

# **Positioning Emergency Callers in Switzerland**

**Regulatory Requirements & System Description for voice emergency calls  
and eCall Situation**

**The Expert Meeting on eCall  
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Dr. Leo Lehmann  
Federal Office of Communication OFCOM  
Biel-Bienne/Switzerland

## Emergency Number/ Organisation (CH):

### International Emergency Number

- ▶ **112** European Emergency Number \*; 112-call routed to police; no 112 call without SIM

### National Emergency Numbers

- ▶ **117** Police\*
- ▶ **118** Fire Brigade\*
- ▶ **143** Charitable services
- ▶ **144** Ambulance\*
- ▶ **147** Child Help



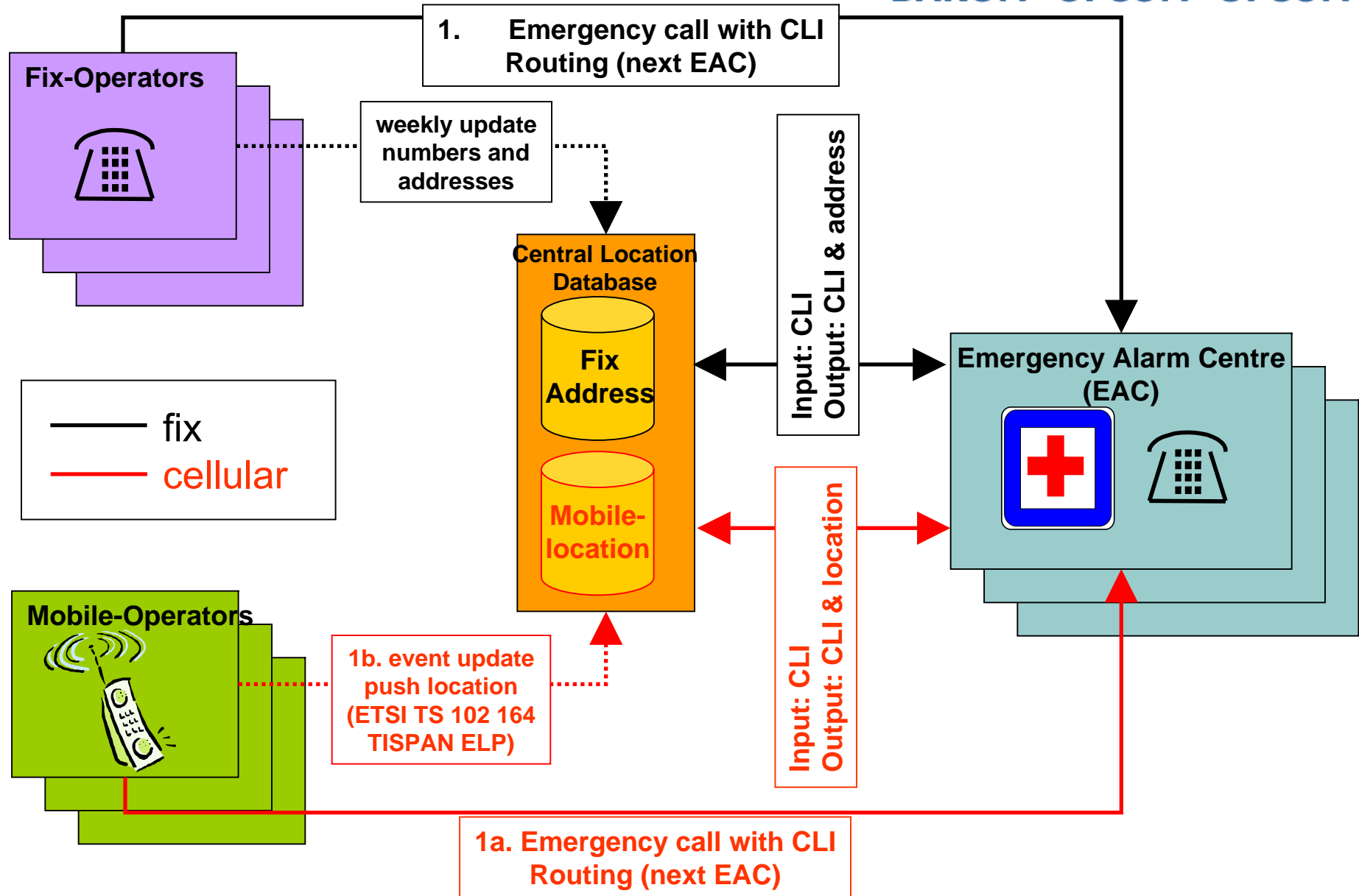
\* Positioning required with regard to fix and mobile networks (GSM/ UMTS) by Swiss law. OFCOM can determine additional numbers to be positioned (e.g. 1414 REGA)

