

A G E N D A

PLANNING COMMITTEE

REGULAR MEETING
FRIDAY, SEPTEMBER 8, 2017, AT 1:00 PM
BOARD ROOM – GATEWAY COMPLEX

1. CALL TO ORDER: Mary Lou Delpech, Chairman
2. ROLL CALL: Delpech, Birdsall, Brown, and Fredlund
3. RESIDENTS' FORUM

The Planning Committee will follow Rossmoor custom and limit comments to 3 minutes.

4. CHAIRMAN'S REPORT
5. ELECTION OF VICE CHAIRMAN
6. UNFINISHED BUSINESS
7. NEW BUSINESS

Discuss final recommendations from TJKM Traffic Engineering Consultants to improve traffic and pedestrian safety in Rossmoor. (Attachment)

8. ADJOURNMENT
9. NEXT MEETING: Friday, October 13, 2017, at 1:00 p.m. in the Board Room at Gateway Complex

TO/kv
cc: GRF Board

Agenda Item: 7
Subject: Traffic and Pedestrian
Safety Recommendations
Meeting Date: September 8, 2017

SUMMARY REPORT GOLDEN RAIN FOUNDATION PLANNING COMMITTEE

REPORT PREPARED BY:

Tim O'Keefe, CEO
Dennis Bell, Public Safety Manager

REQUESTED ACTION/RECOMMENDATION:

Consider prioritizing and recommending improvements to the Board of Directors to improve traffic and pedestrian safety.

BACKGROUND:

As a result of extensive and continuing resident feedback, it is clear that resident safety on the roadways, inside vehicles and when walking on the streets is of paramount importance. The Board of Directors at its June 2016 meeting, agreed to fund a traffic and pedestrian safety study. After a bidding process, TJKM Traffic Engineers was hired to conduct a study which was presented to the Board at the May 25 and July 27, 2017 meetings. (TJKM provides traffic consulting services to many cities, counties and government agencies in California and across the nation, including the City of Walnut Creek.) To implement all the consultant's recommendations would cost approximately \$1,000,000. The Board directed the Planning Committee to evaluate and present recommendations to the Board.

Staff have reviewed the study and recommend that the Committee place an initial emphasis on the 4 locations with the highest rates of automobile accidents (identified in the TJKM report in Figure 5 as S-1, S-2, S-4 and S-5, plus S-3), as well as 2 locations with high rates of speed (identified as N-1 and N-4). The collision information presented on p. 15 of the report includes summarized accident data in Table 3 over a 5 year period averaging 65 accidents per year.

A brief description and estimated cost are noted in the table below. The ID refers to the circled number and "N" roadway network locations on Figure 6 from the report:

ID	NAME	TYPE	AREA	MEASURES	COST
S-1	Rossmoor Entrance	Entrance	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Re-allocate entrance area layout by specifying destinations (Rossmoor Pkwy or Golden Rain Rd) and vehicle types (visitor or resident); 2. Improve wayfinding signs along Rossmoor Pkwy in advance of entrance 	\$5,000
S-2	Rossmoor Pkwy & Golden Rain Rd	Intersection sidewalk	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Widen Crosswalk #53 toward east; paint Crosswalk ladder style; 2. Install rumble strips on northbound traffic 	\$1,850
S-3	Golden Rain Rd & Gateway Clubhouse driveway	intersection	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Remove Crosswalk #1 	\$1,250
S-4	Tice Creek Dr & Golden Rain Rd	Intersection	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Install raised crosswalk for east and west legs (Crosswalk #67 and #69) 	\$25,000
S-5	Tice Creek Dr and Oakmont Dr	Intersection Crosswalk	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Install RRFB at Crosswalk #32; 2. Install pedestrian crossing signs 3. Install advanced warning signs (W11-2 and W16-9P) for Crosswalk #32 and 34 	\$30,000
N-1	Golden Rain Rd (between Tice Creek Dr and Upper/Lower Golden Rain Rd)	Roadway		<ol style="list-style-type: none"> 1. Install golf cart lanes in both directions from Tice Creek Dr to Pine Knoll Dr 2. Install raised pavement markers approaching crosswalk locations along this segment 	<p>\$64,000</p> <p>\$3,000</p>

N-4	Rossmoor Pkwy (between Stanley Dollar Dr and Tice Creek Dr)	Roadway		<ol style="list-style-type: none"> 1. Striped golf cart lane on both sides between Stanley Dollar Dr and Tice Creek Dr 2. Dashed green golf cart lane treatment or guiding lines at intersections (Rossmoor Pkwy at Stanley Dollar Dr and Terra California Dr); 3. Golf cart sharrows at intersections and merging areas 	\$24,000
Total					\$154,100

**Estimated costs include a 20% contingency and are based on the consultant's professional expertise*

The spot improvements in S-1 through S-5 would address the areas with the highest rates of collisions in Rossmoor. The roadway improvements in N-1 and N-4 should slow traffic down by narrowing the street with paint markings and providing a safe lane of travel for golf carts and bicycles which separates both forms of transport from the automobile path of travel.

From the TJKM report:

"The high golf cart usage in the community triggered the consideration of installing new dedicated golf cart lanes and improving the existing lanes with green markings and sharrows.

Green golf cart lanes and sharrow markings reinforce right-of-way for golf carts and heighten drivers' awareness of potential roadway conflict with golf carts. The implementation of golf cart lanes can also help to slow vehicular traffic, due to the reduced roadway width available to other vehicles. With the ample roadway widths, it is recommended that dedicated golf cart lanes be installed along Golden Rain Road between Tice Creek Drive and Lower Golden Rain Road; and along Rossmoor Parkway between Stanley Dollar Drive and Tice Creek Drive."

Staff recommends that accident data be evaluated for a 2 year period following implementation to determine whether the roadway modifications have the intended effect of reducing collisions and speed and before considering further recommendations in the TJKM study.

ALTERNATIVES AND OPTIONS:

The Committee could select more or less items from the TJKM report; or none. The Committee could also consider soliciting additional input from the community via a workshop.

SUBSEQUENT ACTIONS:

The Committee's recommendation will be submitted to the Board of Directors for consideration. If approved, staff will obtain bids.

