PA DOT HPMS Overview

Every year, State Departments of Transportation (DOT's), like Pennsylvania DOT (PennDOT), submit highway performance data to the Federal Highways Administration (FHWA) through the Highway Performance Monitoring System (HPMS). FHWA collects this information from State DOT's to determine the extent, usage, condition, and performance of the Nation's highways. This is done in an effort to assist in needs assessments and performance measures leading ultimately to the distribution of highway funds. Twice a year, State DOT's are required to report this data (an initial report in April and a complete report in June) to the FHWA utilizing a format and collection process detailed in the HPMS Field Manual. PennDot was looking for a solution that could connect directly to their GeoMedia Transportation Manager solution and validate their data against the HPMS field manual requirements, doing so at the source instead of having to create a specific HPMS dataset. PennDOT contracted 1Spatial Inc. to implement an automated, repeatable process using 1Spatial's 1Integrate automated rules engine with FHWA's HPMS ruleset against their GeoMedia implementation to prepare their data for these submittals.

Challenge

Historically, the HPMS submission process for the States has been a time consuming and labor intensive event. In order to successfully meet the HPMS requirements, most DOT's must compile data from across various departments and often in different formats. Further, FHWA is in the midst of updating the HPMS submission process (HPMS 9.0) to include validation checks that will go beyond the attribute only validations of the past, to include geometric and topological checks. Pennsylvania's HPMS data managers recognized the need to prioritize the update of their data management processes to be ready for these additional, more complex validations.

The validity of data is critical for apportioning state funding. Pennsylvania DOT realized they needed to put an emphasis on cleaning their data prior to submission. This data cleanup can be an extremely tedious manual process, taking up valuable resources from key organizational missions set to ensure safe roadways. To reduce the utilization of those resources as well as to protect against possibility for human error, Pennsylvania was looking for ways to automate and streamline the process, simplifying their workflow to gain efficiencies and better accommodate these new requirements.

Solution

To assist Pennsylvania to meet these goals, 1Spatial implemented their 1Integrate HPMS Jump Start package to help PennDOT turn HPMS submittals into a process rather than an event. As a part of the package, 1Spatial performed an HPMS readiness assessment to ensure the data would meet the requirements of the new geospatial and topology quality checks. 1Spatial's consultants then configured and implemented the same HPMS validation rules utilized by FHWA within PennDOT's

environment. In fact, the HPMS rules originally configured for FHWA by 1Spatial are being made available to all states to implement in their own environment, empowering them to leverage the rulesets within their own workflows. The automation provided by the 1Integrate rules engine, enables HPMS to become an ongoing process, minimalizing the effect on resources of the formerly mostly manual push for readiness during submission season.

However, PennDOT manages and stores HPMS related data in their Geomedia Transportation Manager LRS implementation stored in oracle tables which is a different format then what is submitted to FHWA. 1Spatial worked with PennDOT to configure 1Integrate to connect directly to their Geomedia implementation. The data quality reports returned from the 1Integrate HPMS Solution reference the source Geomedia datasets as opposed to a secondary derived product that must be cross walked back to the source system to make corrections.

Advantages of the Solution

By PennDOT implementing this solution there is no need to attempt to interpret the HPMS field manual themselves or to hire a contractor to infer what types of validation checks FHWA may be performing. The rules within the HPMS Jump Start Package are an exact copy and use the same technology that FHWA has implemented. As a bonus, 1Spatial updates the rules yearly to keep them in synchronization with FHWA's rulesets. There is no need to use a third-party pre-processing step or a manual process to generate the HPMS product before running the validation checks. The validation checks run against PennDOTs Geomedia Transportation Manager implementation providing non-conformance reports directly tied to their system of record which streamlines the data correction process by not having to transpose a derivative product back to the source. This makes PennDOT's HPMS submissions more of a process rather than an event. This process can be refined every year to simplify and automate the entire HPMS submittal.

Benefits

State DOT's like West Virginia, Pennsylvania and Massachusetts are implementing 1Spatial's 1Integrate HPMS Jump Start Package and are on their way to a more automated process for performing the HPMS validations required for next year's submission. In fact, states are also providing valuable input back to FHWA on ways the existing HPMS rules and resulting validation reports can be improved or tweaked to make it clearer as to where and why their data does not conform.

> **Some of the benefits to PennDOT and other State DOTs are:**
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> ▶ Uses same validation rules and technology as FHWA to ensure the data is being evaluated in exactly the same manner
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> ▶ Prepares PennDOT to be ready for the new HPMS 9.0 geospatial and topological validations
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> ▶ Savings realized by ensuring the submitted HPMS data will meet FHWA requirements prior to submittal, eliminating the time-consuming back and forth of data correction/ resubmittal
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> ▶ Connects and validates directly against GeoMedia Transportation Manager instead of derivative product, simplifying the data cleanup effort
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> ▶ Efficiencies gained from a process rather than an event
>
> ▶ Minimizes the chance for error over the former more manual process

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