Memo

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From: David Parisi, PE, TE, Parisi Transportation Consulting
CC: Lorriaine Weiss, Design and Development Review, City of Larkspur
Neal Toft, Director of Planning and Building, City of Larkspur
Date: February 11, 2013
Subject: Rose Garden Community Facility Master Plan

The purpose of this memorandum is to assess the potential transportation-related impacts related to the Rose Garden Community Facility Master Plan. The memorandum provides a description of the existing transportation conditions, as well as those planned or under construction as a part of the Rose Garden residential development project. It also provides a discussion of potential transportation impacts related to the Community Facility Master Plan.

SETTING

This section describes the existing transportation conditions, as well as those currently planned or under construction, for the project area.

ROADWAY NETWORK

Currently, Doherty Drive is 40 feet wide measured curb to curb adjacent to the project site. It has two 12-foot wide travel lanes and an eight-foot marked shoulder in each direction. While parking is prohibited in the shoulder, it serves as both a bicycle lane and drop-off/pick-up zone for Hall Middle School.

To the west of Larkspur Plaza Drive, Doherty Drive's westbound lane widens and forms two lanes, one to turn right and one to turn left onto Magnolia Avenue. Its intersection with Magnolia Avenue is signalized.

To the east, Doherty Drive crosses over Larkspur Creek. Between the bridge and Riviera Circle, Doherty Drive was recently reconstructed. It includes a vehicular travel lane in each direction, as well as Class II bicycle lanes.

Doherty Drive, from the Larkspur Creek Bridge to Magnolia Avenue, is planned to be widened to 48 feet between curbs to accommodate a vehicular travel lane in each direction, a left-turn lane, and Class II bicycle lanes in each direction. This improvement will be in conjunction with the Rose Garden development project.

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TRANSPORTATION CONSULTING

The Doherty Drive/Larkspur Plaza intersection is currently controlled with a stop sign facing Larkspur Plaza traffic. As part of the above improvements, this intersection will be signalized and left turn lanes will be added to Doherty Drive.

The Doherty Drive/Piper Park intersection is controlled with a stop sign facing Piper Park. This intersection will continue to be stop sign-controlled in the future. A left turn lane will be added on Doherty Drive, serving Piper Park.

The project site will be served from Rose Lane, which will extend opposite Larkspur Plaza Drive. Rose Lane will be 26 feet wide, which will accommodate one vehicular travel lane in each direction, as well as parallel parking along the eastern side of the roadway. Rose Lane will intersect with a driveway serving the shopping center to the west.

Orchid Lane will be peripheral to the southern edge of the project site. Orchid Lane will be 26 feet wide, with parallel parking along the northern side of the roadway.

TRAFFIC OPERATING CONDITIONS

This study focuses its traffic level of service analysis at three intersections along Doherty Drive: Magnolia Avenue, Larkspur Plaza, and Piper Park. The selection of these study intersection was based upon the project's estimated vehicle trip generation and its potential effect on key intersections. Level of service analysis was conducted for the commute hours during the morning and late afternoon/evening. At signalized intersections, the City sets level of service "D" as the minimum acceptable condition. For unsignalized intersections, level of service "C" is the minimum acceptable condition as noted in General Plan Circulation Policy d and Section 18.14.10 (J) of the City Municipal Code. Tables 1 and 2 provide qualitative descriptions of level of service conditions.

Table 1. Signalized Intersection Level of Service Criteria

Level of Service	Average Control Delay	Description
A	≤ 10.0 sec./veh.	Operations with very slight delay, with no approach phase fully utilized.
B	10.1 – 20.0 sec./veh.	Operations with slight delay, and an occasional approach phase is fully utilized.
C	20.1 – 35.0 sec./veh.	Operations with average delay. Individual cycle failures begin to appear.
D	35.1 – 55.0 sec./veh.	Operations with tolerable delay. Many vehicles stop and individual cycle failures are noticeable.
E	55.1 – 80.0 sec/veh.	Operations with high delay, up to several signal cycles. Long queues form upstream of intersection.
F	> 80.0 sec./veh.	Operation with excessive and unacceptable delays. Volumes vary widely depending on downstream queue

		locations.

