

Questions Received from Allied Vision's Second ITS Webinar

General Questions

- 1. Do you think that Traffic Management systems will change to accommodate this new data source? And if so why?**

In the world of increased budgetary constraints, transportation agencies are striving to do much more with reduced capital budgets. As a result these changes will be led and demanded by transportation agencies needing to promote efficiencies within their own organizations, and thereby reduce overall capital spend, as well as ongoing maintenance. The approach as outlined in this presentation provides one opportunity which could significantly reduce overall spend, as well as provide a framework for improved data at significantly reduced costs.

As discussed in this presentation some system integrators and Advanced Traffic Management Systems (ATMS) providers, are using legacy systems which may prove difficult to collect, process and store this new data source, however in the event that these leaders do not provide what is needed by the transportation agencies, these would soon be superseded by smaller more dynamic organizations providing systems which meet the demand.

- 2. Will different geographies require different approaches?**

Yes. We have already heard that while some geographies disallow the use of cameras to monitor traffic, such as Germany, others are actively encouraging the use of cameras and camera technologies, and some have and/or are in the process of requiring drivers to have mounted dash cams.

While some geographies may indeed prevent the use, or limit the use of cameras and associated camera software, others will embrace it and use this same data for many different purposes and applications. At least one company has actively found a way to reduce the impact of German legislation by encrypting all data being collected and converting a license plate to a unique string which is impossible to be deciphered.

- 3. You have mentioned that the back-end systems will need to change, and that you expect this to happen inside 12-18 months, is it even achievable to change those systems so quickly?**

Yes, back end ATMS systems will need to be adapted to accommodate these new data sources, and to seamlessly process the data received. It is unlikely that within 12-18 months all providers will be able to accommodate all the changes as discussed in this presentation, however it is conceivable that system integrators and ATMS providers who have the capability will have provided some measure of changes to accommodate these new requirements within this timescale. That's not to suggest that any organization will have been able to implement the wholesale changes needed to maximize the overall potential of this data within this timeframe.

Specific Slide Questions

- 1. Slide 6 – Why have you separated Loops and magnetic pucks when they are essentially the same?**

Yes, they are essentially the same, these have been separated primarily as they are used in different applications, for example, while loops can and are successfully used in parking applications, pucks can only be used in applications where clear delineation exists.

2. Slide 7 – Why haven't you included ITS Cameras as a sensing technology?

Within ITS applications, cameras at present are mainly used either by traffic management operators as a visual reference for a section of road or an intersection, or for enforcement purposes, where cameras are linked to Automatic Number Plate Recognition (ANPR) software, to identify a specific infringement.

At present with the exception of streaming video directly streamed to traffic operations agents, cameras are rarely if ever used for the purposes of collecting road use data. It is believed this position will change, as better, more integrated software and systems are able to accommodate the quality and quantity of data made available from a camera.

3. Slide 7 – For FVD, you haven't mentioned mobile applications or even crowd sourced information, do these not play a part?

Yes these do play a part, and perhaps a bigger part than one might first consider. Perhaps the biggest crowd sourced site is Waze which was sold to Google within the last 1-2 years, and is now used to assist Google to provide real-time information. Waze was largely worldwide, when it was sold having attracted literally millions of customers, all of which contributed to providing real-time traffic related information.

As a result of this success, many other organizations are using mobile applications linked together with crowd sourced data to provide a wealth of traffic and transit related information.

4. Slide 8 – Why haven't you included applications such as congestion charging, freight user charging, or weigh-in-Motion?

These are largely tolling systems by any other name, they use essentially use same technologies as what can be found on tolling systems and express lane systems. Some congestion charging schemes use a fixed fee by time of day approach such as London, others use a more complicated approach to charge by time of day or by amount of congestion such as Stockholm and Singapore.

5. Slide 8 – Do you really think that drones will be used for ITS, isn't this technology simply too expensive?

At this time they are clearly too expensive, but who would have thought we would use helicopters to provide "eye-in-the-sky" news 30 years ago. When organizations such as Google and Amazon are looking at drone technology to deliver packages in remote areas, it is perhaps fair to suggest that drone technology will evolve to provide an inexpensive opportunity to monitor and report on traffic and road conditions. But to be clear, this is unlikely to happen in the short-term.

6. Slide 9 – I am not really sure I understand what you mean by transponder-less tolling solutions, please could you explain this in a bit more detail?

At present open road tolling systems in general use transponders based around RFID tags. One is required to be in every vehicle which communicates with the tolling back office system and removes a fee from the driver's electronic wallet. These systems use cameras connected to an ANPR system, in the

case that a transponder fails to read. Cameras connected to ANPR systems can now deliver a successful read rate in excess of 99.2% in all weather conditions, and could be used as the sole technology, doing away with RFID transponders, and the many different proprietary systems which exist, providing an open and more inclusive environment.

On looking into this in more detail one such tolling system was uncovered which was already using this approach, and had a guaranteed success rate of 99.2% in all weather conditions.

7. Slide 9 – Please could you describe what you mean by Operator Flagging?

Operator flagging is the term given to automated systems which when an issue is identified will pop-up warnings and alarms on a Traffic Operators console, requesting that action is taken. These are generally run through decision support systems which in turn also provide suggested responses to the agent.

