Position Paper: Management and Investment in Long-Term ITS Projects

(This Position Paper should be read in conjunction with the Joint ITS (UK)/IET publication - 'Local Authority Guide to Emerging Transport Technology')

1.0 Background

1.1 Regardless of their nature all successful projects require a Project Management methodology (such as PRINCE2 - Projects in Controlled Environments) to effectively monitor dealings with client-organisations, to demonstrate that effective project management and control systems are in place and to ensure the objectives and intended benefits are delivered. Intelligent Transport Systems projects are no different . however where do they rank in the publics and businesses consciousness? Unlike many projects that have physically visible outcomes ITS systems are often IT based with little physical evidence of their installation. Therefore, these projects need to work that much harder, strive more efficiently and continually justify that they represent value for money whilst demonstrating that they are not science-fiction-based futuristic propositions but are systems that are integral to everyday transportation network management and information. This is especially important as ubiquitous connectivity is currently being touted to be the Fourth Industrial Revolution.

1.2 All projects need to incorporate portfolio management structures that ensure key benefits are met through implementation, update reports and publications that illustrate systematic methods that includes development and learning cyclical evaluation processes, accreditation and training needs. Any successful programme needs to incorporate preventative measures to mitigate against risk, to be assured of value for money, attaining Cost Benefit Analysis ratios and specifying Return on Investments requirements.

1.3 The Association of Project Managers defines benefits management as the identification, definition, planning, tracking and realisation of business benefits. It argues that benefits need to be actively managed throughout the whole investment life-cycle. It is thought that only around 20% of organisations report high maturity in benefits realisation.

2.0 The Key Benefits of Project Management Systems include:
- Helping organisations deliver projects on time and on budget
- Increasing project return on investments
- Effectively managing benefit realisation
- Enabling business change and continual improvement
- Assuring a customer focused approach . i.e. helping deliver actual business requirements
- Helping organisations manage risks in line with their risk appetite

2.1 Early project systems were developed solely for IT projects however the evolution of more sophisticated challenges has broadened the scope of project evaluation which are now more widely applicable across all type, manner and size of projects.

2.2 Project Management Systems tend to integrate four primary elements to form a comprehensive framework for managing and delivering projects. These four elements are:

a) Principles: - Guiding principles and best practices determine whether a project is being managed properly. In total there **are seven principal themes** which all need to be met to fully address the project in hand.

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b) Themes: - There are seven themes in PRINCE2 that need to be continually addressed in parallel throughout a project. These themes describe how certain project management disciplines require treatment by project management systems, and why they are necessary.

c) Processes: - There are seven processes in PRINCE2 - as follows: -

    a. **Starting up a project**: preparing a project brief, assigning roles, defining the approach, and planning the next stage.

    b. **Initiating a project**: planning a project, project controls, business case, project initiation document.

    c. **Directing a project**: authorising a project, project direction and project closure.

    d. **Controlling a stage**: authorising work to be undertaken and its completion, assessing and reviewing progress.

    e. **Managing stage boundaries**: planning the stages of the project, updating the project plan, business case and risk assessment, creation of an exception plan.

    f. **Managing product delivery**: delivering a work package to agreed requirements.

    g. **Closing a project**: Executing a controlled close to the project.

d) Tailoring project management to the associated project environment

2.3 As an example of the above elements . Local Authorities are a primary customer however they are all subject to on-going austerity measures; in addition to this, there are issues regarding prioritisation and resourcing, the reduction of staff and the loss of skills and experience. All of this means that potential Project Managers need to provide significant justification that the four Themes and seven Principles, as outlined above, are conveyed authoritatively to Board/Chief Executives before an ITS project can hope to be approved. The outcomes and benefits need to be guaranteed before any project initiation can be approved.

3.0 In Practice

3.1 There are a number of topical areas of ITS developments, such as Autonomous and/or Connected Vehicles and Mobility as a Service (MaaS). These are very much in vogue at the present with considerable activity being directed towards them to the potential exclusion of other areas. Road User Charging and Electric Vehicle projects receive less immediate attention for varying reasons; the former being unlikely in the mid to long-term future owing to political influences, while the focus on low-carbon technologies comes and goes as the environmental and / or legislation requirements dictate.

