The role of Numbers in PSAP operations and the impact of introducing eCall

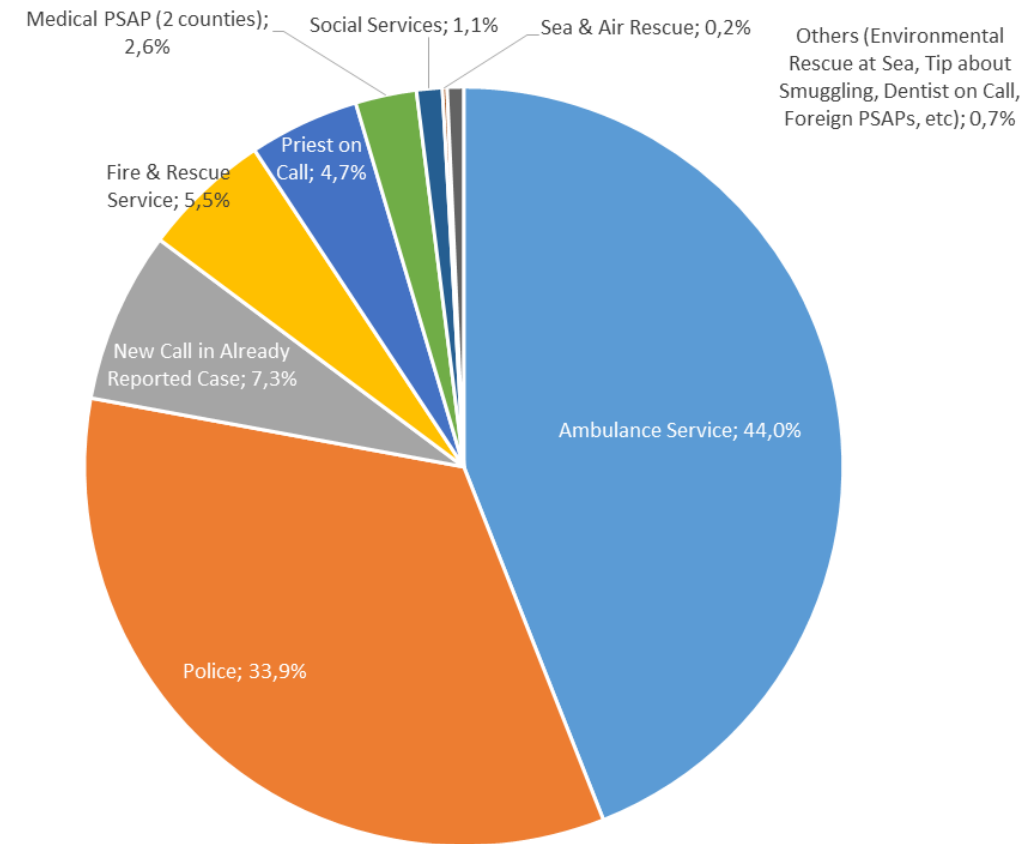BJÖRN SKOGLUND, SOS ALARM, SWEDEN

SOS ALARM

- Formed by the swedish state, county councils and municipalities in 1972 (publicly owned)
- Manages the emergency number 112 by agreement with the Swedish state
- Dispatching of Fire Rescue Services by agreement with municipalities (in most of Sweden)
- Dispatching of Ambulance Services by agreement with the county councils (in most of Sweden)
- Thirteen 112-centers (PSAPs)

- Luleå
- Östersund
- Sundsvall
- Falun

- Stockholm
- Norrköping
- Örebro
- Karlstad

- Jönköping
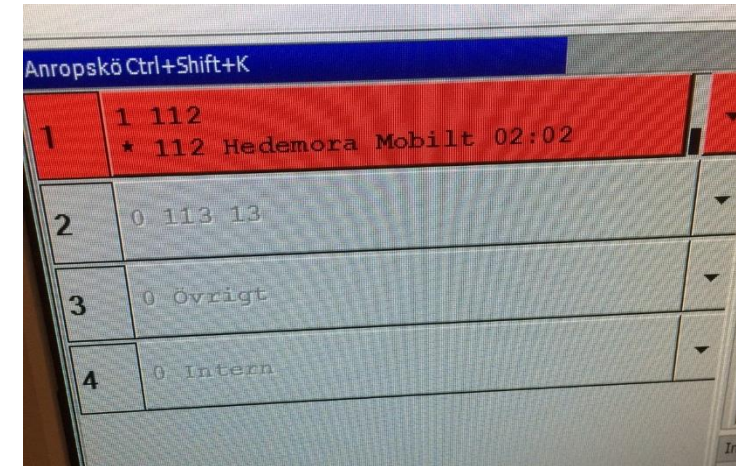- Växjö
- Göteborg
- Halmstad
- Malmö

