Using Autodesk® InfraWorks™ to Win Stakeholder Approvals

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Where We Work: Idaho Power

- 2,000+ employees
- 500,000+ customers over a 24K sq/mi service territory
- 17 low-cost hydroelectric projects

Learning Objectives

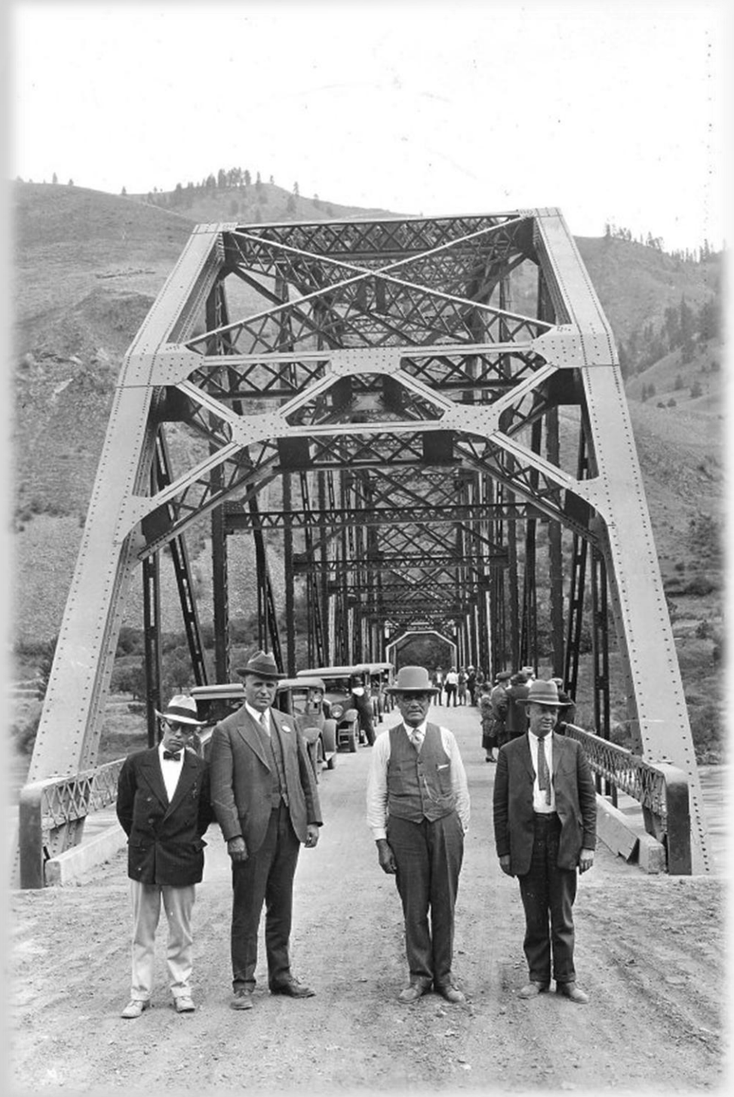
Gather and organize project data

Set up an InfraWorks project

Create a 3D model

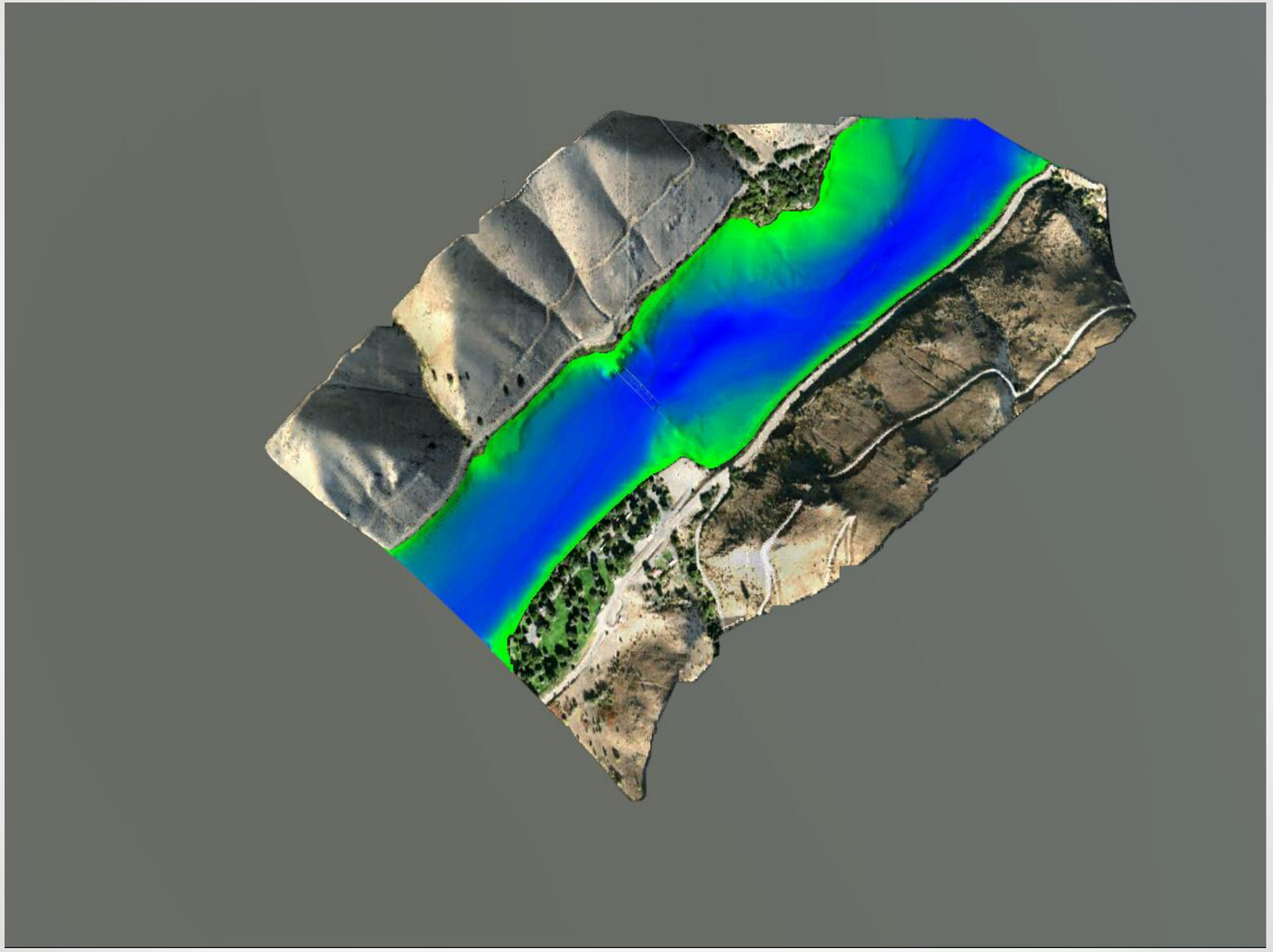
Choose a method for presenting your ideas

