System Development Methodology

Proof of Concept Evaluation Form: ECMS – And Associated Digital Submissions of Contract Plans – DOT Hosted Solution

Project Profile #: ECMS - 1001001

Agency: Department of Transportation

Proof #	Proof Description	Pass/ Fail	Comments
	Initial POC Implementation – Business and Technical Observations		
1	**Technical Resources – Hardware Support and Set-Up -** *"Assessment of a Future Production System"*	F	The DOT's Office of Information Systems has expressed concern to the Quality Assurance Office over the lack of resources to implement and support the hardware infrastructure required to fully implement the production system. Additionally, the Department of Transportation does not have the ability to hire staff to maintain the server operations. DOIT Server Application Hosting Staff has also expressed concern in regards to the resource requirements of a full hosting scenario of the ProjectWise System at their headquarters. A DOT system design, implementation and construction would fail to meet the ECMS Project Schedule. Proposed Solution: A vendor hosted solution should be pursued in order to resolve technical resource shortages.
2	**Technical Resources – System Technical/Application Support -** *"Assessment of a Future Production System"*	F	Primarily, the Department has a single dedicated application development resource (TA2) focused on the majority of Bentley Products including - ProjectWise, MicroStation, InterPlot Organizer and Adobe Acrobat. This individual is also responsible for all hardware associated with the systems operations. A database lead is also assigned to ProjectWise; however, their time is primarily dedicated to all Department Systems. While the TA2 assigned these responsibilities has performed well, it is felt that he cannot solely handle a Production System efficiently with redundancy. An engineering document management system that could potentially support an approximate $500,000,000 capitol program requires support redundancy. A recent (04-09-09) week long outage of the POC system has exposed the importance of a having a production system that can recover in a timely manner with dedicated resources capable of troubleshooting the system.

			Proposed Solution: In the above scenario, being able to take advantage of the vendors expertise could have allowed a more responsive turnaround time. Allow CTDOT to pursue vendor hosting for the major components of the system. This will alleviate internal resource requirements. Internal resources can then be devoted to software deployment and development.
3	**Technical Resources – Business Side (Training, Application Support and Development) – "Assessment of a Future Production System"**	P	With the ability to deliver contract data digitally, the Department is saving a significant amount of money and the contract development process is becoming more transparent. While the applications have worked well for the Pilot Projects (See Results Below) they have been focused on a small number of select projects using a select few business resource support personnel to facilitate it. See strategy below for suggestions on transitioning business personnel into addressing future support requirements. The success of the business is also heavily reliant on Technical IT Resources. A significant finding is that without IT Staff supporting more efficient software management and deployment more time is required by engineering staff troubleshooting software versions and compatibility issues as they relate to implementing new business processes. Proposed Solution: Designation of dedicated project data managers needs to be more specific according to project/discipline or conversely a data management unit should be developed in order to facilitate a full production system. In the short term, existing Quality Assurance employees will be designated as project data managers. The responsibilities of the data managers include the complete coordination of publishing of Digital Submissions and Digital Contract Data and the development of necessary staff training. A clear training program and documentation needs to be developed that is focused on project development using required engineering applications. Consultant Services have been initiated in an effort to begin the development of a Digital Project Development Guide and the required applications that will assist in this endeavor. In the absence of a software distribution mechanism, the Office of Quality Assurance also needs to assess whether the system can be implemented more efficiently with high level users (CAD intensive) using the Thick Client and less advanced users using

