

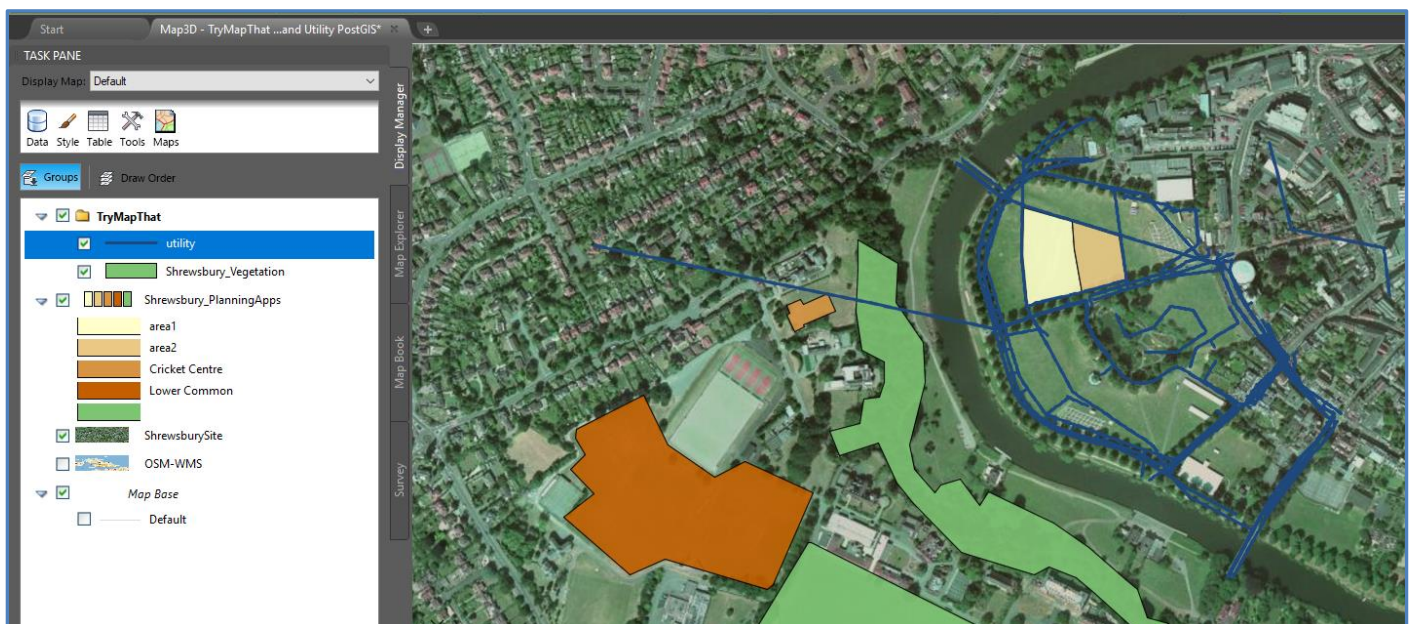
Integrating CAD and GIS (using AutoCAD)

As a *'Geographer in a CAD World'* I am always searching for smarter ways to integrate CAD and GIS – **Software, Data and Processes**. Previously I have concentrated on integrating GIS with geospatial enabled CAD software, such as; Autodesk **Infraworks**, Autodesk **Map3D** and Autodesk **Civils**. This has proved highly successfully as these applications have **Database Connectivity** allowing you to connect to geospatial assets in databases, such as **SQL** and **PostGIS**. If you want to learn how to better integrate these Autodesk applications with your GIS data here is a 4-part video blog:

<https://www.cadlinecommunity.co.uk/hc/en-us/articles/360001096598-Integrated-CAD-and-GIS>

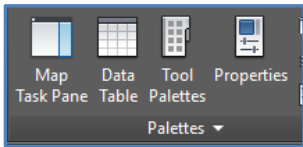
That's the hard work over I thought 😊.... or maybe not. What about Autodesk users who only have as I call it 'flat' or 'vanilla' CAD? Can they also connect to these geospatial data stores and access the same spatial datasets?

