



IT20418

Evolution of Large Organization Implementation of Autodesk Civil 3D at Wisconsin DOT

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Learning Objectives

1. After this class attendees will understand the importance of the project standards.
2. After this class attendees will be learn how to adjust project standards when switching between versions.
3. After this class attendees will understand the importance of the standards rollout to network drive locations.
4. After this class attendees will understand the integration with external project partners.

Description

Since Wisconsin DOT adopted Civil 3D their standards and workflows have evolved in response to their internal users, and their external consultants. With each release new tools and workflows were developed to make continuous improvement in the design results. With a large user-base effected by each change, this process requires careful planning, testing and timing. There is also a significant effort to sharing their standards with users outside of their network in the simplest, and most reliable method possible.

Your AU Expert

Russ Nicloy is a Civil Applications Technician for MasterGraphics. For 12 years he has provided training, consulting, and custom implementation for Civil 3D. Russ is an Autodesk Certified Trainer, as well as a Wisconsin DOT certified trainer. Before joining a reseller Russ worked for 10 years in a production role for gas, water, and site design. He also has 5 years of experience in GIS for utilities. Russ has spoken at Autodesk University as well as many conferences for surveyors, road designers, municipalities, and GIS professionals.

The Importance of Project Standards

Standardization

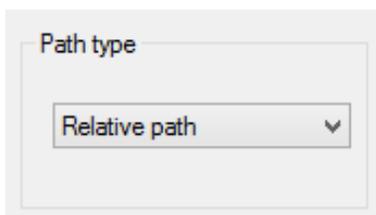
The larger the organization the more important standardization becomes. Standardization should create efficiencies in time savings and reduced frustration to the design team members, and make your data easier to consume by your customers.

Benefits

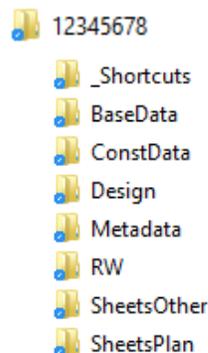
Setting up standards and templates once for all projects means less rework as new projects are started. While some styles are unique to one project, repeatedly creating the same style consistently is a waste of time and drags users away from the actual project design. This process will benefit from review of previous projects, and building standards that reflect what has worked in the past. It is important to keep in mind new tools and proposed workflow changes.

New team members are more easily assimilated into a project because they can more intuitively find source object and reference file locations. This is a potential time-savings gold mine, since a user will jump between files and sources objects many times to understand the design construction up to the point of their joining the project. The larger the project, the more complex, the better an intuitive or consistent project structure is to the forward progress of all future projects.

References will be more integrated as projects are moved between organizations or team members. External references (XREFs) and data shortcut references need to have steady pathing so that the data is shared properly. These paths will likely not be in the same drive letter, or the same folder path as the original source of the project, so “Relative Path” XREFs and a consistently placed “_Shortcuts” folder are critical. If you have a folder structure that is respected by users, the recipients of project data will not have to start work by reconnecting references to their sources. Larger projects have more references, so broken references take longer to rectify.



XREF DIALOG SETTING FOR “RELATIVE PATH” CAN PREVENT BROKEN REFERENCES WHEN PROJECTS ARE TRANSFERRED TO OTHER NETWORKS.



THE _SHORTCUTS FOLDER IS IN THE STANDARD FOLDER STRUCTURE SO THAT IT IS CONSISTENT IN THE PROJECT

Should Separate Offices Create/Manage Their Own Standards

It can be attractive to say that “All of our files will look the same, whether from our Omaha office or our Denver office!” Ask the users in those offices who don’t have the same customers, or the same types of projects. One size does not always fit all. Investigate with your team what special needs they have. You can make the majority of your standards work in all of your locations, if you intentionally plan for those that have unique needs.

Review and Evolve

A critical part of standardizing workflow and styles is the process by which the standards can grow, change, and evolve. This is not a question of “if” they will evolve, they **MUST** evolve. The challenge is how to manage that evolution.

