



# Three Critical Challenges on any ARRA Construction Project

and how to overcome them with online collaboration

aconeX

# Introduction

Federal agencies  
and project  
managers are  
under pressure to  
deliver successful  
projects

To create jobs and upgrade the nation's infrastructure, the American Recovery and Reinvestment Act of 2009 (ARRA) allocates \$130 billion to construction projects, for everything from airports to waterworks.<sup>1</sup>

These projects are expected to help lay the foundations for a robust and sustainable 21st century economy. The public and the media are watching closely.

"The American Recovery and Reinvestment Act has made it clear that every taxpayer dollar spent on our economic recovery must be subject to unprecedented levels of transparency and accountability," says the website [Recovery.gov](http://www.recovery.gov).<sup>2</sup>

Government agencies and project managers are under considerable pressure to deliver ARRA projects with maximum efficiency and minimal waste.

This white paper outlines three critical challenges to any stimulus package construction project:

- + Managing the large number of documents generated
- + Coping with the pressure for on-time delivery of high-profile public projects
- + Complying with tough regulatory requirements for records security and archiving.

The paper then shows how using an online collaboration platform can help overcome these challenges and deliver successful projects. It also provides a detailed checklist of what to look for in such a system.

<sup>1</sup> Debra K. Rubin et al, "Stimulus Progress Report: Rolling Out the Jobs," Engineering News-Record, September 2, 2009. Retrieved September 15, 2009 from [http://enr.construction.com/business\\_management/finance/2009/0902-StimulusProgressReport-1.asp](http://enr.construction.com/business_management/finance/2009/0902-StimulusProgressReport-1.asp)

<sup>2</sup> "Accountability and Transparency," Recovery.gov website. Retrieved September 15, 2009 from [www.recovery.gov/q=content/accountability-and-transparency](http://www.recovery.gov/q=content/accountability-and-transparency)

# Challenge #1

## Huge number of documents

|                                           |
|-------------------------------------------|
| <b>\$10 Million Construction Project</b>  |
| 10,000 documents                          |
| up to 50 participants                     |
| ~10 Gigabytes of data                     |
| <b>\$100 Million Construction Project</b> |
| 100,000 documents                         |
| 100+ participants                         |
| ~100 Gigabytes of data                    |
| <b>\$1 Billion Construction Project</b>   |
| 1 million documents                       |
| 1,000+ participants                       |
| ~1 Terabyte of data (1,024 Gigabytes)     |

Figure 1: Typical Scope of Large Projects

One major challenge for any agency managing a stimulus construction project is the overwhelming volume of documents, formal correspondence and other information created by contractors, subcontractors, engineers, and other parties.

Figure 1 shows the scope of some typical large construction projects, in terms of documents, participants, and data.

These documents include many different types: blueprints, change orders, contracts, drawings, instructions, letters, memos, minutes, notices, reports, specs, schedules, tenders, and many more.

Another complication: As shown in Figure 2, documents do not flow along a neat, linear path. Every day many participants within the project team network need to access, approve, comment on, refer to, and update them.

And this network itself grows and shrinks over time, as various players arrive, provide services, and then leave the project.

To manage all this, agencies need a system that allows all project members to exchange vast numbers of documents with one another in an efficient way.

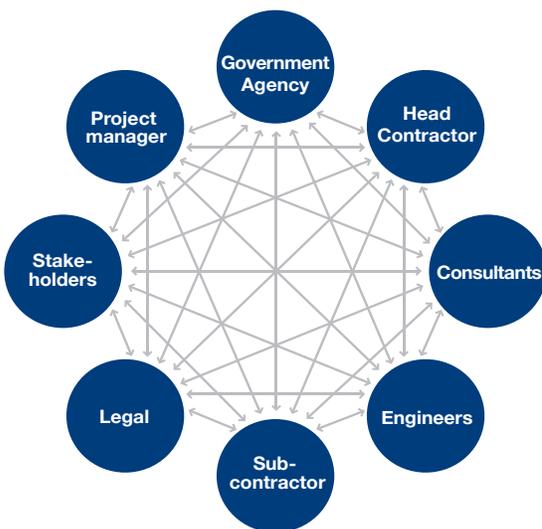


Figure 2: Document Exchange on a Typical Capital Works Construction Project



## Challenge #2 Time pressures

Deadline pressure  
can lead to  
mistakes and  
mis-communication,  
which can easily  
delay a project

With the unprecedented investment of the ARRA, government agencies are being asked to launch and manage billions of dollars worth of projects in a relatively short timeframe.

