

## Exchange of best practices Designing a PSAP

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When designing the layout and organisation of a Public Safety Answering Point (PSAP), there are many aspects to consider. Decision-makers should consider the working conditions of emergency call-takers, communication of information, integration and running of technology, and other important practicalities. In this document, we look at recommendations from PSAPs in different countries about ceiling height, use of video walls, general PSAP set-up and other lessons learned during implementation.

### Ceiling height & use of a video wall

Countries demonstrated different opinions on ceiling height (whether it should be normal height or double floor height). Some PSAPs, such as that in Lower Austria, showed a preference for a normal ceiling height. This was also the case in Slovenia, where PSAPs are smaller centres with a maximum of three operators, therefore having a normal ceiling height.

One reason that some PSAPs choose to have a higher ceiling is to install a video wall. Romania highlighted the importance of a video wall to display information to all call-takers.

In contrast, other countries, such as Sweden, Lower Austria, and Lithuania, prefer to have all the necessary information available at the call-takers' workstations. The UK noted that a good video wall is often used, but the information is also sometimes used on a screen next to the advisor.

Even if a video wall is not installed, many countries emphasised that a higher ceiling can help improve ventilation, temperature control, lighting, acoustics, and with making the space more visually 'open'. The height of the ceiling is therefore often considered a tool to improve the working conditions of call centre staff.

#### Finland

To show information to many people, it is good to have a high ceiling. The role of the Finnish control room is to handle calls, dispatch, and support, not lead operations in the field. Therefore, the need for video walls etc. may be different in centres that have a different role. In Finland, there is a preference for having the necessary information available at the workstation. Information on video walls is normally linked to a specific incident/general information for shift supervisors.

#### Germany (Hamburg)

For operational premises, a higher ceiling is considered fundamentally important, mainly for cooling and acoustics.

#### Iceland

The control room needs to be designed for the well-being of the staff: good ceiling clearance, sound, temperature control, and lighting should be key elements.

#### Italy (Genoa)

Preference for a high ceiling, not only for the implementation of a video wall, but also for air circulation and visual space.

#### Lithuania

High ceilings are implemented primarily for air circulation and ventilation, better acoustics, and to make the space more open so that people do not feel visually constricted by a low ceiling. A large video wall is not installed, since call-takers should concentrate on their screens rather than on the space around them. Individual screens have been installed to display information on changes, news, statistics etc.

#### Romania (Bucharest)

A high ceiling and a big video wall are necessary to display important information for call-takers, dispatchers, and the coordination team. This includes dashboards, resource statistics, maps showing ongoing cases and resource positions, and call lists (e.g. abandoned calls).

#### Sweden

Preference for normal ceiling height. Currently, 5 PSAPs are being built/renovated. All will have a normal ceiling height, whereas previously two had a double floor height. Large video walls are no longer used, with a preference for gathering information on the screens at the workstations. The current main reason for a high ceiling is for ventilation.

#### United Kingdom

Preference for high ceiling for improved acoustics, providing more space, and minimising echo. A good video wall is often used but sometimes the information is on a screen next to the advisor.

**Finland**

When designing the PSAP, attention should be given to General Data Protection Regulation (GDPR) issues, as well as Next Generation 112 (NG112) service requirements.

In Finland, they established a separate command and control centre in 2017 to fulfil purposes such as international contacts, operational communication (including social media) and public warning (also in the 112 app), coordination of the PSAP network, and situations regarding the systems, etc.

**Germany (Hamburg)**

As a new headquarters of a PSAP is a building of critical infrastructure, various points are fundamentally important to the technical equipment. These include self-sufficient power supply, cooling, air conditioning, oxygen supply, heating, and a safety concept, among others.

**Iceland**

Flexibility is key in future-proofing your design. One idea is to have the technical room located directly beneath the floor of the control room, with regularly spaced access holes.

It is important to listen to your users. Small things matter a lot – lighting, sound, ergonomics, temperature, and ventilation. It is also good to have extra space for future purposes and flexibility to change the layout.

**Italy (Genoa)**

It is important to consider the need to adapt in times of large-scale emergency. Usually, the Genoa Fire Brigade has four operators, each receiving a call and sending resources (vertical structure). In case of large-scale emergency, this is changed to a horizontal structure, with some staff acting as call-takers and others as call dispatchers. In addition, an additional operator is added for backed-up calls.

**Lithuania**

The new building in Vilnius was finalised in 2012 and it consists of 2 parts: 6<sup>th</sup> Vilnius City Fire Brigade and 112, which hosts units and the 112 call centre (PSAP) for the eastern part of Lithuania (out of 2 PSAPs in total). You can see [architectural sketches](#) and walk through the 112 centre [virtually](#).

It is important to use good materials, plan the operators' room for a larger number of call-takers/dispatchers than your current needs, and ensure there is enough space between the call-takers' workstations.