Projects in an ITS context need to address certain specific challenges . exemplified by the approach taken by the Centre for Connected and Autonomous Vehicles (C-CAV) a recently appointed joint Department for Transport /Department for Business, Innovation and Skills Policy Unit. C-CAV recognises and highlights how a number of challenges will be tackled: -

Legislation . ITS projects need to address how to legislate in a way that ensures clients are ±comfortableq with the approach taken. There may be value in picking-off issues as they occur rather than tackling the whole issue which may be too large to address all at once.

Insurance . Autonomous vehicles present unique challenges therefore total clarity insurance claim payments will be made has been clearly set out to avoid any ambiguity.

Data . There are legitimate issues regarding intrusion into device privacy. A cyber-security attack on a personal /commercial smartphone that results in a crash is not a major problem - however if car actually crashes because of a cyber-security attack then this becomes an enormous problem . both for the vehicle occupants . but also to the reputation of autonomous/connected vehicles. There is considerable interest at parliamentary levels . e.g. Transport Select Committee and Science and Technology Committee -

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regarding who owns and has access to data, therefore this must rank highly amongst any project's main considerations.

<u>Infrastructure / connectivity -</u> Projects need to recognise the benefits of perpetual connectivity which, as mentioned previously, is regarded by some as the Fourth Industrial Revolution. ITS projects need to capitalise on this unique status whilst realising that any new technologies and/or systems have to be introduced into an environment that will include legacy systems and encompasses an existing and depreciating fleet.

The challenge for project installers is to manage integration; it is never a blank sheet. Local Authorities, in the main, are the main beneficiaries from these projects. However, the benefits they receive will be contrasted with connectivity issues regarding how systems will be integrated, how they will be paid for and how they form part of an organisational strategy. All are all important issues and C-CAV has addressed this by being the single point of contact for any questions or queries.

<u>Security</u> . Depending on the nature of the project there are varying levels of interest in this area but certain topics are more challenging and require a more fundamental approach to reassure clients. There is an imperative challenge to investigate all security and safety implications regarding autonomous and connected vehicles. Cyber-security and safety are their predominant issues and must be comprehensively addressed to guarantee that there can be no breaches through future obsolescence, complacency or oversight.

<u>UK future outside the EU</u> . Many future projects are bound by the implications of the recent referendum when the UK elected to leave the EU. However, pending the invoking of Article / Chapter 50 all UK projects must conform to EU legislative requirements. Post-EU then the terms of project management are likely to vary to a greater or lesser extent. The reality will be that the terms and conditions of any project will be dictated by any national protocols.

<u>Standards</u> . Mapping out the important areas of Standards is crucial to good project management. This means collating existing Standards and also identifying what and where the appropriate expertise lies. Standards are a complex area and one that needs to be addressed . especially as it appears that the USA, Germany and others are working on many of these areas but little is heard of the UK's involvement. Once again the reality is that the Standards that apply to any project will be dictated by any national or international protocols that the project is engaged in. The BSI said immediately after the Referendum that it was business as usual until Article / Chapter 50 was invoked . and even then it was likely to continue to be business as usual' as many of the projects were multi-national.

<u>Implications of road maps</u> . There is a high level of commitment by C-CAV to collaborate on integration of autonomous and connected vehicles onto the strategic and local road networks in a way that the network operators can confidently ensure their introduction onto the network.

a) The component elements are vehicles, network control, parking, infrastructure and users . and the challenge is what is easier / harder to address. Each of the elements may be at different levels of maturity and will involve different stakeholders but they will need to work together.

b) Development paths . the rate of development and adoption/acceptance of the technologies may be difficult to predict. Connected vehicles are seen as important as a way-finder for autonomous vehicles to help demonstrate capabilities and build confidence.

c) Local Authorities . do they have the time, the inclination and the knowledge to address these challenges? They may lack the finance, the staff and the expertise. C-CAV report that LAs are seeking

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their help as they realise that autonomous and connected vehicles are metaphorically heading their way whether they like it or not.

