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 56 143 35 241 6 320 336 689 31 27 853 258
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 56 143 35 241 6 320 336 689 31 27 853 258
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 56 143 35 241 6 320 336 689 31 27 853 258
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 56 143 35 241 6 320 336 689 31 27 853 258

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 0.80 0.20 1.00 1.00 1.00 1.00 0.96 0.04 1.00 1.00 1.00
Final Sat.: 1600 1285 315 1600 1600 1600 1600 1531 69 1600 1600 1600

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Capacity Analysis Module:

Vol/Sat: 0.04 0.11 0.11 0.15 0.00 0.20 0.21 0.45 0.45 0.02 0.53 0.16
Crit Moves: **** **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Main St. (Rte. 166) / Blosser Rd.

Cycle (sec): 100 Critical Vol./Cap. (X): 0.989

Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx

Optimal Cycle: 180 Level Of Service: E

Street Name: Blosser Rd. Main St. (Rte. 166)

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 1 0 1 1 0 1 0 2 0 1 1 0 1 1 0

Volume Module:

Base Vol: 326 969 117 84 542 239 528 517 131 291 526 68

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 326 969 117 84 542 239 528 517 131 291 526 68

User Adj: 1.00 1.00 0.79 1.00 1.00 0.47 1.00 1.00 0.54 1.00 1.00 0.49

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 326 969 92 84 542 112 528 517 71 291 526 33

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 326 969 92 84 542 112 528 517 71 291 526 33

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol.: 326 969 92 84 542 112 528 517 71 291 526 33

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 1.83 0.17 1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.88 0.12

Final Sat.: 1600 2921 279 1600 3200 1600 1600 3200 1600 1600 3009 191

Capacity Analysis Module:

Vol/Sat: 0.20 0.33 0.33 0.05 0.17 0.07 0.33 0.16 0.04 0.18 0.17 0.17

Crit Moves: **** **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Miller/Main

Cycle (sec): 100 Critical Vol./Cap. (X): 1.015
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F

Table with columns for Street Name (Miller St, Main St), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and Lanes (1, 0, 1, 1, 0).

Volume Module table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, and Final Vol. across 12 lanes.

Saturation Flow Module table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. across 12 lanes.

Capacity Analysis Module table with columns for Vol/Sat and Crit Moves across 12 lanes.

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 H St. / Central Ave.

Cycle (sec): 100 Critical Vol./Cap. (X): 1.161

Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx

Optimal Cycle: 180 Level Of Service: F

Street Name: H St. Central Ave.

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 1 0 1 1 0 1 0 2 0 2 2 0 1 1 0 1 0 2 0 1

Volume Module:

Table with 12 columns and 11 rows of volume and adjustment data.

Saturation Flow Module:

Table with 12 columns and 4 rows of saturation flow data.

Capacity Analysis Module:

Table with 12 columns and 2 rows of capacity analysis data.

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Storke/Hollister

Cycle (sec): 100 Critical Vol./Cap. (X): 0.948
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 132 Level Of Service: E

Street Name: Storke Rd Hollister Ave

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 2 0 2 0 1 2 0 2 0 1 2 0 2 0 1

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Volume Module:

Base Vol: 175 915 311 229 671 872 667 541 83 436 903 287

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 175 915 311 229 671 872 667 541 83 436 903 287

User Adj: 1.00 1.00 0.43 1.00 1.00 0.47 1.00 1.00 0.47 1.00 1.00 0.68

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 175 915 134 229 671 410 667 541 39 436 903 195

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 175 915 134 229 671 410 667 541 39 436 903 195

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol.: 175 915 134 229 671 410 667 541 39 436 903 195

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 2.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00

Final Sat.: 3200 3200 1600 3200 3200 1600 3200 3200 1600 3200 3200 1600

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Capacity Analysis Module:

Vol/Sat: 0.05 0.29 0.08 0.07 0.21 0.26 0.21 0.17 0.02 0.14 0.28 0.12

Crit Moves: **** **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Fairview/Calle Real

Cycle (sec): 100 Critical Vol./Cap. (X): 0.905
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 103 Level Of Service: E

Street Name: Fairview Ave Calle Real

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Split Phase Split Phase Protected Protected

Rights: Ovl Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 0 1 1 0 1 1 0 1 1 0 1 2 0 0 1 0

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Volume Module:

Base Vol: 466 472 633 173 413 38 52 302 302 585 337 68

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 466 472 633 173 413 38 52 302 302 585 337 68

User Adj: 1.00 1.00 0.76 1.00 1.00 0.94 1.00 1.00 0.28 1.00 1.00 0.87

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 466 472 481 173 413 36 52 302 85 585 337 59

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 466 472 481 173 413 36 52 302 85 585 337 59

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol.: 466 472 481 173 413 36 52 302 85 585 337 59

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.99 1.01 1.00 1.00 1.84 0.16 1.00 1.00 1.00 2.00 0.85 0.15

Final Sat.: 1590 1610 1600 1600 2945 255 1600 1600 1600 3200 1361 239

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Capacity Analysis Module:

Vol/Sat: 0.29 0.29 0.30 0.11 0.14 0.14 0.03 0.19 0.05 0.18 0.25 0.25

Crit Moves: **** **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Fairview/101 NB Ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.939
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 124 Level Of Service: E

Street Name: Fairview Ave. 101 NB Ramps

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Split Phase Split Phase

Rights: Include Ignore Include Ignore

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 0 0 0 0 0 0 0 1 0 2 2 0 0 0 1 0 0 1 0 1

