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Democratization of Satellite and Aerial Imagery: A Catalyst for AEC Design

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Learning objectives

- Identify the risks associated with incomplete understanding of existing project site conditions
- Recognize the necessity for on-demand access to aerial and satellite imagery from early design stages
- Discover major imagery providers, such as Airbus, Maxar, Nearmap and Hexagon, from within AutoCAD
- Learn how Plex-Earth helps you choose the appropriate imagery and efficiently access them during your design workflow

Description

An overview of how easily and often mistakes occur, creating expensive rework, and how suitably sharp and up-to-date imagery can dramatically improve this, especially when used during the very earliest stages of design, before construction has even started. We will also take a quick look at the top players in the imagery provider space, and how the Plex-Earth software gives you the power to pick the appropriate images or data, on demand and without separate contracts.

Speaker



Lambros Kaliakatsos is a civil engineer, engineering software developer and CEO of Plexscape.

A decade of AEC experience taught him that missing or low-quality data, especially in the early stages of designing, can lead to significant delays, revisions, and costly reworks.

His vision became, and still is, for designers worldwide to have easy access to the best, up-to-date aerial and satellite data. This will make for quicker, better and more informed decisions, and thus building a better world for everyone.

Plex-Earth, the software he first created in 2009 to connect AutoCAD to Google Earth, has already changed how thousands of engineers work. Today, via big improvements and direct partnerships, it gives affordable access to major imagery providers such as Airbus, Maxar, Nearmap, and Hexagon.

Identify the Risks Associated with Incomplete Understanding of Existing Project Site Conditions

It really is incredible what humans can do.

As a species, we've created amazing things, with my home city of Athens housing some famous examples of almost unbelievable architecture.



FIGURE 1: THE ACROPOLIS OF ATHENS VIEWED FROM THE HILL OF THE MUSES
(IMAGE: [CAROLE RADDATO](#))

We are incredible, we are amazing, but you know what? We make a lot of mistakes!

Rework – Let's Start Again...

Since the very beginning of humans constructing things, from the start of written history itself, we've made mistakes and had to do re-do some things or re-think our ideas.

It may have different names in different parts of the world but the common name throughout the construction industry is "rework". That it has a universal name shows how it's a universal problem, and worse, it's considered *routine*.

It's just 'the cost of doing business' they say. So, let's look at that cost...

Recognizing the Cost of Rework

A typical figure for rework is hard to pin down, as it can vary as much as the projects vary. Studies though suggest it is between 5% and 15%, with some examples even stretching to 35%, of the total project cost.

Here's the thing - add the in-direct costs such as loss of company reputation, and it can be a massive expense, arguably more than 100% of any profit your company made!

Most Rework Mistakes are Design Related

In the video I describe my own experience with rework, created by a surveyor guessing at some terrain and not checking cadastre early enough. At the time it seemed like an extreme example, but I have learned the industry regularly throws up such examples, and they follow a clear pattern:

- The most expensive errors occur early in the *design* process, not during construction
- Poor or lacking information is the primary cause – the design doesn't match the real world, either because the information was out of date or the information was wrong

According to [Autodesk Construction Cloud Blog](#), "Up to 70% of total rework experienced in construction and engineering products are a result of design-induced rework."

Yes, up to 70% of actual rework costs are not from the actual construction but from early design errors!

The Necessity for On-Demand Access to Aerial and Satellite Imagery from Early Design Stages

Technical graphs and numbers contain information but rarely communicate it as powerfully as actually being able to *look* at the project area.

Some forms of looking are more useful than others, and the undisputed best view is from above.

A Bird's Eye View

We spend all our adult lives with a viewpoint somewhere between 4 and 7 feet off the ground. Great for seeing over tall grass or wading through 3ft of water, but very restricted when it comes to seeing the bigger picture. We've long envied birds for their ability to take flight, and the very first thing we say if we can get up high? "What a great view!"

Seeing from above helps you see things such as:

Water

Water seems soft, but it turns rocks into sand, and sandpaper isn't soft! Being able to see flood-prone areas or how water is eroding a river bank or beach can help prevent major mistakes. What can be especially useful is if you can see earlier images of the same area, to see if erosion is taking its toll and if so, how much and how fast? The answer could even be a wide-open door into new contracts.

Terrain

Terrain obviously plays a major part in your design and the expected costs. A view from above often reveals terrain details that are entirely invisible from the ground.

Roads

Maps can show you roads, as a line and a number such as A12. An actual photo can show what the road network nearby is really like, and the best angles or approaches to use.

Reality

We could continue with many examples of what you can see from above, however the simple answer is *reality*. **You can see what is really there!** That is your greatest defense against making any major mistakes, or even little ones.

