



I have seen the future of pipeline GIS

Jeff Allen, President

As many of you know I have been working on solving problems relative to pipeline data management and regulatory compliance for over 20 years now. This work began on a CAD platform utilizing dBase files and has rapidly progressed to enterprise databases storing hundreds of millions of records. These systems help maintain the safe and efficient operations of our nation's gas and liquid pipeline infrastructure.

This work has never been easy; always been challenging. Managing decades of historical records in a modern GIS comes with multiple layers of complexity. Many of the best minds in our industry have struggled to design the most efficient way to replicate pipeline measurement systems (engineering stationing, measures, and mileposts) in the form of linear referencing for years. Beyond modeling the past, more than once we have openly challenged the idea of abandoning the concept of stationing for a more GIS centric coordinate based system. The wider adoption of GPS in the field moved that conversation forward, the need to track historical, station based, information was often the barrier.

The foundation of every pipeline GIS solution available on the market today is that pipeline features who occur along a centerline share a common location. The centerline of a pipeline is at the heart of GIS. Events are then layered on top of the centerline to describe the assets. Building up these layers of event data on the centerline is critical. Maintaining all these layers is difficult and is what most modern pipeline GIS data management software packages are tasked with. For example, moving a vertex of the pipeline should trigger any coincident pipeline events to move as appropriate. You shouldn't be able to move the pipeline centerline and leave the valve and the casing orphaned in their old geographic location. Conversely, you don't want your editors to manually move hundreds of events just because one vertex on the centerline moved. Tasking your staff to manage the data to this level of granularity would cause even the most steadfast GIS-er to pull his or her hair out.

I always believed that this core behavior belonged at the Geodatabase level. In virtually all pipeline GIS implementations this behavior is maintained at the application level. Not every application implements the behavior the same way and this functionality has not been a part of what Esri offered in the products.

Last week at the Esri User Conference we saw the "coming out" party for the future of pipeline GIS. The ArcGIS Location Referencing for Pipelines (ALRP) will solve these most fundamental of pipeline data management issues. ALRP will move the geometric and liner referencing backbone into the Geodatabase and some of the core pipeline data management functionally will now be imbedded into ArcGIS Pro. Why am I excited about this? Doesn't this replace some of my tools? Simply put, this puts

the synchronization of the spatial object and linear referenced objects where it belongs. If ALRP existed 15 years ago we would not have built those workflows. ALRP will allow multiple tools to manage and interact with pipeline data in a consistent manner, ushering out the era of fragmented data management strategies that have bogged down the growth of more forward-thinking technology-based solutions.

There is a long road yet to travel. ALRP will be on the ArcGIS Pro platform and won't be available in beta until Q1 2015. Large pipeline companies are slow to implement new technology, so early adopters could have it in production in 2015 but most companies won't become users until 2016.

We have been actively talking with the developers at Esri for some time now, have seen early demos of ALRP, and walked through some typical pipeline data management scenarios. Even the more complicated editing task – like a pipeline re-route on top of a previous re-route - appear to be handled. It is also important to recognize that this advancement is coming from a proven place; the technology was developed for state DOT organizations to maintain highway data so this pipeline solution has not been developed from scratch and has already been successful in a similar, linear-based industry.

We have developed a solid plan for implementing ALRP into existing deployments. PODS Relational implementations should be able to take immediate advantage of the ALRP as most already have some spatial representation of the pipeline centerline in the Geodatabase. We don't foresee complicated data conversions or disruption of enterprise integrations. The additional benefit of ALRP is that the objects in the Geodatabase are simple features and therefore work well with ArcGIS Portal and ArcGIS mobile deployments, something that was difficult using prior Esri linear referenced events.

It looks like ALRP is going to be just what we have been asking for. Our role as technology solution providers is to create roadmaps for exactly these types of technology shifts and develop additional tools that take advantage of an upgraded core. There is still work to be done to meet all the data management and workflow requirements required to maintain a solid asset database.

If you interested in hearing more about these roadmaps, and how I see this all fitting into today's pipeline data management framework, drop me a note at jallen@novarageo.com