Source: Transportation Research Board, Highway Capacity Manual.

Table 2. Stop Sign-Controlled Intersection Level of Service Criteria

Level of Service	Average Control Delay	Description
A	≤ 10.0 sec./veh.	Minimal delay for stop-controlled approaches.
B	10.1 – 15.0 sec./veh	Very light congestion; short delays.
C	15.1 – 25.0 sec./veh.	Light congestion; average delays.
D	25.1 – 35.0 sec./veh.	Significant congestion on critical approaches, but intersection is functional. Moderate to lengthy delays.
E	35.1 – 50.0 sec./veh.	Severe congestion with some longstanding queues on critical approaches. Extremely lengthy delays.
F	> 50.0 sec./veh.	Extreme congestion, with very high delays and lengthy queues unacceptable to most drivers.

Source: Transportation Research Board, Highway Capacity Manual.

Table 3 reports the existing service levels and average motorist delays at each of the study intersections. Each of the three intersections currently operates acceptably.

Table 3. Existing Intersection Level of Service and Delay

Intersection	Traffic Control	Level of Service and Delay	
		AM Peak Hour	PM Peak Hour
Doherty/Magnolia	Signalized	D / 28 sec.	C / 23 sec.
Doherty/Larkspur Plaza	Side-Street Stop	C / 32 sec.	C / 25 sec.
Doherty/Piper Park	Side-Street Stop	B / 14 sec.	B / 15 sec.

Notes: Signalized intersection level of service (LOS) based on average intersection delay, as per methodology in the Highway Capacity Manual (HCM). Side-street stop-controlled LOS based on the worst lane delay, per the HCM.

TRANSIT NETWORK

Golden Gate Transit presently operates two bus routes in the vicinity. Golden Gate Transit Routes 18 and 22 travel along Magnolia Avenue and have stops near Ward Street in downtown Larkspur. Route 18 operates on weekdays and serves commuters between the College of Marin, Larkspur, Corte Madera and San Francisco. It operates seven southbound buses between 6:05 a.m. and 8:16 a.m., and seven northbound buses between 5:03 p.m. and 7:34 p.m.

Route 22 operates on weekdays, as well as on weekends and holidays. It serves San Rafael, San Anselmo, Ross, Kentfield Larkspur, Corte Madera, Strawberry, Marin City and Sausalito. During weekdays 19 southbound buses serve Larkspur, between 8:02 a.m. and 9:01 p.m., and 24 northbound buses provide service between 7:25 a.m. and 11:27 p.m. Fourteen southbound buses are in service on weekends and holidays between 7:57 a.m. and 8:57 p.m., and 15 northbound buses run between 7:22 a.m. and 9:22 a.m.

Marin Transit Route 117 runs along Doherty Drive and serves Hall Middle School. Its bus stops are located on Doherty Drive midway between Larkspur Plaza Drive and the Piper Park driveway. It operates eastbound along Doherty Drive during the morning, with drop-offs at 8:06 a.m. and 8:07 a.m., and runs westbound during the afternoon with pick-ups at 3:13 p.m. and 3:15 p.m. on Wednesdays and Thursdays and at 3:42 p.m. and 3:44 p.m. on Mondays, Tuesdays and Fridays.

PEDESTRIAN AND BICYCLE CONDITIONS

Currently, both the Doherty Drive/Larkspur Plaza Drive and Doherty Drive/Piper Park driveway intersections are unsignalized and each provides one marked crosswalk across Doherty Drive, as well as marked crosswalks across both legs of the side street. During Hall Middle School commencement and adjournment periods, school crossing guards control traffic at the intersections so students can cross.

The vast majority of students traveling to and from school use the Larkspur Plaza Drive crosswalk. Recent counts showed over 130 students crossing at this location during a 15-minute morning period, contracting with only nine crossings during the same time at Piper Park. Most students live west of the school.

