HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: August 9, 2021

To: Jim Lightbody, City of Mountain View

From: Kai-ling Kuo, Gary Black

Subject: Gateway Trip Cap Study for the North Bayshore Area in Mountain View, California

Background

The original 2014 North Bayshore Precise Plan (NBPP) established a trip cap at the combined three gateways in the AM inbound and PM outbound three hour peak periods. The cap was established at 18,850 vehicles in the AM and 16,630 in the PM. The original intent was to measure compliance across all three gateways (e.g., San Antonio, Rengstorff, and Shoreline) in the peak period. Subsequently, however, the City Council narrowed that to compliance at each gateway and then later just to the peak hour at each gateway.

Through the 2017 Precise Plan, which added housing, the trip cap was converted to a two-way measure. That was based on the idea that outbound housing trips in the morning would reduce inbound capacity (by taking away green time). The result was that inbound trip capacity was reduced, even before any housing trips were added. The new cap was used starting with the 2017/18 monitoring reports. The 2017 Precise Plan also exempted residential trips from the trip cap.

Hexagon Transportation Consultants, Inc. has completed a gateway trip cap study for the NBPP area in Mountain View, California. This study evaluates the current gateway trip caps, estimates additional gateway capacity that can be added to the gateways with the proposed interchange and roadway improvements at the Shoreline and Rengstorff gateways, and recommends trip caps that can be applied to these gateways. The San Antonio gateway is not addressed since there are no current plans for modifications at that gateway.

Given there are several possible trip caps, this memorandum recommends a more simplified approach with trip caps that apply only to the peak direction of travel (northbound in the morning and southbound in the evening) for the three-hour peak period. Because the proposed roadway and interchange improvements would occur at the Shoreline and Rengstorff gateways, this study focuses on trip cap evaluation and estimates for these two gateways. The recommended trip caps were estimates based on the 2014 NBPP vehicle trip caps, which do not reflect the residential developments planned for the NBPP area. The timing and effects of the residential development are not known at this time, so Hexagon believes the residential development should be excluded from the trip cap for now. Once residential development is built and occupied, its impact on the traffic conditions in North Bayshore can be assessed, and the trip cap could be revisited if necessary.

Review of Current Trip Caps

The 2014 NBPP trip caps were reviewed by comparing the recent trip monitoring reports and the capacity calculated using the Synchro analysis developed for existing conditions for the 2017 NBPP EIR.

The 2017 NBPP trip caps reflect the residential developments planned for the for the NBPP area, which have not been implemented. Therefore, for the purpose of this study to estimate the trip caps with the proposed interchange and roadway improvements at the Shoreline and Rengstorff gateways, the 2014 NBPP trip caps were used.

Review of the recent trip monitoring reports indicates that the most recent monitoring report (2020 Spring) had the highest volumes, and the peak-hour volumes were all lower than the capacities. To examine whether the trip caps need to be modified, the capacities calculated using the Synchro software were compared to the trip caps. The Synchro capacity calculated for the Rengstorff gateway at the Charleston Road/Rengstorff Avenue/Amphitheatre Parkway/Garcia Avenue (CRAG) intersection is 2,380 vehicles, which is higher than the 2014 NBPP trip cap (2,090). The Synchro capacities that calculated for the Shoreline gateway (both AM and PM peak hours) and the Rengstorff gateway in the AM peak hour are all slightly lower than the caps. Thus, Hexagon believes the PM peak-hour capacity at Rengstorff could be increased to 2,380 vehicles in the PM peak hour, and the other existing capacities should remain as is. The comparison of the trip caps and Synchro capacities is included in Attachment A.

For the peak-period trip caps in the 2014 NBPP, the peak-hour caps were multiplied by a factor of 2.7. The factor is the ratio of 3-hour peak-period to peak-hour volume counted at the Shoreline gateway in 2014. However, that does not reflect the true capacity. Hexagon recommends that the peak-period trip caps be calculated by multiplying the peak-hour capacities by a factor of 3.0.

Table 1 summarized the current trip caps and most recent volumes for the Shoreline and Rengstorff gateways.

Table 1
Current Trip Caps and Recent Volumes

	AM Inbound				PM Outbound			
	Shoreline		Rengstorff		Shoreline		Rengstorff	
	Peak Hour	Peak Period	Peak Hour	Peak Period	Peak Hour	Peak Period	Peak Hour	Peak Period
Current Trip Cap (2014)	2,490	6,720	2,960	7,990	2,730	7,380	2,090	5,630
Most Recent Volume from Monitoring Report (Spring 2020)	2,480	7,220	2,480	6,130	2,410	6,750	2,020	5,150

Trip Cap Estimates with Proposed Roadway Improvements

The additional gateway capacity with the proposed interchange and roadway improvements on Shoreline Boulevard and Rengstorff Avenue were estimated using Synchro software and comparing to the VISSIM simulation prepared by TJKM for the Shoreline and Rengstorff gateways.

The study evaluated the following improvement scenarios:

- Shoreline Boulevard Improvements: Bus Lane, northbound right-turn lane at Pear Avenue, and Plymouth Street/Space Park Way realignment (see Attachment B).
- Shoreline Boulevard/US 101 Northbound Off-Ramp Realignment (see Attachment C).

- CRAG Intersection Turn Lanes: Addition of a 2nd northbound right-turn lane on Rengstorff Avenue, a third westbound left-turn lane on Charleston Road, and conversion of the 2nd eastbound through lane on Garcia Avenue to a right-turn lane (see Attachment D).
- Rengstorff Avenue/US 101 Northbound Ramp Realignment at Landings Frontage Road (see Attachment F).

For the Shoreline Boulevard/US 101 ramp realignment, because the vehicle queuing and weaving on the US 101 northbound off-ramp would limit the ability of vehicles to access the right-turn lane to turn on eastbound La Avenida, the right-turn lane capacity was estimated based on the VISSIM simulation. The 10-minute VISSIM simulation shows 45 vehicles making right turns from the off-ramp to eastbound La Avenida, which calculates to a one-hour capacity of 270 vehicles for the right-turn lane. The realignment project would add a northbound right-turn lane at the Shoreline Boulevard/La Avenida intersection. However, because the right-turn lane would be short and likely to be blocked by the through movement frequently, the right-turn lane capacity was also estimated based on the VISSIM simulation. The VISSIM simulation indicates a one-hour capacity of 100 vehicles for the right-turn lane.

Table 2 summarizes the estimated capacities for these scenarios and the findings/reasonings for the estimates. The assumptions for calculating the capacities using Synchro are included in Attachment A.

The recommended AM and PM trip caps are shown in Tables 3 and 4, respectively. While individual trip caps are estimated for the peak hour and peak period at both the Shoreline and Rengstorff gateways, it is recommended to combine both gateways in the peak periods in order to reflect the shift of future traffic demand when capacity is approached.

Summary of Recommendations

1. Define the trip cap in one direction only (AM inbound, PM outbound). This approach can be revisited when a significant amount of housing has been developed and the impact on peak direction capacity is better understood.
2. Use factor of three to convert peak hour to peak period.
3. Adjust current PM capacity at Rengstorff gateway.
4. Recommend new trip caps to be utilized when specific infrastructure projects are completed.
5. While individual trip caps are estimated for the peak hour and peak period at both the Shoreline and Rengstorff gateways, consider an approach that combines both gateways in the peak periods in order to reflect the shift of future traffic demand when capacity is approached.