Hiring a private helicopter is fun, but expensive and not always practical. Besides, a specialist company has probably already captured great photos of that area.

Let us look at those companies.

Going Beyond Google - Discover Major Imagery Providers, such as Airbus, Maxar, Nearmap and Hexagon, Inside AutoCAD

In the video I describe how Plex-Earth was created to bring Google Earth into AutoCAD, which is generally agreed to supply superior and more up to date images than Bing.

However even the mighty Google can be beaten on either resolution or recency, and sometimes both, by specialists. In fact, it was the frequent complaints of low quality or outdated images in areas outside of the more obvious built-up areas that initially sparked our desire to go even further.

Premium Imagery Providers

This is why we partnered with the world's leading satellite and imagery providers to give users the cream of the crop right inside AutoCAD.

For a single flat subscription, you can use as many images as you need from Airbus, Maxar, Nearmap & Hexagon, among others.

AIRBUSMAXARnearmapHEXAGON

Airbus and Maxar, our partners for high-resolution satellite imagery, offer global coverage, recency and extensive historical imagery which can go back to even more than 10 years.

And our premium aerial imagery providers:

Nearmap, that covers all the major urban areas in the United States, Australia, New Zealand and Canada, famous for its stunning resolution of even less than 3 inches.

And Hexagon that covers rural and urban areas across United States, with 15 or 30 cm.

Learn How Plex-Earth Helps You Choose the Appropriate Images and Efficiently Access Them During Your Design Workflow

Importing top quality imagery straight into AutoCAD is now a breeze. Getting a georeferenced view of your project's area in a matter of seconds and we will offer recommendations for the best available images in the specific location, both in terms of recency and of resolution.

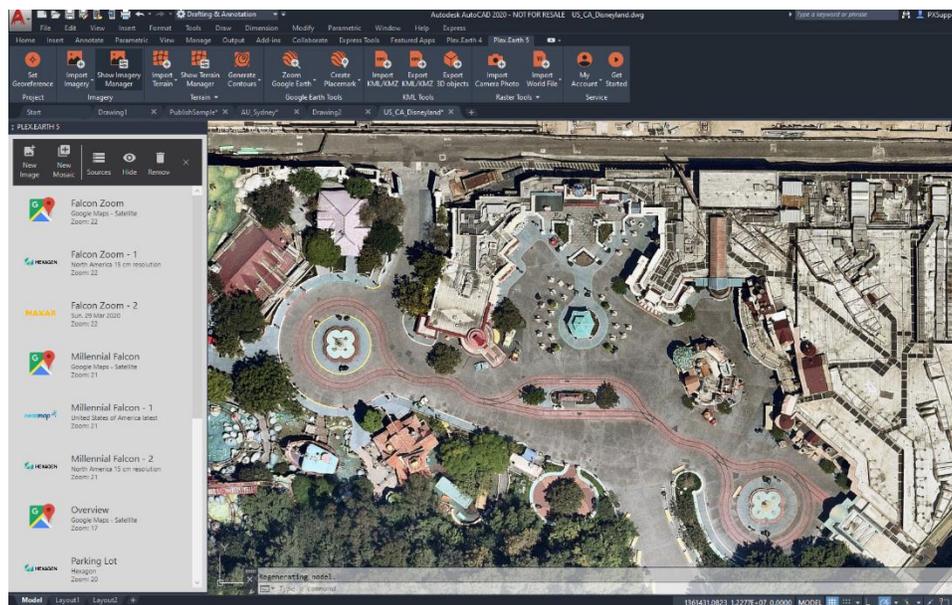


FIGURE 2: VIVID HIGH-RESOLUTION AERIAL IMAGERY MADE AVAILABLE INSIDE AUTOCAD IN SECONDS

Mosaics

And that's not all. You can choose to create imagery mosaics to achieve maximum resolution for areas of any size and have complete control on all the imported tiles, to achieve the best possible balance between drawing size and getting all the data you need for you designs. What is more, **Plex-Earth automatically georeferences each tile individually**, to ensure maximum accuracy across the board!