In fact, three out of five of the ARRA's "crucial objectives" for federal agencies mention time:

- + Recovery funds must be distributed "in a prompt... manner"
- + Public benefits must be reported "in a timely manner"
- + All projects must avoid "unnecessary delays."<sup>3</sup>

That's a clear mandate to move quickly and proceed in an efficient manner. And this is an easy area for the media and the public to monitor. After all, if a bridge is being built in your area, it's not hard to see how far along it is.

Deadline pressure can lead to mistakes and mis-communication, which can easily delay a project. Managers of stimulus projects must do everything they can to deliver as quickly as possible, without making mistakes.



<sup>3</sup> Ibid.

## Challenge #3

# Secure records and permanent archives

Project managers must apply standards and procedures to ensure records security

To comply with ARRA accountability requirements, government agencies must preserve all records relating to decisions, procedures and transactions. In particular, agencies are responsible for reporting any removal, alteration or destruction of records.

As well, many states have their own regulations for archiving public records.

This implies that project managers must impose certain controls over how documents are created, stored, and maintained. They must also apply standards and procedures to ensure records security.

Agencies and project managers must be able to track all changes to a mountain of documents, and guarantee that many thousands of documents are stored securely.

But how can anyone achieve this across a vast network of participants, each with its own corporate standards—and with most documents stored on remote systems, where they are subject to security whims and lapses?

Any system to help manage information on an ARRA construction project must provide an authoritative database of all records, with impeccable version control and detailed audit trails. It must support both fluid exchange of working documents, and permanent archiving.



## What's wrong with existing tools?

According to an IDC study, paper is a major source of information overload

As you know, the traditional tools for managing construction projects include:

- + Hard copies
- + Couriers
- + Fax
- + E-mail
- + CDs and flash drives
- + Shared network drives
- + Internal document management software

If these tools are so effective, why do knowledge workers spend up to 20 hours a week searching for, shuffling, and reformatting information in unproductive ways?<sup>4</sup>

Let's look at the drawbacks of using these traditional tools for stimulus package construction projects.

**Paper files** are so easy to lose or misplace that most construction firms prefer to manage their files electronically. According to an IDC study, paper is a major source of information overload, and 7 out of 10 knowledge workers prefer to deal with digital information.<sup>5</sup>

**Couriers** remain relatively slow and expensive. While **fax** is fast and cheap, it doesn't deliver an electronic file that can be edited on a PC. And large-format documents like blueprints are often too big to fax.

<sup>4</sup> Susan Feldman et al, "The Hidden Costs of Information Work," IDC, March 2005, page 5.

<sup>5</sup> "Cutting the Clutter: Tackling Information Overload at the Source," IDC, March 2009, page 5.

Although **e-mail** is fast and cheap, it's a major source of information overload. In fact, more than half of the American organizations recently surveyed admit that their e-mail is out of control, and they have little confidence that important e-mails will be accessible in the future.<sup>6</sup>

On top of this, e-mail systems struggle to handle large files, with no guarantee of delivery. When there are batches of drawings to transfer, and a supply chain to keep accountable, e-mail falls short of what's required.

Burning **CDs** or copying files to **flash drives** is fast and low-cost, but what about version control: How can anyone tell if they have the latest version of a file?

A **LAN with shared drives** or **internal document management software** does help share information within a company, if everyone is disciplined enough to name files properly and save them to the right locations.

But in reality, many of these tools were designed for internal use within a single company. None was designed for multi-year projects that call for intense collaboration between dozens of organizations and many hundreds of participants.

On large-scale construction projects, use of traditional tools can lead to isolated silos of information, where project members can't find what they need, nor share what they have. And none of these provides a suitable audit trail to show what's been approved, promised, or delivered.

Over the duration of a stimulus package project, this can mean delays, misunderstandings, disputes, quality problems, and non-compliance... **all factors that undermine the project's success.**

<sup>6</sup> "State of the ECM Industry 2009," AIIIM, page 4. Retrieved September 15, 2009 from [www.aiim.org/stateofecm2009](http://www.aiim.org/stateofecm2009)

## Bridging the gap

ARRA projects call for a more industry-specific, more powerful, more reliable platform for sharing information

There is clearly a gap between what's needed for an ARRA construction project, and the traditional tools most often used today.

To bridge this gap, these projects call for a more industry-specific, more powerful, more reliable platform for sharing information. So what would an ideal system to overcome all three challenges look like?

This would likely be a project-centric, web-based service that provides anytime, anywhere access to all participants, no matter what time zone or city they are in, or what computer system they use.

The system would need to scale up for an unlimited volume of data and users. To get high adoption and produce quick results, it would have to be easy to roll out, fast to learn, and simple to use.

And it would need to provide powerful document management and exchange, version control and comparison, secure access, audit trails, and permanent archiving.

