

Scope of Work for Traffic Signal and Interconnect Design Services for Santa Rosa Road

Background

As part of a broader study concerning safety issues on Santa Rosa Road, the firm of Katz Okitsu was requested to perform additional analysis in late 2003 to determine if a series of traffic signals could be synchronized to provide a forced speed corridor on Santa Rosa Road between the intersections of Yucca Drive and Moorpark Road with an average speed of 45 miles per hour using either wireless or cable technology. Their report concluded that it was technically feasible to install such a system, connecting the existing four traffic signals and four additional new signals and synchronizing their operation. At least four additional signals were found to be necessary in order to reasonably synchronize the corridor because the signals would need to be spaced approximately one half mile apart. It would not have been possible to synchronize just the existing signals because they are located too far apart.

The theory behind this system is that drivers traveling and maintaining a pre-set speed in the corridor will be rewarded by not having to stop for a red signal light from beginning to end of the corridor. If traveling too fast (or too slow), the motorist will be required to stop by a red traffic signal indication. Additional signage may be required to advise motorists of the synchronized pre-set speed.

While this concept should theoretically work, the Public Works Agency has not been able to find and evaluate a similar installation in an environment similar to Santa Rosa Road. We have determined that the concept of synchronizing a traffic speed along a corridor has been used in more urbanized locations than Santa Rosa Road, generally on multi-lane (four lanes or more) roads that allow passing around slower moving vehicles. One of the responsibilities of the consultant selected for design of this project will be to research, and obtain data from representative locations where this concept has been utilized, and evaluate the lessons learned and experiences from other locations that are as similar as possible to Santa Rosa Road.

In November 2005, the residents of Santa Rosa Valley and the Board of Supervisors approved the formation of the Santa Rosa Road Assessment District to collect funds for the public improvements set forth in the Board resolution. The scope and objectives of this project have been developed with a view to accomplishing the goals of the Santa Rosa Valley residents as detailed in the County of Ventura, Santa Rosa Road Assessment District, Engineer's Report Fiscal Year 2006-07 dated September 2005 by

Shilts Consultants, Inc. The Improvements set forth in the approved Engineer's Report are generally described as follows:

Installation, maintenance, servicing of traffic improvement facilities and improvements, including, but not limited to, improvement and maintenance of facilities and improvements owned, maintained or acquired by the County of Ventura, as well as incidental expenses. The proposed Improvements include:

- 1.) Installation of traffic signals at the following four Santa Rosa Road intersections:
Vista Arroyo Road/Andalusia Drive West Blanchard Road
Penelope Place/Applewood Lane Brittany Park Road
- 2.) The synchronization and/or system-wide optimization of all eight traffic signals
- 3.) The annual operation and maintenance of the eight signal traffic light system

A complete copy of the approved Engineer's Report is attached as Appendix I for information.

Project Objectives

Consultant will prepare traffic signal and interconnect plans for Santa Rosa Road from Yucca Drive to Moorpark Road. The plans will provide for the design of four new traffic signals and a fiber optic communication system that is similar to the interconnected system that was designed by County staff for Kanan Road, and the interconnection and synchronization of the four new and four existing traffic signals on Santa Rosa Road. The location is shown in Figure 1. The project limits cover approximately 3.5 miles of Santa Rosa Road. Consultant will assist the Ventura County by performing the following services:

- Designing Four New Traffic Signals.
- Evaluating the lessons learned and experiences from other locations that are as similar as possible to Santa Rosa Road.
- Designing Traffic Signal Interconnect for the Four New and Four Existing Traffic Signals to Facilitate Synchronization at 45 mph.
- Modifying Traffic Signal to the Four Existing Traffic Signals.
- Providing Construction Assistance.
- Implementing Traffic Signal Timing Communication.
- Developing Intersection and Master Displays on the Bitrans Quicnet Computer Surveillance System.

- One year of on-call engineering assistance from the date of initial acceptance of the system by the County to assist in “fine-tuning” the system hardware.

Scope of Services

PHASE 1 – TRAFFIC SIGNAL AND INTERCONNECT DESIGN

Task 1.1 – Pre-Design Coordination

At the onset of the Project, Consultant will meet and discuss with the County transportation staff the proposed plan, relevant issues and projects, and current design standards. Base plan information and proposed street improvements for the subject location would also be obtained from progress plans, County records, or other relevant records such as:

- March 2004 Santa Rosa Road – Report on Potential Improvements
- Santa Rosa Road Assessment District Engineer's Report Fiscal Year 2006-07

Task 1.2 - Field Review

The project limits will be fully inspected in the field with respect to needs for preparing the design plans. Physical street improvements, existing traffic signalization, underground or overhead utilities and obstructions, signing and striping, and other relevant items would be located in the field with precision to be shown accurately on the plan. All improvement information obtained from records would also be verified in the field in conjunction with this review.