Table 2
Estimated Peak-Hour Capacity with Proposed Improvements

	AM Peak Hour Inbound Capacity	Note	PM Peak Hour Outbound Capacity	Note
Shoreline Gateway				
Current Gateway Trip Cap (2014)	2,490	The current gateway capacity is constrained by the northbound capacity at the Shoreline/Pear intersection.	2,730	The current gateway capacity is constrained by the southbound capacity on Shoreline and westbound capacity on La Avenida at the Shoreline/La Avenida intersection.
Shoreline Bus Lane + NB RT at Pear Ave + Plymouth/Space Park Realignment	2,590	Although the improvement would increase the northbound capacity at each intersection (Pear and Plymouth), the gateway capacity would be constrained by the upstream intersection at La Avenida. Therefore, the gateway capacity would be the vehicle capacity that can pass through the La Avenida intersection, which would have slightly lower capacity than the capacity at the Pear Avenue intersection.	2,730	Although the improvement would increase the southbound capacity at the Plymouth intersection, the gateway capacity would still be constrained by the downstream intersection at La Avenida. Therefore, no change to the gateway capacity.
Shoreline/US 101 NB Off-Ramp Realignment	3,210 with additional capacity of 350 vehicles on Shoreline and 370 vehicles on La Avenida	Although the new off-ramp would increase the NB capacity on Shoreline north of La Avenida by reducing signal phases at the La Avenida intersection from three to two phases, the capacity is also constrained by the NB capacity approaching the Pear intersection. The northbound capacity on Shoreline would increase by 350 vehicles. The new off-ramp would also provide additional capacity of 370 vehicles for vehicles entering the North Bayshore area through eastbound La Avenida via northbound right turns at the US 101 NB off-ramp/La Avenida and Shoreline/La Avenida intersections.	3,020	The new off-ramp would increase the southbound capacity at the Shoreline/La Avenida intersection by reducing signal phases from three to two phases. The new off-ramp would also increase the westbound capacity on La Avenida. However, because the westbound capacity would also serve a majority of traffic from the US 101 off-ramp, the westbound capacity for the North Bayshore area would not change.
Rengstorff Gateway				
Current Gateway Trip Cap (2014)	2,960	The current gateway capacity is constrained by the northbound capacity at the CRAG intersection.	2,090	The current gateway capacity is constrained by the southbound capacity at the CRAG Intersection.
Recommended One-Hour Capacity at Rengstorff	-		2,380	Based on the comparison of the gateway capacities to the capacities calculated using Synchro, the Synchro capacities are all lower than the gateway capacities, except on Rengstorff in the PM peak hour. The Synchro capacity at CRAG is 2,380 vehicles in the PM peak hour, which is higher than the assumed gateway capacity (2,090). Therefore, the outbound gateway capacity could be increased to 2,380 vehicles at CRAG in the PM peak hour.

	AM Peak Hour Inbound Capacity	Note	PM Peak Hour Outbound Capacity	Note
CRAG Intersection Turn Lanes	2,960	Because the intersection is very close to the US 101 NB off-ramp, the NB vehicle queuing and weaving between the intersection and ramp would limit the ability of vehicles accessing the additional RT lane. Therefore, the 2nd RT lane is not expected to increase the gateway capacity.	2,740	Adding additional turn lanes would increase the gateway capacity by 360 vehicles from 2,380 to 2,740 vehicles.
Rengstorff/US 101 NB Ramp Realignment at Landings Frontage Road	3,700	The improvement would constrain the northbound capacity on Rengstorff at the new ramp intersection, but would provide additional capacity for vehicles entering the North Bayshore area via eastbound Landings Dr. Overall, the gateway capacity would increase.	3,080	The improvement would add southbound capacity on Rengstorff, and would provide additional capacity for vehicles exiting the North Bayshore area via westbound Landings Dr.

Note: Increase/change in gateway capacity was estimated using the intersection level of service analyses developed using the Synchro software for 2017 NBPP existing conditions.

Table 3
Recommended AM Peak Period Trip Caps with Proposed Improvements

Scenario	AM Inbound					
	Shoreline		Rengstorff		Shoreline + Rengstorff	
Scenario	Peak Hour	Peak Period	Peak Hour	Peak Period	Peak Hour	Peak Period
Current Trip Cap (2014)	2,490	6,720	2,960	7,990	5,450	14,710
Recommended Trip Cap	No change	7,470	No change	8,880	No change	16,350
Shoreline Bus Lane + NB RT at Pear Ave + Plymouth/Space Park Realignment	2,590	7,770	No change	8,880	5,550	16,650
Shoreline/US 101 NB Off-Ramp Realignment	3,210	9,630	No change	8,880	6,170	18,510
CRAG Intersection Turn Lanes	No change	7,470	2,960	8,880	5,450	16,350
Rengstorff/US 101 NB Ramp Realignment at Landings Frontage Road	No change	7,470	3,700	11,100	6,190	18,570

Attachment A
Synchro Analysis Approach/Assumptions/Notes

Shoreline AM Inbound

	Trip Cap on Shoreline	Trip Cap on La Avenida	Assumption/Approach	Total NB Capacity on Shoreline by Synchro
2014 Trip Cap	2,490		Based on the Synchro analysis for 2017 NBPP existing conditions. Updated the NB LT lanes from two lane to one lane at Pear Ave. The total NB Lane capacity is 2,272 vehicles.	2,272
NB Bus Lane Phase at Pear Ave	-470		Added a NB bus phase, and increased the cycle length by 9 seconds. Moved 36 NB TH and 12 NB RT vehicles to the bus lane. The total NB lane capacity is reduced from 2,272 to 1,832 vehicles by 19% (470 vehicles).	1,832
NB Bus Lane Phase + NB RT at Pear Ave + Increased Ped Calls	100		Added a NB bus phase, increased the cycle length by 9 seconds (5 sec green and 4 sec yellow+all red for the bus lane phase), increased FDW time for EB/WB due to an additional RT lane, and increased Ped calls for all directions. Moved 36 NB TH and 12 NB RT vehicles to the bus lane. Reduced NB LT lanes from two to one lane and added a NB RT lane. Although the NB RT lane would increase the NB capacity of the Pear Ave intersection, the capacity is also constrained by the NB capacity exiting the La Avenida intersection (2,365 vehicles). Therefore, the NB capacity is expected to increase from 2,272 to 2,365 vehicles by 4% (100 vehicles).	2,365
Plymouth/Space Park Realignment	0		Coded the intersection in Synchro with protected LT phases for all LT lanes. EB includes a shared LT/TH and a RT and WB includes a LT and a shared TH/RT. Added a NB bus lane phase. Moved 10 NB LT and 26 NB TH vehicles to the bus lane. Same cycle length as the Pear Ave intersection with a NB bus phase. Although the realignment would increase the NB capacity of the intersection (2,623 vehicles), the NB capacity is also constrained by the NB capacity exiting the La Avenida intersection (2,365 vehicles). Therefore, the improvement would not increase the gateway capacity, which is constrained by the upstream intersection at La Avenida.	2,623
Trip Cap with Bus phase + NB RT at Pear Ave + Plymouth/ Space Park Realignment	**2,590**			

Shoreline AM Inbound

	Trip Cap on Shoreline	Trip Cap on La Avenida	Assumption/Approach	Total NB Capacity on Shoreline by Synchro
US 101 NB Off-Ramp on La Avenida	350		Although the new off-ramp would increase the NB capacity on Shoreline north of La Avenida (2,687 vehicles) by reducing signal phases at the La Avenida intersection from three to two phases, the capacity is also constrained by the NB capacity approaching the Pear intersection (2,600 vehicles). Therefore, the total NB capacity is expected to increase from 2,272 to 2,600 vehicles by 14% (350 vehicles).	2,600
		100	The new off-ramp would provide the additional capacity for vehicles entering the North Bayshore area through EB La Avenida via the new NB RT lane at the Shoreline/La Avenida intersection. However, because the NB RT lane is very short and likely to be block by the TH movement frequently, the RT capacity is estimated based on the TJKM's VISSIM simulation.	
		270	The new off-ramp would provide the additional capacity for vehicles entering the North Bayshore area through the NB RT at the US 101 NB off-ramp/ La Avenida intersection. However, because the vehicle queuing and weaving on the ramp would limit the ability of vehicles accessing the RT lane, the RT capacity is estimated based on the TJKM's simulation.	
Trip Cap with Bus phase + NB RT at Pear Ave + Plymouth/ Space Park Realignment + US 101 NB Off-Ramp on La Avenida	**2,840**	**370**	**3,210**	