Public Good . Business-case Roadmap - should incorporate:

a) Current and existing technical developments

b) What the commercial-value-chain is

c) What help might be needed with near-term planning

Projects need to develop specific use case studies and also need to assess level of engagement with the European Commission.

Questions to ask in any project proposal

a) What is the potential value of the project output to the clients network management and operations?

b) What is the Value Chain and how can the potential be unlocked? E.g. how can the concept of connected vehicles be sold?

c) What is/ are the trigger points to indicate the successful adoption of a project outcome . e.g. when can the uptake of connected vehicles deemed to be successful?

d) What are the key blockers to adoption of the project outcomes?

e) How will the success of the project be judged and benefits realised?

4.0 Evaluation

4.1 An important element of any project is the evaluation phase to determine whether or not the scheme has been successfully implemented and the desired project initiation benefits have been realised whereby the before and after scenarios can be demonstrated to confirm that the scheme had been successful.

4.2 Case study examples of this include:

4.2.1 Atkins conducted an evaluation of the Smart Motorway All Lane Running Scheme concentrating on three specific areas - Safety Implications of removing the Hard Shoulder, Detailed Accident and Casual Analysis and thirdly, Hazard Assessment. This scheme has been subject to scrutiny as it passed through the Transport Select Committee Inquiry stages and some stakeholders regarded it as unsafe. However, the evidence from the assessment clearly indicates that in its first year of operation the scheme has delivered the expected benefits.

4.2.2 The Executive Summary of the covering report broke the evaluation into three distinct elements:
• Analysis of accident and casualty data collected from the Dual 3-lane Motorways (which have hard shoulders) and multi-lane All-Purpose Trunk Roads (which do not). The purpose of this analysis established the safety implications of converting the hard shoulder to a running lane without any further mitigation.
• Detailed analysis of some of the more significant safety hazards was undertaken using accident and casualty data; the purpose of this was to ensure that the safety implications of these were as fully understood as possible.

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• A Hazard Assessment was undertaken with respect to the Managed Motorways . All Lane Running concept. The purpose of this is to understand how the scheme was expected to perform in terms of safety and how it was expected to impact some key populations.

4.2.2 Independent research has supported an internal evaluation which proves that SPECS average speed cameras significantly reduce casualties wherever they are used. The RAC Foundation, supported by Road Safety Analysis published results from a detailed study into the effectiveness of average speed cameras (covering 25 years of data and dozens of UK routes) to show that significant casualty reductions are achieved where average speed enforcement has been used using SPECS cameras.

4.2.3 Commenting on the results of the research, the Road Safety Analysis stated - %The statistical results clearly show good collision and associated casualty reductions on stretches of road where average speed cameras are used. As the results take into account other influencing factors and only consider the effects of the cameras in isolation, authorities could expect to see similar reductions on other roads where this type of technology is implemented. The reducing cost of average speed cameras and their ability to cover longer stretches of road make them a very cost effective solution that delivers proven results over a long period of time.+

These examples indicate that ITS implementations need to go that extra step to demonstrate to critics who have contrary views or suspicions that these type of installations / schemes will not deliver as predicted, that they actually do provide tangible benefits and improvements.

5.0 Summary

5.1 <u>What are common weaknesses in any ITS project?</u>

   a) Projects are often overly-deliberated and consequently initiated too late . thereby losing headway and subsequent project value to competitors.

   b) Frequently there is insufficient investment . capital, resources, manpower / skills linked with an intransigence to get going. This is the frequent Achilles Heel for UK projects where projects fail to seize the advantages and benefits that they should have achieved. This is often to the UKos disadvantage . e.g. Urban Traffic Management Control took six/seven years to develop a world leading product and the UKos Highways Agency / Transport for London were slow to pick up on the benefits, which in turn delayed the uptake and also the business opportunities.

It is important that the UK capitalises on its successful projects and must use past experience and lessons learnt to prevent repeating previous errors. As an example - mobile providers cannot afford, on commercial grounds, to accommodate OEMsqdevelopmental timetables; the result is that the former are forging ahead regardless and the tendency is that industries will +back the winning horseq

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