

October 2, 2017

RCS Harmony Partners
2305 Historic Decatur Road, Suite 100
San Diego, CA 92106

LLG Reference: 3-14-2314

Subject: **Harmony Grove Village South – Existing ROW Option**

At the request of County staff, this letter summarizes the operational capacity of road improvements to Country Club Drive, south of its intersection with Harmony Grove Road, designed within the current 50-foot right-of-way (“Existing ROW Option” or “The Option”).

BACKGROUND AND SCOPE

1. Within the full scope of its Application, Harmony Grove Village South (“The Project”) proposes a design configuration (“Preferred Configuration”) at this intersection that is believed superior to the Existing ROW Option as described above, in the former’s function as a vibrant village connector between the HGVS and HGV planning areas.

The Preferred Configuration would operate outside of the existing 50’ ROW but also provide a third lane as does The Option.

2. Specifically, this memo addresses:
 - a. The Option’s County roadway classification;
 - b. The intersection operations at Harmony Grove Road/Country Club Drive signalized intersection with The Option (No. 17 in the Traffic Impact Analysis (“TIA”)); and
 - c. The Option’s ability to serve the forecasted Average Daily Traffic (“ADT”) on Country Club Drive.
3. The Existing ROW Option includes the following design components:
 - 2 x 5-foot sidewalks
 - 1 x 4-foot bike lane (northbound direction)
 - 2 x 12-foot travel lanes
 - 1 x 12-foot center turn lane

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The profile of The Option is shown below in *Figure A*:

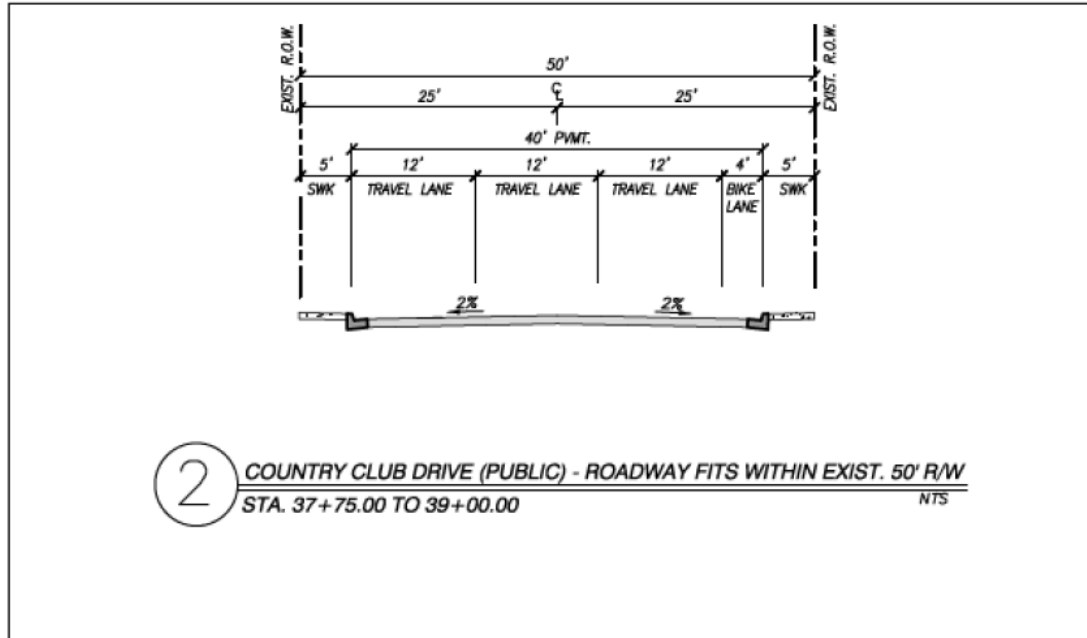


Figure A – 50' R/W (Existing Right-of-Way Option) Profile

ASSESSMENT

County of San Diego Roadway Classification

A review of the County’s Public Road Standards indicates that from a ROW perspective, The Option roadway (40-feet of pavement width) could be considered similar to a Non-Mobility Element public roadway standard for “*Residential Collector*”, which provides two 12-foot travel lanes in 40 feet of pavement width and 60 feet of ROW. The published capacity for this two-lane roadway is 4,500 ADT at LOS C.

A 3-lane roadway segment section—same as the Preferred Configuration—is maintained in The Option, which improves the overall roadway’s function for emergency ingress/egress. The third lane would also substantially increase capacity over that of a two-lane Residential Collector. For example, the County’s published public road standards and roadway capacity tables show that a “*Light Collector with Continuous Left-Turn Lane (2.2B)*” roadway has a capacity of 9,500 ADT at LOS C, whereas the “*Light Collector – No Median (2.2E)*” roadway has a LOS C capacity of 7,100 ADT. The addition of the 3rd lane therefore increases capacity by 2,400 ADT, or 34%.

