EXHIBIT 1
SCOPE OF WORK

The following scope of work has been developed based on the understanding and approach presented in the "Proposal for Civil Engineering Design Services for Patterson Pass Road Improvements, dated December 2, 2011." This Scope of Work is divided into the following tasks:

- Task 1 – Perform Project Management
- Task 2 – Prepare Technical Information
- Task 3 – Develop Alternatives
- Task 4 – Perform Alternative Analysis
- Task 5 – Prepare Preliminary Environmental Analysis Report (PEAR)
- Task 6 – Prepare Project Study Report
- Task 7 – Project Contingency Budget - OPTIONAL

TASK 1 – PERFORM PROJECT MANAGEMENT - Work performed under this task will involve maintaining the fiscal health of the project, management and supervision of the in-house staff and subconsultants, and coordinating the overall project with COUNTY staff. The following subtasks will be performed:

1.1 Project Administration and Supervision

a) Supervise and monitor in-house staff and maintain project filing system. Coordinate project with subconsultants and outside agencies.

b) Attend one (1) kickoff meeting at the beginning of the project to review scope, schedule and budget with COUNTY staff and define project goals.

c) Identify and collect record drawings and documents from the COUNTY and other agencies. Review and determine extent of any extraordinary maintenance or reconstruction that may be needed.

d) Prepare and submit monthly progress reports along with invoices. Reports and invoices will be prepared in accordance with COUNTY's format. Invoices shall include copies of CONSULTANT timesheets, receipts of al reimbursable expenses, and subconsultant invoices and receipts for reimbursable expenses.

e) Implement CONSULTANT's Quality Assurance Plan and perform Quality Control Reviews prior to making milestone submittals to the COUNTY. Errors or omissions that results in re-working of a task or deliverable shall be corrected/performed by the CONSULTANT at no cost to the COUNTY.

f) Prepare and maintain a CPM project schedule using Microsoft Project 2010.

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g) Apply for encroachment permits, if needed from COUNTY, City of Livermore and San Joaquin COUNTY for surveying, environmental, and geotechnical investigations.

1.2 **Project Meetings -** This task will involve holding focused meetings for the project. Noticing and Agendas for each meeting, if needed, will be prepared and distributed by e-mail to an approved listing. CONSULTANT will participate in the following meetings:

a) **Project Development Team (PDT) Meetings**. These meetings will involve CONSULTANT's Project Manager, Lead Civil Engineer, COUNTY and other agencies that will assist in guiding the development of the project. Up to two (2) meetings will be budgeted for.

b) **Public Workshop Meetings.** These meetings will involve attendance by CONSULTANT'S Project Manager and providing information to COUNTY staff for review/approval prior to presentations made to the public. COUNTY shall be responsible for noticing the meetings and providing the location of the meeting. Microsoft Powerpoint slide shows and/or exhibit boards will be prepared for these meetings. Up to two (2) meetings will be budgeted for.

c) **Design Team Coordination Meetings.** These meetings will involve CONSULTANT's Team members to ensure that the PSR elements are fully coordinated. Up to six (6) meetings are budgeted for.

d) **Client Meetings.** These meetings will be held with COUNTY staff to discuss progress and to strategize specific elements of the overall project. Up to five (5) meetings are budgeted.

e) **Agency Meetings.** These meetings will involve agencies and stakeholders other than COUNTY. Up to two (2) meetings are budgeted for.

Task 1 Deliverables

- Meeting agendas and records of meetings
- Quality Assurance and Quality Control Plan
- Monthly progress reports and invoices
- Project Schedule and updates
- Encroachment Permits, if needed

PHASE 1 (PART A) TASKS

Task 2 – Prepare Technical Information

Work performed under this task will include traffic studies, base mapping development, environmental impact analyses, and geotechnical analysis for the project. The following subtasks will be performed:

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2.1 Traffic Forecast Report - CONSULTANT will perform the following subtasks in the preparation of the traffic forecast for the project:

2.1.1 Project Corridor Assessment

a) **Obtain Available Traffic Data (Existing Conditions).** Perform a site visit to identify the travel characteristics and general operating characteristics. Data collection will include presence of traffic control devices, traffic signs and striping, pavement markings, pedestrian/bicycle facilities, posted speed limits, and adjacent land uses. CONSULTANT will also evaluate the adequacy of the signs with respect of the CA MUTCD and standard traffic engineering practices.

b) **Collision Analysis.** CONSULTANT will prepare the most recent five-year history of reported traffic collisions. These analyses will be expanded to identify the location of every accident on a photo-plot of the study area and summaries and findings will be prepared.

c) **Traffic Data Collection and Review.** The volume, speed and classification of existing traffic on each roadway will be determined. CONSULTANT will obtain current 24-hour and peak hour count data along each roadway to determine the volumes, speeds and classification (axle counts) of all vehicles. CONSULTANT will collect turning AM and PM turning movement counts at each key intersection. CONSULTANT will perform bicycle counts using video for two (2) 24-hour periods – one on a typical weekday (between Tuesday and Thursday) and one on a Saturday at two (2) locations (one east and one west of Cross Road)

d) **Speed and Delay Analysis.** Using GPS data, CONSULTANT will conduct peak and off-peak speed and delay studies on each roadway in each direction. CONSULTANT will prepare a speed profile of each street, showing the travel speed at point along the roadway. These data will be used to further identify problem locations.

2.1.2 Traffic Operation Analysis

a) **Existing Conditions Operation Analysis.** Using new count and speed data, the Level of Service (LOS) of all roadway sections and intersections will be determined. CONSULTANT will use the appropriate portions of the Highway Capacity Manual (HCM) to determine roadway and intersection capacities. At non-intersection locations, the LOS will be calculated for each distinctive roadway section.

b) **Traffic Volume Forecast and Future Conditions Operation Analysis.** The Patterson Pass Road route involves inter-COUNTY travel and it will be desirable to use the best represented traffic model to evaluate the most likely traffic volumes for the future. CONSULTANT will examine available 2035 forecasts using the newly updated Alameda CTC model and perform

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adjustments and recalibrations within the eastern portion of the project limits. CONSULTANT will compare the results obtained from three separate models – the Alameda CTC model, the San Joaquin COG model, and the City of Livermore model. CONSULTANT will also evaluate the I-580 Altamont Pass corridor since the peak hour volumes on Patterson Pass Road are strongly influenced by travel speeds and levels of congestion on I-580.

c) **Identify and Prioritize Needed Improvements.** CONSULTANT will develop potential improvement locations and priorities form a traffic operations perspective. Some of the key ingredients to developing the latter will include existing observed geometrics, collision history and details, speed profile information and volume information.

d) **Traffic Operation Analysis Report.** CONSULTANT will summarize the results of the traffic operation analysis in a Draft and Final Traffic Forecast and Operations Report for review/approval by COUNTY.

2.2 **Base Mapping Development -** Under this task, base mapping will be developed within the project limits to support alternative development and preliminary designs.

2.2.1 **Research and Data Collection -** CONSULTANT will contact COUNTY to research and collect the following information and documents. We are assuming that the information indicated below will be provided by COUNTY to CONSULTANT at no cost:

a) Existing as-built drawings of existing street improvements, utilities, drainage systems, and other features within the project area that may be impacted by the proposed improvements.
b) Development plans that may be in review by COUNTY.

2.2.2 **Right of Entries** - Under this task, CONSULTANT will provide draft right of entry letters to COUNTY for the purposes of obtaining access to place aerial control targets on private property.

Assumption - COUNTY will obtain and provide all right of entries to CONSULTANT.

2.2.3 **Prepare Aerial Mapping -** CONSULTANT will develop 1"=100' horizontal scale with 2' contours. Digital orthophotos (600 foot wide strips) will also be provided.

Assumption - Horizontal and vertical control datum is located within ¼ mile of the project. Additional field surveys to bring in control outside this limit are not included in this scope.