Things didn't look promising when I opened 'flat' AutoCAD and tried to find the **TASK PANE** that Map3D and Civils provides user with to connect to external data sources. Here is what the Task Pane looks like in Map3D and Civils, giving users access to their layers from any number of external spatial data formats:

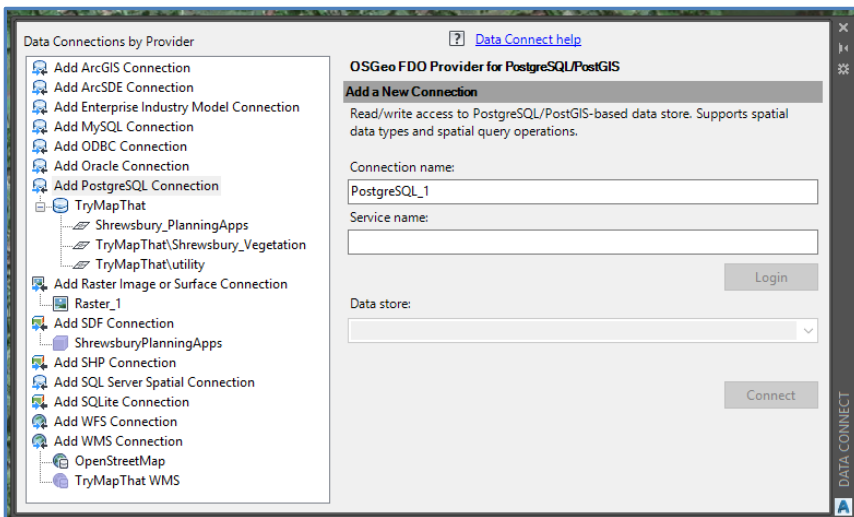


The Map Task Pane is accessed using the **View > Map Task Pane** option.

