

2017 Management Report

Barcelona Fire Brigade



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1. Department

1.1. Mapping

1.2. Simulations

1.1. Mapping

SPEIS' mapping service carried out several projects in 2017 to improve access to graphic information and updating data, so they can be refreshed in real time and are adapted to the new medium (tablets). These tablets are designed to enable specific routing for emergency vehicles, as well as dynamic searches for map information in real time that are linked to the various information repositories (data sheets, detail maps, etc.)

SPEIS' mapping service has taken part in various projects, namely:

- Maintaining, monitoring and updating the emergency routing system so that includes public works, changes in direction and the various events or sports activities that affect the roads.
- Producing and maintaining operational Collserola mapping, SOCC (Collserola Orienteering Mapping System).
- Producing and maintaining operational files for the Port of Barcelona.
- Maintaining the Fire Brigade's Map Library, a platform for displaying all the Barcelona Fire Brigade's web mapping apps.
- Maintaining and improving the Car-toCGE app for rapid spatial information consultations, as well as analysis and geo-processing, such as rapid detection of vulnerable elements in specific fields of action.

- Maintaining the app for reviewing fire hydrants in the city, the Collserola mountain range and the port. This app is used for improving data collection on their state and operating capacity that help to send reports of incidents quickly and contribute to maintaining a network of fire hydrants in good condition.
- Administering the ArcGis Online/Server platform, which enables the creation of 2D and 3D web maps and apps adapted to the specific needs of each campaign, as well as share these maps on different levels of privileges depending on who they are for: in private mode (SPEIS staff) or open mode (general public).
- Administering the Collector and Survey123 apps, which enable the collection of alphanumeric points and data with a spatial component, which help to improve maps and apps.
- Drawing up simulation forest-fire maps geared to prevention on the south-east slope of the Collserola range, which are useful when it comes to designing strategies and tactics for combating forest fires in a more efficient way.
- Maintaining the geo-services that the Barcelona Fire Brigade uses in several apps.
- Creating and maintaining offline maps that are stored in the tablets and used as support in areas with a poor internet connection, mainly on Collserola.

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1.2. Simulations

Following the resumption of the La Sagrera station project, SPEIS has been working with Barcelona Sagrera Alta Velocitat, a company comprising rail infrastructure operators Adif and Barcelona City Council, among others, by providing criteria for improving computer simulations of evacuations and fires in the station, which help to define the basic project. In addition, simulations have been carried out on their initiative to study alternatives that would improve station safety in the event of an emergency. This project also led to the start of a collaboration process between SPEIS and the Consortium of Catalan University Services' supercomputing centre, for the purposes of carrying out fire simulations in large infrastructures.

SPEIS has also worked with Sant Martí District Council in amending the Barcelona Olympic Port Use Plan. In particular, several computer simulations have been carried out to study how evacuation safety varies in the event of an emergency with a different port capacity and layout.

The end of the year saw the start of a collaboration process between SPEIS and the company responsible for computer simulations of evacuating the new Camp Nou as part of the plans to remodel the stadium. More specifically, SPEIS approved the technical criteria governing the simulations by guaranteeing the credibility of the results obtained and supervising their performance.

As regards training, in March the Universitat Politècnica de Catalunya and CLUSIC (Fire Safety Cluster) organised an evacuation computer-simulation course for companies and public authorities. SPEIS provided the classroom at the Espai Bombers (Fire Service museum and training centre) as well as teachers and students.

2. Prevention

2.1. Civil Protection

2.2. Fire prevention

2.1. Civil Protection

The incorporation of civil protection into the Barcelona Fire Brigade was a decisive factor in improving knowledge of the various risks the city faces and increasing the safety indicators for people in such a dynamic environment as Barcelona.

And the lines of work planned in 2016 consolidated the introduction of a specific, adapted civil protection system into an emergency organisation such as the Barcelona Fire Brigade. The day-to-day work of the Civil Protection Unit includes drafting mandatory approval reports for the self-protection plans that are the responsibility of Barcelona City Council and updating the CP approach to facilitate its integration into a single document.

Effective coordination between the Civil Protection and Prevention Division and the Operations Division in drills at companies where there are major risks requires the two divisions to work together and consolidate the professionalism of an integrated emergencies service, which interprets safety as the sum of the approach to civil protection, fire prevention and intervention.

Finally, it is expected that a Single Civil Protection Document will be ready in 2018. Based on conversations with the Catalan Government Directorate-General for Civil Protection, its content structure will be different from the one set out under Decree 155/2014, in order to improving operating capacity when the city's emergency plans are activated. It will consist of a basic document and specific annexes for each type of risk that will include information designed to facilitate the work of the CGE, the emergency management centre.

Initiatives in the area of civil protection and self-defence plans (PAUs)

The following initiatives relating to regulation and prevention were carried out over the course of the year:

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Self-Protection Plans	276
- PAUs under City Council jurisdiction (report)	129
- PAUs under Catalan government jurisdiction (reports and submissions)	83
- PAUs under Catalan regional government jurisdiction (without submissions)	41
Reports on projects and events	23
CECORS	7
Fire drills attended	24
Municipal Civil Protection Commission meetings	1
Civil Protection Executive Commission meetings	3

2.2. Fire prevention

In 2017 the SPEIS Regulations Unit finally adopted the Common Report Template (MCI). This integrated system for drafting mandatory reports has speeded up report management and also, in the short term, consulting the background information on construction plans and activities that have to go through fire procedures.

The joint work of the Civil Protection Unit and the Regulations Unit in monitoring the city's big infrastructure projects should also be noted here. Interpreting aspects of fire prevention is complex and requires a lot of dedication in drawing up the plans. The end result, fruit of coordination with the Projects Department at the Area of Ecology and Environment, BIMSA, BAGURSA and with the districts involved, as well as the participation of various municipal departments, has been very positive and provided indicators that ensure the maintenance and improvement, in many cases, of the specific fire prevention parameters for these infrastructures.

For example, the Regulations Unit and the Civil Protection Unit have intervened in infrastructures such as the Plaça de les Glòries Catalanes tunnel, the big La Sagrera

high-speed and local-commuter railway station, the new Sant Andreu station and the plans for linking up the tramways on Av Diagonal.

As regards professional qualifications, the Civil Protection and Prevention Division is also extending the need to have a basic fire-prevention level to all the staff of both units. Regulations Unit staff need to have an advanced level.

Finally, carrying on from the work done in 2016, the comparison of listed-building renovation projects was consolidated as an additional factor in assessing people's safety by means of simulated structure behaviour in fire situations (CFD). The Castell dels Tres Dragons and Casa Vicens, on C/ Les Carolines, are examples of this approach. Computer simulations are a necessary element for assessing the fire-prevention conditions of infrastructure and other projects associated with big events.

Initiatives on regulations and prevention

The following initiatives relating to regulation and prevention were carried out over the course of the year:

Advice	2.581
- Visits arranged	803
- Telephone queries	1.778
Reports on work projects, activities and events	641
- Project planning reports	531
- Projects reported to the Environment Committee	39
- Reports on events: concerts, "fire runs", firework displays, fireworks, etc.	71
Prevention inspections	239
- Inspections of fireworks and bonfire projects	138
- Preliminary checks supervised by the Environment Committee	21
- Inspections at the request of the Operations Division, the municipal authorities (districts, managers, Irregular Settlements Plan, etc.) and the Catalan government	80
Advice on emergency plans	24
Fire drills attended	24

Number of people from different groups (schools, old people's homes, communities and local residents' associations, etc.) that took part in prevention dissemination initiatives

Fire Prevention Lecture Hall

The Barcelona Fire Brigade has always been an organisation at the service of the public which enjoys showing them its everyday work to ensure people's safety in risk situations. In that regard, the Vall d'Hebron and other fire stations are providing an ideal complement to the Prevention Lecture Hall for introducing facilities, the profession, vehicles and the equipment that are used.

The year saw the consolidation of the Prevention Lecture Hall as a benchmark space for teaching prevention and self-protection in fire situations.

The highest demand for fire-prevention training initiatives comes from schools, under the School Activities Programme (PAE), as well as elderly people and other public authorities and associations, who also request advice. The indicators for 2017 therefore show the following.

We should add to all that the station's preventive and operational concepts which were explained during 84 school visits (47 in 2016) and two open days. (Two open days were also held 2016).

Prevention and self-protection training sessions	170
Primary schools	107
Special needs schools	19
Adult and elderly people groups	13
Other institutions	15
Total number of training-initiative attendees	4.100



Espai Bombers

Espai Bombers started running in 2017, since when several initiatives and activities have been organised to raise the profile of the museum and training centre and encourage people to visit it. More specifically, 17,994 people visit this old fire station during the year, a good number given the fact that it was the first year of the project, following the centre's official opening on 11 November 2016.

Activity campaigns and one-off activities have been organised, with the emphasis on an educational programme, and two temporary exhibitions were held over the course of the year on different aspects of the Barcelona Fire Brigade.

One, entitled "Firefighters and the City: 2nd Barcelona Fire Brigade Photography Competition", featured the winning pictures from the second competition organised by the SPEIS Cultural and Sports Group. The other exhibition, entitled "Firefighting Ideas in Miniature. The Vehicles of Agustí Pech", featured appliances that have formed part of the Barcelona Fire Brigade's history through the eyes of Agustí Pech and his models.

July also saw the start of a cycle entitled "Evenings Round the Fire", a monthly series of talks/lectures designed to introduce various aspects of the firefighting service to the general public.

As regards one-off activities, the Espai took part in Museum Night and the 48h Open House Barcelona Architectural Experience, offering guided tours to enrich visitor experience. Both events helped to put the centre in the city's cultural diary.

They also had a high level of participation, in terms of numbers and in the activities themselves.

The educational activities were organised in two large groups: those planned for weekends and public holidays and those aimed at schools and planned for Wednesdays to Fridays during the centre's opening hours.

In all, 67 school groups came bringing 1,643 students. The numbers rose in July, owing to summer camp and club activities, and in October, November and December, coinciding with the start of the 2017-2018 school year.

These school students and groups were spread between the following activities: "A day with Barcelona's firefighters", aimed at primary school students (45 groups and 1,079 students); "Design your emergency plan", for secondary-school and post-compulsory education students (12 groups and 337 students); and "Action-reaction!", also for secondary-school and post-compulsory education students (10 groups and 227 students).

The weekend and public holiday activities attracted a total of 1,475 participants, of whom 685 attended guided tours and 790 the educational workshop entitled "Firefighters: who, what, how".



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3. Planning

- 3.1. Technical Support Unit
- 3.2. Procedures Unit
- 3.3. Training Area

The Planning Division is split into three units aimed at strengthening the service's internal organisation: the Technical Support Unit, the Procedures Unit and the Training Area.

The Technical Support Unit is involved in defining the technical conditions and monitoring the acquisition of material and intervention equipment such as vehicles, protective equipment, tools, etc. It evaluates their risks and plans their incorporation as part of a continuous improvement process in maintenance, and ensures they are used properly, safely, sustainably and responsibly.

The Procedures Unit drafts the protocols adapted to the city's risk scenarios, taking into account the incorporation of

new equipment and technologies and by coordinating deployment through training and acquisition of the necessary material.

The Training Area identifies and proposes training priorities, ensures knowledge is recycled and incorporates new training initiatives according to technological and organisational requirements or the need for incorporating new equipment, vehicles and materials.

The investment of the three units is structured according to the guidelines of the SPEIS Master Plan initially approved in 2014, and training initiatives have been planned in line with the Training Action Plan for 2016-2020.

3.1. Technical Support Unit

The forecasts for 2017 were met and the indicators maintained at appropriate levels. A large number of new projects were carried out while maintaining the standard of quality of the service's materials, vehicles and equipment.

Maintenance contracts

As regards the more important maintenance contracts, the following measures were carried out:

- Preventive and systemic checking of all the service's electric dewatering pumps.
- Implementation and monitoring of the contract for refilling and checking air cylinders.
- Contract for maintaining, checking and cleaning self-contained breathing apparatus (shoulder pads, accessories and masks). This contract was renewed for two years and the annual budget increased slightly, given this equipment is used more and more.
- Contract for maintaining, checking, cleaning and inspecting personal protection equipment (PPE) for fires (jacket and over-trousers) and station clothing.
- This contract was renewed for an extra two years and the budget increased slightly. More operations were carried out in 2017 and double pockets were sewn into all senior officers' jackets.
- Periodic checks on full-body harnesses and chemical protection suits.
- A public invitation to tender for the supply of hardware was issued to facilitate company access to the procurement process.
- Likewise, the invitation to tender for the supply of foam-forming liquid and for checking and refilling fire extinguishers.

Investment in vehicles

As regards vehicle investment projects (Chapter VI), the following are worth highlighting:

- Receipt of two breathing-apparatus tenders (Bat's) which will be located in each sector of the city and take the necessary material and equipment to interventions: air cylinders, self-contained breathing apparatus (SCBA) and accessories, ventilators, lighting, batteries, a tent, drinks etc.
- Coordination and monitoring of the construction of the two 20-metre automatic telescopic ladders awarded in 2016.
- Invitation to tender for the construction of an equipment vehicle for resolving pathologies.
- Tender for a diesel transport vehicle.
- Tender for two ambulances.
- Incorporation of fire-extinguishing equipment in two all-terrain vehicles for the Sant Andreu and Vall d'Hebron stations, which are surrounded by woodland.
- Acquisition of four Renault Zoe cars. These electric vehicles will carry out administrative tasks in the department's technical structure and replace the old cars.
- Acquisition of two command vehicles to replace the A01, which was written off following an accident, and serve the third command sector (A03).
- Acquisition of two vans. One with a loading platform for storage and the other a mixed six-seater/loading van.

