Information Society Technologies

Annex 1: eCall

The eSafety High-Level Meeting with Public Authorities

Brussels, 27 September 2004

Summary Report
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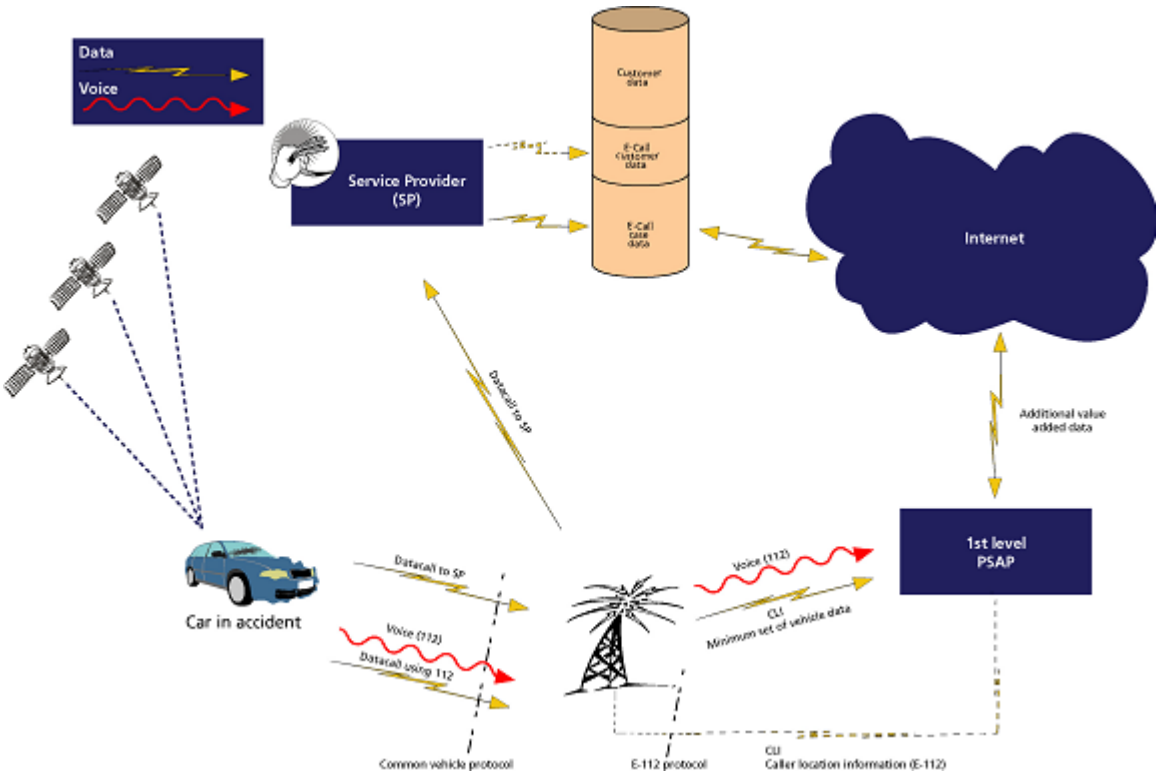
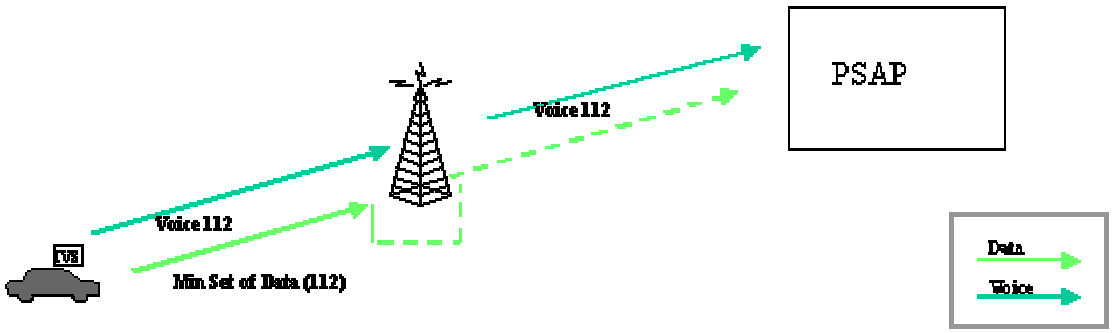
LIST OF CONTENTS

1. TECHNICAL MODEL FOR ECALL IMPLEMENTATION

Architecture and functional model



In order to allow the maximum efficiency for lowest complexity, investment and costs, eCall Driving Group focused (as a first step) on the interface between the vehicle and the PSAP as illustrated below:



Process:

1. The IVS (in-vehicle system), which is the generating agent of the eCall, sends the emergency call to a PSAP, consisting of two elements: a pure voice telephone call based on 112 and the minimum data set of data. The choice of channel to be used for sending these two elements in a quasi-simultaneous way still needs to be taken and has to be considered from a technical and economic point of view among the already existing standards of wireless networks GSM / GPRS / UMTS.
2. The eCall (data + voice) goes through the mobile network, is recognised by the telecom operator as an emergency call, and is first handled by him. The telecom operator enriches the call with the CLI (caller line identification), and at the same time, as a result of E112

best effort principle, will add the mobile location into the location server database. After the emergency call handling, the telecom operator delivers the eCall to the appropriate PSAP via the fixed line network.

3. The PSAP receives two different types of communication via the fixed line network from the Telecom operator: the first one (minimum set of data, CLI, mobile caller location based on specific protocol -E112-) is data communication delivered via a commonly agreed protocol, whilst the second one is a normal voice communication.
4. The PSAP transmits if possible acknowledgement of data received to the IVS and decodes and visualises the minimum set of data.
5. In case the user is a subscriber of a private service provider (SP), the IVS sends a full data set to the SP, after receiving acknowledgement from the PSAP.
    a. The SP receives the data message and starts handling procedures, adding the additional eCall data in the SP database in order to make these data available for the PSAPs.
    b. The SP transmits acknowledgement of data received to the IVS.
6. (Only valid if subscription to SP) If translation is needed, the PSAP can use a toll free number, provided in the MSD, to contact the SP who then starts a conference call with the driver.
7. (Only valid if subscription to SP) The PSAP accesses the SP eCall specific database in order to obtain the additional data set directly from the SP.
8. The PSAP operator elaborates the received data.
9. The PSAP operator dispatches the emergency details to the most appropriate rescue dispatch centre.
10. (Recommended) The PSAP communicates to the SP the involved rescue centres, to allow the SP to be able to provide additional post-accident services. This communication could happen via fixed line network as a simple phone call between the operators, or via Internet. In this last case the PSAP operator can access the SP specific eCall database and enter all available information about the involved rescue centres.