112 IN SWEDEN

- Single emergency number since 1996
- Replaced earlier single emergency number, introduced 1956
- SOS Alarms PSAPs answers about 3 million 112-calls a year
- Whereof some kind of action taken by PSAP in appx 2,1 million calls
- Road traffic incidents 2016: ~31 000
- Whereof fire rescue service dispatched: ~22 000

112-calls with action taken by PSAP, 2016

- Medical PSAP (2 counties); 2,6%
- Social Services; 1,1%
- Sea & Air Rescue; 0,2%
- Others (Environmental Rescue at Sea, Tip about Smuggling, Dentist on Call, Foreign PSAPs, etc); 0,7%
- Priest on Call; 4,7%
- Fire & Rescue Service; 5,5%
- New Call in Already Reported Case; 7,3%
- Ambulance Service; 44,0%
- Police; 33,9%

ROUTING OF CALLS BASED ON MUNICIPALITY IDENTIFICATION CODES

- 290 municipalities in Sweden, each has two Municipality Identification Codes
- One for 112-calls by fixed landlines, one for mobile telephony
- Also codes by county for IP-telephony, one national for satellite telephony and codes for (internal) testing
- Now implementing two more municipality codes for eCall
- Municipality code routes call to geographically appropriate PSAP
- MNO´s has implemented eCall flag
- SOS Alarm not tested this yet due to lack of eCall equipment

HOW IT WORKS....
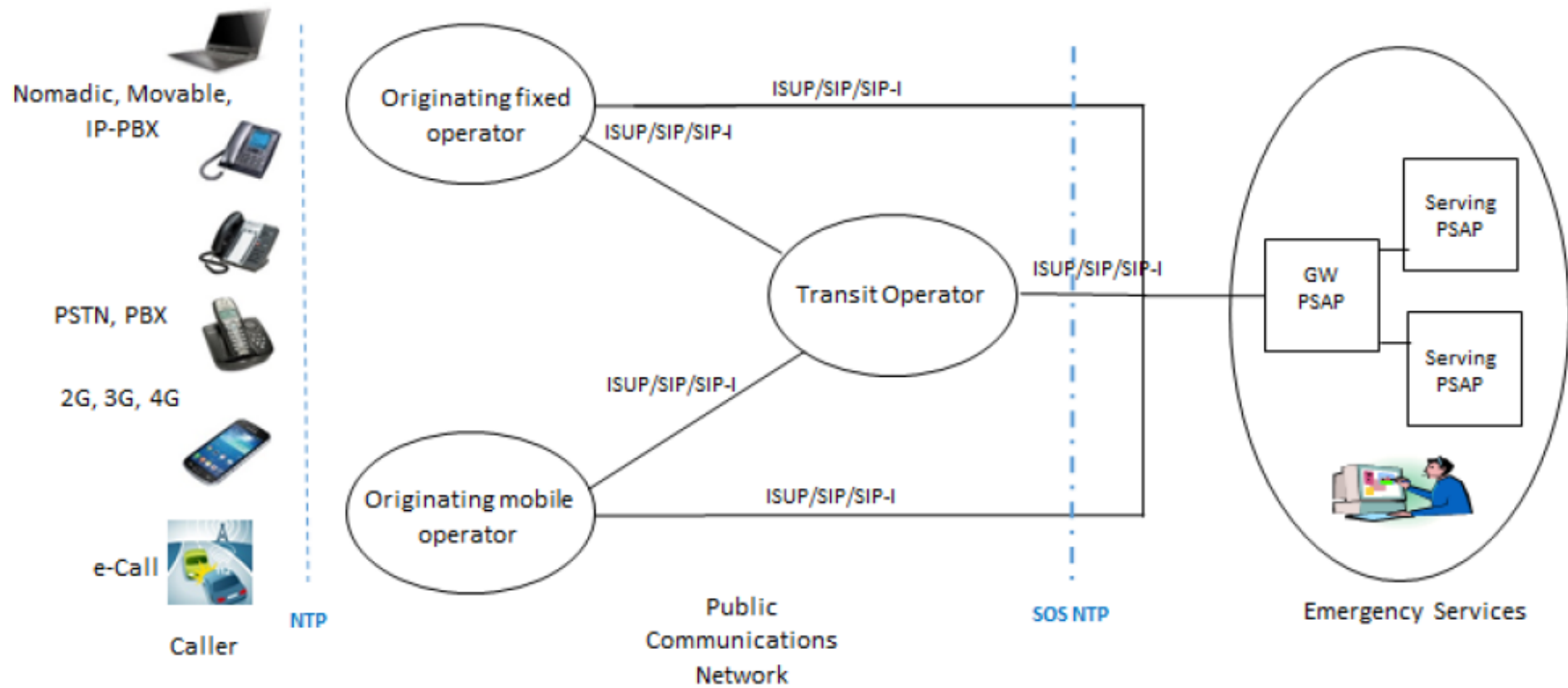
ECALL, MUNICIPALITY IDENTIFICATIONS CODES