**General set-up & lessons learned**

Most countries highlighted the importance of designing the PSAP to be 'people friendly' so that working conditions are as pleasant as possible for call centre staff. As noted above, considerations such as lighting, ventilation/air circulation, temperature control, visual space, physical space between workstations, ergonomics, and acoustics are particularly important. As noted by Romania, it is important to ensure that workspaces are placed in a way that will not allow light sources (or transparent, translucent, or brightly coloured walls) to reflect directly onto screens.

It was also highlighted that many of these points are also fundamentally important to the safe and reliable running of the technical equipment (as well as oxygen supply, safety conditions, etc.). Technological considerations were emphasised by several countries, such as Romania and Germany (Hamburg), which mentioned self-sufficient power supplies and redundancy of equipment, both of which should be considered in the design of the PSAP.

As highlighted by Finland, data protection and Next Generation 112 service requirements should be paid particular attention. For example, what data should be shown on the different screens? How should the space be designed so that personal data is accessed only by those who need to access it? NG112 considerations are particularly important with regards to future-proofing the PSAP. This may involve, for instance, considerations about different types of data coming into the PSAP (video-conversation between PSAPs and units, live video from drones etc.)

Several countries, including Iceland, highlight the need for flexibility, which is key to 'future-proofing' the design. This may involve changing the layout if needed.

The need for flexibility has become clear during the current COVID-19 pandemic. Italy (Genoa) mentioned the need to adapt call-handling procedures in times of large-scale emergency, with the possibility of changing roles or adding members of staff. It was also highlighted by Lithuania that the operators' room should be planned for a larger number of staff than currently needed. Romania suggested that future PSAPs should learn from the pandemic by creating spaces where physical distancing can easily take place.

In terms of the location of different rooms, several countries gave important recommendations. Iceland suggests that the technical room be located directly beneath the floor of the control room, with regularly spaced access holes. The UK notes the importance of call-takers being able to make eye contact with each other, so that they can non-verbally ask for help if needed.

In addition, the UK suggests that the PSAP manager's office is located so that the manager regularly crosses to PSAP, allowing call-takers to informally intercept the manager if needed.

Some countries have specific configurations with regards to the PSAP layout. Romania highlighted that if several agencies share a PSAP, it is important that each agency has a designated area, but that communication between coordinators is still easy. Finland established a separate command and control centre to fulfil specific purposes (e.g. public warning, international contacts, operational communications, etc.).

### **Romania (Bucharest)**

If several agencies share a PSAP, each agency should have its own designated area. The positions of the coordinators should be central, so that the coordinators from each agency can get in touch easily.

To obtain the optimum number of call-takers per shift, you should analyse the medium value for the maximum number of calls per minute recorded in the last years during rush hours and then also consider the medium time for processing the calls and other parameters such as post-processing times, as well as absences, work schedule, and breaks etc.

Redundancy of equipment should also be considered – power supply, servers, workstations, communication equipment.

Windows, ventilation, and lighting are important, as well as the materials used in building the desks. Workspaces should be set up in a way that will not allow light sources, transparent/ translucent/brightly coloured walls to reflect directly onto the screens. The work surface must be matte, to avoid reflections. If the control room is an open space, you should take soundproofing into account.

Considering what we have learned from the COVID-19 pandemic, a new PSAP should ensure a safe distance between workstations and, if possible, create safe, closed areas while keeping visibility among personnel (e.g. using glass walls).

### **Slovenia**

When designing the PSAP, spaces should be designed to be as 'person friendly' as possible.

### **United Kingdom**

As much as possible, advisors should be able to have eye contact with each other when handling calls. This enables them to non-verbally ask for help if there is a problem. 10 square metres a person is an absolute minimum in terms of space: much more should be provided.

It is important that the PSAP manager's office is right next to the centre and that the manager needs to cross the PSAP to get to their office. This means that they see and are seen all the time and it enables advisors to intercept the manager informally if they need to talk about something. In addition, if a crisis occurs, the manager is right there and not at the other end of the building.

Meeting rooms should be off the PSAP floor, not off a separate corridor.

## Conclusions & recommendations

- Design the PSAP with people's working conditions in mind.
- Listen to users: small changes can make an important difference.
- High ceilings can help to improve ventilation, temperate control, visual space, and acoustics.
- While some PSAPs use a large video wall, others prefer to have all necessary information displayed on individual screens at workstations.
- Designs need to be 'future-proof' by taking into consideration technological requirements such as Next Generation 112, as well as the need to be flexible in times of large-scale emergency.
- Supervisors/management should be in regular contact with other call centre staff so that they can easily be approached for assistance.
- To ensure consistent and safe running of technological systems, redundancy of equipment and self-sufficient power supplies should be considered.