Using Data to Drive Underground Infrastructure Decisions

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In the recent months, several states have implemented a requirement for an asset management plan (AMP) when accessing federal or states funds for infrastructure management and replacement.

Most municipalities, especially small ones, are struggling with the monumental task of creating an AMP, often feeling overwhelmed with the daunting task of where to start or even having funds to start the process itself.

How many times have you struggled to decide where to start when planning for your underground infrastructure repair and replacement?

Do you often cave into the customer that makes the loudest noise failing to invest on those areas that truly need the investment?

Or are you simply are not aware of where your main pain points are?

The truth is that most municipalities —big and small — have been inspecting underground infrastructure for years either with internal resources or outside contractors.

In an era where GIS dominates decision-making the integration of your historic inspections and your existing GIS as basic as it might seem to you is the perfect start of your asset management plan and CMOM planning.

An AMP is a living, ever-changing growing task, constantly evolving and in need of updating. Combining forces between your GIS team and your operators is the best way to achieve the task at hand.

Starting an Asset Management Plan

Today, you can find in the market inexpensive tools that can assist you in managing both your GIS data and your CCTV inspection results to make smart decisions using all your historic information to identify those assets in need of immediate attention or showing deterioration over time. Some people make the mistake of disregarding the historic data as they deem it’s obsolete or too old.

The truth is that assets, call it mainlines, laterals or access points (manholes, catch basins, etc.), unless they have been replaced through the years, can show you deterioration between inspections and you can easily use it to identify where your efforts should be

focusing on.

That same information can also be used to plan for your workforce needs and next action steps. Making decisions as to where to rehab, replace or simply perform maintenance operations like root cutting, grease trap needs, can also be identified with a click of a button.

Once you have imported all your historic information in systems like the WICKED Analyzer, you can also perform quality control and quality assurance of your data and subsequently apply the necessary updates to your GIS data using field inspection information.

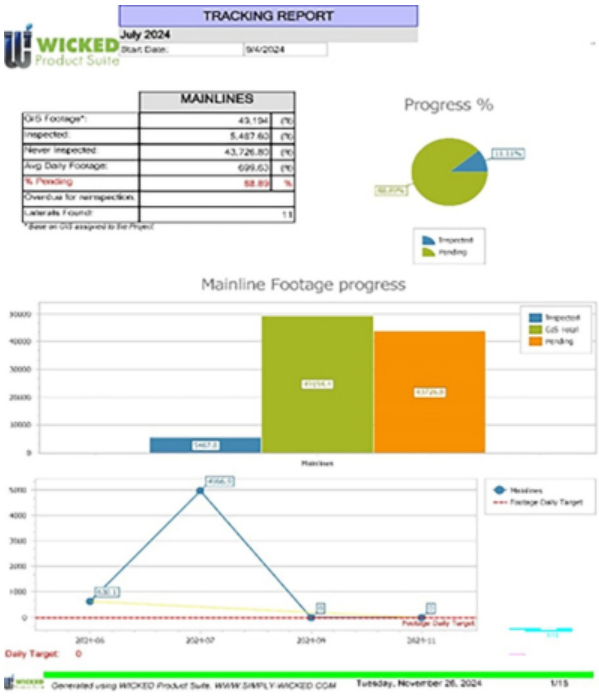
Your GIS team no longer needs to work as a silo, in fact teamwork in conjunction with your field teams is the best way to make sure your information is accurate and up to date.

Over the years we have assisted several utilities standardize and clean historic data, especially if an inspection standard like NASSCO has not been used, providing great insight on where assets have not been inspected or where efforts have been done on assets that really did not require that much attention and making sure funds are applied where they are truly needed.

Analyzing the Data

Once you have compiled your existing GIS, your as-builts and your historic inspections, you have compiled the first version of your asset inventory, your next step is to create your action plan in regards to required maintenance and capital investment needed for repairs and replacements.

Most systems can display the data in multiple ways to assist you in making such decisions by organizing data by material, aging, and shape. Some municipalities have identified that certain pipes and manhole shapes do not hold, as well as others over time identifying how many assets and footage of a certain shape or material by simply clicking on a button makes your budgeting and maintenance planning extremely easy.



Some of the systems in the market, like WICKED Analyzer, can go beyond showing the data in diverse groups like the ones mentioned above, they can use historic inspection data to identify those assets that have shown deterioration between inspections.

For example, if a pipe was inspected 10 years ago and it showed a small crack at a certain distance, that same asset inspected three years later might show a small fracture and in subsequent inspections that fracture has been identified as having a hole with soil visible at the same location.

This type of information is not only useful for that specific assets but by using technology like machine learning and prediction analysis other assets showing the same type of deterioration can be identified before is too late.

Data Quality

Lastly, let's address the issue of data quality. Over the years, the quality of data collected has improved dramatically. Companies and municipalities have recognized the importance of controlling the information that is collected to improve the end reports.

Even though this has improved, thanks to standards like NASSCO and WRC, municipalities still struggle with old inspection data where quality was not at the forefront. Here is where technologies like artificial intelligence (AI) can be extremely beneficial.

Using AI to process your historic videos will assist you in improving your old inspection data to create a baseline. Most of the time, AI can process your videos if the image is clear and has good lighting, HD videos are no longer required for AI processing.

Implementation

In conclusion, it is important to mention that the last step of the asset management plan should be the implementation of a consequence of failure for each asset.

I know this task seems very daunting to most people but identifying those assets where the biggest impact would be felt if they were to fail (impact on people, environment and economical) is critical to assure that your AMP has you spending your time, effort and funds where they are needed the most.

You do not have to go through your entire asset list to assign your consequence of failure, simply start with those that are in the areas where you feel the impact is bigger (e.g: hospitals, schools, near bodies of water that can cause unwanted discharges).