<u>Minimum Set of Data (MSD)</u>
It has been agreed that the MSD, which the IVS should send directly to the PSAP as a minimum, should consist of the following:

- Time stamp
- Precise Location *(simple enough to be used by PSAP without investment, maintenance and training, from single GPS coordinates to a few)*
- Vehicle identification
- Service Provider Identifier *(may vary by Brand, and over vehicle life time)*
- eCall qualifier *(as a minimum a indication stating if the eCall has been manually or automatically initiated)*

The intention is to provide to the PSAP operator enough information in order for him to provide a faster and more effective emergency response than today. This can, according to the involved stakeholders, be done by giving information about:

- "*When*" via the time stamp;
- "*Where*" via precise locations (e.g. satellite positions including the direction of driving);
- "*Who*" via vehicle identification (caller line identification [CLI], colour, make and model including, if possible the vehicle identification number, VIN);
- "*Where to obtain more information*" via service provider identifier (IP address, including for example telephone number and country code); and
- "*How severe*" via eCall qualifier (source of the trigger – manual or automatic including what type of sensors or, if available, the number of sensors).

Coding of MSD at in-vehicle system

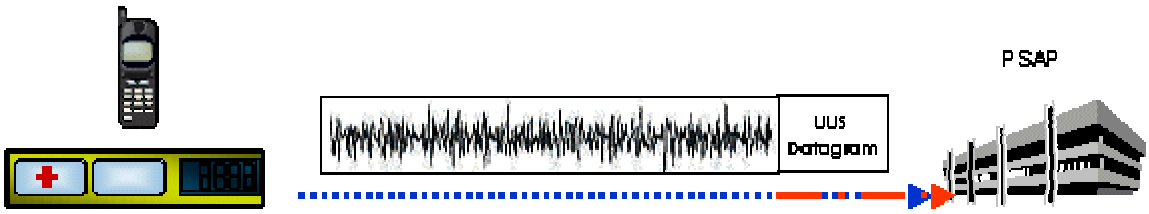
Decision about the common protocol to be used for communication between vehicles and control centres including PSAPs still need to be taken. However, tests have proven GTP (Global Telematics Protocol) to be a candidate for the coding of not only the MSD in relation to an eCall.

Transmission of MSD from vehicle to PSAP

The eCall DG has agreed that MSD should be transmitted as a data stream in the open voice channel.

Proposals of how to achieve this has been developed and sent to major mobile telecom operators and GSM Europe for review. Furthermore, ETSI and in particular OCG EMTEL has been tasked to standardise this interface.

It has been suggested for the communication between IVS and PSAP to use UUS Service Level 1 as illustrated.



User to User Signaling (UUS) Service Level 1 (UUS1) is implemented in ISDN- and GSM-networks and exchanges user-user information during the setup and clearing phases of a call, by transporting information elements in the call control messages meaning that data is transmitted during the emergency call set-up of a call in some free bytes in the set-up message. Voice and data are transmitted in one channel, no complicated SMS handling required. The service is already used on ISDN side for communication within telephone switchboards. The user-user signalling (UUS1) supplementary service allows an ISDN user to send/receive a limited amount of information to/from another ISDN user over the signalling channel in association with a call to the other ISDN user. However, even through the service is available, is has been blocked in many networks because of misusage in the ISDN network – this can be prevented for the “112” use-case if a 112 identifier is employed.

There is an urgent need for ETSI and the major mobile telecom operators to agree on the transmission of the MSD in the open 112 channel in order to ensure that the PSAP operator receiving the 112 voice also receives the MSD at his operator screen.

Decoding of MSD at PSAP

The MSD should ideally be coded in the same way across different in-vehicle systems using the same protocol as described earlier.

However, in case that a decision about the use of one common protocol cannot be reached in due time, then the possibility to introduce a protocol converter at PSAP level exists. The protocol converter is already available and is capable of decoding messages from the most commonly used protocols (ACP, GATS, GTP etc.)

Visualisation of MSD at PSAP

It is recommended that the location information received in the MSD be visualised on a map in order to provide visually the geographical location for the PSAP operator. Also it is recommended that the MSD be visualised on the same operator screen that is being used for handling 112 calls and the future E112 calls (mobile 112 calls enhanced with location data).

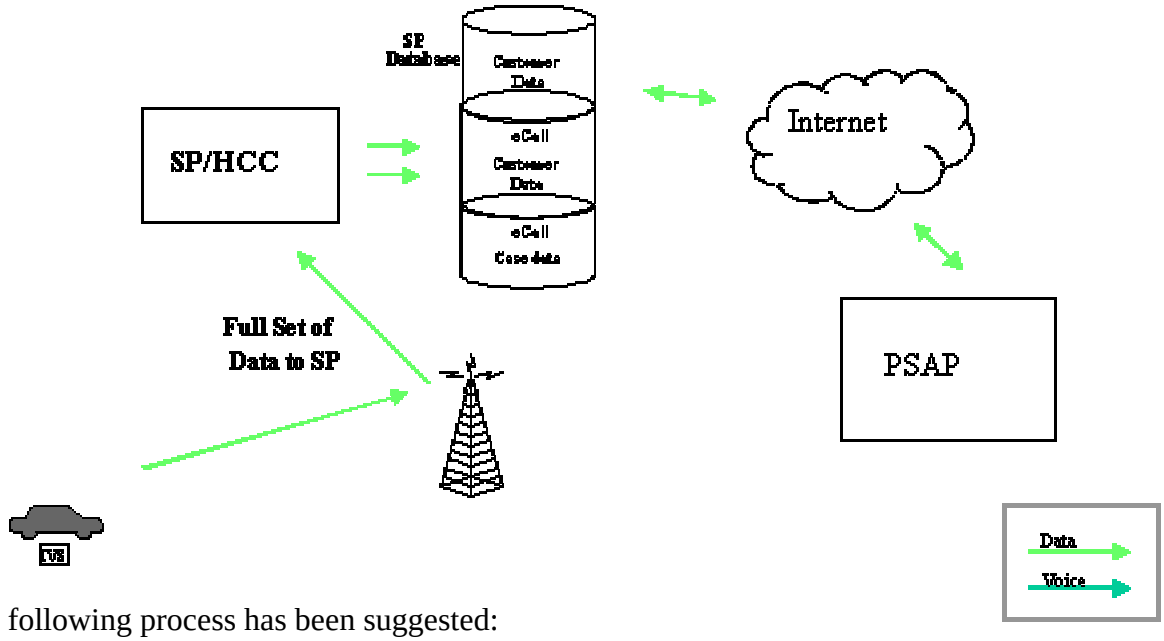
How to implement the visualisation could be country specific or even regionally decided.