Volume Module:

Base Vol: 0 0 0 0 472 853 954 0 236 0 393 829

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 0 0 0 0 472 853 954 0 236 0 393 829

User Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 0.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 0.00

PHF Volume: 0 0 0 0 472 0 954 0 236 0 393 0

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 0 0 0 0 472 0 954 0 236 0 393 0

PCE Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 0.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 0.00

Final Vol.: 0 0 0 0 472 0 954 0 236 0 393 0

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.00 0.00 0.00 0.00 1.00 2.00 2.00 0.00 1.00 0.00 1.00 1.00

Final Sat.: 0 0 0 0 1600 3200 3200 0 1600 0 1600 1600

Capacity Analysis Module:

Vol/Sat: 0.00 0.00 0.00 0.00 0.30 0.00 0.30 0.00 0.15 0.00 0.25 0.00

Crit Moves: **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Patterson/Hollister

Cycle (sec): 100 Critical Vol./Cap. (X): 0.922
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 112 Level Of Service: E

Table with columns for Street Name (Patterson Rd, Hollister Ave), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected, Ignored), Rights (Include, Ignore), and Lanes.

Volume Module:

Table with 13 columns for traffic volume metrics: Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Vol., and Sat/Lane.

Saturation Flow Module:

Table with 13 columns for saturation flow metrics: Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module:

Table with 13 columns for capacity analysis metrics: Vol/Sat, Crit Moves, and other performance indicators.

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Mission/101 SB Ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 1.194
 Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 180 Level Of Service: F

Street Name: 101 SB Ramps Mission St

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Prot+Permit

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 0 0 0 0 0 1 0 1! 0 0 0 0 2 0 1 1 0 2 0 0

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Volume Module:

Base Vol: 0 0 0 1438 0 567 0 586 132 455 475 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 0 0 0 1438 0 567 0 586 132 455 475 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 0 0 0 1438 0 567 0 586 132 455 475 0

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 0 0 0 1438 0 567 0 586 132 455 475 0

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol.: 0 0 0 1438 0 567 0 586 132 455 475 0

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.00 0.00 0.00 1.43 0.00 0.57 0.00 2.00 1.00 1.00 2.00 0.00

Final Sat.: 0 0 0 2295 0 905 0 3200 1600 1600 3200 0

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Capacity Analysis Module:

Vol/Sat: 0.00 0.00 0.00 0.63 0.00 0.63 0.00 0.18 0.08 0.28 0.15 0.00

Crit Moves: **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Castillo/Montecito

Cycle (sec): 100 Critical Vol./Cap. (X): 0.917
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 109 Level Of Service: E

Table with columns for Street Name (Castillo St, Montecito St), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and Lanes.

Volume Module table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, and Final Vol. across 12 lanes.

Saturation Flow Module table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. across 12 lanes.

Capacity Analysis Module table with columns for Vol/Sat and Crit Moves across 12 lanes.

Level of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Castillo/101 SB Ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.924
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Street Name: Castillo St 101 SB Ramps

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Permitted Protected Protected

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 0 0 1 1 0 0 1 2 0 0 0 1 0 0 0 0

Volume Module:

Base Vol: 0 998 118 154 681 0 490 0 761 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 998 118 154 681 0 490 0 761 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 998 118 154 681 0 490 0 761 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 998 118 154 681 0 490 0 761 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 0 998 118 154 681 0 490 0 761 0 0 0

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.00 1.79 0.21 0.55 2.45 0.00 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 0 2862 338 885 3915 0 1600 0 1600 0 0 0

Capacity Analysis Module:

Vol/Sat: 0.00 0.35 0.35 0.10 0.17 0.00 0.31 0.00 0.48 0.00 0.00 0.00
Crit Moves: ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Castillo/101 NB Ramps-Haley

Cycle (sec): 100 Critical Vol./Cap. (X): 1.011
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F

Street Name: Castillo St 101 NB Ramps-Haley St

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Split Phase Split Phase Protected Protected

Rights: Ovl Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Lanes: 1 0 1 0 1 0 1 0 1 0 2 0 0 1 0

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Volume Module:

Base Vol: 771 34 535 39 292 158 0 0 0 885 369 18

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 771 34 535 39 292 158 0 0 0 885 369 18

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 771 34 535 39 292 158 0 0 0 885 369 18

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 771 34 535 39 292 158 0 0 0 885 369 18

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol.: 771 34 535 39 292 158 0 0 0 885 369 18

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 1.00 1.00 0.16 1.19 0.65 0.00 0.00 0.00 2.00 0.95 0.05

Final Sat.: 1600 1600 1600 255 1911 1034 0 0 0 3200 1526 74

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Capacity Analysis Module:

Vol/Sat: 0.48 0.02 0.33 0.15 0.15 0.15 0.00 0.00 0.00 0.28 0.24 0.24

Crit Moves: **** **** ****

Level of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Garden/101 NB Ramps

Cycle (sec): 100 Critical Vol./Cap. (X): 0.966
Loss Time (sec): 10 (Y+R = 4 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 149 Level Of Service: E

Table with columns for Street Name (Garden St, 101 NB Ramps), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected, Include, Ignore), Rights, Min. Green, and Lanes.

Volume Module:

Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, and Final Vol. across various movement categories.

Saturation Flow Module:

Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. across various movement categories.

Capacity Analysis Module:

Table with columns for Vol/Sat and Crit Moves across various movement categories.
