INTERNATIONAL ORIENTEERING FEDERATION

Guidelines for Course Planning

Sprint Competitions

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IOF Foot Orienteering Commission

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Foreword

”Foot orienteering is an endurance sport which involves a huge mental element. There is no marked route – the orienteer must navigate with map and compass while running.”

The core of the sport of Orienteering is to have great maps and courses set in a challenging terrain. This manual is intended to give guidelines to plan an orienteering course that is testing the ability of the competitor both physically and mentally. An orienteering course shall contain elements described for the competition formats in the IOF Competition Rules of Orienteering (“Rules”) for different formats of foot orienteering.

This Course Planning Guideline for orienteering courses in Sprint competition formats is based on the requirements for course planning in the Rules. The purpose of this guideline is to clarify how these requirements are used as a starting point for creating good courses. Throughout this document, reference to specific Rules paragraphs and appendices will be made in boxes such as this:

Rules section 16.1
The IOF *Principles for Course Planning* (see Appendix 2), the competition format descriptions (see Appendix 6) and the Leibnitz Convention (see Appendix 5) shall be followed.

The contents of the box above clarify that it is mandatory for course planners in IOF Events to meet the requirements of the Appendices as well chapter 16 as the appendices mentioned.

Basic course planning requirements

A fair course requires a reliable map, unambiguous control points, accurate placement of control points on the map, and good and challenging course legs between the control points. It is a main goal for a course planner to provide an experience that can be looked back on as a “best orienteering course ever”.

More and more demands are put into TV and arena production to get the sport of orienteering attractive to both spectators on-site and people watching broadcasts all around the world. This requires full co-operation between course planners and TV production crew in very early stages of the course planning.

To keep the quality of the orienteering courses at high level, there is a need to fulfil expectations of the customers of the course planners. This will require an understanding of different format demands for terrain and course planning. This manual is giving insight to those.

Examples of good and not so good solutions in course planning are presented in the Appendices.

Acknowledgement

The authors wish to pay tribute to the great work done by Göran Andersson in putting together the 2014 IOF document “Guidelines for Course Planning – World Class Events”. These guidelines update and build on the precedent set by Göran’s work.

1. Introduction to course planning

The IOF Competition Rules Appendix 2 contains the **IOF principles for course planning**:

Rules - Appendix 2: Principles for course planning 1. Introduction
1.1 Purpose: These principles aim to establish a common standard for the planning of foot orienteering courses in order to ensure fairness in competition and to safeguard the unique character of the sport of orienteering. **1.2 Application of these principles**: Courses in all international foot orienteering events must be planned in accordance with these principles. They should also serve as general guidelines for the planning of other competitive orienteering events. The term 'orienteering' is used throughout to refer specifically to 'orienteering on foot'.
Rules - Appendix 2: Principles for course planning 2. Basic principles
2.1 Definition of orienteering: Orienteering is a sport in which competitors visit a number of points marked on the ground, controls, in the shortest possible time aided only by map and compass. Orienteering on foot may be characterised as running navigation. **2.2 Aim of good course planning**: The aim of course planning is to offer competitors courses correctly designed for their expected abilities. Results must reflect the competitors' technical and physical ability. **2.3 Course planner's golden rules**: The course planner must keep the following principles in mind: • the unique character of foot orienteering as running navigation • the fairness of the competition • competitor enjoyment • the protection of wildlife and the environment • the needs of the media and spectators **2.3.1 Unique character**: Every sport has its own character. The unique character of orienteering is to find and follow the best route through unknown terrain against the clock. This demands orienteering skills: accurate map reading, route choice evaluation, compass handling, concentration under stress, quick decision making, running in natural terrain, etc. **2.3.2 Fairness**: Fairness is a basic requirement in competitive sport. Unless the greatest care is taken at each step of course planning, luck can easily become significant in orienteering competitions. The course planner must consider all such factors to ensure that the contest is fair and that all competitors face the same conditions on every part of the course. **2.3.3 Competitor enjoyment**: The popularity of orienteering can only be enhanced if competitors are satisfied with the courses they are given. Careful course planning is therefore necessary to ensure that courses are appropriate in terms of length, physical and technical difficulty, control siting, etc. In this respect it is particularly important that each course is suitable for the competitors doing that course. **2.3.4 Wildlife and the environment**: The environment is sensitive: wildlife may be disturbed and the ground as well as the vegetation may suffer from overuse. The environment also includes people living in the competition area, walls, fences, cultivated land, buildings and other constructions, etc. It is usually possible to find ways to avoid interference with the most sensitive areas without damage. Experience and research have shown that even large events can be organised in sensitive areas without permanent damage if the correct precautions are taken and the courses are well planned. It is very important that the course planner ensures that there is access to the chosen terrain and that any sensitive areas in the terrain are discovered in advance.