| Subfield name	Subfield value
Nature of address indicator	1 (National (significant) number)
Address signals	123 112 XYZ Note 1, 2, 3

Table 2: Subfields NoA and Address signals

| Note 1 -	123	routing number for short codes 11X and 90X
Note 2 -	112	short code for emergency number
Note 3 -	XYZ	origin of call according to this document

CALLER LOCATION

Today cell-id, tomorrow GPS… there´s a BIG difference!
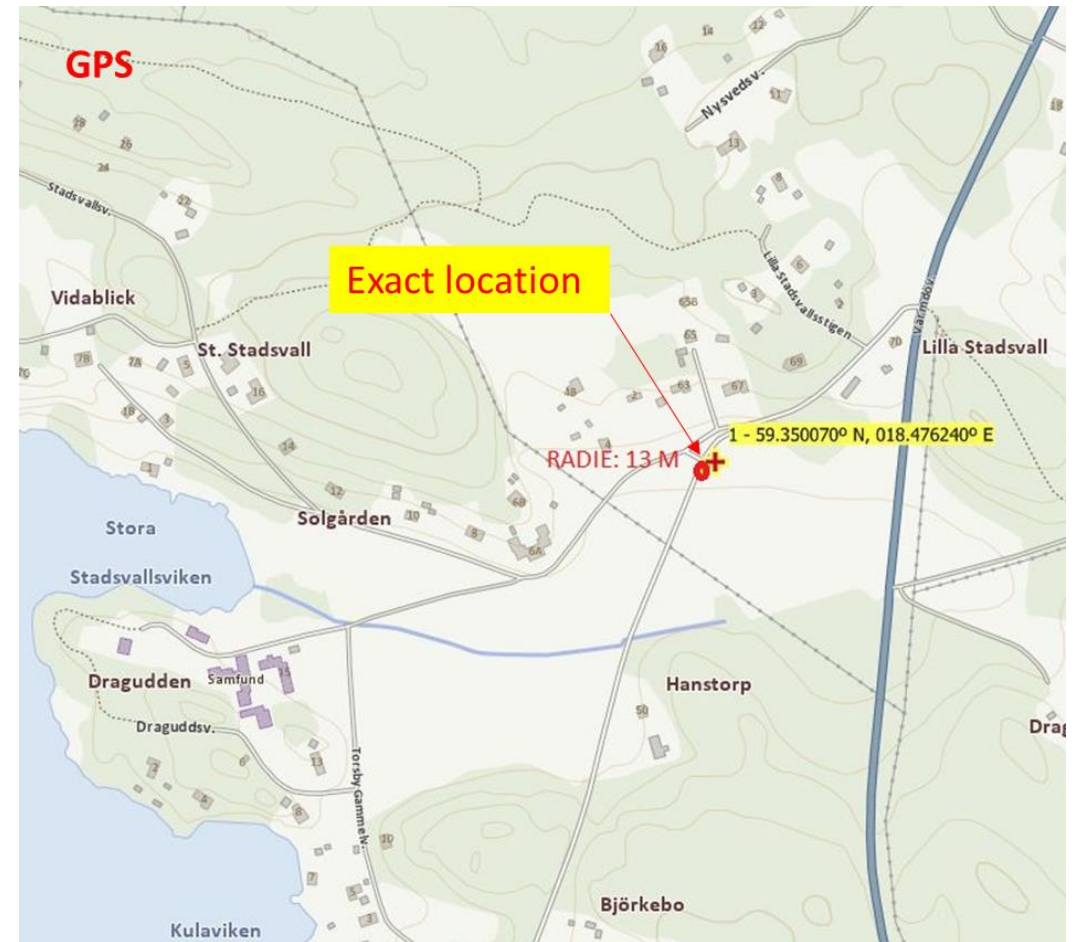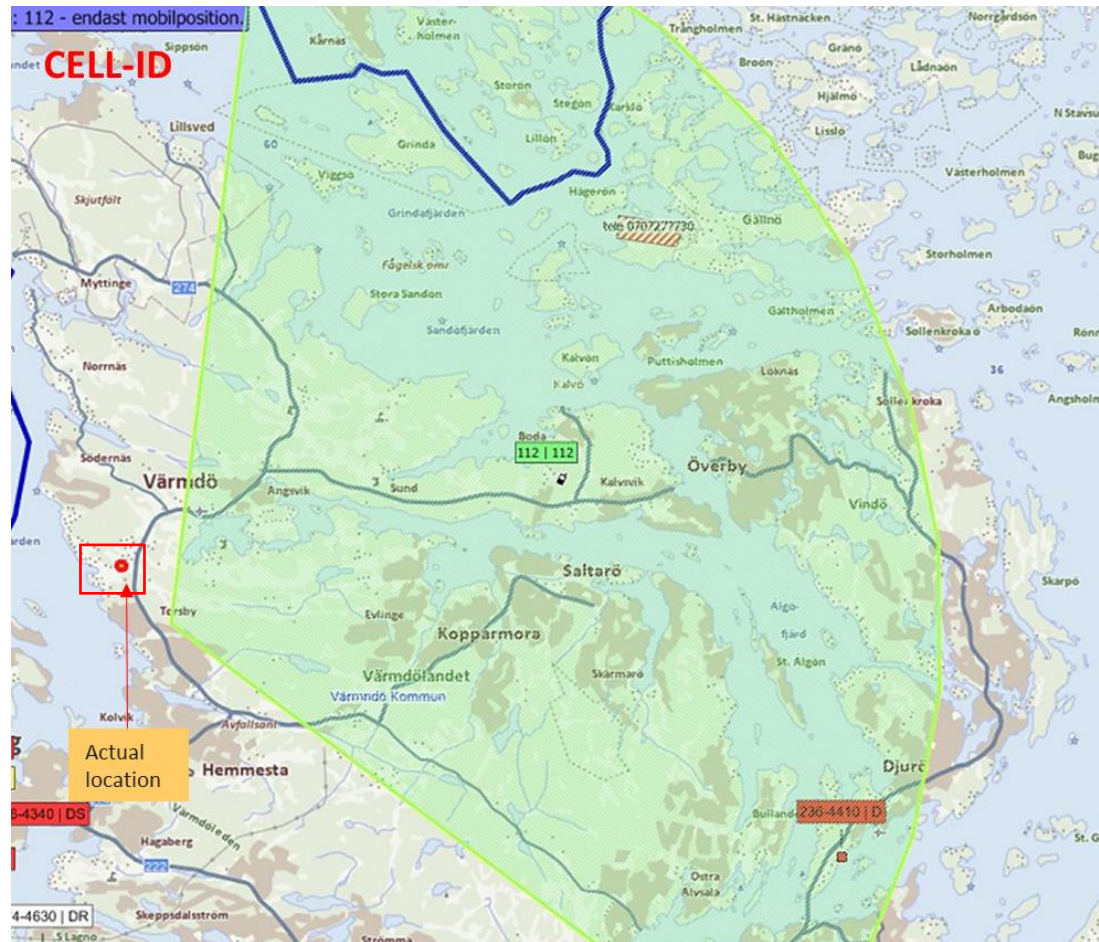
CALLER LOCATION BY GPS