2.2.4 **Supplemental Topographic Survey -** Field topographic surveys will be performed to supplement topographic aerial mapping in areas that are deemed necessary by CONSULTANT. This will entail surveying areas that have incomplete or insufficient data due to obstruction by canopy or

shadow, or where additional field condition verification is needed to complete relevant design data information

2.2.4 Utility Investigations

CONSULTANT will contact existing utility purveyors within the project limits to obtain as-built information regarding their respective facilities. Information gathered will be included on the base mapping.

Assumption: Field surveys for overhead and positive location surveys of underground utilities will not be conducted.

2.2.5 Record Right of Way and Parcel Lines

CONSULTANT will research and collect data from COUNTY records for use in establishing the existing right of way. Available information from APN and record maps depicting existing street right of way and parcel lines will be obtained and placed on the aerial mapping within the project limits. Easements and other property encumbrances will not be researched nor plotted. CONSULTANT will develop and prepare a record base map that will depict existing right of way and property line limits.

Assumption: Field surveys to locate existing monuments outside the roadway right of way will not be conducted.

2.3 Environmental Impact Analysis

CONSULTANT will prepare preliminary environmental evaluation to identify potential impacts and issues related to cultural resources, biological resources, hazardous waste, hydrology/floodplains, scenic/visual resources, construction noise and air quality. The findings will be presented in a draft preliminary memo for use in the PEAR which will include a summary of key issues related to alternatives to be evaluated.

2.4 Geotechnical Investigations

Under this task, CONSULTANT will perform geotechnical analysis for preparing geotechnical design memorandum and geologic base map, and developing concept level designs and cost estimates. The scope of work includes investigations of the following areas:

a) Embankment and cut slope stability
b) Creek bank stability
c) Erosion potential
d) Provision C.3 geotechnical impacts on stability
e) Corrosion potential
f) Pavements

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For Patterson Pass Road, CONSULTANT will review readily available materials, complete reconnaissance geologic mapping, and prepare a Preliminary Geotechnical Evaluation Report. The geotechnical effort will also include the preparation of plan sheets showing conceptual level design for geotechnical improvements at up to six (6) locations. Estimates for the geotechnical improvements will be prepared. No field exploration work is proposed for either Phase 1 or 2, however site review and data research is proposed. The review will be based on readily available data including as-built Log of Test Borings from existing projects and other Agency records (if available).

The potential geotechnical/geologic impacts and mitigations will be discussed on a broad basis including, but not limited to, slope stability, geology, seismic impacts, erosion, groundwater conditions, etc. for the proposed retaining wall, culverts, pavement sections, cuts and embankments. Generally, the geotechnical issues relevant to the proposed project are presented in a qualitative manner with no specific design recommendations. Certain design assumptions are made as to the type of retaining wall, type of foundations, approximate pile lengths and approximate slope angles etc. The potential mitigation measures are also provided in a discussion format to help define the overall design program and evaluating the cost impacts. CONSULTANT will incorporate the findings of the Preliminary Geotechnical Report into the PSR.

Assumption: Subsurface geotechnical exploration will NOT be needed for Phases 1 and 2.

Task 2 Deliverables

- Traffic and Bicycle County Data
- Traffic Study and Operations Analysis Report
- Base Mapping including existing utility and record right-of-way information
- Preliminary Environmental Evaluation
- Preliminary and Supplemental Geotechnical Report and Geologic Base Map

Task 3 – Develop Alternatives

This task will involve developing conceptual alternatives for discussion purposes and obtaining input from the local communities and local agencies. Public outreach will be critical to establishing the alternatives that should be analyzed as part of the Project Study Report. CONSULTANT will be responsible for providing strategic and logistic support for a two-day workshop.

3.1 Develop Conceptual Alternatives

CONSULTANT will prepare up to three (3) alternatives for the project on the base mapping developed under previous task 2. The conceptual alternatives developed under this task will be planning level exhibits only and are intended to generate discussion and input from project stakeholders.

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CONSULTANT will review all applicable Caltrans requirements, visit the site and conduct a site analysis of the project area to determine opportunities and constraints. CONSULTANT will prepare findings of site examination for geometry, collision data, geology, utilities and R/W boundary, as well as possible environmental impacts and funding program documentation; suitable for inclusion in the Project Study Report.

