



The Self-dispatching eCall Solution:

Reconciling the Technical and Economic Paradigm Shifts in the Auto Industry with the Continuing Vision of Pan-European eCall Response

An ATX White Paper
March 2010

Finding a course for European eCall in a period of in-vehicle de-contenting

Undeterred from its decade-old vision to leverage in-vehicle location technology to reduce highway fatalities and simultaneously extend 112 emergency number network across Europe, the European Commission (EC) last fall warned of regulatory action if it did not see significant progress in the deployment of in-vehicle eCall emergency notification capability. If the Commission opts for the legislative stick, a mandate could take effect as soon as 2014.

The dilemma facing European policymakers is that the hint of mandate comes at a time of worldwide economic uncertainty. EU Member States are challenged to make the necessary investments in a 112 emergency number infrastructure. More critical is the unprecedented period of economic constriction of the global automobile industry, and particularly acute for global automobile manufacturers (OEMs) operating in Europe, where growth in sales is predicted to be flat for another half decade. A mandate to install in-vehicle equipment would also come at a time when the industry struggles to comply with stricter emissions controls and diminished consumer demand for its traditional offerings.

To respond to both trends, OEMs must shed weight from or “de-content” the vehicle – and shed costs for their base product. That said, OEMs may have a growing opportunity to lure more technically savvy and continually networked consumers into showrooms with vehicles that promise continual connectivity to IP and mobile phone networks without the risk of distraction. eCall functions most certainly should be a core feature of a connected vehicle platform.

What is clear is that the EC is serious about getting eCall implemented, even if it entails use of private proprietary services. Equally clear is that automotive vehicle manufacturers in Europe are divided as to how to respond and Member States’ insistence that emergency response is a local competency that requires uniquely designed local solutions to match the scope of the local incidents. The result is that not all EU Member States (most notably France and the United Kingdom) have formally committed to align with the EC’s eCall initiative by signing a Memo of Understanding.

Perhaps what has become most clear is that it is time for a paradigm shift in the seemingly endless quest for eCall deployment. With that goal in mind, ATX has developed a self-dispatching eCall solution (patent pending), a component of a suite of emerging new in-vehicle services associated with “connected vehicles,” that seeks to accommodate the central need of each of the primary stakeholders – EU policymakers, public safety authorities in Member States and vehicle manufacturers. Moreover, it does not require a costly pan-European (multi-lingual) call center network.

Combining the public and private approaches to eCall

Currently, two approaches for an emergency eCall have been recognized by the European Commission:

- **Public E112 eCall:** The voice call within the vehicle dials the 112 number via an in-band modem provider solution and data is transferred to the appropriate public safety answering point identified by mobile carrier-enabled location positioning technology.
- **Third-Party Service Provider (TPSP) eCall:** Voice call and data are transmitted to a telematics service provider (TSP) using SMS technology and in-vehicle satellite positioning technology. The calls are screened for false emergencies by TSP call takers fluent in the native language of the motorist and then transmitted via both voice and IP to the appropriate public safety answering points (PSAP) with jurisdiction at the site of the emergency.

For more than a decade, ATX has provided TPSP-based eCall, gaining in the process a deep understanding of actual “field research” on eCall “users” – motorists, PSAPs / emergency dispatchers / responders, and vehicle manufacturers).

Coupling what we know to be true in the “real world” of today’s eCall environment and what has been discussed as the ideal “hypothetically” (ATX has participated in the WG15 Group led by the EC to define pan-European eCall), ATX sought to identify a technically agnostic solution that can be configured to interface with any car traveling in any European country while complying with any local requirements.

ATX’s self-dispatching eCall approach

In ATX’s proposed self-dispatching eCall approach, data and voice are transmitted to a single TSP with European-wide coverage. A TSP server determines the location of the customer and the appropriate PSAP with jurisdiction at that location. Both crash data transmitted by the vehicle and customer-provided data, managed by the TSP in concert with each “connected,” European vehicle owner is aggregated with the location data and sent to the PSAP. This transfer can be achieved either through a proprietary interface, such as one currently used by British Telecom to route eCalls within the United Kingdom, or through a highly secure Web portal for those PSAPs that lack such an interface. The data could be requested by the PSAP via an access code provided by the TSP via the voice channel.

The voice call arrives at the TSP, where a server identifies the number and country code of the appropriate PSAP and matches the call to predefined audio .wav files. The server then calls the PSAP and relays the minimum set of data specified by the EC via automated voice in the native language of the PSAP. Based on the scope of the eCall data received, the automated messages could also convey additional crash severity information, as well as the access code for the Web portal with the associated data. Of course, where required by local protocols, the TPSP could route calls through TPSP call takers – the traditional TPSP.