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Vehicle investment in 2017

	Budget for 2017	Total Budget
Two breathing-apparatus tenders	199.650 €	399.300 €
Two 20-m telescopic ladder appliances	299.894 €	1.299.540 €
One pathology vehicle	71.289 €	201.289 €
One diesel transport vehicle	32.000 €	32.000 €
Two ambulances	46.273 €	253.727 €
Four electric cars	99.497 €	
Two sector-command vehicles	42.857 €	
Two transport trucks	41.349 €	

Investment in equipment and materials

As regards new equipment and PPEs:

- This has been a decisive year for pressing ahead with the project for new tablets, which will carry out the routing function in interventions and also be used as an in-vehicle computer to enable consultations to be made online or at premises.
- New rugged smartphones have also been acquired for all senior officers.

As regards other equipment, the following acquisitions stand out:

- Design and acquisition of a first-aid kit for each service vehicle.
- Camera for confined spaces and geophone.
- Four multi-use battery-powered Holmatro tools for equipping the light urban pump appliances (BULs) that did not have them.
- Replacing most of the carabiner hooks with automatic ones.
- Acquisition of helmet lights to achieve

the number required so everyone has two of them.

- Acquisition of ATEX transceivers for the BGIs. Incorporation of a new Atex PTT.
- Acquisition of a medical mannequin.
- Acquisition of a high-performance thermal camera. Thanks to this, every vehicle now has one that is no more than 5 years old.

As regards PPEs:

- One hundred and twenty pairs of intervention boots have been acquired. Following tests on 20 pairs, more will be carried out in 2018 to see whether they are suitable.
- Similarly, 280 pairs of fire gloves have been acquired to try and improve on the features of the current ones and clean them without problems.
- Acquisition of 10 shoulder pads from a new single line model to check how they function.

3.2. Procedures Unit

The Procedures Unit continued to draft new procedures while revising and amending the existing ones.

These revisions are enshrined in the operational needs of response staff, training needs that require the creation of new training materials that are compatible with the operational work systems, changes in materials and response vehicles and other technological innovations that require ongoing revision of work methods.

In line with previous years, the unit has three strategic goals when it comes to procedures:

- New procedures in multimedia flash format with summary files.
- Multimedia procedures approved in previous years with explanatory videos in the document base.
- Introducing manoeuvre formats into procedures for operational prevention practice carried out at fire stations.

ISO 9001 standard implementation project

An important new development in 2017 included work on the new ISO 9001 standard implementation project in the Procedures Unit, which involved defining work processes, quality standards and indicators, as well as strategic and improvement goals.

The project led to a series of management procedure changes and provided a similar methodology and document base for all procedures.

Quality control mechanisms are established within the project which include surveys of the whole workforce to evaluate the implementation of the various procedures (six months after each one comes into force) and to measure the level of Procedures Unit satisfaction (every two years).

Procedures approved in 2017

“Attempted suicide jump” PROCOP 2.04 (approved 25/05/17)

Procedure that establishes intervention and decision-making parameters for intervening in attempted suicide jumps. Training was planned for all staff in 2017, prior to the protocol coming into force.

“Initial action in chemical hazards” PROCOP 3.05 (came into force on 22/05/17)

Procedure used for staff training on chemical hazards. It came into force once the training had been done and the proposals which that gave rise to had been collected.



Training in procedures awaiting approval and entry into force

“Ventilation techniques” PROCOP 4.10

Once the Occupational Health Committee had given the green light, the procedure was used for training the whole workforce in 2017. It is expected to be approved and come into force in January 2018.

“Communications during interventions” PROCOP 4.11

Procedure that followed a very similar process to the above-mentioned PROCOP 4.10. In this case, the whole workforce has received training, senior officers have been given a second walkie-talkie and the number of channels and call signs redefined. It is also expected to be approved and come into force in January 2018.

New working groups

Several working groups were created for various procedures at the drafting stage following the circuit provided for under the ISO 9001 standard. These procedures are as follows:

- Biological hazard procedure
- Radiological hazard procedure
- Working procedure in collapsed structures
- Intervention procedure in railway tunnels
- Fire procedure in recreational ports

Situation with other procedures

Residential fires:

Procedure that integrates three different visions for responses: objectives, sectors and tasks. It includes an information leaflet for those affected and proposes

guidelines for the arrival of vehicles at the service location. The final document is to be drafted once the tests have been done over months on different watches and at various stations. In this case the plan is to train the whole staff, approve the procedure, which will then come into force, and open up an evaluation period for introducing possible amendments that may be assessed during the first months of implementation.

Fires in underground car parks:

Procedure with finalised document. Approval of the flat fire procedure will determine its entry into force, as it will incorporate the same actions and the same order of outgoing vehicles.

Location of vehicles during interventions (General Operations Agency):

Multi-force working group created by the General Operations Area (AGO) to regulate responses and organise the occupation of public roads with vehicles from the various forces, irrespective of their order of arrival to the service location. This group also worked on the procedure for dealing with suicide attempts. It will validate the final proposal for locating vehicles.

Checking vehicles:

Drafted procedure given the green light by the Occupational Health Committee. It includes the Cooper system and IT tools that did not exist when the previous procedure was being drawn up. Specific files for each type of vehicle still to be drawn up.

Responses in aquatic environments:

Procedure currently being drafted and at the second stage of revision.

Interventions in confined spaces:

Procedure with document drafted and occupational risk table complete. It still has to be put to the senior officers and the Occupational Health Committee and the training process is yet to be planned.

Gas leaks:

Initial document drafted and currently at the revision stage. A representative from the gas company has been incorporated into the working group.

Information on unique projects:

Together with the technical inspection procedure, this is one of the procedures that does not specifically regulate operational intervention work. It is now been drafted and distributed to staff affected by its implementation so they can make proposals.

Multiple victims:

At the drafting stage. After all the staff had been given training in the multiple-victim accident protocol, it was felt necessary to draw up a procedure that would regulate the crews, equipment and specific communications for each type of accident.

**Procedures Unit's other tasks:
Sharepoint**

In 2016, the Procedures Unit led the project to create DOCU (the service document base which concentrates all the information into a single consultation environment) and this year it has led the Sharepoint project. Sharepoint is a Microsoft tool which makes it possible to have a repository with all the information and which incorporates search tools.

This IT tool went into operation in 2017 and coexists with the DOCU files. During the first four months it should be fully installed so all the workforce can use it.

One of the advantages it offers is the possibility of being used outside the corporate network and integrating document base tools, the calendar and a blog which were in different environments until now.

3.3. Training Area

Following the line set out under the 2016-2020 Training Action Plan, the planning process for training in 2017 began in September 2016. The operational staff's training needs were identified through meetings with the senior staff in charge of the various fire stations. The impact of previously implemented measures was evaluated and the aspects that needed to be worked on and improved were raised. At the same time, the various SPEIS units raised their specific training needs, whether it was acquiring new tools or vehicles or applying new training procedures. A study was also done of operational staff accident rates.

Following the action plan too, the sequence marked out for defining the areas to be developed was observed and, for the first

time, made to coincide with a course for firefighters, corporals and sergeants in order to carry out a final exercise-drill to pool the knowledge gained in class.

Training initiatives

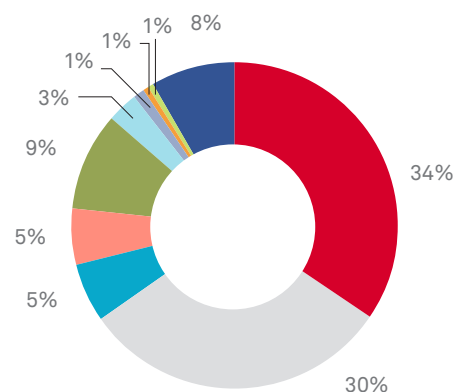
Forty-four training activities were carried out with a total of 324 courses involving 5,247 hours of training and 2,356 participants. But the total impact of all the training activities on SPEIS staff was 34,564 hours of training for the participants.

The breakdown of training, covering all areas, is as follows:

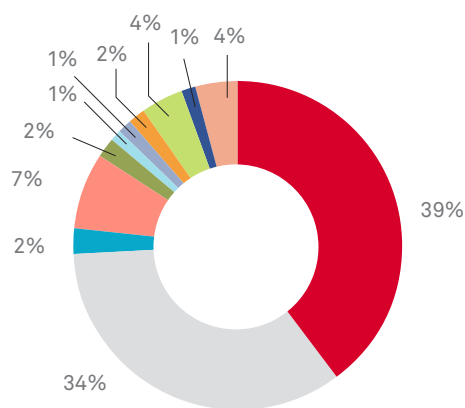
AREAS	Training initiatives	Number courses	Total training	Attendees
Fires	12	109	2.021	615
AMV	5	98	1.764	501
Chemical risk	3	18	125	124
Health-care	5	18	377	190
Vehicles and tools	3	30	100	301
Driving	1	10	60	94
Risk prevention	3	3	64	12
Divers	2	2	84	18
New recruits	2	2	216	11
Procedures	1	26	78	391
Technical English	1	2	198	14
Rescue	6	6	160	85
TOTAL	44	324	5.247	2.356

The percentage distribution was as follows

Number of courses



Training hours



Ongoing training (compulsory)

- Fire ventilation course: This year an 18-hour course was held on fire-smoke ventilation. It was approved by the Firefighters School at the Catalan Institute of Public Safety and Security (ISPC) and for the first time targeted at all operational levels of the service and staff at the Emergencies Management Centre (CGE). The first two days of the course involved exercises and demonstrations of how smoke from fires behaves in various spaces. The third day involved a simulation exercise in dark fires and the fire tunnel, where each category practised what it had been shown within its command role.
- Multiple-victim assistance course: The other ongoing training course was that of assisting multiple victims, a course approved by the Catalan Institute of Public Safety and Security (ISPC) Firefighters School to which Guàrdia Urbana (GUB) police officers, Medical Emergency System (SEM) personnel and Barcelona Metropolitan Transport (TMB) staff were also

invited as observers and to take part in the final simulation exercise in the role corresponding to their service.

TMB provided the site as well as two buses for the simulation scenarios and the participation of nursing-school students as extras, as many as 50 on some editions of the course, should also be mentioned.

Training at fire stations (when on call)

Various short training activities (2-3 hours) were organised following the acquisition of new vehicles and tools, as well as in response to the training needs detected in services provided and driving fire appliances. Specific training was also given by staff at Montjuïc on transferring hydrocarbons in Zona Franca simulators. The training was as follows:

- Transferring hydrocarbons (3 hours x 15 groups)

- New procedure for communications and dealing with suicide attempts (25 courses)
- Driving 4x4 vehicles (Sot del Migdia) x 20 sessions (2 groups of 5 per session)
- Basic and advanced knowledge of the new E22 automatic telescopic ladder appliance (10 sessions)
- New ambulance knowledge (10 sessions)
- Fire ventilation for latest recruits to the fire service (6 hours x 5 sessions)
- Training for oxycut use (10 sessions)
- Course on intervening in fires on boats: Course held at the SEGANOSA (Vigo) training centre where fire-extinguishing techniques are worked on in boats. The course includes a visit to the shipyards, where parts of a boat under construction are shown.

FOCO course:

- Advanced course on high-level rescues where participants study rescuing people in tall buildings and highly complex situations.
- Forest-fire command course for corporals where they study real situations in the Collserola area under SPEIS' control.

New recruit training

- Prevention and Civil Protection Division: Basic fire prevention course for new recruits and an advanced course, both approved by the ISPC.
- Command-room chiefs: Training for new command-room chiefs at the Emergencies Management Centre (CGE).
- Nurses: A course was held to acquaint nursing staff with the hot-area scenarios and development of fires. Exercises were held in the fire tunnel for that purpose.

Voluntary training

- Fires in urban tunnels: Two courses on intervening in fires in tunnels and galleries were organised at the San Pedro de Anes Experimental Centre (Asturias), where practice sessions were held with real fires in a 600-metre tunnel, as well as in the adjacent galleries.
- Advanced course on traffic accidents: Course studying rescue situations with people trapped in traffic accidents. The scenarios and techniques developed are complex and on an advanced level

Divers:

- A rescue course with speed boats held at the facilities of the Centro Jove-llanos (Asturias).
- Basic life support / administering oxygen course.
- Course on speed boat rescues with the Red Cross (Zarautz).
- New recruit training: Equipment configuration, air management, safety and security, dry suit and communications.

Health service staff:

- Course on handling obstructed airways (workshop).
- Course on airway handling

Training in companies or institutions

The following training activities were carried out to promote fire prevention among people and institutions:

- Basic course on putting out fires: Course including a small amount of theory, where students learn to use a building's fire-extinguishing facilities. Extinguishers and equipped fire hydrants (EFHs)
- Intermediate course on putting out fires: In this course students also intervene with hoses, in situations at certain temperatures, and use PPEs.
- Advanced course on putting out fire: Course where participants put out real fires equipped with PPEs and SCBA.
- STWC95 fire-extinguishing course: Courses for sea crews with compulsory practical training in extinguishing crew fires, mainly run by NOSEFO.
- Health course: First-aid day.

Number of companies/ public bodies	Number of training sessions	Total number of students	Total amount invoiced
23	71	872	84.323,18 €

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Facilities and training material

Rubble area / collapsed-structure practice sessions

A practice space was prepared with a mock rubble area simulating the collapse of two buildings. This rubble area is used for carrying out exercises and simulations for Building Area seminars and for Ongoing Training in 2018.

Clinical simulator

A high-performance, life-size manikin was acquired with accessories to simulate casualties and provide health-care training for firefighters and health workers.