What is InfraWorks?



"A way to quickly generate 3D large-scale infrastructure models from existing data sources and easily create high-impact visualizations."

The Ballard Bridge Comes To Life



Typical Project Schedule

- Engineering Design 2010–2015
- Community Involvement 2010–2014
- Easements 2015
- Construction 2016
- Station & Line In Service 2016

A Project Doesn’t Exist Without Stakeholders

Internal Stakeholders:

- Planning
- Engineering
- Drafting/GIS
- Executive office
- Shareholders

External Stakeholders:

- Non-technical public stakeholders
- Surrounding residents
- Business owners
- Government entities
- Customers

Bonus Handout: Creating Positive Experiences Through Effective Stakeholder Engagement

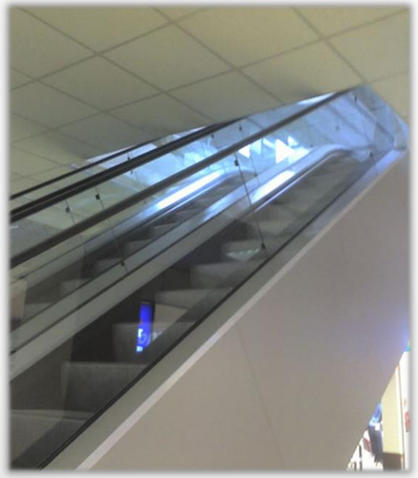
Following are five values that have proven to be effective for engaging stakeholders:

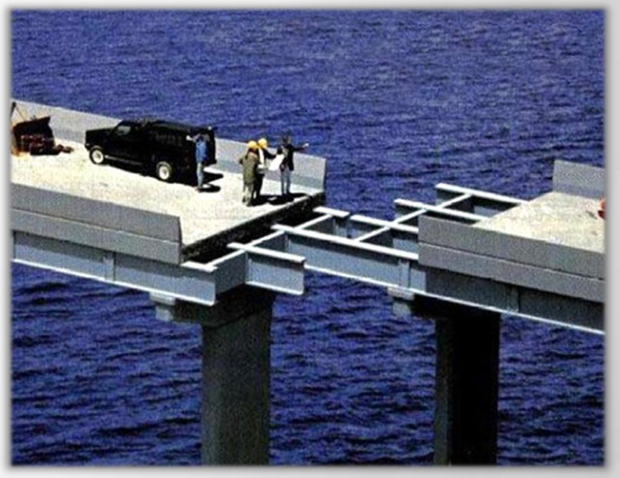
- Trusting Relationships
- Open and Honest Communication
- Fairness
- Cooperation
- Teamwork

Linear 2D Cycles Are The Old Way Of Working

3D Better Than 2D, Says Your Brain

- Non technical audiences have a hard time understanding 2D views
- Not understanding 2D views results in construction errors
- People are 29% more attentive, and on average 7% more engaged when viewing 3D



Even A Four Year Old Can Design And Understand 3D

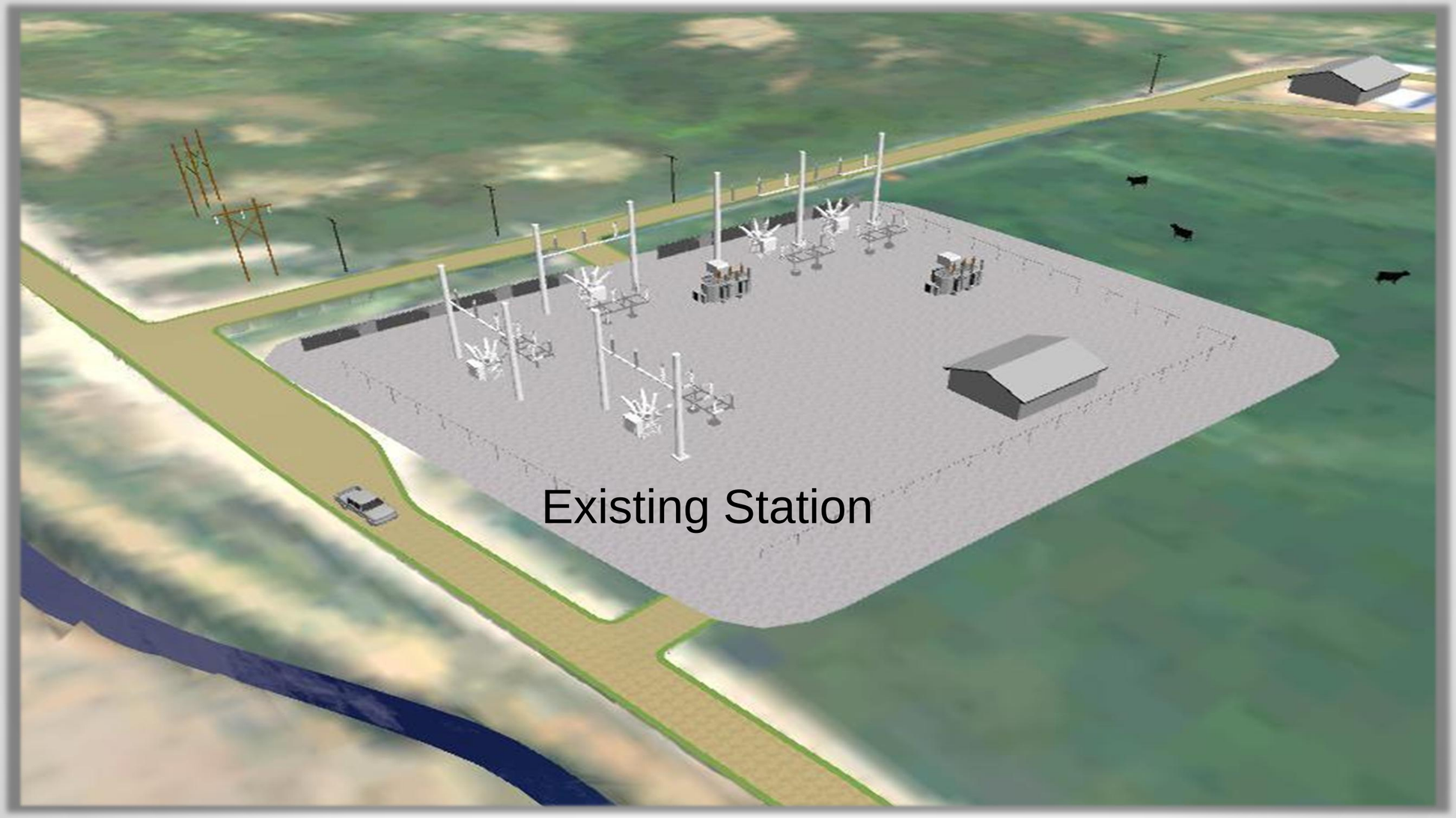
You don’t have to be a rocket scientist to understand why 3D designs are better