Create a Forum that Fosters Input

This is simple in concept. Give the users, from the entire breadth of the organization, a place to come and learn and discuss together. Your users are a great source of information on what works and what doesn’t. You may have to sift through some irrational complaints along the way (weren’t you facing those anyway?), but you’ll learn faster that some workflow or standard has actually created a bottleneck, or a significant amount of extra work. The users will also learn best practices, or troubleshooting techniques in context of your organization standards and workflows.

One of the best forums is the user group. WisDOT has internal user groups in each of their regional offices so that users can learn consistent topics, and discuss issues and concerns. WisDOT is also strongly involved in the ACEC-WI user groups that include WisDOT users and consultants from across the state. These meetings are held with remote meeting software so everyone is seeing the same presentation. Questions are addressed locally, to foster easier discussion. They are also recorded so that users who cannot be involved can catch what they missed.

WisDOT’s Methods Development Unit (MDU) has also gathered several task forces to study issues and workflows, ensuring that external consultants are involved alongside WisDOT users. This has the effect of a very scientific approach to addressing change. Hypothesis, testing, and analysis create better workflows and best practices.

Prioritize Change

You need to prioritize change. Change can be painful, and it may not look great on the *immediate* bottom line, but it can have a great benefit over time. As technology and tools evolve old methods become cumbersome. Not to mention holding on to workflow decisions that with the smallest amount of analysis are shown to be wrong. The organization will grow if you do an honest assessment, and embrace change to a method that has a real chance of being better. This is not an argument for change for the sake of change. Open and honest analysis will be a guide toward what changes are appropriate and needed.

To prioritize the change, schedule time to review and test options. Schedule users in this testing so that you get real world reaction to alternative workflows. Break the workflows to be tested into smaller activities so that no one person is overwhelmed with non-billable tasks. Finally, make a reasonable deadline for testing. Without a deadline users will get pulled back to the billable work, and never finish the testing that needs to be accomplished.



CAD or BIM Managers need to be about managing the change. Many are asked to be billable, which begins a slippery slope to “more billable,” and finally to all billable/no managing. This is not an argument against billable CAD managers. It is, however, a warning that prioritizing change sometimes means a few individuals whose first priority is to the team rather than billable time. It can be useful to have a manager who maintains technical knowledge, and understands what their team is facing on a daily basis.

Adjusting the Project Standards between Versions

While prioritizing change is important, it is manifested in the plan for the “next” update. Some changes will be small and relatively easy to roll out in periodic updates. Others may be more complex and need to be planned for the future.

The Minor Updates

Reports from users of problems with blocks, styles, default settings, are all things that can be adjusted to a template, then released quickly to the users. This does require testing to ensure that the issues have been addressed, and that other issues haven’t been created. Documenting these changes is important so that users who reported issues can check to see if their issue has been addressed.

WisDOT posts a monthly update to their standards of minor adjustments in an FTP location. Along with the updates a Readme file is posted that is a running list of updates, so that they can be reviewed later. A user can check to see if their particular issue with a tool has been addressed and it is now “safe” to use that tool.

The Planned Major Updates

The more complex standards updates require a plan and testing. These are changes that fundamentally change an entire workflow, or changes that affect multiple objects. Go about this in a scientific manner. Hypothesize the solution to the perceived issues, test the proposed fixes, and then schedule how the changes may be delivered.

WisDOT’s MDU brings together the proposed changes, test the changes to ensure their need and if they are worth adopting, then plans out how best to release them. The team distributes the issues to be fixed to team members who focus on testing specifics. These results are brought back to be combined into a larger rollout at a scheduled deadline.

An example of a major change was the WisDOT standard layers. Between the 2014 release and the 2016 release WisDOT went from nearly 800 layers down to 365 layers. Layers being embedded in styles made the reduction not a simple task. Which style layer assignments were not necessary were discussed, tested, and then proposed for the larger 2016 rollout. There were many other changes to the 2016 rollout, and the layer changes were just a part of that.

