Virginia DOT uses data to empower business areas

Virginia DOT's data use and management challenge

As the third largest State Department of Transportation (DOT) in the country, Virginia DOT (VDOT) is a mature organization with respect to data use and management; yet, up until recently staff still found their data analysis and reporting process to be inefficient and time-intensive. Although they had a data warehouse and an enterprise reporting tool, significant Information Technology (IT) staff time and resources were needed to format the data for use by business areas, which VDOT defines as the non-IT functions of VDOT that IT supports, such as Traffic Engineering, Traffic Operations, Maintenance Division, and Structures and Bridges. IT had full control of system, operations, and asset-related data, and analyses and reporting were performed solely by IT based on individual requests by the business areas. For example, the Structures and Bridges division would request quarterly performance reports for a meeting with the Chief Engineer. Each request was then followed by an iterative process between IT and the business area, which often took about a year from the time of the initial request to the completion of the final data analysis and report.

A cultural shift and new technology leads to success

VDOT decided that it needed to change

KEY ACCOMPLISHMENTS

- **VDOT has expanded its data analysis and reporting capabilities**

- **VDOT has enhanced collaboration and productivity across the agency**

- **VDOT is sharing state data with MPOs, local communities and the public**

the way the agency used and analyzed data. From the agency's perspective, there needed to be a cultural shift from IT controlling the data, and producing all analyses and reports to the business areas taking ownership over the data and performing their own analyses as needed. This required IT letting go of some control, but the business areas also had to take on significant new responsibility. The benefits of this cultural shift have been far greater than anticipated. The outcome has not just been more efficient and expedient data analysis, but the agency is now conducting analyses and using data to adjust operations in new ways.

In 2013, VDOT purchased a data analysis and visualization tool, which is supported by IT, but can be used directly by the business areas to create reports and data visualizations. The agency introduced the new tool through a pilot program, offering training to staff in the business areas on how to use it. Now that it has been fully implemented, IT staff has been able to focus more on ensuring data accessibility and addressing its backlog of work requests and less on writing reports. Now that the business areas are becoming more proficient in the use of the tool, they rely more on each other for support, which has also allowed for more efficient use of IT resources.

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Doing more with more [data]

In addition to more efficient data analysis, the shift in data responsibility coupled with the agency's new data analysis and visualization tool has empowered business areas to do more with the available data, and has already resulted in operational changes that are increasing safety, reducing congestion, and decreasing costs. The Operations Division has been able to provide more detailed information on average incident duration times, calculate how long it takes to clear incidents, and characterize associated congestion periods. As a result, they have implemented measures that have led to a decrease in incident duration. The Bridge Maintenance Group has been able to refine its financial analyses, which has led to more strategic funding decisions, and a fundamental change in direction at the Executive level.

VDOT has also leveraged the new data approach and visualization tool to educate and engage local communities and the public. For example, VDOT developed a public portal to present crash data to the public in a more intuitive and useful way, which has been a useful communication tool, and also provides data in a format that local communities and MPOs can use to meet their own needs.
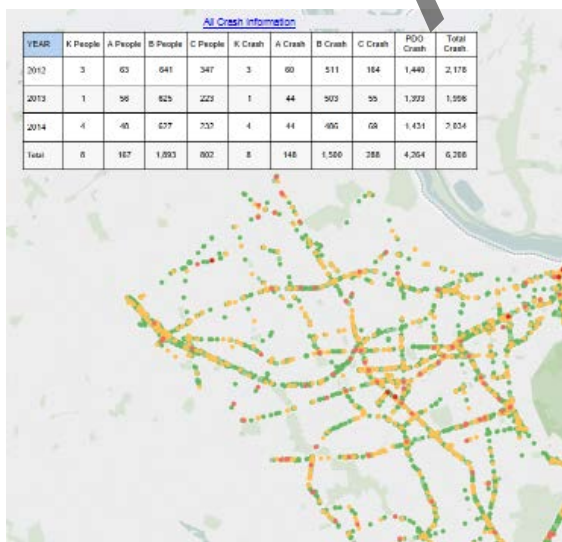

Figure 1 Example Snapshot of VDOT's Crash Tool

There have been unexpected ancillary benefits as well. Use of the tool by a range of business areas has fostered communication across the agency, leading to more collaborative working relationships and new and creative ways to analyze and share information.

Lessons learned

VDOT learned many lessons through the course of this organizational change, including:

- Agencies should not expect that adopting a new technology tool alone will result in success; adoption of the tool must be coupled with a cultural shift related to data responsibility in the organization.
- IT staff need to support the shift in data responsibility, and be able to release ownership (or the perception of ownership) of the data.
- Business area staff need to be involved from the beginning. For example, during the pilot phase, VDOT provided half of the licenses for the new data analysis and visualization tool to business area staff. This not only provided them training early on, but also empowered them to see what they could do with the data.
- When choosing a data analysis and visualization tool, VDOT found that ease of use by staff across the agency was more important than having the most powerful tool.

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