Methacrylate ballot boxes

A methacrylate box was bought to help understand fire ventilation and smoke dynamics. It will be used in the ongoing smoke-ventilation training courses and for fire-prevention training at schools.

Fire tunnel

Options are being studied on improving and extending the current facility.

Financial resources

The financial resources for implementing the SPEIS training plan were as follows.

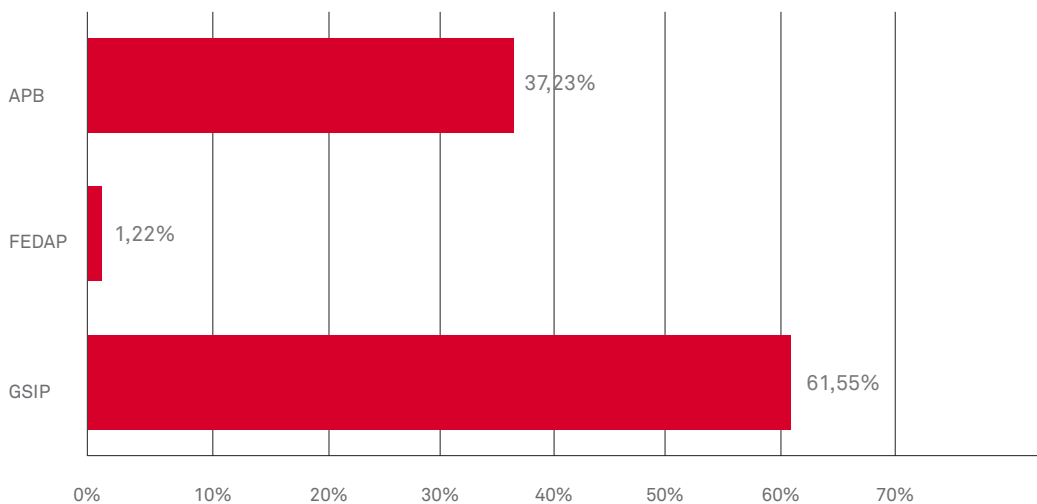
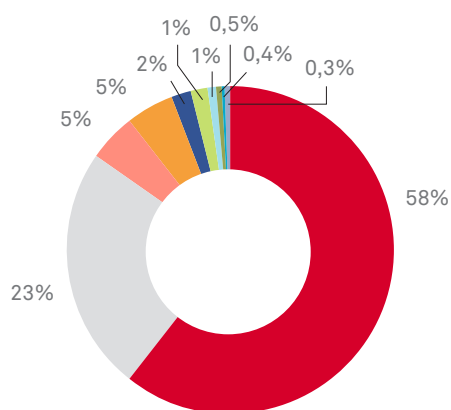
The distribution in accordance with the source of funding was as follows.

Financial resources for implementing training were divided between the various areas as follows.

The total financial resources for training in SPEIS, in accordance with the sources of funding, had the following percentage distribution.

AREAS	Training initiativ.	Number courses	Total training h.	Atten.	Training h. impact	Total amount (€)	GSiP (€)	FEDAP (€)	APB (€)
Fires	12	109	2.021	615	11.164	189.616,58	76.256	2.016	111.344,58
MVAs	5	98	1.764	501	9.018	74.880	74.880	0	0
Chemical risk	3	18	125	124	531	1.321,20	1.321,20	0	0
Health-care	5	18	377	190	2.436	14.898,81	14.898,81	0	0
Vehicles and tools	3	30	100	301	1.198	1.585,44	1.585,44	0	0
Driving	1	10	60	94	564	2.642	2.642	0	0
Risk prevention	3	3	64	12	91	834,24	834,24	0	0
Divers.	2	2	84	18	720	14.828,57	3.568,97	0	11.259,60
New recruits	2	2	216	11	1.272	4.938,16	4.938,16	0	0
Procedures	1	26	78	391	1.173	6.341,76	6.341,76	0	0
Technical English	1	2	198	14	1.386	0	0	0	0
Rescue	6	6	160	85	2.011	17.468,50	15.452,50	2.016	0
Total	44	324	5.247	2.356	31.564	329.355,26	202.719,08	4.032	122.604,18

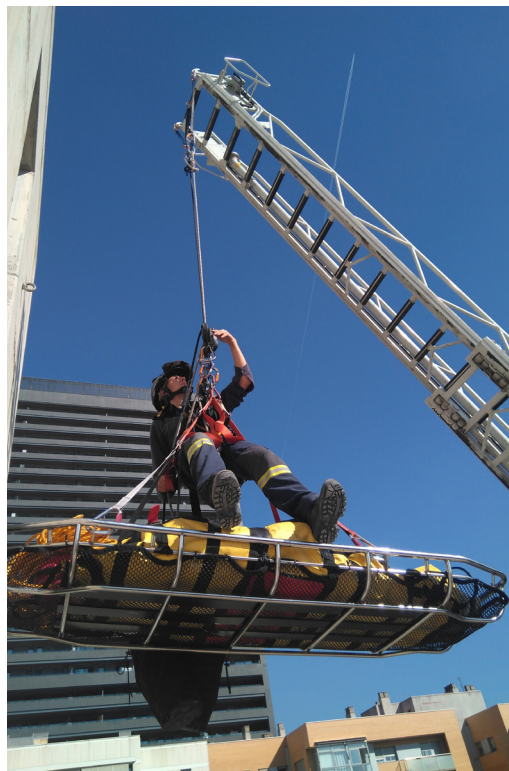
Cost training actions



APB Barcelona Port Authority
 FEDAP Training for Public Authority Employment
 GSIP Manager's Office for Safety and Prevention



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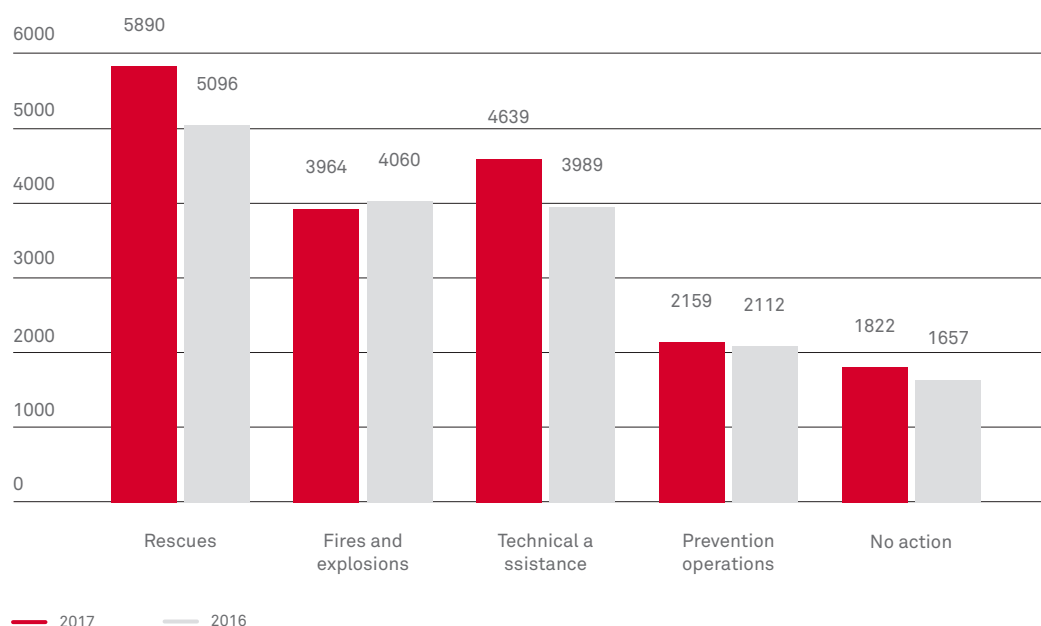
4. Responses

- 4.1. Rescues
- 4.2. Extinguishing fires and explosions
- 4.3. Technical assistance
- 4.4. Operational prevention
- 4.5. Notable services

The Barcelona Fire Brigade carried out 18,474 interventions in 2017. This figure represents an increase of 1,560 services compared to the 16,914 performed in 2016, a 9.22% increase.

The response service figures were as follows:

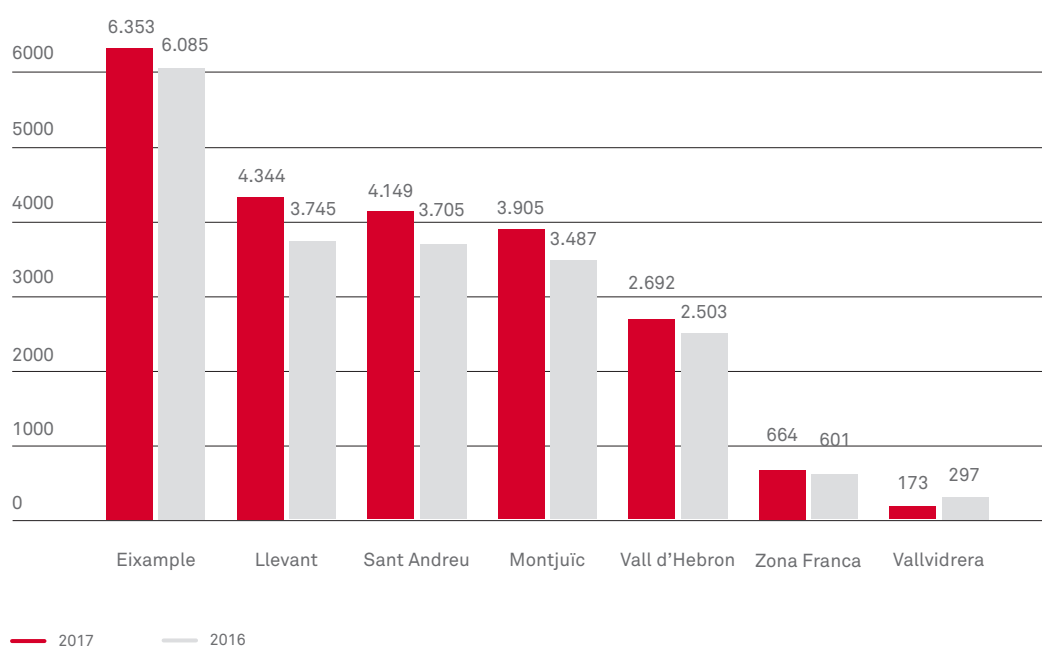
Response services



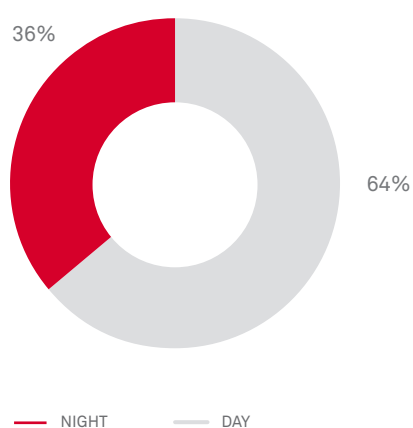
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	Day		Night		TOTAL 2017		TOTAL 2016	
Eixample	3.963	27,87%	2.390	29,67%	6.353	28,51%	6.085	29,79%
Llevant	2.652	18,64%	1.692	21,01%	4.344	19,50%	3.745	18,34%
Sant Andreu	2.561	18%	1.588	19,71%	4.149	18,62%	3.705	18,14%
Montjuïc	2.679	18,83%	1.226	15,22%	3.905	17,53%	3.487	17,07%
Vall d'Hebron	1.717	12,07%	975	12,10%	2.692	12,08%	2.503	12,26%
Zona Franca	492	3,46%	172	2,14%	664	2,98%	601	2,94%
Vallvidrera	161	1,13%	12	0,15%	173	0,78%	297	1,45%
	14.225		8.055		22.280		20.423	

Number of call-outs per station (22,280 call-outs in 2017)



Hourly distribution of call-outs (22,280 call-outs)



4.1. Rescues

There were 5,883 rescue operations in 2017 (not including 7 outside the municipal boundaries), in other words 794 more than in the previous year, which represents 31.88% of the total. There were 5,096 rescue operations in 2016, representing 30.13% of the total.

Out of the total number of rescues, 334 were non-emergencies.

62.84% of the total were to attend to or assist individuals (3,701 responses). 24.01% were to rescue people in lifts (1,414 responses). As for the other rescue operations, 441 were false alarms, 328 were to rescue or capture live animals and six were to recover dead bodies.

Medical assistance was given in 3,111 of all rescue operations and the Fire Brigade’s medical teams took 658 people to hospital. Medical Emergency System (SEM) staff took all the other cases.