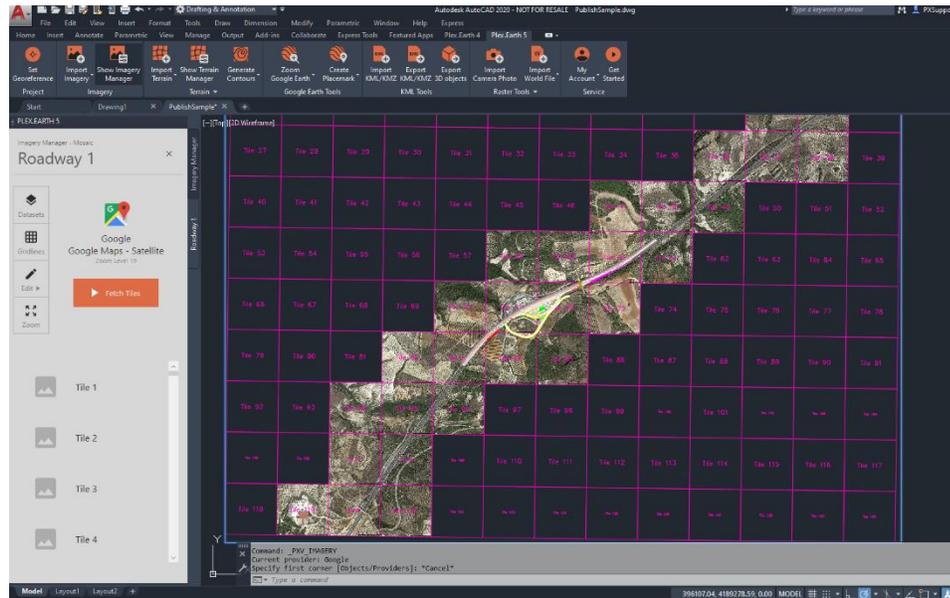


FIGURE 3: ROADWAY PROJECT IN PELOPONNESE, GREECE

Historical Imagery

Access vast archives of historical imagery, going back to more than 10 years in some cases. Track the progress of specific projects, monitor development in any area and even watch natural environments evolve right from within AutoCAD.

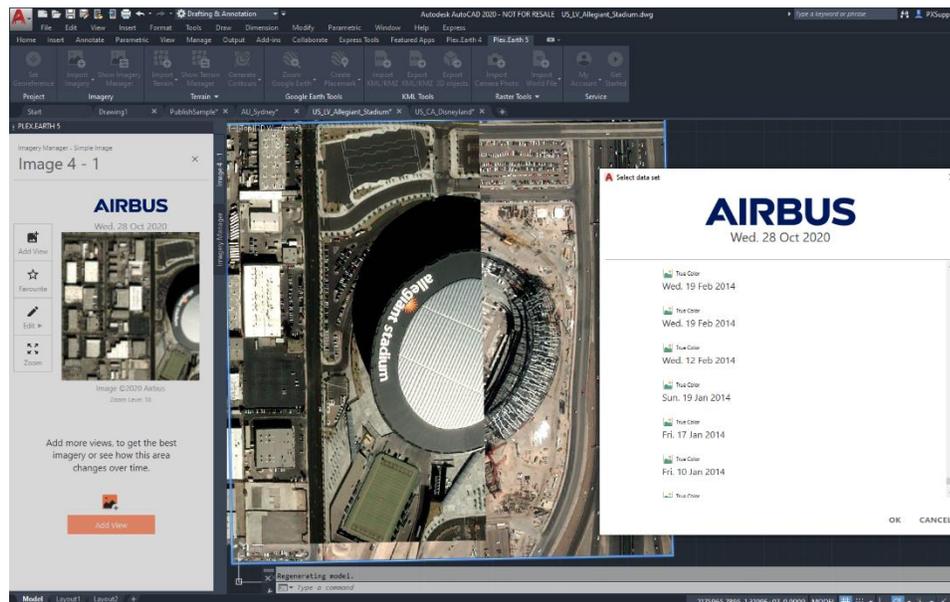


FIGURE 4: AVAILABLE SATELLITE IMAGERY GOING BACK TO JAN 2014 FOR THE LAS VEGAS, NV AREA

Side-by-side Comparison

View images side-by-side, to compare levels of detail and track how specific aspects of projects have changed over time. And if certain datasets appear to be slightly displaced, you can easily align them with others.

