AASHTO Innovation Initiative

[Proposed] Nomination of Innovation Ready for Implementation

Sponsor

Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation

1. Sponsoring DOT (State): California Department of Transportation

2. Name and Title: Cory Binns, District Director

    Organization: California Department of Transportation

    Street Address: 4050 Taylor Street

    City: San Diego

    State: California

    Zip Code: 92110

    Email: cory.binns@dot.ca.gov

    Phone: (619) 688-6668

    Fax: Click or tap here to enter text.

3. Is the sponsoring State DOT willing to promote this innovation to other states by participating on a Lead States Team supported by the AASHTO Innovation Initiative?   ☒ Yes ☐ No

Innovation Description (10 points)

The term "innovation" may include processes, products, techniques, procedures, and practices.

4. Name of the innovation:

PROS (Project Review Organizational System)

5. Please describe the innovation. Describe how this innovation transforms your existing "state of play."

This innovation is an improvement in the method, organization of, and procedures followed in the collection of comments on Project Plan Sheets, Project Reports, and other project-related documentation in within the following Caltrans Districts: 1, 2, 3, 7, 11 and 59 . The system uses Microsoft Access and Adobe Acrobat in a user-friendly interface that allows users to view project documents and to enter comments in a single location (a "one-stop" shop for comments). The system practically eliminates the use of hard copies, providing additional savings in material resources and supports our sustainability goals. The system increases efficiency, accountability, transparency, innovation and teamwork within the District.

6. If appropriate, please attach photographs, diagrams, or other images illustrating the appearance or functionality of the innovation (if electronic, please provide a separate file). Please list your attachments here. Attach photographs, diagrams, or other images here.

Attachments: (a) PROS_HomeScreen.png, (b) PROS User Manual.pdf and (c) estimate from AT&T Application Consulting Services dated June 6, 2014

7. Briefly describe the history of its development.

On a Friday morning, during a lead-worker meeting, the topic of discussion turned to brainstorming improvements to the project delivery review process. The following Monday, one of the lead-workers presented to his supervisor a working prototype of a database accomplishing what had been brainstormed the Friday before. One month later, Adobe Acrobat was added to the prototype creating a user-friendly system. The system has been incrementally improved and has become the core engine for Quality Control and Quality Assurance (QC/QA) for project delivery within our district. No additional hardware or software was required for the implementation of this system. The user interface was created using Microsoft Access and Adobe Acrobat, which are part of the existing Caltrans' software inventory. The system is hosted in a virtual server and uses a free version of a relational database management system (Microsoft SQL).

State of Development (40 points)

Innovations must be successfully deployed in at least one State DOT. The AII selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

8. How ready is this innovation for implementation in an operational environment? Please check of the following options. Please describe.

☐ Prototype is fully functional and yet to be piloted

☐ Prototype demonstrated successfully in a pilot environment

☐ Technology has been deployed multiple times in an operational environment

☒ Technology is ready for full-scale adoption

The system has been incrementally improved and has become the core engine for Quality Control and Quality Assurance (QC/QA) for project delivery within our district.

9. What additional development is necessary to enable routine deployment of the innovation? What resources—such as technical specifications, training materials, and user guides—are already available to assist with the deployment effort?

Development of detailed guides for Administrators and users and an installation wizard would facilitate the installation and deployment of the application.

10. Has any other organization used this innovation? ☐ Yes ☒ No

If so, please list organization names and contacts. Please identify the source of this information.

Organization	Name	Phone	Email
None	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

Potential Payoff (30 points)

Payoff is defined as the combination of broad applicability and significant benefit or advantage over other current practice (baseline).

11. How does the innovation meet customer or stakeholder needs in your State DOT or other organizations that have used it?

The Project Engineer and other reviewers no longer have to wait until all red lines are collected and distributed in order to view comments that were made. Using the system which includes the PROs database in conjunction with shared PDF's, comments can be viewed by all reviewers and the Project Engineer within seconds of the comment being made. The system facilitates collaboration and cross division knowledge transfer between district staff. There are several other advantages to using this system. One is the brainstorm effect; seeing one comment may lead a reviewer to see something in the plans they otherwise may have missed. Another advantage is seeing comments as they are being made helps to avoiding reviewers from generating conflicting comments. Time is saved as reviewers can contact each other during the review period to resolve what otherwise may have been returned as conflicting or misunderstood comments. Furthermore, the Project Engineer's job is made simpler because all comments are submitted in a single format. Feedback from the users of this system has been positive, leading to more comments being made, which has resulted in increased quality of our project documents. In addition to the technical benefits realized by implementing this system, there have been reductions in cost. For example, using PROS to perform 454 project document reviews eliminated nearly 6.5 million paper prints, resulting in printing cost savings of nearly $200,000.00.