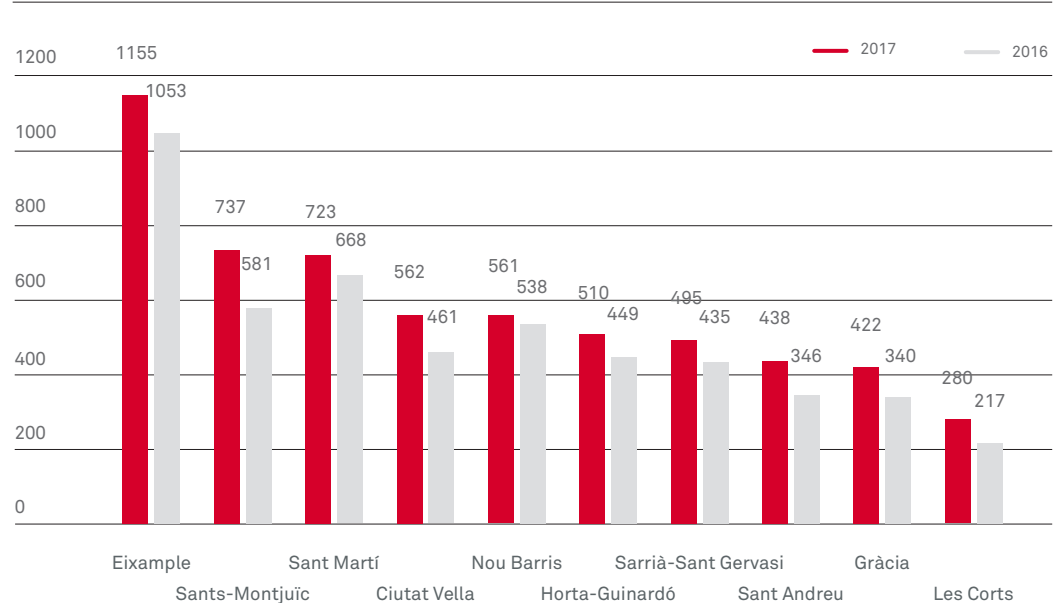
As regards the weekly spread of rescue operations, Thursdays are the least busy day (13.07%) and Saturdays the busiest (15.11%). In fact, weekend rescues (Fridays to Sundays) continue to increase compared to the rest of the week.

Emergency service arrival times were as follows:

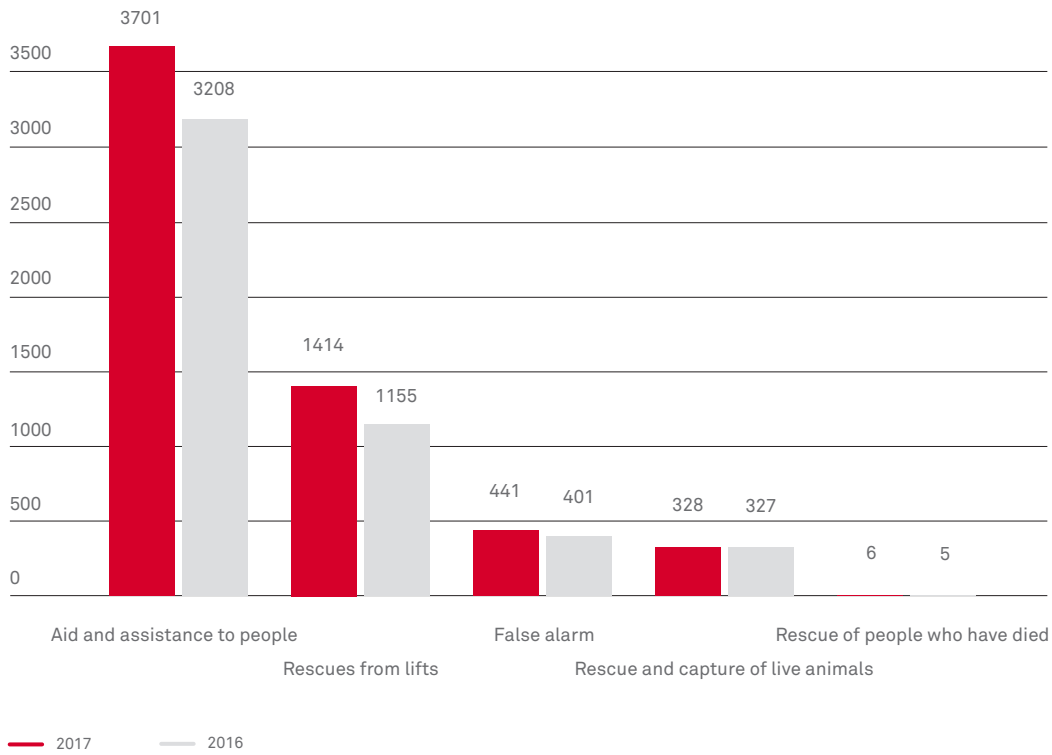
The figures show that the charter’s pledged target of service arrivals in under 10 minutes for 90% of emergencies was exceeded by 4.3 percentage points, as the actual figure was 94.38%. (In 2016 it was 95.68%.) Services arrived in under 5 minutes in 69.37% of rescue operations within Barcelona’s municipal boundaries (73.61% in 2016).

Day-time rescue operations accounted for 61.24% of the total, while 38.76% were carried out at night, compared to 61.79% and 38.21%, respectively, in 2016.

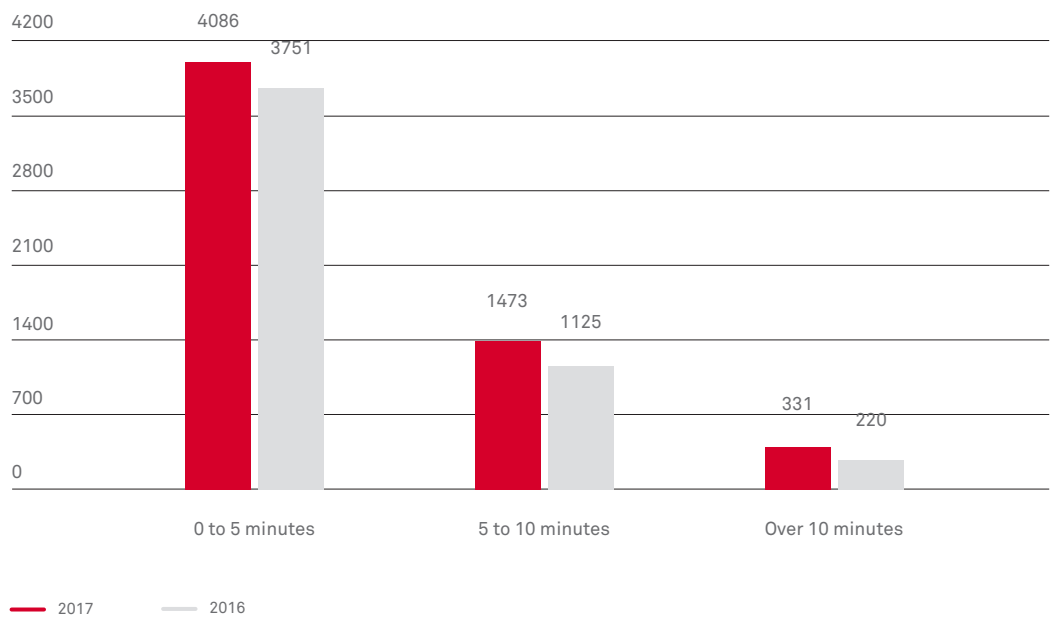
Rescue operations per district



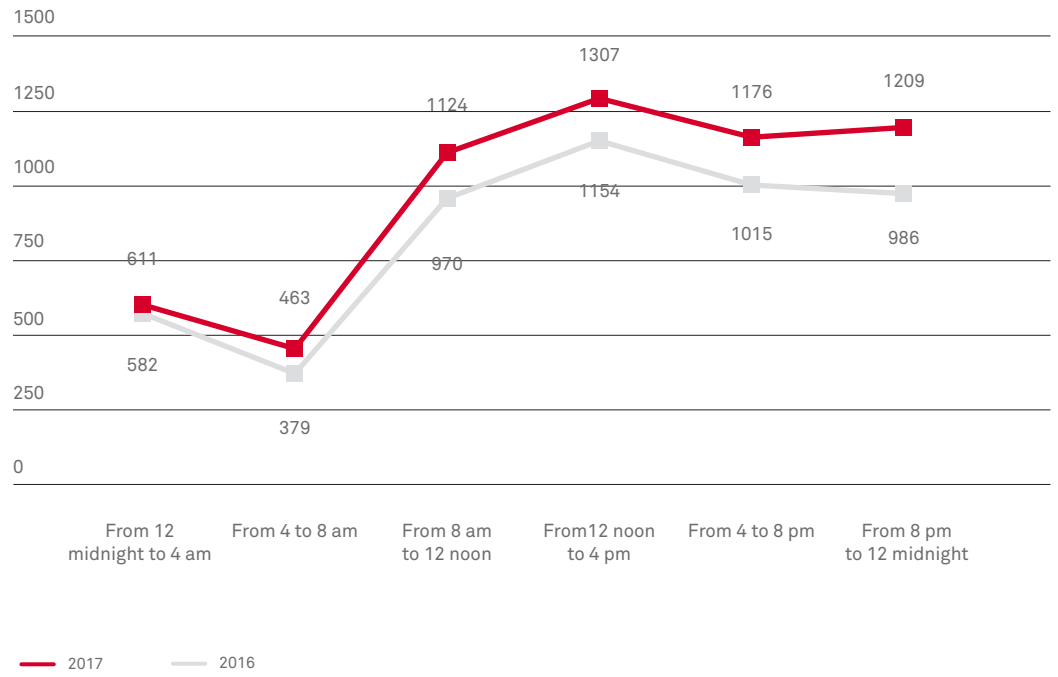
Type of rescue



Rescue-operation arrival times



Times of rescue operations



4.2. Extinguishing fires and explosions

There were 3,964 responses to fires and explosions in 2017, a figure corresponding to 21.46% of all services. In absolute terms, there were 96 more services of this type in 2017 than in the previous year. Excluding the 16 services performed outside the municipal boundaries, the responses were distributed as follows:

There was a slight increase in number of fires in buildings and a decrease in number of fires on public roads and woodland settings. Sixteen of these responses were carried out outside municipal boundaries.

Out of a total of 3,964 interventions, 1,727 were for fires on public roads, a slightly higher figure than the 1,797 recorded in 2016. In addition, responses included putting out 1,989 fires in buildings (1,444 of which started in homes), representing 36.43% of fire-related interventions.

Interventions were required for 62 forest fires, compared to 97 in 2016. The 51.5% drop was the result of more favourable weather conditions. This type of intervention represented 1.56% of firefighting operations.

As regards days of the week, Tuesdays were the quietest (with 12.66%) and Saturdays the busiest (with 16.80%).

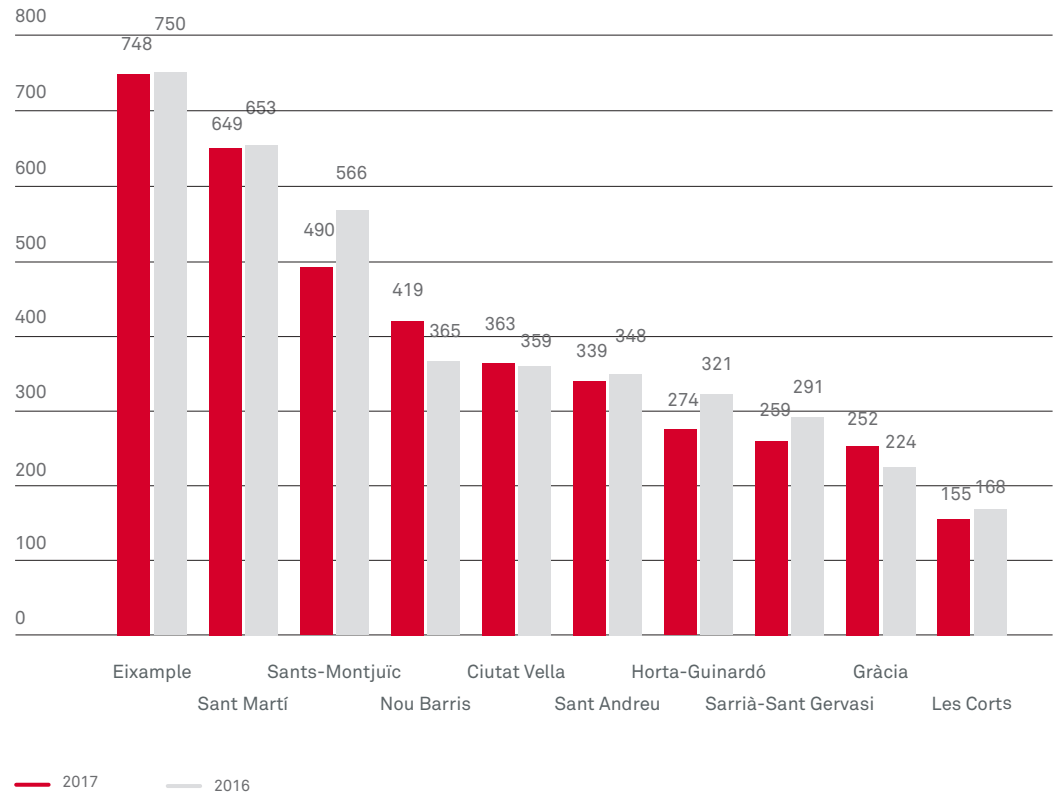
And 49.75% of fire-related services were performed during the day while 50.25% were carried out at the night (between 8 pm and 8 am).

Fire operations in Barcelona exceeded the Service Charter's pledged target (to arrive in under 10 minutes in 90% of emergency cases) by 6 percentage points, as the actual figure was 96.75%. (In 2016 it was 97.04%.) In 75.33% of emergency fire call-outs within the Barcelona municipal area the response time was under 5 minutes (79.66% in 2016).