Shoreline PM Outbound

	Trip Cap on Shoreline	Trip Cap on La Avenida	Assumption/Approach	Total SB TH Capacity on Shoreline by Synchro	WB Capacity on La Avenida by Synchro
2014 Trip Cap	2,250	480	Based on the Synchro analysis for 2017 NBPP existing conditions. The total SB Lane capacity from SB TH and WB LT at the La Avenida intersection is 1,814 vehicles.	1,660	154
SB Bus Lane Phase + NB RT at Pear Ave	0		Added a SB bus phase and increased the cycle length by 9 seconds (5 sec green and 4 sec yellow+all red for the bus lane phase). Moved 12 SB LT & 36 SB TH vehicles to the bus lane. Reduced NB LT lanes from two to one lane and added a NB RT lane. The total SB Lane capacity at the Pear Ave intersection is reduced from 2,003 to 1,787 vehicles. Because the SB capacity is constrained by the SB capacity (1,660 vehicles) approaching the La Avenida intersection, no change to the gateway capacity.	1,787	
Plymouth/Space Park Realignment	0		Coded the intersection in Synchro with protected LT phases for all LT lanes. EB includes a shared LT/TH and a RT and WB includes a LT and a shared TH/RT. The SB capacity at the intersection is higher than the La Avenida intersection. Because the SB capacity is constrained by the SB capacity (1,660 vehicles) approaching the La Avenida intersection, no change to the gateway capacity.	2,525	
Trip Cap with Bus phase + NB RT at Pear Ave + Plymouth/ Space Park Realignment	**2,250**	**480**	**2,730**		

Shoreline PM Outbound

	Trip Cap on Shoreline	Trip Cap on La Avenida	Assumption/Approach	Total SB TH Capacity on Shoreline by Synchro	WB Capacity on La Avenida by Synchro
US 101 NB Off-Ramp on La Avenida	290		The new off-ramp would increase the SB capacity on Shoreline north of La Avenida from 1,660 to 1,880 vehicles by 13% (290 vehicles) by reducing signal phases at the La Avenida intersection from three to two phases.	1,880	
		0	The new off-ramp would also increase the WB capacity on La Avenida. However, because the WB capacity would also serve a majority of traffic from US 101 NB off-ramp. It is assumed the WB capacity for the North Bayshore area would not change.		439
Trip Cap with Bus phase + NB RT at Pear Ave + Plymouth/ Space Park Realignment + US 101 NB Off-Ramp on La Avenida	**2,540**	**480**	**3,020**		

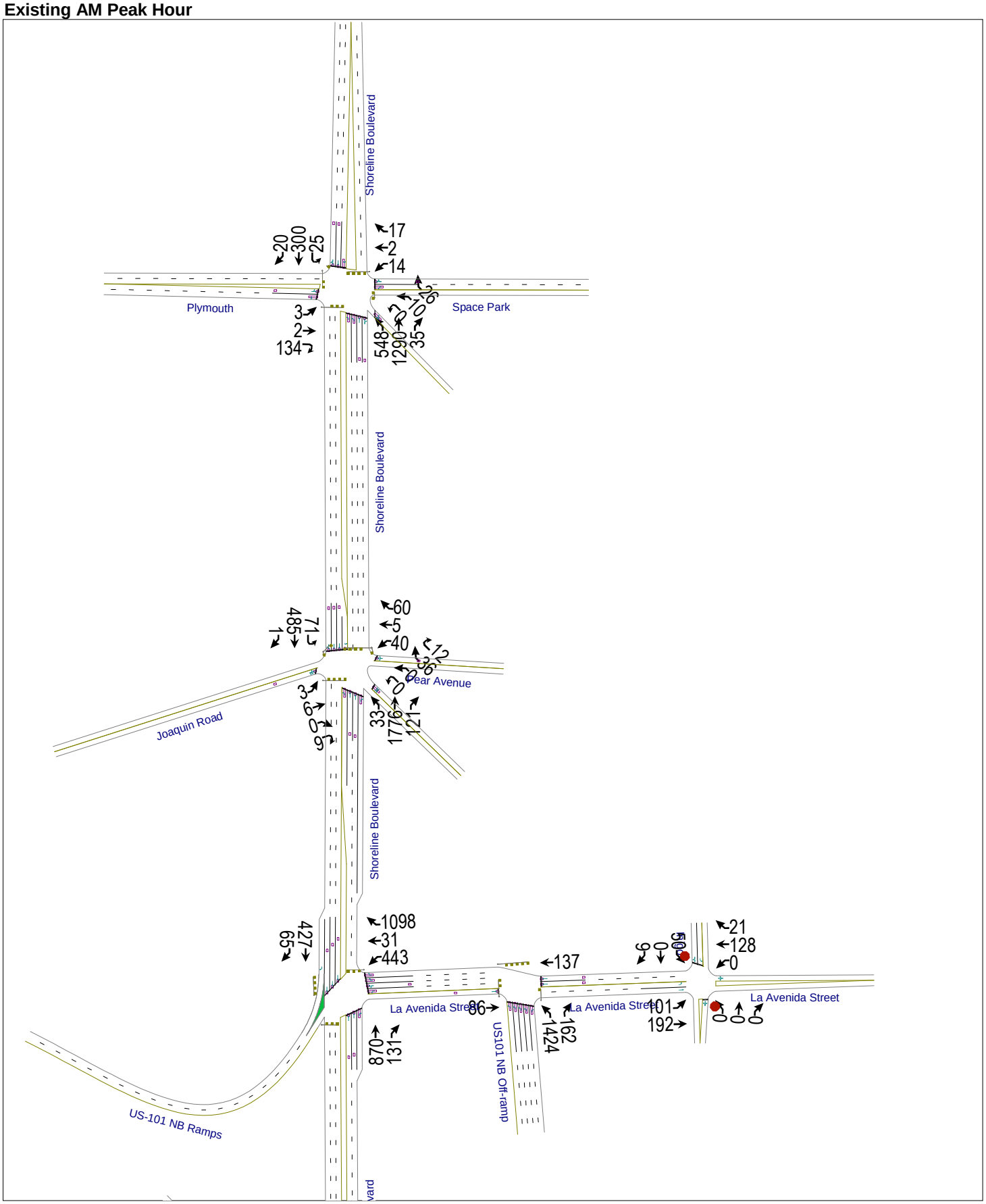
Rengstorff AM Inbound

	Trip Cap on Rengstorff	Trip Cap on Landings	Assumption/Approach	Total NB Capacity on Rengstorff by Synchro	Total EB Capacity on Landings by Synchro
2014 Trip Cap	2,960		Based on the Synchro analysis for 2017 NBPP existing conditions. NB capacity at the CRAG intersection.	2,715	
CRAG Intersection Turn Lanes	0		Added a 2nd NB RT on Rengstorff, a 3rd WB LT on Charleston, a EB RT on Garcia. No change to signal timing/phasing. Because the intersection is very close to the US 101 NB off-ramp, the NB vehicle queuing and weaving between the intersection and ramp would limit the ability of vehicles accessing the additional RT lane. Therefore, the 2nd RT lane is not expected to increase the gateway capacity.	3,241	
Trip Cap with CRAG turn lanes	**2,960**				
Rengstorff/US 101 Ramp Realignment and Landings frontage road	-140		Coded a 4 leg intersection with EB/WB split phases and NB/SB protected phases. NB capacity exiting the intersection (2,575) is lower than the NB approach capacity at CRAG (2,715). Therefore, the NB capacity is constrained by the new intersection and would be reduced by 140 vehicles.	2,575	
		880	Landings Dr would provide the additional capacity for vehicles enter the North Bayshore area via EB Landings Dr.		879
Trip Cap with Rengstorff/US 101 Ramp Realignment and Landings frontage road	**2,820**	**880**	**3,700**		