Case Studies

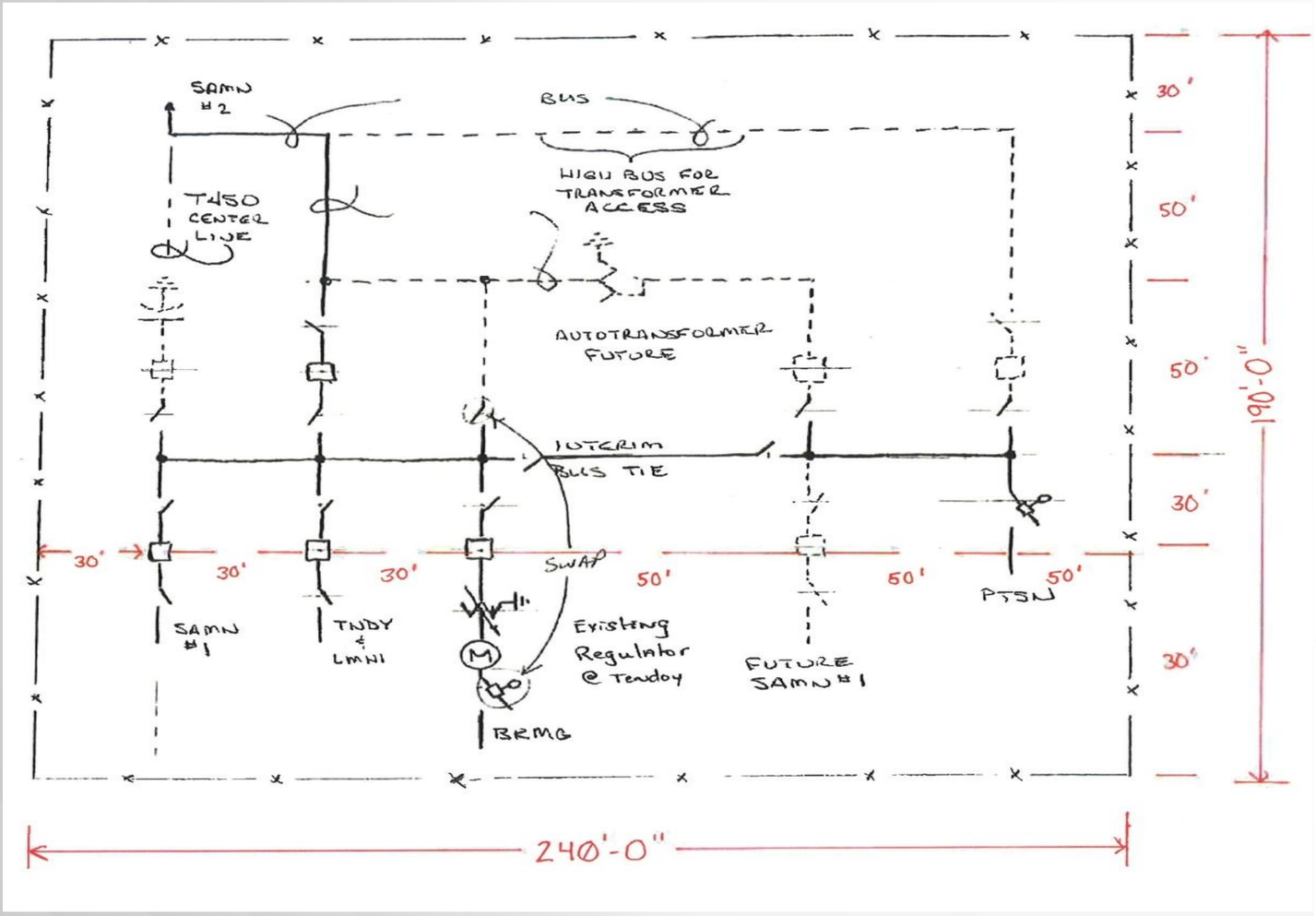
Projects

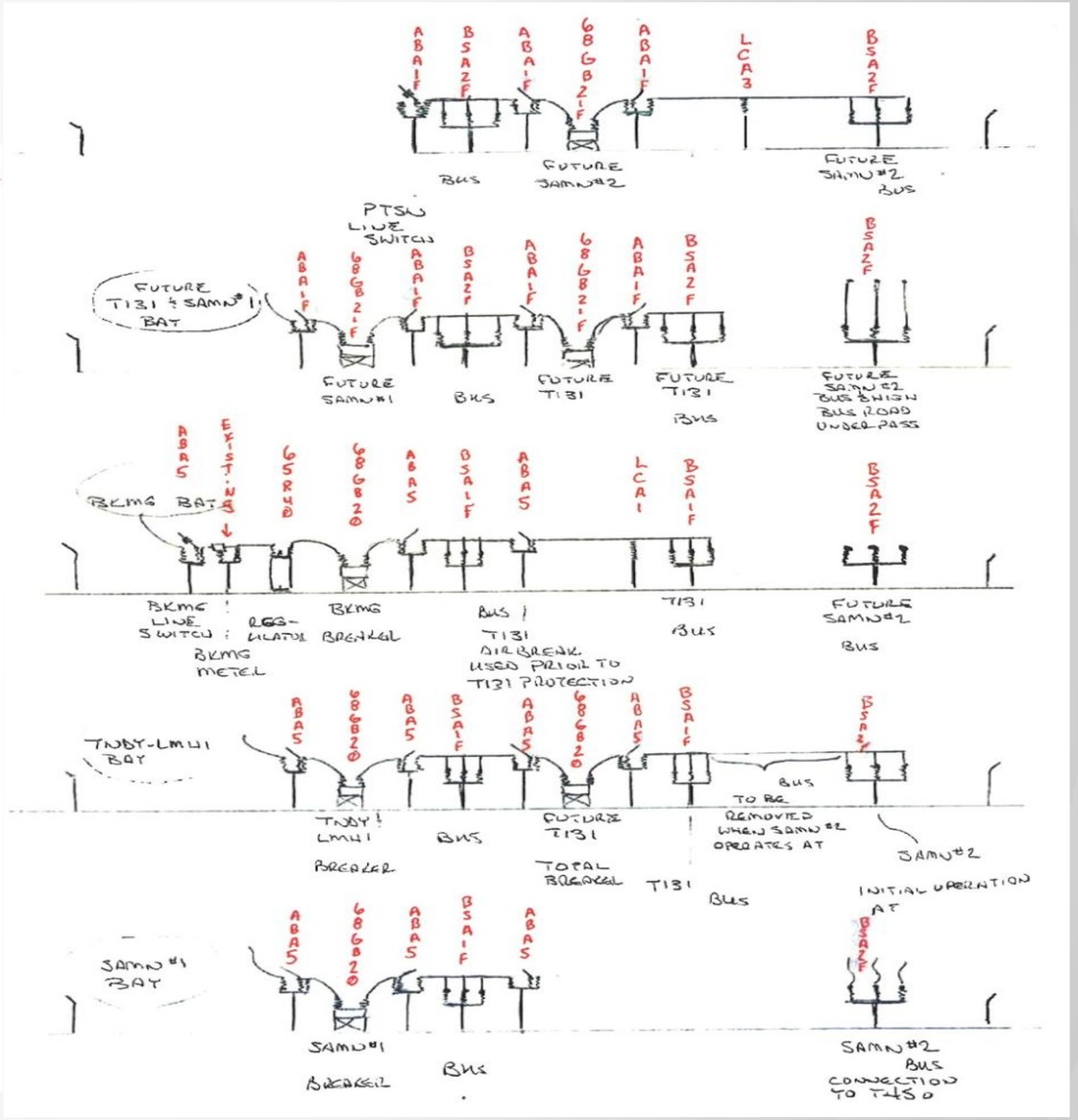
- Case 1: Substation project in Eastern Idaho
- Case 2: Pilot substation project
- Case 3: Stream gauge site in Hells Canyon
- Case 4: KRIS Barn, a conceptual 3D model of an indoor substation (demo)

