



**Final Report  
and  
Recommendations of the Working Group  
for  
Real-time Traffic and Traveller Information (RTTI)**

**Brussels, 18 October 2005**

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## Executive Summary

The Real-time Traffic and Traveller Information Working Group (RTTI WG) started in July 2003. Interested parties were invited to join. The objectives of the RTTI WG were set by the eSafety Working Group in November 2002. They were adopted and extended by the eSafety Steering Group. The objectives are in short:

1. Concentration on Road Traffic.
2. Support for the wider use of pan-European RDS/TMC network for safety-related traffic information and provision of a report with the recommended actions to the European Commission on the status for RDS/TMC implementation and the remaining bottlenecks.
3. By 2010, RTTI services should be available in 50% of all the important metropolitan areas in Europe.
4. Analysing the Member States' responses and checking some possible business models.

During the working time, the wish and the activities within many Member Countries grew considerably to establish - or when already started or when already in operation then to extend – RTTI-services via RDS/TMC and to install more of the necessary infrastructure for the collection of relevant traffic data.

So, RDS/TMC offers at the time being the best platform for a fast growth of RTTI services: Actually, more than 3,5 Mio. RDS/TMC-receivers are used by European customers – and this figure grows by at least 1,5 Mio. additional sets per year – mostly vehicle navigation systems.

As requested from eSafety Working Group, more and more traffic information will be required in metropolitan areas in the near future. Then RDS/TMC will reach inherent limitations when very many more detailed geographic locations than useable with RDS/TMC are wanted. So, the European Broadcasting Union and the TMC Forum started some years ago their evaluation for a RTTI-service via digital transmission broadcast schemes – using preferably TMC but with the option to extend it by a so called TPEG-system when and where necessary, eventually. A final standard for TPEG has not been settled, yet. It may be expected for 2006. So a final conclusion or recommendation of the WG for RTTI via digital broadcast could not be given.

The basic recommendations and conclusions of the WG are as already presented at some High Level Meetings and the European ITS conference in Hanover June 1, 2005:

The Member States should

1. – if not already done - agree at their national level on a strategy, a time schedule and possible business models for the implementation or the extension of RTTI services working to European Norms – starting from RDS/TMC and covering as good as possible both interurban and urban areas,
2. support together with all interested parties the TMC-Forum to promote the safety-related service features of TMC, building on the already existing and standardized formats for the data, messaging and transmission standards,

3. take steps to ensure roaming and interoperability across the RTTI-services in all of the EU,
4. require reluctant authorities to make available existing public data for the provision of RTTI services and to establish additional collection of data for RTTI when and where necessary, in any case should safety relevant data be freely available,
5. request that Traffic Management Centres operate to European Standards such as TMC-encoding of the data. It is recommended that tenders for new or for the extension of existing Traffic Management Centres should ask for a mandatory use of these standards,
6. agree, on the basis of the national RTTI strategies and the Commission's Recommendation on TTI services, with the private service providers on the minimum extent of the public (free of extra charge) services and the conditions for the commercial services, and establish public-private-partnerships if necessary and economically reasonable,
7. publish – following the guidance of the Commission's RTTI recommendation, clear guidelines for the private sector of the conditions for establishing private data collection networks for commercial services,
8. require reluctant FM-Broadcasters – especially those operating under public license - to carry the RDS/TMC-service for public or private users so that 80% or more of all journey drivers can have access to a relevant RTTI service by the year 2010 or earlier,
9. require the authorities to ensure through the appropriate standardisation and regulation bodies that frequency spectrum and broadcast capacity will be made available in the near future for advanced broadcast services via DAB, DRM, DVB-T and eventually satellite DAB,
10. support the development of future advanced services which become possible by DAB, DVB-T, satellite broadcasting, 3G, WLANs and others.
11. The RTTI-WG should make a proposal for a letter to the European Transport Ministries to ask for their position against these recommendations of the RTTI-WG.
12. The Council of the Transport Ministers of the European Union should decide at one of their next reunions that

“All countries within the European Union should agree or should be advised to enable and to extend the installation of the chain of road information and to establish Real-Time Traffic and Traveller Information Services in their countries. By the year 2010 more than 80% of all population should be served with adequate, standardized services.”