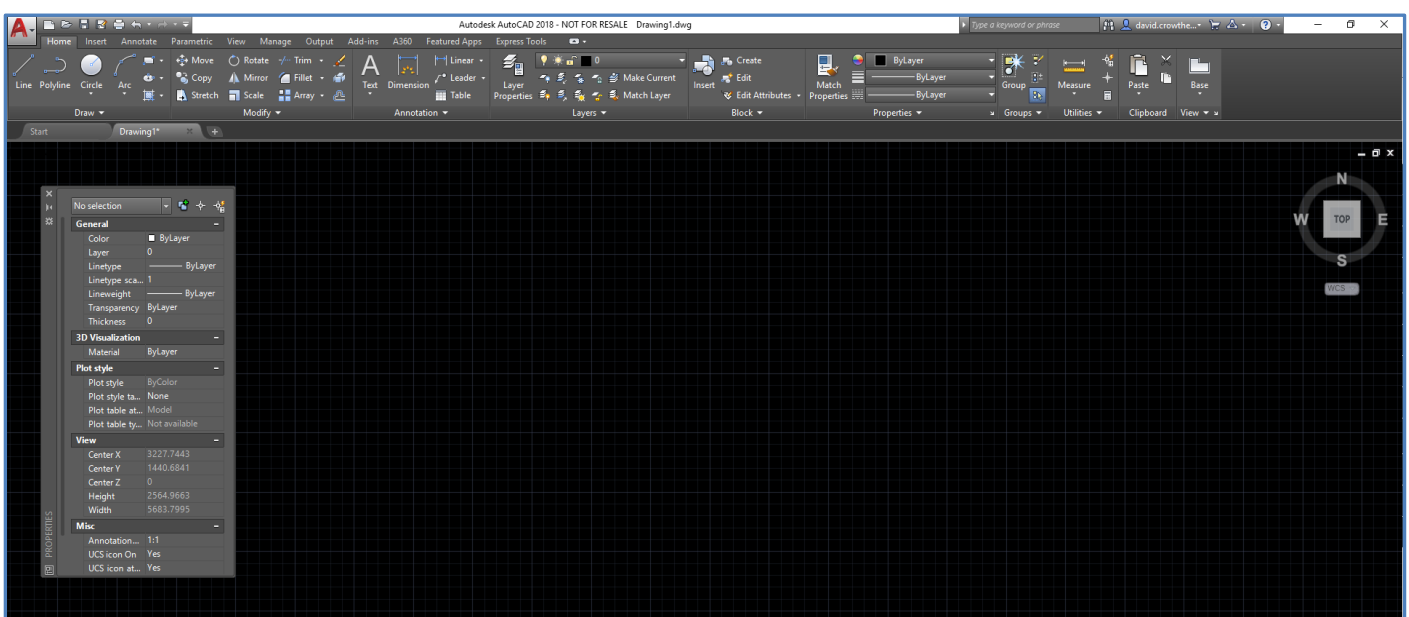




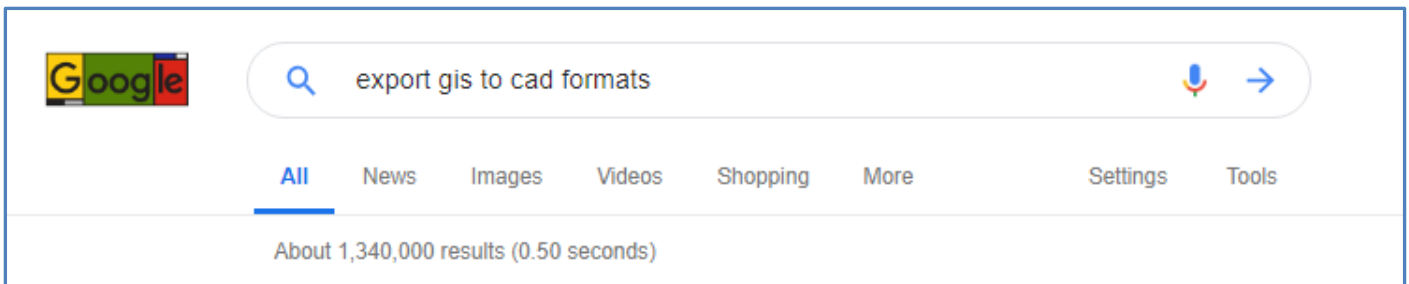
When opened the Map Task Pane then allows you to **Connect to Datasets** such as PostGIS, WMS, Raster, SQL etc....



Unfortunately, within AutoCAD this tool is not available, which led me to understand that if we can't access external geospatial assets then we can't have a direct **live link** to that data in 'flat' CAD. In fact, on opening AutoCAD for the first time since my Cadline AutoCAD training induction, I quickly understood I was a little out of my depth staring at a screen that this 'Geographer' feels looks like the **Matrix!**

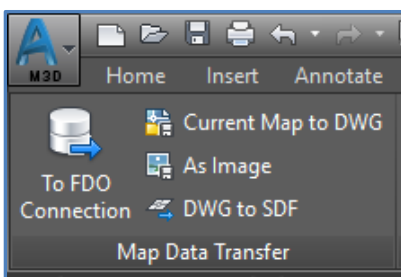


So, with a little googling I tried to understand what would be the best way to open my geospatial assets, stored in a PostGIS database, within CAD.....

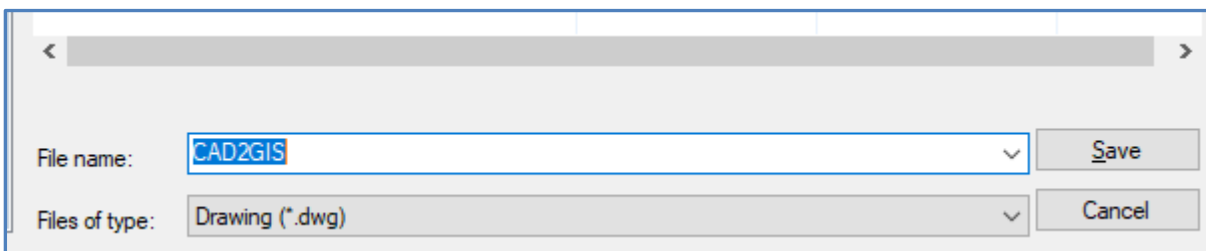


... that's quite a lot of search results and while I am happy following Stack Exchange threads to work things out for myself, this is often when using geospatial applications which I am familiar with, not CAD which as I say feels like the 'Matrix' to me.