The north side of Doherty Drive has a continuous five-foot sidewalk. On the south side of Doherty Drive, the sidewalk is ten feet wide. West of the project site, the sidewalk narrows to five feet. East of the site, a new 12-foot wide multi-use pathway was recently constructed, extending from the east end of the Larkspur Creek bridge to Riviera Circle.

As a part of the Rose Garden development project, the 12-foot wide multi-use pathway is planned to be extended along the periphery of the project site. This pathway will be constructed westerly to Magnolia Drive. In addition, in conjunction with the signalization of the Doherty Drive/Larkspur Plaza Drive intersection, all four legs of the intersection will have crosswalks and pedestrian signals.

Separated sidewalks are proposed along Rose Lane and Orchid Lane as part of the Rose Garden development. A 4.5-foot wide sidewalk is proposed along the west side of Rose Lane and a 12-foot wide sidewalk is proposed along the east side in the vicinity of the project. An 8.5-foot sidewalk is proposed along the north side of Orchid Lane, with a 4.5-foot wide sidewalk on the south side.

PARKING CONDITIONS

On-street parking in the vicinity of the project site is currently limited. However, there are several off-street sites in proximity. These include the Larkspur Plaza lot (170 spaces), the Nazari Property lot (21 spaces), the railroad right-of-way (10 spaces), and Piper Park (110 spaces).

As discussed previously, Rose Lane and Orchid Lane will serve the project site. On-street parallel-oriented parking will be provided on both of these roadways, including 10 spaces on Orchid Lane adjacent to the site and nine spaces on Rose Lane.

ENVIRONMENTAL IMPACTS

This section provides a discussion of potential transportation impacts related to the Rose Garden Community Facility Master Plan.

TRIP GENERATION

The project would consist of a Community Facility ranging in size from 20,000 square feet to 24,000 square feet. To be conservative and estimate the higher number of vehicle-trips that the project could generate, this study assumes that the community facility would be 24,000 square feet.

The facility would consist of a mix of community center and library uses. Vehicle trip generation studies have been conducted by the Institute of Transportation Engineers (ITE) for these separate uses. The ITE trip generation rates generally reflect suburban settings and assume almost all trips to these uses are by vehicles destined solely to these uses. In other words, the ITE trip generation rates do not fully consider that many trips to and from the proposed use would actually be made by transit, bicycle, or by foot, or may be made by a vehicle already traveling along Doherty Drive ("passby trip"). Thus, with the Community Facility's proximity to downtown Larkspur, Piper Park, Hall Middle School and Redwood High School, and residential uses, a high level of trips will be made by transit, bicycle, or by foot. In addition, it is likely that many vehicle trips to and from the site would be linked with other vehicle trips or already passing by the site. It is estimated that about 60 percent of the Community Facilities trips would consist of primary vehicle trips.

A 10,000 square foot community center was approved as part of the Central Larkspur Area Specific Plan. Previous traffic projections for study area intersections included estimated traffic associated with a 10,000 square foot facility, assuming almost all trips were vehicle trips.

Table 4 provides an estimate of the number of additional vehicle trips the proposed Community Facility could generate.

Table 4. Project Trip Generation

Conditions	AM Peak Hour		PM Peak Hour		Daily	
	In	Out	In	Out	In	Out
Vehicle Trip Rates (per 1,000 SF)	0.876	0.464	1.94	2.43	17.6	17.6
24,000 SF Community Facility	21	11	47	58	422	422
60% Primary Vehicle Trips	**13**	**7**	**28**	**35**	**253**	**253**
Less 10,000 SF Center per CLASP	[10]	[6]	[5]	[12]	[82]	[82]
Maximum Difference	**3**	**1**	**23**	**23**	**98**	**98**

Source: Institute of Transportation Engineers, Trip Generation, 9th Edition; Central Larkspur Area Specific Plan

A 24,000 square foot Community Facility would be estimated to generate a total of 20 vehicle trips during the weekday a.m. peak hour, 63 vehicle trips during the p.m. peak hour, and 506 vehicle trips over the course of the day. This would result in 4 additional a.m. peak hour vehicle trips and 46 additional p.m. peak hour vehicle trips compared to the 10,000 square foot community center facility approved as part of the Central Larkspur Area Specific Plan. It would result in 196 additional weekday vehicle trips over the course of a weekday.

