

## Take It Outside: Using Tablets to Bring Company Data to the Field

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**CI3259** Tablets and smartphones have made it possible to carry an infinite amount of project data in the palm of your hand. In this class, we will demonstrate several workflows and strategies for getting project data into the field. We will explore how this can be done on Apple® iPads®, Android™ tablets, and Microsoft® Windows®-based devices. We will show how project managers, inspectors, and surveyors can access information when they need it the most—in the field—even without an Internet connection.

### Learning Objectives

At the end of this class, you will be able to:

- Access project data online and offline with iOS, Android, and Windows devices
- From the field, collaborate with project members in the office
- Identify best practices for sharing, syncing, and securing project data
- Identify strengths and weaknesses of each mobile operating system and explain how to pick the right one for you

### About the Speaker

*Greg has worked in the civil engineering industry 8 years. Beginning on a survey crew, Greg quickly showed his talents and vision to develop streamline and efficient business processes using technology. For the past 2 years he has been a Systems Administrator for a medium sized Civil Engineering / Surveying / Structural / Land Planning firm in Oregon and Washington. Paring together his IT knowledge and experience with his creativity and need to make things more efficient, Greg has successfully introduced new technology and business processes that result in reduced business cost and a more productive workforce.*

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## Access project data online and offline with iOS, Android, and Windows devices

### Communication in the field

Communication between the field and office has always been important for our industry. I joke that due to the high availability, carrier pigeon may have been the best way to communicate during construction of The Empire State Building. During the 1930's what else was there? We didn't see the first pagers until the 50's. Technology has advanced at a feverish pace since then. Over the last 30 years we have gone from 2lb., 30 min talk time, \$4,000 brick phones, to 4oz, 8 hour talk time, \$200 super computers. What can be done with our phones today is truly amazing.

### Data in the field

Blueprints have been around for centuries ([first developed in 1725](#)), even before that we have been able to bring drawings/plan sets into the field. Our biggest hurdle has always been the size of drawings and quantity of sheets needed for large projects. It's not unheard of to see plan sets for large projects containing over 50,000 sheets. Laptops have been an option, although due to its form factor they have not been the perfect fit we have been looking for.

### Tablets to the rescue

The recent surge in tablets has given us the benefits of smart phones and laptops in one device. We can now collaborate in real-time with the office from our job site, while holding an infinite amount of project data in the palm of our hands. The landscape of tablet computing is changing every day. There are great offerings for every operating system; in this class I will outline how we manage project documents, drawings, data collection and office collaboration using Apple, Android, and Windows devices.

### Project Documents

There are several great options for creating and viewing documents on tablets. The key to selecting an "Office" app for your mobile device is to find one that will sync with cloud services and will read/ write the file formats (on and offline) you use within your company. Some apps will only act as readers, or only sync to their own cloud service. Others will read every file format that you need but only write TXT files.

#### Project Documents, what we use:

**iOS: Office2 HD**

**Android: Kingsoft Office**

**Windows: MS Office 2010**

**\* Google drive is used on all three platforms.**

### PDF

I have had my ups and downs with this file format. Back in the days when you had to have Adobe Acrobat to create a PDF, I was constantly cursing those three despicable letters. Later when more software became available to us and creating PDFs became much easier, things were great. Unfortunately due to security holes, the file

format has become a malware nightmare. On mobile devices they are a great tool. PDF's are easily viewed, perfect for redlines, and we have seen a real value in using PDF forms.

**PDF Forms, what we use:**

**iOS: PDF Expert**

**Android: Adobe Reader**

**Windows: Adobe Reader**

**\*Note: Adobe Reader does not have webdav capabilities so the use of a FTP client or cloud services app is also required.**

**SharePoint**

It has become commonplace for companies to move their corporate intranets and project collaboration sites to Microsoft's SharePoint . The development of SharePoint mobile apps has made all this vital corporate and project data available to mobile users even when they are not connected to the internet. Custom forms, task list, and shared calendars can now be accessed on mobile devices and in some cases these apps offer a better user experience than the native desktop web version.

**SharePoint, what we use:**

**iOS: SharePlus Pro**

**Android: SharePlus Pro**

**Windows: SharePoint Workspace**

**Project Drawings: Autodesk offerings**

Autodesk provides several options for viewing, modifying, and creating project drawings and 3D models. It is obvious that they embrace mobile devices and are actively developing applications on all platforms. This allows us to get project data onto mobile devices and into the field.

**Autodesk 360**



Autodesk® 360 is a cloud computing platform that provides a broad set of features, cloud services and products that can help you improve the way you design, visualize, simulate, and share your work with others anytime, anywhere.

## AutoCAD WS



AutoCAD WS enables you view, edit, and share AutoCAD® drawings with anyone, anywhere using your mobile device. Annotate and revise drawings in the office, in the field, or in a meeting. Work on designs without an internet connection, and easily open DWG, DWF, and DXF™ files directly from email.

## AIM 360



The Autodesk 360 Infrastructure Modeler for Mobile app gives you the ability to view design ideas within the context of the existing environment and without the need for additional desktop software.