Rengstorff PM Outbound

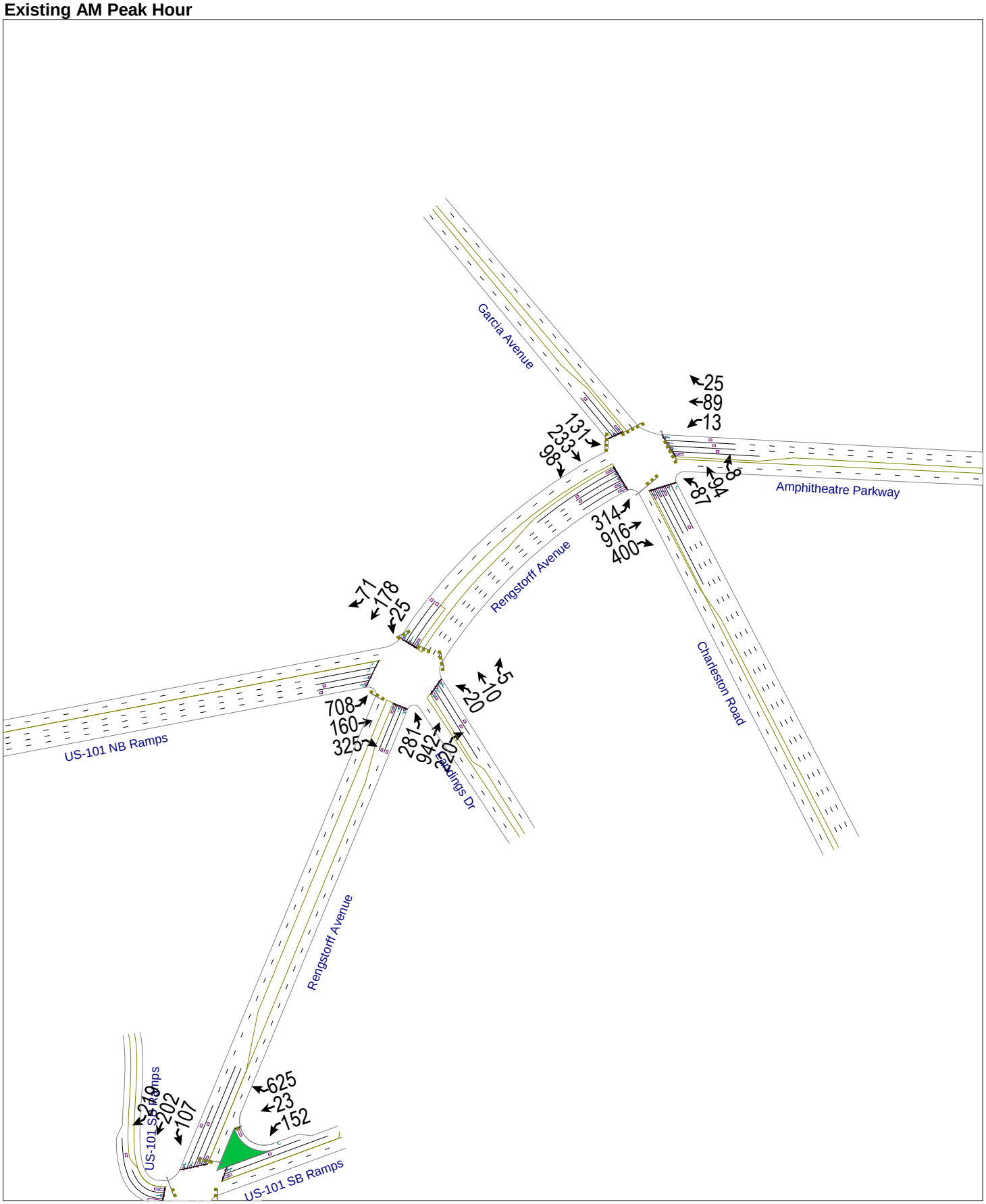
	Trip Cap on Rengstorff	Trip Cap on Landings	Assumption/Approach	Total SB Capacity on Rengstorff by Synchro	Total WB Capacity on Landings by Synchro
2014 Trip Cap	2,090		Based on the Synchro analysis for 2017 NBPP existing conditions. SB capacity at the CRAG intersection.	2,375	
Recommended Change to the Current Capacity	2,380		Based on the comparison of the gateway capacities to the capacities calculated using Synchro, the Synchro capacities are all lower than the gateway capacities, except on Rengstorff in the PM peak hour. The Synchro capacity at CRAG is 2,375 vehicles in the PM peak hour, which is higher than the gateway capacity (2,090). Therefore, the outbound gateway capacity could be increased to 2,380 vehicles at CRAG in the PM peak hour.	2,375	
CRAG Intersection Turn Lanes	360		Added a 2nd NB RT on Rengstorff, a 3rd WB LT on Charleston, a EB RT on Garcia. No change to signal timing/phasing. Increase the SB capacity at CRAG from 2,375 to 2,743 vehicles by 15% (360 vehicles).	2,743	
Trip Cap with CRAG turn lanes	**2,740**				
Rengstorff/US 101 Ramp Realignment and Landings frontage road	150		Coded a 4 leg intersection with EB/WB split phases and NB/SB protected phases. The SB RT to NB on-ramp would provide the additional outbound capacity.	2,526	
		550	Landings Dr would provide the additional capacity for vehicles exit the North Bayshore area via EB Landings Dr.		553
Trip Cap with Rengstorff/US 101 Ramp Realignment and Landings frontage road	**2,530**	**550**	**3,080**		

Trip Cap Analysis with Improvements
Existing AM Peak Hour



07/14/2021
Hexagon

Trip Cap Analysis with Improvements
Existing AM Peak Hour



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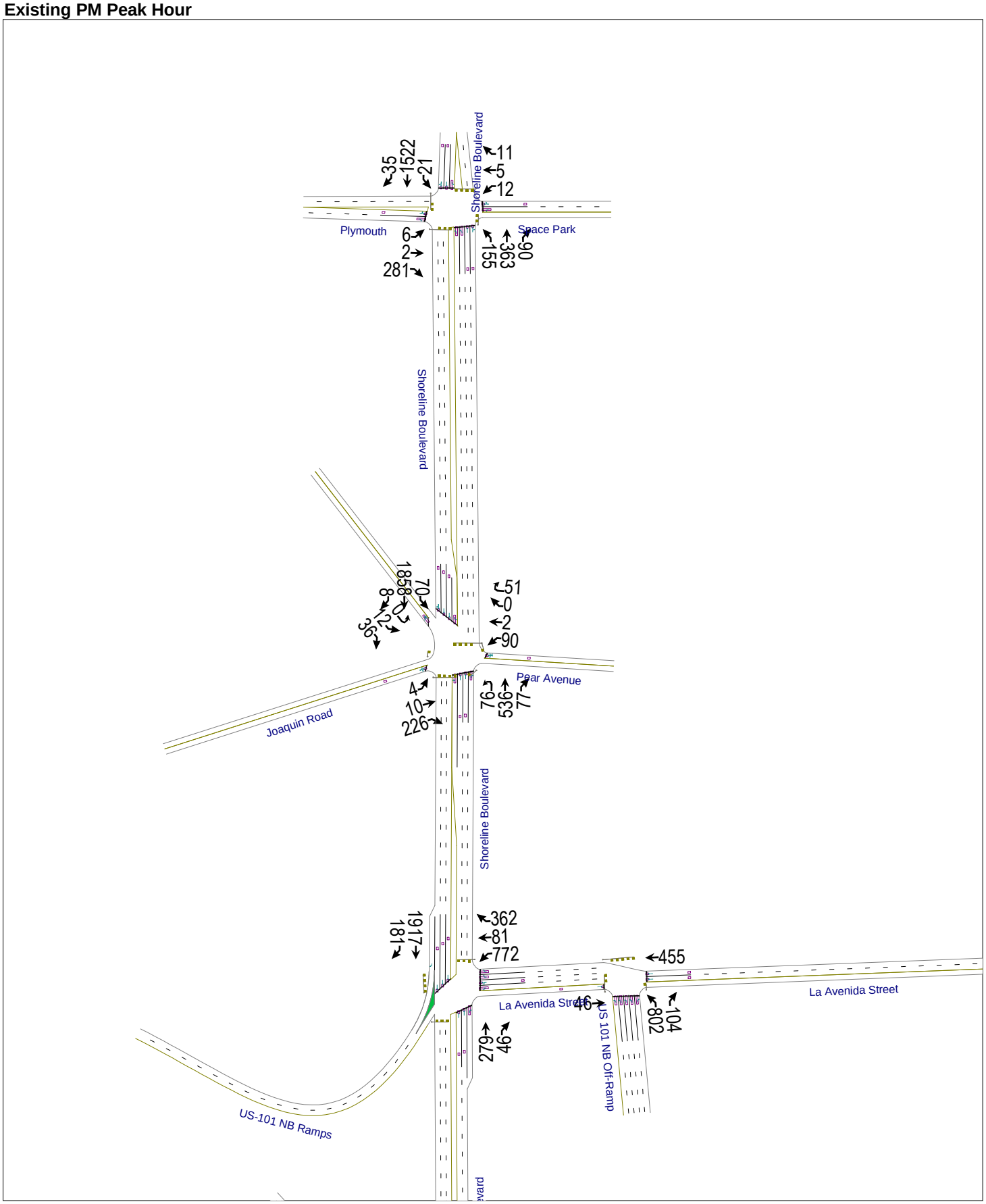
Hexagon