12. What type and scale of benefits have your DOT realized from using this innovation? Include cost savings, safety improvements, transportation efficiency or effectiveness, environmental benefits, or any other advantages over other existing baseline practice. Please identify the following benefit types:

Check boxes that apply	Benefit Types	Select a rating from the drop-down menu
☒	Cost Savings	4-Moderate to High
☒	Shortened Project/Service Delivery Schedule	5-High
☒	Improved Customer Service	5-High
☒	Improved Quality	4-Moderate to High
☒	Environmental Benefits	3-Moderate
☒	Organizational Efficiency	5-High

☐	Improved Safety	Choose an item.
☐	Improved Operation Performance	Choose an item.
☐	Improved Asset Performance	Choose an item.
☐	Other (please describe)	Choose an item.

Provide an additional description, if necessary:

Not applicable

13. Please describe the potential extent of implementation in terms of geography, organization type (including other branches of government and private industry) and size, or other relevant factors. How broadly might the technology be deployed?

In its current form, the system can be implemented with minimum effort for small groups. However, this innovation has a vast potential for full-scale adoption. Further development of this system into a web-based application and consolidation into a single interface would provide a centralized organization-wide deployment. This approach would unite future development, training, and support under a single point of contact. The implementation of a web-based application would support the use of mobile devices, enabling remote access to the information. Due to the similar nature of the work performed, this application could be useful to DOTs, Cities, and Consultants who would benefit from having a common workflow for project delivery quality control.
Please see the attached document from AT&T Application Consulting Services dated June 6, 2014 for an estimate of the cost to develop a web-based version of this system. The estimated cost of $100,000 to $150,000 includes the creation of: a SharePoint application, website development, a user guide and one training session. Caltrans District 11 is seeking assistance from AASHTO's Innovation Initiative program to accelerate the adoption of this proven system nationwide. AASHTO's resources would also aid the next generation (web-based) development of this system, enabling other agencies to easily adopt this proven innovation.

Market Readiness (20 points)

The AII selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

14. What specific actions would another organization need to take along each of the following dimensions to adopt this innovation?

Check boxes that apply	Dimensions	Please describe:
☒	Gaining executive leadership support	Leadership would need to gain confidence that this system would benefit their organization.
☐	Measuring performance (e.g. benefits documentation)	Click or tap here to enter text.
☒	Improving technology understanding	The organization must train staff to support the adoption of new processes.
☐	Overcoming financial constraints	Click or tap here to enter text.
☐	Addressing legal issues (if applicable) (e.g., liability and intellectual property)	Click or tap here to enter text.
☒	Acquiring in-house expertise	Adequate technical expertise is needed for an organization to implement the system.
☐	Resolving conflicts with existing regulations and standards	Click or tap here to enter text.
☐	Other Challenges	Click or tap here to enter text.

15. What is the estimated cost, effort, and length of time required to deploy the innovation in another organization?

Please describe:

Cost: Approximately $5,000

Level of Effort: Minimum

Time: 1 month

16. To what extent should the implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.

 If the necessary expertise in computers is not available in-house, a consultant can be hired.

ATTACHMENT 1

PROS HOME SCREEN

EXIT 44 ↗

Project Review Organizational System

REVIEWS DUE IN THE NEXT SEVEN DAYS

Project	EA	Review Phase	Due Date
IN SAN DIEGO COUNTY IN CARLSBAD & OCEANSIDE ON RTE 5 FROM 0.2 KM S OF ELM ST UC TO 0.3 KM N OF CALIFORNIA ST OC AND ON RTE 78	07890	PS&E Circulation	4/25/2016
IN SAN DIEGO COUNTY IN SAN DIEGO FROM NIMITZ BOULEVARD TO 0.2 MILE WEST OF PRESIDIO PARK OVERCROSSING	40860	PS&E Circulation	4/28/2016

ATTACHMENT 2

PROS USER MANUAL

District 11 PROS user manual

Accessing files in the database:

The invitation email will include the following:

"District Management is strongly encouraging electronic review and commenting to save time and resources. Note, all constructability and safety comments, are to be typed into the database and reference plans/specs as needed. Any comments entered after the due date, at the option of the PE, may be either disregarded or addressed. Attached is the link to the database along with user guides on how to comment electronically."

\\sv11pros1_PROs\Roadway\Front-End\PROS_Rdwy.accde

Click on the link to access the database.