2.3.5 Media and spectators: The need to give a good public image of the sport of orienteering should be a permanent concern for a course planner. The course planner should endeavour to offer spectators and the press the possibility to follow as closely as possible the progress of a competition without compromising sporting fairness.

Unique character of the competition formats

Each competition format has its own demands for choosing terrain and designing a brilliant orienteering course for competitors. Requirements for the formats are found in Appendix 6, Competition Formats in the Rules of Foot Orienteering (https://orienteering.sport/orienteering/competition-rules). It has definitions for controls, route choices, types of running, map, terrain etc. that need to be obeyed when planning courses.

2. The orienteering course

Rules - Appendix 2: Principles for course planning 3. The orienteering course (extract)

3.1 Terrain: The terrain must be chosen so that it can offer fair competition to all competitors. To safeguard the character of the sport, the terrain should be runnable and suitable for testing the orienteering skills of the competitors.

3.2 Definition of an orienteering course: An orienteering course is defined by the start, the controls, and the finish. Between these points, which are given precise locations in the terrain and correspondingly on the map, are the course legs over which the competitor must orienteer.

3.3 The start: The start area should be so situated and organised that:

- there is a warmup area
- waiting competitors cannot see route choices made by those who have started

The point from which orienteering on the first leg begins is marked in the terrain by a control flag with no marking device and on the map by a triangle. The competitors should be faced with orienteering problems right from the start.

3.4. The course legs

3.4.1 Good legs: The course legs are the most important elements of an orienteering course and will largely determine its quality. Good legs offer competitors interesting map-reading problems and lead them through good terrain with possibilities for alternative individual routes. Within the same course different types of legs should be offered, some of them based on intense map-reading and others containing more easily run route choices. There should also be variations with regard to leg length and difficulty to force the competitor to use a range of orienteering techniques and running speeds. The course planner should also endeavour to give changes in general direction for consecutive legs as this forces the competitors to reorient themselves frequently. It is preferable for a course to have a few very good legs joined by short links designed to enhance the legs rather than a larger number of even but lesser quality legs.

3.4.2 Fairness of legs: No leg should contain route choices giving any advantage or disadvantage which cannot be foreseen from the map by a competitor under competitive conditions. Legs which encourage competitors to cross forbidden or dangerous areas must be avoided.

3.5 The controls

3.5.1 Control sites: Controls are placed at features in the terrain that are marked on the map. These must be visited by the competitors in the given order, if the order is specified, but following their own route choices. This demands careful planning and checking to ensure fairness. It is particularly important that the map portrays the ground accurately in the vicinity of the controls, and that the direction and distances from all possible angles of approach are correct. Controls must not be sited

on small features visible only from a short distance if there are no other supporting features on the map. Controls must not be sited where the visibility of the control flag for runners coming from different directions cannot be evaluated from the map or control description.

3.5.2 The function of the controls: The main function of a control is to mark the beginning and end of an orienteering leg. Sometimes controls with other specific purposes need to be used as, for example, to funnel runners around dangerous or out of bounds areas. Controls can also serve as refreshment, press and spectator points.

3.5.3 The control flag: The control equipment must be in accordance with the rules for IOF events. As far as possible, a control flag should be placed in such a manner that competitors first see it only when they have reached the described control feature. For fairness, the visibility of the control should be the same whether or not there is a competitor at the control site. On no account should the control flag be hidden: when competitors reach the control they should not have to search for the flag.

3.5.4 Fairness of control sites: It is necessary to choose control sites with great care and notably to avoid the 'acute angle' effect where incoming competitors can be led into the control by outgoing runners.

3.5.5 Proximity of controls: Controls on different courses placed too close to one another can mislead runners who have navigated correctly to the control site. According to Rule 19.4, controls shall not be sited within 30 metres of each other. For Sprint, this may be reduced. For map scales 1:4000 or 1:3000, the minimum running distance between controls is 25 metres and the minimum straight line distance is 15 metres. Only when the control features are distinctly different in the terrain as well as on the map, should controls be placed closer than 60 metres (30 metres for map scales 1:4000 or 1:3000). The distance between the controls is measured in a straight line.