Old Projects are going to Return

Remember that there was a time before your current standards. Many projects get shelved, for a host of reasons, and some for years. When those projects finally come off the shelf they have not been looked at, let alone updated. The differences can be startling when placed up against the most up-to-date files.

A plan needs to be in place for how to update previous standards to the current standards. Autodesk provides tools that can update standards, layers, etc. It is conceivable that some things cannot be updated with these tools (example: titleblocks) so a system of updating these items needs to be planned and tested. With this workflow in place early, the users will have an easier time adjusting to the new system. As major changes are being tested, a plan to update older files should be tested at the same time. This will prevent surprises and scrambling for a solutions later.

Those who don't follow the standards

Some users will make mistakes, and bungle the carefully laid out and documented standards. You will also have the rogue users that just refuse to follow parts of it because they don't agree with some decision that was made. Realistically, some deviances aren't terrible, but if they start to grow they can negate a lot of hard work. You need to address two things. Do you send it back to have it fixed? Or, do you fix it now that you've found it?

There is not quick answer to this. You need to find a consistent level of acceptance, and make sure it is understood. Weigh that against time and effort (read: budget) that could be lost in either solution, and your answer could present itself.

The cleaning up of these issues is very similar to that of cleaning up an old project file that needs to be updated to the current standards. Autodesk's Import Styles command, and Layer Translator can cover a lot issues. WisDOT also scripted tools to import other updated styles, such as Text Styles and Linestyles.

The Push and Pull of Standards Rollout

Large organizations must plan for how standards are distributed to their users. Whether that inside the organization, or to team members that are outside the organization, or both, Getting timely updates to the team is critical. Then, there is the issue of if the team members will install them in a timely manner.

The decision for distribution comes down to one of two main methods; push or pull. Do you want to push the standards out to the team, or have them pull the standards at the time they prefer?

Pushing Standards Updates

Pushing will mean that the users will be updated as soon as your routine is triggered. WisDOT had scripted their push updates to check the user's machine against the current update at every login. A difference between the user and the current update triggered the update to run.

The benefit of the push method is the update is immediate. The downside is the user gets no choice, and sometimes this process can be lengthy, unexpectedly interrupting what the user had planned to work on.



Pulling Standards Updates

Pulling means the user gets to choose the time that their machine is updated, and doesn't require much in the way of automating. The downside of pulling is the user can choose the time of the download, and may choose to do it later. You have probably run into the user for which "later" never arrives. Either they forget, or they never feel the time is right, so the users are unequally updated with the organizational standards. Any issue that a user reports to your organization should first trigger the question, are you current with the updates? Once it is clear that the updates wouldn't have addressed their issue, a true support case can be pursued.

Minor and Major Updates

While all updates are important, not all updates are equal. Some will be easily pushed to users, and not affect other items. Others are more intricately involved with multiple objects and workflows, and need more planning and execution.

Minor Updates

Minor updates would be the "hot fix" type. Things that your users find in the course of using your standards that are broken or need tweaking. These could be critical issues that need immediate attention, or annoyances that can be fixed quickly rather than waiting.

WisDOT plans a monthly update for these types of issues. Users can expect an update, and generally plan to pull them down regularly. They also send emails through an email distribution list which distributes links to the updates and Readme file regarding what is involved in the updates. This addresses both distribution and communication of updates.

Another thing that WisDOT employed to minimize large downloads and installations of updates was "full" versus "updates" packages. The "full" package is for the new user, or new machine that needs everything. The "updates" package is the latest updates for the established user. The time between installing the two packages can be significant.

