

DAB-TPEG in UK & TPEG Standards Development

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'Digital Radio Connecting the Car' WorldDMB Nov 2012





Traveller Information Services Association

RDS-TMC

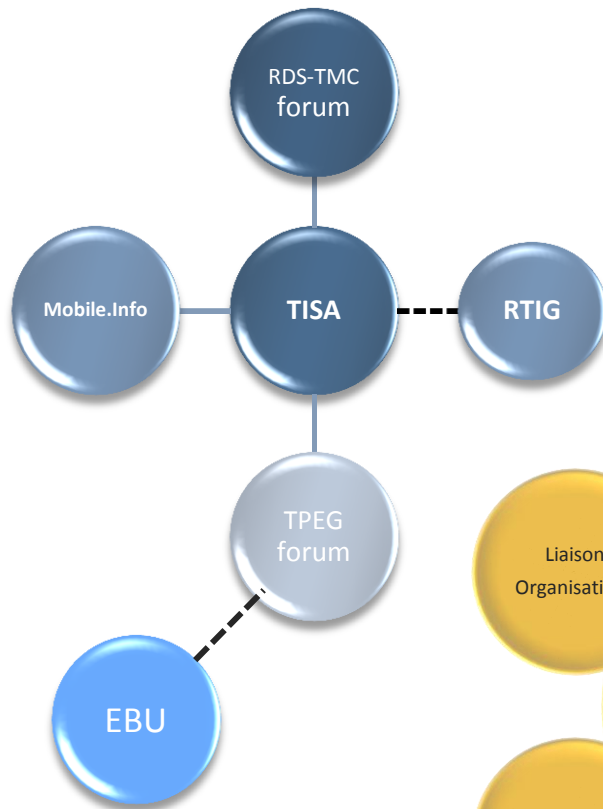
TPEG

Collaboration

Development

Standards

Formation of TISA



- Dec 2007
- Non Profit
- Run by Membership
- Hosted by Ertico
- Brussels
- 100+ members



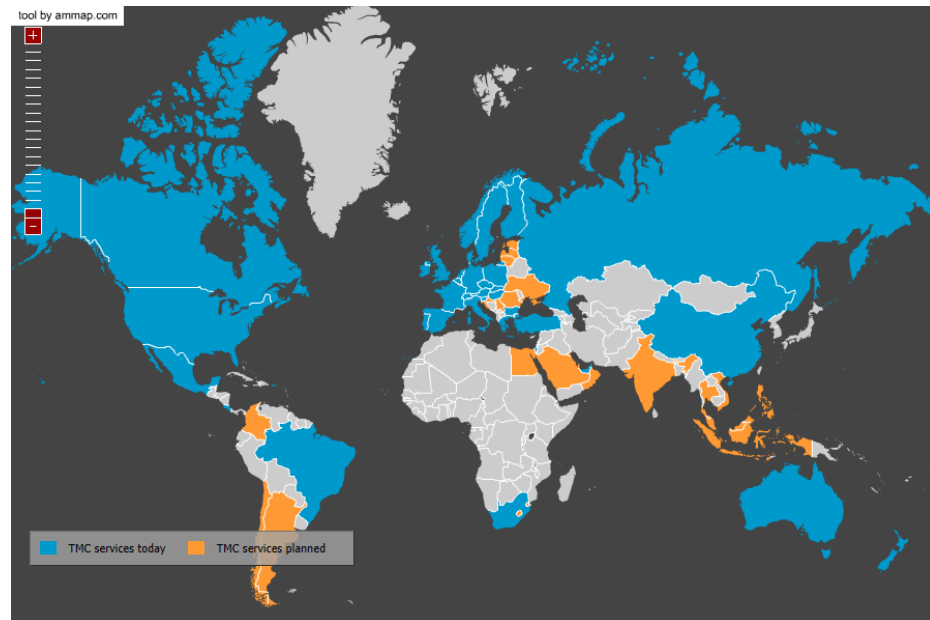
RDS-TMC Worldwide

- RDS-TMC success -> Worldwide adoption

- Standardisation

- Easy to deploy – existing FM Infrastructure

- Still expanding into other countries



TISA

- Most successful Telematics technology....?