Additional information available at private Service Providers

Some or all vehicle makers might decide to provide the opportunity for the vehicle users to access service provider for additional services. As mentioned earlier these service providers could provide added value to the PSAP operators and emergency operators.

Recommendations have been given in the project E-MERGE for the content and development of SP specific databases and data content. It has been suggested to use the HTML “get” command to create a standard interface for the PSAP request for the additional information that a service provider could provide called the FSD (Full Set of Data).

Finally, specification on how the PSAP operator, on the basis of the contact information received in the MSD, can contact the SP operator to initiate a conference call and thus retrieve language support if needed has been suggested.



The following process has been suggested:

In case the user is a subscriber of a private service provider (SP), the IVS sends a full data set to the SP, after receiving acknowledgement from the PSAP.

a. The SP receives the data message and starts handling procedures, adding the additional eCall data in the SP database in order to make these data available for the PSAPs.

b. The SP transmits acknowledgement of data received to the IVS.

If translation is needed, the PSAP can use a toll free number, provided in the MSD, to contact the SP who then starts a conference call with the driver.
The PSAP accesses the SP eCall specific database in order to obtain the additional data set directly from the SP.

2. IMPACT AND BENEFIT ASSESSMENT AND MODEL FOR ECALL IMPLEMENTATION

1 – Objectives of this document

From European Commission goal to reduce road fatality by 50% in 2010 (compared to 2000), and eSafety Forum recommendation to raise eCall as first priority within vehicle innovation contributing to this objective, a private and public workgroup "ECDG" raised several recommendations on the best way to operate eCall trough Europe, and is now focusing on business rational and roll out scenario.
At this stage, it has been recommended and agreed that gradually each vehicle will be fitted with a device allowing automatic trigger of a call (voice+data) directly to E112 selected PSAP, together with precise location, identification, time stamp, and server coordinates offering extra relevant information when available. This first step[1] is the only focus of this analysis.
This approach is in line with several trials and existing products, in Europe and USA. This is allowing identifying benefits related with time saved in alerting and routing rescue, together with side effects on global efficiency and incident management.
Key questions raised in this document are:

1. What are the impacts of automatic trigger and precise location in rescue time, and incident management ;

2. How these impacts turn into better efficiency / lower consequences

3. How better efficiency brings economic impacts beside of human care, and how much could be saved by equipped car,

4. and who shall benefit from this effort

2 – Context: Global economic impact of vehicle's crashes

A car crash has a global cost for society, beside of human drama and political issue.

This economic impact is a shared burden, with emergency operation costs, insurance costs, health costs and lost workplace / productivity costs.
A very strong report is available at NHTSA (http://www.nhtsa.dot.gov/people/economic/EconImpact2000), and is used as reference for this analysis paper. Such figures exist in Europe but they are not available in such a format that a rapid analysis can be done on e-Call case[2].
We can nevertheless assert that figures are in the same range, as global markets are quite similar:
We then propose to use NHTSA report as a reference document, and to challenge major assumptions with European known situations and figures.

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[1] A further step shall allow to collect and manage extra data in order to deliver as much information as PSAP can use to improve rescue operation, and to allow third parties to act beside emergency response to service the distressed people or warn surroundings.

[2] A study on the Potential Socio-Economic Impact of the Introduction of Intelligent Safety Systems in Road Vehicles funded by the EC (DG INFSO) was started on 15/07/2004. The study will analyse the eCall case. (www.vdivde-it.de/SEiSS)

Year 2000 commonly agreed figures	USA	Europe (source : EU COM 311 Final.)
Total registered cars	217 028 000	200 000 000
Total new cars sold/year	17 000 000	16 000 000
Total casualties	3 189 000	1 700 000
Total fatalities	41 821	More than 40 000
Estimated total cost of crashes (k$)	230 600 000	Est 160 000 000

Source : NHTSA report "the economic impact of motor vehicle crashes 2000", may 2002. Economic Impact of Crashes