File name	Description	Last updated
Civil 3D 2016, Windows 7, 64-bit		
wisdot-c3d16-install-guide.pdf	Installation instructions	May 27, 2016
wisdot2016.c3d.msi	WisDOT Civil 3D 2016 installer	August 3, 2016
wisdot-c3d16-fullpkg-2016-05-18.zip	Full package of WisDOT Civil 3D 2016 customizations	May 18, 2016
wisdot-c3d16-update-2016-10-05.zip	Update package that contains only files modified after the full package	October 5, 2016
wisdot-oct-4-16-hotfix.zip	Latest Hotfix for Civil 3D 2016 Installer	October 5, 2016
readme-wisdot-oct-4-16-hotfix.txt	Readme file for latest hotfix	October 5, 2016
wisdot-c3d16-whatsnew.pdf	Change documentation	October 5, 2016

WISDOT FTP UPDATES WEBPAGE

Major Updates

Major updates would be large shifts in process. For example, between the 2014 and 2016 adoption WisDOT made fundamental changes to the templates and how they would be maintained and delivered. After the decision that major adjustments would make the process work more efficiently, they scheduled deadlines for when they wanted these changes to be prepared by. Then, they broke the tasks down between team members, so that they could be ready for rollout. They planned testing and adjustments into the timeframe so that the tools would be working all together by the time they were released.

Integration with External Project Partners

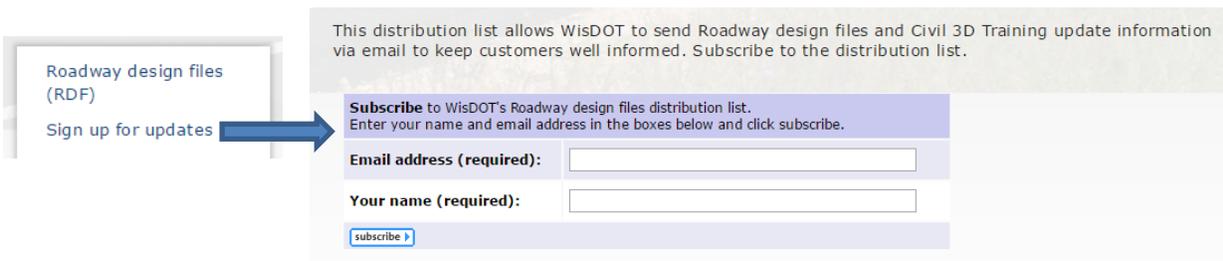
Large organizations and large projects are more likely to have the need to coordinate between more than one organization. This naturally leads to challenges around the coordination of the design work. Planning for the integration of external partners, and how standards and design data will be shared is critical.

The Challenges of external partners

Large organizations, or temporary project partnerships, face a unique challenge of having partners external to their organization. One organization may be in the lead, but different organizations have different cultures, and differing control mechanisms.

Communication

Automated platforms are a great way to communicate changes to standards or project data to large groups. Email distribution lists allow announcements of changes to be immediately pushed to all those concerned. Instead of manually emailing or contacting, email listing makes sure you haven't left anyone out of the communication loop. You may even notice that those only peripherally involved in a project will appreciate being on a list such as this, so they can keep an ear to the project.



Roadway design files (RDF)

Sign up for updates

This distribution list allows WisDOT to send Roadway design files and Civil 3D Training update information via email to keep customers well informed. Subscribe to the distribution list.

Subscribe to WisDOT's Roadway design files distribution list.
Enter your name and email address in the boxes below and click subscribe.

Email address (required):

Your name (required):

WisDOT WEBSITE SIGN-UP FOR EMAIL DISTRIBUTION LIST FOR UPDATES

Standards and Updates

Having an FTP site, or similar type location, will allow for one posting to be shared through the communication loop. Hyperlinking a post in email, or other communications, allows quick direction to the correct location. Dated postings and "readme" files that explain updates can be useful to allow recipients. If the posting includes a running dated list, participants can double check what is current and what has been changed over time.

Turn-around Time

Plan releases and plan time for some external partners to not respond immediately. While the electronic communication process has made instant communication possible, the human factor still can slow this down. Other organizations have internal processes that may take time to filter through the changes and communications.