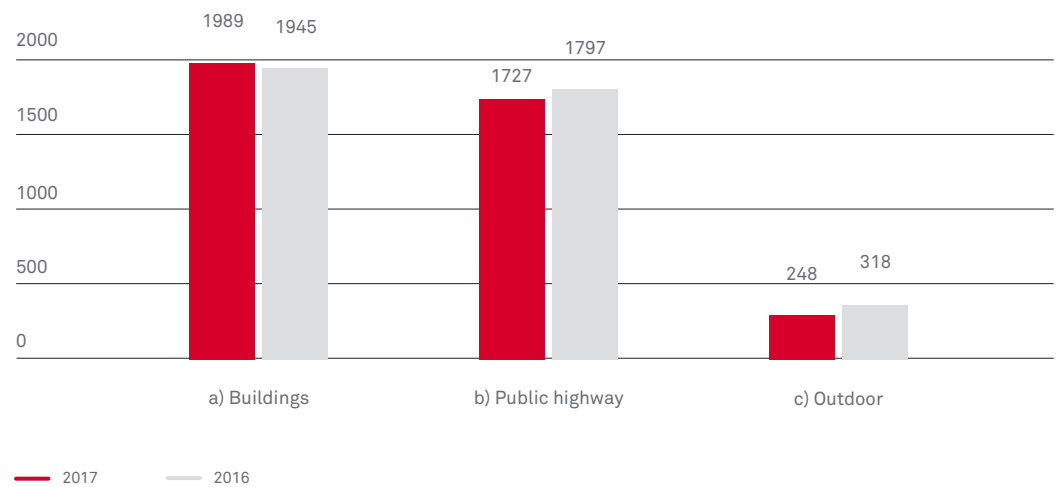
The average arrival time for emergencies (fires/explosions and emergency rescues) was 3 minutes and 59 seconds, compared to 3 minutes and 57 seconds in 2016.

Finally, the duration times for putting out fires were distributed as follows:

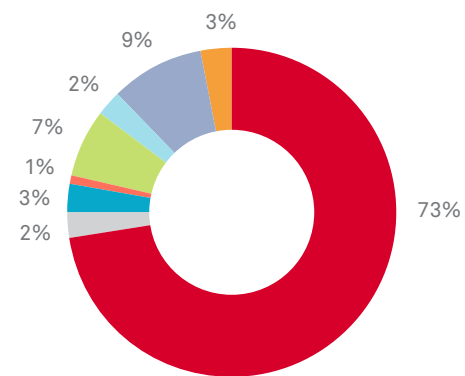
Number of fire and explosion operations.



Location of fires and explosions

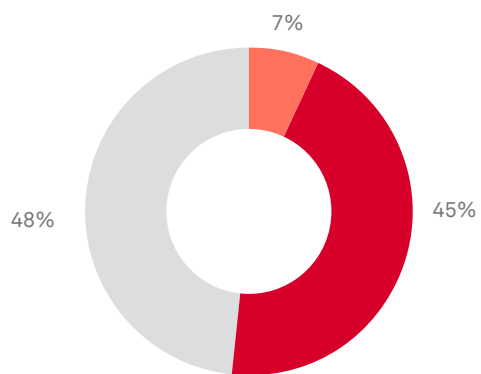


a) Fires and explosions in buildings

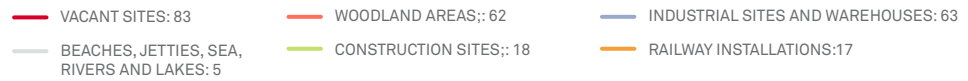
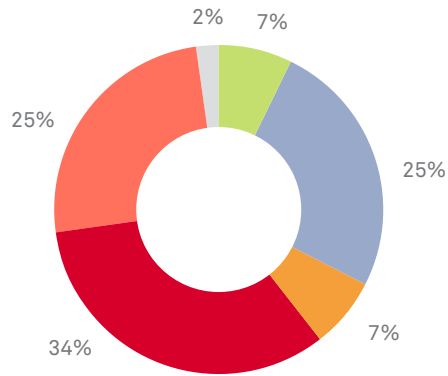


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b) Fires and explosions on the public highway

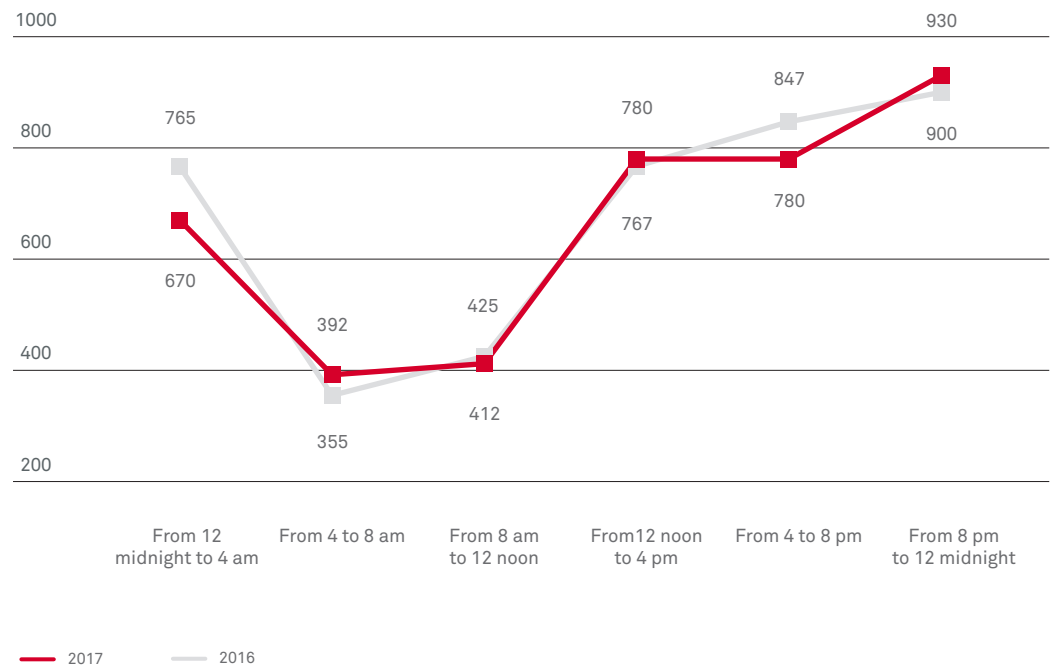


c) Outdoor fires and explosions

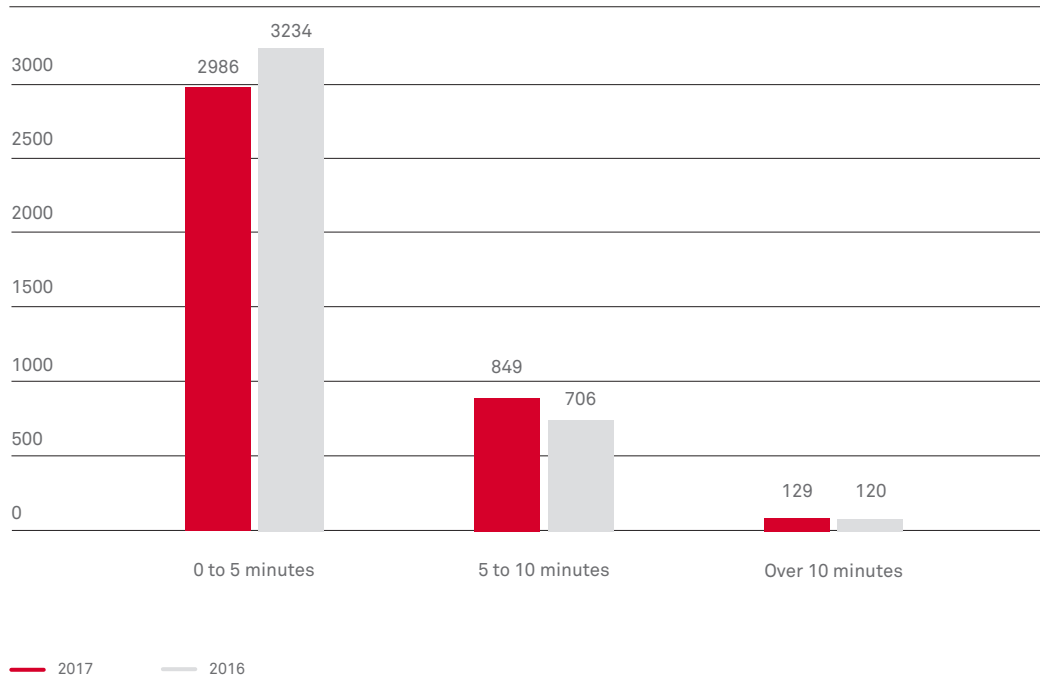


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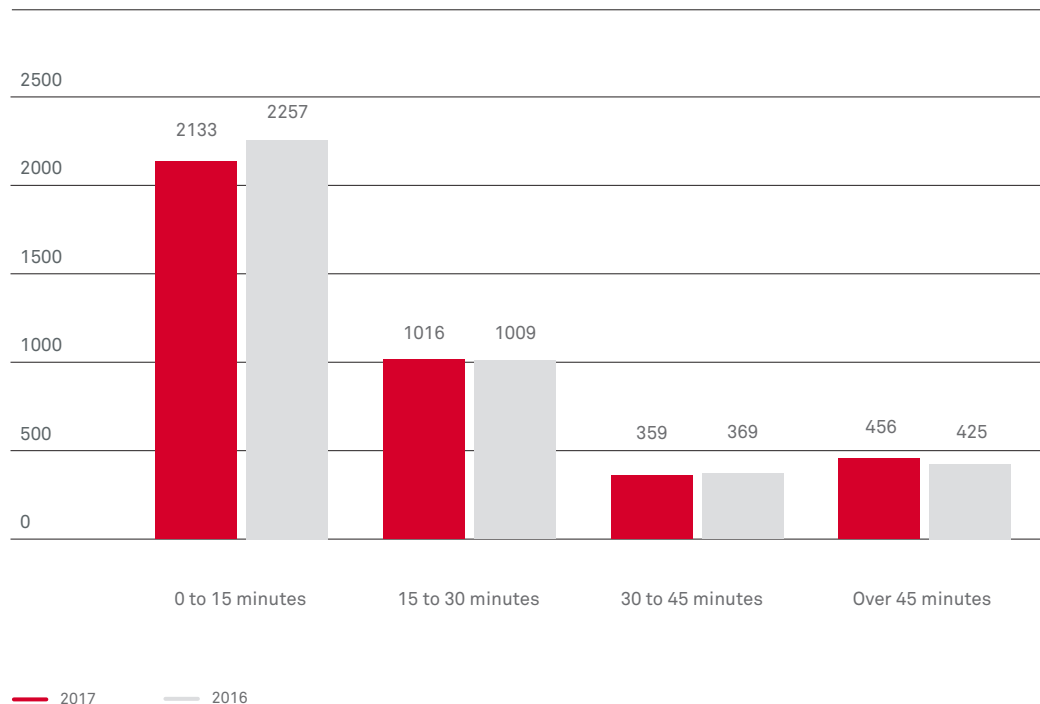
Fire and explosion time bands



Arrival times for fire and explosion interventions



Times for extinguishing fires and explosions



4.3. Technical assistance

Firefighters perform a large number of highly varied, “non-emergency” help services for the public which are classed as technical assistance.

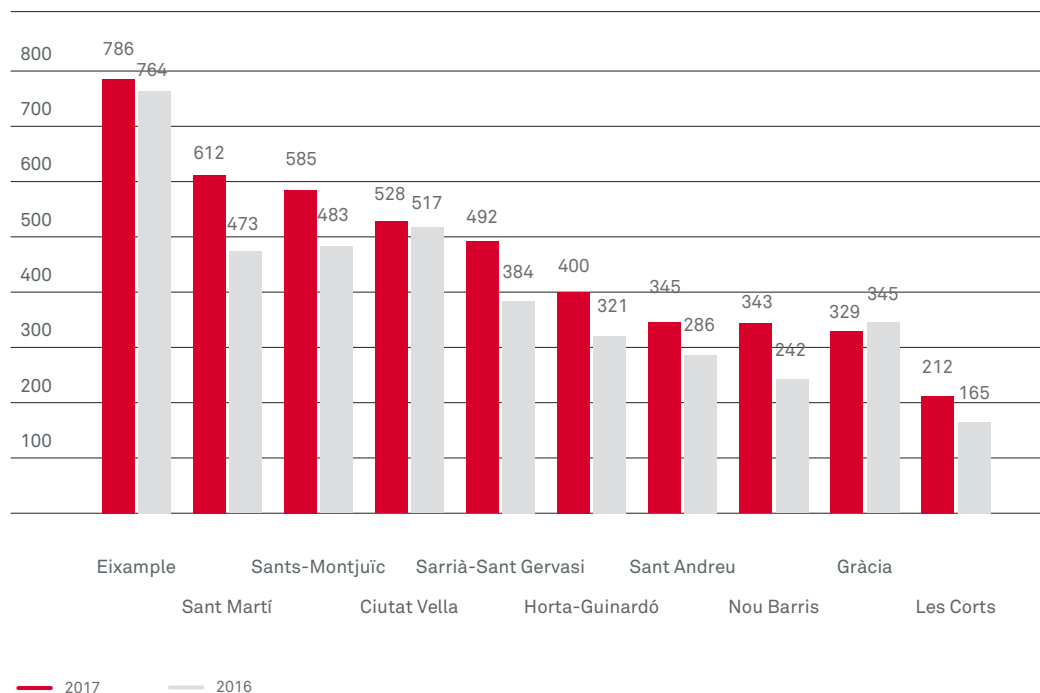
A total of 4,639 operational technical assistance services were performed in 2017 (compared to 3,989 in 2016), representing 25.11% of all responses.

Excluding the 7 services performed outside the municipal boundaries, the district breakdown of responses was as follows.

