

COMPANY

Idaho Power

LOCATION

Boise, Idaho

SOFTWARE

Autodesk® InfraWorks 360™

Visualizing old substations faster

Idaho Power mines existing conditions data to find unexpected value

So far, we've used InfraWorks models to plan, communicate with stakeholders, and improve documentation quality. When something works with data from a variety of sources so readily, it's practical to experiment and find unexpected value.

— **Erin Sorensen**
GIS Technician
Idaho Power



Conceptual design for an indoor substation in Autodesk InfraWorks 360. Image courtesy of Idaho Power.

Introduction

Founded in 1916, Idaho Power delivers power—much of it generated from hydroelectric sources—to more than 500,000 customers across 24,000 square miles. The company's vast service area includes more than 275 substations and 4,851 pole-miles of transmission lines. Idaho Power is taking advantage of 3D models and light detection and ranging (LIDAR) remote-sensing technology to improve its documentation of remote assets and more. Autodesk® InfraWorks 360™ and a wealth of LIDAR data helped the company to create, in just hours, models of existing conditions with greater accuracy. These 3D models are helping Idaho Power to do the following:

- Create more accurate design models of existing assets in hours instead of weeks.
- Plan projects across large areas using more detailed information about existing conditions
- Gather more informed input from community stakeholders about projects
- Gain approval of projects more quickly
- Save field crews time due to fewer unnecessary trips to remote job sites

The challenge

Keeping all of Idaho Power's assets in great shape is no small task, especially because many are in remote locations and surrounded by challenging terrain. Substations illustrate the difficulties; many of the company's substations were designed decades ago, and since then they've been maintained and repeatedly upgraded. Drafters added computer-aided designs (CAD) on top of scanned drawings. Many of the plans were not geospatially correct, making it difficult to work with the company's geographic information system (GIS) and other internal departments for upgrades. Idaho Power used aerial photographs as a guide to make the drawings more accurate, but that process can take weeks.

"Inaccuracies in drawings can cause problems in the field," said Erin Sorensen, a GIS technician with Idaho Power. "A field technician could drive several hours to a site to verify location of facilities, and if they forget something during a site visit they may have to go back again to collect more data. In advance of major work, a substation designer previously referred to detailed aerial imagery to

3D helps improve productivity and decision-making

correct as much of a yard plan as possible. But it took weeks, and you might still need to do a site visit to verify things like errors in footing heights and clearances.”

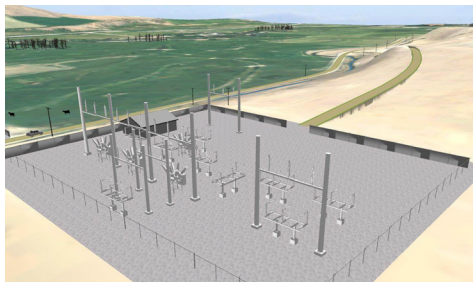
The solution

The CAD production team at Idaho Power began using LIDAR data and one of the company’s newer tools, Autodesk InfraWorks 360, to help improve the accuracy of substation design documentation. InfraWorks generates large-scale infrastructure models from existing data sources and proposed designs. For example, Idaho Power used InfraWorks to share design options for a small substation on a college campus with the school’s leaders. The company also uses InfraWorks to model options for improving the flow of the Snake River in the context of existing conditions.

“You can generate a model in InfraWorks more quickly,” said Eric Bush, a CAD technician with Idaho Power. “On the campus project, being able to share design alternatives in context helped to speed the process of selecting the preferred option. Stakeholders, even those with no design experience at all, can more clearly see how infrastructure may look. I like that Idaho Power employees are beginning to use 3D modeling to make more informed decisions earlier and with fewer site visits.” Sorensen added, “If you’ve got data showing existing conditions, you’re halfway there to creating a model in InfraWorks. We had a substantial amount of LIDAR data from a survey of our transmission lines several years ago. The data set included fairly detailed point clouds of substations along the lines.”

Generating a model

The substation project began with a call to Sorensen from a department leader asking her to create a substation model for use at a meeting the next day. She went to the company’s GIS and identified the point cloud that held the relevant



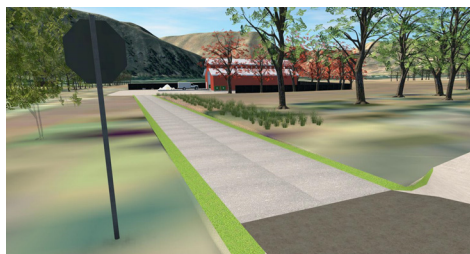
InfraWorks model of a substation in Eastern Idaho used in a presentation to the landowner, station is currently under construction. Image courtesy of Idaho Power.

data. After filtering out irrelevant information, she brought the raw data set into Autodesk® ReCap™ software, which she used to quickly edit the data. She then brought the data into InfraWorks 360 and generated a model. Adding an analysis theme made the model look more realistic. As a final step, she created a video fly-through of the sample substation for use in the meeting.

“The whole process of creating the substation model took under two hours using Recap and InfraWorks 360,” explained Sorensen. “Comparing it to the original, you could easily see the spatial inaccuracies in the placement of equipment and fencing in the old plans. The company is moving forward with using our existing data paired with InfraWorks to help clean up our substation designs.”

Getting the details right

The InfraWorks 360 models show more accurate locations and measurements, but the models don’t contain the level of detail needed to engineer substation upgrades and plan maintenance. To get to that level of detail, Idaho Power added intelligent, 3D models to the process. The company took 3D design models in Autodesk® Revit® software provided by the manufacturer of the substation equipment. Its CAD team referred to the InfraWorks visualizations to help place the equipment correctly in the substation plan. They



Outside view of a conceptual design for a substation in a barn using Autodesk InfraWorks 360. Image courtesy of Idaho Power.



Two alternative proposals were presented at a board of directors meeting—a transmission line across a property or a decision to relocate a proposed substation. Image courtesy of Idaho Power.

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could even correct measurements and heights to within just a few inches.

“3D models of our substations can help us to improve productivity,” said Bush. “Starting a new project could be faster in 3D. Currently, it is multi-week process to clean up the old plans. And productivity in the field could be improved as they could access more accurate equipment information and clearances with fewer visits to substations.”

The result

Idaho Power sees the substation modeling effort as part of a larger trend toward uncovering efficiencies by using existing data and technology in new ways. “We had all this great LIDAR data from a mapping project, and we were able to apply it to our substation engineering process,” said Sorensen. “InfraWorks helped make it easy. So far, we’ve used InfraWorks models to plan, communicate with stakeholders, and improve documentation quality. When something works with data from a variety of sources so readily, it’s practical to experiment and find unexpected value.”

To learn more about InfraWorks 360 visit www.autodesk.com/infracworks.