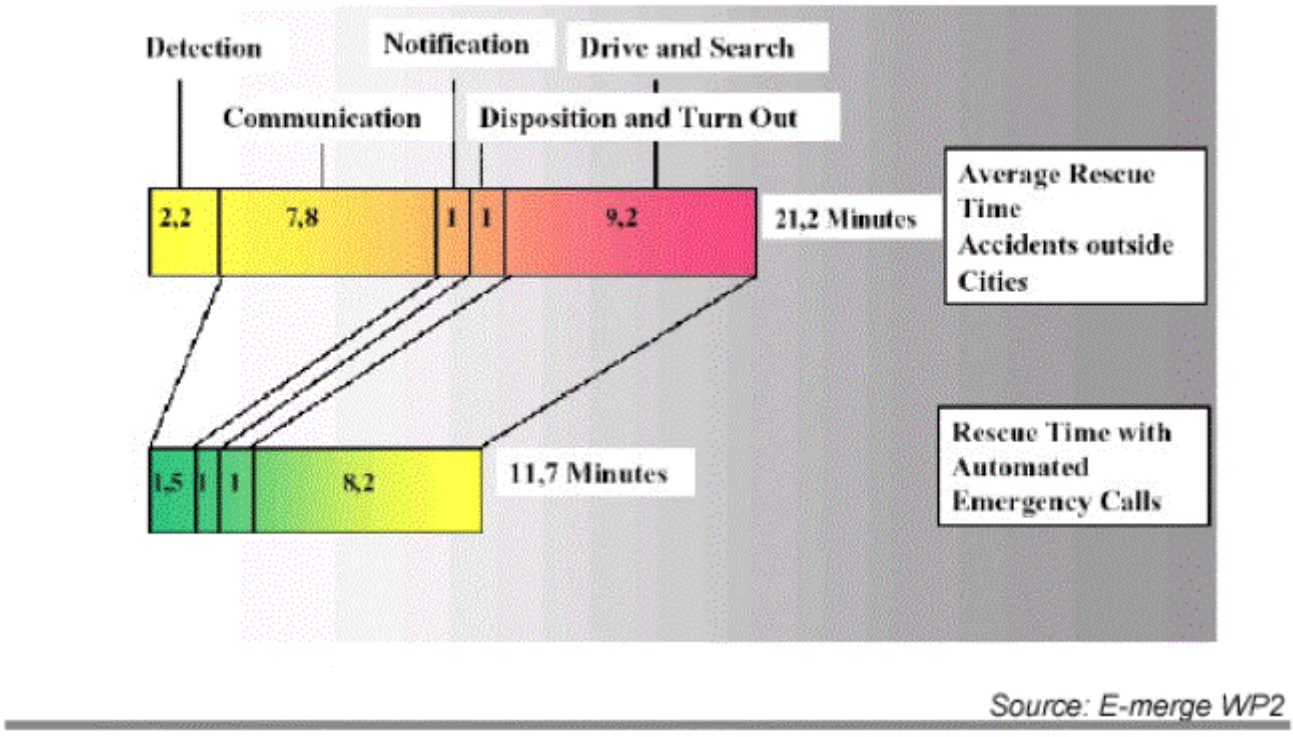
> The cost of motor vehicle crashes that occurred in 2000 totaled $230.6 billion. This is equal to approximately $820 for every person living in the United States and 2.3 percent of the U.S. Gross Domestic Product.
> The lifetime economic cost to society for each fatality is over $977,000. Over 80 percent of this amount is attributable to lost workplace and household productivity.
> Each critically injured survivor costs an average of $1.1 million. Medical costs and lost productivity accounted for 84 percent of the cost for this most serious level of non-fatal injury.
> Lost workplace productivity costs totaled $61 billion, which equaled 26 percent of the total costs. Lost household productivity totaled $20.2 billion, representing 9 percent of the total costs.
> Total property damage costs for all crash types (fatal, injury, and property damage only) totaled $59 billion and accounted for 26 percent of all costs.
> Property damage only crashes (in which vehicles were damaged but nobody was injured) were the most costly type of crash, due to their very high rate of occurrence. Their costs totaled $59.8 billion and accounted for 26 percent of total motor vehicle crash costs.
> Present and future medical costs due to injuries occurring in 2000 were $32.6 billion, representing 14 percent of the total costs. Medical costs accounted for 26 percent of costs from non-fatal injuries.
> Travel delay costs $25.6 billion or 11 percent of total crash costs.
> Approximately 9 percent of all motor vehicle crash costs are paid from public revenues. Federal revenues accounted for 6 percent and states and localities paid for approximately 3 percent. Private insurers pay approximately 50 percent of all costs. Individual crash victims pay approximately 26 percent while third parties such as uninvolved motorists delayed in traffic, charities, and health care providers pay about 14 percent. Overall, those not directly involved in crashes pay for nearly three-quarters of all crash costs, primarily through insurance premiums, taxes and travel delay. In 2000 these costs, borne by society rather than by crash victims, totaled over $170 billion.

3 – Impact analysis from existing materials

3.1 – Impact of automatic trigger, precise location and identification in rescue time and incident management

Automatic triggered emergency call with precise location & direction shows a clear improvement in reducing rescue time at the crash scene.
Quite robust assumptions can be shared from European and US trials and reports, as they were made in various places and times and reached the same levels:

Europe:
E-Merge project used a German study "STORM" (Stuttgart Transport Operation by Regional Management), showing almost 50% rescue time improvement in rural area, with a net gain of almost 10 minutes:



Source: E-merge WP2

When the average time in urban areas decreased from 13 minutes down to 8 minutes.
PSA and Renault were also involved with French "Préfecture de Paris" for a live test in Paris (summer 2000), and its nearby rural area. This test proved the same kind of positive effect on rescue time, and rescue coordination enhanced efficiency. It also shown the opportunity to rise alert to the environment, and then to avoid over-accident and route congestion.

USA:
These figures and information have been collected on several US federal websites, as recommended by Dr. Ricardo Martinez, former NHTSA Administrator (94/99) and current CEO of Safety Intelligence System. Phone interviews and mail exchanges with Dr Martinez secured these elements.

✓
Average times without Automatic Crash Notification (ACN) in USA are in line with STORM report, regardless of differences in road infrastructures, cars and driving behavior[3]:

Area type	*Average notification*	*Average time to scene*	***Total***
Rural	*9,6 min*	*11 min*	***20,6 min***
Urban	*5,2 min*	*3,4 min*	***8,6 min***

✓ Emergency efficiency: *ACN allow a strong average 2 minutes notification time when an average rural 7 minutes was going up to hours* [4]: to compare with 11 minutes down to 2.5 minutes in Storm study. Rural crashes account for most of the fatalities (60%), and single rural crashes for

[3] Recommendations for ITS Technology in Technology in Emergency Medical Services, August 2003, William T. Baker, ITS America, (202) 484-4540. ***www.itsa.org***
[4] US Department of Transportation – ACN Field Operational Test, Western New York area, 2000
Ref DOT HS 809 303, www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/ACN%20Final/index.htm#toc

almost 1/3 of US fatalities. This is likely to be at same levels in Europe, when eCall is proving maximal impact in rural areas.