- Currently Mobile Network Operator´s delivers cell-id

- Other technical solutions delivers GPS or WIFI

- Upcoming: eCall

- Implemented in several EU countries : AML (Advanced Mobile Location) / AEL (Android Emergency Location); handset or operational system delivering location

- Used in many countries: solution where PSAP sends an SMS including an web link where the user accepts the PSAP to locate, which in turn sends the location to PSAP

- Future (now!): the MNO´s should deliver GPS location to PSAPs
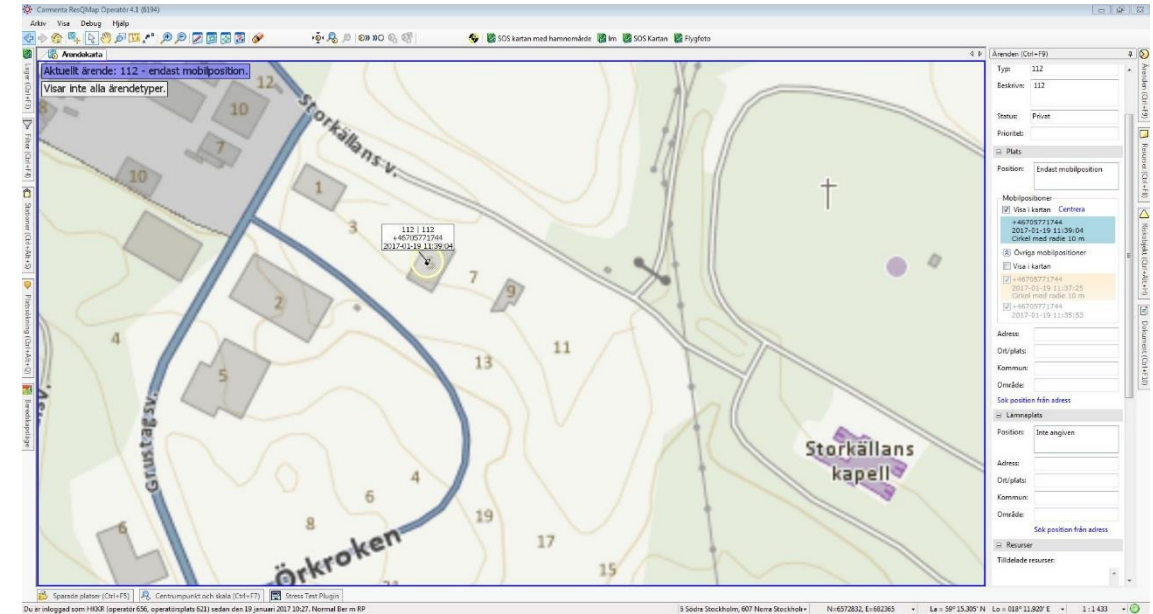
CALLER ID

- Not unusual with dropped calls to 112
- If the call drops in an early stage, vital information could be missed
- In worst case this could result in:
  - wrong kind of resources alerted,
  - no resources or not enough resources sent
  - the location is unknown
  - the location is not verified
- PSAP must therefore be able to call back to the car (the device)
- Caller line identification, a valid telephone number, should always be presented (as I suppose the owner of the car does not know it)
- The number must be possible to call

TESTING ECALL

- Is testing necessary? Yes, probably in the same way as other systems in the car are tested

- Who will be responsible?

- How will testing be done?

- Important: this must mean **NO** involvement from PSAPs!

In-Vehicle System

Antenna System
- GNSS
- Cellular

Telematics User Interface
- SOS (eCall) Button
- On Call (bCall) button

Infotainment System
- HMI
- Settings
- Audio

Airbag Control Unit
- Crash detection
- Crash recording
- Threshold design is optimized

Telematics Control Unit
- NAD
- GNSS
- Backup Power
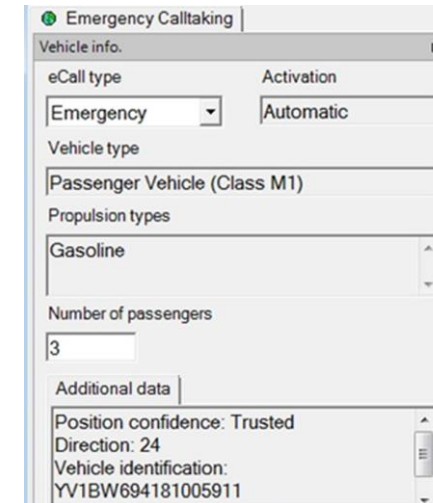- Backup Audio
- Applications

