Newly installed Asset and Fault Management System

an asset itself in Ireland

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Without a clear understanding of their assets and quick responses to faults, the vast majority of organisations would face costs which quickly escalate out of control. Thankfully, through the use of technology and ITS knowledge, the industry has responded to clients' key pain points, making the entire process increasingly efficient, flexible and cost-effective.

Ask any organisation their key issues when it comes to the management of ITS/field-based assets, and they are likely to include some, if not all, of those shown in the table at Figure 1. Using technologies, including web-based connectivity, and smart phone applications, the National Road Authority's (NRA) new Asset and Fault Management System (AFMS) Project in Ireland, is delivering significant benefits, 'easing the pain' and becoming a valuable asset in itself.

1 http://nra.ie/
nra-research/
04/ 06/2015
2 http://nra.ie/
public-private-
partnership/a-
decade-of-
progress/
04/06/2015

For Road Authorities, the safe operation of assets and their environmental footprint is being increasingly scrutinised by external agencies and local residents. The NRA is no exception. With its primary function to *'secure the provision of a safe and efficient network of national roads'*[1] it is no surprise that maintaining the asset value, reliability, and functionality of the network is 'Priority 1' for the authority[2]. Developed, and recently installed, by ITS provider Nicander, the NRA's AFMS manages the entire portfolio

of 3,000 assets on Ireland's national road network providing a common, real-time dashboard and a central management and reporting function for both the client and contractor organisations. The AFMS can interface to, and receive fault inputs from, CCTV cameras, Variable Message Signs (VMS), Automatic Incident Detection (AID) side-fire radar, Lane Control Signals (LCS), weather monitoring equipment, additional Police ANPR cameras, traffic signals and other associated equipment.

So, how does this new ITS System help ease the pain?

Nicander has worked closely with the NRA and Imtech Traffic & Infra UK and Ireland, to successfully provide intelligent solutions to address the concerns identified in Figure 1. The new system transforms maintenance and operational performance. By

Client Pain Points	ITS System Solution, delivered by Nicander's AFMS
High costs	Virtualised application
	Optimised data transfer
	Reduced travel costs
Lack of cohesion between clients and contractors	Compliance to KPIs via multi-access, centralised management system."
Delays in identification of faults	External system interfaces for continual monitoring of faults
Delays in response to faults	Real-time map and tabular views of the data
	Mobile app and map tools for mobile workers
Inefficiencies	System reliability
	Single point of data entry
	Exportable data
	Easy access to real-time information
	Automated systems
	Single view of asset performance
	Integration of planned maintenance with fault management activities
Environmental concerns	Reduced paper usage
	Optimised routes
	Optimised task allocation
	Green IT and virtualisation
Lack of forward thinking and continuous improvement	A powerful knowledge base with tools to allow closer analysis of data
Multiple contracts and contractors	Mobile device connectivity – secure and centralised tasks across multiple contractors
Unable to 'see the wood for the trees'	Dashboard linked to KPIs allows an overarching view of the bigger picture
Lack of asset lifecycle information regardless of asset location	Web interface - inventory of the status of assets on site, in storage and for repair
Difficult to manage workload out in the field and delays in updates	Remote access to the system in real-time
	Standard smartphone features e.g. GPS location and photographic evidence
	Additional mobile apps for inspection reports and work order processing
Locating required information "like finding a needle in a haystack"	Tools to make it quick and easy to drill down to the information a user needs
Poor quality, out of date reporting	Regular and ad hoc reports at the click of the mouse
	Dashboard for real-time operational management reporting
	Mobile app delivers real-time information to all users
Training costs are high and systems are not user friendly	Intuitive system – users understand problems quickly and can utilise all functionality
	Use of multiple windows for greater flexibility when viewing information
	Web-based for multiple user access
Hardware costly and paper based system once back in office	BYOD – engineers and personnel on site can remotely access and update in real time via their own android devices
	Use of standard smartphone and tablet technology enables cost effective delivery and integration into normal business operation
	Use of standard Microsoft products enables ease of integration with corporate business information systems

joining multiple fragmented, complex datasets (across all types of highway assets, multiple operators and contractors) into a single view of asset performance, roadside engineers, supervisors and managers are each provided the information they need to perform their roles effectively and efficiently. The true value of each asset is fully understood by its owners and a complete full lifecycle view of performance across all assets enables more effective decision making on new asset deployment and replacement programmes. By ensuring that faulty assets are fixed and maintained in timely manner road users also encounter fewer problems, resulting in more reliable journey times, safer roads and better informed drivers.

Implementing established asset management tools and techniques in innovative and original ways... »

Building on Dublin City Council's inventory and fault management system, Nicander has enhanced the core product and implemented the NRA's AFMS with interfaces to external systems providing it with fault and other information. Asset status information is updated automatically through an exchange of data with other systems or manually by a user. Each fault reported by an external system is mapped to a fault code in the AFMS. The fault code, asset type and location information is used to determine the priority or severity of fault which consequently impacts on the presentation of the fault within the system and mobile application. The response times for different faults are configurable to reflect the operational impact a fault may have.

Engineers are advised on work priorities through the AFMS's notification processes whereby e-mails or SMS messages can be sent to technician's mobile devices when new or updated fault information is received. The AFMS mobile application installed on the device also sounds alerts when new or updated fault or maintenance task information is available. These notifications keep technicians informed and enable them to respond to events within the contract service levels enabling KPIs to be met. Technicians are also notified and alerted when a task is approaching a deadline for a response.

AFMS work orders define the process that the technicians have to follow to complete a task and enforce the entry of required information. All work orders have an audit trail which contains a record of the work performed.

The AFMS provides links to documents and photographs to assist technicians and other users. These can include risk assessments, method statements, site data packs and so on. The location information also provides details of whether Traffic Management is needed, whether a mobile elevating work platform is needed and where the technician should park safely. Having this information available electronically means technicians are not required to transport what could be a large number of documents around with them.

The number and types of reports available from the AFMS possible are limitless. In the AFMS an asset has a number of cost attributes defined for it. Work Orders also contain attributes to determine the labour effort involved in working on an asset. By creating a report within the AFMS to amalgamate this information it is possible to analyse the total cost of ownership of assets. Using this information the customer can compare the relative costs of similar types of asset and make judgements when making capital expenditure decisions on new or replacement items.

And finally...

Nicander's AFMS product is flexible and can easily be tailored to meet an authority's requirements for ITS technology asset and fault management as well as providing additional features to manage other infrastructure assets and services such as grass verge cutting and waste collection.

Mark Horgan, Imtech's Business Manager in Ireland said : "The benefits of the new system are many: the browser-based interface provides access from both the office and the field and is very intuitive; users have noticed significant improvement in application response; many new features have been added to the new system including planned maintenance scheduling.

The FMS system provides a new insight into the management of all our maintenance activities and this will result in greater efficiencies and a higher achievement of KPIs."