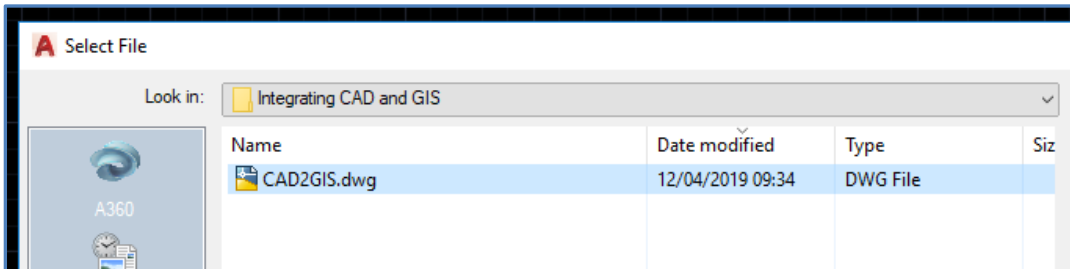
So, I called in the cavalry, in the form of Cadlines expert Autodesk Support Engineer and asked them for their thoughts on how we could try to integrate external geospatial assets with Autodesk AutoCAD. Our Support Engineer Justin immediately decided the best option in Map3D was to use the **Current Map to DWG** tool from the **Output > Map Data Transfer** menu.



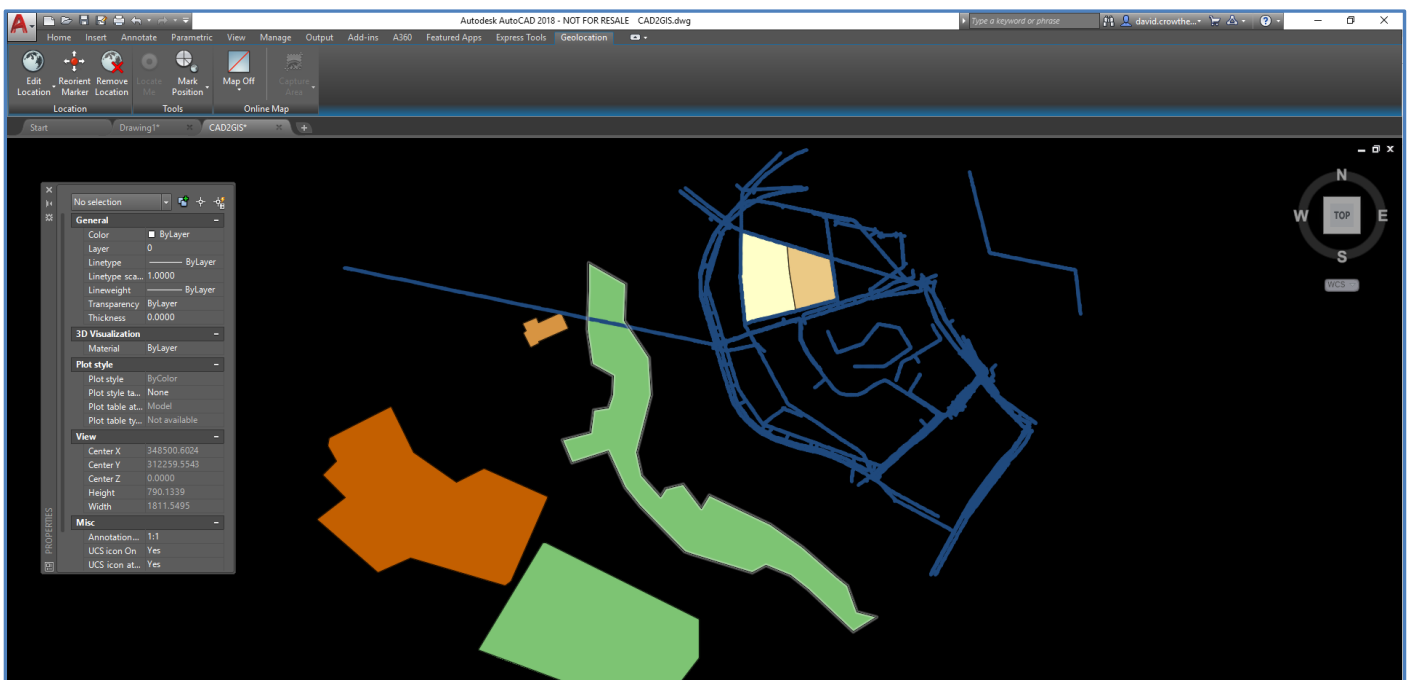
I saved the current map to a location on the server and saved the file in **.DWG** format.