Task 3 Deliverables

- Exhibits showing up to Three Alternatives
- Site Examination Findings

Task 4 – Perform Alternative Analysis

This task will involve a wide variety of engineering elements to support the determination of alternative evaluation criteria, performing alignment analyses, preparing geometric approval drawings, and providing miscellaneous technical support during the project development phase. The following elements of work will be performed:

4.1 Develop Evaluation Criteria, Project Reference Sheets and Technical Memo

Under this task, CONSULTANT will develop evaluation criteria matrix including elements related to traffic, geometric standard, environmental, C3 requirements, right-of-way, and utility impacts for evaluating alternatives developed for the project and condense them into a project reference sheet for each respective project, which will be used to aide in screening. A technical memorandum will establish design elements and principles determined between COUNTY and CONSULTANT as a basis of design, including policy exceptions.

Assumption: Upon determination of the design basis, no changes will be allowed thereafter, without consideration of additional work required.

4.2 Screen and Identify Alternatives

CONSULTANT will identify alternatives for the project based on existing land uses, prominent physical features, restricted land uses, environmental, C3 requirements, and right of way impacts. CONSULTANT will show up to three (3) alternatives and identify the best values for each alternative with a best value matrix. Alternatives that are deemed not viable or feasible shall be screened out from further analysis. The three alternatives shall consist of an alternative comprising of interim improvements (Group A as defined in the PSR) and two (2) alternative alignments that will be categorized in Groups B and C. In addition to the three alternatives, a NO BUILD alternative will also be evaluated.

4.3 Two Day Improvements Prioritization Workshop (Pre-VA)

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Under this task, CONSULTANT will establish the project requirements, attributes and project risks. The prioritization of project attributes and the ranking of project risks will be determined at this workshop. The workshop will include the COUNTY and designer representatives. External stakeholders, at the prerogative of the COUNTY, may be included.

4.4 Determine Viability of Alternatives

CONSULTANT will evaluate the viability of the alternatives. A memorandum or report will be prepared to present the results of this analysis for review and consideration by COUNTY and other stakeholders. A meeting will be called to discuss the results of the analysis and to develop a consensus on which alternatives will be included in the project and those that can be removed from further consideration.

Task 4 Deliverables

- Evaluation criteria matrix
- Project reference sheet
- Technical memorandum
- Best value matrix
- Lead Workshop and Document Findings
- Submit Prioritization Workshop Report
- Memorandum on Alternative Selection Recommendation

PHASE 2 (PART B) TASKS

Task 5 – Preliminary Environmental Analysis Report (PEAR)

CONSULTANT will prepare a PEAR in accordance with Caltrans Guidelines for Preparation of the Preliminary Environmental Analysis Report and follow the established PEAR format. Preparation of the PEAR will include the following activities:

5.1 Project Site Review/Windshield Survey

The project site review will involve a reconnaissance windshield survey as well as a review of available data of the project areas.

5.2 Prepare Draft PEAR

Preparation of the Draft PEAR will include the following tasks:

Preparation of Project Description - The PEAR project description will include a text description of the project, the statement of purpose and need, and a description of the alternatives.

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Cultural Resources - Cultural resources include sites of historical, archeological, or architectural significance. This evaluation will involve a literature search, consultation of available data, incorporation of the findings of the windshield survey. A report will be prepared that lists the records consulted, discuss possible cultural resources and project effects on these resources, and describe the permits and Native American consultation required for the project. No archaeological testing or site records will be prepared under this phase.

Biological Resources - The biological resources analysis will involve review of the available data for known special-status species occurrences in the project areas. No special status species surveys will be conducted under this phase.

Air Quality - The Air Quality analysis will confirm the Air Quality Attainment/Maintenance Plan status of the project area at the time of preparation of the PEAR. Consultation of available data will confirm the presence of land uses sensitive to localized air pollution, such as schools, agricultural areas, and parks. No air quality monitoring or prediction of future air emissions is included in this scope of work.