✓*PSAP efficiency: ACN reliability to avoid false alarms was proven in a 700 ACN system pilot 3 where a low 3.5% false alarm was observed. 27% of received calls were originated by mobile phones at time of the report. This share is still growing, bringing multiple calls for a same incident (80 to 100 calls per crash in urban area, to compare with an average of 6 call from fixed lines!), together with loose or no location. ACN can help to filter calls thanks to automatic trigger and precise location. Public Safety Community able to successfully use ACN; can help to adapt resources to the case (FSD) 3*

✓ Side effects: *Fast notification of an incident for surrounding traffic allowed 2,8% new crash reduction (San Antonio, Texas) and reduced average incident duration by more than 55% (Maryland)*[5]

Conclusions:

- STORM figures are viable assumptions, from US bench and "words of experts". Regardless the time and place, same level of results were observed in US and Europe.
- eCall shall allow almost 50% shorter reach (about 10 minutes saved) to the scene in rural area, where alert can be very late and location hard to find, and up to 40% shorter reach in urban areas (4 to 5 minutes).
- Moreover, US tests proved impacts on surrounding warning, then reducing risks of new crashes and dropping average incident duration by more than 50%.
- Last, eCall brought a better PSAP resources efficiency by reducing false alerts and allowing better resources fit to the scene.

3.2 – How these impacts turn into better efficiency and lower severity

Emergency Organizations are well aware of the "Golden Hour" concept, stating that the first tens on minutes following a crash are critical for survival or reduced injuries.

A good presentation of this concept is available on an US ITS report.

US Department of Transportation – ACN Field Operational Test, Erie County, New York, 2001[6] :

"The time dependence of trauma is commonly accepted. For example, Reference 21 states for traumatic brain injury, "All neurological damage does not occur at the moment of impact (primary injury), but rather evolves over the ensuing minutes, hours, and days. This secondary brain injury can result in increased mortality and more disabling injuries." What remains in question is the exact quantification of this variable. Contemporary literature in this field (References 20 - 24) often refers to a "golden hour" where the first 60 minutes of care after a multiple trauma injury is described as "crucial." Furthermore, within this first hour, care seeking to correct the underlying problem causing the patient's condition to worsen must be administered. This type of care can best be administered in a suitable facility such as an emergency room or, even better, a dedicated trauma center. Thus, ***transport of the victim to such a facility needs to be accomplished within this time frame****. **Administration of fluids and other simple, supportive care treatments**, while not enough in critical situations,* ***should be started within the "Golden Ten Minutes"*** *(Reference 25). This offers a loose bound of 10 minutes on the time from the occurrence*

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[5] Intelligent Transportation Systems Benefits and Costs, update 2003
Mitretek System for Fedral Highway Administration, Report N° FHWA-OP-03-075;
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13772.html

[6] *Ref DOT HS 809 304, http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE//13830.html*

of the motor vehicle crash to the arrival of medical aid in severe cases. "…"The change in the time distribution of deaths resulting from trauma is significant due to the likely causes of these changes. The "early deaths" peak likely has been reduced due to a better understanding of trauma and improved facilities and thus more quickly administered medical aid. A study reported in 1998 in Portland, Oregon (Reference 29) further bolsters the importance of the time-dependence of trauma. The researchers found, after examining 848 trauma cases, that the response time was significantly shorter (3.5 ± 1.2 minutes) for unexpected survivors compared to unexpected fatalities (5.4 ± 4.3 minutes). Simply put, a shorter response time resulted in a greater likelihood of survival. "

Even if we can hardly turn that common understanding into robust statistics, it is obvious that saving average 10 minutes in rural area, where almost 1/3 of crashes and 2/3 of fatalities occur (and securing an alert when no witness can give a good Samaritan call within minutes), will have a dramatic positive impact in saving people and reducing severity of wounds. A very conservative assumption would be a 10% average reduction of severity; a more realistic view could be up to 20%.

US Department of Transportation – ACN Field Operational Test, Erie County, New York, 2001[7] :

An ACN system should reduce the length of time between traumas and needed restorative medical care. Extrapolating from the findings of air transport fatality reduction studies (References 30 and 31), the ACN system could offer an approximate 20% reduction in fatalities from motor vehicle collisions. This estimate assumes that adequate medical facilities would be available. Unfortunately, no studies have been found to assess the time dependence of injury severity caused by motor vehicle trauma. Thus, any estimate of the affect of ACN on reducing injury severity would be little more than a guess. This area requires further study. However, an NHTSA-sponsored multidisciplinary research team has produced a computer program (References 2, 4, and 5) which attempts to produce an easily understood probability of serious injury estimate making use of data which would be available from an ACN system.

To further support this assumption, another US study (non identified but quoted in [2]) came down to the conclusion that ACN could save a yearly 1,676 life (6%) and have "even more far reaching" effect on severity of highways injuries.

Side effects on incident management and improved rescue efficiency (false call filtering, better resources fit to the situation) can hardly be estimated, but can be seen as bonuses securing the 10% assumption.

Conclusion:

eCall shall allow a conservative 10 to 15% average gain on severity brackets (as used in NHTSA reference report), together with improved rescue costs and reduced incident impacts on the traffic.

3.3 – Financial Benefits of eCall

A key pending question is now, from confirmed benefits of eCall (reduction on rescue time on European accidents, improved PSAP efficiency, better surroundings warning), to evaluate the global economic benefits from existing statistics and costs split.

- eCall benefits are mostly expected to reduce fatality and injury level, with a direct impact in health costs (public sector & insurances) and insurance costs (insurances).
- It should also reduce emergency services costs (public sector) and travel delay (speeding access to the crash and information to road users: public sector)
- Legal costs should as well be reduced according with crash severity reduction, and using data received from the crash scene to better solve legal disputes.

[7] *Ref DOT HS 809 304, http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE//13830.html*

- Last, market productivity and household work loss are less directly linked with identified players, but must be a political concern and by the way, drive attention from state organization as well as insurance companies.