			the thin (Web) client.
			In order to further reduce support requirements during reproductions, it would be an additional benefit if the Department had an alternative website dedicated to hosting contract data during the advertising process.
			Consultant IT Services will be needed in order to develop required AEC Applications as defined by Quality Assurance.
4	**Application Version Upgrades – Assessment of the Department Technical Staff's Ability to /New Technology Capability**	F	Bentley System Inc. continually upgrades their applications in order to provide more efficiency in terms of application functionality and offerings of new technology. The Department's OIS Staffing can only handle system upgrades at 1.5-2 year intervals. Difficulties are also experienced deploying necessary software version upgrades, since our Eng. OIS Staff does not appear to have necessary direction, priority, technical resources and skills necessary to deploy software efficiently. At times, Eng. OIS Support Staff are not given the required network rights to successfully complete their assignments.
			Solution: Proceed with the evaluation of a vendor hosted Solution in order to minimize system resource requirements so IT Staff can be more focused on software deployment and development.
5	**IT Infrastructure – Network DOT Main Office**	P	The Department's Main Office network has been performing very well during the POC.
6	**IT Infrastructure – Network DOT Remote Offices**	F	The DOT's major remote offices generally lack adequate bandwidth to facilitate an optimal system solution given the data sizes the engineering business requires. An evaluation of remote location caching servers is on-going, however, the implementation and testing has run into technical difficulties. Bentley has been requested to assist with the completion of this item (if it can be). The Office of Quality Assurance will be initiating a request to OIS for assessment of providing fiber-optic network at District 3 and 3A. The connections to the remote offices are generally inadequate to support the necessary business of the Agency. The network needs to be re-tooled.
7	**Assessment of End-Users Technical Skills and Ability to Work with Digital Engineering Data.**	F	The Office of Quality Assurance – Engineering Applications Section has performed preliminary training for Pilot Project participants. The training has exposed that the level of technical expertise and knowledge about technical engineering applications, basic computer operations, and data management is sorely lacking, particularly by the Contract Development Unit. More specifically, end-users need to better understand basic

			Microsoft Windows and Office Operating functions and the causes and effects of storing data on the network, versus on local drives, proper data management, dealing with digital media and best practices for digital reproductions. A "ground roots" training program needs to be developed and established that is focused on project delivery using the required technical applications.
8	**Internal IT / Vendor Coordination**	F	In general, the overall environment is difficult to coordinate (vendor, internal IT, and DOIT) and needs to be streamlined. During the POC implementation, Bentley Systems Inc. (DOT Vendor) did not get full cooperation with required statement of work items necessary to upgrade servers under the purview of CTDOT Office of Information Systems. Bentley, Quality Assurance Staff and the Office of Information – Business Systems staff has expressed concern over the condition of the server the POC System is on. While there were initial coordination issues on preliminary technical architecture and requirements, DOIT staff cooperated fully with the vendor on the initial planning and set-up of the POC at DOIT.

ProjectWise/Acrobat Software Functionality

9	**ProjectWise Typical CE Firm (Web Client) Upload/Download Testing**	P	Generally, the initial testing showed as expected results. The common problem found at CE/External firms was they had T1 lines to the web that are shared by multiple users. An interesting result was obtained from Close Jenson and Miller (CJM) had a Business Class Cable Internet Connection (COX) the performance testing was better than average. Further testing of Cable Internet Connections (Comcast) has showed promising results. The Quality Assurance Group is considering the development of a specification for External Partners that will require the procurement of high speed internet connections for specific sized projects based on dollar size and potential file size submissions. (i.e. For Q-Bridge Engineers, Contractors, etc. a spec would be created requiring internet connections of 22MBps down / 5MBps upload) The costs of the service could be billed as direct costs towards the project or corridor project) By requiring a specific PC and connection, the Department can then better recommend virus protection software.)
10	**ProjectWise Typical Construction Trailer (Web Client)**	P	Same as above. The Office of Construction and the Constructions Applications Group is interested in pursuing a specification for Cable Web Connections for field offices.
11	**ProjectWise - Web Functionality**	P	ProjectWise's Web provides basic functionality to facilitate electronic file transfer, which may be able to suffice on the short term, however, the following are items that were identified as desired functionality: - We did notice that the web did not provide the ability to search Project Attributes. This is a feature that should be provided. The feature request was brought up to Bentley during a recent training class. - An additional requested feature allows users to change their own password. Not having this feature causes more administration requirements for staffing. - It would also be beneficial to have basic automated notifications available when users transmit data externally into ProjectWise.
12	**ProjectWise - Project Administration, Set-Up, Attribute Integration**	P	Generally, it is very simple to configure and set-up Projects in ProjectWise. There is significant work that needs to be done that is required to look at integrating Project Attributes to existing Department Databases. During System Design, we plan on

