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Data and the DoT: Going beyond the technology to drive long-term value

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Around the world, Departments of Transport and Transportation Agencies (hitherto referred to as DoTs) are facing unprecedented disruption. On the one hand, new 'transportation technologies' such as drones, autonomous vehicles, electronic tolling and traveler information systems are putting unexpected strain on government resources.

At the same time, most DoTs are facing massive internal pressures. The more progressive organizations are focused on integrating the management of programs and driving efficiencies across the organization. And, with government budgets under continued pressure, most are being asked to achieve more with fewer resources.

Data disruption or data dividend?

Most DoTs have recognized that it is data that is driving the current disruption. Much like most other industry sectors — from consumer goods through to engine manufacturers — the availability of data and analytics technologies is changing expectations and models for DoTs around the world.

At the root of this data-driven disruption is the pervasive shift from 'pull' data acquisition (where the operator collects the data on a periodic basis) to a 'push' acquisition approach (where the sensors or data collectors push a constant stream of data to the operator). DoTs now have access to massive amounts of real-time data and that — in turn — is unlocking new strategic approaches and value for transportation systems and their shareholders.

Take, for example, the impact that real-time data and sophisticated analytics can have on improving 'whole of life' costs and value. Indeed, by linking key data from design and construction to the operations and management (O&M)

information management system, some DoTs are already unlocking significant value in whole of life cost reductions and improvements in total expenditure.

D&A, O&M and AMOs, oh my!

Big data and analytics are also being harnessed on the operations and maintenance side. Some agencies are using their access to data to develop a much richer view of the real-time conditions across their system and to predict future conditions. In the US, for example, both the Dallas and the San Diego metropolitan areas have implemented Integrated Corridor Management (ICM) projects aimed at optimizing the available multi-modal infrastructure in a specific corridor.

Others are using data that streams from connected vehicles to drive operational improvements. Data from a small number of connected test vehicles are already being used to collect travel time information. Now DoTs are considering how they might use these vehicles to capture data on pavement conditions, weather data and fleet monitoring to support a wide range of potential business cases.

Data is also being used to drive more fundamental shifts on the maintenance side, not only to uncover innovative ways to deliver routine activities, but also to help transition the function towards more of an Asset Management Organization role. Asset Management Organizations generally drive value by aligning organizational goals and objectives with the lifecycle management of their assets, focusing on managing the performance of the assets. And this requires access to real-time performance and operational data.

Understanding the value in the data

Not surprisingly, DoTs around the world are rapidly awakening to the value of their data. In fact, performance and operational data is already becoming an asset class of its own, demonstrating enduring value and costs. Many organizations currently list asset data collection costs on their balance sheets and it will not be long before data becomes a balance sheet asset and liability in the transportation sector.

Customer data and information is also becoming increasingly valuable to DoTs, particularly in helping organizations make smart long-term decisions on the use of scarce maintenance resources. Customer engagement and insights gleaned from smartphone applications and data crawling tools are already helping transportation agencies fine-tune their investment allocations. As customers share more data with their transportation agencies — either through mobile apps or connected cars — the value of customer data should significantly increase.

Go beyond the technology

Recognizing that data — and the ability to manage, analyze and integrate massive amounts of it — is key to delivering their programs and services, some DoTs have started to go beyond the technical and operational questions to focus on the effective governance and analysis of their data. Simply put, these organizations want to ensure that the data they are analyzing — and the insights they are gleaning — are reliable and effective.

In the US, many DoTs are enhancing their governance and analytics as part of their efforts to comply with the Moving Ahead for Progress in the 21st Century (MAP-21) Act passed in 2012. This initial data effort is largely focused on bolstering asset inventories, particularly for bridges and interstates.

While these initiatives will enhance some capabilities, it also has forced many DoTs to take a hard look at their current data and data management practices. And most found themselves to be seriously lacking. Not only was the data they were collecting not the right data, but it wasn't being used to drive value or effectively manage their organizations. Rather than create confidence, the initiative actually brought awareness to the size of the problem in the US. Other markets may be further ahead... but most are likely further behind.

Taking the right steps

So what can DoTs and transportation agencies do to improve their data governance and management? Obviously, investment into technologies, capabilities and skills will be critical. But our experience suggests that most DoTs are struggling not with the technical aspects but rather with catalyzing the shift in culture and business practices that are necessary to drive value from data.

When we work with DoTs around the world to improve data management, we often look for five key factors:

- The organization's ability to connect asset performance data to the objectives of the business and desired outcomes
- A clear understanding of what data is required to identify the performance and failure factors that have the greatest impact on the business
- A robust, effective and auditable data collection process that assures data quality and accuracy
- A suite of tools and applications that allow management access to the data and insights that drive decision-making
- A formal data management and governance function that assigns responsibility for working across the various business units to a senior executive level.

We believe that today's data 'revolution' offers DoTs, transportation asset investors and citizens at large a massive opportunity to do more with their transportation budgets and to respond to the ongoing disruption now underway across the sector. But first, DoTs will need to trust their data and their analytics.

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