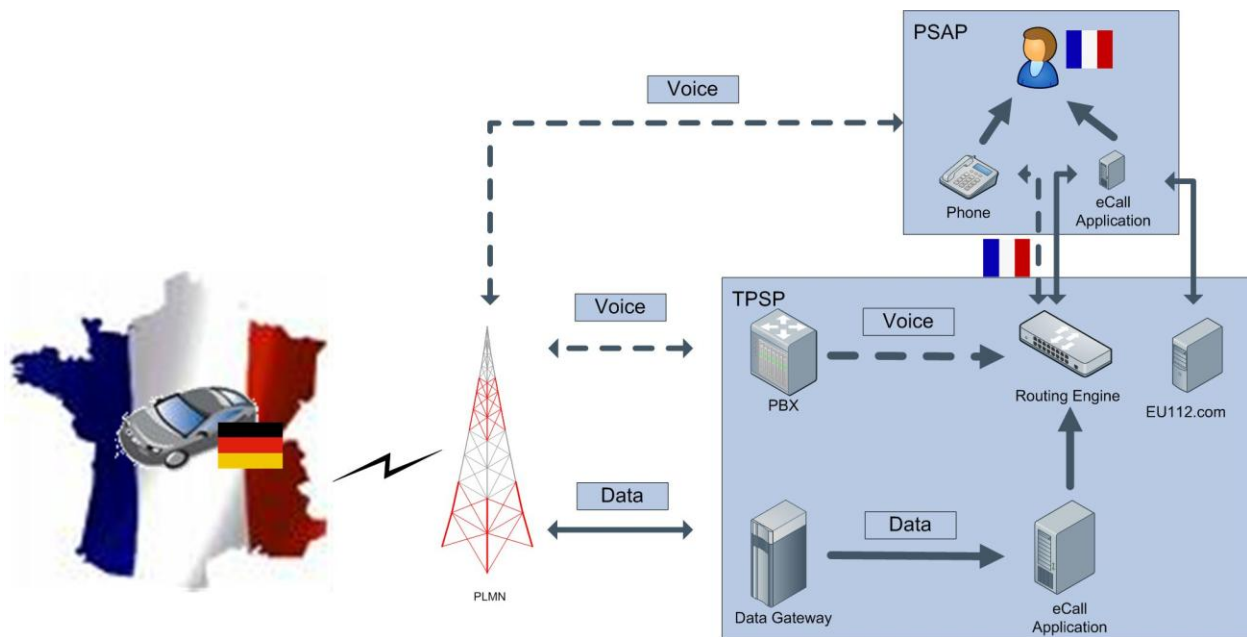


Diagram: Schematic outline showing delivery of self-dispatching eCall

Benefits of the self-dispatching eCall approach

- Technical Flexibility and Cost.** The major hallmarks of the self-dispatching approach are that it can accommodate either an in-band or SMS technical solution and it doesn’t require any system upgrades at the PSAP level, hurdling two of the most obstinate issues that have delayed

deployment. Perhaps an even more critical factor is its low cost to implement, particularly when viewed in terms of its technical functionality over the lifetime of the vehicle. Its reliance on data communications significantly reduces the two principal costs encountered in agreements with third party service providers – the cost of staffing a 24x7x365 call center and wireless communications costs.

- **Uniform Interface between Vehicles.** The self-dispatching eCall approach also provides a uniform interface between the vehicle and the complex montage of local PSAP networks, infrastructures and protocols found across the EU patchwork. PSAP call re-routing, recalling or implementing a fallback functionality can be easily implemented by a TPSP. The TPSP can ensure that the voice and data portions of every eCall are transmitted to the same PSAP as well as continually maintaining and enhancing positioning algorithms and PSAP databases. By providing a flexible interface with local PSAPs, eCall deployment is not stymied by waiting on local funding of PSAP system upgrades or call taker training.
- **Advantages to Vehicle Manufacturers.** The self-dispatching approach offers a significant advantage to vehicle manufacturers because it provides a thin client approach – complexity is moved from the in-vehicle head unit to the TPSP servers, thereby ensuring that updated software or algorithms don't leave legacy vehicles with incompatible systems. The OEM also maintains greater control on the routing of call and data, which has been a difficult issue for some OEMs in the U.S. when they've attempted direct connections to PSAPs. Additionally, there is value in the OEM retaining eCall statistics.

Another lesson from a decade of deployed eCall programs is the value of having a TPSP continually enhance the Minimum Data Set. This has entailed either parsing or adding specific crash-related data for specific local PSAP response protocols, re-calibrating crash severity algorithms transmitted to PSAPs, and collecting additional data for automotive crash research or customer-provided data for use in emergencies.

This new approach also synchronizes with the emerging proliferation of applications in connected vehicles beyond safety. The resulting impact is that the growing number of applications that can generate return on investment for automobile manufacturers and simultaneously marginalizing the in-vehicle cost of eCall deployment, hopefully to a point where eCall simply becomes an application that becomes a “free ride” on a suite of services, functions and applications that cover the manufacturers' equipment costs. This is extremely critical given the current economic pressures facing vehicle manufacturers in today's competitive, global market.

- **Leverages Recent Advances in IVR Technology.** The self-dispatching approach also incorporates the dramatic advances in interactive and automated voice response technologies that were unproven when the European eCall process began nearly a decade ago. Text-to-speech conversion is now well developed and market proven, providing a viable solution to cross-border language issues and less need to rely on continually upgrading in-vehicle hardware and data storage or having to invest in the overhead of a TSP with native-language call takers based in each EU Member State.

Likewise, the emergence of personal Web sites associated with ownership of a “connected” vehicle offers greater potential for third party centers to append customer-provided emergency data that is of interest beyond the PSAP with emergency medical personnel.

- **Compatibility for the Future.** Most of all, relying on a self-dispatching eCall assures flexibility for the future. Today, the European Commission seeks an eCall with a minimum data set, of which immediate notification and location is the most critical. Tomorrow, it is very likely emergency responders will want more. As second-generation eCall emerges across the U.S., PSAPs are beginning to ask for data first and more of it – more personal and positioning data on vehicle occupants, video downloads from the vehicle, and more data on circumstances prior to impact.

And tomorrow, drivers will want more – from safety advisories (advancing weather, roadway conditions, accident prone stretches of highway) to total vehicle accident assistance beyond notification to emergency responders.

Conclusion

Self-dispatching eCall simply gets the eCall ball rolling, saving lives without having to first resolve long-term issues regarding standards, technical interfaces, or deployment costs. Under this approach, deployment can proceed without concern over future compatibility with standards or level of technology in vehicle or PSAP.