## 1. Introduction

Real-time Traffic and Traveller Information (RTTI) offers a very significant method to improve safety on roads: Early warning and most actual information result in more careful and more relaxed driving which will lead then to fewer accidents.

Consequently most of all traffic information can be regarded as safety relevant.

In all countries of the European Union some RTTI systems have been installed for decades: They are well known for the real-time control of traffic lights or of green waves or of moving traffic signs. In parallel, verbal – i.e. analogue - traffic announcements via radio are broadcasted since decades, too.

These types of RTTI-information are well established and will not be regarded any further in this report.

But RTTI services via RDS/TMC which inform the drivers with digitally coded messages via broadcast or via mobile radio services have been installed just some years before (earliest regular service 1997, tests started as soon as 1991) in some – but by far not in all - Member Countries of the European Union, yet (see Annex 1).

So, in Nov. 2002, the eSafety Working Group published its famous 28 Recommendations which showed possibilities and chances to improve safety on roads – proposing to use more extensively electrical means in the vehicle or at the road side.

The recommendations 15 to 17 referred already to “Real-time Traffic and Traveller Information”, and the eSafety Forum and its Steering Committee decided to establish a Working Group (WG) to deal with this topic and to make recommendations for realization (see Annex 2).

The interested organisations, companies, governmental bodies, operators were invited to participate and to contribute with their views and specific proposals. So many persons joined the Working Group and its many meetings regularly or on a temporary basis. Participants are named in Annex 3.

The wording of the Recommendation 17 “Support the wider use of pan-European RDS/TMC network for safety-related traffic information” reminded already that the status of RTTI-services at the start of the eSafety-Programme was – and still is - in fact very different in Europe. The differences became even more visible after the entry of the 10 new members into the European Union in 2004.

So it was obvious from the very beginning that the WG has to have a differentiated view as to the different countries and to the speed necessary or possible for the introduction or extension of RTTI-services.

Additionally, the eSafety Forum had added a very specific task to the Recommendations mentioned above: “By 2010, RTTI services should be available in 50% of all the important metropolitan areas in Europe”. This formulated a strong task, because until now most Traffic Information dealt with highways and main inter-urban routes, only.

With this summarizing report the RTTI Working Group presents its results in a paper which gives its recommendations and proposals how to realize and to improve RTTI-services in the next years. The document will be passed to the DG INFSO for its evaluation. Finally the report will be sent to the European Commission and to the European Parliament.

## 2. Objectives of the RTTI WG

As intended by the Recommendations, the WG dealt with

- \* the collection of relevant traffic information,
- \* the transformation into traffic messages,
- \* the use and distribution of these messages,
- \* the business models.

It was agreed within the WG that it is not the task of the WG to define or to evaluate specific products for infrastructural/roadside installation or for the in-vehicle use.

## 3. RTTI Status at the Start of the WG

RTTI services have been introduced in Europe since very many years in different versions, but in all systems the traffic information passes 4 steps as shown in Annex 4:

- \* Generation of Traffic Data with all types of sensors
- \* Data collection and processing – e.g. in Traffic Management Centres
- \* Data distribution (via service and network operators)
- \* Use of the traffic data – i.e. especially in vehicles.

It is important to recognize that these 4 steps can be realized independently from each other. This enables regionally different speeds of introduction – which consequently happened in the past: Countries or areas with heavy traffic were keen to introduce earlier than areas with low traffic density.

The major issue to be covered here is the wireless information of the drivers which can be realized cheapest by broadcasting.

Broadcasted traffic Information to the drivers started with verbal announcements – and this is maintained by some broadcasting stations until now. But the number of different messages per hour obviously is very limited and the messages relevant for a specific route can neither be selected electronically nor fed into a navigation systems so to adopt the route to the actual traffic situation.

Some countries preferred to introduce a separate FM-radio channel dedicated mainly to traffic announcements (F, UK, I), others used to have the information on many different and mostly regional FM-stations (some Central European countries such as CH, A, D, NL, B).

In the mean time very many FM-stations added a 57 kHz pilot carrier to their transmission scheme which can be digitally modulated with a data rate of about 1 kbit/s. Part of this data rate has been agreed and standardized to be dedicated to digitally encoded traffic information. This whole approach is called Radio Data system with Traffic Message Channel (= RDS/TMC).

So, RDS/TMC has been developed in Europe, was then standardized internationally (see Ref. 1) and in the mean time became operational in some European countries (Annex 1) and abroad.