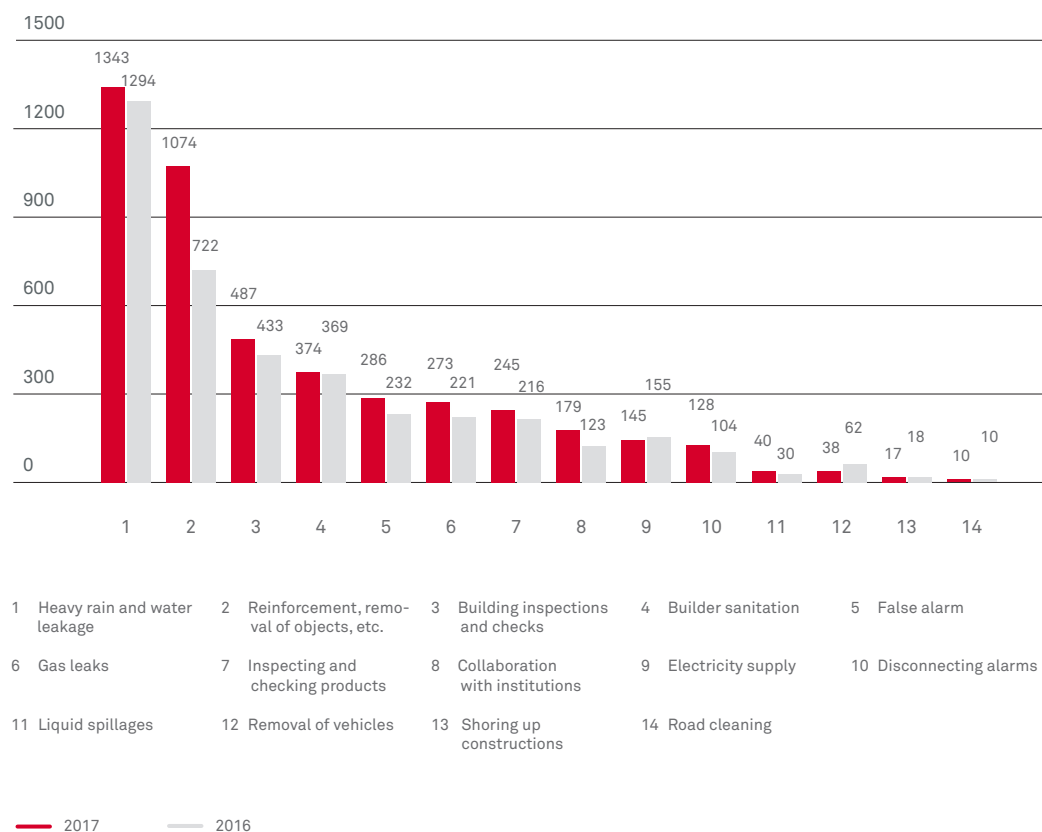
The type of technical assistance carried out varied.

64.52% of the technical assistance was provided during the day and 35.48% at night.

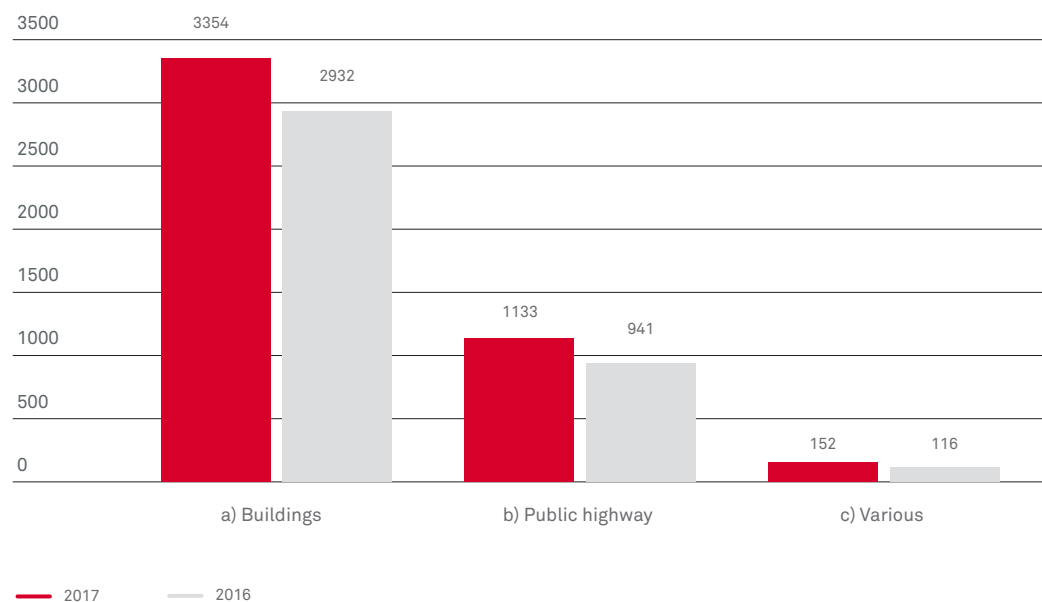
Number of technical assistance operations



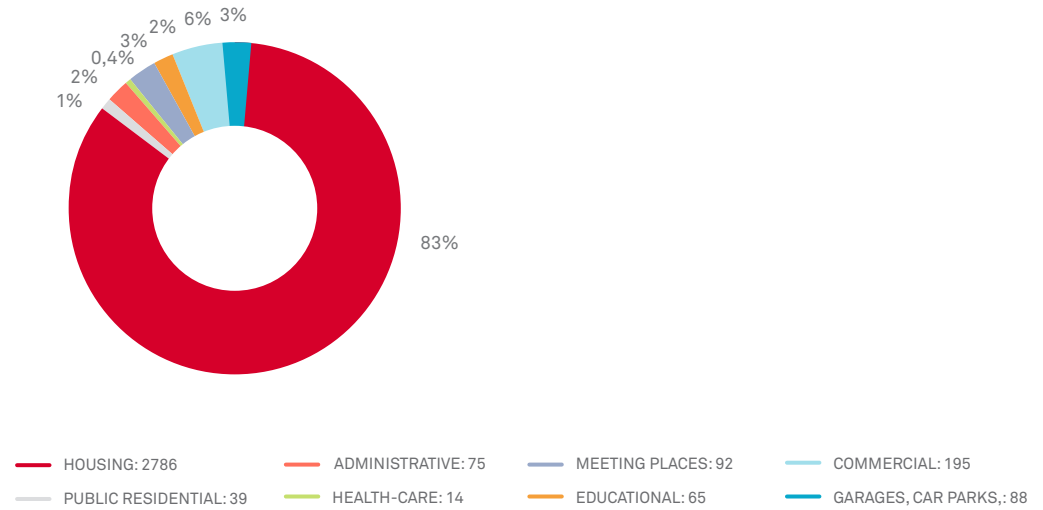
Types of technical assistance



Location of technical assistance

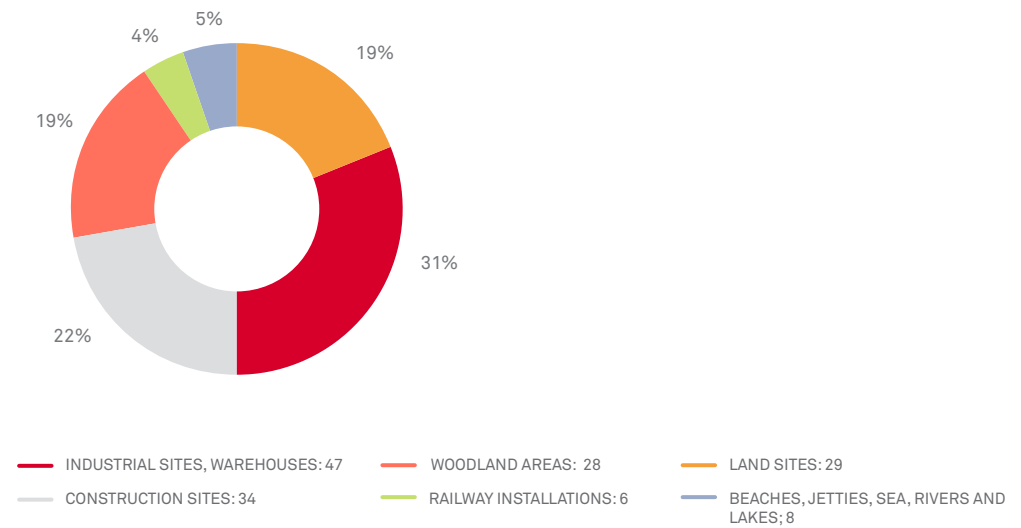


a) Buildings

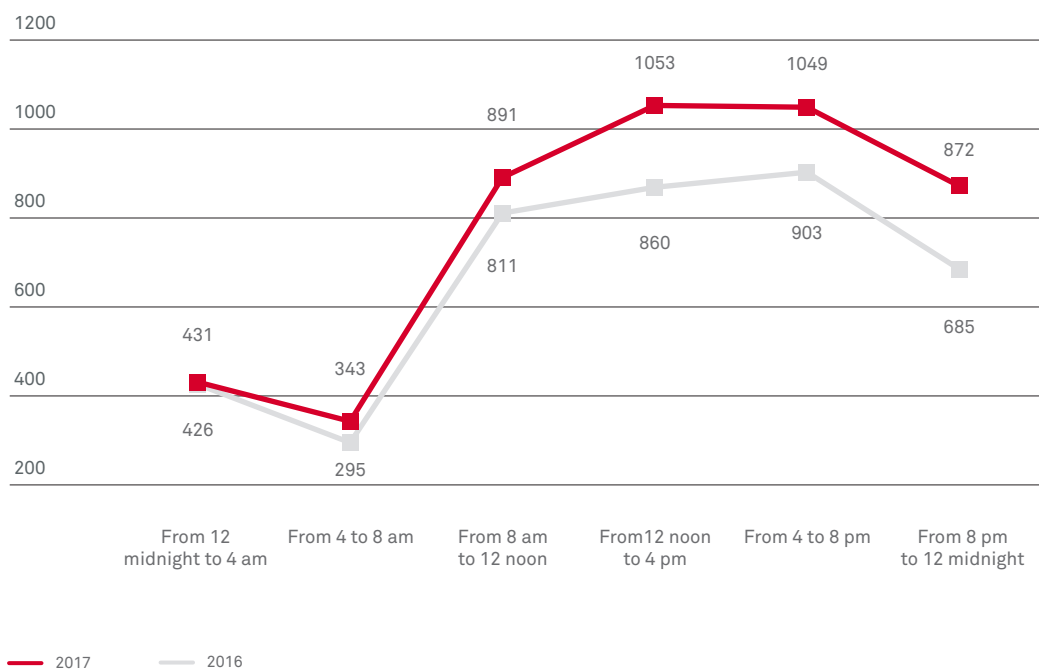


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c) Various



Technical assistance time bands



4.4. Operational prevention

Under the generic name of “operational prevention”, SPEIS includes every initiative that enables a better understanding of intervention environments, including roads and access points, as well as buildings and special features. Environmental and activity monitoring services are also counted as a preventive measure. In both cases, these activities lead to greater effectiveness and safety.

There were 2,159 environmental knowledge and monitoring operations carried out in 2017, representing 11.69% of the total. In absolute terms, that means 47 more environmental knowledge and monitoring operations were performed than in the previous year (2016).

Of these operations and monitoring activities, 90.74% were performed during the day and 9.26% at night.

4.5. Notable services

Evacuation of three buildings in Poblenou owing to the risk of collapse

On 15 March a worker carrying out a repair in a basement alerted SPEIS that he had detected cracks which seemed dangerous to him. This affected a building with a basement, ground floor and two upper floors, with four flats on each, and land on the other side of the street where two hotels were being built. It was confirmed that one of the basement's load walls was broken and permeated by water, and that the paving surrounding the area had a 70 cm gap. The inspection showed that the building adjoining it was suffering from similar pathologies.

As a preventive measure, the brigade proceeded to evacuate residents from the three properties. The subsoil was strengthened, structural shoring carried out and possible movements monitored, in addition to accompanying residents on numerous occasions to get items from their homes. In all, 19 dwellings with 32 residents were affected. The operation was coordinated with the Sant Martí

district authorities, CUESB, the Guàrdia Urbana, building companies, municipal services and power companies. A week later, residents began a staggered return to their homes and the Fire Brigade closed the operation on 31 March.

Fire at Port del Fòrum

Barcelona firefighters were needed to help the Catalan Government Fire Brigade put out a fire on boats at Port Forum (inside the municipal boundary of Sant Adrià del Besòs) on 8 April. Initially four yachts caught fire but their proximity to the pier and scale of the blaze meant the fire spread quickly to nearby yachts. The operation ended with the fire being put out on ten boats, seven of which sank while the other three suffered considerable damage, as did part of the pier's facilities.





Railway accident in the Port of Barcelona

A call made from the Port of Barcelona required intervention in an accident involving a lorry and a goods train at the port, causing a small spillage of diesel on 12 April. As soon as it had been confirmed there were no injuries, the fuel leakage was neutralised and potential risks to the rail facilities put under control. Thanks to the use of cut and release techniques, the lorry was freed from the fence it was stuck in and from the train's structure, and then removed. Once the area's safety had been ensured, rail traffic was re-established.