[Further notes for Sprint: the minimum distance between control features is 30 metres. If the features are distinctly different in the terrain as well as on the map, this minimum is reduced to 25 metres. Because there may often be impassable barriers between controls, this distance corresponds to the running distance and not the straight line one, but note also that the straight line distance cannot be less than 15 metres]

3.5.6 The control description: The position of the control with respect to the feature shown on the map is defined by the control description. The exact control feature on the ground, and the point marked on the map, must be indisputable. Controls which cannot be clearly and easily defined by the IOF control symbols are usually not suitable and should be avoided.

3.6 The Finish: At least the last part of the route to the finish line should be a compulsory marked route.

3.7 The elements of map-reading: On a good orienteering course, competitors are forced to concentrate on navigation throughout the race. Sections requiring no map-reading or attention to navigation should be avoided unless they result from particularly good route choices.

3.8 Route choices: Alternative routes force competitors to use the map to assess the terrain and to draw conclusions from it. Route choices make competitors think independently and will split up the field, thus minimising 'following'.

3.9 The degree of difficulty: For any terrain and map, a course planner can plan courses with a wide range of difficulty. The degree of difficulty of the legs can be varied by making them follow line features more or less closely. Competitors should be able to assess the degree of difficulty of the approach to a control from the information available on the map, and so choose the appropriate technique. Attention should be paid to the competitors' expected skill, experience and ability to read or understand the fine detail of the map. It is particularly important to get the level of difficulty right when planning courses for novices and children.

3.10 Competition types

Course planning must account for specific requirements of the type of competition considered. For instance, course planning for Sprint and Middle distance orienteering must call on detailed map reading and on a high degree of concentration throughout the entire course. Course planning for relay competitions should consider the need for spectators to be able to follow closely the progress of the

competition. Course planning for relays should incorporate a good and sufficient forking/splitting system.

3. The course planner

Rules - Appendix 2: Principles for course planning 4. The course planner

The person responsible for course planning must have an understanding and appreciation of the qualities of a good course gained from personal experience. He or she must also be familiar with the theory of course planning and appreciate the special requirements of different classes and different types of competition.

The course planner must be able to assess, on site, the various factors which can affect the competition, such as the conditions of the terrain, the quality of the map, the presence of participants and spectators, etc.

The course planner is responsible for the courses and the running of the competition between the start and the finish line. The course planner's work must be checked by the controller. This is essential because of the numerous opportunities for error, which could have serious consequences.

Rules - Appendix 2: Principles for course planning 3. The orienteering course (extract)

3.11 What the course planner should aim for

3.11.1 Know the terrain: The course planner should be fully acquainted with the terrain before he or she plans to use any control or leg. The planner should also be aware that on the day of the competition the conditions regarding map and terrain could be different from those which exist at the time the courses are planned.

3.11.2 Get the degree of difficulty right: It is very easy to make courses for novices and children too difficult. The course planner should be careful not to estimate the difficulty just on his or her own skill at navigating or on his or her walking speed when surveying the area.

3.11.3 Use fair control sites: The desire to make the best possible legs often leads a planner to use unsuitable control sites. Competitors seldom notice any difference between a good and a superb leg, but they will immediately notice if a control leads to unpredictable loss of time due to a hidden control site or flag, ambiguity, a misleading control description etc.

3.11.4 Placing controls sufficiently far apart: Even though the controls have code numbers they should not be so close to each other as to mislead competitors who navigate correctly to the control site on their course.

3.11.5 Avoid over-complicating the route choices: The planner may see route choices which will never be taken and thereby may waste time by constructing intricate problems, whereas the competitors may take a 'next best' route, thus saving time on route planning.

3.11.6 Courses that are not too physically demanding. Courses should be planned so that normally fit competitors can run over most of the course set for their level of ability. The total climb of a course should normally not exceed 4% of the length of the shortest sensible route. The physical difficulty of courses should progressively decrease as the age of the competitors increases in Masters' classes. Special care must be taken that the courses for classes M70 and over and W65 and over are not too physically demanding.