			developing a Statement of Work for Bentley Systems to assist us in integrating ProjectWise to existing Department Databases.
13	**ProjectWise -Security Administration**	P	The ease of applying security to project set-up becomes difficult when applying design security settings to multiple folders at once. It would be desirable to apply security settings to multiple folders at once. This should be a requested feature to Bentley in a future release. A necessary work-around has been developed that takes advantage of project templates for State Design and Consultant Design.
14	**ProjectWise Delta File Transfer**	F	We had initial hopes that the web client would work with delta file transfer. After the system was set-up, we found that it does not work with the web. Since the Business process relies on changing filenames during certain milestones, taking advantage of Delta File Transfer is not feasible at this time for PDF File Transfer. Once CAD Production data can be tested properly, we anticipate delta file transfer can be tested more successfully.
15	**ProjectWise Remote Office - Caching Server Test**	F	Initial tests of the Caching Server crashed the Department's Network located at Engineering Records (T1). OIS is investigating the cause. The Office of Quality Assurance has initiated a request to OIS for upgrading the Department's Network Infrastructure at District 3 and 3A.
16	**ProjectWise General Engineering Data Management - Application**	P	Overall, the performance of ProjectWise allows for very secure and easy to use data management functionality.
17	**ProjectWise Document/Folder Security**	P	Out of the box, ProjectWise does not allow read/only restrictions on a folder/document and allow a user to create a new document. This would be beneficial if it worked this way so that users can create documents, but not alter existing documents. As a work around, Content Managers are required to mark documents as read-only.

| 18 | **Adobe Acrobat CDS - Digital Signature Usage** | P | In June of 2007, the Department was given approval to Pilot the use of Digital Signatures using Adobe's CDS. The overall results of this application have worked very well. Piloting continues, and has actually helped the Department change Engineering Content Management in order to improve business processes. IT Support is minimal since it relies on external subscription services. It would be desirable to have an internal certification lisc. Management application in place, this is a feature current CDS Vendors are considering. (i.e. In the case, a DOT employee leaves or is transferred, the certificate can be transferred to other Department employees). |

Pilot Project Observations and Results

<Pilot Project 107-0158> State Design - 70% Design Submission – Digital Final Contract Drawings

19	1. PDF Plotting 2. Sending the Design Submission on a **(DOT Internal)** collaborative review using Adobe Acrobat.	P	The Project Manager involved in the project was very receptive to trying the new processes. There were some initial difficulties with PDF Plotting that was mainly associated with versions of software (Mainly IPlot Org. and MicroStation). Once the versions were stabilized, the pdf plotting was simple for the project manager. The Project Manager needed to plot the PDF's for the disciplines involved in the project, since training was not provided. Quality Assurance/Engineering Applications provided training for the projects team that was involved in the Adobe Acrobat design review process. A couple of bugs were noted in Acrobat and the biggest challenge was getting the user familiar with new comment approval processes. Once a workflow was established users grasped what needed to be done. Better training and clearer documentation is needed to transition to a production environment. The use of Acrobat and not Reader is a must. Reader limited some users from working efficiently summarizing comments etc. Several users provided positive feedback in the application.
	3. Software Versions	F	OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment. Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.

	4. Final Design/Advertising Process
	    a. Digital Signature Process
	    b. Advertising process via DVD vs. Paper Method – Time and Cost Study
		F	The Contract Development Unit made numerous comments during final design that resulted in numerous re-plotting and re-signing attempts by the Project Engineer and Managers. Several Contractors complained about not having paper plans available with such a small job. Contract Development sent Eng. Records (Printing Services) the incorrect notification of engineering paper sizes to plot. Contractors were offered paper plots, however, a lack of training and knowledge of how to properly plot PDF's was occurring. A short-term software upgrade was required at Engineering Records. Significant Technical Support was required by Engineering Application staff during the reproductions process.

			Solution: Contract Development needs to be involved in a design review prior to FDP. Contract Dev. needs to properly inform Eng. Records (Printing Services)of paper sizes. To our knowledge a form field was created on for Eng. Records (Printing Services)Staff to inform them of plan sizes for future projects. In order to further reduce support requirements during reproductions, it would be an additional benefit if the Department had an alternative website dedicated to hosting contract data during the advertising process. Eng. Records (Printing Services)needs to be trained thoroughly in an effort to improve their capabilities in dealing with digital contract data.

