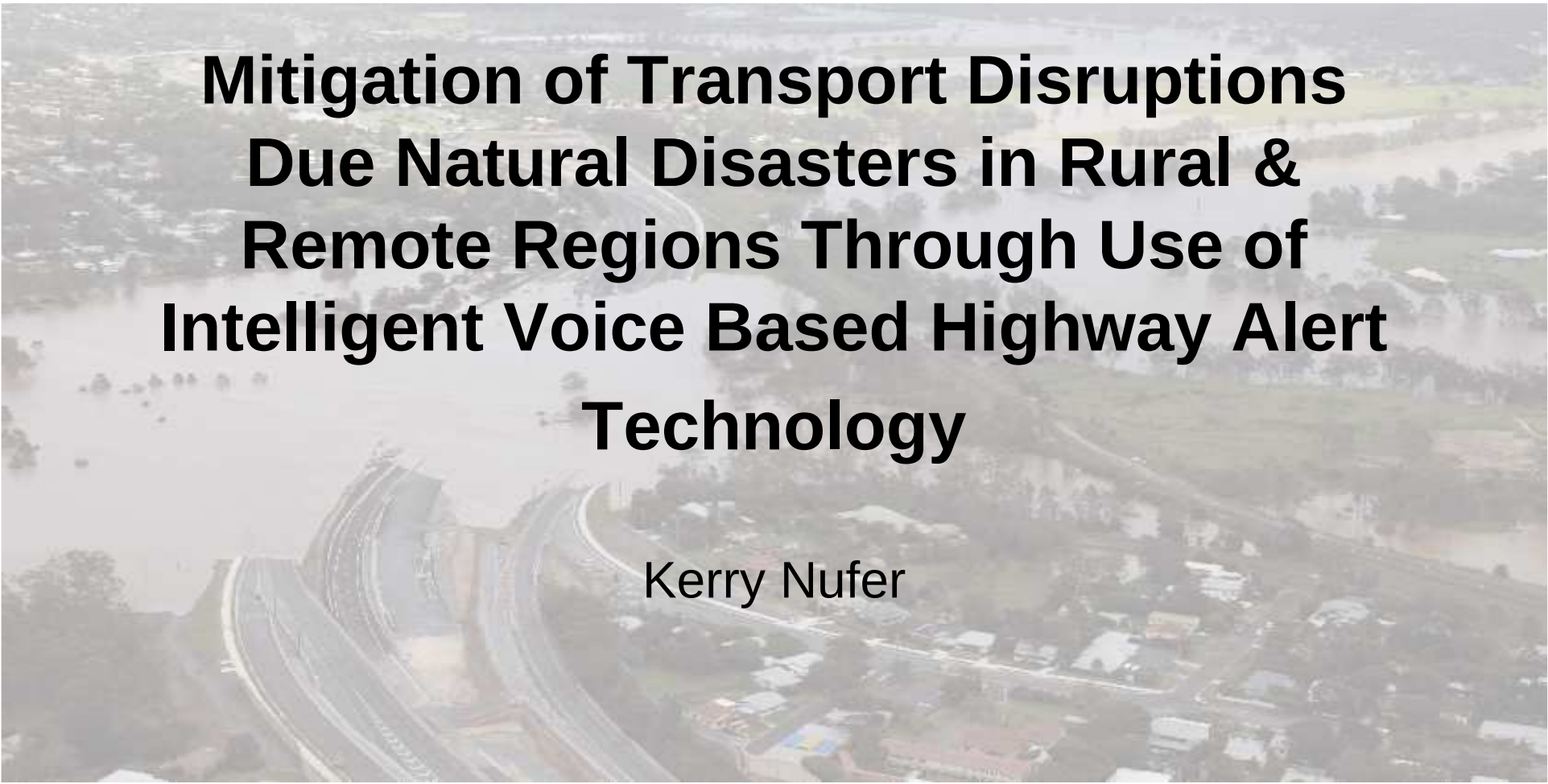




Mitigation of Transport Disruptions Due Natural Disasters in Rural & Remote Regions Through Use of Intelligent Voice Based Highway Alert Technology

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Department of Transport and Main Roads' Engineering Technology Forum 2011
Natural Disasters and the Impact on the Transport Network

Genesis

- 2009 Ballina Bypass Alliance called for new device to mitigate against truck driver speeding accidents
- September 2009 device (called TelePath) delivered
- By all accounts it has been successful in eliminating accidents wherever installed on this project
- Three truck accident in past 6 years at installed location – none during installation of approximately 6 months
- Would suggest therefore there was some benefit in its usage to mitigate against truck accidents

Subsequent Realisations

- Subsequent realisation that it could mitigate against this risk then others as well
- Technology really known as Highway Advisory Radio (HAR) or Annunciated Signage
- Effected through use of UHF CB radio instead of AM/ FM frequencies
- Developing kit of modules to further extend the speed mitigation function to other applications involving the mitigation of natural disasters and informing others of problem
- Lots of potential applications such as flood levels, landslides, road ice, wind speed, other traffic problems such as road accidents.