Noise - As part of the windshield survey, CONSULTANT will identify any land uses in the project area that could be considered noise-sensitive and affected by the project. Sensitive land uses include schools, public parks, daycare centers, hospitals and residential neighborhoods. Measurements of existing noise levels and prediction of future noise levels are not included in the preliminary report at this phase.

Water Quality and Floodplains - The Water Quality and Floodplains analysis will involve research of Federal Insurance Rate Maps (FIRMs), information from ACFCD and available data to identify existing hydrology and floodplains in the project area.

Hazardous Waste - This task will involve preparation of an Initial Site Assessment (ISA). The ISA involves a search of existing recorded sites, a search of the most current Hazardous Waste and Substance Site List and field review. CONSULTANT will prepare Phase I Initial Site Assessment study report for the proposed project. The ISA will be prepared to identify potential hazardous waste sites and evaluate environmental factors that may have impacted the soil groundwater quality within the project limits. The study will include data collection and documents research including historical land use based on study of aerial photographs and other relevant documents. No field exploration and/or testing are included in this phase of the work. Caltrans Check List will be included in the report.

Scenic Resources - The analysis of visual impacts will identify scenic and visual resources that may be affected by the project. CONSULTANT will identify scenic highway status and locally-designated scenic resources or vistas and incorporate findings of the windshield survey. The analysis will discuss likely removal of tree stands or other public landscaping, and potential landscaping costs, including decorative structural features on roadway infrastructure.

The PEAR Document will contain the following elements:

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- Project Information
- Project Description and Environmental Setting
- Anticipated Environmental Approval (type of document and timeline)
- Summary Statement
- Special Considerations (e.g. NEPA/404, seasonal constraints, Section 7 and data gaps)
- Mitigation (description and cost)
- Permits (including timelines for acquiring permits)
- Disclaimer
- Reviewed by (signature block)
- Summary Checklist
- Discussion of Technical Review
- List of Preparers
- PEAR Mitigation Cost Estimate

5.3 Prepare Final PEAR

CONSULTANT will document and track comments received on the Draft PEAR and provide written responses for substantive comments. CONSULTANT will revise the Draft PEAR and submit the final PEAR for incorporation into the PSR.

PEAR Assumptions:

a) No field work other than windshield surveys will be conducted for cultural or biological resources.
b) The analysis in the PEAR will be based on windshield surveys, existing data, and aerial photographs obtained from COUNTY.
c) Two (2) meetings with COUNTY during the development of the PEAR are included in the budget under this task.

Task 5 Deliverables

- Draft and Final PEAR

Task 6 – Prepare Project Study Report

Under this task, CONSULTANT will prepare a Draft and Final Project Study Report for the project in conformance with current COUNTY, Caltrans and Federal standards, policies, and procedures. The following subtasks will be performed accordingly:

6.1 Identification of Alternatives

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At least three (3) viable alternatives will be developed from the two day improvements prioritization workshop. One of the alternatives will include interim improvements that can be constructed within 12 months and with minimal costs and impacts to right of way and environment. No Project alternative will also be evaluated.

6.2 Value Analysis (VA) Study Report

CONSULTANT will perform VA Study for each alternative and prepare report to identify the preferred alternatives for each corridor.

a) Lead 5-day VA Study
b) Ensure that applicable data and correspondence, other relevant information necessary for the VA study is collected, developed and distributed.
c) Provide VA study documentation in general accordance with the Caltrans VA Report Guide. An Implementation Meeting will not be held. Implementation of VA findings may require additional budget.

6.3 Phasing for Preferred Alternatives

The preferred alternatives will be categorized into one of the following three categories:

(1) Under $1 million in cost for immediate construction within 2 years
(2) $1 to $5 million in cost for construction within 2 to 4 years
(3) Over $5 million in cost for construction with a longer time frame up to 10 years

CONSULTANT will evaluate constructability in terms of potential impacts of maintaining two-way traffic during most time periods. Each construction phase will be independently constructible by itself and be prioritized.