Within RDS/TMC, every specific traffic information consists from two components – the location code and the event code. The total sets of those codes are stored within the FM radio (or the

navigation system which may be combined with the radio) so that a decoding becomes possible indicating then the location and the event of the specific traffic situation.

When received, the traffic information can then be transformed into a speech output, but this is done very rarely because the many traffic announcements may disturb the driver. Most RDS/TMC-systems just update the navigation system and optimize the route indicated to the drivers considering the actual traffic situation transmitted.

Two business models are in operation:

\* In most countries with a monthly radio fee, the RDS/TMC-service of public radio stations is included at no extra charge (A, CH, NL, D etc.).

\* In France, in the UK and by many private radio stations in some other countries (e.g. Germany) the RDS/TMC service is encrypted. With a one-time down-payment of about 60 € per set, the radio will be enabled to decode these messages, too.

Vehicles equipped with this type of radio can then drive through Europe and receive everywhere the RDS/TMC messages as long as there is a roaming agreement between the private operators in the different countries which provide encrypted services.

Besides FM-broadcasting, traffic information naturally can be asked from Call Centers via all two-way communications links - wired or wirelessly (via mobile radio of all kinds).

A TMC-Forum organized by ERTICO cares for the updating and extensions of the RDS/TMC-system which may be wanted from time to time. Beside this, the TMC-Forum cares that all manufacturers using the TMC-logo stick exactly to that norm so that basically compatibility and correct operation for RDS/TMC-services in all areas is assured. Update of location codes in a specific country or new sets of location codes in countries which start RDS/TMC services require an input to the radio memory – mostly done by getting the new codes together with an update of the digital maps in the navigation system which may be connected to the FM-radio.

The RTTI via RDS/TMC allows the navigation system to adjust the proposed route to the actual traffic situation – to “dynamize” the selected route. Almost all modern navigation systems – as vehicle-installed or as nomadic device - provide this feature and contribute to the ever increasing number of receivers with RDS/TMC-functionality.

## **4. Running Activities and the International Situation**

### **4.1. TMC-Forum**

Coordinated by ERTICO, the European multi-sector, public-private partnership organisation based in Brussels and pursuing the development and deployment of intelligent transport systems and services, the Forum works very effectively on the spreading of TMC-services and on the further development and extension of TMC-services.

The activities are organized in some Working groups and Task Forces.

The Forum grants the use of the TMC-logo to those companies which agree to maintain and to stick to the TMC-standardisation so to enable compatibility.

It cares to reach an improved coverage of TMC-services in Europe, participates e.g. within the European project CONNECT in the development of RDS/TMC-services in the new European Member States and organises together with its industrial and public partners demonstration projects whenever necessary - e.g. in China (project DYNASTY).

A very comprehensive survey can be found under J.Burgess, "TMC-Forum – Results, Activities, Developments", presented May 11, 2005 at a RTTI-meeting in Berlin and published in [www.eScope.info](http://www.eScope.info).

#### 4.2. TPEG – a scheme for the transmission of encoded traffic information via digital broadcasting

This topic is beyond the original scope of the RTTI WG. A standard has not been fixed, yet, drafts refer to Ref. 2.

So no formal agreements or recommendations have been made in the WG.

But because broadcasters and industry discuss this topic since long, a summary of the reasoning for this potential extension of RDS/TMC is given here:

A strong demand can be expected in future to provide urban traffic information so to allow a very detailed dynamic navigation in towns.

RDS/TMC is applied in more and more big cities to allow this service – starting with the main roads. Positive examples are Paris, London and many cities in e.g. the Netherlands or Germany.

But when to be extended to every small street, the European Broadcasting Union (EBU) feared that RDS/TMC alone may not satisfy such an increased demand. So, the EBU decided for the future Digital Audio Broadcasting (DAB)

- to make continuous use of the advantageous features of RDS/TMC and to take the standardized digital event codes and the location codes wherever applicable,
- but to apply additionally georeferenced location codes.
- In a joint effort a "Road Traffic Information Group" (RTIG) from members of the EBU and the TMC-Forum are actively working for a joint solution which then will be standardized in ISO TC 204. Two solutions for location referencing are under discussion, IPR-agreements will be settled in the near future. The parties are optimistic that a final test can be made during the Soccer World Championship 2006 already (project Mobil-Info).