- **Art. 20 LTC (Law on Telecomm.); Art. 19 para. 1 c DTS (Decree on Telecomm. Services); Art. 28 paras. 3 and 4 DTS**
  
- **SR 784.101.113 / 1.3 (Technical and Administrative Regulations on Routing and Identifying the Location of Emergency Calls )**  
**Revision 1 (1999) specifies the positioning of emergency calls in Swiss Fixnet**  
**Revision 7 (2005) includes also the positioning of emergency calls with regard to Swiss mobile (cellular) networks**
  
- **Art. 61 para. 4 DTS (Data Protection)**  
**The presentation of calling line identification has to be guaranteed for all calls where positioning is required according Art. 28 para. 3 DTS**



# System Overview Location Identification (Fix & Cellular)

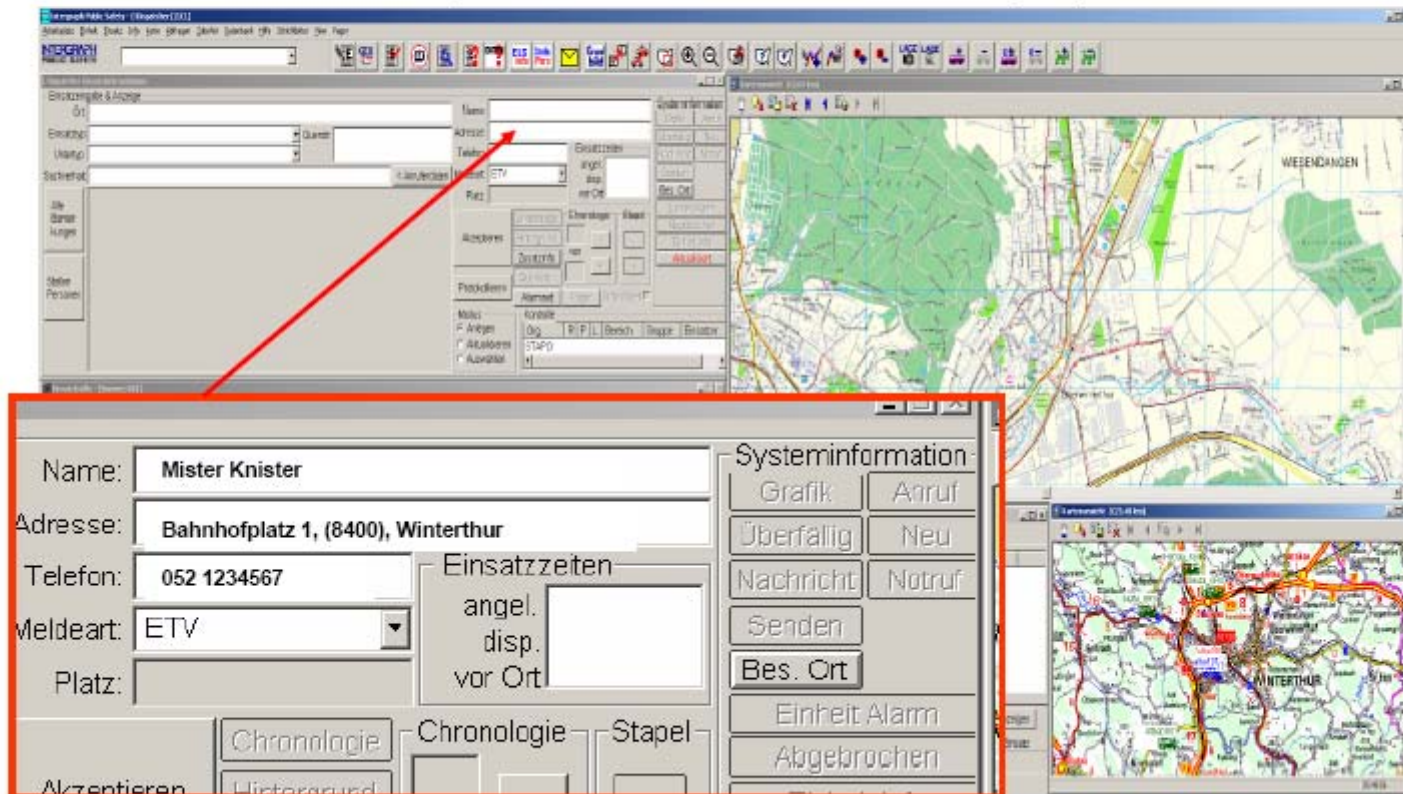
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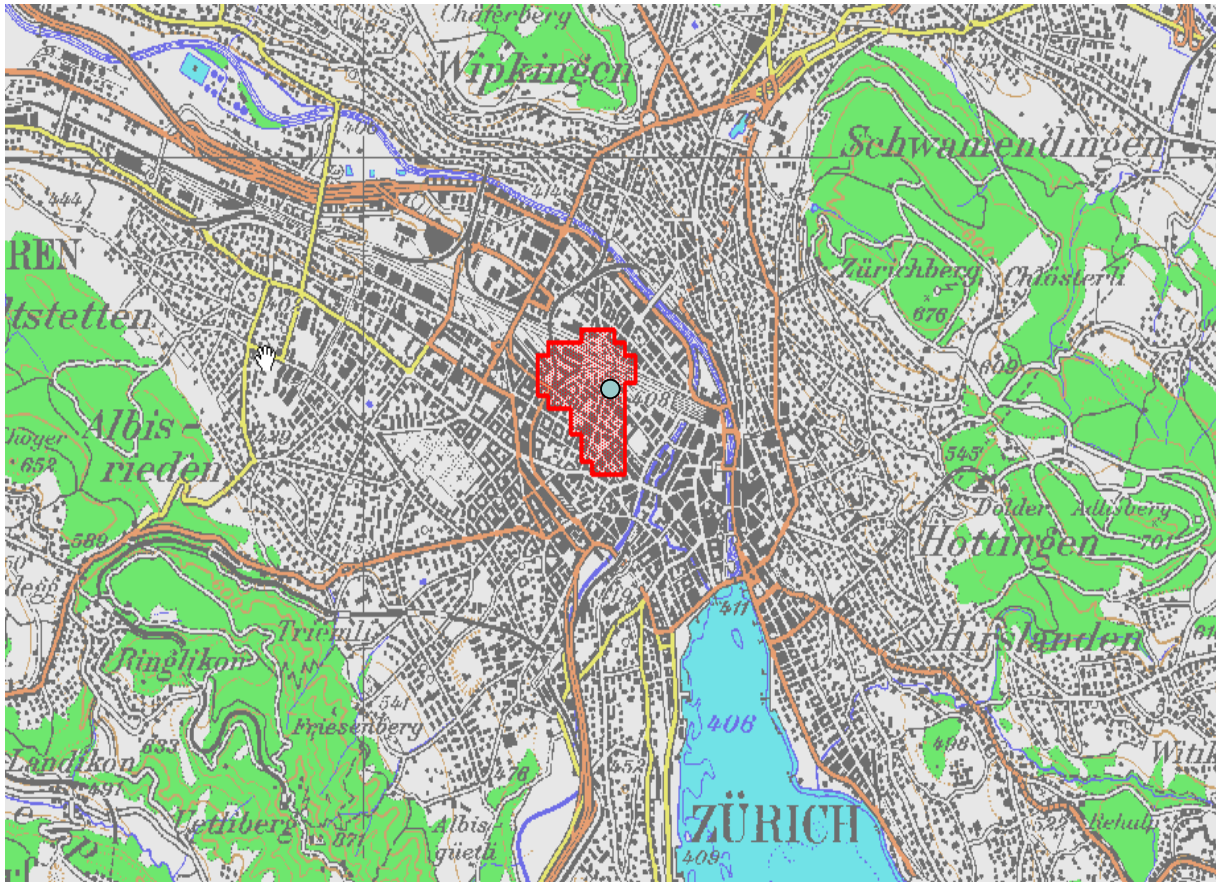
# Positioning Example - 1