Moments later in AutoCAD I simply chose to **open** this new .DWG file.

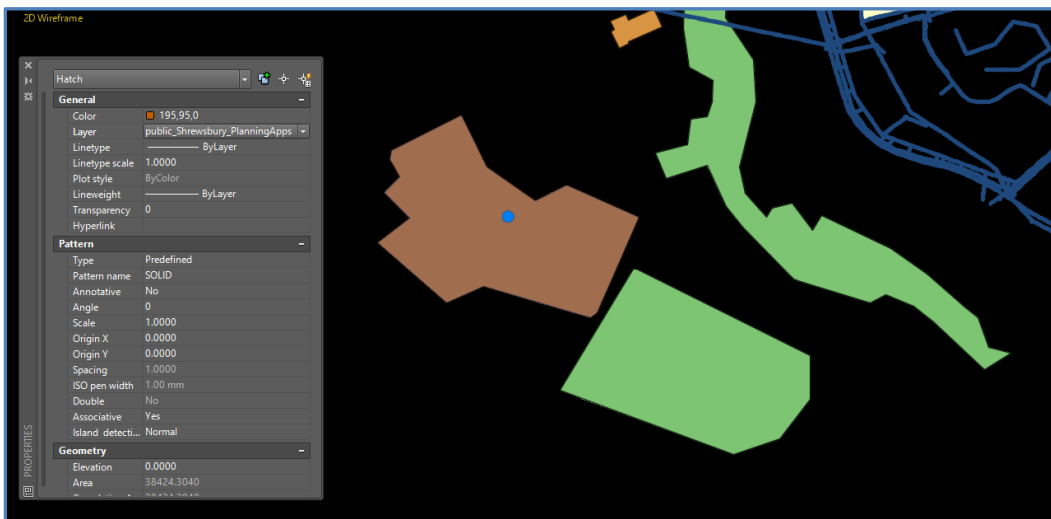


And in seconds I now had all the geospatial features previously viewed in Map3D, now open and accessible within AutoCAD.

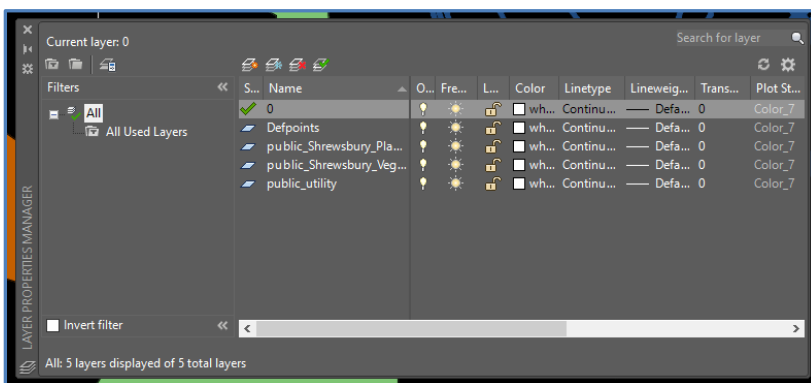


This was a great start!.... but did these exported features still have their **'integrity'**? could they even have their **attributes** attached to them as I would expect to see in a GIS application? Unfortunately having attributes still attached was a step too far,... but the objects imported into my CAD.DWG file were fully functioning and also retained the **Style** that I had applied within Map3D.