4. The Three Sprint Formats

SUMMARY TABLE	Sprint	Sprint Relay	Knock-Out Sprint
Controls	Technically easy.	Technically easy.	Technically easy.
Route Choice	Difficult route choice, requiring high concentration.	Difficult route choice, requiring high concentration.	Difficult route choice, requiring high concentration.
Type of Running	Very high speed.	Very high speed.	Very high speed.
Terrain	Predominantly in very runnable park or urban (streets/buildings) terrain. Some fast runnable forest may be included. Spectators are allowed along the course	Predominantly in very runnable park or urban (streets/buildings) terrain. Some fast runnable forest may be included. Spectators are allowed along the course	Predominantly in very runnable park or urban (streets/buildings) terrain. Some fast runnable forest may be included. Spectators are allowed along the course
Map	1:4000 (1:3000 for older WMOC classes)	1:4000	1:4000
Start Interval	1 minute	Mass start	1 minute for qualification round. Mass start for knock-out rounds,
Timing	1 second	Mass start so the finish order is the order across the line.	1 second for qualification round. Mass start for knock-out rounds so the finish order is the order across the line.,

4.1 Sprint

Rules Appendix 6: 1 SPRINT

1.1 The profile

The Sprint profile is high speed. It tests the athletes' ability to read and translate the map in complex environments, and to plan and carry out route choices running at high speed. The course must be planned so that the element of speed is maintained throughout the race. The course may require climbing but steepness forcing the competitors to walk should be avoided. Finding the controls should not be the challenge; rather the ability to choose and complete the best route to them. For example, the most obvious way out from a control should not necessarily be the most favourable one. The course should be set to require the athletes' full concentration throughout the race. An environment that cannot provide this challenge is not appropriate for the Sprint.

1.2 Course planning considerations

In Sprint spectators are allowed along the course. The course planning shall consider this, and all controls must be manned. It may also be necessary to have guards at critical passages alerting spectators of approaching competitors and making sure that competitors are not hindered. The start

should be at the Arena and spectator sites may be arranged along the course. The spectator value could be enhanced by building temporary stands and by having an on-course announcer. Both spectator sites and sites for media/photographers shall be announced at the Arena. The course must be planned to avoid tempting competitors to take shortcuts through private property and other out-of-bound areas. If there is such a risk, a referee should be at such locations to prevent possible attempts. Areas so complex that it is doubtful whether a competitor can interpret the map at high speed should be avoided (e.g. when there are complex three-dimensional structures).

1.3 The map

The ISSprOM specification shall be followed. The map scale is 1:4000. It is crucial that the map is correct and possible to interpret at high speed, and that the mapping of features that affect route choice and speed are accurate. In non-urban areas, the correct mapping of conditions reducing running speed, both to degree and extent, is important. In urban areas, barriers hindering the passage must be correctly represented and drawn to size.

1.4 Winning time, start interval and timing

The winning time, for both women and men, shall be 12 – 15 minutes, preferably in the lower part of the interval. In WOC and World Cup there is no difference between qualification and final races. The start interval is 1 minute and a time-trial, individual format is used. Timing is to 1 second accuracy. The competitor shall have passed the start gate before having access to the map.

4.2 Sprint Relay

Rules Appendix 6: 5 SPRINT RELAY

5.1 The profile

The Sprint Relay profile is mixed-gender high-speed head-to-head competition. It takes place in an urban and park environment. The format is a combination of the Sprint and Relay concepts. There are four legs and the first and last legs must be run by women.

5.2 Course planning considerations

A relatively small area is required for a competition (especially with the use of an arena passage). The event shall be easy to understand for the spectators. It should be possible to cover at least 70-80 % of the course with TV cameras. The competition should be based on a 75 minute live broadcasting and arena production concept; 15 minutes should be allocated for broadcasting introductions, interviews and prize-giving ceremonies. An arena passage should be used, if possible without compromising course quality too much. When there is a comprehensive TV coverage on the course, the arena passage may not always be required. This also gives more flexibility for course planning and may enable better and more challenging courses. Two loops per leg should be used if there is an arena passage with one loop printed on each side of the map. Courses shall be forked. GPS-tracking is required and contactless punching should be considered.

5.3 The map - See 1.3 Sprint.

5.4 Winning time, start interval and timing

The winning time (the total time for the winning team) shall be 55-60 minutes. The time for each leg shall be 12-15 minutes so the first and last legs (which are run by women) should be a little shorter than the second and third legs. In WOC timing shall preferably be made by electronic means, but manual systems may be used. At the finish line there shall be photo-finish equipment to assist in judging the placings.

4.3 Knock-Out Sprint

Rules Appendix 6: 6 KNOCK-OUT SPRINT

6.1 The profile

The Knock-Out Sprint profile is an individual multiple-round high-speed competition with head-to-head racing in all but the first round. It takes place in an urban and park environment. There are parallel heats with an interval start to qualify for the knock-out section. In this there are one or more knock-out rounds with several parallel heats and mass starts where the leading runners qualify for the next round. Finally, there is a single mass start race to determine the winner.