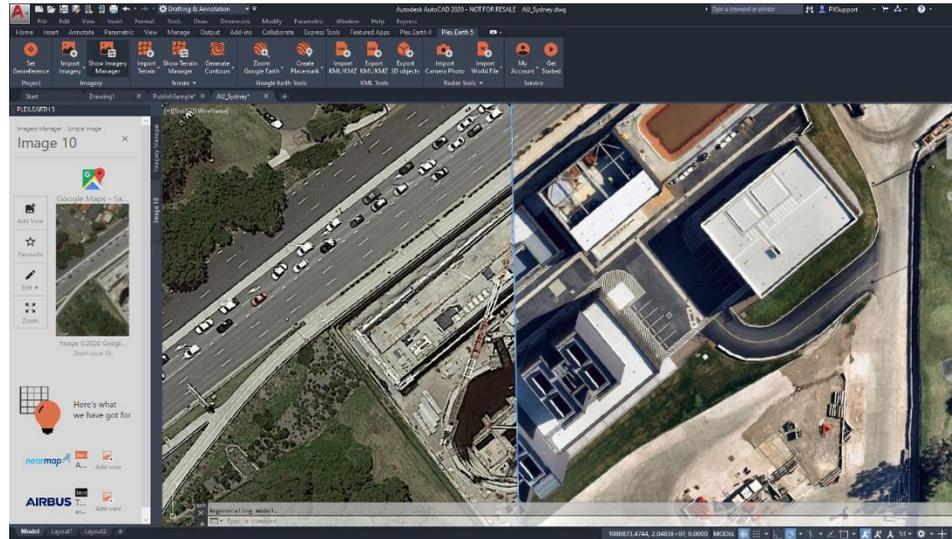


FIGURE 5: A BUILDING DURING THE CONSTRUCTION PHASE (LEFT) AND FULLY DEVELOPED (RIGHT)

All-in-One Solution to Connect to the Real World

As a platform created by engineers for engineers, Plex-Earth also offers a complete toolkit to allow engineers to get a 3D view of their project area and validate their designs in their actual environment.

Terrain Importing and Analysis

Plex-Earth 5 offers designers all the tools they need to import elevation data from Bing and other providers within seconds, create a variety of surface objects and perform terrain analysis based on height, slope and direction.

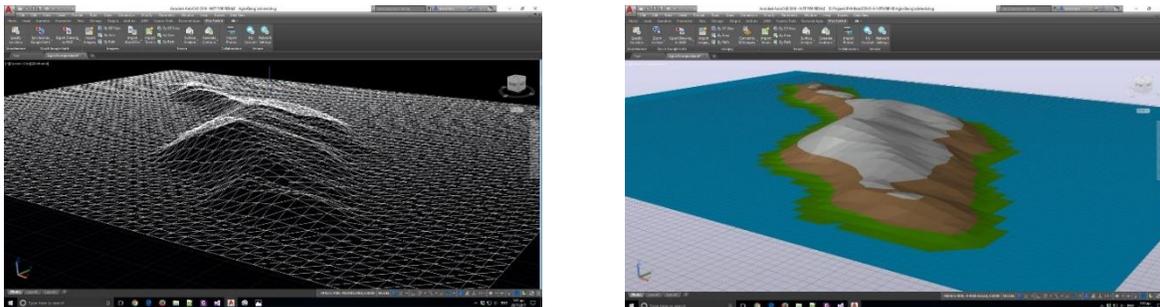


FIGURE 6: TERRAIN MESH OBJECT (LEFT) AND ELEVATION ANALYSIS IN AUTOCAD (RIGHT)

Visualization in Google Earth

And last but certainly not least, Plex-Earth allows users to export any 2D or 3D drawings, complete with textures and materials to Google Earth, for perfect visualization and the ability to showcase their designs in their actual environment to partners and stakeholders.



*FIGURE 7: A WASTEWATER TREATMENT PLANT,
DESIGNED EXCLUSIVELY IN AUTOCAD, VISUALIZED IN GOOGLE EARTH*

Additionally, passing information to field agents and third-party services has never been easier. Users can import any KML/KMZ files handed to them into AutoCAD with a one-click “process”.

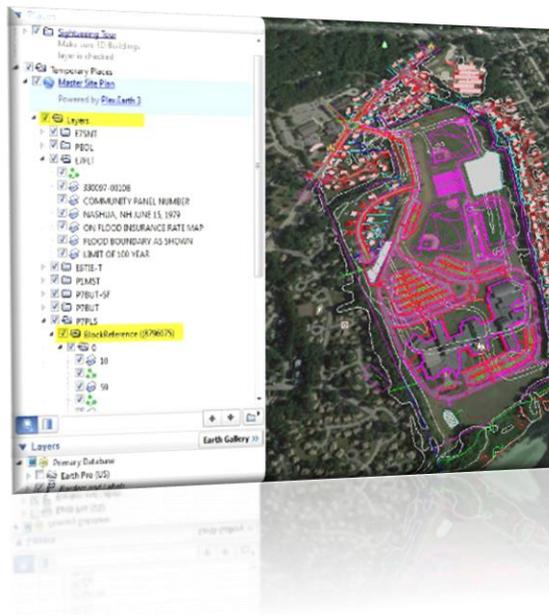


FIGURE 8: THE DRAWING LAYER STRUCTURE IS RETAINED IN GOOGLE EARTH, TO EASILY FILTER THROUGH ELEMENTS

Ready to join the future of imagery in AutoCAD?



If you are an AEC professional wanting to supercharge your designs, visit our website at www.plexearth.com now! You can start a free trial today, which especially for AU attendants include unlimited access, without watermarks, ready to use in your projects.

Or if you create real-world data, for any place in the world, [contact us](#).

We want you to be a part of Plex-Earth platform, and help designers all around the globe do their job better.