Trip Cap Analysis with Improvements
Existing PM Peak Hour



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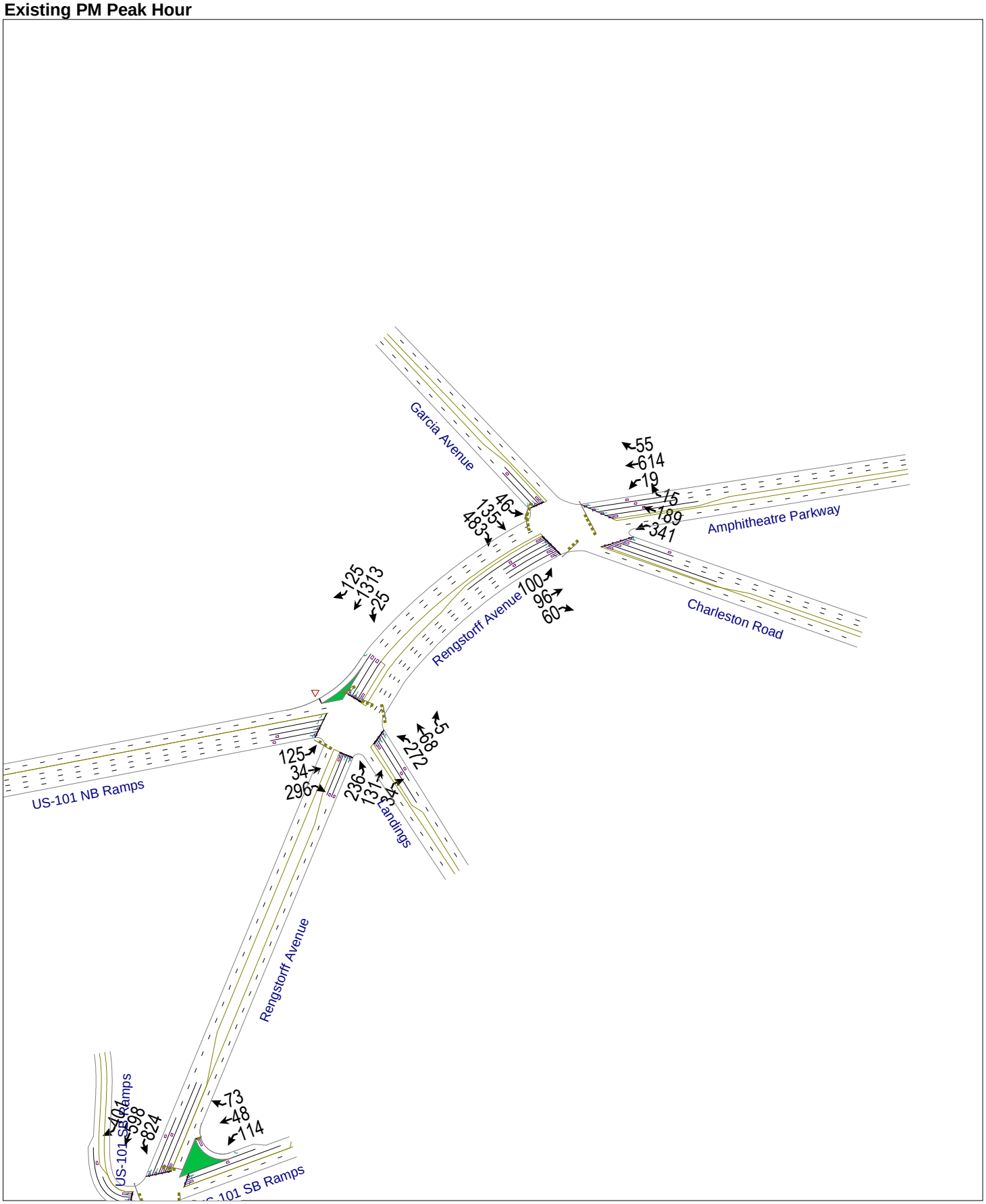
Hexagon

Trip Cap Analysis with Improvements
Existing PM Peak Hour



07/14/2021
Hexagon

Attachment B
Plymouth Realignment and Shoreline Bus Lane Plan

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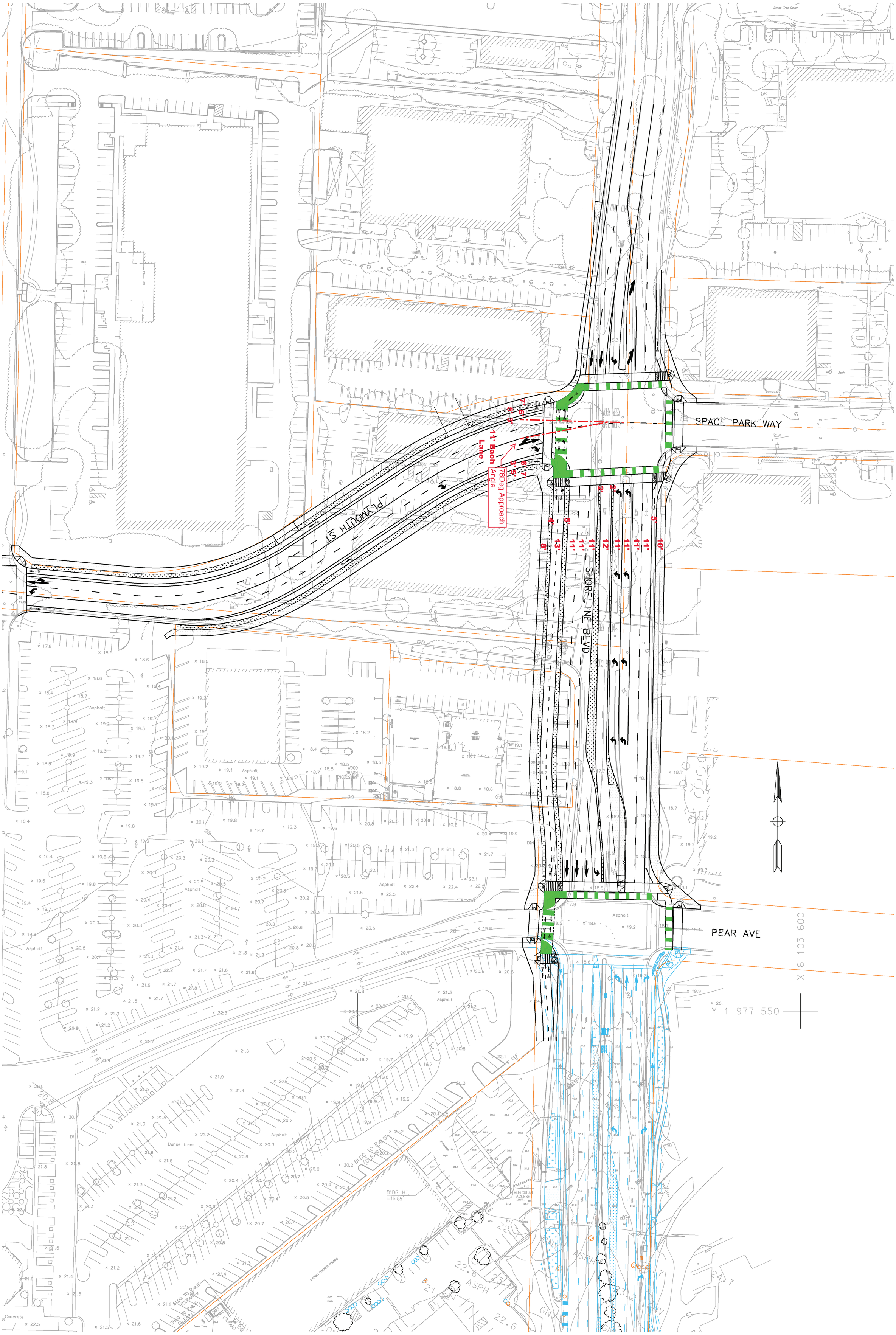
PLOTTED BY: CHAN