TPS ECALL, LONG NUMBERS

- Third Party Service not regulated in pan-European eCall
- SOS Alarm has agreements with 4 Third Party Service Providers (TPSP)
- Advantage: Filtering non-emergency calls
- Disadvantage: non-effective way fpr real emergencies – a detour to PSAP
- Ford Sync - alternative solution
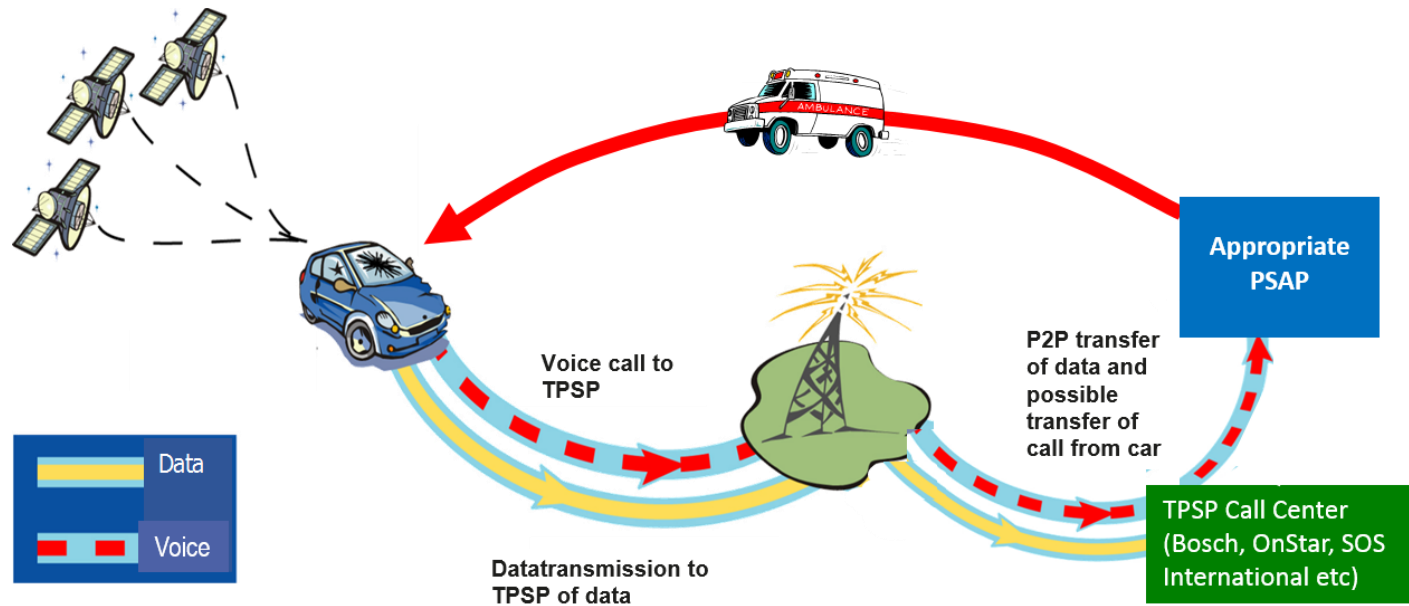
PSAP CHALLENGES...

- Be ready in time for PSAP eCallstart 1 Oct
- Handle additional data to emergency call - new feature!
- Cooperation with Police, Fire Rescue Services and Ambulance Services
- How to handle silent manual/automatic calls?
- How to transfer data in cross border calls? Possible or not?
- eCall means increased number of calls to 112...

OTHER CHALLENGES (not related specifically to eCall)

- Transfer emergency call to PSAPs in other countries (TN Database)
- Location of IP based telephony
- Developing EU standards for Next Generation 112
- Handle additional data or alternate ways of "calling"/reaching 112
- Keep up with technology development, with new features in telecom industry, and the constantly raising demands and expectations from the general public

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