

Transport Scotland switches on Big Data for immediate and ongoing value



Transport Scotland has reaped multiple benefits since starting a trial of INRIX Roadway Analytics, including vastly improved journey time information and far faster response times to public and ministerial information requests

The Challenge: Efficiently extracting insight from big data

When Transport Scotland looked into the potential of using third party big data sources, both to improve its real-time traffic information and as a network management tool, it was impressed by INRIX Roadway Analytics' easy-to-use "front end" software.

"A lot of providers are only able to provide access to the data, and are not especially focused on how the user can easily extract value out of it," says Nick Murray, Senior Traffic Technologist for Scotland's National Transport Agency. "But INRIX Roadway Analytics comes with a suite of in-depth analytical tools designed to extract insights from big traffic data."

“Many data providers are only able to offer access to the data through development of the client’s in-house systems, and as is often the case, the expense of developing software to integrate big data sources can run into hundreds of thousands of pounds – trying to make sense of big data can be a near impossible and thankless task.”

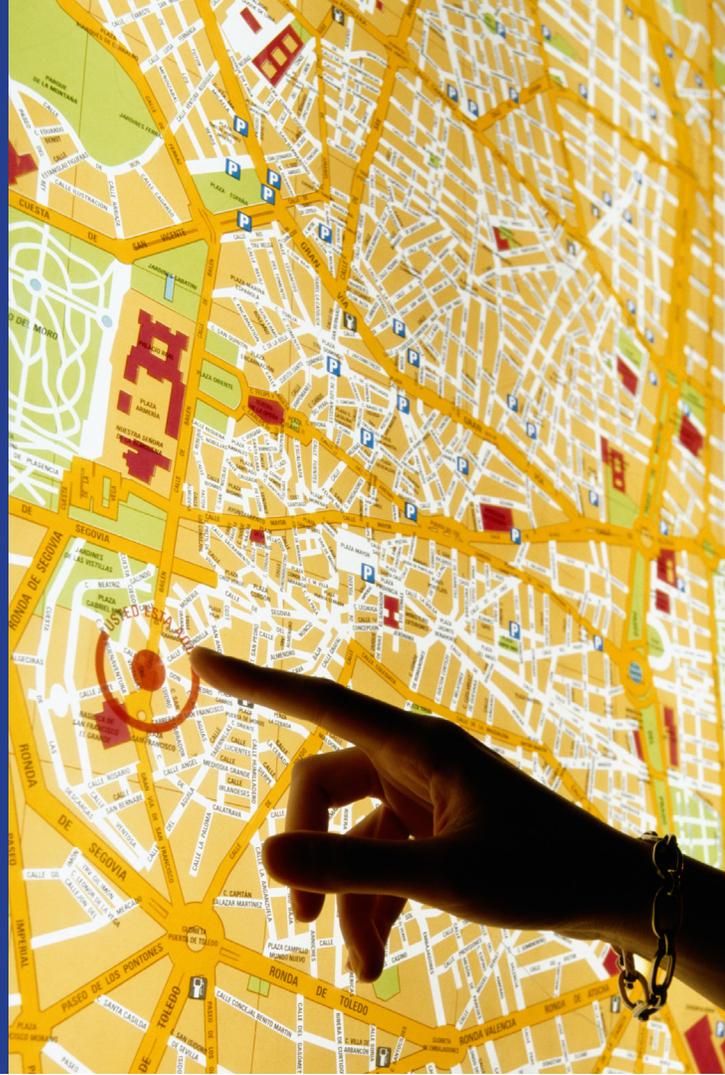
Nick Murray
Senior Traffic Technologist for
Scotland's National Transport Agency

The Solution: Turnkey, easy-to-use analytics platform

“Transport Scotland was able to pull meaningful data out of the INRIX system via Roadway Analytics on the first day without any additional training, software or hardware,” Murray adds.

Roadway Analytics is underpinned by INRIX Traffic, a vast global traffic dataset which is largely based on floating vehicle data from a variety of data sources. These include in-car GPS and driver and passenger smart phones, the proliferation of which means that INRIX is collecting more types of data more often than ever before.

Transport Scotland’s initial motivation was to explore the use of third party traffic data to reduce its reliance on roadside infrastructure. However, it is now championing INRIX Big Data plus Roadway Analytics as a service approach, since adopting both real-time traffic and analytics software packages in November 2017.