Drawing Number:	Date: 07/14/2020	No.	Revisions
	Scale: 1"=50'		
	Design: T.CHAN		
	Drawn: T.CHAN		
	Approved:		
	Job No: 20180889		

PLYMOUTH STREET REALIGNMENT
PLYMOUTH SPACE PARK EXHIBIT
OPTION - 1A (15' CLEARANCE)

MOUNTAIN VIEW SANTA CLARA CA

BkF 100+ YEARS
ENGINEERS . SURVEYORS . PLANNERS
4670 WILLOW ROAD
SUITE 250
PLEASANTON, CA 94588
925-396-7700
925-396-7799 (FAX)

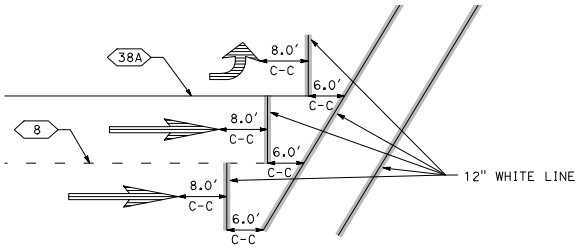
BKF ENGINEERS

NOTES:

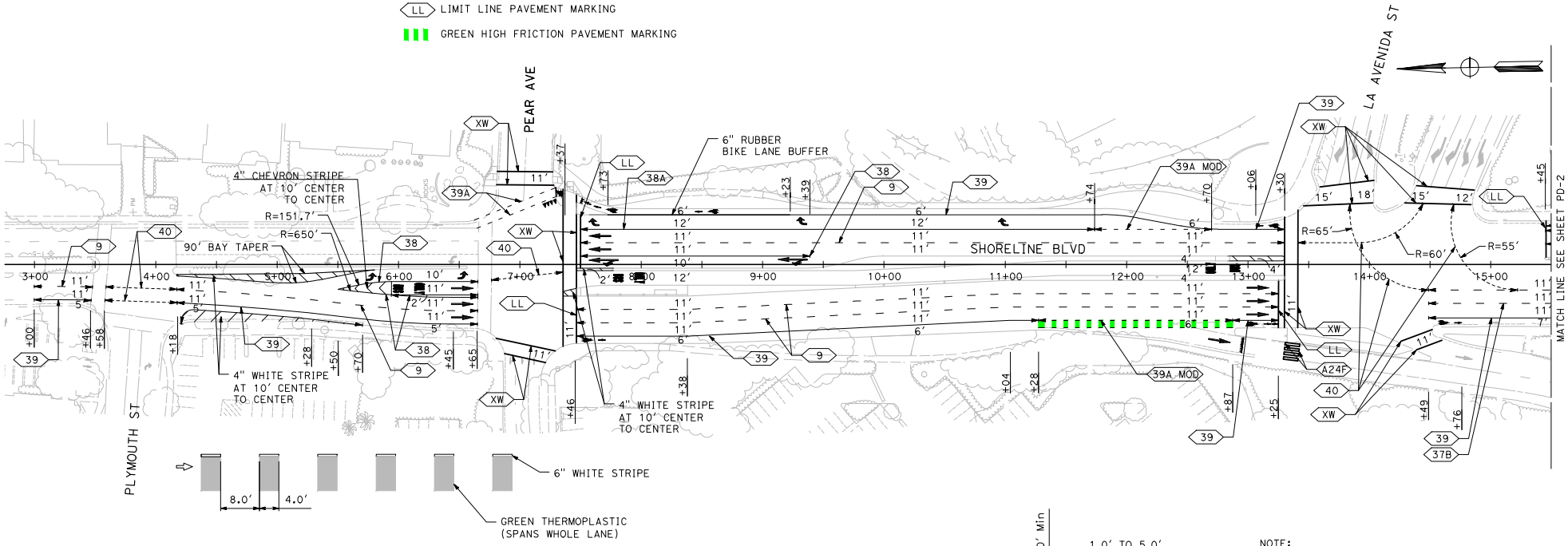
1. CONTRACTOR SHALL REMOVE CONFLICTING EXISTING STRIPING AND MARKING.
2. ALL PERMANENT STRIPING AND PAVEMENT MARKING SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. FOR DETAILS NOT SHOWN, SEE CALTRANS Std PLAN A20A AND A20B.

LEGEND:

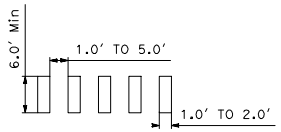
- TYPE I 18' ARROW
- TYPE IV (L) ARROW
- TYPE III (R) ARROW
- BICYCLE LOOP DETECTOR SYMBOL
- BIKE LANE SYMBOL WITH PERSON AND BIKE LANE ARROW
- "35" PVMT MARKING
- YIELD LINE
- (No.) PAVEMENT DELINEATION DETAIL
- (XW) 24" WIDE CROSSWALK STRIPING
- (LL) LIMIT LINE PAVEMENT MARKING
- GREEN HIGH FRICTION PAVEMENT MARKING



LIMIT LINE PLACEMENT (TYP)
NO SCALE



DETAIL 39A MOD
NO SCALE



DETAIL A24F
NO SCALE

NOTE:
1. SPACES BETWEEN MARKINGS SHOULD BE PLACED IN WHEEL TRACKS OF EACH LANE.

SCALE: 1"=40'

NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE.
Underground Service Alert
Call: TOLL FREE
1-800
642-2444
TWO WORKING DAYS BEFORE YOU DIG

MARK THOMAS
2290 NORTH FIRST STREET, SUITE 304
SAN JOSE, CA 95131
(408) 453-5373

REGISTERED PROFESSIONAL ENGINEER
ALEXANDER LEE
No. 73244
CIVIL
STATE OF CALIFORNIA

100% SUBMITTAL NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	DESCRIPTION	APPROVED

DESIGNED BY: AL
DRAWN BY: DP

CITY OF MOUNTAIN VIEW

CITY OF MOUNTAIN VIEW, CALIFORNIA
PUBLIC WORKS DEPARTMENT
500 CASTRO STREET, MOUNTAIN VIEW, CA 94041

SHORELINE BOULEVARD BUS LANE AND UTILITY IMPROVEMENTS
PROJECT NO. 16-58

PAVEMENT DELINEATION

SCALE:	DATE:	PIN:	SHEET:
1" = 40'	08/02/2019	8586	PD-1 87 OF 154

2-Aug-19
13:34

Attachment C
Shoreline/US 101 Northbound Off-Ramp Realignment Plan

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	101	48.4/48.6	-	-

REGISTERED CIVIL ENGINEER _____ DATE _____

PLANS APPROVAL DATE _____

REGISTERED PROFESSIONAL ENGINEER — No. _____ Exp. _____ CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