Task 1.3 – Traffic Signal Design and Interconnect Plan (PS&E) Preparation

1.3.1 – Traffic Signal Design Base Preparation

An intersection base plan will be prepared at 1"=20' for each location. The base plan will show centerlines, right-of-way lines, relevant existing or proposed street improvements, utilities of record, and existing traffic controls and improvements. All existing traffic signal poles, equipment, notes and schedules would be inventoried in the field and shown on the base plan. Proposed new or modified facilities will be designed and shown on the drawing to create a complete traffic signal plan.

Each plan would conform to the requirements of Ventura County and would reference the latest edition of the Caltrans Standard Plans and Specifications. The plan would be designed in the specific format required or requested by Ventura County to meet their approval. The plan will include all notes, schedules, and other features required to show future conditions completely and properly. The plans and specifications will include any special design features that are routinely used by Ventura County at all signalized

intersections. The plans to be prepared will provide for installation of four new traffic signals at the following locations:

- Santa Rosa Road at Blanchard Road
- Santa Rosa Road at Brittany Park Road
- Santa Rosa Road at Applewood Lane
- Santa Rosa Road at Vista Arroyo Road

The design of the new traffic signals will include the following special features:

- Provide 170HC11 controllers at all signals.
- Locate the signal controller cabinet and power supply such that they do not block the standing area for horses and can accommodate school children walking to school bus stops and joggers/cyclists/pedestrians.
- Locate the Type 170 Master Controller for the synchronization at Moorpark Road and Santa Rosa Road. The controller is to be connected to the existing phone line located in the controller cabinet via a modem.
- Provide Bitrans Software for operating and synchronizing the traffic signals.
- Provide separate push buttons for the equestrians at new traffic signal locations.
- Locate ADA type pedestrian "push buttons" to minimize hazards to pedestrians.
- Provide "Count Down" type pedestrian signal indications.
- Provide left-turn phases at all the new traffic signals for the Santa Rosa Road approaches.
- Provide safe waiting areas at all new traffic signals, which are large enough to accompany horses and riders, and can accommodate school children walking to school bus stops or a family walking their dog, children/cyclists with their bicycles.
- Provide vehicle detection systems that are manufactured by Iteris or equivalent Video detection System.
- Provide Battery Backup Systems at New Traffic Signals: Myers or Equal Model MEUG35-PD.
- Retain the raised markings and edge line grooving traffic calming features made to Santa Rosa Road as part of the traffic calming project where striping changes are made.
- Stripe "Keep Clear" zones wherever queues are anticipated to block local street intersections upstream of existing and new signals when they are red for Santa Rosa Road traffic.

- Install shields on the traffic safety lighting to minimize light pollution into adjacent residential properties.
- Provide right-turn channelizing striped islands marked with Botts Dots for the Santa Rosa Road approaches.
- Provide two spare 170 HC11 controllers.

The plans to be prepared will also provide for performing the following modifications to the existing traffic signals:

- Upgrade the existing "Prepare to Stop" signal warning system at Yucca Drive for the eastbound traffic to County approved specifications.
- Relocate the existing "Prepare to Stop" warning system for westbound traffic at Yucca Drive to just north of Lexington Drive on Moorpark Road for southbound traffic. Upgrade the relocated "Prepare to Stop" signal warning system to County approved specifications.
- Modify the existing traffic signal at Moorpark Road and Santa Rosa Road to remove the existing "No Right Turn on Red" restrictions and provide a southbound right-turn overlap that includes a red arrow. The red arrow interval must be variable during the overlap phase so that the amount of green arrow overlap time can be varied. Post "Right Turn on Green Arrow Only" signs. Restrict eastbound U-turns to avoid conflicts with the right-turn overlap.
- Provide an exclusive pedestrian phase across the north leg of the Moorpark Road and Santa Rosa Road intersection
- Provide separate push buttons for the equestrians at existing traffic signal locations except at Yucca Drive and East Las Posas where they currently exist.
- Install ADA type pedestrian "push buttons" to minimize hazards to pedestrians at the existing traffic signal locations.
- Provide "Count Down" type pedestrian signal indications at existing Moorpark/Santa Rosa Road traffic signal. They are already installed at all other existing traffic signals.
- Provide left-turn phases if they do not currently exist at traffic signals for the Santa Rosa Road approaches.

1.3.2 – Signing and Striping Plans

Signing and Striping Plans will be prepared showing the affected construction area and all affected traffic stripes. The plans will show the location of all proposed traffic stripes and markings and the proper disposition of all affected existing signs and markings. Any work required to transition the proposed stripes to join with existing stripes on intersection approaches will also be provided. The final signing and striping plans would

be prepared for final plotting on D-sized sheets at 1" = 20 feet. Approximately 1 striping plan sheet is envisioned for each intersection.

1.3.3 – Traffic Signal Interconnect Base Preparation

The plans will provide for installation of traffic signal interconnect conduit and related communication facilities for all new traffic signals and for any existing signals that are not already interconnected. Conduit, pullboxes, and necessary notes will also be shown for the mid-block portions. Interconnect plans to be prepared at 1"=40' scale. This work will require approximately 12 sheets.

1.3.4 – Detail Sheet

Consultant will provide a detail sheet showing the fiber optic vault, pullboxes, splicing cabinets, and fiber splicing details.