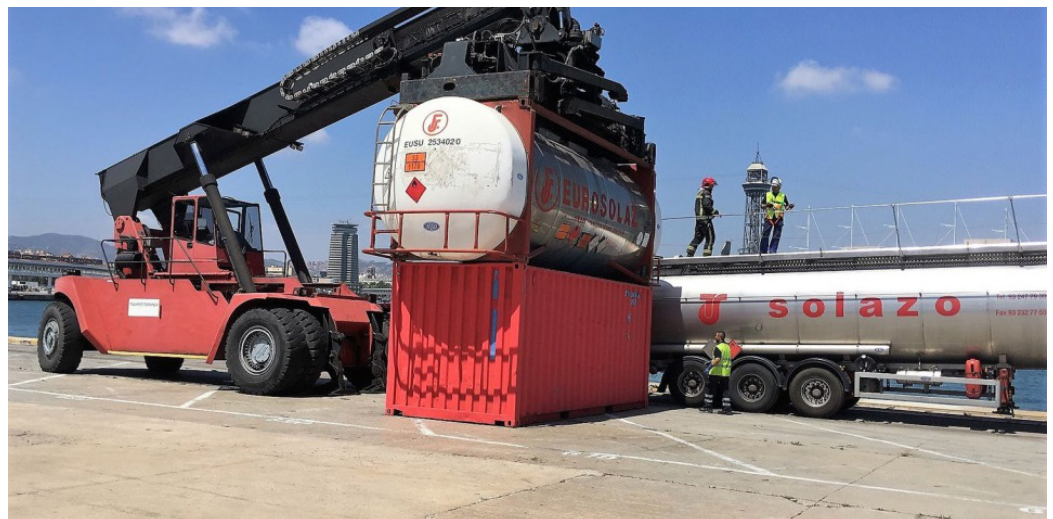
Rescue of passengers on Metro Line 3

A call from Barcelona Metropolitan Transport (TMB) made on 6 May alerted the Fire Brigade to an incident at the Plaça del Centre station on Line 3. A train was stuck in the tunnel owing to lack of power and passengers were rescued with the help

of metal ladders that enabled them to get off the train and up onto the platform. The evacuation ended without any incidents and TMB staff were left to handle the situation.

Ethanol spillage at the Port of Barcelona

On 8 June the Port Police alerted the Fire Brigade of a leakage of ethanol from a tanker berthed at the Sant Bertran wharf. Once firefighters had reached the site, they detected the tanker's metal casing had been punctured and a decision was taken to transfer the ethanol. For that they worked on a simulation of the scenario using the ALOHA programme to anticipate the possible effects of any spillage igniting. Once the transfer had been completed, the damaged tank was taken to the storage area agreed to with port staff. This was the first incident involving chemical product simulators had been used in.



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Accident at França Railway Station

At 7.32 am, on 28 July, we received a warning that a local-commuter train had smashed against a buffer at França Station on track 11. When firefighters arrived, they confirmed the first carriage had been derailed, the driver was trapped in his cabin and there was a large number of wounded people. The protocol for accidents with multiple casualties was activated, an evaluation cell was set up and “START triage” applied to the wounded. Firefighters then proceeded to rescue and transfer injured people to the emergency area and, subsequently, to hospitals in some of the cases. Fifty-six people were assisted in all, of whom one was seriously injured and 19 slightly injured.

Terrorist attack on La Rambla

17 August, 5 pm. A vehicle enters the central section of the Rambla, driving down from Plaça Catalunya to Pla de la Boqueria and attempting to run over as many people as possible. This was a terrorist attack that three light urban fire engines, a rescue and release vehicle, four ambulances and the Fire Brigade’s Command Centre were assigned to deal with.

The protocol for accidents with multiple casualties was activated and an advance command centre was set up with two advance medical centres, one at each end of the intervention site. A total of 29 injured people were attended to and 11 were hospitalised.

The Barcelona Fire Brigade took part in the rescue, providing medical assistance and transferring the injured; in setting up the emergency management centre; in lighting the surrounding area to facilitate the tasks being carried out, and in the technical checks on the facilities that could have been affected.

As a result of this operation, we were awarded the Catalan Government Gold Medal.

Rescue of eight people in a fire at Plaça del Bonsuccés

During the early hours of 12 September, firefighters were sent to put out a fire in Plaça del Bonsuccés, a short distance from La Rambla. The fire, initially reported in a shop, spread to a car park, a Chinese bazaar and a flat, causing heavy smoke and spreading panic among passers-by and local residents.

Eight people had to be rescued, two of whom were treated for smoke inhalation.



Serious fire on C/ Saragossa

At 9.50 am on 1 November, we received warning of a fire on the sixth floor of a building on C/ Saragossa. Fifteen fire-fighting crews were deployed there, as well as 14 from the Medical Emergency System (SEM) and a number of city (GUB) and regional (Mossos) police officers.

The fire, which was put out around midday, affected the building's three upper floors, while the other flats were evacuated as a precaution.

As a result of the fire, a 93-year-old man died, one person was seriously injured and 18 people were slightly injured, 12 of whom were transferred to different hospitals and 6 attended to on site.



Deadly fire in Sants-Montjuïc

On 14 November, we received notice of a fire on C/ Nou de la Rambla in the Sants-Montjuïc neighbourhood of Poble-sec. Seven Barcelona Fire Brigade crews were sent to the site. As a result of the fire, an 80-year-old man died and a seriously injured 86-year-old woman was transferred to Hospital de Sant Joan Despí Moisès Broggi. The fire seriously affected the flat where it started but it did not cause any structural damage to the building.

A fire burns down a cake shop on C/ Numància

On 5 December, seven crews intervened to put out a fire that broke out in a cake shop on C/ Numància. The fire was extinguished within nearly half an hour but it produced a spectacular cloud of smoke. It broke out

at around 5 pm in the electric oven of the shop, which is on C/ Numància, almost level with Av Diagonal. No one was injured.

Three people wounded in a flat fire on C/ Piferrer

A first-floor flat on C/ Piferrer, in the Porta neighbourhood of Nou Barris, caught fire at around 10 am on 17 December. Five fire crews put out the fire and rescued a number of people. Three people were slightly injured from inhaling smoke during the incident, one of whom was an 80-year-old man who was taken to hospital to keep him under observation. The building did not suffer any structural problems, although the flat that caught fire was rendered uninhabitable.



5. People

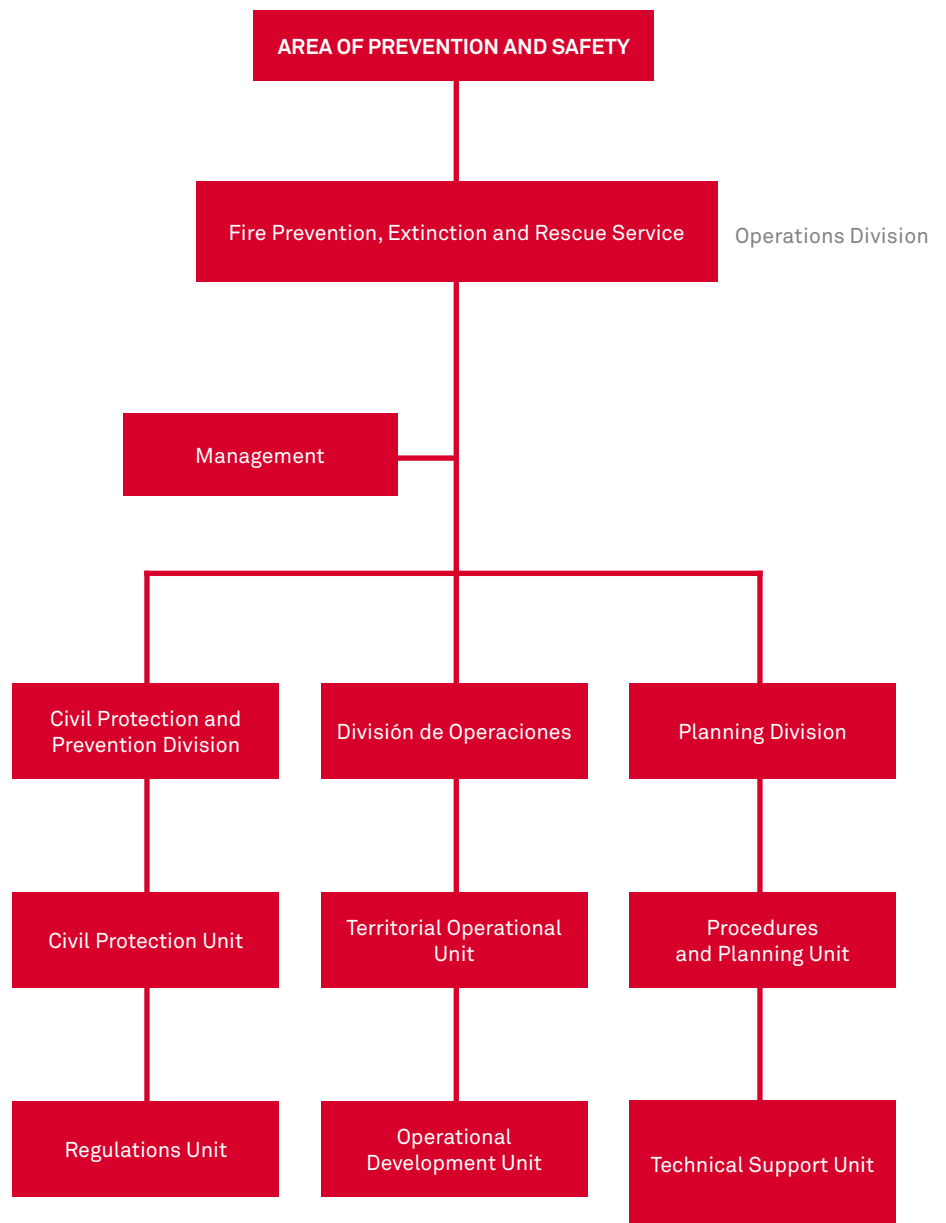
5.1. Organisational Chart

5.2. Breakdown of staff

5.3. Women in the Barcelona Fire Brigade

5.4. Staff management

5.1. Organisational Chart



5.2. Breakdown of staff

The breakdown of staff in 2017 was as follows.

SPEIS staff in 2017 consisted of 658 people and had 47 more compared to 2016 as a result of the incorporation of several officers (health, prevention and planning), as well as 59 new recruit firefighters, who partly replaced some of those who had retired.

The organisational structure breaks down as follows.

The average age of operational staff on 31 December 2017 was 42.27, representing a slight increase on the previous year. (It was 42.04 in 2016.)

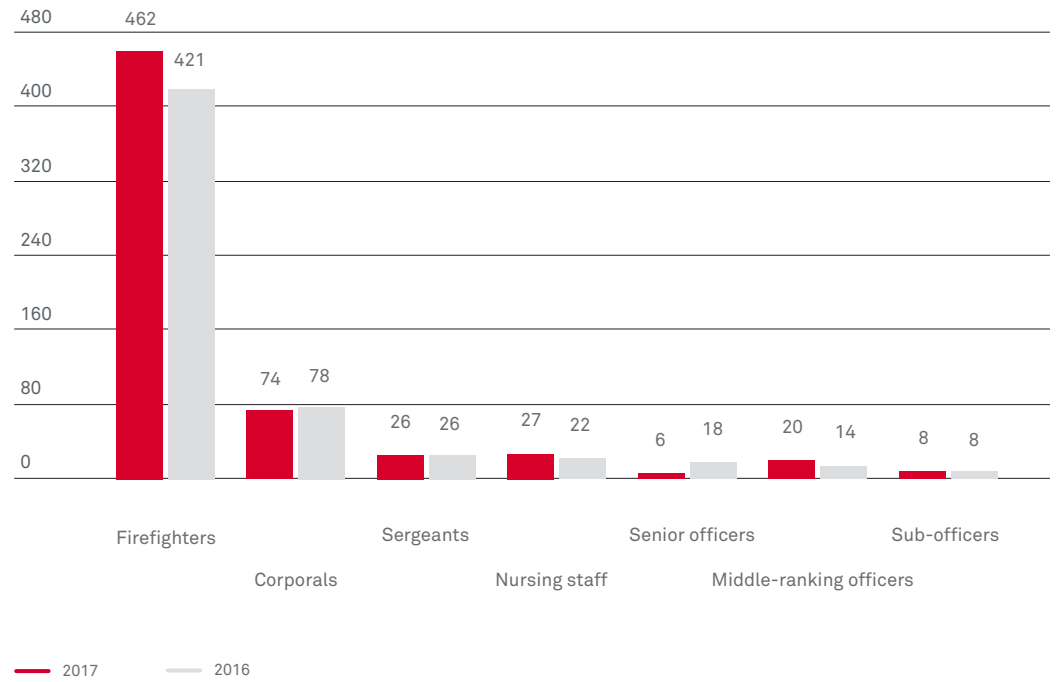
The average age of non-operational staff went from 48.25 in 2016 to 46.68 in 2017.

