

Caltrans Overview

Senate Bill 1, the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017. This legislative package invests \$54 billion over the next decade to fix roads, freeways, and bridges in communities across California and puts more dollars toward transit and safety. To ensure the funding is well spent, Caltrans invested in an Enterprise Data Governance initiative. One of the main pillars of data governance is data quality. Caltrans was looking for a suite of applications that could help assess the quality of their data including Pavement, Bridge, Traffic, Project and others. This ranged from complex spatial datasets like the Linear Reference System (LRS) network to non-spatial flat text files like excel spreadsheets. After a review of many validation products in the market, they decided to go with 1Spatial's 1Integrate product due to its ability to handle validating their massive spatial and non-spatial datasets in a scalable way. Also, as part of SB1, Caltrans wanted to invest in a Transportation Asset Management System (TAMS) to help reduce costs and gain efficiencies in project planning.

Challenge

A Transportation Asset Management system requires all the pertinent asset information to be funnelled up into a central repository while still managing the core assets in their respective databases. CalTrans recognized this effort would require a massive data integration project and thus set out to develop an RFP to retain a Systems Integrator to implement the effort.

There have been numerous studies that have shown data integration projects can be risky. In fact, according to the article "Drowning in Dirty Data [1]", it is estimated that 88% of all data integration projects fail mainly due to poor data quality. Caltrans did not want to be part of that 88%. They wanted to provide the system integrators responding to the RFP all the necessary information and address any potential issues before work starts.

Solution

Caltrans contracted with 1Spatial and Gartner to build an Information Architecture and Data Quality Management Plan (IA/DQMP) to be included as supplemental documentation to the RFP for the TAMS procurement process. 1Spatial facilitated business rule workshops with subject matter experts and stakeholders to determine what business

rules need to be applied to all the different asset systems. The business rules determined were then configured within 1Integrate and the asset systems were assessed. This included validation checks that would assess not just each individual asset system, but also validate across assets.

For example, combine the LRS, Bridge and Pavement Data to determine if there are bridges reported in the pavement system that are not represented in the bridge database.

Advantages:

- ▶ Validate Asset Systems (Spatial and Non-Spatial)
- ▶ Handle Large Complex Asset Databases
- ▶ Cross Asset Validation Checks
- ▶ Performed a Data Health Check on Asset Systems

Benefits

Caltrans found that many asset systems that were in decent shape, especially when looking at the asset system by itself. This helped the System Integrators understand that most of the data was complete and accurate. However, Caltrans did discover some issues with current data governance policies such as the use of multiple LRS networks and inconsistent precision across assets which could lead to extreme issues with the integration project if not addressed. As a result of this effort the Enterprise Data and Geospatial Governance Program is driving change to move Caltrans to a single LRS network, define the precision that should be used and to begin to establish other policies to ensure data governance.

Future

Caltrans will continue to run validation checks within 1Integrate on their asset systems to ensure the data governance policy changes are being institutionalized and the data integration work will be more streamlined. 1Spatial will continue working on other data governance quality initiatives to help Caltrans ensure quality data is being used throughout the enterprise. The client appreciated 1Spatial's efforts and found them so valuable that additional work was assigned to the team, including:

- ▶ Continued assessment of other assets
- ▶ Working with Business Data Stewards to validate additional systems and datasets
- ▶ Implementing HPMS validation checks

[1] Marsh, R. (2005). Drowning in dirty data? It's time to sink or swim: A four-stage methodology for total data quality management. *Database Marketing & Customer Strategy Management*, 12(2), 105-112. doi:10.1057/palgrave.dbm.3240247