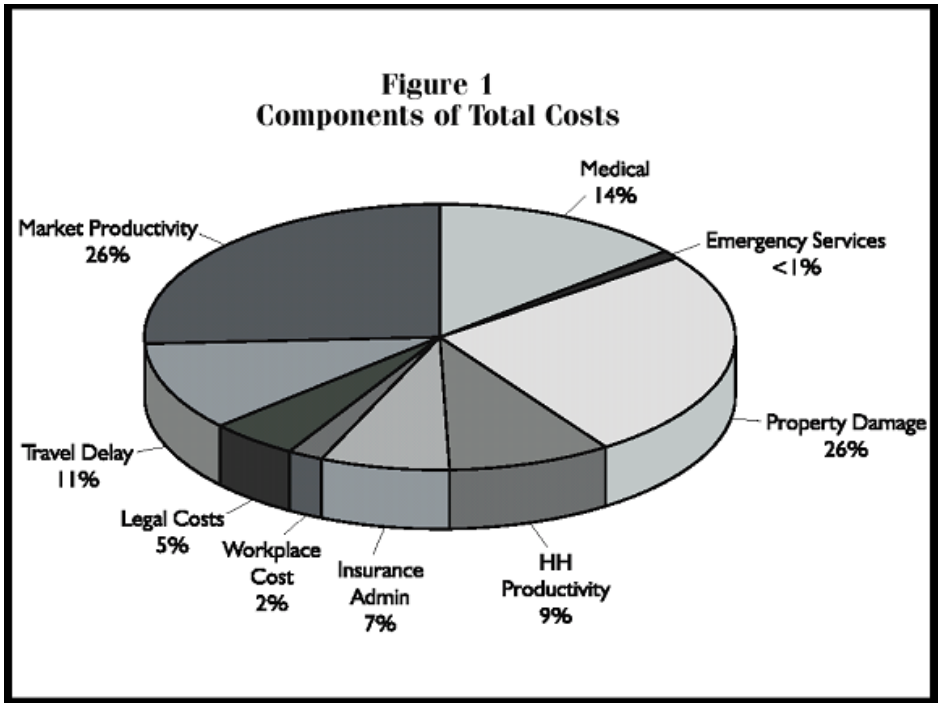
- The main field where eCall has a marginal impact (if any) is on Property Damages.

High level assumptions

From NHTSA figures, and not diving into details, we can already bring some assumptions and estimate the economic effect.

✓ First high-level assumption is that reduced time to the crash should bring up to 15% of the victims to the lower category.

✓ Second assumption from NHTSA split of total cost, is that eCall shall impact at least 50% of this total cost, with lower perceived benefit on Productivity issues and Property Damages as insurance ability to recover on these cost is not yet proven.



Part of this amount impacted by shorter rescue time	
Medical	14%
Rescue cost	1%
Market productivity	26%
Household Productivity	9%
Workplace Cost	2%
Travel delay	11%
Insurance administration	7%
	70%

✓ Third assumption is that European crash figures are the same than US, and that 1 USD = 1 EUR[8]

[8] Figures from 2000. EUR should be multiplied by a correction factor to reflect inflation.

From these three high level assumptions and NHTSA figures, and as a discussion basis, we can bring complementary following analyses:

1 – First assumption from US current cost split by severity:

To support this way of computing the possible savings due to an e-Call system, it may be worth to mention again a US study (US Department of Transportation – ACN Field Operational Test, Erie County, New York, 2001[9]):

To compute the possible cost savings that could result due to an ACN system, several assumptions need to be made. The dollar amounts shown in the preceding paragraph have to be averaged over the number of people injured or killed. This assumes that each person injured or killed caused an equivalent financial loss, or, that the inexpensive ones exactly balance the expensive cases. Next, it is assumed that the total number of people killed or injured would remain the same. Although there could be a substantial reduction in the number of people injured due to the ACN, this is not taken into account. Thus, if usage of the ACN system reduced the number of fatalities, the number injured would increase by approximately the same amount. Those who originally would have been fatalities but survive due to earlier medical intervention might be considered to become injured at the "average" financial level. Although this may seem counterintuitive at first, two factors support this assumption. First, neurological traumas in automobile crashes can result in severe and expensive permanent disabilities. However, many of the fatalities caused by severe neurological trauma would be virtually impossible to prevent. Secondly, those people who could be saved by earlier medical intervention often die from loss of blood or difficulties breathing. If these injuries can be stabilized, many times a full recovery can be expected as opposed to an extremely expensive and permanent handicap.

This is quite in line with existing analysis shared by eCall Driving group, as hereafter:

Year 2000	Total cost	Population	Unit average cost
Fatalities	40 859 117 000	41 821	$ 977 000
Very severe injury (MAIS 5)	10 372 971 543	9 463	$ 1 096 161
Severe injury (MAIS 4)	12 709 987 697	36 509	$ 348 133
MAIS 3	23 430 170 591	125 903	$ 186 097
MAIS 2	29 133 987 740	436 007	$ 66 820
MAIS 1	49 214 536 770	4 659 585	$ 10 562
MAIS 0	5 000 074 596	2 548 458	$ 1 962
	170 720 845 937		

This is already removing Property Damage Crashes (about 60 billion USD), as they show no clear benefit from eCall (except over-accident avoiding).

In order to reduce interpretation on severity of injury and bracket effects, we propose to reduce number of severity levels by half:

Year 2000, EU=US	Population	average Per Person Costs
Fatalities	41 821	$ 977 000
Severe injury (MAIS 4+5)	45 972	$ 502 109
Medium injury (MAIS 2+3)	561 910	$ 93 546
Light injury (MAIS 0+1)	7 208 043	$ 7 521

[9] ***Ref DOT HS 809 304, http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE//13830.html***

Then, to consider that a fairly conservative 15% of crashes victims will fall in lower category thanks to eCall reduced time to the scene:

	Initial Population	Improved population
Fatalities	41 821	35 548
Severe injury (MAIS 4+5)	45 972	45 349
Medium injury (MAIS 2+3)	561 910	484 519
Light injury (MAIS 0+1)	7 208 043	6 211 123

We can of course consider that light injuries will not benefit in the same extend of reduced emergency arrival time, but the risk of waiting beside of a car in a crash situation may prove some benefits as well.
Economic outlook would then be:

	Improved population	average Costs Per Person	Improved costs
Fatalities	35 548	$ 977 000	$ 34 730 249 450
Severe injury (MAIS 4+5)	45 349	$ 502 109	$ 22 770 321 013
Medium injury (MAIS 2+3)	484 519	$ 93 546	$ 45 324 605 719
Light injury (MAIS 0+1)	6 211 123	$ 7 521	$ 46 716 372 572
		Total	**$149 541 548 754**

Estimated total economic benefit for all players should then be around 21,180 million €,
This first estimate does not take into account operation efficiency improvements, nor reduced congestion and further accident avoiding.
From the above calculation, and the new cars sold each year in Europe (16 000 000), we can identify a **662 € statistic saving opportunity per new car sold.**

2 – From estimated average risk per vehicle & per year
A simpler way to compute a rough estimate would be to identify average yearly risk per vehicle from global costs, then to focus on the ratio impacted by shorter alert and reach to the scene, and finally, to assume an average global risk reduction thanks to eCall.
An estimated 10% risk reduction is assumed from former discussion, knowing that this figure is highly hypothetical and shall need further test and analysis.
Such rough analysis would bring a European average risk of 800 € per year (160 billions € divided by 200 billions motor vehicles), from wich 70% are impacted by shorter rescue time.
This average 560€ impacted risk would then be reduced by 10%, allowing a 56€ gain per vehicle per year.

For a 12 years average vehicle lifetime, total potential saving per vehicle would be in the range of 600 to 700€, quite coherent with former more detailed analysis.

3.4 – Who shall benefit from this effort

Final customer is obviously among the main stakeholders benefiting eCall, as this can save their lives as well as protect their family and friends. They could appreciate enhanced peace of mind, and later enjoy accident management as well as further value added services from the same technical platform. But …Final customers are not willing to pay for eCall, as they mostly consider this as a public duty. On the other end, they are aware of the benefits of an automatic and located call.

Public sector and insurance companies should prove a rational benefit, both on economic and social effect of crashes, but also on positive communication opportunity.
As a matter of fact, from NHTSA split of road accidents cost, they appear to be by far the main stakeholders supporting the impacted costs:

Share of this amount impacted by shorter rescue time		
Medical	Public Sector ; Insurance	14%
Rescue cost	Public Sector	1%
Market productivity	Public Sector ; Insurance	26%
Household Productivity	Public Sector , global economy	9%
Workplace Cost	Public Sector ; industry	2%
Travel delay	Public Sector , global economy	11%
Insurance administration	Insurance industry	7%
		70%

We can assume than far more that 50% of potential savings will directly or non-directly benefit these two stakeholders. Public sector is also concerned by global economy and competitiveness, where eCall can support a local industry and protect household productivity.
Car industry unsuccessfully tried to promote eCall. Carmakers have a clear view of technical environment, relevant data and operations cost, and cannot, in a competitive market, support alone the cost of such effort, when this effort brings a clear benefit for most players on the market and end-user/citizen.

4 - Conclusions :

The ECDG sub-group in charge of benefits assumptions can consider:

1. That an average 10 minutes (50%) time reduction is a sound figure in rural areas in most European areas

2. That a 4 to 5 minutes (40%) time reduction is also quite robust in Urban areas

3. That rural crash are bringing more risk of late alert and late arrival of rescues, when rural crashes are bringing around 1/3 of road statistics and 2/3 of fatalities. eCall being even more efficient in rural areas, we can assume that the positive effects will prove substantial.

4. That side benefits in rescue operations, false alarms filtering, and better scene management will bring extra benefits which should secure current economic assumptions

5. That this shorter time to the scene has a substantial impact on death and severity reduction, which shall turn in lower global cost for society. 10 to 20% involved people moving to lower severity bracket is seen as realistic.

6. That from these elements, and although this would need further analysis and trials, an estimation between 500 to 700 € average saving per equipped vehicle, is likely.

eSafety Forum
eCall Driving Group

Memorandum of Understanding
for
Realisation of Interoperable In-Vehicle eCall

Table of Contents

European Memorandum of Understanding

for Realisation of Interoperable In-Vehicle eCall

The purpose of this European Memorandum of Understanding (MoU) is to secure the realisation of an interoperable in-vehicle emergency call service (eCall) supplied, introduced and operated across Europe. This MoU does not represent a legally binding agreement; rather, it is an expression of the individual and collective commitment of the signatories to work in partnership in order to realise a shared objective to the benefit of everyone.

1. Preamble

1.1 Rationale

The introduction and use of in-vehicle eCall for deployment of emergency assistance will save lives and reduce social burden by improving the notification of road accidents and speeding up emergency service response. There is an urgent need for a European solution in order to contribute to a reduction of the 39,200[10] people killed, 3.3 million casualties and annual costs in relation to traffic accidents of more than 180 billion Euro. This is why the European Commission-led eSafety Forum adopted eCall as the highest priority amongst the eSafety measures contained in the recent eSafety Communication[11].

1.2 Definition of In-vehicle eCall

The in-vehicle eCall is an emergency call generated either manually by vehicle occupants or automatically via activation of in-vehicle sensors. When activated, the in-vehicle eCall system will establish a voice connection directly with the relevant PSAP (Public Safety Answering Point), this being either a public or a private eCall centre operating under the regulation and/or authorisation of a public body. At the same time, a minimum set of incident data (MDS)[12] will be sent to the eCall operator receiving the voice call.

1.3 Framework

This MoU creates a framework for the introduction of in-vehicle emergency call at all levels in the emergency call chain – including the public sector, the private sector and/or through public-private partnerships. The aim of this MoU is to encourage co-operation between the vehicle makers, Telecom Operators, the EC and the Member States (in particular the emergency agencies, the public PSAPs and the private PSAPs operating under the regulation of a public body) together with other relevant parties such as the insurance industry, automobile clubs and other relevant industrial partners.

2. Involved Parties

Moving forward with implementation of in-vehicle eCall requires parallel commitment and joint effort to work on common, co-ordinated implementation and supporting business plans from all Parties constituting the basic eCall service and value chain.