AECOM
4 N. Second St
Suite 675
San Jose, CA 95113

CITY OF MOUNTAIN VIEW
500 CASTRO St
MOUNTAIN VIEW, CA 94041

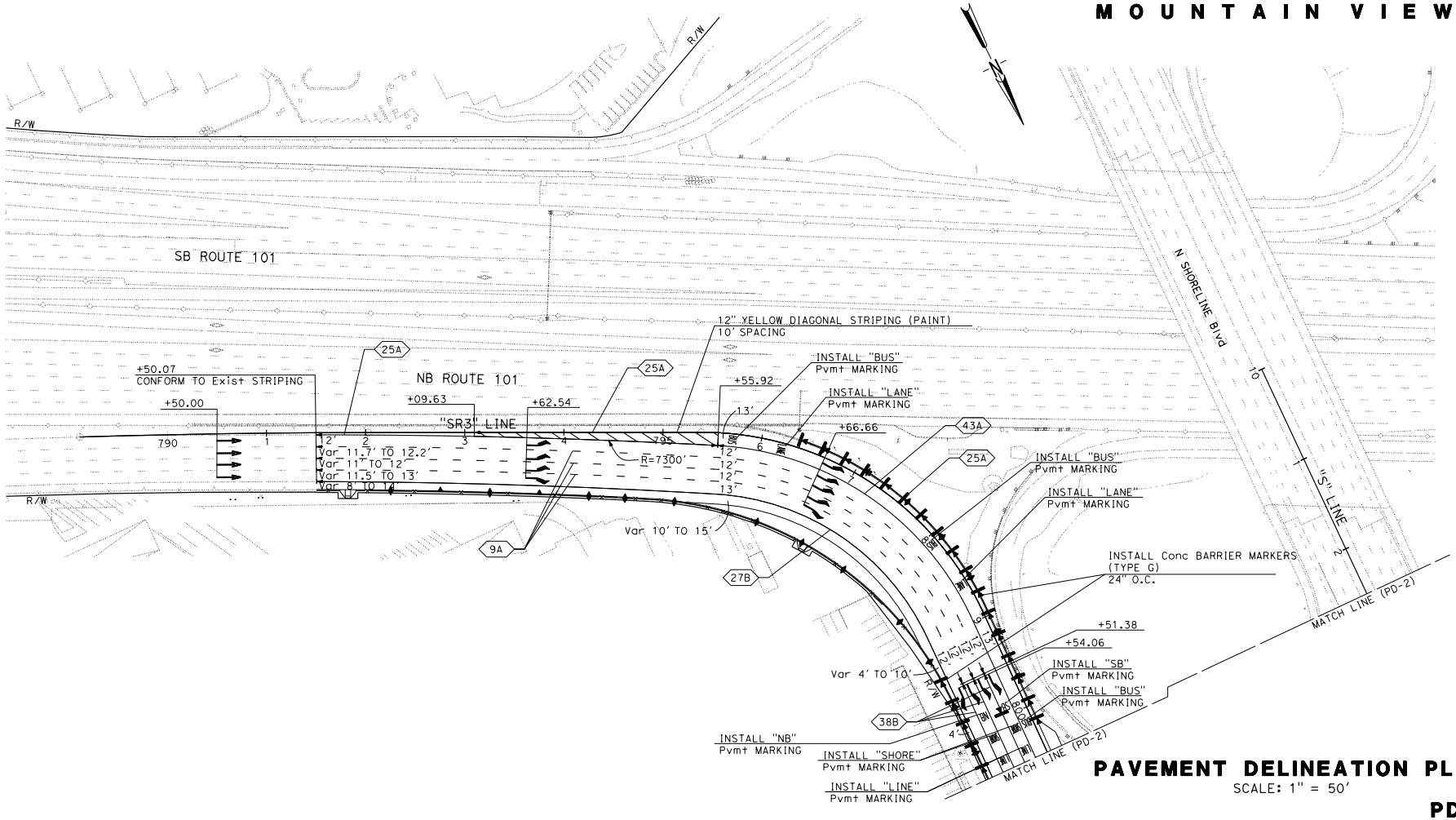
NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. THE CONCRETE BARRIER MARKERS MUST BE THE SAME COLOR AS THE LEFT EDGE LINE. THE SPACING OF CONCRETE BARRIER MARKERS MUST BE 48 FEET.
3. REPLACE ALL MEDIAN CONCRETE BARRIER MARKERS AS AUTHORIZED WITHIN JOB LIMITS.
4. FOR LIMITS OF PREPARE AND PAINT POSTMILE MARKINGS ON CONCRETE BARRIER SEE PAVEMENT DELINEATION QUANTITIES.
5. INSTALL MGS AND STBB DELINEATORS AT 25' O/C.

LEGEND:

- (No.) STANDARD PAVEMENT DELINEATION DETAIL No.
- BEGIN/END OF TRAFFIC STRIPE DETAIL
- CHANGE OF TRAFFIC STRIPE DETAIL
- TYPE I 18' ARROW
- TYPE II (L OR R) ARROW
- TYPE III (R OR L) ARROW
- TYPE V ARROW
- BIKE LANE SYMBOL WITH BIKE LANE ARROW
- BIKE LANE SYMBOL WITH BIKE LANE ARROW
- GREEN SKIP-STRIPING
- ISA SYMBOL

MOUNTAIN VIEW



PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

PD-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY	-
Caltrans	DANIEL HO	CHECKED BY	DATE REVISED	-
-		KAREN LO		
		LAN HO		

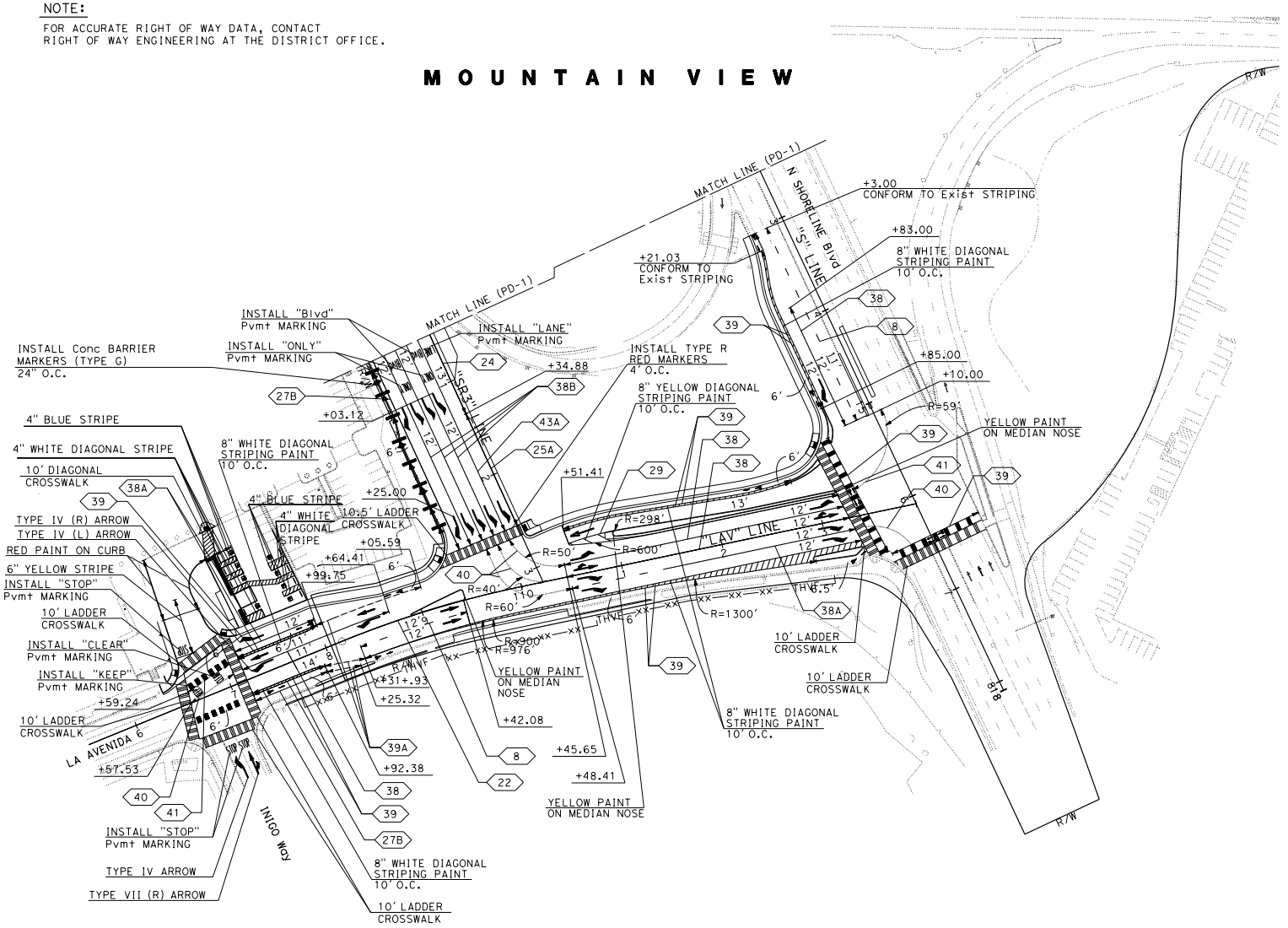
LAST REVISION -
DATE PLOTTED => 26-AUG-2020
TIME PLOTTED => 16:09

