European Orienteering Championships Ticino Switzerland 2018

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International Orienteering Federation (IOF)

Final Report EOC 2018 Switzerland

Summary

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1. Introduction

The European Orienteering Championships 2018 were held in Switzerland from 5th to 13th of May 2018.
The Event Centre was situated centrally in Cadempino, 6 km from the main city Lugano.
The EOC 2018 organisers refused holding conjunctively the European Trail Orienteering Championships, as there are no events in this discipline in Switzerland thus no organizational know-how.

Swiss Orienteering assigned the responsibility for the organisation to the ASTI EOC 2018 Association that had been formed just for that purpose. All 8 clubs of the region were fully involved in the project, covering the main part of the necessary know how. Additionally the organisers could count on competent help from few skilled people from all over Switzerland.
The association carried out the event with great support from the various host cities, the Canton of Ticino and the Swiss Government, and also from several private sponsors.

The objectives of the organising committee:
- Flawless and highly technical orienteering competitions to award the "European Champion" titles
- Cost control and a balanced championships budget
- Holding Championships with respect to the environment and the goal for sustainable development
- 30 or more participating nations
- To promote orienteering in the region

30 km² of terrain were mapped for trainings, qualifications and final races. The competition maps were of very high technical quality.
The areas were chosen and courses planned to conform to the technical requirement of each competition format. The goal for the choice of competition venues was to show the diversity of the areas in our region (which is also different from the usual characteristics of the rest of Switzerland) and yet stay close to the competition centre.
All competition areas were already previously mapped, and were newly revised and drawn for EOC, starting from new LIDAR data.
All the areas were embargoed starting autumn 2015.

EOC closed with a benefit. To achieve this goal, the organising committee had to constantly fight for it, as the cost requirements for an EOC organiser (specially in the TV, media and communication area) are very high.

The organisers had to follow very strict functional specification requirements concerning conservation of the environment and sustainability.
The spectators and participants of the Swiss 5 Days were encouraged to utilise public transportation. Implementation of this programme was subject to rigorous controlling through the Swiss
Olympic Association and the municipal and cantonal authorities. The goals set by us were achieved.

The championships were attended by 371 accredited athletes + coaches, from 33 nations, 4 of which came from outside Europe, as the competition was registered as World Cup event.

This goal was achieved thanks to the help of a fund that was supported by Swiss orienteering clubs and individual people. 10 nations were sponsored (mainly accommodation and food) through that fund with CHF 25'000.

The near future will prove the achievement of the goal of the promotion of orienteering in the region. The attention by the media and the public was very positive, and we are quite confident to achieve also this objective.

The detailed program can be found in the Bulletins.

The championships were held in accordance with the IOF rules. The competition rules for IOF Foot Orienteering Events from January 2017 applied, with one amendment, the sprint final race took place before the opening ceremony. The amendment was approved by the SEA (Senior Event Advisor).

The purpose of the final report is to summarize the workload involved and to give advice to future organizers based on the experiences that were gained.

2. Programme

The European Championships were accompanied by a number of other events. The complete programme of the week was designed with the following specifications:
- Planning of city competitions on weekends and on holiday to avoid traffic problems
- The best possible spread of events for the athletes
- Long distance as last competition, as this was a tough race, which needed to be followed by a rest day
- Allow the Swiss 5 Days participants to conveniently watch all the WOC finals (except the final departure day).

2.1 EOC 2018

The four required bulletins were issued on time according to IOF Rules.
Bulletin 1, 2 and 3 appeared only as internet version, bulletin 4 also in printed version.
The production of these bulletins (especially bulletins 3+4) required a huge amount of work, but we were aware of this and started always with ahead of time.

372 athletes, representing 33 nations took part at EOC. Details can be found in EOC 2018 bulletin 4.
Compared to previous EOC we reached similar numbers, and this is to be considered a success, as Switzerland is quite expensive and some nations didn't have enough budget to attend WOC and EOC in the same year.
This was the case of Hungary, which decided to not participate to our event.
Other 10 nations were helped financially to allow them to participate by our "EOC foundation", sponsored by Swiss Orienteering Clubs and individual persons in the value of 25'000 CHF.

Start lists and results can be seen on the Internet.

The jury was composed of:
- Jaroslav Kacmarcik, CZE (SQ, SF, MQ)
- David Aleš, CZE (MF, SR, Relay, LF)
- Birgitte Husebye, NOR
- André W. Schöpfer, SUI

In the sprint final there was a complaint by the Ukraine team, as Daniel Hubmann didn't follow the compulsory route over the bridge to the map change, making a major detour returning in his footsteps.
The event director, together with the jury and the advisers, went to the map change site and checked the situation. A tape was partially removed by the TV operator to allow better camera pictures, so the compulsory route was not any more clear. So the event director rejected the complaint.
In the middle qualification there was a complaint from Finland that his athlete had lost 3 minutes because an SI station was fallen down for a while and there was no code on the pole. The complaint was accepted by the event director and the athlete was admitted to the final as the first starter.
Finally in the sprint relay there was a complaint from Poland for their missing punch at the control point just after arena passage. The girl in the first leg claimed to have been in the group and that everyone had seen her correct passage. The video images available from the TV were analyzed, but it was not

possible to confirm her punching. Disqualification was therefore confirmed. No protests. The coach from Poland wrote a mail a couple of weeks after the EOC, to excuse his protest, as his girl admitted later on to have skipped this control...

2.2 EGK Swiss 5 Days event

The planning for the public event was integrated in the EOC 2018 global planning.
The organization had lots of common parts.
Technique, infrastructure, parking, medical service, media and communication, material and transport, were all sectors that took care of both events, EOC and 5-days.
IT was coordinated by one person (Sandro Corsi), but was physically done by two separated teams (Daniel Leibundgut for EOC and Michele Dolfi for 5-days).
Just start and finish team, and the administration team were completely separated.
The 5-days director, Giovanni Furia, was a member of the executive committee of EOC, and his role was to coordinate 5-days specific tasks.

The SEA tried to push initially to have a completely separate organizational structure for the 5-days event. We insisted and finally convinced him, as in that way we could better coordinate things and exploit synergies.
Additionally we already had a positive experience working in this way at the JWOC 2005.

The 5-days event had following deadlines:
- February 2016: flyer n°1
- February 2017: flyer n°2 (with deadlines for registration)
- September 2017: opening of registration
- 18 February 2018 (2.5 months in advance): closing of registration with a reduced entry fee
- 12th April 2018 (one month in advance): closing of registration
- 25th April 2018: publication of start lists and programme.

The first EOC competition weekend we didn't have spectator races yet, however several athletes arrived earlier, in order to assist to the first exciting sprint competition day. We estimated that 500 runners were already in the arena in Mendrisio.
900 runners took part in the first two days of the 5-days competition.
And finally 2200 runners took part in the last three days of the 5-days event.
Thanks to the good weather and the compatible start times, we estimated that the main part of those runners watched the EOC finals. This meant that there was always a lot of audience in the EOC arenas, transmitting great environment and emotions both live and on television.

2.3 sCOOL Cup

On the day of break (Monday) we planned the sCOOL Cup (the annual orienteering event among the schools of the canton), which was emphasized much more than ever, due to the concurrent EOC high level orienteering week.
So this year the sCOOL Cup mobilized 3'000 students (instead of the usual 1000-1200) in a great and joyful challenge in the central park of Lugano.
This event was an important organizational commitment, aimed at arousing even greater attention around the EOCs and expanding the circle of people interested in the event.

3 Organization

3.1 Committee

We had a very simple organisation with one Executive committee, meeting every 2 months starting in April 2015 (after assignment of the event by the IOF). In the last 5 months there was a meeting each month.
The members of this committee were:

- Francesco Guglielmetti — President and event director
- Giovanni Furia — Vice-president – Swiss 5-days
- Stefano Castelli — Technical director
- Claudio Alfieri — Sponsoring
- Daniela Guglielmetti — Administration
- Patrick Rossetti — Finance
- Lorenzo Patocchi — Media and Communication
- Sandro Corsi — IT
- Andrea Ronchetti — Logistic
- Vincenzo Pellegrini — Transport and security
- Alessio Pietra — Secretary
- Hansruedi Walser — Consultant Swiss Orienteering
- Edo Pellandini — Representant ASTI
- Jürg Hellmüller — Representant Swiss Orienteering
- Tulla Spinelli — Chief swiss tecnical advisor

Additionally on paper (because there was never a meeting) we had a "supporting committee" composed by famous personalities of all environments (politic, tourisms, sport, military, spectacle, ...) which gave their commitment to our EOC.

Organization chart: see annexe 1

3.2 Staff

All the 8 orienteering clubs of the canton fully supported this EOC 2018 project, which aimed to organize something unforgettable.
350 collaborators had contributed their time, two thirds of which have given a hand for at least 4 days, and a hundred for the duration of the whole event (10 days).
A total of about 3,200 volunteer days were worked.
The allocation of those volunteers to the various job every day (as the needs were quite variable during the week) was a huge job. We decided to manage this by a simple excel sheet, as the evaluation of other tools showed a lack of flexibility and effectiveness.

In addition to these 350 volunteers, mention should be made of the approximately 35 people hired by the committee to perform particularly specialized tasks that mainly revolved around TV production (in total 600 days). These people were staying in hotels provided by the organization, and they were at least partially compensated for their work onsite.

It is necessary to add, according to the various competition days, from 30 up to a maximum of 50 people from the civil protection (of the four Ticino districts)

that were made available for a total of 450 days for the surveillance of the control points on the ground and for the transport of competitors with their own minibuses (4 days). These guys returned after each competition to their homes.