Case No. 1 Substation Project In Eastern Idaho

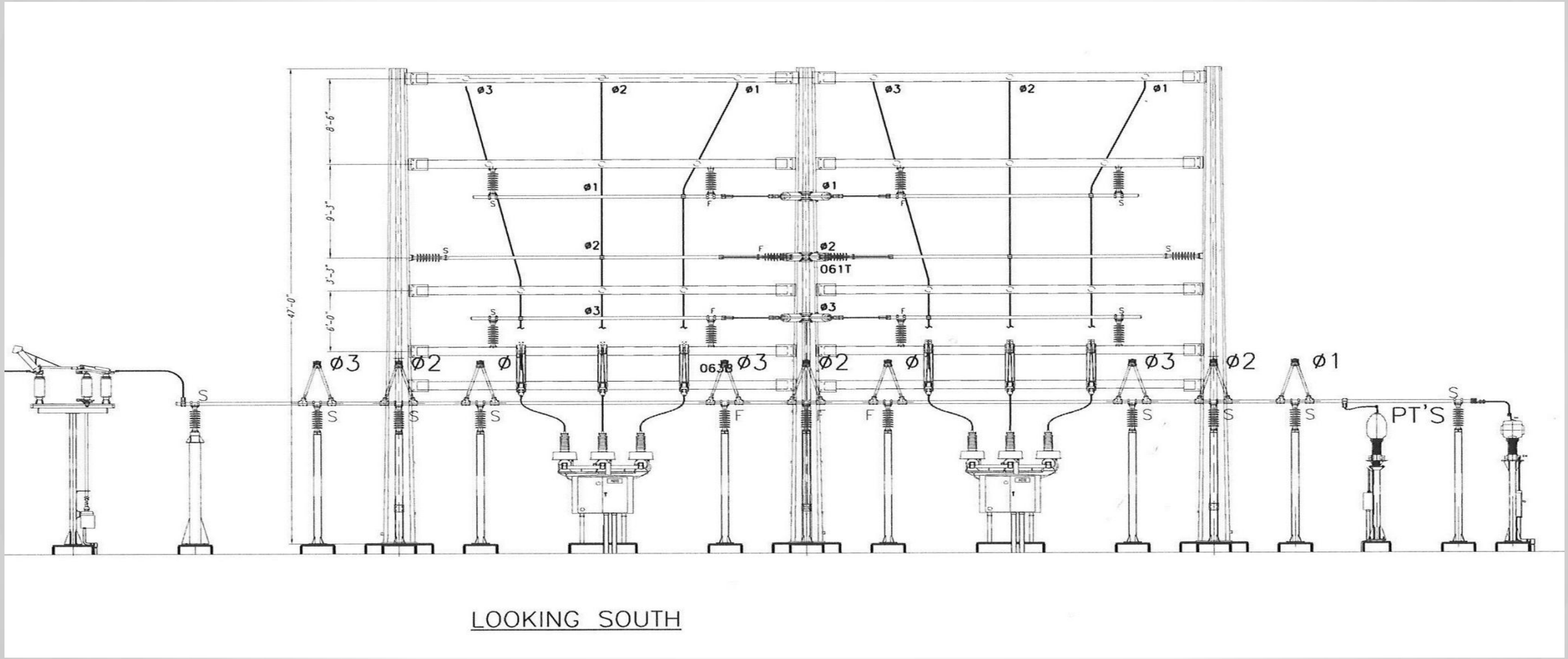


Case No. 1

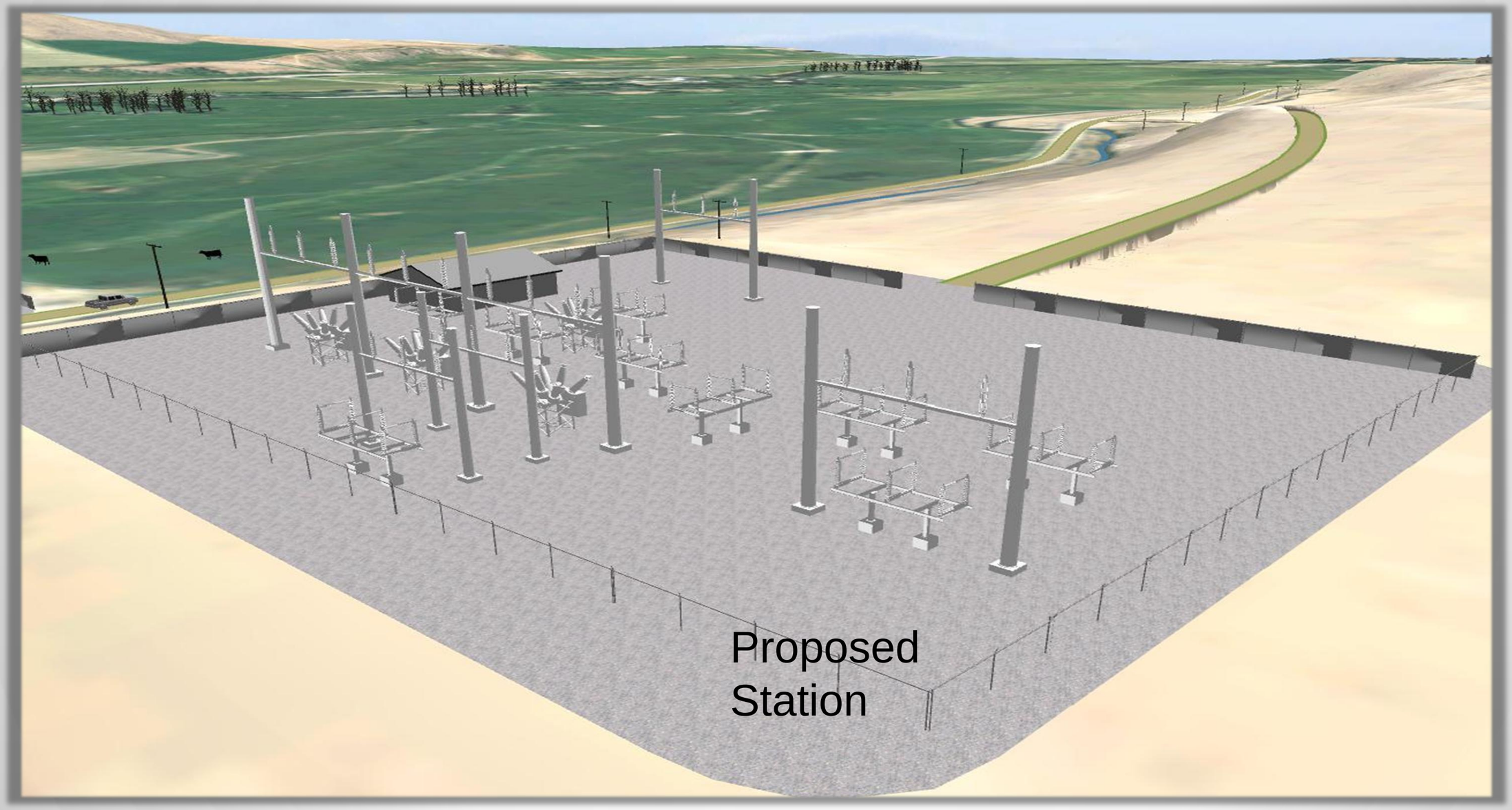

SAMN #2
BUS
HIGH BUS FOR TRANSFORMER ACCESS
T450 CENTER LINE
AUTOTRANSFORMER FUTURE
INTERIM BUS TIE
SWAP
Existing Regulator @ Tendoy
BRMG
SAMN #1
TNDY & LMN1
FUTURE SAMN #1
PTSN
30'
50'
190'-0"
240'-0"


ABAIF
BSA2F
ABA-F
6GB2-F
LCA3
BUS
FUTURE SAMN#2
FUTURE SAMN#2 BUS
PTSN LINE SWITCH
FUTURE T131 & SAMN#1 BAT
FUTURE SAMN#1
FUTURE T131
FUTURE SAMN#2 BUS DIVISION BUS ROAD UNDER PASS
ABA5
EXISTING
6SRYD
6GB620
ABAS
BSAIF
LCA1
BKMG BAT
BKMG LINE SWITCH
BKMG METER
REGULATOR
BKMG BREAKER
T131 AIR BREAK USED PRIOR TO T131 PROTECTION
TNDY-LMN1 BAT
TNDY LMN1 BREAKER
TO BE REMOVED WHEN SAMN#2 OPERATES AT
INITIAL OPERATION AT
SAMN#1 BAT
SAMN#1 BREAKER
SAMN#2 BUS CONNECTION TO T450