You will see the following window,
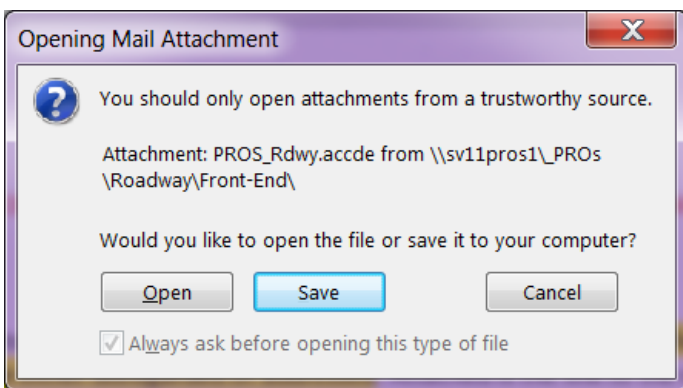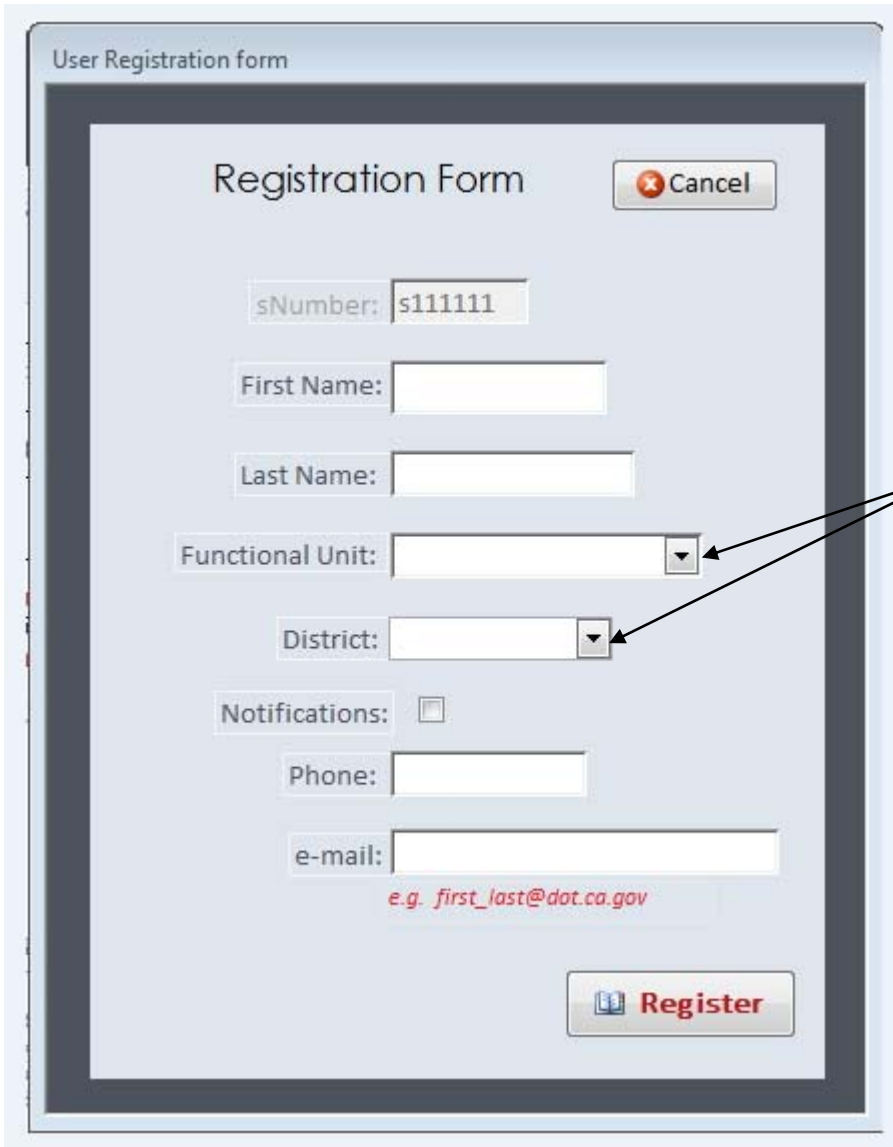
You can either open or save…it is recommended to save the database to your desktop.
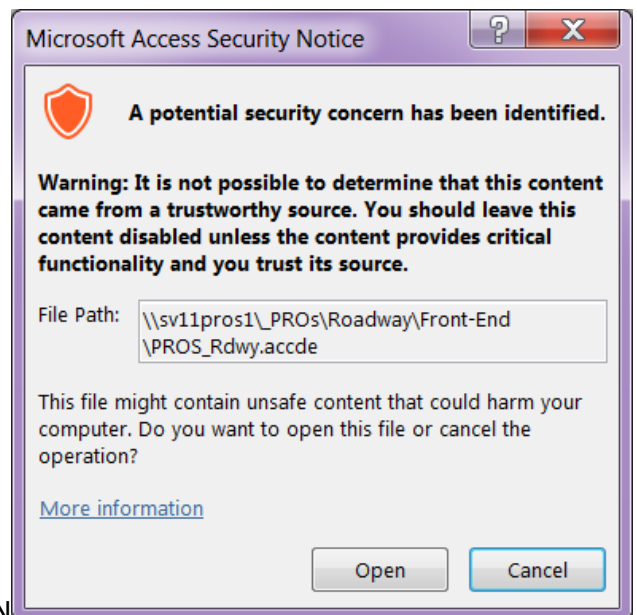
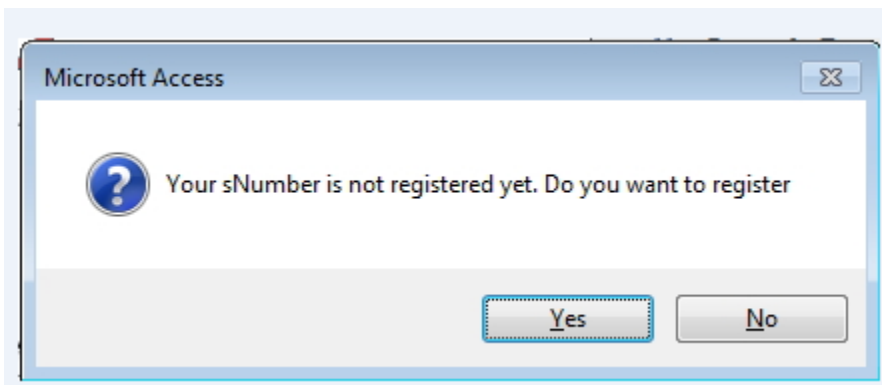The following box may or may not open, if it does, select OPEN.