The Results: More data at minimal additional cost

According to Murray, the big win in the long-term is gaining of an extra data source without the need for infrastructure and ongoing maintenance cost, as well as building expertise on a platform that offers opportunity for application in other areas.

To date, Transport Scotland has used this new data source in three main areas. Firstly, its National Traffic Control Centre operator, Traffic Scotland, uses the real-time data to monitor live journey times and network conditions.

Secondly, Transport Scotland’s strategic transport planning team uses the analytics platform to assess proposed roads schemes and to evaluate the before and

after benefits of deployed schemes.

And thirdly, Transport Scotland uses the analytics platform for answering the numerous information queries they receive from a wide range of interested parties on the performance of Scotland’s strategic road networks.

Transport Scotland can now deliver a much faster and more accurate response to requests. “Previously it would have been impossible to answer specific point-to-point traffic condition enquiries with confidence, explains Murray, “But the new analytics platforms totally configurable functionality means it is a 10-minute task to establish traffic conditions or journey times on any part of the network at any given time in the past.”





A key attribute of the system is that it reveals historic traffic speeds/journey times across any part of the network going back to the start of 2014. Using the old system, based around fixed traffic monitoring assets such as Bluetooth and automated number plate cameras, Transport Scotland could only extract historic data on routes based around this fixed infrastructure. But with INRIX Roadway Analytics, it can integrate traffic data between any points within the network, across any time period.

Transport Scotland's existing roadside traffic monitoring hardware is largely concentrated in the country's Central Belt running between Edinburgh and Glasgow, the area of Scotland's highest population density. But in the more remote parts of the country, particularly further north, traffic has been monitored by a large quantity of disparate traffic monitoring sites, which are often difficult to place for maximum benefit in such a large geographical area. The locations of these monitoring

sites are restricted by their infrastructure requirements and the need to have them easily accessible. Furthermore, these more remote sites do not report 'live' data, and cannot be used for monitoring network conditions. "Since using the INRIX system," says Murray, "We are no longer restricted and we have full coverage across the whole network."

Additional Benefits: Far more than greater coverage

"Floating vehicle data is significantly more useful and reliable than earlier technology," Murray notes, "because it is more granular than possible with fixed infrastructure alone, and often more indicative of the actual traffic conditions due to the increased sample size." INRIX XD Traffic allows users to focus on much finer detail than previously possible.

"Induction loops," he explains, "Measure a point in time

and space, and are difficult to interpret over distance - is that slow speed data point highlighting a slow moving vehicle causing a transient queue at that point, or is there a long static queue extending far beyond the point of measurement?" Similarly, Bluetooth monitoring technology requires a Bluetooth onboard vehicle to pass a point, and just gives the time taken for the vehicle to get from A to B; it can't tell whether a vehicle has stopped for fuel or is held up by an incident or heavy traffic.

Historically, low traffic flows have meant that gaining a

A major application has been to measure the impact of the Queensferry Crossing, which on opening in August 2017 became the main crossing of the Forth Estuary to the east of Edinburgh.

Since adopting Roadway Analytics, various analyses have been undertaken to look at how the new bridge has affected journeys in the surrounding areas. This is enabling a deeper and more accurate evaluation than could have been carried out previously and is allowing Transport Scotland to report and demonstrate the increase in reliability resulting from the bridge's construction.

true understanding of traffic conditions in more remote parts of Scotland was very unreliable, but as Murray puts it, "Using the INRIX system "gets rid of data outliers like mid-journey stops from existing systems."

A further benefit is that INRIX is happy for Transport Scotland to give access to Roadway Analytics to its multiple partners working across its network. This means Transport Scotland is not paying expensive fees for lots of data crunching from its consultants who are freed up to focus on providing their value-added services.

Another area where Transport Scotland is achieving much deeper insight into the performance of its network is in the modelling of delays through roadworks. The in-house delay modeling tool relies on algorithms which, according to Murray, "don't suit all roadworks scenarios, but we can now understand what is happening based on actual evidence from previous works of the same type".

After spending the better part of a year using Roadway Analytics, Murray feels that the use of third party data has proven to be extremely valuable. Transport Scotland is now looking to decommission some of its roadside equipment, which will reduce maintenance costs as well as the health and safety risks associated with road side maintenance.

Transport Scotland also sees great potential in developing its own interfaces, which will allow deeper integration of the traffic dataset information available from the INRIX system, which Murray believes will allow it to get even more value out of the data.