Case No. 1



Case No. 1



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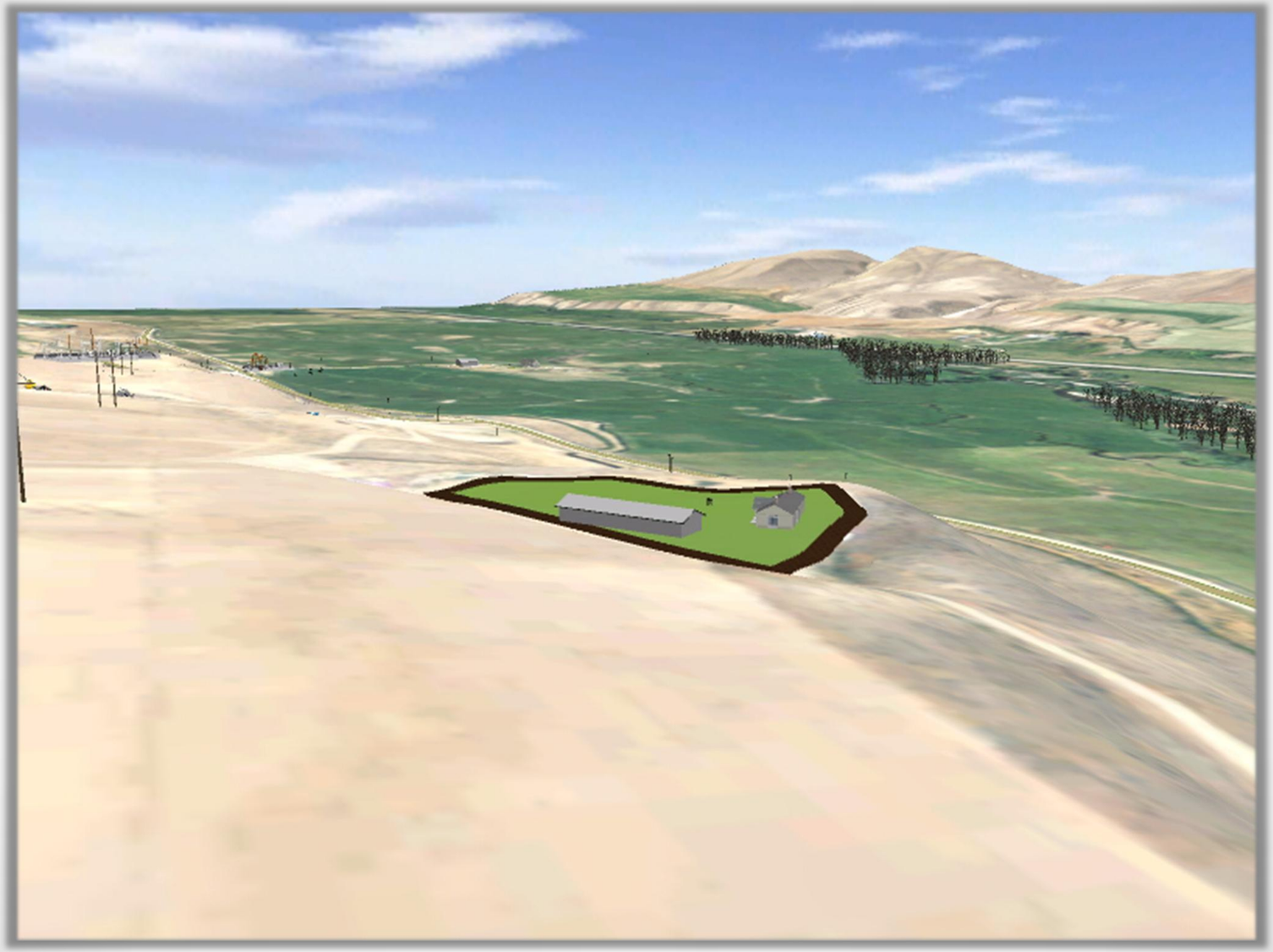


How I Impressed This Stakeholder

- Presentation was brought on site to remote location with an iPad/laptop.
- Demonstrated the view of the proposed station from stakeholders' front door.

Lesson Learned: Know your audience, I used general 3D models of people in the simulation, it was a distraction because the models did not resemble the property owners.

Case No. 2 Pilot Substation Project

How I Impressed This Stakeholder

- Presentation was brought on site to a corporate board room
- Demonstrated the view of the proposed station from stakeholders campus
- Lesson Learned—film speed was too fast

Case No. 3 Stream Gauge Site In Hells Canyon

Stock Stream Gauge photo by IPC

Case No. 3

Case No. 3

Case No. 3

Case No. 3

Case No. 3

How I’m Working With This Stakeholder

Working with internal stakeholders to create the 3D model to have a better understanding about the impacts of the project.

Demonstrating the view of the proposed stream gauge site from two external stakeholders’ point of view– a jet boat, and a rafter approaching the site from upstream or downstream.

The model will be used interactively to work with government stakeholders during the permitting process.

How To Gather And Organize Project Data

I Have A Project For A Stakeholder Review, How Do I Get Started?

In a pinch you can get started modeling your project in 3D with the following:

- A surface model
- Aerial imagery
- A CAD application
- A shopping list

What Is A Shopping List?

A shopping list is a list of items you need to create your 3D model. Here is a sample shopping list from one of my projects. I've added a note to each item indicating where it was found.

1. Trimble Warehouse:
    a. Chain link fence
    b. Control building
    c. Transformer
    d. Air Brakes
    e. Cows
    f. House
    g. Shop
2. InfraWorks:
    a. Distribution poles
    b. People
    c. Pickup
    d. Trees
3. PLS CAD—structures
4. Surface Model—NED
5. Aerial Imagery—IDOR NAIP
6. Circuit Breaker—from manufacturer

Where Can I Find Data?