History of HAR Overseas – the UK

- Highway Advisory Radio is not new – concept around since 1955 or so
- UK Traffic Radio as a dedicated digital radio service
- Updated every 10 minutes/ every 20 minutes outside busy times, 24 hours a day every day
- Any driver can access the service as a dedicated channel on their DAB receiver
- Delays en route, as well as road works and general congestion

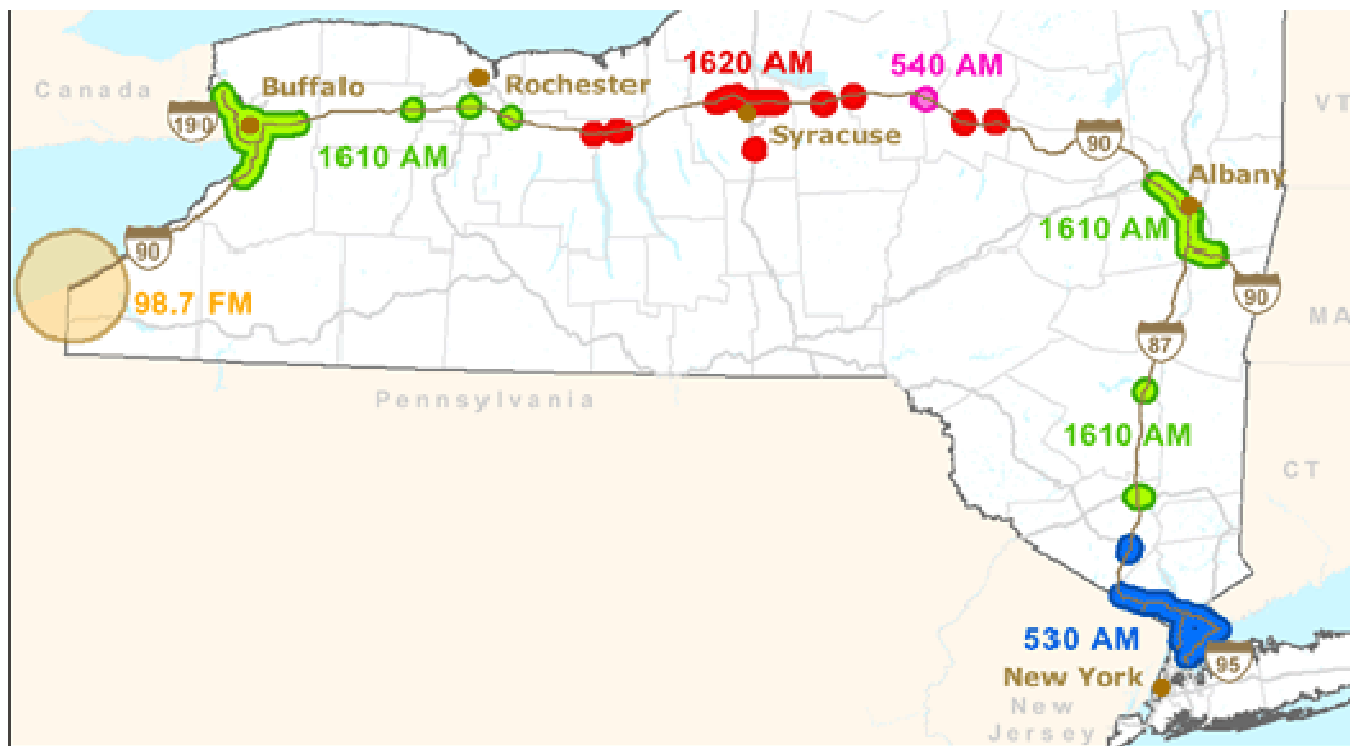
History of HAR – the USA



- Tend to operate slightly differently to the UK with more localisation
- US systems concentrate on the use of the FM and AM radio frequency bands
- Operate through the use of low power transmissions on licensed AM services
- Mostly high level generic information to all road users

US AM Highway Alert Radio System

- Example of system between Buffalo and New York



The Australian Experience in HAR

- No great usage of HAR
- Used exclusively in traffic tunnels as a break-in service in case of emergency
- FM frequency coverage outside tunnel on FM band limited to approximately 70 metres due to power restrictions
- Most recent submission on use of AM/ FM for Highway Advisory Radio made to ACMA in 2005 – no outcomes since
- Remaining options include the UHF CB frequency band which despite not wide use by general public has excellent support by truckies, professional drivers and general public in western communities
- Use of UHF CB
 - o Relatively cost effective
 - o Increased availability through recent doubling of channels in frequency band
 - o Ease of implementation in vehicles