And then again 30 soldiers, with 4 large trucks, which helped us for a total of about 350 days in the major work of material transport, assembly and disassembly of the arenas, as well as for the health service of the races. At the end of their task the military returned to their accommodation in Cadenazzo, where the whole troop was staying.

	man days before EOC week	man days during EOC week	
Committee	700	100	
Volunteers	700	1700	
Specialists	100	390	
Civil protection	20	430	
Military	15	330	
Total	1535	2950	4485

3.3   Confidentiality and security of data

All volunteers with a possible access to confidential information or data have signed a confidentiality declaration. Strict instructions were given that no confidential information was to be sent by e-mail.
Confidential data was handled via a secure website which had various sections to which persons had selective access according to their tasks. Only the following were given access to the maps and/or the courses:
•   the two SEAs
•   the national controller
•   the event and the technical director
•   the responsible of mapping
•   the course planners (each only to his course)
•   in the last phase:
•   the GPS team responsible, for data preparation
•   the head of the TV production staff

3.4   Event Advisors

IOF Senior Event Advisor: Janos Mannarin (ITA)
Assistant IOF Senior Event Advisor: Olivier Benevello (FRA)
National Controller: Tulla Spinelli (SUI)

A total of 3 visits were taking place on the following dates:
1:   December 2015
2:   May 2017
3:   February 2018
Total: 10 days (excluding presence during EOC week).

The collaboration between the OC and the IOF Event advisors was very good and helpful. The National Controller did also a very great job in the organisation of EOC 2018.
The WOC Organiser's guidelines were a big help, however it's sometimes difficult to understand which rules apply for EOC + World Cup...

3.5   Maps

A total of 10 maps covering a surface of ca 30 km2 were mapped for EOC 2018 competitions and just one for trainings.
Forest maps: Tesserete, Carona, Monte San Giorgio, Capriasca, Isone-Medeglia
City maps: Bellinzona, Mendrisio, Capriasca paese, Riva San Vitale, Comano (training)
Three forest maps have been produced by two professional Swiss map makers (Urs Steiner, Beat Imhof).
The remaining two forest maps were produced by two experience Swiss cartographers (Hanspeter Oswald and Francesco Guglielmetti – the event director).
Three city maps were produced again by Francesco Guglielmetti, and the remaining two by Camilla Moreni, an emerging cartographer, with the final survey of Francesco Guglielmetti.

For the official trainings we used a revised city map (Comano), part of the new Monte San Giorgio map, part of the new forest reserve map, and an existing map (Cademario-Arosio).
This map was not revised recently, and we got several critics by the teams as the objects on the maps were sometimes too small according to IOF norm (in the terrain, and also the symbol on the map), the green was not any more fully up to date.
We definitely underestimated the importance the teams give to those maps, sometimes requesting training maps revised by the same person as the later competition map...

Total costs for the production CHF 71'000
Total costs for printing (maps and races) CHF 17'000
A total of approx 7'000 maps have been printed for EOC races, training, media and spectators, and additional 12'000 maps for the Swiss 5-days event.

EOC 2018 paid all the maps, and got the permission of the local regional federation to use and print them without paying royalties, giving them back the ownership to the Ticino federation (ASTI) after the EOC.

The base maps with contour line intervals every meter, the orthophotos and the vegetation models were bought from the organization by Swisstopo.

Course setters could work in the initial phase with the old maps.
All the maps were ready one year in advance, with the exception of Capriasca (long distance), which was finished in November 2017 (but about 60% of the map was ready one year in advance).
The maps had to be corrected due to the change of the ISOM 2017 rules.
Several maps were viewed by the SEA and ASEA. Discussions were mainly about specific cartography problems of city maps.

All competition maps were also sent in October 2017 for a formal review to Christer Carlsson (chief of IOF map commission), who gave back few considerations:
-    a symbol not used properly on map Capriasca

- several symbols not respecting minimal dimensions (specially rocks) in Carona and Tesserete

There were lot of discussions on map printing (sealed/unsealed, laser/offset). We had lots of experience in using special paper to print orienteering maps used unsealed in all events (big and small). So we had no concern on granting paper robustness and printing quality.
However the used paper is not completely white, but this has no real importance for city maps (which have anyway a high colour coverage) and also for the 1:10'000 maps, which are very well readable anyway.
We had some concerns with the long distance 1:15'000 map, which needed a perfectly printed map, to reach good readability, so we decided to print this map in offset.

We made lot of tests, and invested lots of time, in order to reach the needed print quality by the local typographer, which had no similar experience before. Finally in agreement with the SEA we took the final decision to print all the EOC 2018 competition maps on 120gr Antius paper in offset, except the maps 1:15'000 for the long distance (competition and test map).

All maps were printed in double copy, the long distance in three copies, as one copy was used at a control along the course in case of need of exchange of a damaged map.

Clean maps with courses on it were handed out to the teams, IOF, VIP and to the media as soon as they were released by the Event Advisor.
This rule required that a very large number of maps were printed.

Maps for EOC and Swiss 5-Days Trainings/Model Events:
Comano 1:4'000 Francesco Guglielmetti
Monte San Giorgio Nord, 1:10'000, Beat Imhof
Cima di Medeglia, 1:10'000/1:15'000 Hanspeter Oswald
Cademario-Arosio, 1:10'000 (old map, by Fausto Tettamanti and
Francesco Guglielmetti)
Maps for EOC and Swiss 5-Days courses:
sprint qualification Bellinzona 1:4'000 Francesco Guglielmetti
sprint final Mendrisio 1:4'000 Camilla Moreni
sprint spare map Riva San Vitale 1:4'000 Camilla Moreni
sprint relay Capriasca paese 1:4'000 Francesco Guglielmetti
Monte San Giorgio, 1:10'000, Beat Imhof
Isone-Cima di Medeglia, 1:10'000/1:15'000 Hanspeter Oswald
Map for sCOOL Cup:
Parco Ciani-sCOOL 1:2'000 Caia Maddalena

3.6 Course planning

We had a team of 16 course planners for all the events, having the following tasks (helped by 5 additional persons):
• Course planning for their respective races
• Managing the control equipment
• Setting the courses
• Setting the people watching the controls
• Setting the people watching the traffic in the cities

Competition director: Stefano Castelli
Course setters:
Olivier Minotti   SQ Bellinzona

Andrea Beltraminelli	SQ Bellinzona
Giorgio Bernasconi	SF Mendrisio
Raffaele Crivelli	SF Mendrisio, day 1 Carona
Sergio Cantoreggi	MQ Carona, day 1 Carona
Toncsi Kocsis	day 1 Carona
Vincenzo Jacomella	MF Serpiano, day 2 Serpiano
Gianni Pettinari	MF Serpiano, day 2 Serpiano
Gianni Guglielmetti	SR Capriasca paese
Alessandro Santini	SR Capriasca paese
Pier Brazzola	day 3 Capriasca paese
Giovanni Carbonetti	day 3 Capriasca paese
Federico Tettamanti	Relay Tesserete, day 5 Tesserete
Roberto Tettamanti	Relay Tesserete, day 5 Tesserete
Michele Ren	Long Capriasca, day 4 Capriasca
Stefano Castelli	Long Capriasca, day 4 Capriasca

All the EOC forest courses were tested in May 2017 (exactly one year in advance). The planned EOC running times for each course were surprisingly very well respected. It's not always easy to find suitable test runners, and make accurate pretictions!

Despite having asked to avoid changes in the cities, the course setters of the city races had to cope up to the last minute with surprises (new works on roads, building to be destroyed, trees cut, ...). Keeping those things under control required energy and time, often influencing the normal planning, which caused hurried work.

3.7   Trainings

We didn't offer official training camps.
We offered instead about 8 maps with controls set in the forest and suggested courses, that were sometimes requested by the athletes.
However many teams, groups, single athletes which visited Ticino for training purposes often requested OCAD files in order to prepare own courses.
We provided them all full support (suggestions, printing and sending maps, ...).

Additionally we organized 3 selection races (one sprint, middle and long distance) one month before EOC mainly for the Swiss team, but few other teams and individual athletes joined this event.
As the level of those courses had obviously to be high, there were additional efforts to do, like reviewing two additional maps.

3.8   Accommodations

Most of the teams taking part in the EOC have personally reserved their accommodations.
The organization has made available cheap accommodation (Bellinzona G+S Centre, Savosa Youth Hostel) which have been used by 8 national teams.
Half board was also organized at G+S in Bellinzona, while in the Savosa Hostel the competitors (Ukraine) had the opportunity to cook themselves, saving on costs.
For both structures we received excellent feedback from competitors.
The negotiations for housing the athletes were very demanding.
Up until 2 weeks before the EOCs there was still some small team or single athlete looking for accommodation, we finally settled them all in a convenient way. The basic problem of almost everyone was the price. Several teams had reserved an accommodation in Italy, much less expensive, taking into

consideration much longer journeys, but also risks of long lines and delays, frequent on certain roads in our region.
Finally we were able to convince almost everyone to use housing in Switzerland, offering them important discounts, thanks to the "support fund for poor nations", created for this purpose, which collected over 25,000 francs from various benefactors. Sometimes the discussion with teams and people was very touching, often to take part in competitions they had to pay from their own pockets, and the cost of living in Switzerland was really prohibitive for them.

For the 5-day competitors a list of possible hotels and facilities has been published, and contacts and reservations have been delegated to the tourism office, or to the structures themselves.

Most of our volunteers were staying in their homes, some looked for solutions at convenient and nearby accommodations or friends, while other volunteers (a variable number, but at most thirty, depending on the commitments of the various days) housed in the civil protection under the Cadempino Event Centre. The teams engaged for TV production were staying in a couple of hotels near the competition centre, provided by the organization.

3.9 Event Centre

The Event Centre in Cadempino was really ideal, with rooms available for organizers (work areas, meals and overnight stays) and competitors.
The only problem was the complete reservation of the entire centre for 10 days in a row, although in practice it was only occupied for a few hours a day, with consequent higher costs.

In the Event Centre we had:
- Accreditation and information centre EOC
- Accreditation and information centre 5-days (separated from the other one)
- Accreditation and Media centre
- Meal centre for volunteers
- Offices for the organising committee
- Room for the team leader meetings

3.10 Arenas

The overall concept for EOC 2018 planned to offer spectacular and urban competitions visible to the public.
At the same time, the objective was also to offer challenging and fair competitions.
Based on this concept the most suitable arenas were selected.
TV coverage was planned for all finals and had runners passing through the arena. In all these arenas a large screen was used to display TV coverage and GPS tracking. In addition, results were shown in each arena on two small screens in the spectator area and one additional screen in the coaching area.
The concept for the design of the arenas was to give the spectators a best possible view to see runners live when they were passing through and to follow the course on the large screen.
The final arenas were designed to fit about 2-3'000 spectators and access was free of charge for spectators.
A large VIP-area was built at all the final arenas and a smaller VIP-area at the qualification races.
Access to all the arenas was possible with public transport.