This work is still under way. Therefore the RTTI WG registered these activities but could not make concrete recommendations, yet.

Further details refer to the presentations of  
 Bev Marks, "TPEG – a Status Report" and  
 H.-W. Pfeiffer et al. „Demonstration of the TMC and Dynamic Navigation"  
 all presented at the eSafety Expert Meeting on RTTI, May 11, 2005 in Berlin and published under [www.eScope.info](http://www.eScope.info).

#### 4.3. Minimum quality requirements for traffic information

ERIC - the "European Road Information Center", a federation of the automobile clubs in Europe, which organizes the internal distribution of traffic information which is relevant to the main roads and thru-traffic - has defined for this purpose a minimum set of requirements

which may be used to have a minimum level.

The Bundesamt für Straßenwesen (BAST) in Germany developed an even more detailed proposal which is – between others – under the joint evaluation by the European Highway authorities.

The Swiss authorities have specified their requirements for traffic information in the Swiss Standard SN 671 921 and specified additionally the future wishes for border-crossing traffic information.

Similar attempt have been made in many European Member Countries.

The agreement on a the RDS/TMC-norm, its coding structure and the look-up tables involved led already in the field of RDS/TMC-messages to a RTTI-information which then fulfils automatically such a set of requirements – so to guarantee that the RDS/TMC-receivers can be used in all the many countries with a RDS/TMC broadcast service.

The RTTI WG appreciated these efforts because they enable a basically seamless service (encryption see 3.3.)

#### 4.4. Statements of the European Member States

At the High Level Meeting Sept. 27, 2004 in Brussels, the representatives of some Member States presented their view as to the extension of RTTI services in their countries.

The efforts and the recommendations of the RTTI WG have been presented at that meeting (see ref. 3). They were unanimously supported by the representatives of the Member States. But not all of the representatives gave a detailed programme how to expand the RTTI services and specifically the RDS/TMC based services in their individual countries.

So, from obvious reasons some countries did not see at that time a necessity for a country-wide RDS/TMC-service if some areas are scarcely populated (Finland, Norway): It became clear that because of the different traffic densities and the investments required eventually, the speed for the introduction and of the extension of RTTI may be quite different in the Member States.

Some countries have published the basics of their RTTI strategies, already. But to generate a detailed survey it was decided within the RTTI WG to contact the responsible Transport Ministries in the Member Countries to get their most actual views.

The expected answers may not be very detailed at the time being but the actual RTTI strategy of the different countries may be seen.

Within these answers, it is expected to get an very actual view of the monitoring infrastructure installed on the highways of the member countries as a prerequisite to collect traffic data of appropriate completeness and reliability for a RTTI-service covering the highways. Annex 5 shows that not in all countries installations exist – and only a few countries can claim to have sufficient traffic detectors installed to get enough data for a RTTI service.

As another example Annex 6 presents the German view as given by the State Secretary Dr. Nagel of the Ministry of Traffic, Construction and Housing (BMVBW) May 11, 2005:

The major points regarding RTTI are:

- RDS/TMC is in operation in Germany since many years, its further spreading is supported
- Digital broadcasting and its options should be used as soon as standardisation has been realized

- Safety relevant information should be provided at lowest possible costs to the drivers.

His statement as to the business model reads:

"It should be possible continuously to access basic safety-related traffic information free of charge throughout Europe.

This does not rule out the incorporation of private-sector commercial information service providers, who can target specific market segments and provide customized information services – services that cannot be provided in this form by the public sector. I can imagine that roaming agreements will be concluded – like those between mobile phone operators – which give seamless cross-border access to traffic information."

#### 4.5. International Developments

##### \* Japan

VICS shows no alternative which may be directly applicable in Europe.

The basic functionalities have been realized similarly in earlier European developments (IR-Beacon, Microwave Beacon, RDS/TMC, tests with Digital Radio)

##### \* China

RDS/TMC is demonstrated there by European companies (see 4.1. Project DYNASTY).

##### \* USA

The two Satellite Digital Automobile Radio Systems (SDARS = Sirius and XM Radio) use or will use a RDS/TMC-comparable transmission scheme for RTTI-services. No direct application to Europe.

### 5. Results and Recommendations

#### 1. The WG agreed that

"All traffic information is potentially safety relevant and an important tool for traffic management.