6.2 Course planning considerations

A relatively small area is required for a competition (especially with the use of an arena passage). The event shall be easy to understand for the spectators. It should be possible to cover at least 70-80 % of the course with TV cameras. The courses for the knock-out rounds may be forked. As an alternative to standard forking, course choice forking shall be used whereby each runner has 20 seconds, before the start, to choose one of three maps, each with a different course. GPS-tracking is required and contactless punching should be considered.

6.3 The map

See 1.3 Sprint.

6.4 Winning time, start interval and timing

The winning time for the initial qualification race shall be 8-10 minutes. The winning time for the knock-out rounds shall be 6-8 minutes. At the finish line there shall be photo-finish equipment to assist in judging the placings.

Remarks on section 6.1 above:

The Knock-Out Sprint format consists of:

- a Qualification race in the morning and
- Elimination rounds (Sprint heats) with a total of three rounds either in the morning or in the afternoon (first elimination round) and semi-final and final in the late afternoon.
- See also Appendix 3 of these Guidelines

Remarks on section 6.2 above:

Course planning considerations

- The courses are built on the technically demanding concept of the Sprint distance.
- For the elimination rounds, the courses may incorporate a forking/splitting system. The following two forking methods shall be considered, if there is a TV-coverage:
  a) No forking (recommended for the final in WOC and World Cup competitions)
  b) "Course Choice Model" where each competitor picks one of three options
- The Start and the Finish can be at different locations
- If it is possible to create technically demanding course variations for all elimination rounds, all must end at the same Finish area (one arena for QF, SF and F).
- An arena passage is possible if the arena for the finals is inside a technically complex terrain. Semi-finals and the final must finish in the arena. The Start of the elimination rounds can be outside of the arena due to organisational reasons (quarantine, warm-up, etc.).
- Background notes on the organisation of qualification for Knock Out Sprint races are given in Appendix 3.

5. Special features of Sprint planning

Sprint orienteering, by its definition is high speed route navigation in an urban and/or runnable park environment. It tests the athletes' ability to read and translate the map in complex environments, and to plan and carry out route choices running at high speed. Finding the controls should not be the challenge; rather the ability to choose and execute the best route to them. The course should be set to require the athletes' full concentration throughout the race.

This means that the Sprint orienteering course must minimise the number of legs that don't offer any major route choices and all the orienteers take the same route.

A good Sprint competition requires

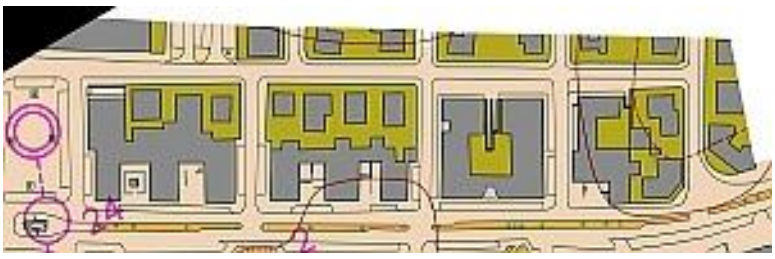
- Terrain that supports the format
- Good map (accurate and well-generalised to the runners' needs)
- Challenging courses
- General arrangements that ensure fairness and safety

Competition area

The terrain should offer varying challenges and give the course planners options to create courses that test the competitors' navigation skills, decision making and physical abilities at a very high level. Terrains which have legs which allow competitors to proceed in a straight line between controls must be avoided. The terrain should include at least one complex urban area that provides challenging route choices with excellent runnability.

There should not be any longer distances with poor runnability and, if there are, they should be clearly readable on the map and represented in the Model events. Bulletins should describe any taping used as well as the type of running surface for the runners so they can select the correct type of shoes.

Look for a suitable terrain with an open mind. Use different base maps for terrain selection, including aerial photos. Wander through different areas and observe all their possibilities. Get excited but don't stick to your selection if it doesn't support the full requirements set for the competition.



The concept of "granularity" is a useful one to take on board. The example shown on the left is of large, regular terrain blocks where route choices will be straightforward. It has "large granularity" and areas of this type make for poor Sprint courses. The right hand example (from the same map!) shows "small granularity" where complex short route choices are abundant and where a high degree of decision making is required.

It's often possible to accept or reject a terrain more or less at a glance by considering its granularity.

When you have found a suitable area, collect a small group of people who understand the nature of Sprint orienteering, its challenges and restrictions and present your ideas to them. Be very critical about the terrain and whether it might support the level of competition you are thinking of.