BORDER LAST REVISED 7/2/2010 | USERNAME => ernie.garnica | DGN FILE => 0417000339na001.dgn | UNIT - | PROJECT NUMBER & PHASE 04170003391

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

MOUNTAIN VIEW



FOR NOTES AND LEGEND,
SEE SHEET PD-1

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

PD-2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	101	48.4/48.6	-	-

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

AECOM
4 N. Second St
Suite 675
San Jose, CA 95113

CITY OF MOUNTAIN VIEW
500 CASTRO St
MOUNTAIN VIEW, CA 94041

REVISED BY	DATE REVISED
-	-

KAREN LO — LAN HO — CALCULATED-DESIGNED BY — CHECKED BY

FUNCTIONAL SUPERVISOR: DANIEL HO

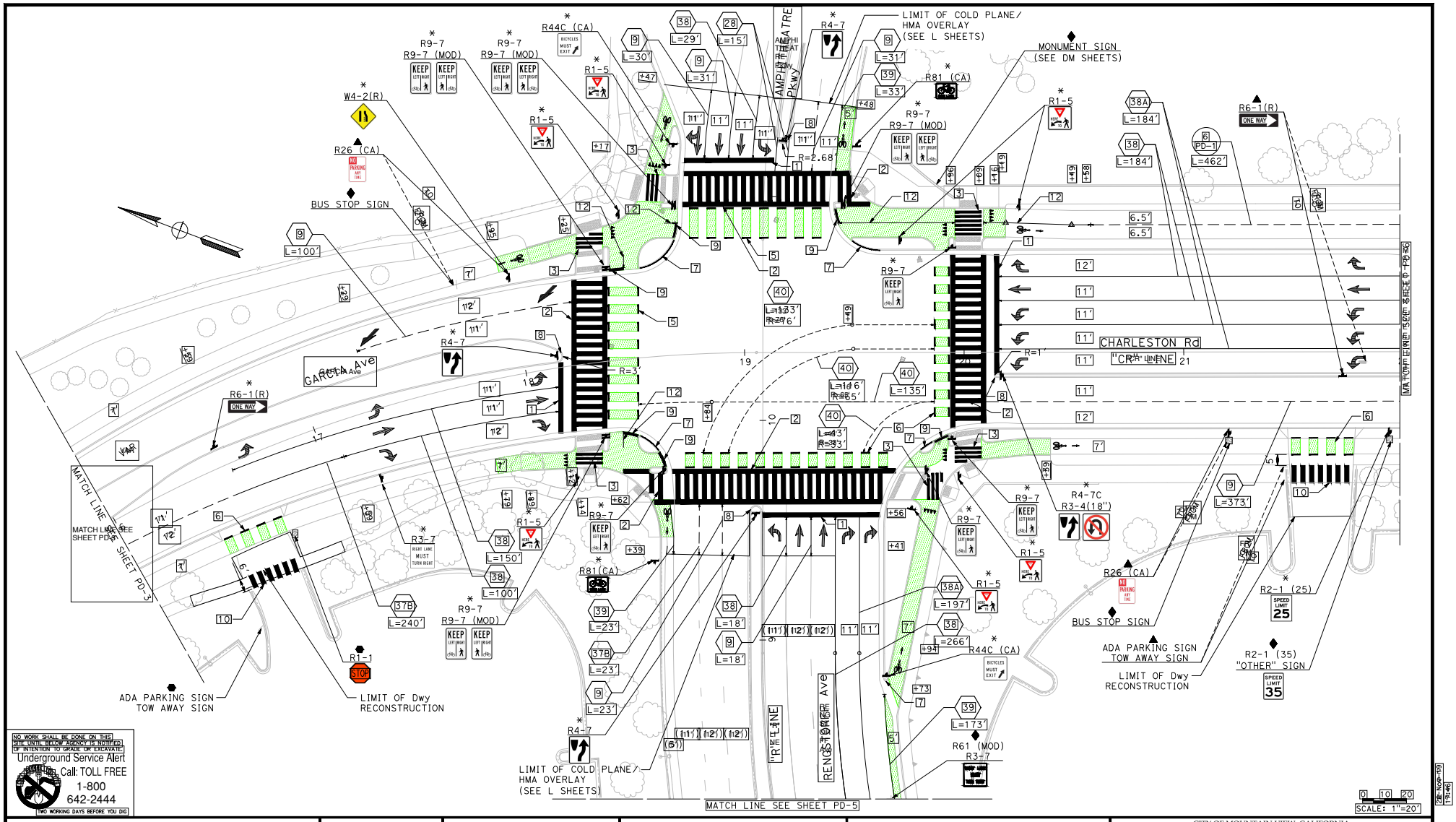
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — -

LAST REVISION — DATE PLOTTED => 28-AUG-2020 — TIME PLOTTED => 16:09

BORDER LAST REVISED 7/2/2010 | USERNAME => ernie.garnica | DGN FILE => 0417000339na002.dgn | UNIT - | PROJECT NUMBER & PHASE 04170003391

Attachment D

Charleston/Rengstorff/Amphitheatre/Garcia (CARG)
Intersection Turn Lanes Plan



NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE.
Underground Service Alert
Call: TOLL FREE
1-800
642-2444
TWO WORKING DAYS BEFORE YOU DIG

MARK THOMAS
2833 JUNCTION AVENUE, SUITE 110
SAN JOSE, CA 95134
(408) 453-5373

DANIEL THOMAS BOMQUIST
No. 65875
Exp. 12/31/21
CIVIL

PRELIMINARY
PRELIMINARY 95% DESIGN
95% DESIGN

REVISIONS

NO.	DATE	DESCRIPTION	APPROVED

DESIGNED BY: ECL
DRAWN BY: KHD

CITY OF MOUNTAIN VIEW

CITY OF MOUNTAIN VIEW, CALIFORNIA
PUBLIC WORKS DEPARTMENT
500 CASTRO STREET, MOUNTAIN VIEW, CA 94041

CHARLESTON CORRIDOR IMPROVEMENTS
CHARLESTON CORRIDOR IMPROVEMENTS PHASE 2 AND 3 PROJECT
PHASE 2 AND 3
PROJECT NO. 21-37

PAVEMENT DELINEATION

SCALE:	DATE:	PIN:	SHEET:
1" = 20'	11/27/2019		PD-4 150 OF 213

anoga
CR_Pavement Delineation_(1-6).dwg

Attachment E
Rengstorff/101 Northbound Ramps Realignment Plan

AMPHITHEATRE PKWY

CHARLESTON RD

GOOGLE

GOOGLE

NB 101

US 101

NB 101 ON-RAMP

BAYSHORE FWY

NB 101 OFF-RAMP

LANDINGS DR

PARCEL 2

PARCEL B

RENGSTORFF AVE OVERCROSSING

CHARLESTON RD

SB 101 ON-RAMP

WB RENGSTORFF AVE

EB RENGSTORFF AVE

SB 101 OFF-RAMP

NB 101 OFF-RAMP

WEST AMERICA

BRCP-LANDMARK, LLC

N RENGSTORFF AVE

PARCEL A

COSTCO WHOLESALE

US 101

SB 101

80 0 40 80 160 320

1 inch = 80 ft.

LEGEND

EXISTING RIGHT OF WAY

PAVING

MEDIAN

SIDEWALK

PLANTING

RENGSTORFF AVENUE/LANDINGS DRIVE/US 101 NB RAMPS

NORTHBOUND ON AND OFF RAMP

CITY OF MOUNTAIN VIEW, SANTA CLARA COUNTY

JULY 2021

FOR DISCUSSION PURPOSE ONLY, NOT FOR CONSTRUCTION

CITY OF MOUNTAIN VIEW

BkF 100+ YEARS

ENGINEERS / SURVEYORS / PLANNERS