: When you open the Database for the first time, you <mark>may</mark> be asked to fill out credentials/information. Please fill out this portion, you will only be required to do it once.

User Registration form

Registration Form

❌ Cancel

sNumber: s111111

First Name: _____

Last Name: _____

Functional Unit: _____ ▼

District: _____ ▼

Notifications: ☐

Phone: _____

e-mail: _____

e.g. first_last@dot.ca.gov

📖 **Register**

Select one of the Choices in the scroll down menu

Once you register, the database will ask for confirmation. Select Yes

Microsoft Access ⊠

❓ Your sNumber is not registered yet. Do you want to register
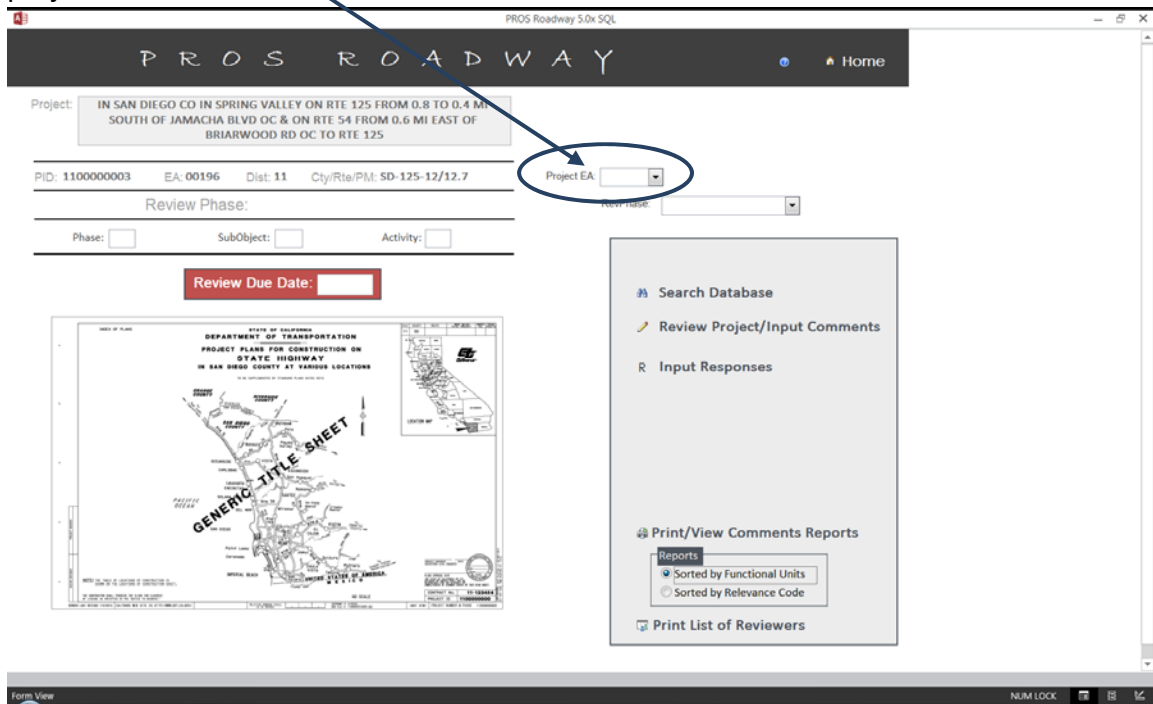
Yes   No

The Database will open and the following steps can be followed:

1. Click on the "Active Projects" or select from the list of "Reviews Due in the Next Seven Days"
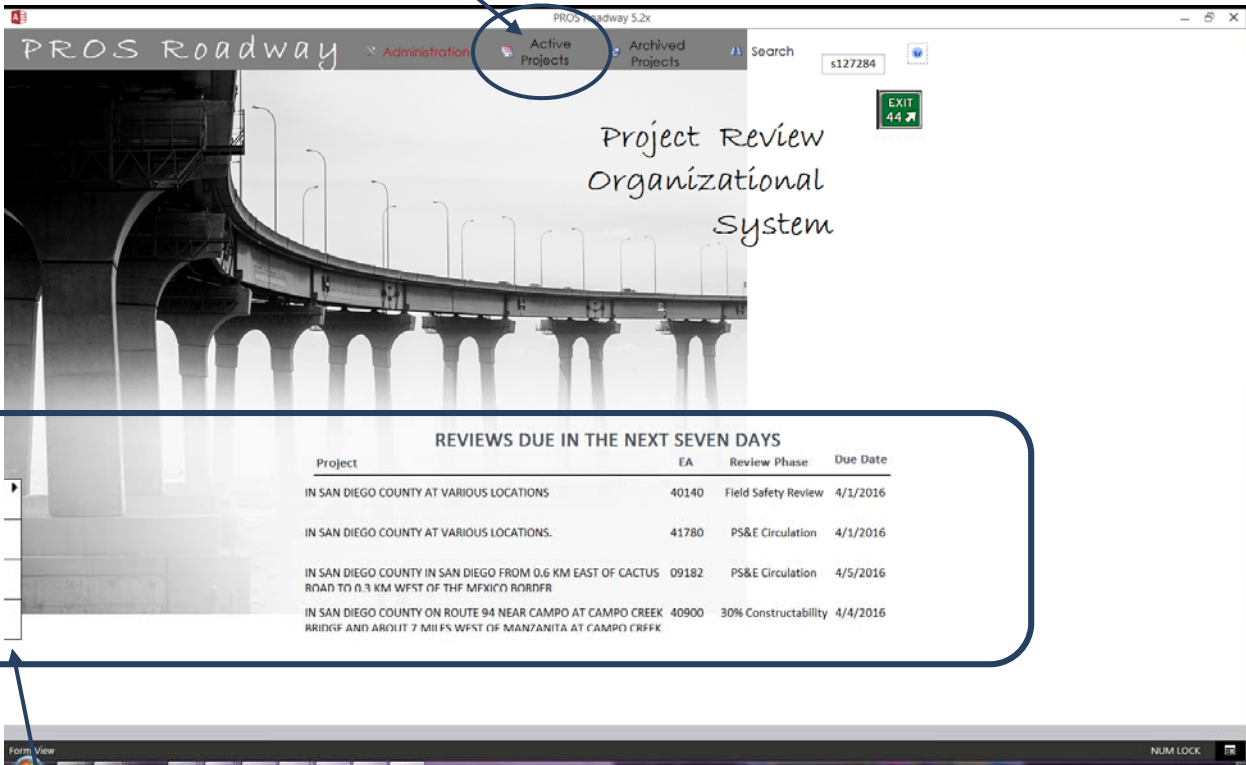
Double click the white tab that corresponds to project on the right.

2. If you select "Active Projects" the following window opens. Under Project EA, scroll and select the project or enter the EA
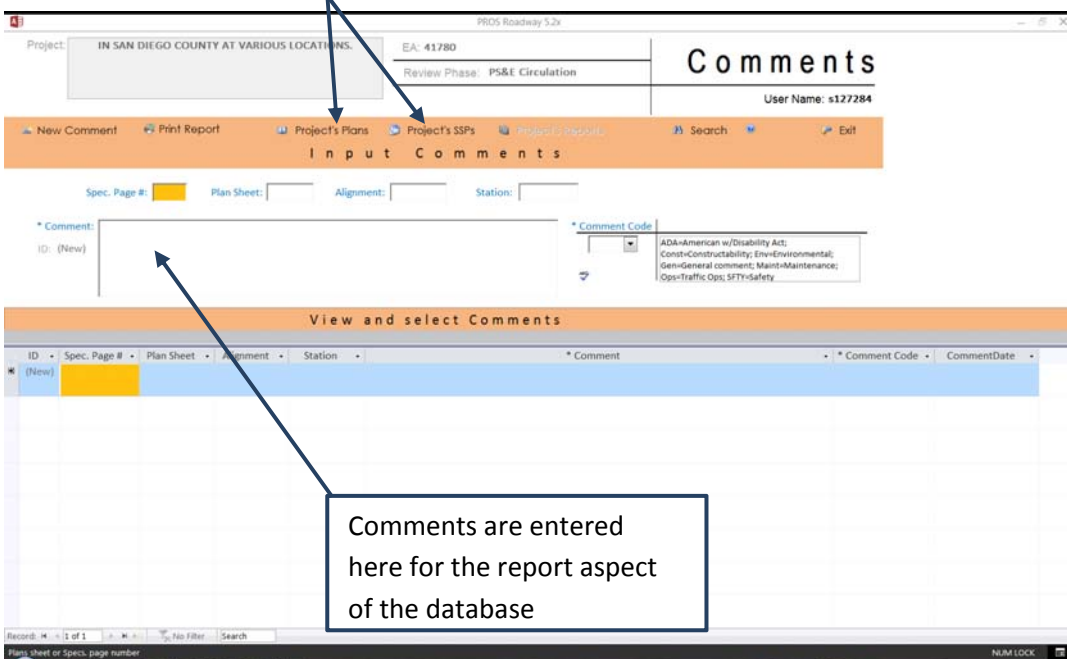
3. Once Project is selected, you can choose the RevPhase (Review Phase) and enter the Review Files (click on pencil icon).
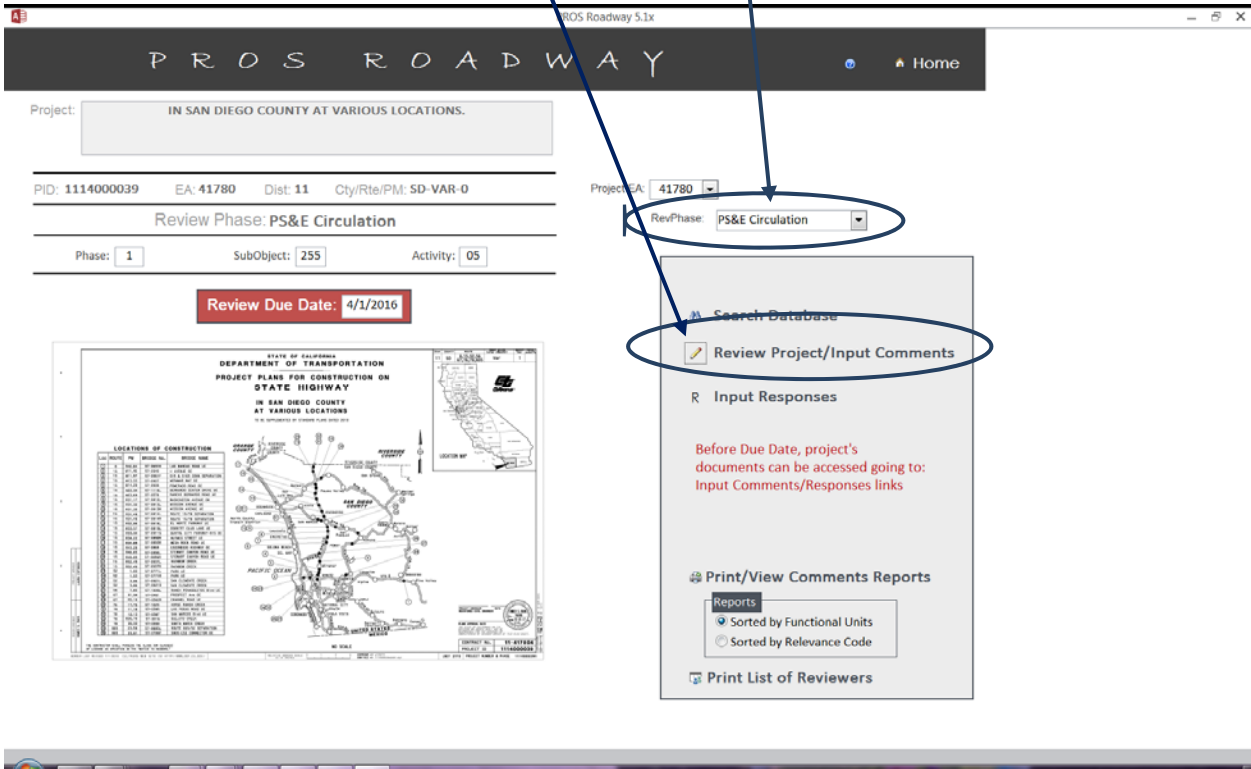
4. Front End of database opens. Here you will be able to add comments on Constructability, Safety, Maintenance, etc. You will also have access to the plans, specs and other documents.

To access plans and specifications, select these buttons.

To Navigate this area use the "TAB" key

Comments are entered here for the report aspect of the database

5. You can adjust column and row widths by "right clicking" on the row or column you want to change, or by changing manually (similar to excel).

ID	Page #	Plan Sh	Alignment	Station	Comment				m.Code	Redlines	Attachment	Func. Unit	Reviewer	RevName
213					Supplement Closure Signs with PC are extensive - Harwell Ontoy		Sort A to Z		S	☐	⓪(0)	Constructabilit y	s116492	l. espinoza
214					Use COZEEP during closures. New units onsite, 1 for deterrent & the Harwell Ontoy		Sort Z to A / Copy / Paste / Column Width...		M	☐	⓪(0)	Constructabilit y	s116492	l. espinoza
215					Increase engineer's estimate to all		Hide Columns / Unhide Columns...		M	☐	⓪(0)	Constructabilit y	s116492	l. espinoza
216					Prior to excavation for foundation maintenance for locations of elect Harwell Ontoy		Freeze Columns / Unfreeze All Columns		M	☐	⓪(0)	Constructabilit y	s116492	l. espinoza
217					What acceptable staging areas for to paved areas (?) to avoid damage landscaping - Harwell Ontoy		Add Existing Fields / Conditional Formatting...		S	☐	⓪(0)	Constructabilit y	s116492	l. espinoza

Responding to comments

Project EA: 41780 ▾

RevPhase: PS&E Circulation ▾

🔍 **Search Database**

✏️ **Review Project/Input Comments**

R **Input Responses**

Click Input Responses

Before Due Date, project's documents
can be accessed going to:
Input Comments/Responses links above

🖨️ **Print/View Comments Reports**

Reports
- ⦿ Sorted by Functional Units
- ○ Sorted by Relevance Code

🖼️ **Print List of Reviewers**

Write response on the top response box (Input Responses)

Print Report of Comments entered into the database—select the Print Report icon

It is recommended that the report be printed/saved in a PDF.

ATTACHMENT 3

AT&T COST ESTIMATE

AT&T Application Consulting Services

Rough Order of Magnitude Pricing for California Department of
Transportation, District 7
June 6, 2014

Presented By

Ryan Griffin
Professional Systems Project Manager

AT&T Business Solutions

rg612j@att.com

Contents

Project Objectives

This rough order of magnitude ("ROM") has been prepared to offer AT&T's assistance to California Department of Transportation, District 7 ("Customer") with the Project Review Organizational System ("PROs") project. Customer has identified the following objectives for the project:

- Implement a web based application with similar features and functionalities to the Customer's existing Microsoft Access-based Project Review Organizational System.

Order of Magnitude Estimate

AT&T has assessed Customer's high-level requirements and the estimate for the project scope below is between $100,000 and $150,000. This estimate is provided prior to completion of any formal requirements elaboration. Therefore, this estimate is for budgetary purposes only, subject to change and is not guaranteed to be accurate. Professional services work is to be completed on a fixed fee basis.

Project Scope

The following describes AT&T's understanding of the work to be performed.

NOTE The following scope is tentative, based on high level discussions of the desired application functionality. A requirements elaboration exercise would need to be completed to elicit a sufficient level of detailed requirements to finalize on a technical design. The following scope is used as a basis to provide Customer with budgetary pricing for a solution.

Inclusions

AT&T will perform the following tasks as part of this services engagement:

1. AT&T will create a SharePoint application that meets the following business requirements:
   a. Projects
      i. The system shall provide the ability to add, edit, archive, and delete projects.
      ii. A project consists of the following attributes:
         1. Description
         2. Project type
         3. Revision phase
         4. Project ID
         5. Post mile start
         6. Post mile end
         7. Phase
         8. Sub object

  9. Activity

  10. Due date

  11. Title sheet file

  12. Review complete

 iii. The system shall provide the ability to send an email with a link to access the project.

 iv. The system shall provide the ability to search for projects.

 v. The system shall provide the ability to list all projects.

 vi. The system shall provide the ability to view projects on a map.

  1. Each project shall be represented by an icon.

   a. Project icons shall be differentiated by the phase of the project.

b. Checklist

 i. The system shall provide the ability to capture checklist information when a project phase is completed.

 ii. Checklist information consists of the following attributes:

  1. Checklist item description

  2. Checklist item status (yes, no, not applicable)

c. Comments

 i. The system shall provide the ability to make comments on a project.

 ii. A comment consists of the following attributes:

  1. ID

  2. Specs page #

  3. Plan sheet

  4. Alignment

  5. Station

  6. Comment

  7. Comm. code

  8. Functional unit

  9. Reviewer

 iii. The system shall provide the ability to print comments.

 iv. The system shall provide the ability to export comments to Excel.

 v. Comments can only be added for the current project phase.

 vi. Comments cannot be added to archived projects.

d. Responses

 i. The system shall provide the ability to make responses on a project.

 ii. A response consists of the following attributes:

  1. ID

2. Comment ID
3. Response
4. Response code
5. Responsible
6. Resolved
 iii. The system shall provide the ability to print responses.
 iv. The system shall provide the ability to export responses to Excel.
 v. Responses can only be added for the current project phase.
 vi. Responses cannot be added to archived projects.