It was estimated that 73 percent of the site-generated vehicle trips would be to and from the east along Doherty Drive, while 27 percent would be to and from the west (with 14 percent via Magnolia Drive to the north and 13 percent via Magnolia Drive to the south), consistent with the trip distribution estimates from the Central Larkspur Area Specific Plan.

TRAFFIC

The project's potential additional 4 weekday a.m. peak hour vehicle trips and 46 weekday p.m. peak hour vehicle trips were assigned to the three study intersections. Table 5 presents the estimated resulting intersection service levels and average motorist delays. The results in Table 5 assume all traffic associated with the Rose Garden development.

Table 5. Project Conditions Intersection Level of Service and Delay

Intersection	Traffic Control	Level of Service and Delay	
		AM Peak Hour	PM Peak Hour
Doherty/Magnolia	Signalized	D / 28 sec.	C / 24 sec.
Doherty/Larkspur Plaza	Signalized	A / 8 sec.	A / 10 sec.
Doherty/Piper Park	Side-Street Stop	B / 12 sec.	C / 20 sec.

Notes: Signalized intersection level of service (LOS) based on average intersection delay, as per methodology in the Highway Capacity Manual (HCM). Side-street stop-controlled LOS based on the worst lane delay, per the HCM.

The additional project-related traffic would retain the study intersections at acceptable service levels. The inclusion of a traffic signal at Doherty Dive/Larkspur Plaza, as well as left turn lanes, will improve the intersection's operations to level of service "A" conditions. The stop sign-controlled intersection at Doherty Drive/Piper Park will slightly improve during the a.m. peak hour due to provision of a new left turn on Doherty Drive serving Piper Park. It will also degrade to level of service "C" conditions during the late afternoon/evening peak hour. Therefore, any impacts would be less than significant.

Two alternative site layouts are currently proposed for the Community Facility: the "north option" and the "southwest option." Both options would have similar circulation patterns, with on-site parking accessed via driveways with Rose Lane and Orchid Lane. They would each have a one-way northbound drop-off lane accessed and egressed via Rose Lane. Both options would also have an angled parking area located just west of Rose Lane, accessed via a one-way southbound lane.

The traffic plan is consistent with the Central Larkspur Area Specific Plan's access and circulation elements, designed to allow smooth flow of traffic through the project area and provide for public safety. Impacts associated with access and circulation elements would be less than significant.

TRANSIT

The project would be served by Golden Gate Transit Routes 18 and 22, which travel along Magnolia Avenue, as well as Marin Transit Route 117 which operates along Doherty Drive, serving Hall Middle School. The bus stops are within walking distance of the project site, and accessed via accessible walkways. The buses retain adequate capacity to accommodate riders to and from the project site.

Public transit would serve the project via routes along Magnolia Avenue and Doherty Drive. Impacts would be less than significant.

PEDESTRIAN AND BICYCLE

The project would be accessed via multiple pedestrian and bicycle routes, including a multi-use pathway along the south side of Doherty Drive, a five-foot wide sidewalk along the north side of Doherty Drive, Class II bicycle lanes in both direction on Doherty Drive, and crosswalks across Doherty Drive, including signalized crosswalks at the Doherty Drive/Larkspur Plaza intersection.

Separated sidewalks are proposed along Rose Lane and Orchid Lane as part of the Rose Garden development. A 4.5-foot wide sidewalk is proposed along the west side of Rose Lane and a 12-foot wide sidewalk is proposed along the east side in the vicinity of the project. An 8.5-foot sidewalk is proposed along the north side of Orchid Lane, with a 4.5-foot wide sidewalk on the south side.

Bicycle parking would be provided on-site.