1.3.5 - Title Sheet Preparation

Consultant will prepare a title sheet for this project. The Title Sheet will include the following items:

- Project Title
- Vicinity (Location) Map
- Title Block
- General Notes
- Sheet Index
- State Standard Plans Used
- Telephone Numbers of Utilities and Other Affected Agencies or Businesses
- Any Specialized Details that the County may require

1.3.6 - Specifications and Estimate

Consultant will prepare typewritten special provisions relating to the design work. Also, an engineer's cost estimate would be provided at appropriate intervals.

Task 1.4 - Utility Coordination

The location of all utilities marked or evident in the field, indicated on reference plans, or indicated by utility companies will be shown on the plans. Consultant will distribute the plans and coordinate the design directly with all utility companies which may have facilities in the site vicinity. The consultant will make design adjustments to avoid utilities as appropriate.

Special coordination with the serving electrical utility will be required to provide traffic signal service and utility connections. Consultant will make direct contact with Southern California Edison as required to secure electrical service.

Task 1.5 - Submittal of Plans & Response to Revisions

A registered Civil and Traffic Engineer would sign the completed plans. Full size black line copies of these plans will be furnished directly to the Ventura County Transportation Department for checking.

Any revisions requested by the Ventura County Transportation Department or other responsible parties would be fully addressed and incorporated properly into the plans, until they are ready for final approval by Ventura County.

Task 1.6 - Bidding Assistance

Consultant will be available to answer questions during bidding and construction from our offices. Consultant will also attend up to one pre-bidding meeting for each intersection.

Consultant will assist Ventura County staff with additional assistance during construction. This assistance will be billed on a time-and-material basis and will be considered out of scope from Consultant's cost estimate.

Task 1.7 - Printing and Reproduction

Consultant will provide the necessary copies of our plans and specifications during the course of plan preparation, and at the conclusions of the project within the following parameters:

- Design plans will be in ACAD 14 format as well as on original "D" size Mylar plan sheets.
- Specifications documents, including technical specification in Microsoft Word for Windows format.
- Detailed cost estimates will be prepared in an Excel for Windows format.
- All Plans, Specifications & Estimates (PS&E) will be provided in the electronic formats indicated on a compact disk.

PHASE 2 - CONSTRUCTION ASSISTANCE

Consultant will:

- Assist County staff with the review of the submitted bids and provide a recommendation as to the award of the contract.
- Be available by phone and in person to interpret and clarify our design sheets and Special Provisions.
- Review of shop drawings.
- Attend the pre-construction meeting.
- Review any changes in the plans, possible change orders, and provide recommendations.
- Conduct a thorough examination of the communication system and assist the Contractor in verifying that it is designed as intended and is operational (approximately 24 field hours).

The County will conduct daily construction inspection and general construction contract administration and acceptance. However, Consultant's presence will be required to facilitate testing and final acceptance of fiber optic interconnect systems to augment the Contractor's experience, and to provide professional engineering and technical assistance to the County.

PHASE 3 – BITRANS QUICNET INTERSECTION AND FIELD MASTER

DISPLAYS - DEVELOPMENT

Task 3.1 – Intersection Displays

Consultant will develop intersection displays for the County's Bitrans Quicnet Computer Surveillance System for the following intersections:

1. Santa Rosa Road at Yucca Drive
2. Santa Rosa Road at East Las Posas Road
3. Santa Rosa Road at Vista Grande
4. Santa Rosa Road at Moorpark Road
5. Santa Rosa Road at Blanchard Road
6. Santa Rosa Road at Brittany Park Road
7. Santa Rosa Road at Applewood Lane
8. Santa Rosa Road at Vista Arroyo Road

Task 3.2 – Field Master Displays

Consultant will develop a Field Master display in the County's Bitrans Quicnet Computer Surveillance System for the Santa Rosa Road Signal System similar to the display current on the County's Computer System for Kanan Road.

Task 3.3 – Communications

Consultant will make all necessary software and hardware adjustments to make sure that:

- The County's Bitrans Quicnet Computer Surveillance System is communicating with the new field master at Moorpark and Santa Rosa Road.
- The Field Master is communicating with all the eight (8) local intersections under its command.
- Intersection and Field Master displays are providing real time information.
- Timing data can be uploaded and downloaded to the Field Master and all the eight (8) local intersections via the Bitrans Quicnet Computer Surveillance System.

PHASE 4 – TECHNICAL ASSISTANCE

Consultant will assist Ventura County staff with additional technical assistance for up to a year after project acceptance. This assistance will be billed on a time-and-material basis and will be considered out of scope from Consultant's cost estimate.

SCHEDULE

Traffic Signal and Interconnect Design

A design schedule is proposed allowing for submittal of plans for initial checking within approximately eight (8) weeks following your authorization. The client will provide Consultant with accurate street plans relevant to our design prior to initiation of project schedule. Responses to revisions would be completed approximately 10 business days following receipt.

Bitrans Quicnet Intersection and Master Displays

The Intersection and Field Master displays for the County's Bitrans Central Computer Surveillance System shall be completed approximately three (3) weeks following the completion of all four traffic signals, interconnect and Field Master controller installation.