The EOC Event Director and Technical Director were responsible for the design of all the arenas.

This was an huge work, which required continuous verifications and modifications, as soon as the many details become more clear.

Fulfilling the requests of TV production, and considering the requirements of the Swiss 5-days when using the same arena was specially time demanding.

Arena building

The directors for infrastructure were responsible for the set-up as well as the taking-down and the transportation of all arenas.

5 volunteers and 25 members of the Swiss Army were assigned to these tasks. Moving the arena equipment between locations was very hard work.

We tried to duplicate some material, in order to avoid moving to the next arena in short time.

For example the big screen (23 m2, very good quality) was duplicated in the critical days, as the required mount time was 3-4 hours, followed by the time required for tests.

Anyway there were a couple of arena moves which were quite challenging for the whole organising committee....

The logistics of moving the equipment between the locations was a very demanding task and it is important to have sufficient resources available for these operations.

Bellinzona (sprint qualification)

This was an area with a reduced infrastructure. The arena was built in the central city square with no big screen, a reduced VIP and media area and a small drink and food stand.

Mendrisio (sprint final)

A big arena was built in the park of Villa Argentina with TV production, a large screen, a big VIP-area, and a drink and food stand in collaboration with a local restaurant.

The media centre was in the Villa Argentina.

This arena was also used for the opening ceremony and the prize giving ceremony.

Carona (middle qualification)

The arena was quite small, near the historical Church Madonna d'Ongero, in the middle of the wood.

There was a reduced infrastructure with tents for athletes, no big screen, a reduced VIP and media area, no food nor drinks (except athlete's refreshment). However from the arena the competitors could return after the race in the quarantine placed in the swimming pool area, with all facilities (shower, food and drinks, ...).

The arena (finish area) was used both for the Swiss 5 Days race as well as for EOC race.

Serpiano (middle final)

A big arena was built in one open field with a big tent for catering and lot of small tents for athletes and various services. Additionally, there was TV production, a large screen, a big VIP and media area, and a big parking area in the field.

Building this arena was the biggest challenge of the EOC week as the access to this location was very difficult. Mobile and internet coverage was also very poor up there, and an additional antenna had to be built.

The arena (finish area) was used both for the Swiss 5 Days race as well as for EOC race (including prize giving ceremony).

Tesserete (sprint relay)

A big area was built in the court of the primary school, with TV production, a large screen, a big VIP-area, and a drink and food stand. The media centre was in the school itself.

This arena was also used for the prize giving ceremonies (middle and sprint relay).

The 5-days competition centre was placed near the arena, however the finish was more distant.

Vaglio (relay)

A big arena was built in one open field, about 700 m from the arena Tesserete, where almost all infrastructure was still present. In particular parking was in Tesserete, and spectators and athletes had to walk to the arena.

So just a small tent for catering was set-up in the arena, plus lots of small tents for athletes and various services. Additionally there was TV production with a camera moving on a high cable, a large screen, a big VIP and media area.

The arena was used for the prize giving ceremony.

Tesserete (long distance)

Same arena as for the sprint relay.

3.11 Anti -Doping

Anti-doping testing was conducted under the auspices of the Swiss Anti-Doping Agency.

Tests were carried out on two different days:
- At the middle final in Serpiano 19.05.2018 (4 people tested)
- At the sprint relay in Tesserete 20.5.2018 (2 people tested)

For the middle, the tests were under a simple tent in the field, with one dedicated WC.

For the sprint relay there was a room in the school with dedicated WC.

3.12 Safety, Security and First Aid

Safety

An emergency plan was set up by the EOC 2018 organising committee. Fortunately we didn't need to use it...

Traffic in competition areas

The access to the sprint competition areas was strictly controlled, to avoid almost all traffic circulation. In Bellinzona and especially in Mendrisio the local police helped a lot, placing signposts and fences and watching with its own personnel.

Site surveillance

This task was outsourced to the Security Agency SECURITAS, engaged to watch on the sites:
- Camping at the Event Centre (24 hours a day)
- Arena and TV infrastructures (the last night before the race, where almost everything was already set-up)

First Aid

During all the events there were medical services in the arenas and, where necessary (long distances races), in a chosen locations in the forest.
A first aid unit was present on each competition site (EOC & Swiss 5 Days), staffed by 1 doctor, 2 first aiders and 5-6 soldiers of the Swiss Army medical team.
There was a special radio channel foreseen for first aid communications.
A total of 72 interventions had been provided during the EOC week, one person was evacuated to the hospital.
There were no serious accidents in the EOC events.
The Swiss Army personal was not familiar with orienteering and was therefore not always helpful...

3.13 Transport and Parking

In general the EOC athletes moved independently by cars to the races.
No one requested our collaboration to reach Ticino or, during the EOC week, the competition areas.
We are aware of very few single athletes that joined other teams staying at the same accommodation, in order to reach the competition areas.
Swiss 5 Days participants and spectators was encouraged to reach the arenas with public transports whenever possible.

Public transport
A very high percentage (40%!) of athletes of the 5-days reached the Ticino and the places of competition by public transport. This is mainly due to the predictable traffic jams along the San Gottardo axis during the long Ascension weekend.
However, this caused a lot of organizational work, to reinforce the public transport, which notoriously in Ticino is not very efficient (running only every hour, on holidays even less, and not early enough).
After publication of the start lists, we urged the athletes to communicate (through a special form on the site) with which bus they intended to reach the races. It must be acknowledged that the appeal launched was well received and the overwhelming majority cooperated with the intention of securing a place on public transport.
Thanks to the collaboration with Postbus and ARL, we have sized the single bus schedules in such a way as to be able to transport all the competitors. We arranged also a couple of additional vans with own drivers to manage exceptional events... We have received countless thanks from the competitors for the excellent service.

Signposting
All road signs had the same basic design, onto which were added specific indications to differentiate clearly between the different destinations and between EOC and Swiss 5 Days.
The signposting was operated by two volunteers.

Parking
The base strategy was to give some priority to EOC people, VIP and media (with closer parking slots) and later to Swiss 5 Days people and spectators.
This was not always possible, because of the different arrival times, and also we were forced to keep some spare parking slots for EOC people when their races were after the Swiss 5-days races.
In Carona the parking slots were very limited, and the traffic flow crossed the passing of athletes. This required special attention in order to grant traffic fluidity.

In Tesserete, with many more participants, we were aware that the parking would be difficult. And in fact the first day we had some queues accessing the parking, due also to the high local traffic on the roads.
Parking was under the responsibility of our parking team (from 8 to 12 persons, depending on the day).
In Tesserete 3 people from Securitas helped as well.

Athletes' transport
For three races (middle quali, middle final, long final) the EOC athletes were then transported from quarantine to the start with civil protection vehicles.
Each time the transport was ca 4 to 6 km, transport frequency was carefully planned (see also bulletins).
The most critical day was the middle qualification, which required 15 vehicles (minibuses for 8+1 persons), as all athletes (and coaches) started very close.
Transport of coaches was separat from athletes' transport, because we were not aware of coaches time requirements. Thus we had two minibuses allocated only for them, starting at variable times (mainly when almost full...).
The transport was efficient and very timely, well calculated on time.

One day (4th leg) of the Swiss 5-days we used the same vehicles from the civil protection to transport children (up to 11 years old) and old people (from 70 years), so that their walking time to the start was reduced from 45-50 minutes to 15-20 minutes.

Volunteers transport
Some volunteers used public transport, but most were organized themselves in small groups, on the insistent appeal of the organizing committee, to rationalize the number of vehicles and not to overload the parking lots, in some very limited days.
It worked well, we have sometimes provided special parking in private areas, where we tried to "pile up" the organizers' cars ...

Media transport
Only for the long distance we organized a transport for media to a TV control after about 1/3 of the course. This was done as, in this special case, photographers had the opportunity to take some pictures and return back to the finish area to see the final part of the course.
In all other cases there was a control point in walking distance where photographers could go and come back independently.

3.14 Secretariat

We engaged a young man 9 months before EOC to help in administrative tasks. This was initially a 30-50% job and in the last 3-4 months a 100% job.
His initial tasks was to be the central contact for EOC and to become aware of all processes and wht's going on. But his main activity was the management of the volunteers (principally job assignment, but also organization of mealplans, transport and accommodation). This was a particularly time consuming task.
Immediately prior to EOC the secretariat prepared the accreditation badges.
During the EOC, 4-5 volunteers were working in the secretariat for the various reception needs
and to accomplish the very many unplanned tasks that had to be solved.

3.15 Accreditation

For the registration and accreditation procedure IOF Eventor was used, as required by IOF.

All people receiving an accreditation (teams, staff, guests, media) could enter the details online.
At the end we exported the data (and also the photo, if available) from Eventor.

We prepared a special accreditation form for media people, which was sent to all known media people (we picked up several address lists).
This way we got more than 60 people registered (instead of the 4 in Eventor).

Additionally we prepared a list of all VIPs invited every day and a list with all volunteers (mostly without photo Just the responsible staff or people belonging to guest/VIP services had a photo.

With all those lists we prepared the various badges (athletes, coaches, staff, VIP+guests, media) to grant access to the different services. The volunteers list had special fields for meals during their working days.
We printed also empty badges (without names), which were used in case of new needs.
During the week we didn't had an equipment to produce badges in real time (we just organized 3-4 new badges of athletes and coaches, otherwise just filled up empty badges with names…).