20	**<Pilot Project 0092-0619 – I95/91 Breakout> FDP - Consultant Design Submission – Digital Final Contract Drawings**		

	1. Final Design/Advertising Process
	    a. PDF Plotting
	    b. Sending the Design Submission on a **(DOT Internal)** collaborative review using Adobe Acrobat.
	    c. Digital Signature Process
	    d. DCD Review by FHWA
	    e. Advertising process via DVD
		F	After some initial support requirements for Bentley's InterPlot Organizer, the Consultant Engineer involved in the project was able to successfully use the software to plot PDF's. One issue the Consultant Engineer Recommended was minimizing the amount of signatures required on Plan Sheets.
			
			The Contract Development Unit made numerous comments during final design that resulted in re-plotting and re-signing attempts by the Project Engineer and Managers. Due to this, it was difficult to determine what changes were occurring from the FDP Submission to the DCD Submission.
			
			There was no issue reported with the digital signature issuance and usage.
			
			Contract Development decided to submit digitally via DVD the DCD approval to the FHWA. While it was a savings in paper, it required significant support from Engineering Applications Staff since Contract Development Staff is not trained sufficiently and does not have sufficient knowledge in dealing with digital contract data.
			
			Quality Assurance Engineering Applications provided initial pilot training and support for the Contract Development Unit; however, additional documentation and training will still be required.
			
			Significant technical support by Quality Assurance/Engineering Applications Staff to Engineering Records Staff was required during Reproduction of the DVD's issued to Contractors.
			
			In general, contractors accepted the method of receiving the data via DVD.

			Solution: A plan for streamlining project plan assembly and creation in PDF format is in progress. It will involve changes to the Department of Consumer Protection Regulations as it would pertain to digital signature usage. Contract Development needs to be involved in a design review prior to FDP. Provide FHWA with proper training in using ProjectWise Web, they could easily access the DCD Data (Plans and Specs) rather than using the DVD Distribution Method. This would significantly reduce technical support. In order to further reduce support requirements during reproductions, it would be an additional benefit if the Department had an alternative website dedicated to hosting contract data during the advertising process. Eng. Records (Printing Services)needs to be trained thoroughly in an effort to improve their capabilities in dealing with digital contract data.
	2. Software Versions	F	Internally at DOT, OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment and inconsistent versions of Acrobat.
			Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.

	3. Potential for Operation Cost Savings and Use of Data by Contractors.	P	As a potential service, significant operational savings can be realized with full production of digital data. In general, contractors accepted the method of receiving the data via DVD. The delivery of electronic data makes it significantly easy for Contractors to communicate more efficiently and distribute plans and specs faster. It seems as though the larger contractors are better prepared to deal with electronic media. Ultimately, the project ended up getting 4 bidders with Walsh Construction being awarded the contract.
	4. Digital Submissions of Construction Order Processes	P	The Consultant Engineer successfully transmitted change order data through ProjectWise. No issues were experienced and the application continues to work fine. In an effort to minimize data management resources in the future Engineering Applications is developing new procedures to streamline the plan production process.
	5. Const. Dist. Access a. Basic File Transfer/Reading of files via the WEL	TBD	This has not been set-up and/or coordinated yet. Training is anticipated to occur soon.
	6. ProjectWise & Primavera Expedition Interoperability	TBD	For the piloting, Quality Assurance/Engineering Applications provided the prime data manager for the Q-Corridor Project access to the ProjectWise Web with the understanding that they need to be aware that the latest and greatest contract plan data is located on the ProjectWise System, and copies could be distributed via Expedition as needed. For the future, there is a definitive need for better collaboration, archival procedures, and linking between both systems via common dashboards and/or synchronized account administration. Without the development of a clear integration plan it will be difficult for the department to progress using both systems.