UK INRIX RDS-TMC Service

UK RDS-TMC service (ITIS → INRIX)

- Commercial Service started in the UK in 2001 (First customer :Toyota)
- Now over 20 vehicle OEMs, aftermarket and PND makers.
- The INRIX service now supports estimated **3+ Million** RDS-TMC devices in the UK
- Service free to end users, paid for by OEM per unit. Lifetime* access.
- TMC could continue for many years.....?? UK Digital Switchover !!
- **Expectation increased –additional services**
- **Quality of available data increased**
- TPEG designed to provide Enhanced “Next Generation” Traffic Services

INRIX UK DAB-TPEG

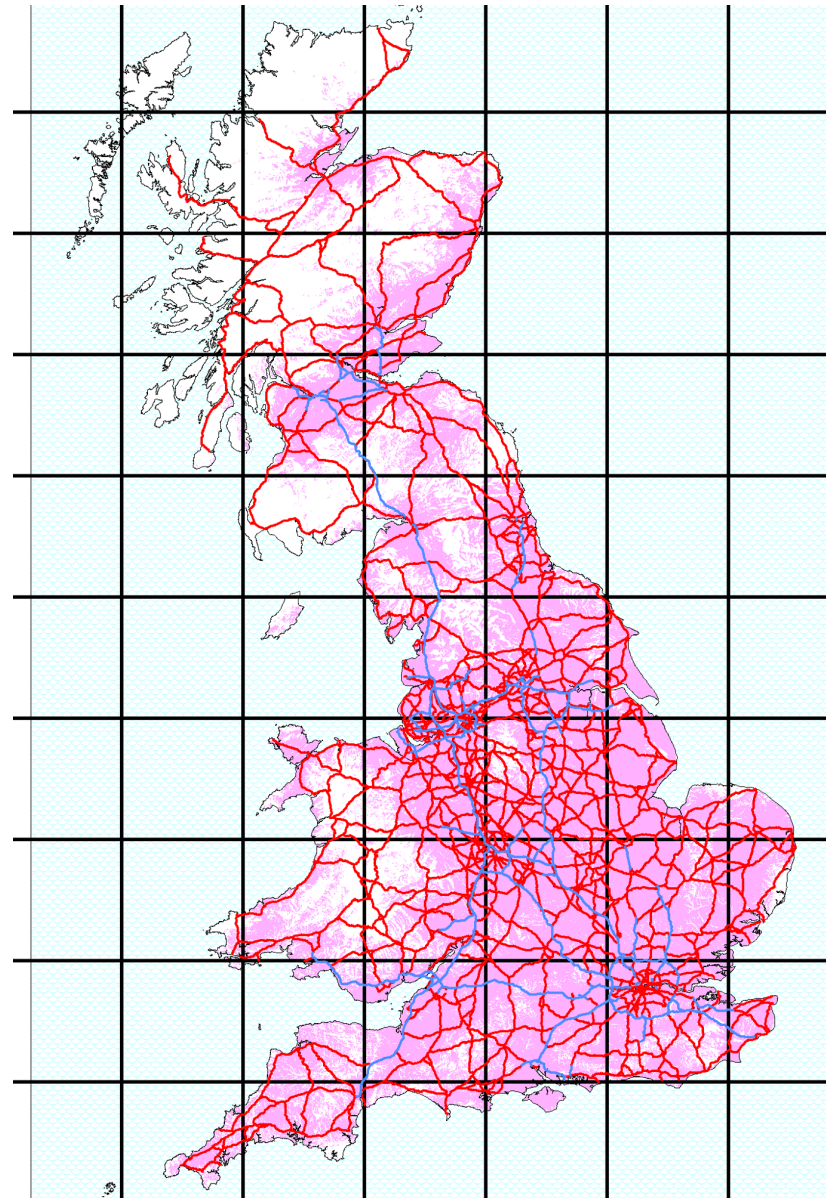
Live UK TPEG Data on Air since Aug 2010
via Digital 1 “National” multiplex

Applications

TEC - Incident

TFP - Traffic Flow

- Digital 1 “National” 16kb/s
- 108 transmitters
- 2 SFN
 - England/Wales ch 11D
 - Scotland ch 12A



Toyota and Garmin

- Currently we have 2 customers using the DAB service in the UK
- Toyota – launched on 2 models in Feb 2012
- GARMIN will launch with PND in new year.