3.16 IOF Eventor

This tool was used by the team to enter the names and assign them to the races.
Apparently this step worked well, the teams managed this easily.
Just one team who made the accreditation and forgot the assignment to the courses.
When the first entry deadline was over, the problems began.
The financial management of IOF Eventor is unusable.
It' is much better to make own forms and calculations (and this is OK, we don't expect Eventor to do this…).
But beyond that, several teams didn't pay on time, so when they looked to Eventor for the payment information, the tool indicated the increased entry fees, and they paid too much, causing additional work to the organizers.
There were few changes after the deadline and it seems that there was no possibility to do them online (or they didn't know how to…), so the teams asked us to make modifications. And we always forwarded the requests to Daniel Leibundgut or Henrik Skoglund.
But the bigger problems were later, in the EOC week, when we had time constraints to prepare the start lists….
The teams had to confirm the runners and insert the starting groups (early, middle, late).
Several teams were not able to do this in Eventor, and asked us for help via Email or phone.
We had often to call and remind the teams to do this job. In some cases where we didn't get responses, we assigned the groups ourselves.
The management of the last minute changes were also made by hand and not via Eventor.
In summary, the tool seems to have some limitations, to be too complicated and needs further improvements.

3.17 Ceremonies

The opening ceremony was held in Mendrisio before the prize giving of the first final course, the sprint.
We didn't had a team's parade, just a band playing 3 pieces between the usual speeches (politician, IOF, event director).

The whole ceremony lasted 20 minutes, and was followed by the flower and medal ceremony of the sprint event (only for women, because pending of complaint for the men's course).

The flower ceremonies were held in the arenas immediately after each event.

The medal ceremonies for middle and sprint relay were held in the Arena Tesserete after the sprint relay race. In addition the medal ceremony was held for the men sprint (due to the complaint).
The medal ceremonies for the relay and long distance were held again in the Arena Tesserete after the last competition (long distance) and were followed by the closing ceremony, where again the IOF and one politician had their short speeches. No handover of the IOF flag took place.

3.18 Side events

On Thursday evening a dinner was organized in the big tent in Tesserete, followed by an evening animated by the famous local singer Sebalter, addressed to the orienteering people but also to the local population, who had largely taken advantage of it, flocking to in masses.
Finally, as tradition, the final event (banquet) for the EOC runners, that has been organized at Splash & Spa in Rivera (dinner, pool / SPA, disco), an event that surprised the approx. 200 participants for its intended originality.
The VIP and Media race took also place on Friday, with the participation of around 50 persons.
The sCOOL Cup can also be considered a side event, in this case a big one, because of the high engagement of approx. 80 volunteers and the high target numbers of 3000 school children.

3.19 Sustainability measures

Orienteering is a magnificent sport and its « playground » is nature. In order for orienteering to survive, we need to respect her and the environment.
This is the reason the EOC Organising Committee in the planning phase had adopted several measures to organise an event which respects sustainable development.

From the point of view of course setting:
• All the sensitive areas in the terrain were avoided and the courses had the approval of the environmental regulatory authorities.

From the point of view of mobility, as mentioned before, it was achieved by:
• Promoting closer accommodation for EOC teams to reduce travel
• Promoting the use of public transport to reach Ticino and for travelling to the various races for all 5-day competitions (and the result of 40%, for Ticino is to be considered exceptional)
• Promoting and coordinating car pooling for EOC and 5-day employees
• Detailed planning of the material needed for the various arenas, in order to minimize the displacements and transports
• Offering special tickets for public transport at a fixed price for the participants of the sCOOL Cup (3000 in total), used by as many as 1600 students (of which 600 others came from the city of Lugano and arrived with city buses).

From the point of view of catering, there have been many discussions before making final decisions. We wanted to do more, but the fact of having to

constantly move the arenas every day, but especially the fact of having some arenas without adequate infrastructure (practically in the meadows ...) forced us to partially resize the measures, and to cancel some small project that seemed exciting on paper, but after careful analysis proved to be difficult to do (the costs were not so much the blocking factor, but the staff commitment).
Among the measures taken, it should be mentioned that:

- Supply of food and drinks possibly at zero km (from local suppliers)
- Use of ecological disposable tableware
- Waiver of the use of ALU cans and glass bottles (except in the VIP area, with the service of drinks managed by our responsible staff) with consequent limitation of waste to only two types (PET and the rest). This time the separation of trash has worked quite well, because previous experiences have shown that too much differentiation is not adequately respected, especially by foreigners who are used to other habits
- Wherever possible, distribution of PET bottles for refreshment after the race (EOC + 5-days event), eliminating large volumes of paper cups
- Display of all start list and ranking list on screens, without printing them on paper (except for VIP and media), causing an important reduction in the number of printed pages!

The department for environment and sustainability of the Swiss Olympic Association attested to the organisers that they reached all the desired objectives.

3.20 Hosting VIP and Guests

A total of seven receptions on seven different sites were organised during the EOC week.
The access was controlled by a badge, that could be picked up at the entrance of the stand.
VIP Hosting was provided in all the arenas of the finals.
Depending on the day, we had from 50 to 150 guests in the VIP area.
A reduced VIP service was provided for the two qualification events in Bellinzona and Carona (we had only ca 30 guests each day).
The VIP service was managed by 4-6 volunteers which could count on the support of the catering team for some food supplies.

3.21 Catering

Athletes:
Most of the teams took care of their own meal plans or in agreement with the hotels they stayed in.
Those staying in the structures offered by the organization (centre G + S in Bellinzona) had breakfast and dinner included in the price of the accommodation.
For the lunches during the EOC competition days the organization offered a hot meal at a very favourable price. Some teams have used and appreciated this offer.
Depending on the times of the competitions, a more or less expanded catering was organized for competitors and volunteers. This involved a considerable amount of up to 60 employees, to offer meals for over 2,500 people on crucial days.
The variety of food and the quality has been highly praised by everyone. A good service that creates a lot of work but in the end also brings important financial benefits (also because the costs for meals of our volunteers are very cheap).

Volunteers:
Breakfast and dinner were organized at the Event Centre by one of our kitchen-teams, at very flexible hours. Employees who had very busy work schedules and did not (or only late) returned to their homes, as well as all the teams engaged in the TV production (apart from breakfast, which they took in the hotel) took advantage of this service.

On Thursday evening all the employees were invited to dine at the expense of the organization for the evening at Tesserete with the singer Sebalter.

The days when they were busy at work, the employees were entitled to a meal at our buvette. For those who were busy in the field or in other places, a picnic was organized that was delivered to them.

The organization was also responsible for feeding army personnel and civil protection people during the hours of their engagement. Again, people were often stationed outside, so a picnic was prepared.

4 Information Technology

4.1 Entries

All entries, including changes, were handled directly by the teams using Eventor on the IOF web page. Sometimes help by our specialists was requested by the teams...

4.2 Timekeeping

The exact same timekeeping setup was used on all competitions.

- SIAC
  - All competitors received a personally assigned SIAC (SPORTident ActiveCard) to be used for all the competitions. The use of personal SIACs was not allowed.
  - The SIACs were part of the material handed over to the team officials upon arrival. They were returned by the team officials to the EOC-info after the last race.
  - Reserve SIACs were ready both at the quarantine and at the start.
  - SIAC battery level check units were available in the quarantine and at the pre-start.
- Pre-Start
  - At the entrance to the pre-start an EOC official checked both the SIAC number and the battery level
  - Spare SIACs were available in case of number mismatch or low battery.
  - Some competitors had to replace the SIAC (wrong number), especially in the first competitions. The new number was immediately communicated via radio to the timekeeping team.
  - No SIAC had a low battery
- Start
  - No gate and no SPORTident START unit was used.
  - The EOC start official put a hand on the map and one on the competitor's shoulder, until the start time.
  - A big digital clock with beep sound was well visible to the starting competitor.
  - A GoPro video camera recorded the starts.
    No false start has been reported, and thus the recordings were not used.
- Finish
  - The finish time was taken using SI-Air+ with the SPORTident BS-11 and the loop antenna.
  - The antenna was covered with a rubber mat, and the borders taped to the ground. No competitor stumbled, fell or had any other inconvenience because of the rubber mat.
  - The BS-11 was configured in "radio mode", i.e. instructing the SIAC to emit its data. This data was captured by SRR dongles a few meters after the finish line.
  - The SRR dongles were connected to the RACOM radio modems and the data was thus immediately transmitted to the evaluation software on the server, which sent it on to the TV (stopping the overlay time).
  - The initial set of a single SRR dongle showed problematic and not all finish times were transmitted. Two SRR dongles, one on each side of

the finish lane, slightly offset and with an angle of 90 degrees to each other, solved the problem.

- o In the Quali Middle arena in Carona the SRR dongles lost data packets, probably due to interference from the WiFi antennas (both working at 2.4 GHz) or (less likely) from the media tent that was much closer to the finish line than in other arenas.
- o In Bellinzona, at the sprint qualification race, the finish was on the roof top of the car parking and thus on reinforced concrete ground, which knowingly reduces the vertical range of the loop antenna. To guarantee the range is high enough also for tall runners crossing the finish line with their arms stretched over the head, the antenna was extended in a U-shape up the two pillars on both sides of the finish line.

- SI-Card Readout
  - o SI-Card readout was done immediately after the finish, i.e. within few seconds (< 1') after finishing the race.
  - o EOC Officials did the readout for those competitors who were too exhausted to go to the read-out, making sure to minimize the time between finish and read-out.
  - o Read-out was done using the OR-Ware software.
  - o Split times were printed on a 72mm strip of thermal paper and given to the competitors.
  - o The read-out data and the control evaluation results were immediately forwarded to the server.
  - o In relay competitions, the SIACs were read-out twice, once in OR-Ware and once in OL-Staffel, because of the Eventor integration with OL-Staffel.

- Secondary Timekeeping System
  - o A camera was mounted on a tripod placed on the finish line.
  - o The camera was pointed in the direction of the finish line, i.e. perpendicular to the running direction of the competitors.
  - o No frontal camera was used.
  - o A two-lenses light beam system was mounted on the finish line and connected to the camera
  - o The camera continuously recorded, but only saved the video when triggered by the light beam system. Each video included 5" before to 8" after the trigger.
  - o The video monitor and controlling PC were mounted inside the VAN of the EOC server team.
  - o The server team used the videos to find missing finish times as identified during SIAC read-out.
  - o In cases where the competitor could not be easily identified, the server team used the manual timekeeping data to find the correct video.