Professional categories

a) Operational staff	Hombres		Mujeres		TOTAL 2017	TOTAL 2016
Senior officers	6	1%	0	0%	6	18
Technical staff	17	2,8%	3	16,7%	20	14
Nursing staff	18	3%	9	50%	27	22
Sub-officers	8	1,3%	0	0%	8	8
Sergeants	26	4,3%	0	0%	26	26
Corporals	74	12,2%	0	0%	74	78
Firefighters	456	75,4%	6	33,3%	462	421
TOTAL Operational staff	605	100%	18	100%	623	587
b) Non-operational staff						
Senior technical staff	12	52,2%	3	25%	15	11
Middle management technicals staff	1	4,3%	1	8,3%	2	1
Administrative staff	4	17,4%	3	25%	7	7
Administrative support staff	6	26,1%	4	33,3%	10	4
GUB police officers	0	0%	1	8,3%	1	1
TOTAL Non-operational staff	23	100%	12	100%	35	24
TOTAL staff	628		30		658	611

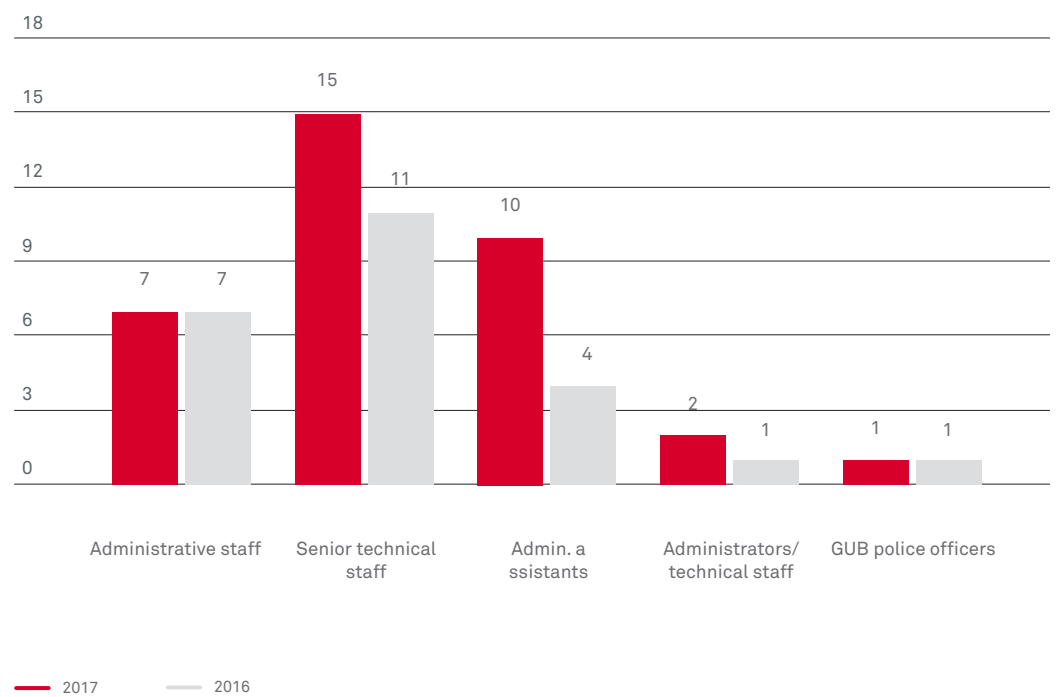
Firefighter apprenticeships are not added as operational staff (they are included in previous reports).

Operational staff



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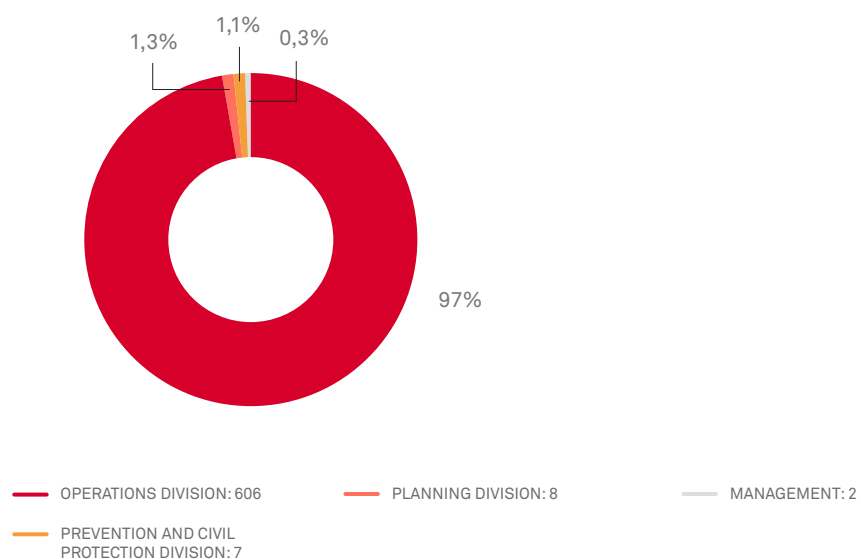
Non-operational staff



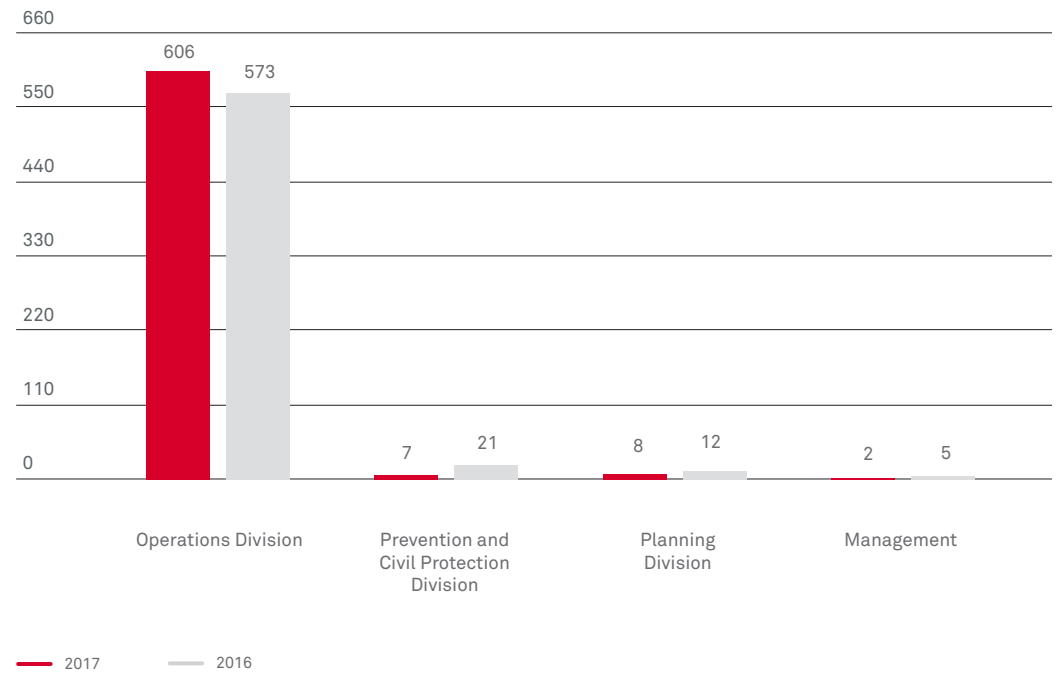
Organisational structure

	Operational staff		Non-operat. staff		TOTAL 2017	TOTAL 2016
Management	2	0%	4	11,4%	6	5
Operations Division	606	97,3%	10	28,6%	616	573
Prevention and Civil Protection Division	7	1,1%	16	45,7%	23	21
Planning Division	8	1,3%	5	14,3%	13	12
TOTAL staff	623	100%	35	100%	658	611

Organisational structure I

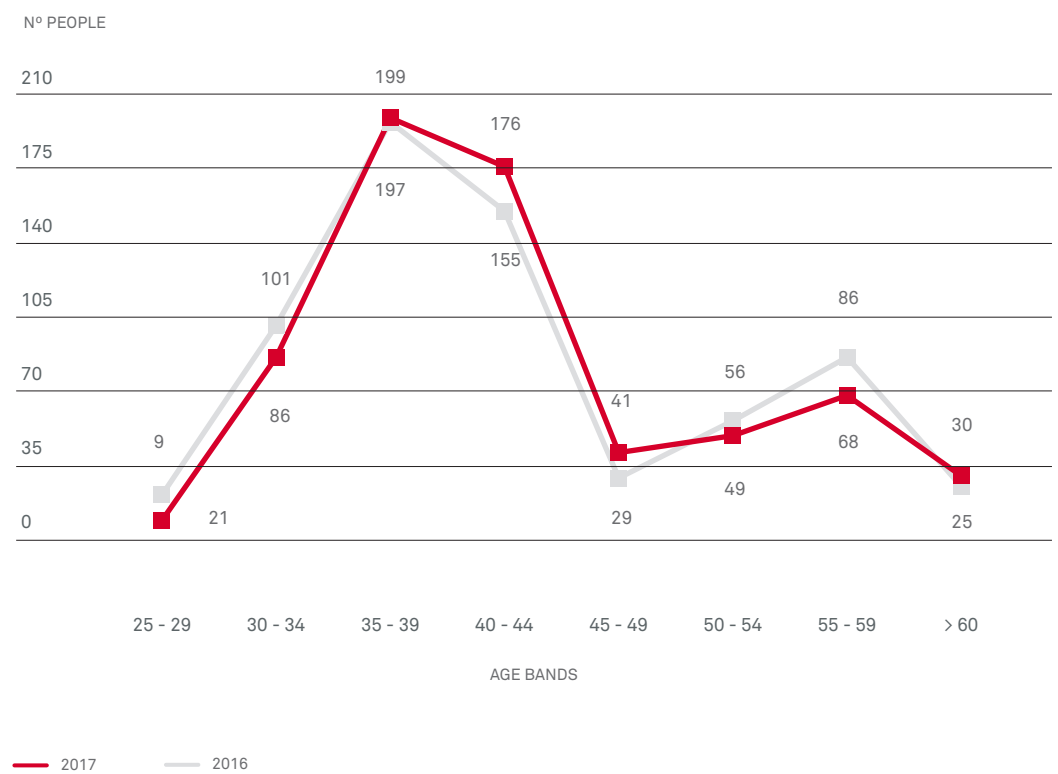


Organisational structure II



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Age



5.3. Women in the Barcelona Fire Brigade

The incorporation of women into the Barcelona Fire Brigade is a relatively recent development (2007) and they still represent a very low percentage of the staff as a whole. So the City Council is working on selection process measures to benefit women who apply in the coming years.

In terms of the data, while the overall percentage of women within SPEIS continues to grow slightly, up 1.23% on 2013, most of that increase has been due to women joining the brigade's central and health services.

So, to help highlight and increase the presence of women in the force, in March 2017 the Fire Brigade participated in an event organised by the Area of Prevention and Safety entitled "Women in the Safety and Emergency Services". This was the first time it included the vision of the Fire Service and the Medical Emergency System. The purpose of the meeting was to step up the necessary fight for gender equality in the uniformed forces, as well as invite reflection on the role of women in the public safety and emergency forces.

Opening the event, the City Council Safety and Prevention Manager, Jordi Samsó, the

Chief Constable, Evelio Vázquez, and the Director of SPEIS, Manel Pardo, reflected on the need to incorporate a women's perspective in the area of emergencies. More specifically, the Chief Constable highlighted the spirit of service, serenity and sensitivity of women for resolving disputes.

For her part, the Head of the Department of Gender Mainstreaming at the City Council, Sonia Ruiz, presented the Municipal Plan for Gender Justice, a commitment to promoting initiatives that seek to ensure equality at every level in the institution.

Trinidad Yera Cuesta (IESE Business School and UNIR) gave a speech on "Autoritas", in feminine key, and Begonya Curto Ferré (Deputy Director-General of Police Coordination in Catalonia) chaired a round table on local public safety in the hands of women, with members of the Vila-real (Castille) and Oñati (Basque Country) local police forces, the Catalan Medical Emergency System (SEM) and the Barcelona City Council Fire Prevention, Extinction and Rescue Service (SPEIS)





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The task of bringing the meeting to a close fell to the Commissioner for Security and Safety, Amadeu Recasens, and the Mayor of Barcelona, Ada Colau, who pointed out that, historically, women have always been in the first line of safety and prevention, despite the long time it has taken for such responsibility to be transferred to a professional level.

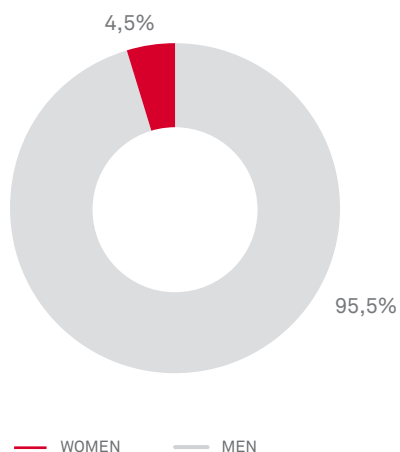
SPEIS also attended the Education Fair for the first time. They shared a booth with the GUB (city police), where firefighters dealt with requests for information from a large number of young people who came to the booth to ask what it took to become a firefighter.

And they offered an informal talk at the Àgora, explaining all the job options the fire service offers. They also explained the various ways of entering the service and the requirements for joining it.

Finally, it is important to stress that the Equality Plan Technical Committee (made up of City Council and trade union representatives) approved and implemented a protocol for preventing, detecting and resolving situations of sexual and sex-related assault.

This protocol determines the actions and responsibilities of the bodies that need to intervene in resolving these situations and ensures a plurality of interventions to guarantee appropriate treatment in assessing each of the actions, following the most suitable methodology in each case, in line with the general principles established.

Staff breakdown by sex



5.4. Staff management

There was a 6.33% absenteeism rate among SPEIS operational staff in 2016. More specifically, 210 officers were off on sick leave and there were 269 cases of temporary incapacity for work, representing a total of 8,499 days off work. In the case of non-operational staff, there were 5 cases of sick leave among five people, totalling 180 days and representing a rate of 0.83%.

The most notable steps taken to reduce levels of absenteeism including monitoring cases of sick leave (some by summoning the person concerned); adapting workplaces; the work carried out by the Manager's Office inspection team, contacting health centres to go through waiting lists both as proof of visits and

surgery; authorisation for rehabilitation during service hours to check the duration of sick leave, and coordination with the City Council medical inspection team and the mutual insurance company PAMEM, until it was wound up.

On the other hand, given the nature of its work, the Barcelona Fire Brigade has one of the highest levels of work-related accidents. More specifically, 73 accidents leading to sick leave were recorded in 2017, corresponding to a total of 2,573 accident-related sick-leave days. These data include accident-related sick-leave days caused by accidents going to work or returning home and relapses from previous accidents.

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