The project is consistent with the Central Larkspur Area Specific Plan, which includes a system of integrated pedestrian and bicycle routes that enhance existing pedestrian paths and bikeways. Impacts would be less than significant.

PARKING

The City's architect has proposed a parking rate of 3.0 spaces per 1,000 square feet of building area for "convenient parking" – on-site and nearby off-site parking – related to community facilities. This rate is based on best practices and case studies undertaken by the architect and would require 60 convenient spaces for a 20,000 square-foot facility to 72 convenient spaces for a 24,000 square-foot facility.

Community input gathered during the master plan process has identified a high value on maximizing open space. Therefore nearby on-street parking is factored into meeting the above convenient parking requirement. Nine on-street parking spaces are planned to be provided along the east side of Rose Lane as part of the overall Rose Garden development project. Ten spaces are planned to be provided along the north side of Orchid Lane. More than ten additional on-street parking spaces are planned to be available elsewhere in the Rose Garden development project within walking distance to the community facility parcel. In total, more than a dozen on-street spaces may be considered convenient to the Community Facility site.

After factoring in the availability of on-street parking, the City's architect recommends an on-site parking standard of 2.5 spaces per 1,000 square feet of building; this is equivalent to a range of 50 spaces for a 20,000 square-foot facility to 60 spaces for a 24,000 square-foot facility. On-site parking may be provided on either or both parcel "A" (larger parcel to east of Rose Lane) and parcel "B" (smaller parcel to the west side of Rose Lane). If this parking is provided on-site then there would be no parking deficit and no parking impact would result.

As previously stated, due to the Community Facility's proximity to downtown Larkspur, Piper Park, schools, and residential uses, it is likely that many vehicle trips to and from the site would be linked with other vehicle trips. In other words, some patrons may park at another location and walk to the site. In addition, the site is conveniently serviced by public transit, and soon by continuous wide pathways and bicycle lanes. It is likely that a high level of trips would be made by transit, bicycle, or by foot, resulting in lower parking demands.

Community input gathered during the master plan process was favorable to utilizing off-site parking options to meet peak use parking demands. The City's Piper Park has parking that is located across from the Community Facility Parcel to the north of Doherty Drive. Hall Middle School is also directly across Doherty Drive and school peak parking is complementary to the proposed uses of the Community Facilities Parcel. The Community Facility should estimate parking demands for special activities and work with nearby properties to assure parking demands can be met off-site. It is recommended that the facility's special events be coordinated in conjunction with planned activities at Piper Park, Hall Middle School, Redwood High School, and the adjacent shopping center. The Community Facility should also encourage visitors, particularly to special events, to carpool, take public transit, bicycle or walk.

INITIAL STUDY QUESTIONS

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

> The project is consistent with the City of Larkspur's Circulation Element of the General Plan, the City's Bicycle and Pedestrian Master Plan, and with the various objectives, policies and standards of the Central Larkspur Area Specific Plan. Its traffic generation would not result in any study intersections operating at less than acceptable service levels. The project would be adequately served by existing and planned pedestrian, bicycle and transit systems. **Less than significant impact.**

b) Conflict with applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

The project's study area roadways are not subject to Marin County's Congestion Management Program. Regardless, the project's traffic would not result in any study intersection operating at or below unacceptable service level standards. **No impact.**

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The project will not affect air traffic patterns. **No impact.**

d) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The project will not affect air traffic patterns. **No impact.**

e) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project is consistent with the design features per the Central Larkspur Area Specific Plan. The traffic, parking, pedestrian and bicycle features enable smooth and standard access and circulation. **Less than significant impact.**

f) Result in inadequate emergency access?

The project provides adequate emergency access through its roadway, driveway, and parking lot design features. **Less than significant impact.**

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The project is consistent with the City of Larkspur's Circulation Element of the General Plan, the City's Bicycle and Pedestrian Master Plan, and with the various objectives, policies and standards of the Central Larkspur Area Specific Plan. Its traffic generation would not result in any study intersections operating at less than acceptable service levels. The project would be adequately served by existing and planned pedestrian, bicycle and transit systems. **Less than significant impact.**