- Manual Timekeeping
  - o On the finish line, a Chronoprinter was used to record the time of each competitor.
  - o The Chronoprinter was triggered by pressing a button on a stick. An EOC official sat on the finish line just outside the finish lane and had a free sight on the finish area.
  - o The Chronoprinter printed the time and a sequential ID
  - o Another EOC official wrote the ID and the competitor's bib number on a paper form.

- o Additional EOC officials helped make sure the bib number and ID were correctly recorded, and multiple times recorded by mistake by the Chronoprinter were identified.
- o The manual timekeeping was used once during the EOC to restore a finish time lost by a wrong manipulation in the OR-Ware software.

4.3   Radio controls

Radio controls were used for
- Finish times (to stop the overlay time on TV when the competitor crosses the finish line)
- TV controls (to stop the overlay time on TV when the competitor punches)
- Pre-warnings (to warn TV crew or arena speakers that a competitor is arriving).
  These are usually the control preceding a TV control, the control before the arena passage, or the last control (or second last, depending on distance).
- Intermediate split times on the live online results.

Two types of radio controls were used.
- RACOM
  - o These radio modems are very fast but heavy, bulky, and therefore harder to install in the forest.
  - o Preliminary surveys were conducted to ensure good signal reception and identify locations requiring additional relay controls.
  - o RACOM modems were used at all the TV controls and at the finish (all with the SRR dongle)
  - o They were also used as pre-warning where the GSM signal was poor or absent as well as in the sprint races, where fast responses are required, and the installation was not a problem

- SPORTident SIGSM-DN
  - o This GSM modem is very light and easy to install.
  - o It requires GSM (mobile phone) coverage, and could therefore not be used everywhere (at the long competition we lost most of the pre-warnings because the GSM signal decreased in strength during the day)
  - o This devices were used only as pre-warnings as they are slower than the RACOM (the data is first sent to a SPORTident server before reaching the EOC server).

Number of radio controls per race:

Competition	RACOM	GSM
Sprint Quali	3	-
Sprint Final	5	5
Middle Quali	5	-
Middle Final	8	-
Sprint Relay	5	2
Relay	6	3
Long	6	2

4.4 Results

The goal was a paperless display of the results

- Arena and TV speakers had PCs connected directly to the local EOC server and they had the results shown using the OOIS system
- The EOC-server immediately uploaded the incoming times to the internet, where the results were visible online to everybody.
- The online results were shown in the arena on four 55" screens (two equal sets with one for women, and one for men classes), with auto-scrolling panes. The screens fetched the new results every few minutes directly from the internet server, although a dedicated local server was in place as well.
- Two 42" screens (same system as above) were placed in the competitors' area (coaching zone).
- A spare screen, when available, was setup in the media center as well.
- The screens showed also the start times
- A single copy of printed results was used after the race and hung up in the competitors' area close to the screens. The complain time started when the paper copy was published.

4.5 WiFi networks

In many arenas there was no GSM (mobile phone) coverage. A number of special WiFi networks covered the connectivity requirements.

- WiFi Media
  - This network had internet access initially, but the first morning at the Sprint Qualification some users downloaded several GB of data (probably watching videos).
    The users were identified and warned.
  - The bandwidth for this network has been limited and constantly monitored.
  - In some arenas during the competition hours the internet access of this network was blocked
- WiFi IT
  - This network, accessible only to selected members of the IT staff, had full internet access with no limitations
- WiFi TV
  - This network was only used by the TV screens to fetch the results either from the local server or from the server on the internet.
- WiFi Public
  - In addition to the online live results and the 12 TV screens in the arena (4 for EOC races and 8 for the 5-days races), this WiFi network allowed access to the live results on the user's own devices without the high additional costs of the Swiss roaming fees.
  - The WiFi Public network covered the main spectator spaces in the arenas, including the food court tent in the Tesserete arena. It gave access only to the live results of both EOC and 5-days, but not to the internet.
  - Accessing the WiFi automatically opened the landing page on the local server, which had its own DNS server to prevent internet accesses. The local server refreshed its cache fetching the results from the internet every few minutes. The application running on the local server was the same as the online internet server, so the display of the results was identical.
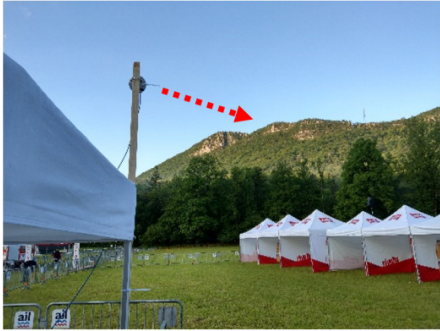
- Four Ubiquity mesh antennas were used, two connected via cable to the net, two pure network extenders.

4.6 Network

In every arena a fast internet access was provided to all the involved parties.

Competition	Place	ADSL provider
Sprint Quali	Bellinzona	Network provided by the town
Sprint Final	Mendrisio	Network provided by the university
Middle Quali	Carona	Finish area: Network provided by a private company in Barbengo and brought to Carona via two network bridges - from Barbengo to cliff (~1.5km, 250m up) - from cliff to finish area (~100m) Food court / showers area: WiFi networks provided by the town (swimming pool)
Middle Final	Serpiano	Network provided by the university in Mendrisio, brought to Serpiano via two network bridges: - from Mendrisio to a mountain top (~4.5km, ~500m up) - from the mountain top down to arena (~800m, ~300m down) Antenna in arena pointing to network bridge on mountain top
Sprint Relay	Tesserete	Network provided by the town (school)
Relay	Vaglio	Network provided by the town (school), and brought to Vaglio via ~1km optic fibre cable installed by the TV crew (TPC) DHCP server broke down shortly before the race and had to be replaced by our own infrastructure.
Long	Tesserete	Network provided by the town (school)

- The infrastructure was rented from and preconfigured by Infrared SA, Rivera.
- The network bridges were made with four Hiperlan directional antennas.
  - They were so easy to setup that they were also used in Tesserete to connect the more remote Ubiquity repeaters without the need to lay long cables (~100m)
- A firewall protected the EOC network from the internet

- A switch managed several separate EOC networks, applying traffic shaping where required.
- The networks were:
  - EOC TV + Timekeeping
    - The central switch had a single, cabled connection to the TV team.
    - The TV team distributed the network via copper or optic fibre cable to the other parties in this net.
    - It served all the machines directly related to timekeeping and TV:
      - Timekeeping / result processing
        - This network was additionally decoupled by a separate router / PC with two network cards.
      - radio control handling
      - arena and TV speakers
      - GPS Team
      - TV graphic overlay
      - TV direction
      - Mega-screen in the arena
  - EOC Media
    - Cabled network for the EOC team's real-time tweets
    - Cabled network for the EOC internal journalists and photographers
    - Cabled network for (one) selected external journalist with high network requirements
  - WIFI Networks
    - See separate description
  - Streaming
    - During live TV broadcast, streaming was done by SRG directly.
    - The other races were streamed from the arena.
  - 5-days spectator races
    - The spectator races were handled by a completely separate team with its own infrastructure
    - In most arenas the internet connection was provided by a SIM/GSM based router dedicated to 5-days.
    - In Carona and Serpiano, where no GSM signal was available, the internet connection was provided by the EOC infrastructure, with a subnet dedicated to 5-days.

4.7 GPS Tracking

- Usage
  - GPS Tracking was used in all races except the Sprint Qualification, which took place just a few hours before the Sprint Finals, with a challenge to collect and redistribute the trackers on time as well as guaranteeing a sufficiently charged battery.
  - All EOC participants received a GPS Tracking vest as a present. This was appreciated by the athletes, and guaranteed that all had a vest, with no need to distribute, collect, wash and dry the vests between races.
  - The list of the 110 runners with a GPS tracker assigned were published and available in the quarantine.
- LoRa Trackers
  - All the race areas suffered from poor GSM coverage, making the traditional 2G-GSM-based trackers practically unusable.
  - This was true even in urban areas like Mendrisio and Tesserete, mainly because of the narrow streets in the old town centers.

- o The EOC team created new tracker devices based on the LoRa technology.
  The involved parties were
    - Gimasi, Mendrisio: Hardware
    - Cryms, Lamone: Software
    - Swisscom, Zurich: Antennas, Gateways, Net connectivity
- o The LoRa Trackers were compatible with the GSM Trackers. Both the GPS team manipulating the tracks for the TV and megascreen, as well as the public following the races from home used the well-known, unchanged GPSSeuranta/tulospalvelu.fi system.
- • LoRa Technology
  - o LoRa has legal limitations on the amount on the bandwidth that any one user is allowed to use (called *duty cycle*).
  - o The amount of used bandwidth depends on the connection speed (called *spread factor* with values from 7 to 12). The faster the connection, the lower the number and the less bandwidth is used. Swisscom limited our devices to only use spread factors 7-9, ensuring not to consume bandwidth in areas with no or poor connection.
  - o An advanced algorithm allowed the device to sample the position every 3 seconds and send three positions as a packet. Messages were sent every 8 seconds, containing up to five packets (but usually just a single packet), not breaking the duty cycle.
  - o The devices sent the messages using "fire-and-forget", i.e. with no feedback from the server that the message arrived.
  - o LoRa automatically assigns a sequential ID to each message, which was used by the server to detect missing packets.
  - o Even in "fire-and-forget" mode, LoRa devices are in receive mode for a few seconds after transmission. The server sent a message with the IDs of the missing packets to the device, which sent them in the payload of the next message(s).
  - o Missing packets were usually resent relatively quickly, meaning the uncovered areas were generally small.
- • Gateways
  - o LoRa trackers sent the position to LoRa Gateways (antennas positioned in the forest where GSM was available). LoRa Gateways sent the position on to Swisscom (via GSM), which sent them on to Cryms, where the data was decoded, transformed and forwarded to GPSSeuranta
  - o Many race areas were already covered by the existing Swisscom infrastructure. Swisscom additionally upgraded two antennas to also support the LoRa protocol.
  - o Swisscom lent us 12 Gateways
    - a large one used in the finish area, with 220V power (or POE), outdoor model, with larger antenna attached through a 1m cable, GSM 4G or Ethernet.
    - 11 small ones, indoor models, with antennas attached directly to the gateway, GSM 4G (one was 3G). Power was provided by 12V motorbike batteries.
  - o Indoor gateways were attached to wooden poles ~3m high, inside a plastic box with the opening towards the ground, acting as umbrella in case of rain. The gateways were mounted upside-down with the antennas extending out from the bottom of the box.
  - o The gateways required at least GSM with 3G quality. Below 3G they were very slow and unreliable.

- o The best position of many gateways has been identified during (long) survey days and test races. The remaining antennas were positioned based on the experience gained and verified by Swisscom with simulators. The outcome of the simulator was visualized on Google Earth (along with the orienteering map), to make sure all relevant areas were covered by the LoRa signal.
- o The overlap between the areas covered by each gateway allowed one broken gateway to go unnoticed for the full week (i.e. there were no large uncovered areas).
- o Positioning a single gateway took about 15 minutes. Most of the time was waiting for the GSM signal (we introduced LoRa because of poor GSM signals after all…).
- o Gateways were installed in the forest (usually on hill tops, where GSM was still available). Some gateways were installed on the opposite side of the valley, up to a couple of km from the competition ground. In the picture the race area were the two hills in the background.

- o In Serpiano three gateways were installed on the mountain ridge, in the area of the internet bridge, where GSM signal was available. In the finish area, three gateways were positioned close to installations that had internet connectivity, with ethernet cables up to 96m.
- Distribution
  - o GPS Trackers were given to the athletes at the prestart, where the trackers were turned on and checked for correct connectivity using an online verification tool. During the week, a couple of trackers had to be replaced at the prestart.
  - o The GPS Trackers were collected after the finish line (before the refreshment). They were connected (via USB) to a PC to download all data both to provide possible missing data to the GPS team, as well as for backup.

4.8 Printing

CHC Business Solutions provided:
- 2 large printers, A4, double sided, color, copier, ethernet (no WiFi)
  - o Both were installed in the event center in Cadempino
  - o 2 printers in order to minimize the risk of failure and the need for support.
- 5 smaller, "portable", A4, single sided, color printers, ethernet (no WiFi)
  - o 1 was installed in the IT room in the event center in Cadempino
  - o 1 was installed in the truck of the EOC timekeeping
  - o 1 was installed in the media tent
  - o 1 was used by the 5-days timekeeping team
  - o 1 was used by the IT team in the competition areas (was meant as reserve printer in case of problems).
- 20'000 sheets of paper. Most of the paper was not used as the competition was mainly paperless.

4.9 Staff

The IT staff was divided in several groups, but not all team members were present every day.
In *italic* the teams mainly composed of external professionals.

Sector	Team	Daily	Total
Network		5	6
Tracking			24
	Radio controls (only)	3	3
	LoRa GW (and Radio controls, on demand)	6-8	9
	GPS data	3-4	5
	LoRa Trackers distribution	2	3
	LoRa Trackers collection	2	4
Timekeeping			23
	Server	3-4	4
	SIAC Read-out	2-3	3
	Finish line (secondary and manual timekeeping, …)	5-6	11
	Refreshment	2	4
	TV graphic overlay	1	1
5-days		6-7	9
TOTAL		40-47	62

5 Communication

5.1 Early steps

First step of communication team was to set up a list of intent for EOC2018 general communication:
- Promote orienteering knowledge and awareness in Ticino (particularly) and in Switzerland (generally).
- Demonstrate the ability to organize quality and technical top level orienteering event.
- Get local and national media attention on orienteering.
- Attract (sport) public from Europe.

Every action of the communication team was related to one or more of those points.

Setup of main communication channels:
- Drop Box for internal communication and Organizing team protected document sharing
- Email mailboxes
- Website managed with a Content Management System CMS (Magnolia)
- Facebook, Instagram, Twitter, Youtube social media channels
- LinkedIn for volunteers
- Document templates

5.2 Draft schedule of communication actions
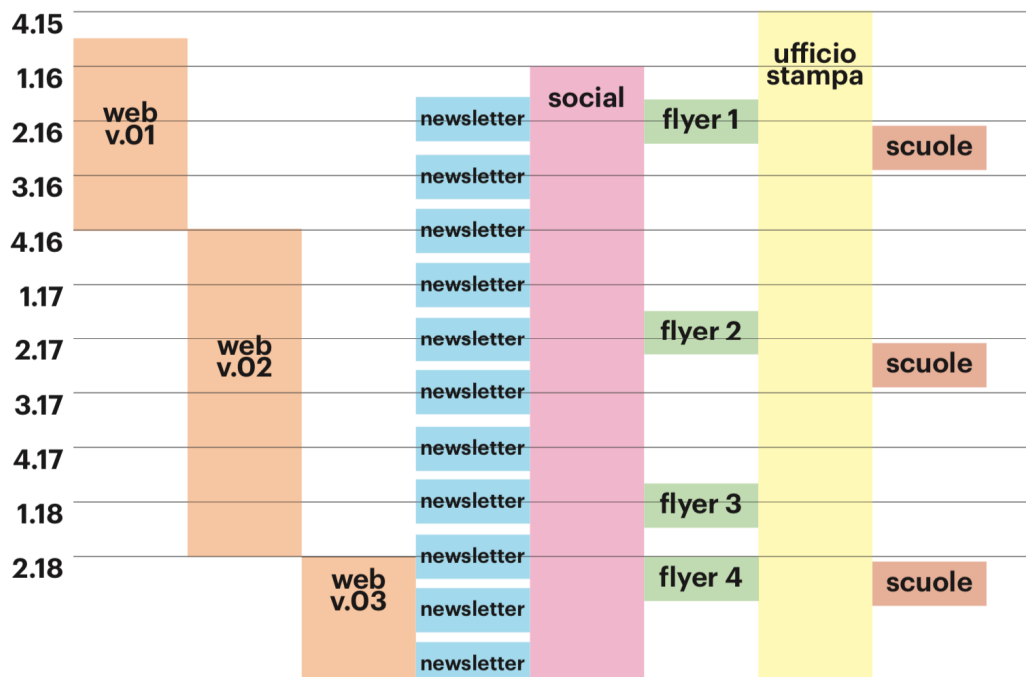
5.3 Brand

Since very beginning the communication team was looking for a disruptive way of communication under every aspect: logo should not contain orienteering elements, base concepts should not follow orienteering stereotypes, TV spot should not show only running people, commenting on socials doesn't require orienteering top level knowledge, etc.

The chosen logo is composed by 3 elements that may look like to orienteering elements but in fact they are not, instigating interest and attention to orienteers.

Every use of the logo: gadget, layout, print, poster, tv, ranking, website, postcard, flag, video, etc. has been carefully checked against the art director Paolo Jannuzzi to maintain a common and unique corporate identity among all the media.

European Orienteering Championship Ticino Switzerland 2018

5.4 Marketing

We identified the following categories of possible target.
- Internal Organisation Committee (website, branding, info and equipment)
- Local orienteers as potential volunteers
- EOC athletes
- Potential 5 days participants
- Spectators or general public

For each target audience we identified a wish list of activities or actions to be taken.

Based on the possibilities the Organization Committee decided to either go ahead or drop the action. The decision to continue was based on a feasibility assessment considering some of the influencing factors such as finances, partners, as well as workload.

Some proposals came from the sponsors themselves.

Realized projects
- 3'000 Flyers to distribute at international events (2 years before)
- 4'000 new Flyers to distribute at international events (1 year before)
- 50 car stickers for EOC staff (1.5 years before)
- Clothes for organizing committee (1.5 years before)
- 200 USB Keys for VIP and guests (1.5 years before)
- 400 post-it for VIP and guests (1.5 years before)
- 100 swiss army knives for VIP and guests (1.5 years before)
- 200 sturdy bags for different purposes (1.5 years before)
- Contest on WorldofO to win Swiss-5-days starting places
- 150 T-shirt for early announced volunteers (starting 1 year before)
- 500 Orienteering 2018 calendars (to be distributed in Ticino, 6 months before)
- 2000 ecological bags for different purposes (6 months before)
- 100 EOC big posters for media conferences, ,marketing campaign on billboards and for selling (3 months before)
- 500 EOC small posters distributed in stores, bar, restaurants, shops, in the cities of the courses (3 months before)
- 40'000 table sets for the restaurants in Ticino (2 months before)

- 25 EOC banners set up in the cities of the courses and along strong traffic roads (3 weeks before)
- 1000 post cards with athletes images, for spectators (1 month before)
- TV spots on the local TV stations (starting 1 month before)
- Several spots on a regional radio station (last month)
- 700 T-shirts and 350 K-ways for the volunteers
- 350 GPS vests for EOC athletes (very appreciated)
- printing stand for merchandising (done by an external enterprise, only the 3 most populated days of the week...)
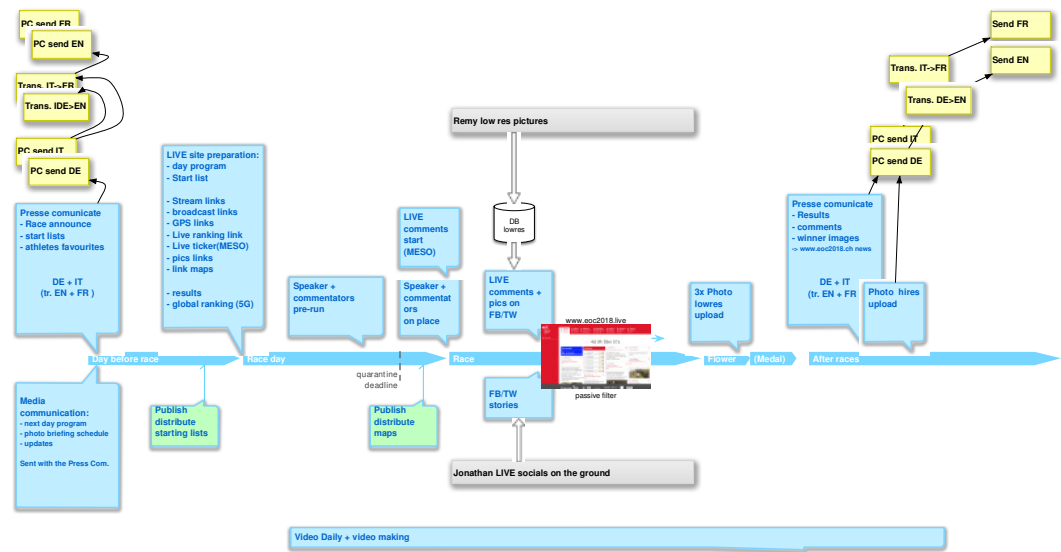
Banner 3m x 1m

Poster F4

5.5 General information flow

PC send FR
PC send EN
Trans. IT->FR
Trans. IDE>EN
PC send IT
PC send DE

Presse comunicate
- Race announce
- start lists
- athletes favourites

DE + IT
(tr. EN + FR)

LIVE site preparation:
- day program
- Start list

- Stream links
- broadcast links
- GPS links
- Live ranking link
- Live ticker(MESO)
- pics links
- link maps

- results
- global ranking (5G)

Speaker +
commentators
pre-run

Speaker +
commentat
ors
on place

LIVE
comments
start
(MESO)

Remy low res pictures

DB
lowres

LIVE
comments +
pics on
FB/TW

www.eoc2018.live

3x Photo
lowres
upload

Presse comunicate
- Results
- comments
- winner images
-> www.eoc2018.ch news

DE + IT
(tr. EN + FR)

Photo hires
upload

Send FR
Send EN
Trans. IT->FR
Trans. DE>EN
PC send IT
PC send DE

Day before race   Race day   quarantine deadline   Race   Flower   (Medal)   After races

Media
communication:
- next day program
- photo briefing schedule
- updates

Sent with the Press Com.

Publish
distribute
starting lists

Publish
distribute
maps

FB/TW
stories

passive filter

Jonathan LIVE socials on the ground

Video Daily + video making

5.6 Local media

Resources where invested to help local media to understand rules and exciting aspects of orienteering sport to inject the spring that light the fuse of media machine.
We organized Orienteering base courses for media journalists, we organized press conference with young athletes to present them and light the interest about their challenges, we kick-started business projects that may create future work places based on new and innovative projects (LoRa GPS tracker and SportIdent Tracking watch)

Accredited media
Only 4 accreditations arrived by Eventor platform.
3 month before the event our own media accreditation system was opened, offering 3 forms: one for local media in italian, one in german for the Swiss media and one in english for the rest of the media.
At the event where accredited:

- media people from Ticino, italian language. 17 contacts: 5 press, 6 TV/Radio, 2 online, 5 photographer
- media people from Switzerland, german language. 20 contacts: 12 press, 5 TV/Radio, 6 online, 5 photographer
- media people of the rest of the world, english language. 23 contacts: press, 10 TV/Radio, 14 online, 10 photographer

2 accreditation requests from Pakistan were refused.
Total: 60 accredited people produced 175 articles

Media Accreditation gave rights to:
- Press release prior to the competitions with indications of the best athletes
- Press release after the competitions with results and specialized comments
- Start lists
- Original maps of the competition areas
- Access to high resolution images of professional photographers
- Access to areas reserved to the Media, who interviews athletes after the competition

- Free access to the Media room/tent and internet WiFi access (some areas do not have mobile coverage), press documentation, deposit for press equipment, snack and beverage
- For photographers: access to the privileged zones with good view on the arrival area in the arenas
- Helpdesk support for information.

Communication to accredited media
Two weeks before the event a document "EOC2018 Media Information" has been sent. It contained general and daily important information (contacts, complete Schedule, media rooms/tents, transport/parking maps, embargo timings,quarantine schedule, VIP&Media race, ...).
During the EOC2018 an email was sent the day before each race with following information:
- day schedule (with eventual highlighted updates)
- photo briefing schedule
- links to the LIVE site, official starting lists, LIVE results, LIVE GPS

Documents, Embargo Timing and Quarantine
At the Media centre the following documentation was made available the day of the race:
- Race day starting lists (not extended version)
- Race day unofficial results (10 min after the flower ceremony)
- Race day official results (no later than 4h after the end of the race)
- Previous day race official results

Media accredited where warned that they have access to sensitive information in advance.
In order to guarantee the fairness of the competition, they had to take care to avoid publishing following information (descriptions, schema, pictures or videos) before the quarantine deadline time:
- Arena running lanes
- Race area
- Race start
- Race show points

Race maps have been released only after quarantine deadline:

5.7 Written media
During the event we defined 3 main groups of press to organize the communication by language and area. The documents where distributed with:
- Media from Ticino in italian: 107 contacts
- Media from Switzerland in german: 115 contacts
- All the rest of the media in english: 221 contacts

Each group had a copywriter in charge of producing press releases.
English documents were translated from the german ones.

Press release schedule
During the 2 years of preparation the following press releases and conferences where organized:
- 26.2.2016: Presse conference in Cadempino
- 10.5.2016: Press conference Swiss Orienteering in Zurich
- 24.3.2017: Press conference Bancastato Bellinzona on Sprint-Relay in Comano

- 26.3.2017: Sprint-Relay Comano results
- 22.5.2017: Press conference at Splash&SPA Rivera, one year before EOC2018
- 13.4.2018: Momenti d'incontro Manno: Meeting with E. Roos and F. Guglielmetti
- 27.4.2018: Presse conference in Bellinzona, one week before EOC 2018
- 3.5.2018: Presse conference in Bern

Since the Swiss National Hockey League tournament ended very late in April and Lugano club was one of the finalists, it has not been possible to motivate local press to give space to EOC2018 before mid April 2018.

During the EOC2018
A press communicate has been produced before every EOC race, in order to present leading athletes, and also after, to present results and pictures.

5.8 Radio/TV media

Host Broadcaster
SRG-SSR TV production of the races has been managed by Alex Wenger and Luka Schubnell on behalf of EOC2018.

Data	Titolo	QDM%	Rt-M
10.05.2018	Sprint staffetta mista	10.7%	76.7
12.05.2018	staffetta maschile e femminile	11.6%	33.3
Media		**11.3%**	**42.4**

Nella Svizzera tedesca, le due dirette dedicate ai Campionati Europei di corsa d'orientamento in Ticino, hanno ottenuto, in media, l'11.3% di quota di mercato con 42'400 telespettatori.

From above table we see that both relays were watched by more than 40'000 people, a considerable result for our sport!

Even the TV responsibles were positively suprised by the very high audience, dspite the not always optimal time schedule.

Media partnership
Media partnership with Radiotelevisione svizzera di lingua italiana (RSI) has been a precious help in divulgating orienteering messages (about athletes, events, organization, rules, technologies, projects, facts, ...) among Ticino population at no extra costs.

TV Live events

Europei Corsa d'Orientamento, sprint women and men (06.05.2018)
http://www.rsi.ch/g/10531421

Europei Corsa d'Orientamento, mixed relay (10.05.2018)
http://www.rsi.ch/g/10565180

Europei Corsa d'Orientamento, relay women and men (12.05.2018)
http://www.rsi.ch/g/10564802

5.9 Photographers
Photo briefings were held at the Media centres on each competition day after the quarantine closed. The exact time of the briefings was emailed to all the accredited photographers a day in advance.

Rules for photographers
- Photographers were not allowed to walk through the forest during competition unless accompanied by an organizer
- During competition, photographers must use the transport provided by the event organizer when going to the photo control and back to the finish
- At the photo control in the forest, photographers must stay in the exact place assigned by the event organizer
- At the photo control in the forest, photographers must remain quiet (no cheering!) and are not allowed to make signs or any other activity that can lead the athletes to the control
- Photographers have specific placement areas with good view on the running lanes and during ceremonies
- Video-Photographers must have a photo vest in the forest . These vests were available in limited number at arenas Event Office desk with a deposit of CHF 20.-.

Photo service
EOC2018 provided Rémy Steinegger's pictures in low and high resolution after the races at no costs for the accredited media.
Low resolution with copyright watermark:
https://www.dropbox.com/sh/09mjdjrsekhjibu/AACPKLsLkEJzFTEjNL0Q8X1ua?dl=0
High resolution with copyright and captions in metadata:
https://www.dropbox.com/sh/5p8n2ich5iapyuu/AAAWiqL8H1gOSG585uOSUFfka?dl=0

5.10 Social Media

Official Tags

#EOC2018
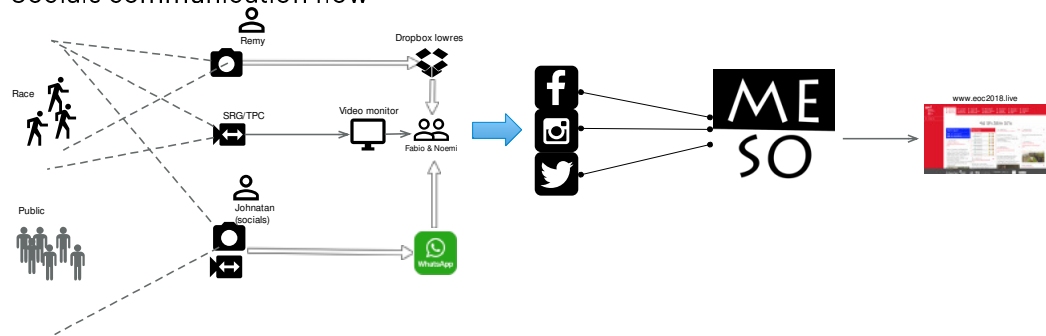#EGKSwiss5Days
#BancaStatoSCOOLCup

Link to official EOC2018 accounts
Facebook   @EOC2018
Twitter   @EOC_2018
Instagram   @EOC2018

Offical pages
https://www.facebook.com/eoc2018
https://twitter.com/EOC_2018
https://www.instagram.com/eoc2018
https://www.youtube.com/channel/UC5MckU73tvr3YJLDyZ-g5Yw

Socials communication flow

TV video spots

EOC2018 presentation:
 https://youtu.be/VXtAVC9y9Yw
A very early launch video has been produced by RSI broadcast media to accompany the launch of the EOC2018 press conference and start to produce communication about the event 2 years before the event (26 Feb 2016). The main reason of such early communication was to rise the interests among the future sponsors. 2200 views.

First official promo:
https://youtu.be/uHLwe-Ym0uE
The first official promo video, produced with professional collaborators and representative athletes as actors, where presented on the 10th May 2016 to accompany the project presentation, the "Save-The-Date" and the acquisition of the first Presenting Sponsor.
The video presents the main running fields – woods, highlands and hamlets – and the main athletes categories, each one carrying a T-shirt with a piece of the logo-
- Anders Holmberg as EOC élite category
- Dieter Wolf representing the 5 days
- Elisa Bertozzi representing the Bancastato sCOOL Cup young races

The three joining for a short moment and showing the full logo over a beautiful picture of Lugano region.
The video has been published online on website and socials and watched 26'000 times in 2 years.

TV/Social SPOT
https://www.youtube.com/playlist?list=PLtHbMDt6_cpTR9wuKe2OwQXA-nW9fnsGl

To complete the launch, one month before the event we produced a 5 episode spot engaging EOC2018 director: Francesco Guglielmetti and EOC selected Swiss team athletes: Elena Roos, Judith Wyder and Daniel Hubmann.

The slogan "veniamo al punto" (translated: "Let's get to the point") indicates both to come and see, come and run and come and enjoy the event.

Episodes from 1 to 4 showed élite orienteering athletes in their normal life with the insertion of a "strange thing" (a control point) and an orienteering common action (punching the control point), producing a funny situation for orienteers and for non-orienteers, triggering self interest in searching for answer (what is doing with that stuff?), so capturing interest on EOC2018.

Final episode shows the 4 athletes running on orienteering grounds and unveiling the solution of the "strange thing" in the first 4 episodes.

The TV spot where launched every day since 2 weeks before the event on prime time (19.30-20.00) on the two main local channels RSI LA1 and RSI LA2.

Simultaneously the same videos where launched on socials (Facebook and Twitter) with paid promotional posts in two way:

- 2 weeks before the event: globally with Orienteering, outdoor, trail related interests
- 1 week before the event: locally (Ticino and Switzerland) with any interests.

With the 1st week we obtained viral distribution and a total of 84'000 views in 1 month.

Daily video
https://www.youtube.com/playlist?list=PLtHbMDt6_cpS7nW_ZcTpT-Ho6XlBeSoSq

For the 4 finals a professional daily video has been produced by Livemotion of Rafael Huber.

22'500 video views.

5.11 Websites

www.eoc2018.ch
The website where to gather official information, official news, accommodation structures, transport information, general contacts for EOC2018 athletes and coaches.

Under same website the information on the EGK Swiss 5 days races could be found (in a different color).

www.eoc2018.live
The website was presenting race information during the EOC2018, day by day. On main horizontal menu the race days and on vertical menu the content available for the selected day. In the body the social contents populated by EOC2018 social staff and selected posts from general public.

- **Before the races**
    - race schedule
    - starting lists (PDF)
    - arena location
    - race type
    - weather forecasts
    - link to EOC2018 official live results
    - link to IOF live orienteering platform

- **During the races**
    - social contents pushed by EOC2018 social team and photographers

- maps of the races
- link to EOC2018 official live results (link to http://eoc.eoc2018.live)
- links to live streaming SRG/RSI

- **After the races**
  - Split times (on https://www.o-l.ch)
  - Low res pictures
  - Official results (PDF)

eoc.eoc2018.live
This website was hosting the EOC2018 live ranking results.

tv.eoc2018.live
This website was supplying the content for the live results TV in the arena (is not anymore active).

5.12 Statistics

Websites
eoc2018.ch: 50'000 users - 120'000 visits - 256'000 page visualisations
eoc2018.live (homepage live): 62'000 users con 140'000 visits
eoc.eoc2018.live (live ranking): 40'000 users 74'000 visits
Facebook: 200'000 reached users, 1'700 followers (1'000 last month), 165'000 video visualizations, 83'000 likes, comments, shares
Twitter: 168'000 reached users 440'000 Tweet visualizations
Instagram: 11'000 likes on our photo

5.13 Staff

Sector	Team	Total
Responsible		1
Speakers		
	Arena	2
	TV & streaming	4
Photo		
	EOC2018	3
	5 days	1
Media		
	Copywriter (paper, multimedia, social)	4
	Translators	4
	Media managers	2
	Assistant	2
	TV interface	2
Online		
	Graphics	1
	Webmaster	1
Brand		
	Arena decoration manager	1
TOTAL		28

6 Financial aspects

The budget of the event of 1.5 million meant that the association ASTI EOC 2018 was subject to VAT.

The budget was partially based on the results of the WOC in Lausanne in 2012. This was not always helpful due to sometimes very different conditions but also to things that have changed in recent years.
The hardest part to estimate was around the TV production, an area that nobody knew from direct experience, and that required a large investment of time to be understood and kept under control (the figures at stake were very important!), and consequently the budget had to be constantly updated, for fear of making a deficit.

The revenue had been carefully planned. Registration fees were taken from previous similar international competitions, or for the Swiss 5-days were respectively predefined by the Swiss federations, so the variable was just the number of competitors, especially those of the 5-days. The excellent proposed program, interesting competition venues and good propaganda in Switzerland and abroad meant that, despite the risk of dissuasion due to heavy traffic in this time period, as well as the high course of the franc for many foreigners, the number of entries was higher than expected, causing a higher and welcome income.

Even the sponsor side provided a positive surprise compared to estimates. Perhaps the visibility on TV and / or the importance of the event for the Ticino, has meant that institutions and individuals were very sensitive and generous towards the EOC 2018. At the last moment EGK joined, and wanted even to become a presenting sponsor together with the cantonal bank.
The percentage of sponsors was divided into 35/65% between individuals and institutions.

An important entry for the event was the Swisslos fund for small lotteries, where several cantons sold part of their quota to Ticino because of the importance of the event.

But as always, a great contribution came from the many services received (services from municipalities, private companies, prizes, etc.) that went to decrease some costs and sometimes even and much appreciated, our organizational commitment.

Costs, as mentioned before, have always been kept under observation, and have thus remained in the initial forecasts, even with some shifting from one account to another (in fact, it was sometimes not easy to correctly split the costs or benefits on the various accounts).

So in the end the balance could close with a small profit, taking into account the most probable remaining payments of Swiss Olympic and Baspo.

The profit will be devolved, as planned, for projects in favour of youth promotion and also more in general promotion of orienteering in Ticino.
Some potential recipients of this money have already been identified (e.g. to maintain the current level of the sCOOL Cup in the coming years, to finance the training of young graduate coaches, to restructure the cantonal camp on the basis of the growing number of interested parties, etc.).

Presenting sponsors

A working group, responsible for evaluating these projects and deciding their funding, has been set up.

EXPENDITURE

Installations start + finish	89'262.53	
Installation WC, water, electricity	8'410.72	
Area, tents, infrastructure rentals	35'286.57	
Damages and loss	3'062.64	
Infrastructures		**136'022.46**
Map production	93'409.24	
Map printing	16'299.59	
Maps		**109'708.83**
Personnel expenditures	2'396.79	
Acquisition material	9'302.46	
Rental material	3'743.63	
Radio control, Wifi, internet	15'586.41	
GPS tracking service	87'895.37	
Time keeping service	37'408.91	
Security	20'000.00	
Competitions		**176'333.57**
Accommodation EOC Athletes	41'906.47	
Accommodation officials, meida, VIP	8'435.25	
Accommodation volunteers	13'019.00	
Accommodation		**63'360.72**
Transport Swiss 5-days	3'249.77	
Transport volunteers and material	17'757.91	
Transport		**21'007.68**
Food and drinks		**53'941.70**
Secretary	52'236.25	
Material	3'907.56	
Administration		**56'143.81**
Indemnisation partner clubs	250'000.00	
Swiss Orienteering taxes	48'080.31	
IOF taxes	38'497.76	
Contribution to associations	27'973.00	
Indemnisations, taxes		**364'551.07**
OC expenses	16'863.38	
OC indemnisations (clothing, gifts)	38'273.83	
IOF SEA	1'847.40	
Army	40'000.00	
Civil protection	28'532.60	
Personnel		**125'517.21**
Graphical and communication consultant	15'379.99	
TV production	206'953.38	

Big screen, TV graphic, speaker	26'121.00	
Marketing actions, conferences	28'708.26	
Videoclips, Spots, Fotos	15'064.78	
sCOOL Cup	21'748.07	
Marketing and communication		**313'975.48**
Material + artists for ceremonies	6'408.17	
Prizes	5'836.56	
EOC gala	15'760.45	
Volunteers gala	10'649.30	
VIP dinner	2'692.66	
Ceremonies		**41'347.14**
Finance (VAT)		**35'504.38**
Total expenditures		**1'497'414.05**

INCOME

Entries + accreditation EOC	-171'147.45	
Accreditation VIP + media	-325.75	
Entries Swiss 5-days	-231'096.20	
sCOOL Cup	-21'714.88	
Entries		**-424'284.28**
Shop and map sale	-9'858.86	
Radio and TV rights	-61'123.19	
Product sale		**-70'982.05**
Private Sponsors (cash)		**-286'791.11**
Cities + canton	-237'500.00	
Swiss institutions	-250'000.00	
Military and civil protection	-51'935.00	
Other institutions	-180'908.94	
Institutional Sponsors		**-720'343.94**
Food and drinks arena	-60'225.02	
Food and drinks party	-9'080.04	
Food and drinks		**-69'305.06**
Finances (VAT)		**-421.81**
Total income		**-1'572'128.25**
Final result		**74'714.20**

Presenting sponsors

BancaStato
BANCA DELLO STATO DEL CANTONE TICINO

EGK
Assicurati in modo sano

IOF
INTERNATIONAL ORIENTEERING FEDERATION

Swiss orienteering