### Project Drawings: PDF

What we have found is, although Autodesk gives us the ability to open DWG's on mobile devices, viewing and redlining DWG's is much easier when they are PDF's. By using PDF our users don't have to create new user accounts with Autodesk or remember which app does what. For iOS we use an app called GoodReader (\$5). GoodReader is PDF reader that can handle just about any file type you throw at it.

**Quick tip:** Flatten PDF's to and from GoodReader to help with Acrobat/Bluebeam compatibility.

**PDF Drawings, what we use:**

**iOS: GoodReader**

**Android: Adobe Reader**

**Windows: Adobe Reader**

**\*Note: Adobe Reader does not have webdav capabilities so the use of an FTP client or cloud services app is also required.**

## From the field, collaborate with project members in the office

### Survey Data...

The most desirable application for our business would be a Trimble or TopCon to make a mobile app that works with our total stations. Our surveyors have some pretty incredible devices in their hands, yet we still have to support their terrible Pocket PC based data collectors. They are slow, and compatible with NOTHING. Back in 2004 I pioneered a system with TDS Rangers, Cellular Modem, and FTP software to allow us to share data between the field and office. Unfortunately almost 9 years later nothing has changed, we are still using that same process. Our data collectors still can't receive data via blue tooth from other devices. The only options seems to be paying for a modem for them at \$50-60/month or using the survey crew phones as hot spots, we have chosen the later.

Tablets for our survey crews at this point don't really make a whole lot of sense. iPhone's have proven to be very helpful, we share notes and pictures with the office in real-time. The most useful applications for our survey crews are Evernote, the camera, and GoodReader. If the field crews run into any problems or have a question about something they make a note in Evernote. Generally they insert a picture and audio describing the issue along with typing in a few notes. Evernote uses the phones GPS to add a location to the note and pictures.

### Pictures from Mobile Devices

Having a camera on your tablet or phone is essential to getting information back to the office. Make sure that location services are enabled; it can be very useful for future reference. Most of the time the camera on your mobile device is good enough but there are times when you want a higher quality picture, or due to weather conditions you don't want to be holding up a tablet to take pictures. For those situations Eye-fi cards paired with a rugged camera are great.

### Field Notes

As mentioned earlier we have found Evernote to be extremely useful for taking notes in the field. Rather than using Rite in the Rain notebooks for each project our survey

crews are able to keep all their notes in Evernote. They can insert pictures, audio notes, sketches, and even their current location. Evernote's search features far exceed thumbing through the dirty pages of hand written notes. You can search by location, tags, and text. Evernote will even search text in pictures. The syncing feature of Evernote makes collaboration between field and office really easy. Notes made in the field are reflected in the offices almost instantly.

**Field Notes, what we use:**

**iOS: Evernote, MS Onenote**

**Android: Evernote**

**Windows: Evernote**

### Field Sketches

Photographs, red lines, and notes are all useful for capturing information while at project sites but sometimes nothing beats a quick sketch on a napkin or field book. There are many options for making sketches on tablets. Autodesk's Sketchbook is available on both iOS and Android.

**Field Sketches, what we use:**

**iOS: Paper, Sketchbook**

**Android: Sketchbook**

**Windows: Paint**

**\*Note: Pencil and paper plus a mobile devices camera is still used from time to time**

### 3D Models on Tablets

Right now I am not sure there is a huge need for creating 3D models in the field with tablets, but it is possible, and there is a WOW factor associated with it. 123D Catch and 123D Design are Autodesk products that allow you to create models from mobile devices. A possible use case is capturing existing conditions on a job site, so the office can insert the 3D mesh into the project model.



### Remote Desktop

We use remote desktop in the field to access specialty applications, internal websites, and IM clients that we have not otherwise made available to mobile devices. We have found using virtual machines with tablet friendly screen resolutions makes the user experience much better. Also, adding several desktop icons to often used applications and websites will make navigating from a tablet much easier.

<b>Remote Desktop, what we use:</b>
iOS: Splashtop
Android: Splashtop
Windows: VPN Client and Remote Desktop Connection

### Selecting a platform

3-4 years ago there were almost NO options, I would have said use a laptop, netbook, and if you must, HP tablet. 2 years ago my choice would have been iPad. Today I believe a company can support all three platforms. What it really comes down to is your application and sometimes hardware needs. There are still a couple general guidelines to consider.

- Never go bottom shelf!
- iOS tends to be easier for inexperienced users.
- Windows will give you a 1 to 1 most of the time.

## Securing your mobile devices

Securing the data on mobile devices, as well as the corporate information it has access to, is often an afterthought. Tablets and smart phones are a hot commodity right now and their portability makes theft and loss a common occurrence. At the very minimum make sure that any device containing corporate data has some sort of remote wipe capability.

**Quick tip:** If you are connecting to MS Exchange 2007 or later remote wipe should already be available.

## Other considerations should include:

- Multiple users on one device (pool phone/tablets).
- Allowed applications list
- Device image management
- Device encryption (especially for Windows devices)

## Hardware Considerations

Mobile devices are a very personal thing and even if your company decides on a single platform/device there will be accessories and related hardware that will need to be provided. Some people will find using the on-screen keyboard completely impossible and will require an external one. For those who will be sketching a lot, a stylus may be useful. How will you protect your tablet from being dropped? Should you buy a tablet with 3G/4G built in, buy an external hotspot, or just hope there is an open hot spot available on site (will it be secure)?