Table A shows a summary of the Public Roadway Standards and the increase in capacity afforded by the 3rd lane.

TABLE A
 COMPARATIVE INCREASE IN LOS CAPACITY WITH CONTINUOUS (TWO-WAY) LEFT TURN LANE
 FOR COUNTY MOBILITY ELEMENT ROADS

Mobility Element Roads		Levels of Service					
Road Classification	No. of Travel Lanes	A	B	C	D	E	
<i>Light Collector</i>	<i>w/Continuous Left Turn Lane (2.2B)</i>	2	<3,000	<6,000	<9,500	<13,500	<19,000
	<i>No Median (2.2E)</i>	2	<1,900	<4,100	<7,100	<10,900	<16,200
% Increase w/Continuous Left Turn Lane			58%	46%	34%	24%	17%

Source: County of San Diego “Table 1 Average Daily Vehicle Trips”

This relative magnitude of increase would be expected for “*Enhanced Residential Collector*” series proposed for The Option as well.

Based on the above, the capacity for the The Option would increase from 4,500 ADT (standard) to 6,030 ADT with the enhancement of the 3rd lane, as shown in **Table B**.

TABLE B
 ESTIMATED INCREASE IN LOS WITH CONTINUOUS (TWO-WAY) LEFT TURN LANE
 FOR COUNTY NON-MOBILITY ELEMENT RESIDENTIAL COLLECTOR

Non-Mobility Element Roads		Levels of Service				
Road Classification	No. of Travel Lanes	A	B	C	D	E
<i>Residential Collector</i>	2	–	–	<4,500	–	–
ADT Increase w/Continuous Left Turn Lane (+34%)		–	–	<6,030	–	–

Source: County of San Diego “Table 1 Average Daily Vehicle Trips” and LLG, 2017.

Attachment A shows the County’s published public road standards. **Attachment B** shows the County’s roadway capacity.

Intersection Operations

The northbound approach of The Option provides for a left-turn lane and a shared through/right-turn lane on Country Club Drive at Harmony Grove Road. LLG’s capacity analyses conducted for The Option’s design criteria, concluded ***no new significant intersection impacts*** would occur, compared to the Preferred Configuration.

Roadway Segment Operations

The maximum Average Daily Traffic (ADT) load forecasted for Country Club Drive is 5,105 ADT under Existing + Project + Cumulative traffic volumes (See *Figure 8-2* of the TIA – “*Existing + Project + Cumulative Traffic Volumes*”).

As discussed above, the Option section is similar in ROW to the County’s two-lane “Residential Collector” standard, which has a published capacity of 4,500 ADT at LOS C, but with the addition a third lane. This results in an increase in capacity of 34% to 6,030 ADT. Thus, The Option would result in better than LOS D operations, and *no new significant street segment impacts* would be calculated.

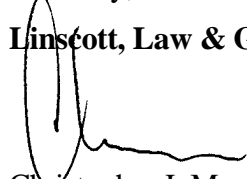
CONCLUSIONS

The Option will provide an enhancement to the Residential Collector standard for Country Club Drive by providing a third lane which is estimated to provide a 34% increase in capacity to 6,030 ADT (LOS C) based on similar comparisons of other published County Mobility Element roadways. The maximum traffic volume demand for this segment is 5,105 ADT. Therefore, the proposed Existing ROW Option roadway segment will provide sufficient segment capacity to address all forecasted volumes and no significant impacts are calculated.

Furthermore, no significant impacts are calculated at the Country Club Drive/Harmony Grove Road intersection with the two-lane northbound approach (left-turn lane and a shared through/right-turn lane).

Sincerely,

Linscott, Law & Greenspan, Engineers



Christopher J. Mendiara
Associate Principal

Attachments: *Attachment A:* Table 2A/B County of San Diego Public Road Standards
 Attachment B: Table 1 Average Daily Vehicle Trips