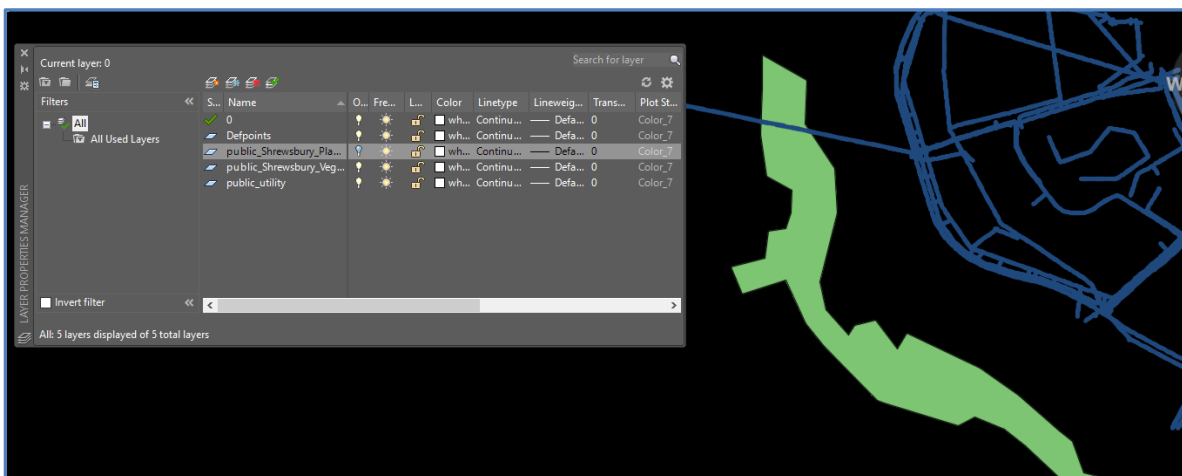
Clicking on a Planning Application object in the CAD window and viewing the **Properties Pane** indicated that the feature was a **HATCH** and was also stored in a Layer named – **public_shrewsbury_planningapps**.



We then checked the **Layer Properties Manager** and found that the imported data had indeed been successfully split into the individual layers as they were stored in my PostGIS database.



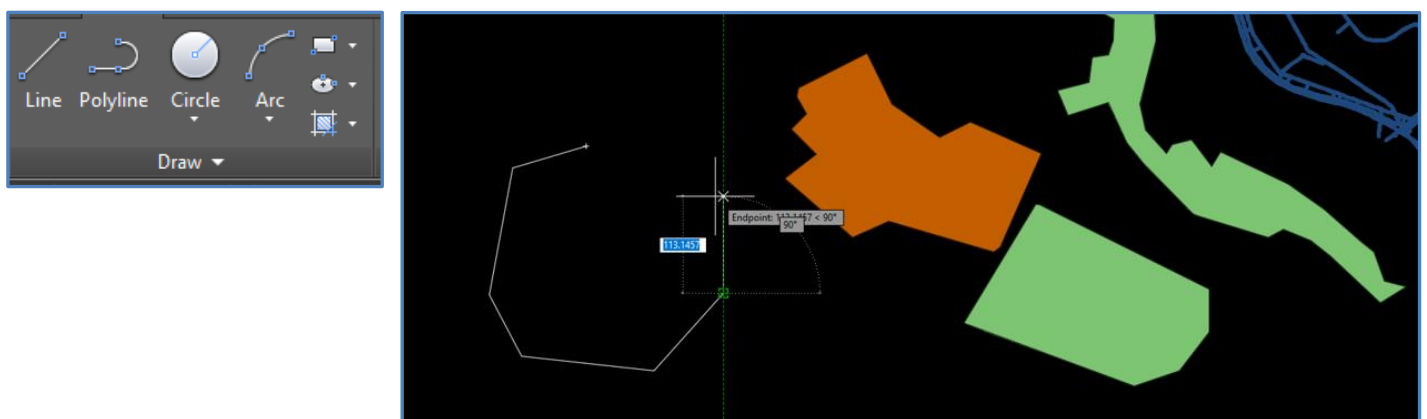
With a little bit of CAD wizardry Justin showed me how to make a layer invisible and it almost felt like I was using a more familiar GIS application!



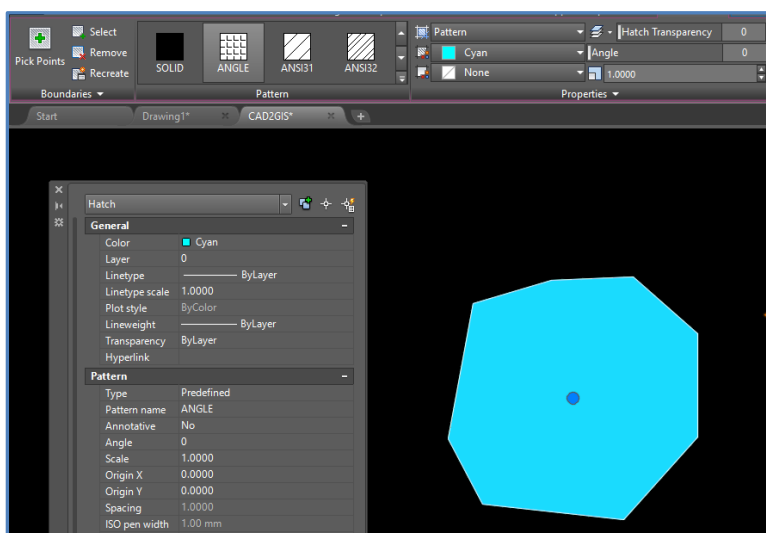
This was welcome news, we now had a process to very quickly transfer bulk geospatial assets from a spatial database into AutoCAD and then allow our CAD users to work with those objects.