FINANCIAL IMPACT:

The preliminary estimate is \$154,100 however the actual costs will not be determined until the project is submitted for bid.

ATTACHMENTS:

From the TJKM report (full report is available for review upon request):

Pages 15-16 Table 3 and Figure 5

Pages 25-26 Roadway diagrams

Page 27 Figure 6

Pages 28-37 Table 5

Pages 39-49 Table 7



4 COLLISION AND CROSSWALK SAFETY - ANALYSIS AND METHODOLOGY

4.1 Collision Analysis

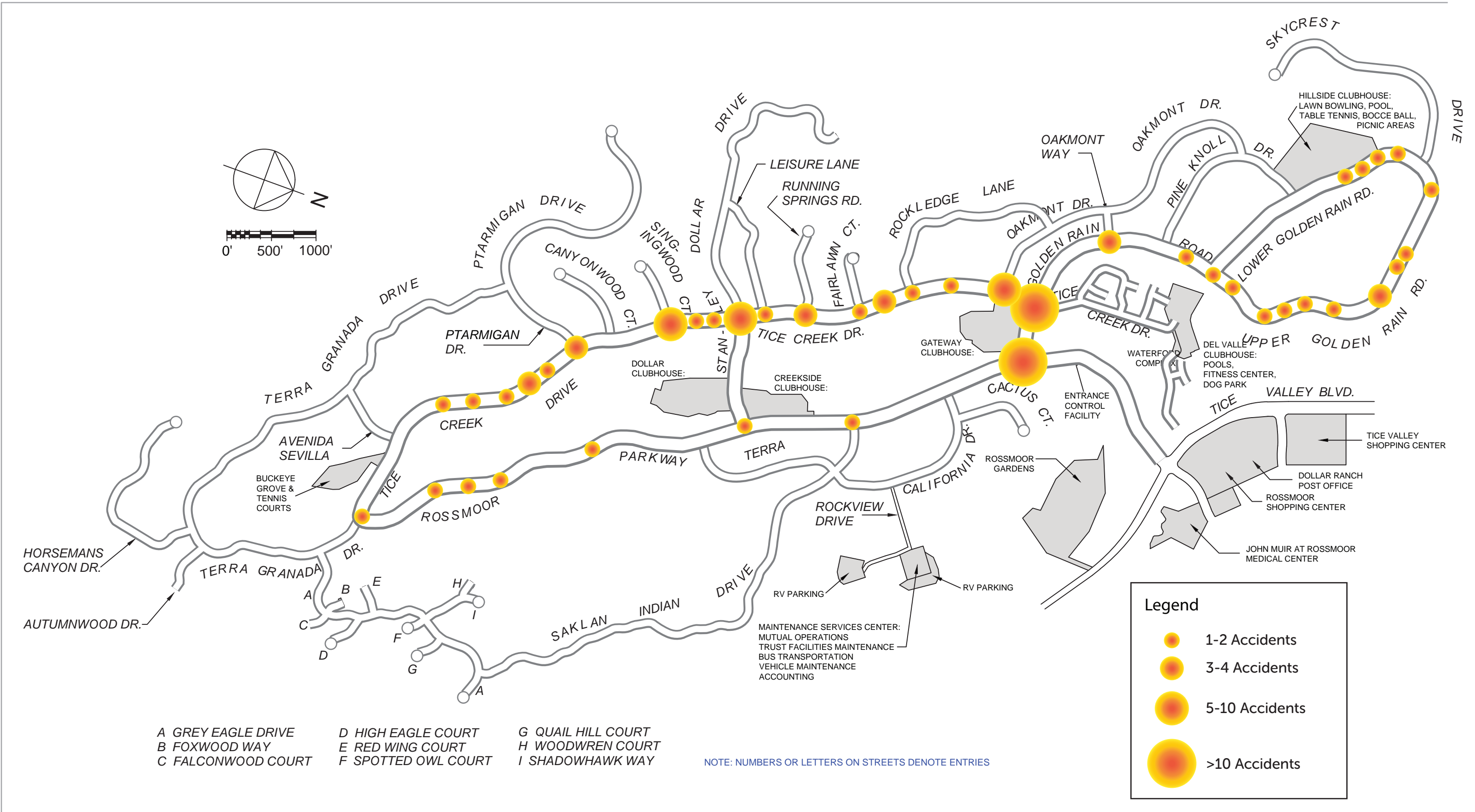
TJKM analyzed the reported accidents provided by GRF and identified where each was located. Of the 537 accidents that occurred between January 2011 and July 2016, 323 (about 60 percent) occurred on roadways or in parking lots within the study area. **Table 3** below shows the number of accidents within each portion of the study area, including the number of injury accidents in each area and a breakdown of pedestrian involvement. Accidents occurring at intersections were categorized based on the primary street identified in the accident record. Note that the accident data does not differentiate accidents occurred on the GRF roads from those within the entries. TJKM categorized the accidents into locations based on the name and description of each accident. **Figure 5** illustrates accident locations more precisely, identifying hot spots.