8. Slide 9 – What do you mean by Vehicle classification, do you mean identifying the make and model of a car?

Vehicle Classification is the term given to identifying the overall type of a vehicle for example, Large Truck, Small Truck, Family Car, Motor Bike etc. At present depending where in the world you are there can be up to 8 different classifications, although it is also fair to say that many of the technologies which currently exist cannot identify the classifications as accurately as transportation agencies need.

9. Slide 10 – How can ITS systems have limited intelligence, when the very definition of ITS is Intelligent Transportation Solutions?

ITS has evolved over many years, as has our own definition of intelligence. When ITS was in its infancy the intelligence which could be expected through automated systems was limited, however that same capability has changed significantly over the last 5+ years and continues to evolve at a rapid rate. At present many ITS systems are proprietary systems, which have simply not evolved at the same pace as technology or indeed the same pace as required by the very systems that the traveling public are demanding.

10. Slide 10 – Please describe what you mean by Management Telematics.

I am suggesting that as part of any modern ITS systems management module the system should be able to provide a real-time management dashboard with some predictive capabilities.

11. Slide 10 – What do you mean by time-stop data analysis – surely everyone is monitoring in real-time, how does this differ from real-time?

Time stop data analysis refers to being able to cut and slide all available data in as many ways as necessary to fully understand the depth of the data that is available. In many cases data can be better understood by analyzing the data in several minute segments to identify through profile analysis when an issue started to occur. Unfortunately many of the ITS systems that currently exist do not have sufficient data mining and reporting capabilities to undertake minute by minute analysis, let alone analysis of data across months or years.

12. Slide 11 – Do you not see a need for operator viewing of cameras? If not why not?

Absolutely, however cameras can do much more, and be used for much more than simply delivering a streaming feed.

13. Slide 11 – What do you mean by Origin – Destination modelling?

In order to fully understand what is happening on a road network, and what will happen on a road network, one has to first understand the basic movement of vehicles on the road network. In order to do this, ITS has developed standards to identify where the average person leaves from, the routes they take, and their destinations. This provides transportation modeling tools with Origin Destination analysis. While this is not 100% accurate, it provides a robust amount of data in order to provide a level of accuracy.

In order to fully understand the effect of congestion, an accident or a road closure, origin destination understanding is imperative as this provides the turning movements and therefore routes that the average road user uses, and from this modeling tools can identify where choke points are likely to be, and indeed what mitigation strategies should be used to relieve those choke points as much as possible.

14. Slide 12 – Some of these things you are discussing are not related to ANPR, where will this other software come from?

It will be up to the Transportation Agencies to define their requirements, and up to the systems integrators and Advanced Traffic Management Systems (ATMS) providers to provide software fit for purpose.

15. Slide 12 – It's not really clear what you meant by New technological Applications – please could you provide your thoughts?

As indicated throughout this presentation, ITS and technology are evolving at a fair rate, new technologies are constantly emerging, such as that which the Connected Vehicle Program is concentrating on, which is to use Dynamic Short Range Communication (DSRC) to communicate a wealth of data from every vehicle. This will undoubtedly change the concepts and approach of ITS, as will other technologies.

16. Slide 13 – Do you need an IR lighting array if you have adequate HDR?

This is up for debate and it really seems to depend on who you ask and which technology they have preferred. In my view having HDR is as important as having an IR array, but others are likely to disagree.

17. Slide 14 – you suggest the camera can see in any conditions is that really true, what about fog or snow?

Yes, cameras on average can see about 10 times better than the human eye, in all weather conditions, which includes rain, ice, fog, snow, night, dusk, ice storms etc. There are of course exceptions to this and choosing the right sensor is imperative to getting the best image quality in all conditions.

18. Slide 14 – Please define what you mean by Operator triggering?

Please refer to answer given for Slide 9. This relates to Operator Flagging.

19. Slide 15 – Please define Decision Support Systems in a bit more detail.

Decision Support Systems (DSS) are systems which automatically assess the road network to identify accidents, lane obstructions, congestion, slow downs etc. This information is sent to a DSS, which assess whether current conditions are similar to historic conditions, and indeed if the same, then no action should be taken, if different the system also assesses whether a similar condition has existed in the past, and if so, what mitigation strategies were deployed on that occasion. It will also check a set of scenarios to see whether this has been predicted and what the proposed course or courses of action should be in that event. All this information is then provided to the Transportation Agent for them to make the final decision.

As these systems evolve, it is reasonable to expect that simple decisions will be able to be undertaken automatically by the DSS, without requiring operator approval.

20. Slide 15 – Is one of the biggest issues, not simply that camera technology has been abused for enforcement purposes, such as reducing yellows at signals, that now the public have little trust in this technology?

This has been an issue, but that was some time ago. Yes there is a certain amount of distrust of cameras being used, and perhaps abused, but as ITS transitions away from enforcement to a safety and informational role, and the travelling public observe real value from the data they are receiving, this perception will become more favorable.

21. Slide 16 – There seems to be a lots of perhaps, maybe's and might's in this, how confident are you that this will happen, and why?

ITS must change in order to be more effective, more efficient and more cost effective. While ITS has not evolved in line with technology, it is true to say that for many reasons including budgetary constraints that transportation agencies are requiring that more be done for less. While it is perhaps not known what and when change will happen, it is clear to all involved in ITS that significant change is just over the horizon.