TABLE 2A: COUNTY OF SAN DIEGO - PUBLIC ROAD STANDARDS**MOBILITY ELEMENT ROAD CLASSIFICATIONS**

ROAD CLASSIFICATION	# LANES / LANE WIDTH	MEDIAN WIDTH	ROAD SURFACING WIDTH	R.O.W. WIDTH	PAVED SHOULDER (# / WIDTH)	PARKWAY WIDTH	MIN. CURVE RADIUS	MAX. DESIRABLE GRADE	MIN. DESIGN SPEED (MPH)
Expressway (6.1)	6 / 12'	34'	126'	146'	2 / 10'	10'	1,700'	6%	65
Prime Arterial (6.2)	6 / 12'	14'	102'	122'	2 / 8'	10'	1,700'	6%	65
Major Road									
With Raised Median (4.1A)	4 / 12'	14'	78'	98'	2 / 8'	10'	1,200'	7%	55
With Intermittent Turn Lanes (4.1B)	4 / 12'	-	64' - 78'	84' - 98'	2 / 8'	10'	1,200'	7%	55
Boulevard									
With Raised Median (4.2A)	4 / 12'	14'	78'	106'	2 / 8'	14'	500'	9%	40
With Intermittent Turn Lanes (4.2B)	4 / 12'	-	64' - 78'	92' - 106'	2 / 8'	14'	500'	9%	40
Community Collector									
With Raised Median (2.1A)	2 / 12'	14'	54'	74'	2 / 8'	10'	700'	9%	45
With Continuous Left Turn Lane (2.1B)	2 / 12'	14'	54'	74'	2 / 8'	10'	700'	9%	45
With Intermittent Turn Lanes (2.1C)	2 / 12'	-	40' - 54'	60' - 74'	2 / 8'	10'	700'	9%	45
With Improvement Options (2.1D)	2 / 12'	-	40' - 54'	84'	2 / 8'	15' - 22'	700'	9%	45
No Median (2.1E)	2 / 12'	-	40'	60'	2 / 8'	10'	700'	9%	45
Light Collector									
With Raised Median (2.2A)	2 / 12'	14'	54'	78'	2 / 8'	12'	500'	9%	40
With Continuous Left Turn Lane (2.2B)	2 / 12'	14'	54'	78'	2 / 8'	12'	500'	9%	40
With Intermittent Turn Lanes (2.2C)	2 / 12'	-	40' - 54'	64' - 78'	2 / 8'	12'	500'	9%	40
With Improvement Options (2.2D)	2 / 12'	-	40' - 54'	88'	2 / 8'	17' - 24'	500'	9%	40
No Median (2.2E)	2 / 12'	-	40'	64'	2 / 8'	12'	500'	9%	40
With Reduced Shoulder (2.2F)	2 / 12'	-	28'	52'	2 / 2'	12'	500'	9%	40
Minor Collector									
With Raised Median (2.3A)	2 / 12'	14'	54'	82'	2 / 8'	14'	350'	12%	35
With Intermittent Turn Lanes (2.3B)	2 / 12'	-	40' - 54'	68' - 82'	2 / 8'	14'	350'	12%	35
No Median (2.3C)	2 / 12'	-	40'	68'	2 / 8'	14'	350'	12%	35

NOTES:

- 1 Minimum longitudinal gradient shall be 1.0 percent for all road classificationis shown above.
- 2 The maximum grade for a permanent cul-de-sac street turning area shall be 6 percent.
- 3 The maximum grade for a temporary cul-de-sac street turning area shall be that of the classification of the road being constructed.
- 4 For standards, see County Design Standard Drawing DS-2, DS-3, DS-4, and Section 4.5N of these Standards.
- 5 Additional pavement and ROW may be required for ME Boulevards / Community Collectors (4 feet) and Light Collectors (12 feet) in Industrial/Commercial Zones.
- 6 ME roads needing additional turn or passing lanes will require an additional 12 to 14 feet of pavement and ROW for each lane.
- 7 The maximum superelevation allowed on ME roads is 6%. Superelevation is not normally required on Non-ME roads.
- 8 ME roads designated with Bike Lanes will require an additional 10 feet of pavement and ROW. This may be increased to 12' for four-lane roads and above based upon the provisions in Section 7.3 of these standards.
- 9 The minimum curve radii, shown in the table above, are based on the design speed with 6% superelevation.
- 10 Interim roads are to be a minimum of 28 feet A.C. within a 40 feet graded roadbed. They may be larger if traffic volumes require more travel lanes.
- 11 Road surfacing widths include median width.