e. Milestones
 i. The system shall provide the ability to specify project milestones.
 ii. A milestone consists of the following attributes:
1. Milestone name
2. Actual Finish Date
3. Late Finish Date
4. FY Qtr

f. Search
 i. The system shall provide the ability to search comments and responses by:
1. ID
2. Project ID
3. Revision phase
4. Reviewer functional unit
5. Project type
6. Comment
7. Keyword
8. Reviewer
9. Post mile
 ii. The system shall provide the ability to search project plans by keyword.
1. **NOTE** Project plan PDF files will only be searchable if they contain embedded text.

g. Security and Permissions
 i. The system shall use Active Directory for user authentication.
 ii. The system shall use SharePoint security for user authorization.
 iii. The system shall use Integrated Windows web application authentication.
 iv. The system shall support the ability to grant project-level permissions:
1. Manage permissions

2. Edit content
                3. Read-only
            v. The system shall support the ability to grant project phase-level permissions:
                1. Edit content
                2. Read-only
            vi. The system shall support the ability to grant administrator permissions.
                1. Only administrators can create new projects.
    h. Documents
        i. The system shall provide a per-project document library.
        ii. The system shall provide a mechanism to store project plan PDF files and their associated shared comments.
            1. **NOTE** This functionality will require Adobe Acrobat Pro version XI or newer.
2. AT&T will create the following components in support of the business requirements specified above:
    a. Custom Web Parts
        i. Project Administration
        ii. Project Search
        iii. Project Information
        iv. Projects Map
        v. Comments
        vi. Responses
        vii. Milestones
        viii. Checklist
    b. Custom Features
        i. Project Site Provisioning
    c. Custom Branding
        i. One (1) SharePoint master page
        ii. One (1) SharePoint page layout
        iii. One (1) CSS file
    d. Lists
        i. Comments
        ii. Responses
        iii. Project metadata
        iv. Milestones
        v. Checklists
    e. Libraries

    i. Supporting Documents / Project Plan
  f. Search Scope for projects
  g. One (1) Managed Metadata term set for classifying supporting documentation
  h. One (1) Managed Metadata term set for classifying project phases
  i. One (1) Managed Metadata term set for milestone names
  j. One (1) Managed Metadata term set for Fiscal Year Quarter
3. AT&T will migrate up to one (1) year of data from one (1) Access databases (District 7 only).
  a. The following information shall be migrated:
    i. Comments
    ii. Responses
    iii. Project information
    iv. Project plan PDF files
      1. **NOTE** Only project plan PDF files that are consistent with the naming convention of the application will be migrated.
    v. **NOTE** Due to differences between the new system and the legacy Access database application, some fields in the target environment may need to have default values established to support the migration.
4. Training
  a. User guide
  b. Contextual help
    i. Information on each screen of the application to assist the user in the proper usage of the application.
  c. One (1) train-the-trainer web conference session for up to twenty (20) attendants.

Exclusions

The following items have been deemed out of scope for this services engagement:

1. Visual design work
  a. Customer to provide AT&T with desired visual design.
2. Office 365 compatibility
  a. The solution will be compatible with SharePoint 2010/2013 on premise installations.
3. Mobile device support
4. Modifications to existing SharePoint 2010 farm physical or logical architectures.

Project Approach

AT&T will deliver these services by conducting three high-level phases:

- Envision
- Elaborate
- Execute

Each of these phases is further described below.

Envision

The Envision phase sets the stage for the delivery of the services contained in this ROM.

The Envision phase consists of the following key activities:

- Plan the engagement with the project sponsors
- Confirm the engagement scope, plan, and approach
- Discuss and plan project logistics, including milestone dates

Elaborate

The Elaborate phase establishes the detailed steps necessary to implement the desired scope.

The Elaborate phase consists of the following key activities:

- Clarify and expound on Customer business requirements
- Create a detailed technical solution design document
- Review technical solution design with Customer

Execute

The Execute phase involves the core implementation of activities identified in the scope of this ROM, and the plans defined during the Envision and Elaborate phases.

The Execute phase consists of the following key activities:

- Implement scope as defined in Project Scope section and refined during Elaborate phase

Work Description & Deliverables

The project will result in the following deliverables:

1. Business requirements specification
2. Technical design document
3. Application source code for all items listed in Scope section
4. User guide
5. Training presentation

Projected Timeline

The exact timeline will be determined in cooperation between Customer and AT&T based on AT&T and Customer resource availability. AT&T has estimated this SOW to be approximately 16-20 calendar weeks in duration, excluding any schedule constraints that Customer may need to implement.

ROM Assumptions

This ROM has been prepared considering the following assumptions:

1. Application will be deployed to Customer's existing SharePoint 2010 Enterprise farm.
2. Customer's production and non-production environments are sufficient to support project activities.
3. AT&T will leverage Customer's existing SharePoint branding with minimal modification.