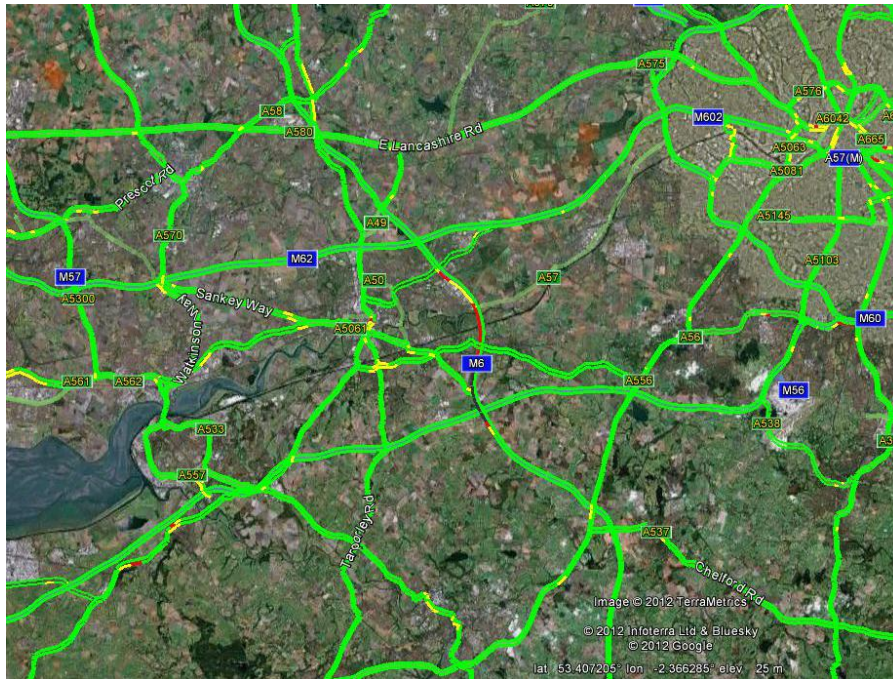


DAB-TPEG in UK

- Flow - TFP (Traffic Flow and Prediction)
 - 2200 fixed position TFP messages
 - LOS and speed
 - Full UK network flow data received in less than 2 minutes.
 - Offsets allow precise positioning of Jams.
- Incident - TEC (Traffic Event Compact)
 - Typically 600-900 incidents
 - All Incident data received in less than 60 seconds
- Faster than RDS-TMC
- More info – road works/congestion info on smaller roads can be sent
- Higher precision – full flow
- Additional content possible

Typical TMC service:
3-5 mins cycle time

What is TFP ?



- TFP (either broadcast or Connected) gives a real boost to user perception of traffic service.
- Allows delivery of high quality traffic data
- Provides real-time traffic information
- Improves traffic flow
- Accurate traffic data
- Better traffic management



- Data evaluated at 100m “Interpolated Points”
- LOS aggregation
- TMC Location with Referencing metric OS
- Average Speeds per LOS section