Time to go the other way!.... what if our CAD users then updated those assets, maybe by adding a new Planning Application, and we then wanted to share those updates with the GIS team members... was this just as simple?

Firstly, Justin showed me how to add a new feature using the **Draw > Polyline** tool.



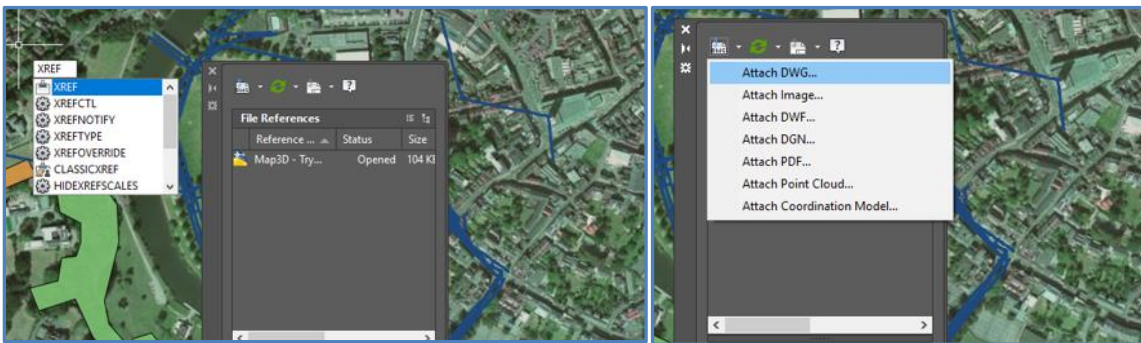
Once the new feature was created we used the **HATCH** tool to apply a style to this 'Closed' Polyline.



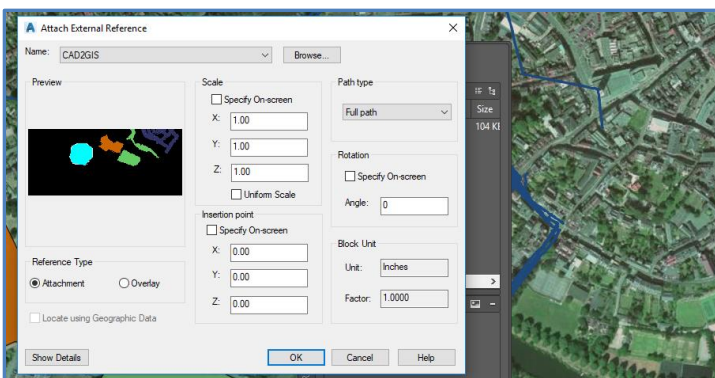
And finally, with a new object added we re-saved the .DWG file.

The final part to the puzzle was to then allow our geospatial team, using Map3D, to then access this updated .DWG file so they could share the updates undertaken by the CAD team. In Map3D we used the **External References** tool (typing XRef) to reference in the updated .DWG.

From the External References pane we chose **Attach > DWG >** and chose the updated .DWG file.



We used the default settings in the **Attach External Reference** window and pressed **ok**.



Then within seconds the .DWG file was referenced into MAP3D and added to the map window now with the updated Planning Application object visible.



Our Geospatial users can now view the updated CAD features and decide whether or not to amend existing objects or create new objects into the GeoStore.

Now that we have included **'flat' CAD** into the process maybe we can definitely state that integrating CAD and GIS is possible! Not only is it possible but it can help you reduce multiple processing tasks, eliminate expensive re-work and truly share your geospatial assets with everyone in your organisation.