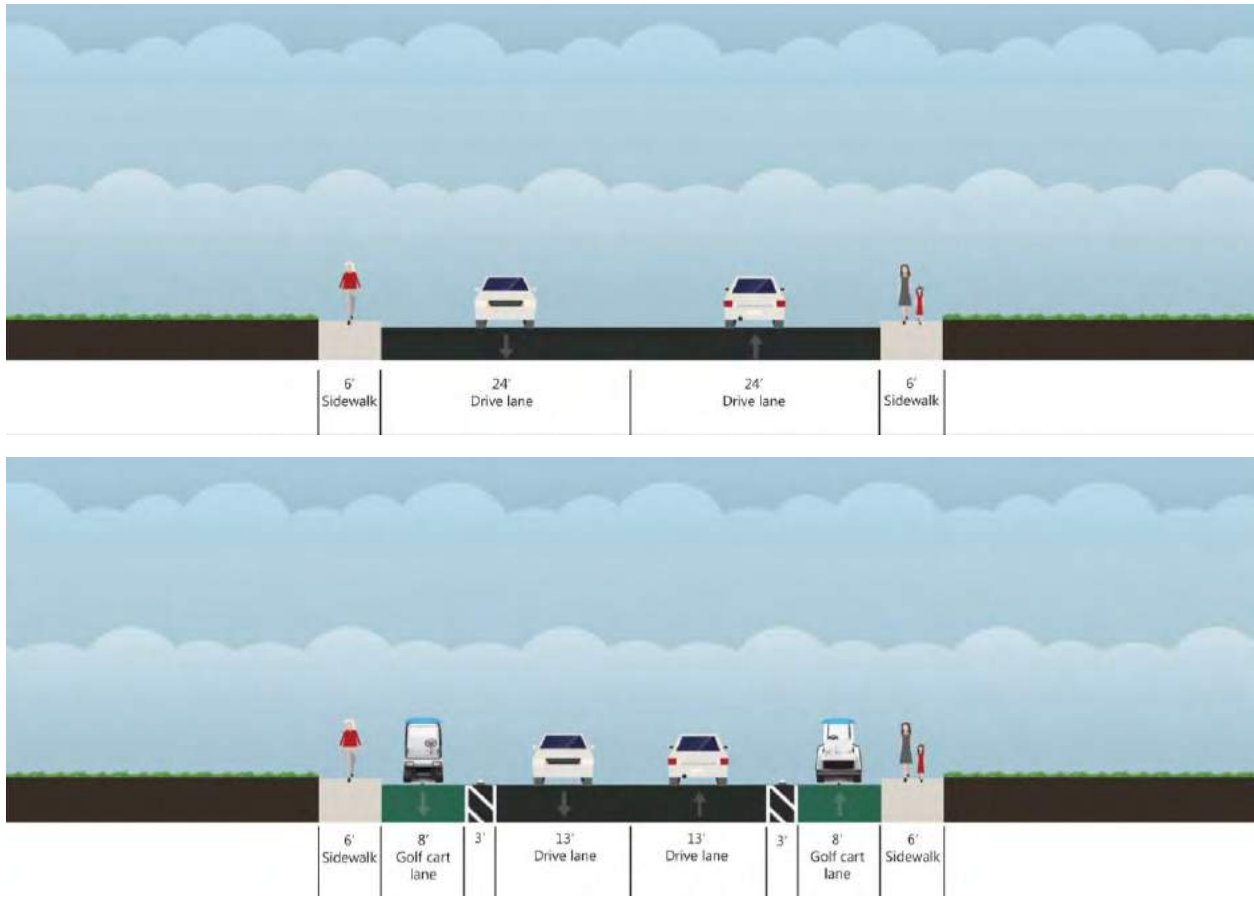
Notably, there were two injury accidents at the intersection of Tice Creek Drive and Golden Rain Road and three injury accidents at the intersection of Tice Creek Drive and Oakmont Drive. There were also three injury accidents at various points along Golden Rain Road, five injury accidents along Tice Creek Drive, and three injury accidents in clubhouse parking lots. Seven injury accidents involved vehicles striking pedestrians: one at Tice Creek Drive and Golden Rain Road, two at Tice Creek Drive and Oakmont Drive, and one each at Golden Rain Road and Oakmont Way, Stanley Dollar Drive and Tice Creek Drive, the Gateway Clubhouse parking lot, and the Creekside Clubhouse parking lot. There were also two pedestrians struck by vehicles with no injuries reported, one each at the intersection of Stanley Dollar Drive and Tice Creek Drive, and in front of the Gateway Club House on Golden Rain Road.

Table 3. Accidents in the Study Area

Location	All Accidents	Injury Accidents	Vehicle vs. Pedestrian	Pedestrian Injured	Pedestrian Not Injured
Rossmoor Entrance	111	1			
Clubhouses	78	5	2	2	
Rossmoor Parkway	16	1			
Golden Rain Road	39	2	2	1	1
Tice Creek Drive	66	9	3	3	
Stanley Dollar Drive	13	2	2	1	1
Total within Study Area	323	20	9	7	2
Yearly Average	65	4			
<i>Note: Accidents at intersections are categorized by the main street included in the report.</i>					

Figure 5. Collision History

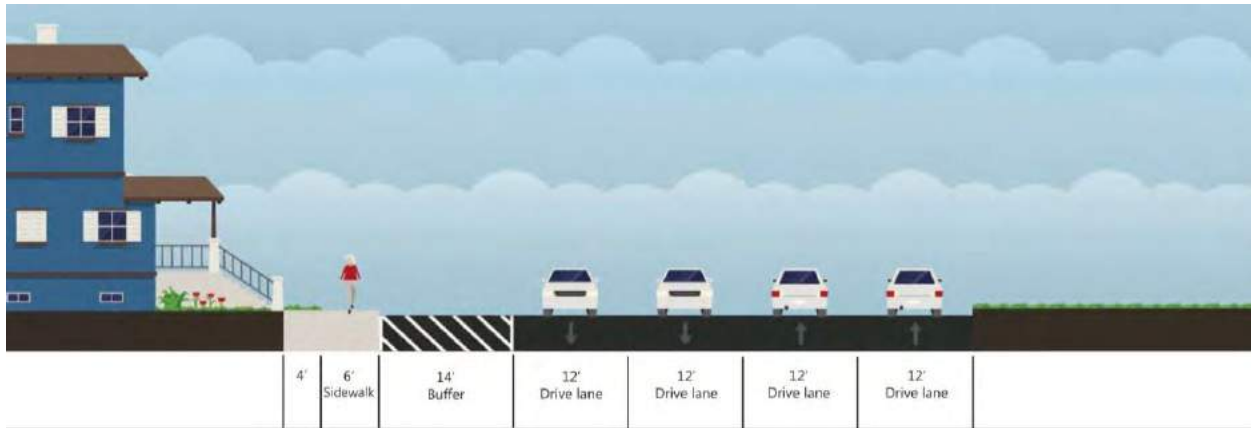




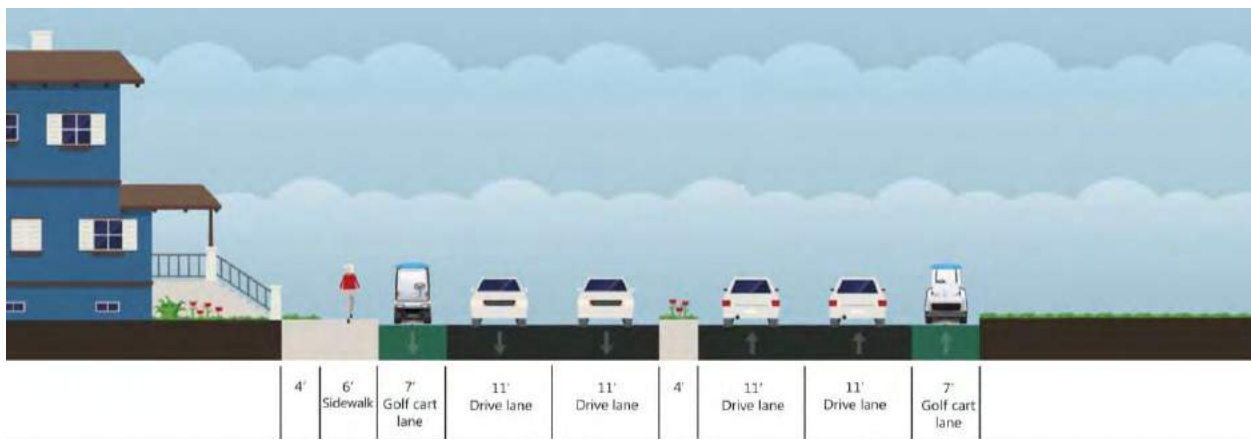
(Top) Rossmoor Parkway Existing and Proposed Cross Section (between Stanley Dollar Drive and Tice Creek Drive).

(Bottom) Rendering of proposed safety enhancement on Rossmoor Parkway (between Stanley Dollar Drive and Tice Creek Drive).





Golden Rain Road Existing Cross Section (between Tice Creek Drive and Lower Golden Rain Road).



Golden Rain Road Proposed Cross Section (between Tice Creek Drive and Lower Golden Rain Road).

Table 5 and **Table 6** list all spot and network improvements, respectively, that would improve Rossmoor vehicle and pedestrian safety. Detailed maps of improvement locations and conceptual drawings are provided in **Appendix E**.

Figure 6 shows all locations for spot and network improvements.

Figure 6. Locations of Improvements

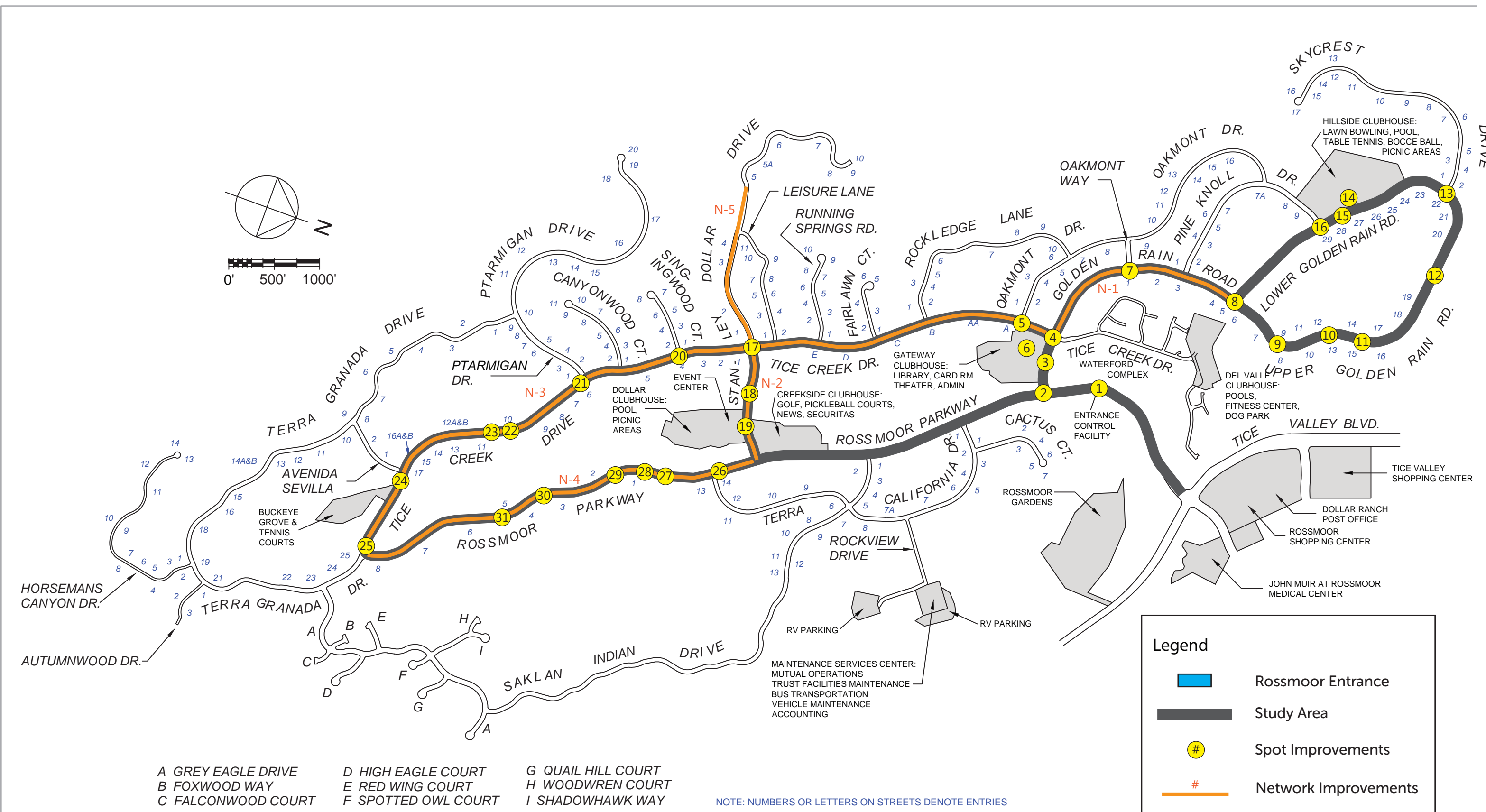




Table 5. Spot Improvements

ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
Gateway Area							
S-1	Rossmoor Entrance	Entrance	Gateway Clubhouse Area	1. Unclear wayfinding signs; 2. Observed weaving due to booth setup and lane geometry.	1. Re-allocate booth layout by specifying destinations (Rossmoor Parkway or Golden Rain Road) and vehicle types (visitor or resident); 2. Improve wayfinding signs along Rossmoor Parkway before entrance.	1. Reduce possibility of weaving.	1. Cannot fully accommodate all potential routes due to gate configuration; cannot fully prevent from weaving.
S-2	Rossmoor Parkway & Golden Rain Road	Intersection Sidewalk	Gateway Clubhouse Area	1. High vehicular traffic volume; 2. Multi-lane intersection with stop control not fully complied by motorists; 3. Crosswalk #53 blocked by median island and street light.	1. Widen Crosswalk #53 toward east; paint Crosswalk #53 ladder style; 2. Install rumble strips on northbound traffic.	1. Safer environment for motorists and non-motorized users.	1. Noise increase that may be heard by manors above.
S-3	Golden Rain Road & Gateway Clubhouse Driveway	Intersection	Gateway Clubhouse Area	1. Confusion of stop control (westbound traffic does not stop); 2. Low utilization of Crosswalk #1.	1. Remove Crosswalk #1	1. Eliminate conflict points with pedestrians.	1. Pedestrians are required to use crosswalks at Rossmoor Parkway or Tice Creek Drive.



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
S-4	Tice Creek Drive & Golden Rain Road	Intersection	Gateway Clubhouse Area	1. Stop control compliance (feedback from residents).	1. Install raised crosswalks for east and west legs (Crosswalk #67 and #69).	1. Raised crosswalks can slow traffic and heighten visibility of pedestrians.	1. May increase emergency response time.
S-5	Tice Creek Drive & Oakmont Drive	Intersection Crosswalk	Gateway Clubhouse Area	1. High volume of turning traffic; 2. Crosswalk #32 conflicts with vehicle Right-of-Way (Gateway Clubhouse driveway); 3. Mislocation of refuge; 4. Low visibility of Crosswalk #34.	1. Install RRFB at Crosswalk #32; 2. Install pedestrian crossing signs 3. Install advanced warning signs (W11-2 and W16-9P) for Crosswalk #32 and 34.	1. Slows vehicle speeds; 2. Increase visibility of pedestrians;	(No impact on existing traffic)
S-6	Gateway Clubhouse	Parking	Gateway Clubhouse Area	1. In-lot circulation.	1. Preliminary engineering review shows current parking lot layout is better than any other variations assessed.	N/A	(No impact on existing traffic)
Golden Rain Area							
S-7 (N-1)	Crosswalk #2 (Golden Rain Road & Oakmont Way)	Crosswalk	Golden Rain Area	1. High vehicle speeds (downhill); 2. Limited sight distance due to horizontal curve for traffic coming uphill.	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
S-8	Crosswalk #48 (Golden Rain Road & Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Limited sight distance due to vertical curve (Crosswalk #48 located at lowest point of roadway segment;	1. Install stop control; 2. Install "Stop Ahead" sign.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)
S-9	Crosswalk #43 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Limited sight distance due to great horizontal curves from both directions.	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)
S-10	Crosswalk #44 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Limited sight distance due to horizontal curve and parked vehicles.	1. Remove Crosswalk #44	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)
S-11	Crosswalk #45 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Limited sight distance due to great horizontal curves from both directions; 2. Limited sight distance due to parked vehicles.	1. Extend red curb southbound to Driveway #18; extend red curb northbound to Driveway # 13 to create visual clearance near the crosswalk.	1. Enhanced pedestrian crossing safety.	1. Reduced parking availability.
S-12	Crosswalk #47 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Crosswalk #47 presents low visibility; 2. Sidewalk gap in vicinity.	1. Move Crosswalk #47 near Driveway #20 where grade is flat; 2. Install pedestrian crossing sign; 3. Build sidewalk to connect	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
					new location with overlook path.		
S-13	Crosswalk #52 (Lower Golden Rain Road)	Crosswalk	Golden Rain Area	1. Limited sight distance due to great horizontal curve from both directions.	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)
S-14	Hillside Clubhouse	Parking	Golden Rain Area	1. Narrow parking lot entrance/exit at Golden Rain Road; 2. Limited sight distance and sharp turns at Golden Rain Road.	1. Squaring of intersection OR create southbound right turn pocket (9 feet).	1. Increased intersection sight distance; 2. Improved vehicle circulation.	(No impact on existing traffic)
S-15	Crosswalk #46 (Hillside Clubhouse)	Crosswalk	Golden Rain Area	1. Located away from intersection, increasing number of conflict points.	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign; 3. Consider relocate to Hillside intersection.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
S-16	Crosswalk #50 (Hillside Clubhouse)	Crosswalk	Golden Rain Area	1. Low visibility; 2. Lighting is not adequate.	1. Paint high visibility crosswalk; 2. Install pedestrian crossing sign; 3. Install advanced "Pedestrian Ahead" sign; 4. Enhance lighting for this crosswalk.	1. Enhanced pedestrian crossing safety.	(No impact on existing traffic)
Stanley Dollar Area							
S-17 (N-2)	Tice Creek Drive & Stanley Dollar Drive	Intersection	Stanley Dollar Area	1. A primary route to Creekside and Dollar Clubhouses; 2. High golf cart usage.	1. Install raised intersection.	1. Heighten drivers' awareness of entering a pedestrian- and golf cart-oriented area.	1. May increase emergency response time.
S-18 (N-2)	Crosswalk #20 (Stanley Dollar Drive)	Crosswalk	Stanley Dollar Area	1. Crosswalk #20 presents low visibility; 2. Crossing signs and push buttons too far from crossing point.	1. Add golf cart crossing sign; 2. Paint legend "Golf Cart Crossing Ahead"; 3. Paint high visibility crosswalk; 4. Add raised pavement markers on Stanley Dollar Drive west of Crosswalk #20; 5. Paint curb red to remove parking near Crosswalk #20 (approx. 5 stalls); 6. Move crossing signs closer to crossing point; 7. Make crossing signs double-sided.	1. Enhanced pedestrian and golf cart safety.	(No impact on existing traffic)



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
S-19 (N-2)	Crosswalk #21 (Stanley Dollar Drive)	Crosswalk	Stanley Dollar Area	1. Low contrast of crosswalk color compared to pavement; 2. Pedestrian crossing signs and push buttons too far from crossing point.	1. Add painted stripes to outline Crosswalk #21; 2. Relocate existing pedestrian crossing sign and push button closer to curb; 3. Make pedestrian crossing signs double-sided.	1. Enhanced pedestrian and golf cart safety.	(No impact on existing traffic)
Lower Tice Creek Area							
S-20 (N-3)	Tice Creek Drive & Singingwood Court	Intersection	Lower Rossmoor Area	1. Limited sight distance due to vertical curve; 2. Accident rate 5+ between 2011 to 2015	1. Install curb extension (bulb-out) at intersection.	1. Increases visibility of pedestrians; 2. Shorten crossing distance; 3. Slows vehicle speed due to narrowed roadway.	1. Minimum impact on existing traffic.
S-21 (N-3)	Crosswalk #35 (Tice Creek Drive & Ptarmigan Drive)	Crosswalk	Lower Tice Creek Area	1. Limited sight distance (vertical curve).	1. Install curb extension (bulb-out) at intersection; 2. Install pedestrian crossing sign Or RRFB.	1. Improved crosswalk sight distance; 2. Shorten crossing distance.	1. Minimum impact on existing traffic.
S-22 (N-3)	Crosswalk #25 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Limited sight distance due to horizontal curve; 2. Closely placed with Crosswalk #24 in vicinity.	1. Remove Crosswalk #25	1. Enhanced pedestrian and vehicle safety.	1. Reduced pedestrian accessibility.



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
S-23 (N-3)	Crosswalk #24 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Missing red curb at crosswalk.	1. Paint curb red at and near Crosswalk on both sides; 2. Install pedestrian crossing sign.	1. Enhanced pedestrian and vehicle safety.	1. Reduced parking availability.
S-24 (N-3)	Crosswalk #26 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Missing red curb at crosswalk; 2. Low visibility.	1. Paint curb red at and near Crosswalk on both sides; 2. Paint high visibility crosswalk.	1. Enhanced pedestrian and vehicle safety.	1. Reduced parking availability.
S-25 (N-3)	Crosswalk #59 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Low visibility.	1. Paint high visibility crosswalk; 2. Install RRFB for golf cart crossing.	1. Enhanced pedestrian and golf cart safety.	(No impact on existing traffic)
Lower Rossmoor Area							
S-26 (N-4)	Crosswalk #19 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Ramps not compliant with ADA requirements.	1. Rebuild ramps on both side to comply with ADA requirements; 2. Paint high visibility crosswalk. 3. Install pedestrian crossing sign.	1. Enhanced pedestrian safety and accessibility.	(No impact on existing traffic)
S-27 (N-4)	Crosswalk #17 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Golf crossing location but not clearly signed.	1. Install golf cart crossing sign; 2. Add golf cart crossing legend; 3. Paint curb red to prevent parking at crossing location. 4. Consider RRFB for golf carts and pedestrians.	1. Enhanced pedestrian and golf cart safety.	1. Reduced parking availability.
S-28 (N-4)	Crosswalk #16 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Not correctly striped; 2. Short crosswalk	1. Remove Crosswalk #16	1. Enhanced pedestrian and vehicle safety.	1. Reduced pedestrian accessibility.



ID	Name	Type	Area	Issue	Measures		
					Description	Pros	Cons
				spacing with Crosswalk #17.			
S-29 (N-4)	Crosswalk #18 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Golf crossing location but not clearly signed.	1. Install golf cart crossing sign; 2. Add golf cart crossing legend; 3. Paint curb red to prevent parking at crossing location; 4. Consider RRFB for golf carts and pedestrians.	1. Enhanced pedestrian and golf cart safety.	1. Reduced parking availability.
S-30 (N-4)	Crosswalk #14 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Crosswalk #14 presents low visibility to northbound traffic.	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	1. Enhanced pedestrian and vehicle safety.	(No impact on existing traffic)
S-31 (N-4)	Crosswalk #15 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Limited sight distance due to horizontal curve on southbound traffic	1. Install pedestrian crossing sign; 2. Add hashed striping (striped bulb-out) to narrow southbound approach; 3. Construct ADA compliant ramps; 4. Paint curb red near crosswalk.	1. Enhanced pedestrian and vehicle safety.	1. Reduced parking availability.



Table 6. Network Improvements

ID	Name	Type	Issue	Description of Measures
N-1	Golden Rain Road (Tice Creek Drive and Upper/Lower Golden Rain Road)	Roadway	1. Great vertical curves.	1. Install golf cart lanes in both directions from Tice Creek Drive to Pine Knoll Drive; 2. Consider raised medians; 3. Install raised pavement markers approaching crosswalk locations along this segment.
N-2	Stanley Dollar Drive (Tice Creek Drive and Rossmoor Parkway)	Roadway	1. High pedestrian activity; 2. High golf cart usage;	1. Reinforce this segment to be pedestrian- and golf cart-oriented 2. Add golf cart sharrows/markings eastbound between Tice Creek Drive and "Golf Cart Must Exit" sign; 3. Add golf car sharrows/markings westbound from Creekside Clubhouse driveway to Tice Creek Drive where golf cart lane is not provided; 4. Green golf cart lane.
N-3	Tice Creek Drive (Rockledge Lane and Rossmoor Parkway)	Roadway	1. Horizontal curves and sight distance.	1. Paint curb red at locations where sight distance are limited; 2. No Parking Signs (or red curb) south of Avenida Sevilla due to narrowed street width; 3. Stripe parking lane along this segment; 4. Curb extension (bulb-out) at Rockledge, Fairlawn, Running Springs, Leisure, Singingwood, Canyonwood, and Ptarmigan.



ID	Name	Type	Issue	Description of Measures
N-4	Rossmoor Parkway (Stanley Dollar Drive and Tice Creek Drive)	Roadway	1. Wide travel lane; 2. Shared use with golf carts.	1. Striped golf cart lane on both side between Stanley Dollar Drive and Tice Creek Drive; 2. Dashed green golf cart lane treatment or guiding lines at intersections (Rossmoor Parkway at Stanley Dollar Drive and Terra California Drive); 3. Golf cart sharrows at intersections and merging areas.
N-5*	Stanley Dollar Drive (West of Tice Creek Drive)	Roadway	1. High percentage grade; 2. High vehicle speeds (comments from residents).	1. Install speed lumps at one or two locations
*N-5 is not within the study area. TJKM considers including this segment due to multiple comments received from the residents regarding speeding.				

6 COST ESTIMATES AND PHASING

This chapter describes the cost estimation and prioritization process for the spot and network improvements proposed in the previous chapter. The cost of each improvement was calculated and determined based on consultant’s experience in working with various jurisdictions in the Bay Area. The phasing of all spot and network improvements were prioritized considering the following attributes:

- Cost-effectiveness of each improvement;
- Degree of enhanced safety levels for each improvement; and
- Values created that will ensure the enhancement of overall safety in the community.

6.1 Phase I Projects

Phase I contains 11 projects. These projects were expected to improve safety at the key locations, and maximize overall level of safety for the community. All 11 projects can be implemented within existing budget available. **Table 7** lists all Phase I improvements with preliminary cost estimates. Note that cost estimates include only construction cost of each improvement, with a 20 percent contingency. Phase I improvements totals \$101,100.

Table 7. Phase I Improvements and Preliminary Cost Estimates

ID	Name	Type	Area	Measures	Cost
Phase I					
S-2	Rossmoor Parkway & Golden Rain Road	Intersection Sidewalk	Gateway Clubhouse Area	1. Widen Crosswalk #53 toward east; paint Crosswalk #53 ladder style; 2. Install rumble strips on northbound traffic.	\$1,850
S-3	Golden Rain Road & Gateway Clubhouse Driveway	Intersection	Gateway Clubhouse Area	1. Remove Crosswalk #1	\$1,250



ID	Name	Type	Area	Measures	Cost
Phase I					
N-5*	Stanley Dollar Drive (West of Tice Creek Drive)	Roadway		1. Install speed lumps at one or two locations	\$10,000
S-5	Tice Creek Drive & Oakmont Drive	Intersection Crosswalk	Gateway Clubhouse Area	1. Install RRFB at Crosswalk #32; 2. Install pedestrian crossing signs 3. Install advanced warning signs (W11-2 and W16-9P) for Crosswalk #32 and 34.	\$30,000
S-8	Crosswalk #48 (Golden Rain Road & Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Install stop control; 2. Install "Stop Ahead" sign.	\$2,500
N-2	Stanley Dollar Drive (Tice Creek Drive and Rossmoor Parkway)	Roadway	Golden Rain Area	1. Reinforce this segment to be pedestrian- and golf cart-oriented 2. Add golf cart sharrows/markings eastbound between Tice Creek Drive and "Golf Cart Must Exit" sign; 3. Add golf car sharrows/markings westbound from Creekside Clubhouse driveway to Tice Creek	\$5,000



ID	Name	Type	Area	Measures	Cost
Phase I					
				Drive where golf cart lane is not provided; 4. Green golf cart dashes.	
S-18 (N-2)	Crosswalk #20 (Stanley Dollar Drive)	Crosswalk	Stanley Dollar Area	1. Add golf cart crossing sign; 2. Paint legend "Golf Cart Crossing Ahead"; 3. Paint high visibility crosswalk; 4. Add rumble strips on Stanley Dollar Drive west of Crosswalk #20; 5. Paint curb red to remove parking near Crosswalk #20 (approx. 3 stalls); 6. Move crossing signs closer to crossing point; 7. Make crossing signs double-sided.	\$3,200
S-19 (N-2)	Crosswalk #21 (Stanley Dollar Drive)	Crosswalk	Stanley Dollar Area	1. Add painted stripes to outline Crosswalk #21; 2. Relocate existing pedestrian crossing sign and push button closer to curb; 3. Make pedestrian crossing signs double-sided.	\$1,500



ID	Name	Type	Area	Measures	Cost
Phase I					
S-14	Hillside Clubhouse	Parking	Golden Rain Area	1. Squaring of intersection OR create southbound right turn pocket (9 feet).	\$12,000
S-27 (N-4)	Crosswalk #17 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Install golf cart crossing sign; 2. Add golf cart crossing legend; 3. paint curb red to prevent parking at crossing location. 4. Consider RRFB for golf carts and pedestrians.	\$30,000
N-3* (partial)	Tice Creek Drive (Rockledge Lane and Rossmoor Parkway))	Roadway		Stripe parking lane along this segment	\$3,800
Phase 1 Total (including 20% contingency)					\$101,100

6.2 Phase II Projects

Phase II contains 15 improvement projects. These projects would create additional safety enhancement at particular locations. The implementation of Phase I and II is a comprehensive safety improvement that will make Rossmoor a safe environment for all modes of transportation. Some of the Phase II projects might require budgeting efforts for the next five fiscal years to ensure budget is available upon design and construction. **Table 8** below lists all Phase II improvements with attached preliminary cost estimates, including a 20 percent contingency. Phase II improvements totals \$222,300.

Table 8. Phase II Improvements and Preliminary Cost Estimates

ID	Name	Type	Area	Measures	Cost
Phase II					
S-4	Tice Creek Drive & Golden Rain Road	Intersection	Gateway Clubhouse Area	1. Install raised crosswalks for east and west legs (Crosswalk #67 and #69).	\$25,000
S-7 (N-1)	Crosswalk #2 (Golden Rain Road & Oakmont Way)	Crosswalk	Golden Rain Area	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	\$500
S-10	Crosswalk #44 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Remove Crosswalk #44	\$1,250
S-21 (N-3)	Crosswalk #35 (Tice Creek Drive & Ptarmigan Drive)	Crosswalk	Lower Tice Creek Area	1. Install curb extension (bulb-out) at intersection; 2. Install pedestrian crossing sign OR RRFB.	\$50,000
S-28 (N-4)	Crosswalk #16 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Remove Crosswalk #16	\$1,250
S-29 (N-4)	Crosswalk #18 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Install golf cart crossing sign; 2. Add golf cart crossing legend; 3. paint curb red to prevent parking at crossing location; 4. Consider RRFB for	\$30,000



ID	Name	Type	Area	Measures	Cost
Phase II					
				golf carts and pedestrians.	
S-1	Rossmoor Entrance	Entrance	Gateway Clubhouse Area	<ol style="list-style-type: none"> 1. Re-allocate entrance area layout by specifying destinations (Rossmoor Parkway or Golden Rain Road) and vehicle types (visitor or resident); 2. Improve wayfinding signs along Rossmoor Parkway in advance of entrance. 	\$5,000
S-11	Crosswalk #45 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	<ol style="list-style-type: none"> 1. Extend red curb southbound to Driveway #18; extend red curb northbound to Driveway # 13 to improve sight distance near the crosswalk. 	\$1,200
S-15	Crosswalk #46 (Hillside Clubhouse)	Crosswalk	Golden Rain Area	<ol style="list-style-type: none"> 1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign; 3. Consider relocation to Hillside intersection. 	\$500
S-16	Crosswalk #50 (Hillside Clubhouse)	Crosswalk	Golden Rain Area	<ol style="list-style-type: none"> 1. Paint high visibility crosswalk; 2. Install pedestrian crossing sign; 3. Install advanced 	\$2,250



ID	Name	Type	Area	Measures	Cost
Phase II					
				"Pedestrian Ahead" sign; 4. Enhance lighting for this crosswalk.	
S-17 (N-2)	Tice Creek Drive & Stanley Dollar Drive	Intersection	Stanley Dollar Area	1. Install raised intersection.	\$51,000
S-20 (N-3)	Tice Creek Drive & Singingwood Court	Intersection	Lower Rossmoor Area	1. Install curb extension (bulb-out) at intersection.	\$24,000
S-22 (N-3)	Crosswalk #25 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Remove Crosswalk #25	\$1,250
S-25 (N-3)	Crosswalk #59 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Paint high visibility crosswalk; 2. Install RRFB for golf cart crossing.	\$27,650



ID	Name	Type	Area	Measures	Cost
Phase II					
S-31 (N-4)	Crosswalk #15 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Install pedestrian crossing sign; 2. Add hashed striping (striped bulb-out) to narrow southbound approach; 3. Construct ADA compliant ramps; 4. Paint curb red near crosswalk.	\$1,450
Phase II Total (including 20% contingency)					\$222,300

6.3 Phase III Projects

Phase III contains 10 improvement projects. These projects were considered long-term improvements that can be implemented in a five to ten year timeframe. The improvements on safety are incremental and do not require immediate attention. Additional budgeting is required to ensure funding is available upon design and construction. **Table 9** below lists all Phase III improvements with attached preliminary cost estimates, including a 20 percent contingency. Phase III improvements totals \$672,180.

Table 9. Phase III Improvements and Preliminary Cost Estimates

ID	Name	Type	Area	Measures	Cost
Phase III					
S-9	Crosswalk #43 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	\$500
S-12	Crosswalk #47 (Upper Golden Rain Road)	Crosswalk	Golden Rain Area	1. Move Crosswalk #47 near Driveway #20 where grade is 0%; 2. Install pedestrian crossing sign; 3. Build sidewalk to connect new location with overlook path.	\$52,740
S-13	Crosswalk #52 (Lower Golden Rain Road)	Crosswalk	Golden Rain Area	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	\$500
S-23 (N-3)	Crosswalk #24 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Paint curb red at and near Crosswalk on both sides; 2. Install pedestrian crossing sign.	\$1,200



ID	Name	Type	Area	Measures	Cost
Phase III					
S-24 (N-3)	Crosswalk #26 (Tice Creek Drive)	Crosswalk	Lower Tice Creek Area	1. Paint curb red at and near Crosswalk on both sides; 2. Paint high visibility crosswalk.	\$2,450
S-26 (N-4)	Crosswalk #19 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Rebuild ramps on both side to comply with ADA requirements; 2. Paint high visibility crosswalk. 3. Install pedestrian crossing sign.	\$1,490
S-30 (N-4)	Crosswalk #14 (Rossmoor Parkway)	Crosswalk	Lower Rossmoor Area	1. Install pedestrian crossing sign; 2. Install advanced "Pedestrian Ahead" sign.	\$500
N-1	Golden Rain Road (Tice Creek Drive and Upper/Lower Golden Rain Road)	Roadway		1. Install golf cart lanes in both directions from Tice Creek Drive to Pine Knoll Drive;	\$64,000
				2. Consider raised medians;	\$400,000
				3. Install raised pavement markers approaching crosswalk locations along this segment.	\$3,000
N-3	Tice Creek Drive (Rockledge Lane)	Roadway		1. Paint curb red at locations where sight distances are limited;	\$121,800



ID	Name	Type	Area	Measures	Cost
Phase III					
	and Rossmoor Parkway)			2. No Parking Signs (or red curb) south of Avenida Sevilla due to narrowed street width; 3. Stripe parking lane along this segment; 4. Curb extension (bulb-out) at Rockledge, Fairlawn, Running Springs, Leisure, Singingwood, Canyonwood, and Ptarmigan.	
N-4	Rossmoor Parkway (Stanley Dollar Drive and Tice Creek Drive)	Roadway		1. Striped golf cart lane on both sides between Stanley Dollar Drive and Tice Creek Drive; 2. Dashed green golf cart lane treatment or guiding lines at intersections (Rossmoor Parkway at Stanley Dollar Drive and Terra California Drive); 3. Golf cart sharrows at intersections and merging areas.	\$24,000
Phase III Total (including 20% contingency)					\$672,180