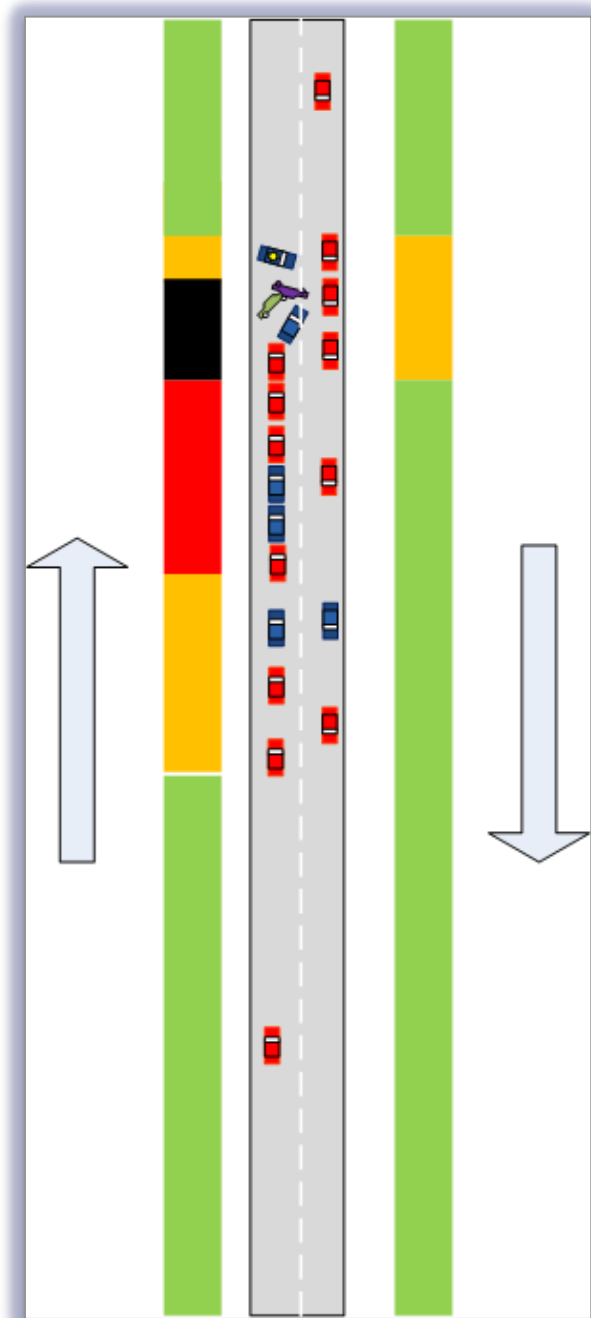
M6 NORTHBOUND - CHESHIRE

Two lanes closed and queueing traffic due to fuel spillage and overturned vehicle on M6 Northbound after J21 A57 / B5210 (Woolston), congestion to J20 A50 / B5158 (Lymm Interchange)

The Emergency Services are on scene where lanes one and two (Of four) are closed. Source: Caller Derek.

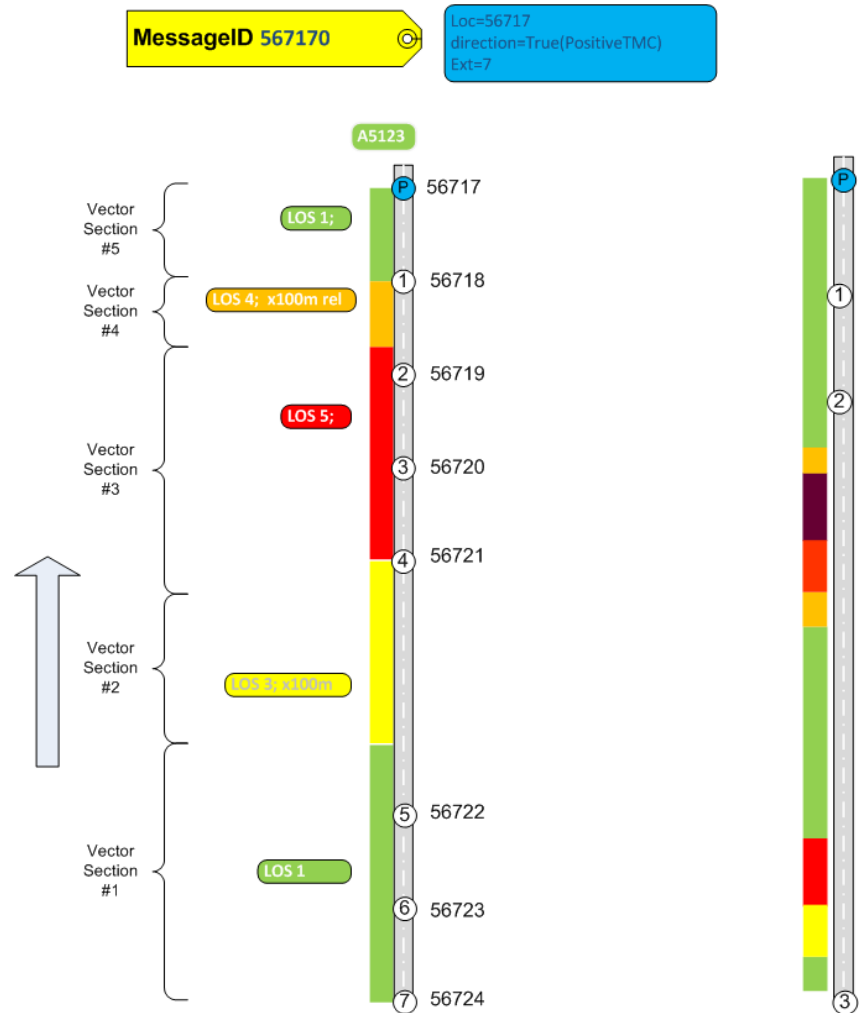
Application TFP

- TFP provides FLOW data
- Current status (and Prediction)
- Different reports over Long road section split into small “sections”
 - Traffic colour ,
LOS = “Level Of Service”
 - LOS 1 -Free Flow
 - (LOS2-Heavy)
 - LOS3- Slow
 - LOS 4-Queuing
 - LOS5 -Stationary
 - LOS6- Blocked /No flow
- Average Speed (kph)
- Still Generally uses TMC location referencing (compact data size)



Application TFP

- Road defined by LRC (typ max 30)
- TFP Vector- represents status at specific time (start + offset)
- Vector split into Vector Sections
- Each section positioned either with TMC Offset from ref point or using metric offset
 - Average Speed (kph)
 - TMC location referencing (compact data size)
- LOS is best defined by Service provider
 - Speed , nominal speed , road type
- Table Versioning!



Moving forward with TPEG

Proprietary Solutions



Standardised delivery

Traffic



+ Driver Services

- **Proprietary systems exist in market today**
- **-> Vehicle OEMs**
requesting Standardised solutions
- **-> Providers:**
collaborate on Standards ; Compete on Quality and Content



Why TPEG?

- Standardised in ISO – wide adoption and consistency (ISO21219 series)
- Binary (for compact transmission) and XML forms
- Standard message structure and management
- new Applications can be added
 - extendibility within Apps
 - Older receiver can skip over (new) unknown features.
- Language independent
- Multiple location reference methods:
 - TMC Tables
 - DLR: Agora-C, OpenLR, ULR (new)

TPEG Technology – Application Support



Traffic Flow

- TPE-TFP (TrafficFlow & Prediction) describes traffic flow for real time as well as predictive speeds for time periods of minutes or hours into the future



Traffic Incidents

- TPEG-TEC (Traffic Event Compact) Incidents, road works and safety related items /info



Parking Information

- TPEG-PKI
Parking information, price, static and dynamic availability



Fuel Pricing

- TPEG -FPI provides fuel type availability and pricing information.



Weather

- Currently being drafted (expected Q4 2012)



Dynamic Speed Limit Information

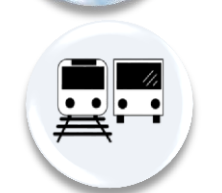
- TPEG-SPI (Speed Information) currently in draft form.



“Safety” camera data +
traffic camera (images) (INRIX)



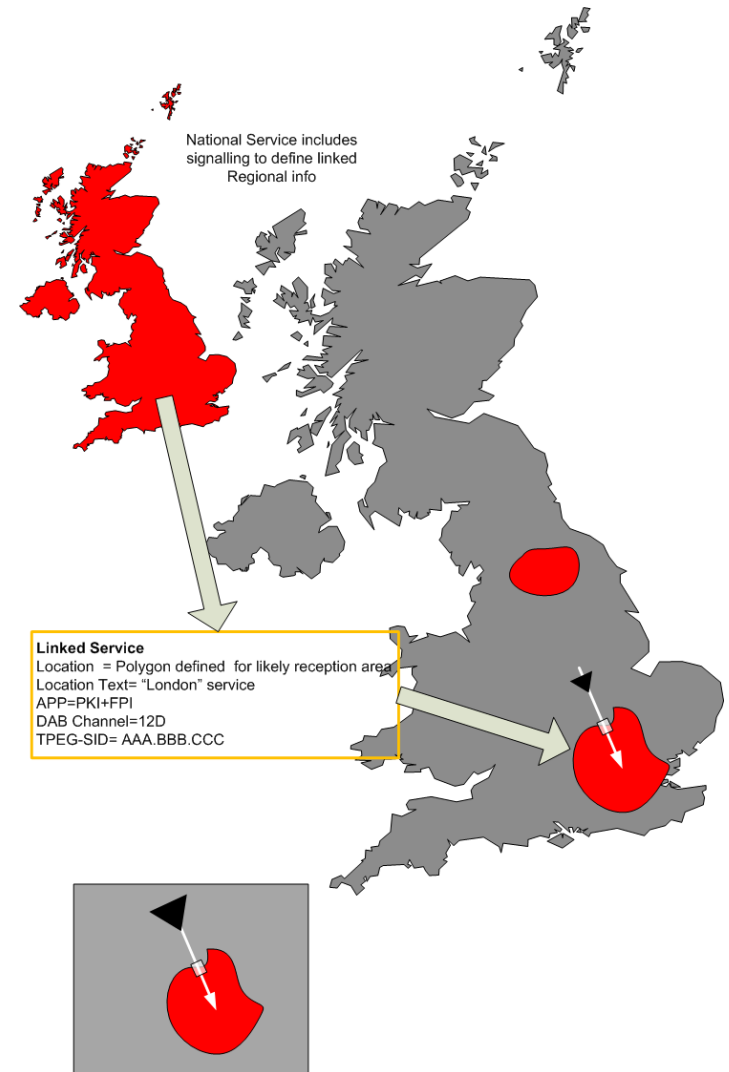
Flight Arrival Departure times (Proposed
-BMT)



Road and Multimodal Routing (BMW)

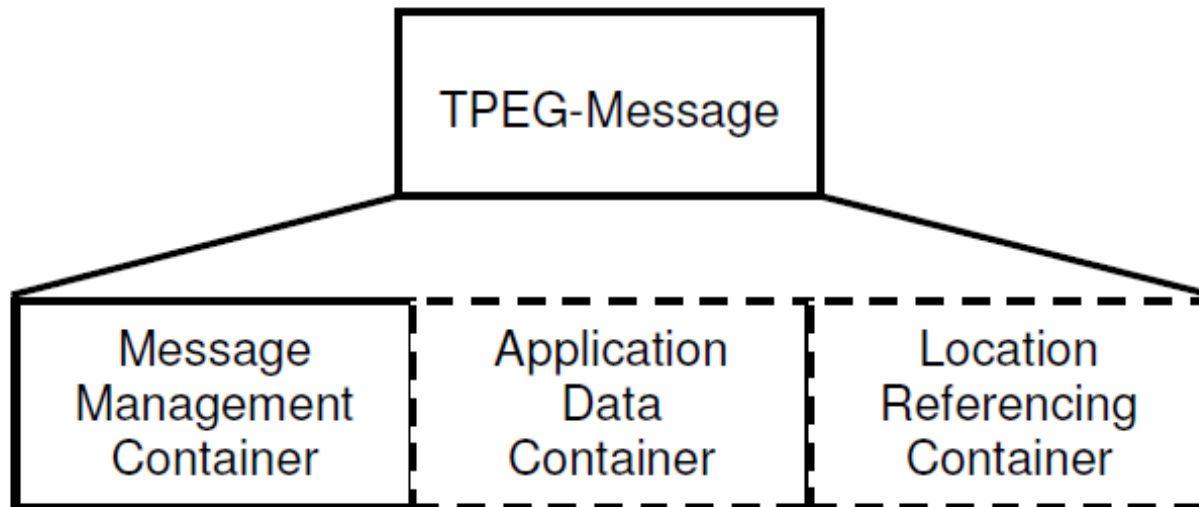
Other Content and Regional Broadcast

- Linking National and Regional Services
 - Sending Local info on a National Broadcast is inefficient
 - Regional - Periodically accessed by user.
 - **PKI** - Availability and Pricing 16000 sites nationwide
 - **FPI** - 15000 sites nationwide
 - Broadcast of this localised data is best on Regional broadcast.
 - Linked Service Info
 - Content type
 - Reception Area
 - Requires some additional Tuner linkage info defining.
 - SNI info – TISA USE CASE



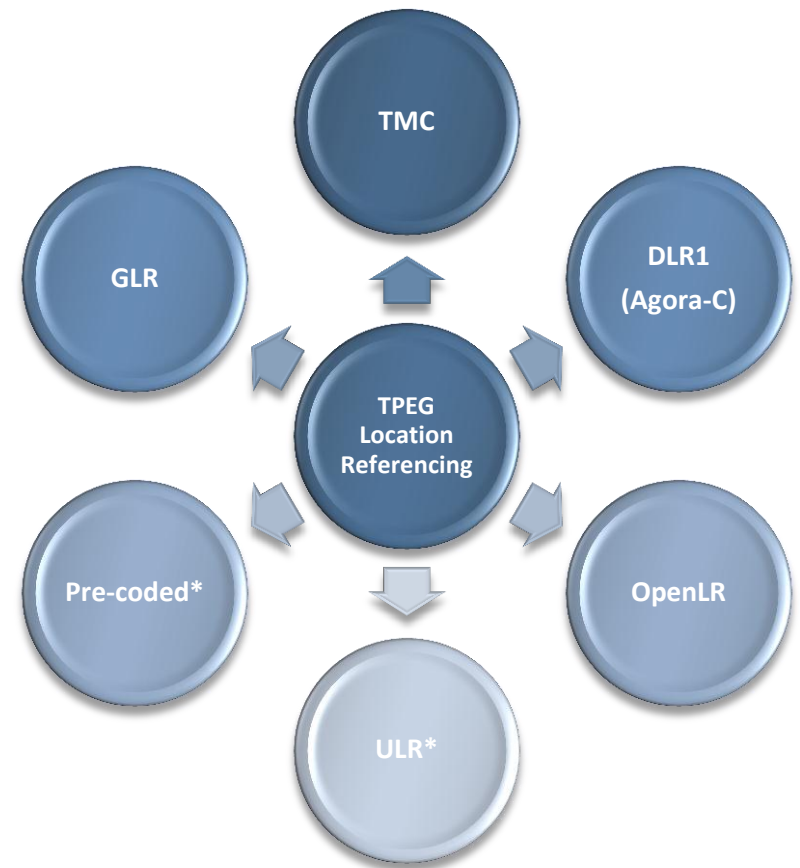
TPEG Message

- TPEG Messages have same overall structure
 - MMC - Message management Container (when)
 - APP - Application Container (what)
 - LRC – Location Reference Container (where)

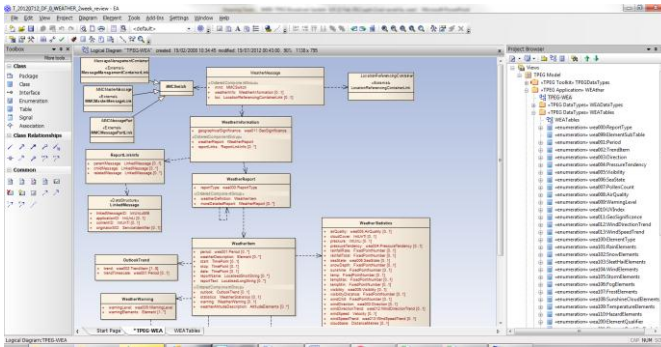


Location Referencing

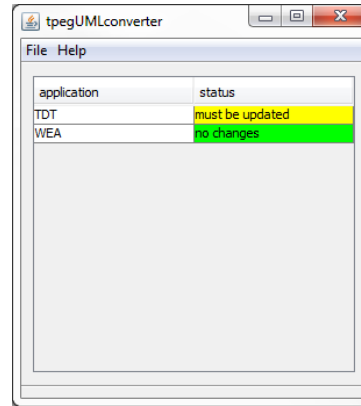
- Multiple Methods available
- Currently most services use TMC as base method
 - Compact and easily integrated with existing mapping
- Desire to
 - improve service
 - better content
 - More diverse content (additional driver services)
- Increasingly we are seeing the use of Dynamic Location Referencing
- DLR solutions provide on the fly referencing , but can increase message size dramatically.
-



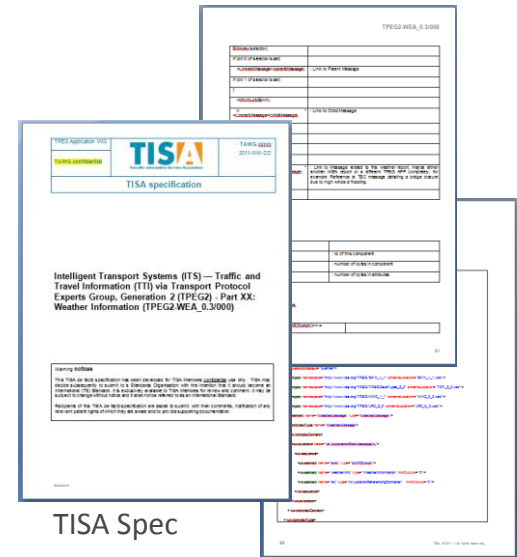
TPEG Specification development



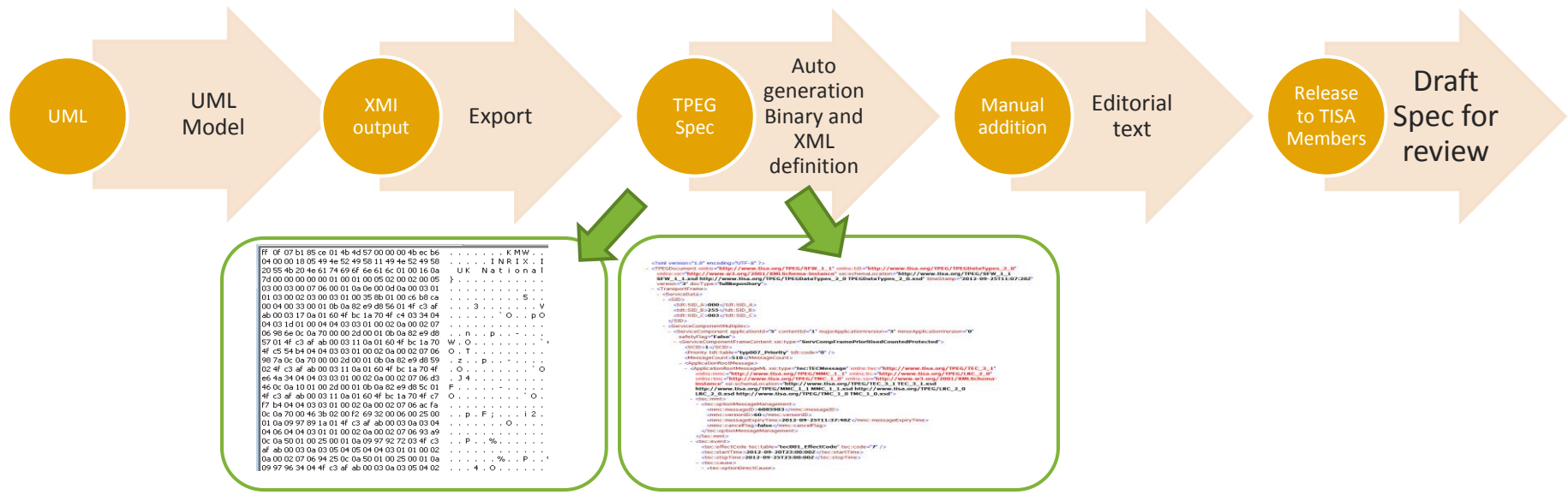
Modelling Tool – Enterprise Architect



TISA UML Converter



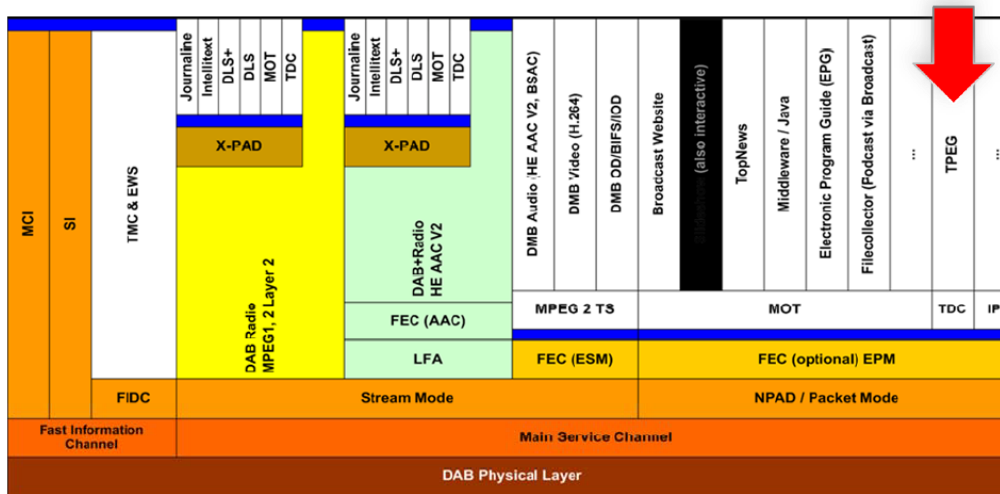
TISA Spec



DAB Adaption of TPEG

Digital Radio – Transport Layers

arqiva



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- TPEG Transport Frames sent in Transparent Data Channel
- Data Groups
- Packet Mode
- + EPM
- Similar Adaption spec exists for HD radio
- Same data at TPEG level

DAB-TPEG

- DAB is now starting to becoming established in many countries across EU
- ..but not all
- Some countries still have no plans for DAB ☹️
- Difficult for OEMs to chose DAB as a Traffic Info Delivery Channel -need consistency
- DAB has lost out to Connected services with many OEMs
 - + Wider coverage/availability
 - + Back channel allows more flexibility other driver services
 - - Data download cost often still a concern – but for how long?

• Example of INRIX Connected TFP implementations LIVE in EU and NA



BMW

- Germany will offer Free public DAB –TPEG service in EU from mid 2013
- -> accelerate TPEG over DAB take-up in other countries....?

Distribution – Broadcast vs Connected



Broadcast

- + Fast update
- + only 1 system to operate , fixed cost for service provider.
- + Allows cost free data transfer Lifetime license model. No data carrier fees to pay.
- - Not flexible for different customers
- - Large dataset for receivers – memory /message handling
- - Inconsistent Rollout



Connected

- + Large coverage possible
- + IP connection shared to other vehicle functions; can be used with users tethered phone.
- + Allows other customer specific Location based services to be delivered.
- + Map, location table and vehicle and OEM specific differences can be supported
- - Bandwidth concerns

Summary

- UK deployed DAB-TPEG service (2 years old !)
- Real Receivers are in Market
- TPEG specifications continue to be developed – New Applications
Traffic → Traveller Info /Driver Services
- DAB-TPEG - perfect for cost free traffic/traveller data delivery to user.
- German Market likely to accelerate DAB-TPEG with Public service offering

A nighttime photograph of a city skyline with several illuminated skyscrapers. The sky is dark blue, and the buildings are lit up with various colors, including blue and white. The foreground shows a street with some greenery and a pedestrian walkway.

Thank You

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