What we are Doing

- Focussing on expansion of HAR in Annunciated Signage role
- Implementing a key system we call
 - Telepath for fixed systems
 - Voice Beacon for mobile systems
- Designing our core systems to take data from environmental sensors
- Expanding our software to leverage our interfaces for the generation of automated messages
- Such examples as may be *“This is Queensland Main Roads, please divert through Murphies Creek to avoid landslide on Toowoomba Range”*

TelePath & Voice Beacon



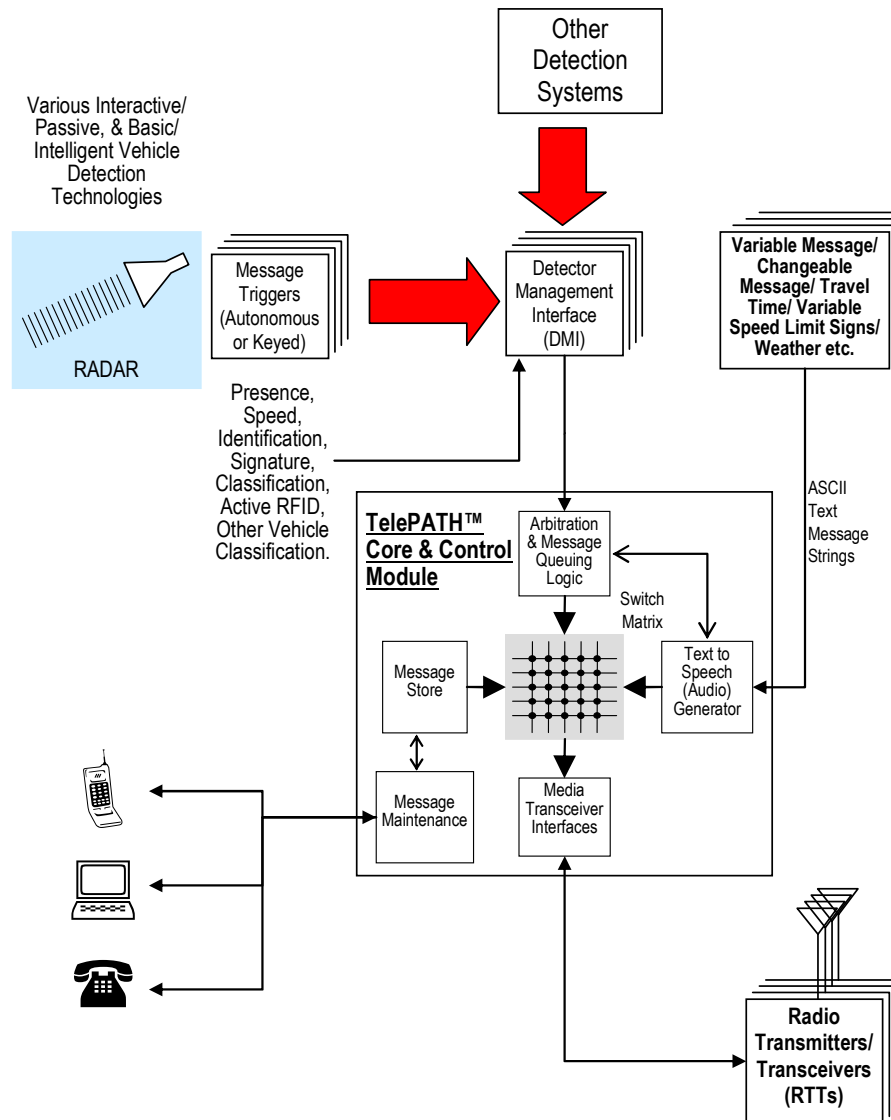
Benefits of Highway Advisory Radio or Annunciated Signage

- Set up quickly (within minutes) and is not limited to short billboard messages or detour signs with little or no detail these 'signs' are dynamic and changeable;
- Set up with various ranges of coverage from 100s of metres to kilometres, and directional coverage;
- Received without drivers taking their eyes off the road, and with message repetition varied to suit the circumstances;
- Updated quickly, either from ad hoc voice recordings on-site, pre-recorded or on-the-spot single or multiple voice sources;
- Set to cover wide areas of concern especially where detour decisions need to be made in advance for motorists and transport operators;
- Set to have much longer length messages than can be carried by a VMS sign, with various repetition rates;
- Sensitive to other usage of the channel through the use of an etiquette mode which prevents transmission whilst others using the channel;
- Organised to respond to various triggers like actual vehicle detection, or UHF CB radio activity, and automated alert information as a beacon arrangement;
- Able to respond automatically and intelligently to direct sensor input information from flood heights, ice detection, weather parameters such as wind speed etc.
- Ideal in rural and remote areas where distances are large and the greater population is equipped with and makes use of the UHF CB radio network.