- Get familiar with data already at the office
- Freebies from the web
  - http://sketchup.google.com/3dwarehouse/
  - http://grabcad.com
  - http://viewer.nationalmap.gov/viewer/
- Create or purchase new data

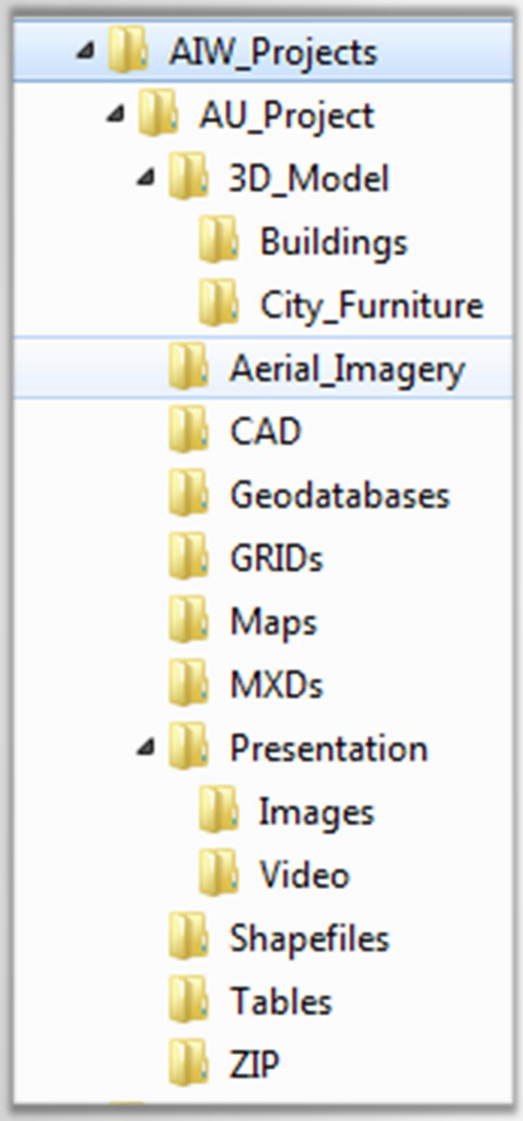
I've Never Modeled Anything In 3D Before, Should I Give Up Now, Take More Training—Please Advise?

- Think like a pirate
- Connect with experts within your organization
- Join a local user group
- Read the Autodesk InfraWorks Training Guide
- Check out the Autodesk InfraWorks 2014 learning videos on YouTube

How Do I Keep Track Of All This “Big Data”?

- Create a system of organizing your data
- Create a template project folder and use it to begin each project
- Work with your IT department to establish best practices

The Template Structure



- *AIW_Projects*—The main folder.
- *3D_Model*—Broken down by discipline, anything that is custom made or downloaded from the web that can be used on other projects is archived here. fbx .3ds .obj .dae .dxf .imx.
- *Aerial Imagery*—Project-specific clipped images in the following formats: .tiff .tif (.aux .tif.xml .tfw) .jpeg .sid (.aux .sid.xml .sid.aux.xml .sdw) .dog .ecw .img .jp2 .jpg .png .vrt .xml .adf .asc .bt .ddf .dem .dt0 .dt1 .dt2 .grd .hgt.
- *CAD*—.dwg .dxf .bak .dwt.
- *Geodatabases*—.gdb
- *GRIDs*—ESRI raster files.
- *Maps*—Map products like images or PDFs.
- *MXDs*—.mxd .nmf.
- *Presentation*—.avi .wmv image files .ppt etc.
- *Shapefiles*—.shp .dbf .idx .prj .shx .dbf .idx .sdf .aux .rdd .dir .dat .nit .ovr .ini.
- *Tables*—Database tables, such as .xlsx .csv .doc .txt.
- *ZIP*—.7z .zip.

•Set up an InfraWorks project

Setting Up An InfraWorks Project

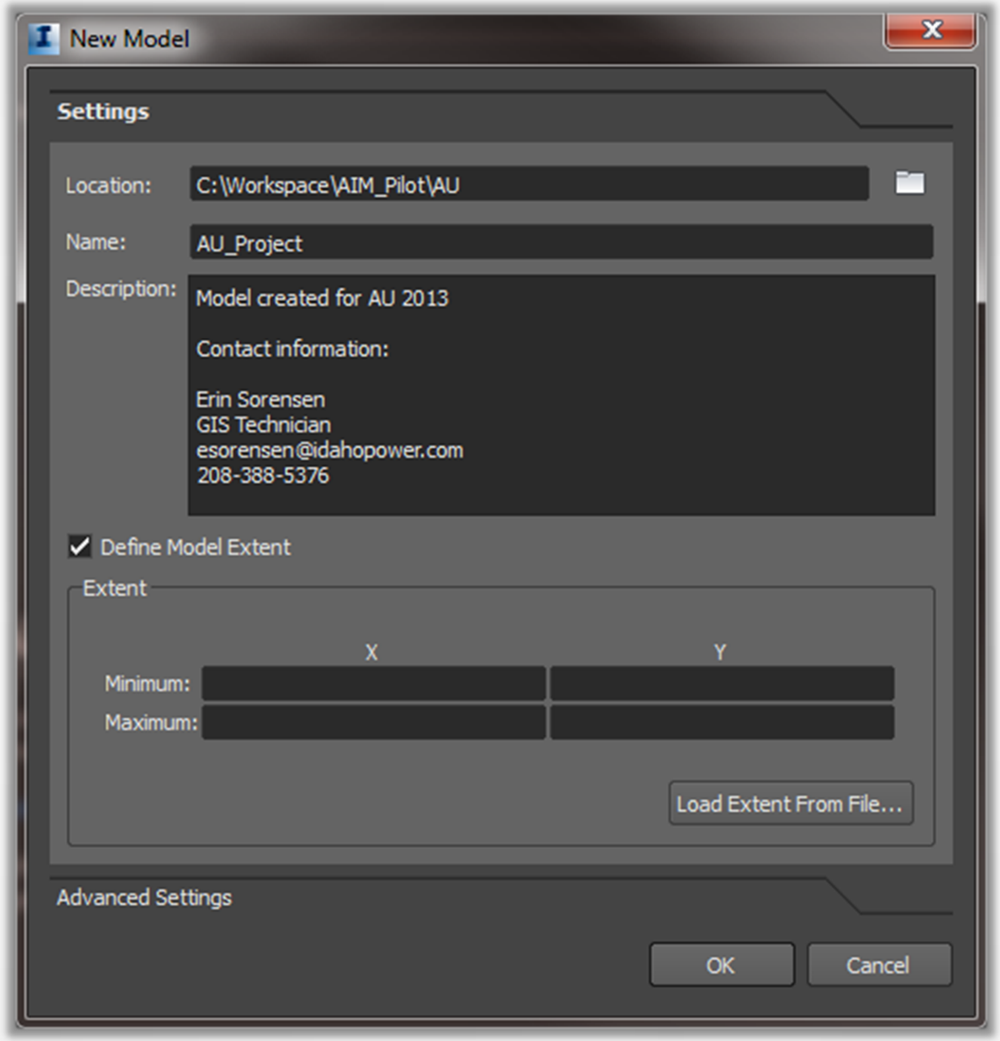
Ok, Now That I Have Data How Do I Set Up My InfraWorks Project?