TABLE 2B: COUNTY OF SAN DIEGO - PUBLIC ROAD STANDARDS

NON-MOBILITY ELEMENT ROAD CLASSIFICATIONS									
ROAD CLASSIFICATION	# LANES / LANE WIDTH	MEDIAN WIDTH	ROAD SURFACING WIDTH	R.O.W. WIDTH	PAVED SHOULDERS (# / WIDTH)	PARKWAY WIDTH	MINIMUM CURVE RADIUS	MAXIMUM DESIRABLE GRADE	MINIMUM DESIGN SPEED (MPH)
Residential Collector	2 / 12'	-	40'	60'	2 / 8'	10'	300'	12%	30
Rural Residential Collector *	2 / 12'	-	28'	48'	2 / 2'	10'	300'	12%	30
Residential Road	2 / 12'	-	36'	56'	2 / 6'	10'	200'	15%	30
Rural Residential Road *	2 / 12'	-	28'	48'	2 / 2'	10'	200'	15%	30
Residential Cul-de-sac	2 / 12'	-	32'	52'	2 / 4'	10'	200'	15%	30
Residential Loop	2 / 12'	-	32'	52'	2 / 4'	10'	200'	15%	30
Industrial/Commerical Collector	4 / 12'	-	68'	88'	2 / 10'	10'	300'	8%	30
Industrial/Commerical	2 / 16'	-	52'	72'	2 / 10'	10'	200'	8%	30
Industrial/Commercial Cul-de-sac	2 / 16'	-	52'	72'	2 / 10'	10'	200	8%	30
Frontage	2 / 12'	-	32' min	52' min	1 / 8'	10'	See above	See above	-
Alley	2 / 10'	-	20-30'	20-30'	None	None	50'	12%	n/a
Hillside Residential	See NOTE 4	-	-	-	-	-	-	-	-

- NOTES:**
- 1 Minimum longitudinal gradient shall be 1.0 percent for all road classificationis shown above.
 - 2 The maximum grade for a permanent cul-de-sac street turning area shall be 6 percent.
 - 3 The maximum grade for a temporary cul-de-sac street turning area shall be that of the classification of the road being constructed.
 - 4 For standards, see County Design Standard Drawing DS-2, DS-3, DS-4, and Section 4.5N of these Standards.
 - 5 The minimum curve radii, shown in the table above, are based on the design speed with 6% superelevation.
 - 6 Interim roads are to be a minimum of 28 feet A.C. within a 40 feet graded roadbed. They may be larger if traffic volumes require more travel lanes.

LEGEND: * Serves lots > 2 acres in size w/
no demand for on-street parking

Attachment B

**TABLE 1
AVERAGE DAILY VEHICLE TRIPS***

MOBILITY ELEMENT ROADS		LEVELS OF SERVICE					
Road Classification	# of Travel Lanes	A	B	C	D	E	
Expressway (6.1)	6	<36,000	<54,000	<70,000	<86,000	<108,000	
Prime Arterial (6.2)	6	<22,200	<37,000	<44,600	<50,000	<57,000	
Major Road	w/ Raised Median (4.1A)	4	<14,800	<24,700	<29,600	<33,400	<37,000
	w/ Intermittent Turn Lanes (4.1B)	4	<13,700	<22,800	<27,400	<30,800	<34,200
Boulevard	w/ Raised Median (4.2A)	4	<18,000	<21,000	<24,000	<27,000	<30,000
	w/ Intermittent Turn Lanes (4.2B)	4	<16,800	<19,600	<22,500	<25,000	<28,000
Community Collector	w/ Raised Median (2.1A)	2	<10,000	<11,700	<13,400	<15,000	<19,000
	w/ Continuous Left Turn Lane (2.1B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Intermittent Turn Lane (2.1C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Passing Lane (2.1D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.1E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
Light Collector	w/ Raised Median (2.2A)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Continuous Left Turn Lane (2.2B)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Intermittent Turn Lane (2.2C)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	w/ Passing Lane (2.2D)	2	<3,000	<6,000	<9,500	<13,500	<19,000
	No Median (2.2E)	2	<1,900	<4,100	<7,100	<10,900	<16,200
	w/ Reduced Shoulder (2.2F)	2	<5,800	<6,800	<7,800	<8,700	<9,700
Minor Collector	w/ Raised Median (2.3A)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	w/ Intermittent Turn Lane (2.3B)	2	<3,000	<6,000	<7,000	<8,000	<9,000
	No Median (2.3C)	2	<1,900	<4,100	<6,000	<7,000	<8,000
NON-MOBILITY ELEMENT ROADS**		LEVELS OF SERVICE					
Residential Collector	2	-	-	<4,500	-	-	
Rural Residential Collector***	2	-	-	<4,500	-	-	
Residential Road	2	-	-	<1,500	-	-	
Rural Residential Road***	2	-	-	<1,500	-	-	
Residential Cul-de-Sac or Loop Road	2	-	-	<200	-	-	

* The values shown are subject to adjustment based on the geometry of the roadway, side frictions, and other relevant factors as determined by the Director, Department of Public Works.

** Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

*** Rural Residential Collectors and Rural Residential Roads are intended to serve areas with lot sizes of 2 acres or more which do not have a demand for on-street parking. On-street parking is not assured for these cross sections. Additional right-of-way is needed if on-street parking is in paved area.

**** See Tables 2A and 2B for roadway surfacing and right-of-way widths.