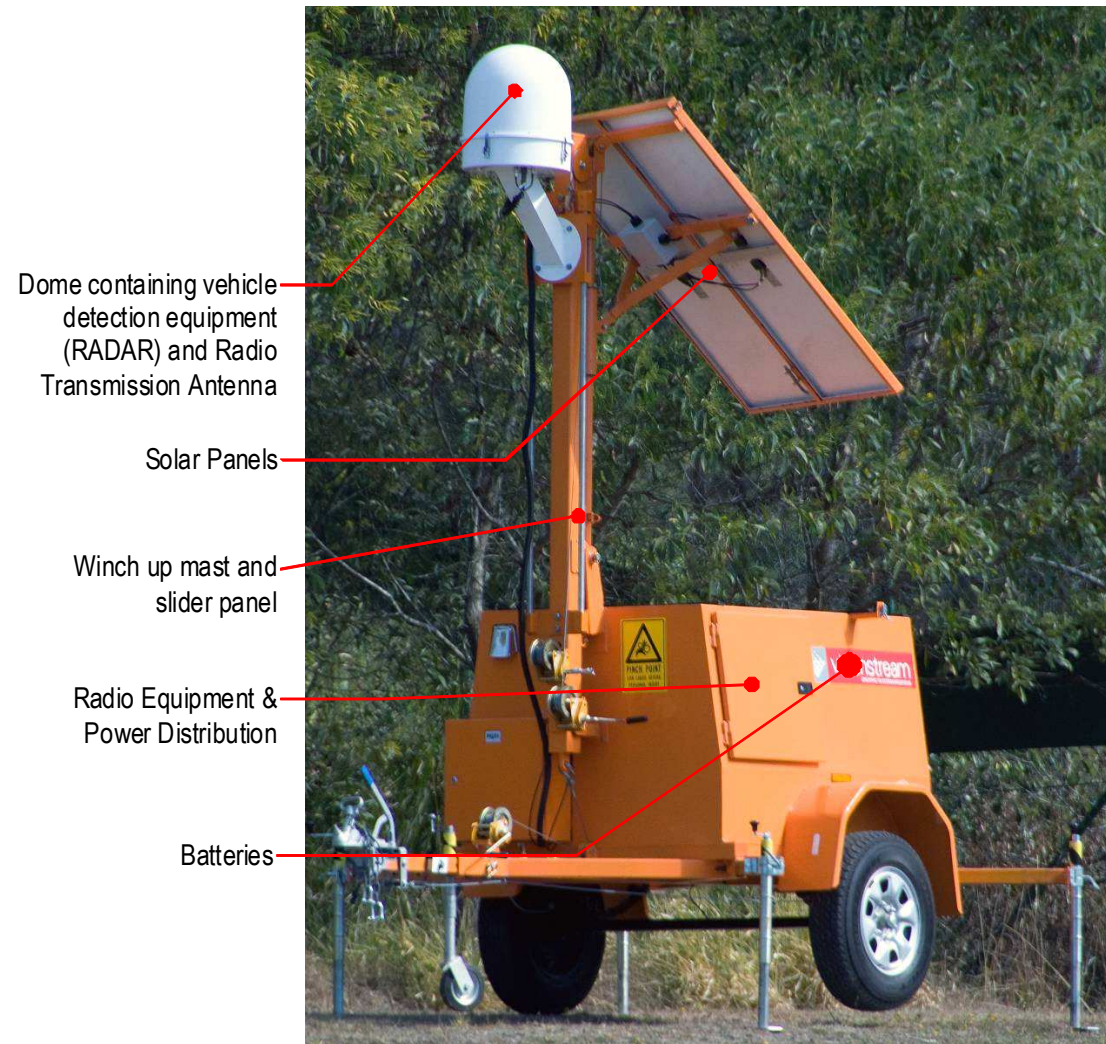
TelePath Controller



Implementation – Block Diagram



Installation – To Date



Conclusions & Recommendation

- HAR or Annunciated Signage if a further option that can be considered for mitigation of transport disruptions
- Although limited to UHF CB radio it does offer advantages to professional drivers and others on remote rural areas not covered by conventional radio stations
- As well as ad hoc, and canned messages it can be set up to generate automated messages such as flood heights, weather information, and other road conditions
- The system is upgradeable to operate with AM/FM radio and even private radio systems should these be required in the future
- We invite any of you who may have other requirements to become involved with the evolution of these products for your applications

The End

- Any Questions?