6.4 Prepare Preliminary Geometric Plans

CONSULTANT will prepare PSR-level geometric layouts for up to three (3) alternatives for each project. Layouts will be incorporated onto base mapping developed under Phase 1. Lane geometrics will be developed based on traffic data prepared under Phase 1. Preliminary typical section, profiles and superelevation diagrams will be prepared under this task.

6.5 Mandatory and Advisory Design Exceptions

CONSULTANT will identify mandatory and advisory design exceptions to the standard design criteria identified in the Highway Design Manual (HDM) and prepare Fact Sheets.

6.6 Prepare Preliminary R/W Data Sheets

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Based on the conceptual geometric plans, CONSULTANT will identify the right of way needs, public utility easements and temporary construction easements for each alternative. Up to four (4) R/W Identification Meetings will be held. R/W Data Sheets will include up to forty-three (43) parcels for Patterson Pass Road. Impacts to existing utilities will also be identified as part of this task and will be included in the standard R/W Data Sheet formats. Planning activities include a field review of the project and developing a preliminary R/W capital cost estimate based on preliminary plans. This task will include developing an R/W scoping report that provide an examination of the project right of way needs and highlights the various risks and solutions to ensure that right of way acquisition does not become a critical path issue.

6.7 Prepare Preliminary Construction Estimates

CONSULTANT will prepare preliminary construction estimates using standard Caltrans PSR formats.

6.8 Prepare Stormwater Data Report

CONSULTANT will prepare and PSR-level stormwater data report summarizing project impacts to water quality, general mitigation measures, and recommend best management practices (BMPs). The report will address only the impacts from roadway improvements and will utilize Caltrans standard checklists. The report will also address the needs for erosion control measures.

6.9 Prepare Landscape Concept Plan

CONSULTANT will prepare landscape concept plan under this task. The purpose of this task will be to refine and develop the final scope of the landscape improvements based on concepts accepted by the COUNTY and Bay-Friendly requirements.

6.10 Prepare Draft and Final Project Study Report

CONSULTANT will culminate the information developed under task 2 thru 6 in a Draft and Final Project Study Report. This PSR will define the purpose and need of the project, discuss alternatives evaluated, review collision history and summarize traffic operation results, identify costs of each alternative; and make project recommendations.

Task 6 Deliverables

- VA 5-day Workshop and Study Report
- Preliminary Geometric Plans including existing and proposed right of way ad easements, cut and fill limits, daylight lines, and existing utilities and proposed utilities
- Preliminary Profiles and Typical Sections
- Design Exceptions
- Preliminary R/W Data Sheet

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- Preliminary Construction Estimate
- Preliminary Stormwater Data Report
- Landscape Concept Plan
- Draft Project Study Report
- Final Project Study Report
- Electronic files including PDFs, AutoCAD DWG and C3D files/drawings, Excel spreadsheets, Word documents, and other documents. CONSULTANT and SUBCONSULTANT signatures, seals, and company logos will not be provided on any electronic file provided to COUNTY with the exception of PDF files and hard copies.

Task 7 - Project Contingency Budget - OPTIONAL

Given the undefined nature of the possible roadway improvements that may be identified along Patterson Pass Road and the complexity of the terrain, this task shall constitute a contingency budget that would only be used with the approval of the COUNTY. In the case that out of scope work is encountered, CONSULTANT shall notify COUNTY immediately and shall request written approval from the COUNTY to reallocate necessary budget to cover said out of scope work from this task.

SUMMARY OF ITEMS REQUIRED OF THE COUNTY

1. Provide all as-built drawings and relevant documents from prior and future improvement projects.
2. Provide all information regarding existing COUNTY survey monuments and datum records.
3. Provide all record maps and record information deemed necessary to create base mapping.
4. Provide rights of entry onto private properties that will allow for field surveys, site reviews, and investigations.
5. Provide all existing geotechnical data from existing projects (if available).
6. Provide all existing traffic data and collision records (if available).
7. Provide for meeting space and noticing of all public outreach meetings.
8. Participate in the 2-day improvements prioritization workshops (Pre-VA).
9. Provide the meeting space and noticing to selected participants for the 5-day VA workshop.

--- END SCOPE OF WORK ---