Importantly, the system must remain independent of any one organization, including the agency and project manager. That way, no participant is expected to store documents behind another firm's firewall and risk losing control of their intellectual property.

"Enhanced security and reporting requirements associated with most federally funded... programs almost demand some type of electronic content management solution to track and protect the myriad of data collected and exchanged," says one expert.<sup>7</sup>

<sup>7</sup> Jim Till, "ARRA Stimulus Funds and Your ECM Project?" Just Sharing blog, April 1, 2009. Retrieved September 15, 2009 from <http://easyecm.blogspot.com/2009/04/arra-stimulus-funds-and-your-ecm.html>



## The Solution: A project collaboration platform



**Figure 3:** Information Exchange using a Project Collaboration Platform

Fortunately, a system that meets every requirement is available and already widely used within the construction and engineering industries.

A project collaboration platform allows all project members — from the owner to the subcontractors — to access, distribute, track and store their documents and correspondence using a single, web-based system. All project data is securely archived and cannot be deleted or accessed by unauthorized personnel.

This provides a proven way to manage information at every stage of an ARRA project.

**In the early stages**, the collaboration platform supports the capture of every drawing and specification, ready for handover to the selected contractor.

**During construction**, all team members have fast access to their documents through a single, secure platform. Government agencies and project managers have visibility over the progress of tasks and can easily track communications and generate reports that identify bottlenecks.

**And on project completion**, there is a complete, fully-searchable archive of asset-related documentation that supports government agencies in meeting ARRA accountability requirements.

More and more of the construction industry has adopted this type of collaboration technology. And those who have used it, like it.

“Overall, 96% of people that have used collaboration technology are happy with it,” reports one recent study, and they “are likely to re-use the technology on future projects.”<sup>8</sup>

<sup>7</sup> Paul Watts, “Proving Collaboration Pays Study Report,” NCCTP, June 2006, page 5. Retrieved September 15, 2009 from <http://ncctp.constructingexcellence.org.uk/marketresearch.jsp>

## Checklist: What to look for in a provider

These lists detail what to look for when selecting a project collaboration platform, and how it can help overcome each of the the three major challenges on an ARRA construction project.

### Overcoming challenge #1: Huge number of documents

- ✓ A central repository that provides a “single version of the truth” for all participants
- ✓ Efficient storage and distribution of large volume of documents in many different formats
- ✓ Unlimited number of users
- ✓ Unlimited number of documents
- ✓ No high licensing fees; the option to pay-as-you-go.

### Overcoming challenge #2: Time pressures

- ✓ 24/7 access to all project information
- ✓ Google-style keyword searches for real-time retrieval of documents
- ✓ Rapid distribution of information to any authorized team member
- ✓ Instant reports on key tasks and milestones
- ✓ Real-time visibility of costs, claims, variations, changes
- ✓ Fast and easy to implement across entire project team
- ✓ Consulting to encourage adoption by entire team
- ✓ Training for all team members
- ✓ Unlimited 24/7 support.

### Overcoming challenge #3: Secure records and permanent archives

- ✓ Frequent automatic backups of all documents
- ✓ Consulting on best practices for records management
- ✓ Granular permissions for “need-to-know” access
- ✓ Effective version control of all documents
- ✓ Detailed audit trail of all changes to all documents to show “who did what when”
- ✓ Continuity when anyone joins or leaves the project
- ✓ Neutral, independent platform that gives all organizations control over their data
- ✓ Disaster recovery plans and procedures
- ✓ Permanent, secure archiving of all documents
- ✓ At project completion, complete historical database available for ongoing maintenance of asset.

## Conclusions

A system that meets these requirements is available today from Aconex

To ensure the success of ARRA construction projects, government agencies and project managers need to manage a vast number of documents, under intense time pressures, and comply with tight regulations for records security and archiving.

The solution is to use a project collaboration platform – a secure, on-demand, web-based system for managing information and communication on construction projects.

Among other things, this platform must be able to support unlimited documents, users, and data. And it should be bundled with a high level of support services to help encourage high adoption.

A system that meets these requirements is available today from Aconex, the world's leading supplier of online collaboration solutions for construction and engineering projects.

### About Aconex

With 35 offices around the world, Aconex has serviced more than 5,500 projects with a combined value of in excess of \$210 billion.

Clients include AECOM, Arcadis, Arup, Las Vegas Sands, McDonald's Restaurants, and Parsons Brinckerhoff.

To find out more about how Aconex can help you overcome the three critical challenges to your ARRA construction project, visit [www.aconex.com](http://www.aconex.com) and click on Government & Infrastructure, or call one of our industry consultants on **1-888-5ACONEX**.



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