## Emergency Call from Fixnet

User Interface: Automatically Presentation after 5 secs or manually request



### Emergency Call from Urban Areas/ Small Cells: Cell Id based Location Estimation:



#### General :

41% GSM Radio Cells in CH: Radius (sector)  $\leq 1\text{km}$

#### Observations:

- Small cell size improves search area: in (best) case of micro cells down to street
- Depending from cell size still blurring results (several streets, blocks)



## eCall: The Technical Principle



- Regulatory base does not include eCall according eSafety initiative; Only routing and identifying the Location of Voice Emergency Calls from fix and mobile phones are considered by SR 784.101.113 / 1.3.
- Any realisation of eCall using the European emergency number 112 needs the commitment of Swiss Police (number owner 112); in case of another Swiss Emergency Number the same applies for the appropriate number owner.
- For eCall systems using Swiss GSM/UMTS networks valid and registered SIM cards will be mandatory (no exemption with regard to 112)

- Usage of pre-paid SIM Cards without any call (=accident) is restricted to 12 month (Migros budget 3 month)
- In case of an eCall realisation Swiss operators are not exempt from the requirements to deliver location information for voice emergency calls according existing Swiss regulations (SR 784.101.113 / 1.3)
- Based on 3GPP TR22.967 Rev 0.0.2 (10/2005) OFCOM still identifies many gaps and open issues with regard to standardisation progress of eCall (e.g. affected interfaces of cellular network, channels, network load)



## 1. **Separate number for eCall, information relay to the appropriate emergency Organisation)**

- Service provider has to be registered; Pan-European harmonization of specific short number
- Pre-paid SIM Card problematic has to be solved
- eCall solutions must not generate traffic (location updates while roaming) until a emergency situation is detected
- Harmonization of MSD data definition with positioning data definition according SR 784.101.113 / 1.3 not mandatory

## 2. **eCall Realisation uses emergency number 112**

Beside 1. the following issues have to be considered additionally

- Solution has to be accepted by Swiss police and has to fulfil additional requirements from Swiss police side (e.g. no automatic trigger of eCall but only by push button)
- Solution must not generate any conflicts with emergency call positioning according SR 784.101.113 / 1.3 (interfaces, avoidance of redundancies, harmonization message formats, system response time)
- Solution has to be fully standardized by ETSI, 3GPP

- The existing solution on Identifying the location of emergency calls enables the Swiss alarm centres to identify the exact location of an emergency caller in case of the call is raised within the Swiss Fixnet. If the call is raised in a Swiss mobile network, the system supports the appropriate alarm centre by an estimation of the area where the caller is supposed to be.
- OFCOM monitors the development with regard to commercial availability of 3GPP/ ETSI standardised positioning methods with higher positioning accuracy and will adopt the regulations at the appropriate time
- OFCOM will follow up the progress of eCall activities. The scale of regulatory involvement depends from the chosen realisation scenario. A scenario, which does not use any of the existing Swiss emergency numbers seems to be favourable.