21	**<Pilot Project 0092-0532 – Q-Bridge > FDP - Consultant Design Submission – Digital Final Contract Drawings**		
	1. Final Design/Advertising Process a. PDF Plotting b. Digital Submissions c. Digital Signature Process d. DCD Review by FHWA e. Advertising process via DVD	F	After some initial support requirements for Bentley's InterPlot Organizer, the Consultant Engineer involved in the project was able to successfully use the software to plot PDF's. There were no issues reported with the digital signature issuance and usage, however, there was an issue that occurred that that required contract sheet #'s to change throughout the entire plan volume set, thus requiring signers to re-digitally sign a significant amount of sheets. Contract Development decided to submit digitally via DVD the DCD approval to the FHWA. While it was a savings in paper, it required significant support from Engineering Applications Staff since Contract Development Staff is not trained sufficiently and does not have sufficient knowledge in dealing with digital contract data. Significant Technical Support was required by Engineering Application staff during the reproductions process. Quality Assurance Engineering Applications provided initial pilot training and support for the Contract Development Unit; however, additional documentation and training will still be required. Significant technical support by Quality Assurance/Engineering Applications Staff to Engineering Records Staff was required during Reproduction of the DVD's issued to Contractors. In general contractors accepted the method of receiving the data via DVD.

			Solution: A plan for streamlining project plan assembly and creation in PDF format is in progress. It will involve changes to the Department of Consumer Protection Regulations as it would pertain to digital signature usage. Contract Development needs to be involved in a design review prior to FDP. Provide training to FHWA so they can use ProjectWise Web, to access the DCD Data (Plans and Specs) rather than using the DVD Distribution Method. This will significantly reduce technical support. In order to further reduce support requirements during reproductions, it would be an additional benefit if the Department had an alternative website dedicated to hosting contract data during the advertising process. Eng. Records (Printing Services) needs to be trained thoroughly in an effort to improve their capabilities in dealing with digital contract data.
	2. Addendum Process and Use of ProjectWise Web for Design Submissions.	P	The consultant engineers were successfully trained and transmitted significant sized data through the system. Typically Consultant Engineers would transmit the data on PC's that were independent so they would not interrupt normal production or they would transfer data after hours. ProjectWise Web has been instrumental in QA/QC Routines with checking the final project plans prior to them being advertised.
	3. Software Versions	F	Internally at DOT, OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment and inconsistent versions of Acrobat.
			Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.

	4. Potential for Operation Cost Savings and Use of Data by Contractors.	P	As a potential service, significant operational savings are being realized with full production of digital data. In general, contractors accepted the method of receiving the data via DVD. The delivery of electronic data makes it significantly easy for Contractors to communicate more efficiently and distribute plans and specs faster. It seems as thought the larger contractors and better prepared to deal with electronic media. Ultimately, the project ended up getting 4 bidders with Walsh Construction being awarded the contract.
	5. Construction Order Process	TBD	TBD
	6. Const. Dist. Access b. Basic File Transfer/Reading of files via the WEL	TBD	This has not been set-up and/or coordinated yet. Training is anticipated to occur soon.
	7. ProjectWise & Primavera Expedition Interoperability	TBD	For the piloting, Quality Assurance/Engineering Applications provided the prime data manager for the Q-Corridor Project access to the ProjectWise Web with the understanding that they need to be aware that the latest and greatest contract plan data is located on the ProjectWise System, and copies could be distributed via Expedition as needed. For the future, there is a definitive need for better collaboration, archival procedures, and linking between both systems via common dashboards and/or synchronized account administration. Without the development of a clear integration plan it will be difficult for the department to progress using both systems.

<Pilot Project 0138-0221 – Moses Wheeler Bridge > FDP - Consultant Design Submission –Digital Final Contract Drawings

| 22 | 1. Final Design/Advertising Process
    a. PDF Plotting
    b. Digital Signature Process
    c. DCD Review by FHWA
    d. Advertising process via DVD | F | After some initial support requirements for Bentley's InterPlot Organizer, the Consultant Engineer involved in the project was able to successfully use the software to plot PDF's.

There were numerous issues reported with the digital signature installation and confusion on how to use the signature. The problems seemed to stem from the Consultant Firms IT and Engineering Departments confusion on how to install and set-up the digital signature properly. After some initial by Quality Assurance – Engineering Applications Staff support and GeoTrust/VeriSign support.

Contract Development decided to submit digitally via DVD the DCD approval to the FHWA. While it was a savings in paper, it required significant support from Engineering Applications Staff since Contract Development Staff is not trained sufficiently and does not have sufficient knowledge in dealing with digital contract data. One issue occurred in which the project engineer assumed the system would take care automatic DCD approval from FHWA and he was not clear that he needed to reproduce a DVD. The ultimate result was a delay in timely advertising of an addendum and required federal approvals.

Quality Assurance Engineering Applications provided initial pilot training and support for the Contract Development Unit; however, additional documentation and training will still be required. See Engineering Business Assessment Above.

Significant technical support by Quality Assurance/Engineering Applications Staff to Engineering Records Staff was required during Reproduction of the DVD's issued to Contractors.
In general contractors accepted the method of receiving the data via DVD. There were issues plotting pdf's via Reprodesk. |

				Solution: A plan for streamlining project plan assembly and creation in PDF format is in progress. It will involve changes to the Department of Consumer Protection Regulations as it would pertain to digital signature usage. Contract Development needs to be involved in a design review prior to FDP and needs significant basic computer training. Provide training to FHWA using ProjectWise Web, so they can easily access the DCD Data (Plans and Specs) rather than using the DVD Distribution Method. This would significantly reduce technical support. Eng. Records (Printing Services) needs to be trained thoroughly in an effort to improve their capabilities in dealing with digital contract data.
		2. Addendum Process and Use of ProjectWise Web for Design Submissions.	TBD	The consultant was trained, but it appears they will require additional training.
		3. Software Versions	F	Internally at DOT, OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment and inconsistent versions of Acrobat.
				Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.
		4. Potential for Operation Cost Savings and Use of Data by Contractors.	P	As a potential service, significant operational savings are being realized with full production of digital data. In general, contractors accepted the method of receiving the data via DVD. The delivery of electronic data makes it significantly easy for Contractors to communicate more efficiently and distribute plans and specs faster. It seems as thought the larger contractors and better prepared to deal with electronic media. Ultimately, the project ended up getting 4 bidders with Walsh Construction being awarded the contract.
		5. Construction Order Process	TBD	TBD
		6. Const. Dist. Access c. Basic File Transfer/Reading of files via the WEL	TBD	TBD

	7. ProjectWise & Primavera Expedition Interoperability	TBD	TBD

23	**<Pilot Project 0301-0106 – >New Haven Rail Yard – CCO Shop> - FDP - Consultant Design Submission – Digital Final Contract Drawings**		

	1. Final Design/Advertising Process
	    a. PDF Plotting
	    b. Digital Signature Process
	    c. Digital Submission Process
	    d. Advertising process via DVD
		P	The Consultant Engineer had initially prepared their design plans according to the 2005 digital design environment, and was already familiar with Bentley IPlot Software. This project also incorporated recommendations by the Quality Assurance Engineering Applications to streamline the plan assembly and digital signature processes. Legally, this posed issues since we were required by DOT's legal staff to enforce supplemental agreement language into the Department's Contracts with Consultant Engineers. With the revised procedures it becomes very important for Consumer Protection to incorporate new language similar to what Landscape Architects have been approved for.
			
			The Consultant Engineer successfully submitted their FDP Plan Set through ProjectWise Web.
			
			This project happened to be the 4th Pilot Project the Engineer from Contract Development was involved with. Significant progress was made by the engineer in better understanding of the system uses. It is apparent the more use by the engineers, the more they become familiar with the system.

	2. Addendum Process and Use of ProjectWise Web for Design Submissions.	TBD	TBD
	3. Software Versions	F	Internally at DOT, OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment and inconsistent versions of Acrobat. Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.
	4. Potential for Operation Cost Savings and Use of Data by Contractors.	P	As a potential service, significant operational savings are being realized with full production of digital data. In general, contractors accepted the method of receiving the data via DVD. The delivery of electronic data makes it significantly easy for Contractors to communicate more efficiently and distribute plans and specs faster. It seems as thought the larger contractors and better prepared to deal with electronic media. Ultimately, the project ended up getting 4 bidders with Walsh Construction being awarded the contract.