You can create a new project without to having to change the default settings for the project (recommended for most projects).

Or you can start a new project from the startup menu with customized settings. To set up custom project parameters you will need to:

- Create project file location
- Describe the project
- Define the model extent
- Establish a project coordinate system
- Set up your units

Demo: Project Setup KRIS Substation



Useful Tips:

- Be patient when importing imagery and surfaces, depending on the data size, your PC setup this can take awhile.
- Layer imagery to fill in gaps.
- Importing point shape files for interactive placement of objects.

Choose The Best Method For Presenting Your Ideas

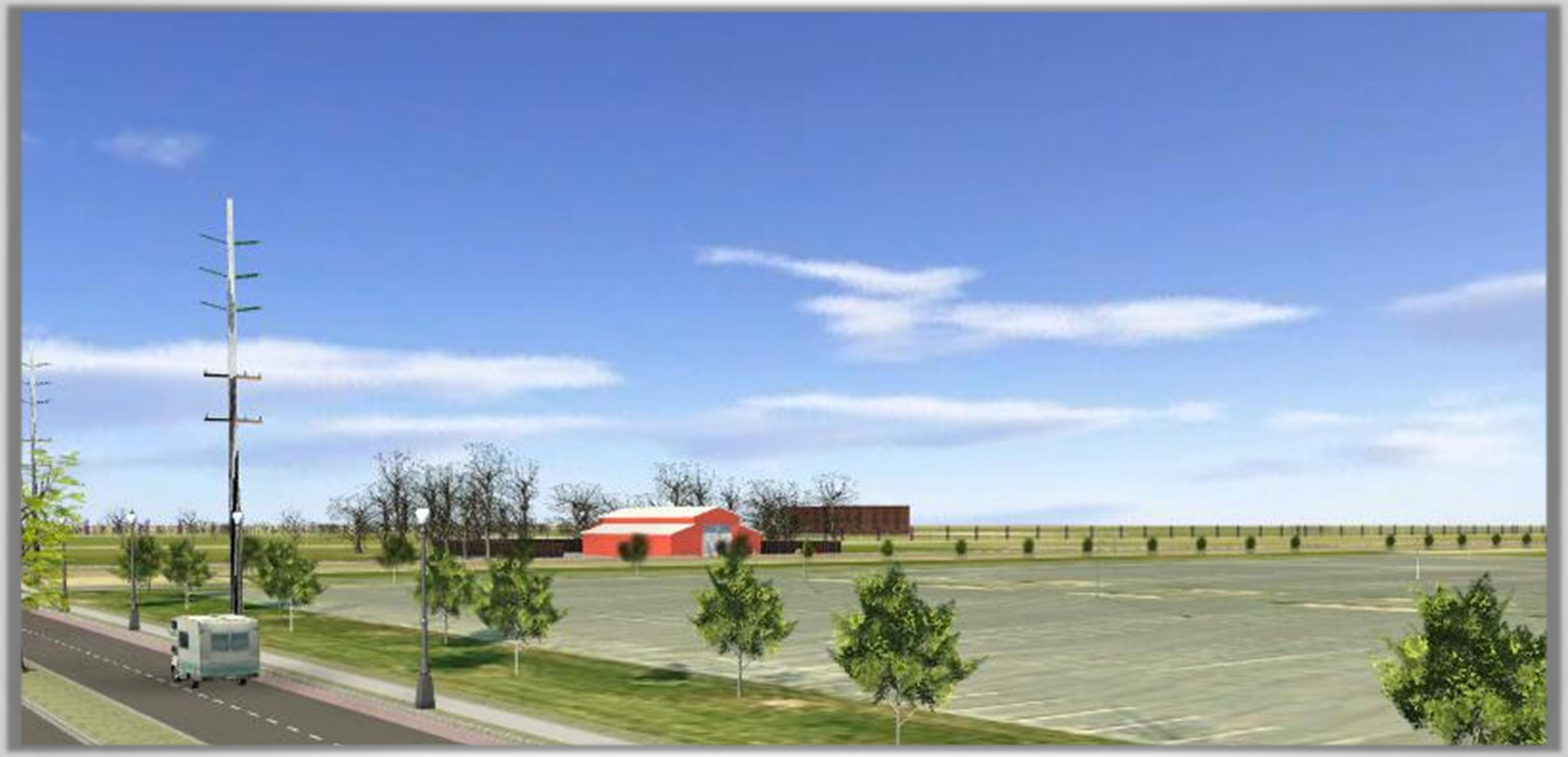
What's The Best Method For Presenting Your Ideas?

- The best presentation method matches the needs of your audience
- To know your audience do research, meet your audience
- Save a few fun tricks for live presentations

Film Basics, What Not To Do

Film Basics What To Do…

Film Tips



Q&A


Thank you!