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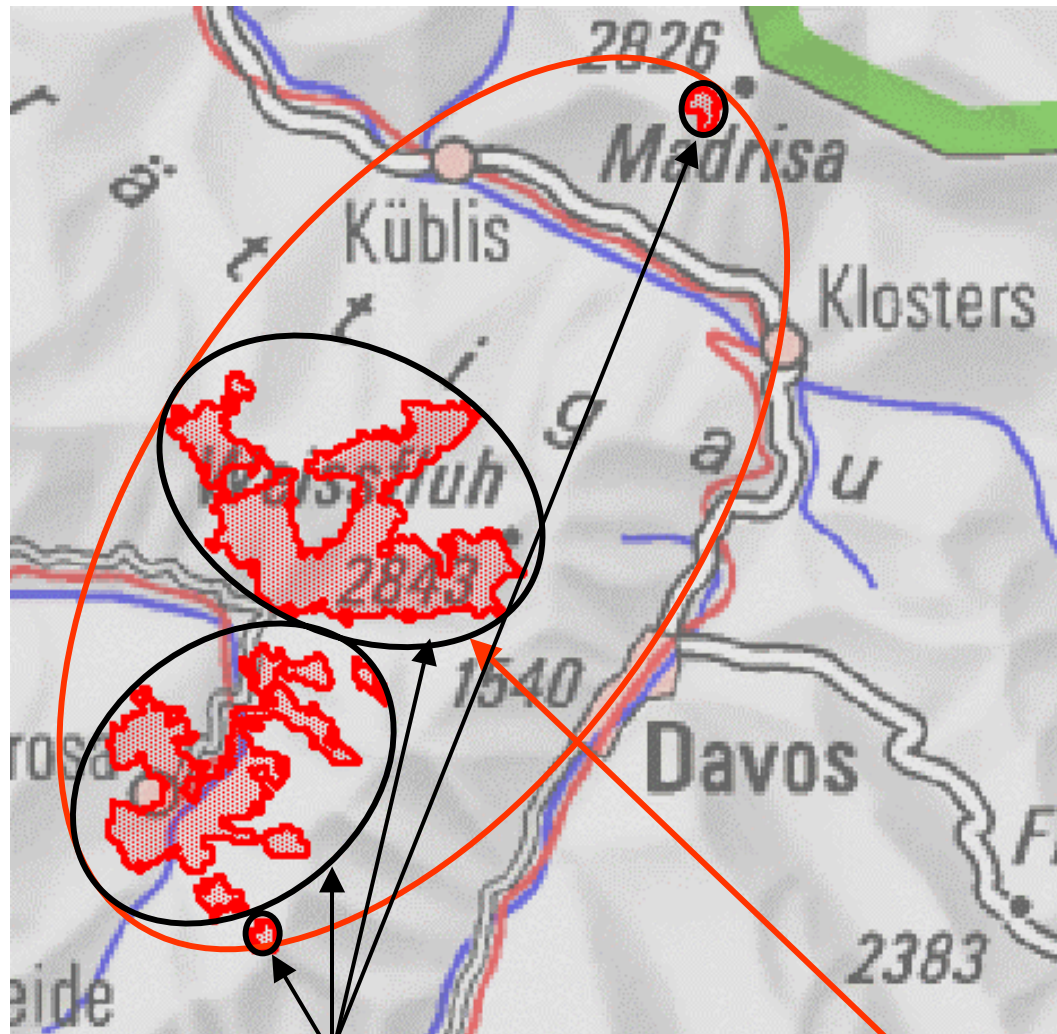
back up

- Following „**Best Effort**“ Recommendation of European Commission
  - No mandated standards for location precision
  - Location Estimation, delivered by the cellular network is only based on Cell Id method in a first phase
- The architecture shall support the implementation of positioning methods with **higher accuracy like A-GPS in a later phase**
- The interface between Cellular Networks and Central Location Database shall use a **standardized protocol (ETSI TS 102 164 (TISPA Emergency Location Protocol))**

**Development of System Solution in national working groups with Swiss Regulator, Swiss Alarm Organisations as well as Swiss Mobile Operators and Swiss Universal Service Licensee (Swisscom Fixnet)**

### Emergency Call from Rural Areas: Cell Id based Location Estimation:

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Covered Spots from  
Operator DB

Envelope

#### General :

56% GSM Radio Cells in CH:  
Radius (sector)  $\leq 10\text{km}$

Location estimation in large radio cells (rural area) difficult with one Elliptical Arc (un-contiguous coverage due to shadowing, deflection)

Possibly much smaller search area Information can be improved if more than one Elliptical Arc or Polygon can be delivered by an Emergency Location Report