The more "real-time" the information is, the better."

#### 2. Customer's awareness and interest in RTTI-services is augmented with more and more actual and correct traffic information. This includes not only warning for traffic problems but in addition to this information of the end of that problem - or even the expected end – and an extension to e.g. detailed inner-urban traffic information and even to expected travel times, eventually.

#### 3. Regional differences from the geographical situation and/or the traffic density will result in a different speed and different schedules for the realisation or the extension of RTTI in the different countries.

#### 4. The business models remain different – depending upon the operator of the traffic services. There was consensus that any information should be freely available to all drivers which may save lives and avoid accidents.

On the other side it was expressively stated that a service "Expected Travel Times" could be a typical service which may be offered only against a fee to be paid by the user.

#### 5. All interested parties should support the TMC-Forum to promote the safety-related service features of TMC.

6. The operators of RDS/TMC-services should take steps to ensure roaming and interoperability across Europe for the RTTI-services.
7. In many countries the public authorities such as the governmental highway operators provide already some existing RTTI data to operators and broadcasters. Whenever this is not the case, the authorities should be requested to do so to accelerate the deployment of RTTI services. When public organisations and communities show little or no interest to provide an adequate RTTI service, support and start-up allowances for private data collection and service provision should be given.
8. Traffic Management Centres should be requested to operate to European Standards such as TMC-encoding of the data. It is recommended that tenders for new or for the extension of existing Traffic Management Centres should ask for a mandatory use of these standards.

Services should be offered according to these Standards. Clear guidelines ought to be published for the private sector for the conditions of private data collection networks.

9. Broadcasters should be requested to carry the RDS/TMC-service.
10. Frequency spectrum and broadcast capacity should be made available for advanced broadcast services such as DAB, DRM, DVB-T and eventually satellite DAB as soon as they have been standardized. Some support ought then to be given to install those services using these broadcast schemes and mobile radio (e.g. 3G).
11. RTTI-WG should make a proposal for a letter to the European Transport Ministries to ask for their position against these recommendations of the RTTI-WG.
12. The Council of the Transport Ministers of the European Union should decide at one of their next reunions that  
 "All countries within the European Union should agree or should be advised to enable and to extend the installation of the chain of road information and to establish Real-Time Traffic and Traveller Information Services in their countries. By the year 2010 more than 80% of all population should be served with adequate, standardized services."

## 6. Steps ahead in the very near Future

- \* From the answers to the letter to the national ministries an actual survey is to be expected of the strategies of the Member States.
  - \* The new member states will install rather rapidly RTTI-services.
  - \* Standardisation of TPEG should become true within short allowing first trials and evaluations with RTTI-services in 2006, eventually.
  - \* Agreements with as many Urban Traffic Centres as possible should be made so that traffic information which is readily available there may be used for RTTI-services.
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- \* To avoid expensive installation of new sensors for traffic data collection, it has been proposed e.g. by the company LogicaCMG to use the location information of mobile phones to measure traffic density and average speed. First installations for RTTI services may be realized in the near future, eventually. This may be most valuable in towns, suburban

areas and on roads without sensors to monitor the actual traffic flow.

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- Annex 1 European RDS/TMC-Services in operation. Source: ERTICO
- Annex 2 Recommendation 15 – 17 of the “Final Report of the eSafety Working Group (Road Safety), published Nov. 2002, (see [www.eScope.info](http://www.eScope.info))
- Annex 3 List of temporary and regular Participants to the WG
- Annex 4 RTTI-process overview
- Annex 5 Provision of European Highways with traffic monitoring systems  
Source: R. Kulmala, Report to the Safety Forum, June 2005
- Annex 6 State Secretary Nagel at RTTI-conference May 11, 2005 in Berlin  
(see [www.eScope.info](http://www.eScope.info), reference eSafety Expert Meeting on RTTI May 11, 2005)
- Ref. 1 TMC-Standard EN ISO 14819, parts 1 -3 and 6 (2002)  
RDS-Standard IEC 62106:2000
- Ref. 2 TPEC-Loc CEN/ISO TS 18234-6  
AGORA-C specification version 1.0, April 06, 2005
- Ref. 3 RTTI-Report to the eSafety High-Level Meeting, Sept. 27, 2004  
(see [www.eScope.info](http://www.eScope.info))