	5. Construction Order Process	TBD	TBD
	6. Const. Dist. Access d. Basic File Transfer/Reading of files via the WEL	TBD	TBD
	7. ProjectWise & Primavera Expedition Interoperability	TBD	TBD
	\<Pilot Project 0150-0126> Washington – Retaining Wall – 30% Preliminary Design Review		
24	1. PDF Plotting 2. Sending the Design Submission on a **(DOT Internal)** collaborative review using Adobe Acrobat.	P	The project engineer did not have any issues assembling and using Bentley IPlot Organizer. The Soils and Foundations Group suggested having the ability to edit or modify each others comments especially within their own group. Out of the Box, Adobe Acrobat does not allow for this, would need to be custom.
	3. Software Versions	F	Internally at DOT, OIS EA Support was unable to script software installation on users PC's thus resulting in inefficient software deployment and inconsistent versions of Acrobat. Solution: OIS EA Support needs to deploy software via scripting and to keep users updated with the latest software versions.

Additional Items

25	**<Accessing Archive Const. Data>**	P	Since test results showed promising result with dealing with ProjectWise Web Access, it is assumed that Municipalities, Planning Agencies, Engineers, Surveyors and Architects will no issues accessing the system. The issues experienced with searching via the web client are not applicable since a likely archive system will take on individual document attributes rather than project attributes. It is preferred to test this scenario when a production system is in place.

26	**<CAD Production - Development- PW Internal Managed Workspace>*.**
	    1. Development of a PW Management Workspace Environment
	    2. Testing of a PW Management Workspace Environment
	        a. Plotting / Publishing
	            i. Local vs. Server
	        b. InRoads Integration
	
	   * Consultant Help Needed for Management Workspace Integration
		TBD	We have been waiting for approval for the use of DOIT Consultant Services to assist in this testing

27	**<CAD Production - Development- PW External Managed Workspace>.**
	    1. Development of a PW External Managed Workspace Environment
	    2. Testing of a PW External Managed Workspace Environment
	        a. Plotting / Publishing
	            i. Local vs. Server
	        b. InRoads Integration
		TBD	We have been waiting for approval for the use of DOIT Consultant Services to assist in this testing

V8i Version Technical Evaluation Criteria for ProjectWise Proof of Concept			
Technical Point	**Significance**	**Previous Functional Evaluations**	**Pass/Fail**
Athens using .Net vs. TomCat	Allows deployment at DOIT. Previous web server versions used freeware components contrary to DOIT standards. Attempts at using other web presentation layers (i.e. Go Global) failed.	Previous version setup at DOT. Used in-house: performance sufficient, abilities insufficient Demonstrated with DDE in 2006; warm reception. Used by 2 Consulting Firms via VPN fall 2006: VPN connections unreliable, data transfer rates insufficient and variable.	P
Gateway Server – Integration Server complete integration	Older versions of gateway services routed to Integration Server, Database Server and File Caching Server. New version routes all requests through Integration Server, which will pass through and back data requests. Allows deployment of major components at DOT vs. DOIT	N/A	P
Net change capability with file caching servers	Ability to analyze binary layout of files on main file server vs. satellite file server and only transmit delta. For large files, this reduces network load and user lag time.	Testing with District Offices and Engineering Archives facilities with older version yielded 60 – 70 minute download times.	F
No other DOT using Bentley's products has the requirement of using a remote location (DOIT) for internet access	No way to determine from vendor experience impact of network latency across multiple connections / tiers		P

Proof of Concept Summary

Summarize the results and conclusions drawn from the POC testing

1. **CTDOT does not have necessary IT Technical Resources to effectively support and maintain a DOT Hosted system. A vendor hosted solution should be pursued to further evaluate the pros and cons.**

2. **Software versioning, distribution and management methods have not been properly standardized on by DOT's OIS Engineering Applications Support Unit.**

3. **DOT's Remote Offices will need a more robust Network Infrastructure (Increased Broadband Capability). A phased approach considering funding the District 3 and 3A should be considered.**

4. **In order for the engineering business process using an ECMS to be successful, significant training, documentation and support will be required for both Internal and External Design Groups. Suggestions for the development of support structure are outlined above.**

5. **The continued development in the area of digital contract plans submissions and electronic bidding must continue to support the Governor's Executive Directive #3.**