Such co-ordinated roll-out and business plans need to include optimised technical solutions, quality standards, co-ordinated target dates when emergency calls from in-vehicle systems can be handled by the infrastructure, the incremental investments needed to develop, produce and operate such systems and infrastructure adaptations, a financial model how investments

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[10] *ETSC report on Transport Safety Performance in the EU – A statistical overview 2003 (2001 statistics)*

[11] *COM(2003) 542 final: COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT "Information and Communications Technologies for Safe and Intelligent Vehicles"*

[12] *See Annex B*

and service costs could be financed and by whom, the possibility of fiscal and financial incentives, the benefits and savings by stakeholder group, etc.
The relevant stakeholder groups with the highest impact on the realisation of a European solution can be divided into two major groups: The Parties directly forming the eCall service chain (2.1 – 2.4) and the other Parties (2.5 – 2.8), which are essential contributors and accelerators of the process. Both groups need to work together to achieve the overall objectives and should be represented in the European Coordination Platform.

2.1 Member States

Member States signing this MoU and in particular those authorities in charge of emergency call services and related finance - e.g. civil protection authorities, Ministry of Interior and Ministry of Finance - agree to contribute to the development and agreement of country specific implementation plans conforming to the principles for pan-European eCall as defined in 1.2 and Annex B. For Member States having one or more Service Providers acting as PSAPs for the 112 services, this MoU requires a special handling. The Member State should, after signing this MoU, ensure that the Service Providers who are operating as PSAPs under their regulation gets a commission to handle in-vehicle eCall services. The agreement between the Member State and the Service Provider should include specification, financing and time plan of the in-vehicle eCall service implementation and operations.

2.3 Telecom operators

Telecom Operators signing this MoU agree to contribute to the development and agreement of feasible implementation and business plans conforming to the principles for pan-European eCall as defined in 1.2 and Annex B.

2.4 Vehicle Manufacturers

Vehicle Manufacturers signing this MoU agree to contribute to the development and agreement of feasible implementation and business plans conforming to the principles for pan-European eCall as defined in 1.2 and Annex B.

2.4 Service Providers operating as PSAPs under the regulation of a public body

Private Service Providers who are operating as PSAPs under the regulation of a public body signing this MoU agree to contribute to the development and agreement of implementation and business plans conforming to the principles for pan-European eCall as defined in Para 1.2 and Annex B.

In addition to the essential Parties constituting the eCall service chain, other players are an important part of the value chain and have an important role in supporting and accelerating market take up e.g. through specific support in the business and implementation planning phase and/or contributing to the overall business and outreach plan. These players have been identified as follows:

2.5 Insurance companies

2.6 Automobile clubs, service providers and other end user focused entities
2.7 European Commission DG Information Society, DG Transport, DG Environment
2.8 Related Industrial partners (equipment manufactures, location technology providers, repair industry etc.)

3. Act

The Parties signing this MoU will actively contribute to the development and agreement of feasible implementation and business plans conforming to the principles for pan-European eCall as defined in 1.2 and Annex B.

The Parties signing this MoU will – within the first 12 months following the signature of this MoU, which is targeted to take place within the first half of 2004 - define an overall European work plan and present their recommendation for decision.

To achieve the objectives each party signing the MoU will delegate minimum one expert as a member to the Driving Group on eCall. The representative should be empowered to take necessary decisions.

4. Process

4.1 European Co-ordination

The Parties signing this MoU will interact through a European Co-ordination Platform to co-ordinate their activities by bringing together all relevant stakeholders. Provided sufficient funds can be made available, the co-ordination platform will include studies on the economics underlying the introduction and the drafting of a road map at European level.

The European Commission is the appropriate body to determine the platform to be used for this European Co-ordination. Currently the Driving Group on eCall within the eSafety Forum is the appropriate platform, but the co-ordination may take another form in subsequent years to support implementers and monitor progress of implementation across Europe. However, such co-ordination should continue to be under the auspices of the eSafety Forum.

4.2 Status of the Memorandum of Understanding

This MoU summarises the current intentions of the different Parties signing this MoU. It will form the basis for action by each of the Parties according to their respective roles. However, nothing in this MoU legally obliges any Party to any other Party. Also, this MoU does not affect the rights (including intellectual property rights) of any Party to material or services supplied by them as part of the in-vehicle eCall chain. This MoU recognises that all Parties carry their own risks and costs in providing, carrying and handling the in-vehicle eCall initiative.

4.3 Review of this MoU

For this MoU to provide an effective framework for co-operation active participation of all sectors concerned is required. Progress on implementation and business planning by all Parties concerned will be reviewed when appropriate. However, first review should take place not later than after 12 months following the signature of the MoU. When appropriate

the Parties, will consider the need for improvements in their co-operation and make and introduce suitable proposals for modification or termination to this MoU.

European Memorandum of Understanding

for in-vehicle e-call

SIGNATURE PAGES

Representative from
(Please tick)

☐ Member State
☐ Telecom Operator
☐ Vehicle manufacturer
☐ Service Provider operating as PSAP under the regulation of a public body
☐ Insurance Company/ Organisation
☐ Automobile Club
☐ Service Provider
☐ Related Industrial Party
☐ Other

Name _____

Status _____

Organisation _____

Contact Address _____

Signature _____

Date _____

Annex A - Relevant European Resolutions, Conclusions and Decisions

C(2003) 2657 final
COMMISSION RECOMMENDATION of 25/07/2003 on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services

COM(2003) 542 final:
COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT "Information and Communications Technologies for Safe and Intelligent Vehicles"

Universal Service Directive
(http://europa.eu.int/eur-lex/en/archive/2002/l_10820020424en.html)

Final CGALIES report
(http://europa.eu.int/comm/environment/civil/index.htm)

ETSC report
Transport Safety Performance in the EU – A statistical overview 2003 (2001 statistics)
ISBN: 90-76024-154

Annex B - The in-vehicle e-call minimum data set

Minimum Data Set
The parties agree to the following minimum data set that have to be sent directly from the vehicle to the public PSAPs or the private service providers operating as PSAPs under the regulation of a public body, in case of a manual or automatic emergency call initiated from the in-vehicle system.

Mandatory to be included:

- **Time stamp**
- **Precise Location**
- **Vehicle identification**
- **Service Provider Identifier**
- **E-call qualifier** *(as a minimum a indication stating if the eCall has been manually or automatically initiated)*

Legal notice by the Commission of the European Communities: