

**NAPA COUNTY  
DEPARTMENT OF PUBLIC WORKS**

**County Traffic Engineer – Engineering & Traffic Survey**

**Location:** Big Ranch Road

**Date:** September 22, 2009

**Background**

Supervisor Dillon's office was contacted by various residents along Big Ranch Road, expressing concerns about traffic operations along the road. These concerns included volume of traffic, speed of traffic, the designation of passing zones along the corridor, the lack of shoulders for bicycling, walking and/or accessing mailboxes, recent collisions, and the possibility of closing the segment north of Oak Knoll Avenue to the public.

**Existing Conditions**

Big Ranch Road is classified, in the Circulation Element of the General Plan, as a Rural Collector from Trancas Avenue in the city of Napa to Oak Knoll Avenue, and as a Local Roadway north of Oak Knoll Avenue. The focus of this study is the segment between the city limit (north of Rosewood Lane) and Oak Knoll. There are some short intermittent segments of County road between Trancas Avenue and Rosewood, which are not included in this study. There is a brief evaluation of the segment north of Oak Knoll, although it is not the primary area of focus. Within the study area, there are intersections with El Centro Avenue, Salvador Avenue and Oak Knoll Avenue, all of which are also designated Rural Collectors in the Circulation Element. El Centro and Salvador both "tee" into Big Ranch from the west. Oak Knoll meets Big Ranch in an offset intersection, with the westerly leg approximately 250 feet south of the easterly leg.

The neighborhood is characterized by agricultural parcels, mostly planted with wine grapes, ranging from approximately ten to fifty acres. There are numerous residential parcels as small as one acre as well. The road runs from southeast to northwest as it travels approximately two miles from the city limit to Oak Knoll, and it continues approximately 3/4 mile beyond Oak Knoll to its terminus. The terrain and the road itself are flat, with virtually no curvature along its length.

**Existing Traffic Controls**

Big Ranch Road, between the city limit and Oak Knoll, has a posted speed limit of 50 mph. The entire length of this segment is centerline-striped and does permit passing in some areas north of Salvador. White edgelines are provided along the full length of this segment as well. The intersections of El Centro, Salvador and Oak Knoll are all stop-sign controlled as they approach Big Ranch Road. No left-turn pockets are provided at any of the intersections.

**Traffic Data**

Traffic volume counts were conducted in July, 2009. Speed surveys were conducted in August, 2009. Collision records for the most recent five years were also evaluated. The results are presented here:

**Corridor traffic volumes**

<b>Location</b>	<b>Direction</b>	<b>Average Daily Traffic</b>
Big Ranch Rd @ city limit N/Rosewood	northbound	3164
Big Ranch Rd @ city limit N/Rosewood	southbound	3308
Big Ranch Rd S/El Centro	northbound	3054
Big Ranch Rd S/El Centro	southbound	3282
Big Ranch Rd N/El Centro	northbound	2411
Big Ranch Rd N/El Centro	southbound	2771
Big Ranch Rd S/Salvador	northbound	2316
Big Ranch Rd S/Salvador	southbound	2734
Big Ranch Rd N/Salvador	northbound	1700
Big Ranch Rd N/Salvador	southbound	2078
Big Ranch Rd S/Oak Knoll	northbound	1595
Big Ranch Rd S/Oak Knoll	southbound	2007
Big Ranch Rd N/Oak Knoll	northbound	207
Big Ranch Rd N/Oak Knoll	southbound	242
El Centro Ave W/Big Ranch	eastbound	1132
El Centro Ave W/Big Ranch	westbound	1416
Salvador Ave W/Big Ranch	eastbound	1290
Salvador Ave W/Big Ranch	westbound	1318
Oak Knoll Ave W/Big Ranch	eastbound	1796
Oak Knoll Ave W/Big Ranch	westbound	1867
Oak Knoll Ave E/Big Ranch	eastbound	1584
Oak Knoll Ave E/Big Ranch	westbound	2014

**Big Ranch Road speed surveys**

<b>Location</b>	<b>Direction</b>	<b>Prevailing Speed</b>
1/4 mile north of El Centro	northbound	51
1/4 mile north of El Centro	southbound	53
1/2 mile south of Oak Knoll	northbound	55
1/2 mile south of Oak Knoll	southbound	54

### Big Ranch Road collisions, 2004-2008

Location	Number of Collisions	Comments
Mile 0.0-0.8 (Trancas - Rosewood)	N/A	segment not part of this study
Mile 0.8-1.3 (Rosewood - El Centro)	6	3 at El Centro intersection
Mile 1.3-1.8 (El Centro - Salvador)	12	9 at Salvador intersection
Mile 1.8-2.9 (Salvador - Oak Knoll)	16	3 at Oak Knoll intersection
Mile 2.9-3.6 (Oak Knoll - northerly end)	0	

### Speed Limit Evaluation

The establishment of speed limits on public roads in California is governed by the requirements of the Vehicle Code. The primary requirement is the preparation of an Engineering & Traffic Survey, which this report is. The report must address the following:

- Prevailing speeds
- Collisions
- Conditions not readily apparent to the driver

A posted speed limit is required to be at the 5-mph increment nearest to the measured prevailing speed. It may be lowered by 5 mph if the Engineering & Traffic Survey documents in writing the conditions and justification for the lower speed limit.

The speed limit on Big Ranch Road is evaluated as follows:

1. Prevailing speeds support the posting of a 55 mph speed limit for the segment of Big Ranch Road north of Salvador Avenue, and 50 mph for the segment south of Salvador.
2. Collision records indicate a concern with speed of traffic and passing zone designations. Typical behaviors identified:
  - Rear-end collision into vehicle slowed or stopped for turn movement
  - Entering traffic selecting too small of gaps in traffic
  - Vehicle passing another which is slowed or stopped for turn movement
  - Vehicle run off road due to speed – hit fixed object
3. It is my recommendation that the collision history for Big Ranch Road north of Salvador indicates the presence of conditions not readily apparent to the driver. This would support a 5 mph reduction in the speed limit, from 55 mph to 50 mph. (The result would be no change from what is currently posted.) Initial speed limit postings in each direction will be modified to larger signs, with the addition of pavement legends.

## **Intersection Traffic Controls Evaluation**

All-way stop control at public road intersections can be useful as a safety measure when certain traffic conditions exist. The determination is governed by the criteria provided by the California Manual on Uniform Traffic Control Devices. As with speed limits, the primary requirement is the preparation of an engineering study. The following criteria apply to determining whether to implement all-way stop control:

- Collision pattern (5 or more correctable collisions in a 12-month period)
- Major street traffic > 300 vehicles/hour for 8 hours
- Minor street traffic > 200 vehicles/hour for 8 hours
- Thresholds reduced to 210 and 140, respectively, for speed > 40 mph on major street

Other factors to consider include the need to control left-turn conflicts, pedestrian/vehicle conflicts and sight distance limitations. Additionally, the intersection of two “residential neighborhood collector through streets” of similar design and operating characteristics may be considered where all-way stop control would improve operational characteristics.

The need for all-way stop control at each intersection is evaluated as follows:

### **El Centro Avenue**

- Two correctable collisions in five years
- Major street traffic > 340 veh/hr for 8 hrs
- Minor street traffic > 65 veh/hr for 8 hrs
- No left-turn conflicts (no opposing left turns)
- No pedestrian conflicts
- No sight distance limitation
- Streets do not meet residential neighborhood definition

This intersection is not recommended for all-way stop control.

### **Salvador Avenue**

- Six correctable collisions in five years
- Major street traffic > 240 veh/hr for 8 hrs
- Minor street traffic > 82 veh/hr for 8 hrs
- No left-turn conflicts (no opposing left turns)
- No pedestrian conflicts
- No sight distance limitation
- Streets do not meet residential neighborhood definition

This intersection is not recommended for all-way stop control.

### **Oak Knoll Avenue**

- Two correctable collisions in five years
- Major street traffic > 118 veh/hr for 8 hrs
- Minor street traffic > 195 veh/hr for 8 hrs
- Potential left-turn conflicts due to offset alignment
- No pedestrian conflicts
- Sight distance not affected by offset alignment
- Streets do not meet residential neighborhood definition

This intersection is not recommended for all-way stop control.

## **Other Concerns Expressed by Neighborhood**

Neighborhood residents expressed concerns about other miscellaneous topics, which are evaluated as follows:

### **Passing zones**

As noted above, the evaluation of collision patterns along Big Ranch Road does indicate a concern with inappropriate passing. It is recommended to re-stripe the entire length of the road from the city limit to Oak Knoll as double yellow, no passing permitted.

### **Closure of road north of Oak Knoll to public**

It is possible to close a public road with an action by the Board of Supervisors known as “abandonment” of the road right-of-way. Through a noticed public hearing process, the Board can make a determination that the road is not needed for present or prospective public use. This process can be initiated through a petition of interested property owners. Staff would perform an evaluation of the request’s relationship to the goals and policies of the General Plan, then prepare the matter for consideration by the Board. There is a \$2,140 fee to initiate this process.

### **Potential capital improvements**

Concern was expressed about bicycling or walking along Big Ranch and accessing mailboxes, due to the lack of adequate shoulders along much of the length of the roadway. The road in this corridor is constrained by the drainage ditches which run along most of its length, and limited available right-of-way. Widening the shoulders would involve either replacing the ditches with storm drains or acquisition of additional right-of-way, both of which are extremely expensive. Adequate funds for such a capital project are not currently available from known funding sources, nor are financial conditions expected to change significantly any time soon. Area residents could form an Assessment District to fund this kind of construction project, if there was support from at least 2/3 of the affected properties. Residents should be aware that widening the shoulder would likely result in increased vehicular speeds on the road.

A suggestion which was provided to staff to reduce the volume of traffic on Big Ranch Road was to construct a connection between Big Ranch and Silverado Trail, south of Salvador Avenue. This type of construction would face even greater financial constraints than widening the existing road, as there is no existing right-of-way and it would all need to be acquired. There might also be General Plan considerations involving the conversion of agricultural land and potential inconsistency with the Circulation Element map.

### **Alternative speed controls**

Suggestions were provided for various alternative ways to control speed of vehicles along Big Ranch Road. These included speed bumps and cameras or other technical means to actively control drivers’ behavior in the corridor.

Speed bumps are a relatively-new tool which is gaining increased awareness and implementation in communities throughout the country which are dealing with speeding issues. They are intended for use in higher-density residential neighborhoods, where speeding traffic “cuts through” neighborhoods on local streets which were not intended for this volume or speed of traffic. Since Big Ranch Road is a collector (as are all the connecting roads discussed in this report), it would not be eligible for this type of treatment.

Driver feedback signs use radar to inform drivers when they are exceeding properly-established speed limits. They are an effective tool for use on collector roads. A typical installation would provide for one unit in each direction along a roadway, costing approximately \$20,000 total for equipment and installation. While this is substantially less than a capital improvement project, it is still a substantial expenditure which is not provided for in the current

year's Roads budget. One possible approach: these signs were recently installed on Rutherford Road, with financing provided entirely by property owners in the area who had expressed concerns about vehicle speeds on that road.

Other technical suggestions included speed cameras and traffic signals for control of speed. There are no such approved devices provided for in the Manual on Uniform Traffic Control Devices.

### **Summary of Findings**

1. Speed limit will remain posted at 50 mph.
2. Larger speed limit signs will be provided at each location, supplemented with pavement legends.
3. Road will be re-stripped to eliminate passing zones.
4. All-way stop control not recommended at any intersections. "Cross traffic does not stop" signs to be added to side-street stop sign postings. "Stop" legend and limit lines to be re-painted in all locations.
5. Driver feedback signs could be installed with funding from area property owners.
6. Capital improvements could be pursued with formation of an Assessment District.
7. Big Ranch Road north of Oak Knoll Avenue can be considered for being closed to the public, upon initiation of an abandonment proceeding – submitting petition along with \$2,140 fee.

Report filed by:  
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Principal Transportation Engineer