Permissions

Written agreements with landowners must be in place well before the competition. It should be clear who grants access to which area when asking for permissions to use the area. Both parties should be very careful to agree upon forbidden areas, and outline these very clearly on maps connected with the agreement. If any kind of payment is involved, it should also be agreed in writing.

The access agreements must involve access for mappers, planners and controllers, and also be very strict about when the access is valid, starting dates and end of access, and also any excluded periods.

It is very important to aim to follow the agreements in place at every stage. It is crucial that forbidden areas are not breached when course planning, taping and controlling. Orienteering as a sport has a good reputation. Let's keep it that way.

Maps and mapping

The quality (accuracy) and readability (generalisation) of the map are of high importance in Sprint orienteering, thus it is critical to select a mapper with experience in Sprint map making. Also, the availability of this map maker needs to be clear for the last few weeks before the event, in case any changes are needed. The International Standard for Sprint Orienteering Maps (currently ISSprOM 2019) is available from the IOF website.

Course planners need to know the ISSprOM and guidelines how to draw (design) courses. It is also good practice to get the course planning software settings correct from the beginning of the planning process. The SEA and controllers will do their final checking from printed versions of maps and courses so these versions need to be printed by the same printer who prints the competition maps. Any corrections needed must be approved by the SEA.

Course Length

In Sprint orienteering, the course length must be given as the length of the shortest straight line from the Start via the controls to the Finish deviating for, and only for, physically impassable obstructions (buildings, high fences, lakes, impassable cliffs etc.), prohibited areas and marked routes. Competition Rules, Chapter 16 specifies winning times for each of the formats. It is important to follow the agreed schedule of competition because of TV and online streaming.

Competition Rules chapter 16: Courses
16.9/16.10 For WOC and World Cup: Courses shall be set to give the following winning times in minutes for women and men: 12-15 min Sprint qualification race 12-15 min Sprint final 12-15 min Sprint Relay for each leg 55-60 min Sprint Relay, sum of fastest times for all legs 8-10 min Knock-Out Sprint qualification 6-8 min Knock-Out Sprint mass-start races **16.11** For JWOC and WMOC: The courses shall be set to give the following winning times in minutes for Women and Men: 12-15 min Sprint

Note that, since many Sprint/Urban races are held on hard surfaces (including short grass), the best runners achieve very similar speeds, whatever the area used. Analysis of past results shows that the best Men average 3.5 min/km (Women are 4.1 min/km) when course lengths are measured by IOF Rules and corrected for height climb (100m climb is equivalent to 1 km distance).

This means that the (corrected) course length to achieve a Men's winning time of 14 minutes is 14/3.5 = 4.0 km. In practice, this may need to be adjusted up or down **by a little**, depending on the complexity of the terrain.

Course Planning

Keywords:

- Speed
- Route choice
- Decision points
- Stress

Every course planner has his/her unique style of planning good Sprint courses. Many good courses rely on teamwork for their success, involving a close cooperation of 1-3 course planners, map maker and controllers with the SEA's support. It will be the course planners' responsibility to design quality courses and the SEA and controllers make sure that guidelines and rules are obeyed.

Before the planning process starts, the course planner should be well-acquainted with the terrain and its characteristics. The old map, an aerial photo or even construction maps from the town or municipality are good starting points. Observe any traffic hubs or car park usage and how they are used during the time of the competition (e.g. on Sunday between 09:00-13:00). Are they possible to use at all or do these areas need to be defined as forbidden? Fences, corridors and shelters need to be checked regarding whether they affect the competition and, if so, in which way. Every note made at this point will be useful when starting to plan the courses. When the competition map starts to be ready it is important to update it after every visit to the terrain with any changes noticed.

When it is time to start the course planning with the actual competition map, the planner should study paper printouts as well as the computer screen. The competitor makes his/her decision based on what is shown on the map so at every step, the course planner needs to look at the planning he/she's done on the right scale map.

Be open-minded. Start planning by designing single, best possible legs with exceptional route choices. Use your controller and Event Adviser as opponents to tune up your ideas and thinking. Even the craziest ideas at the early phase of planning might end up to be the "diamonds" of the course. Remember, the more you look at a specific leg, the more obvious its solution will be.

Key features:

- Fairness, fairness, fairness! - keep in mind
- High rate of decision making
- Readable map
- Courses planned to minimise the chance of runners going out of bounds – if there is a chance of this happening, tape must be used to prevent this
- Neither a puzzle, nor just track running!

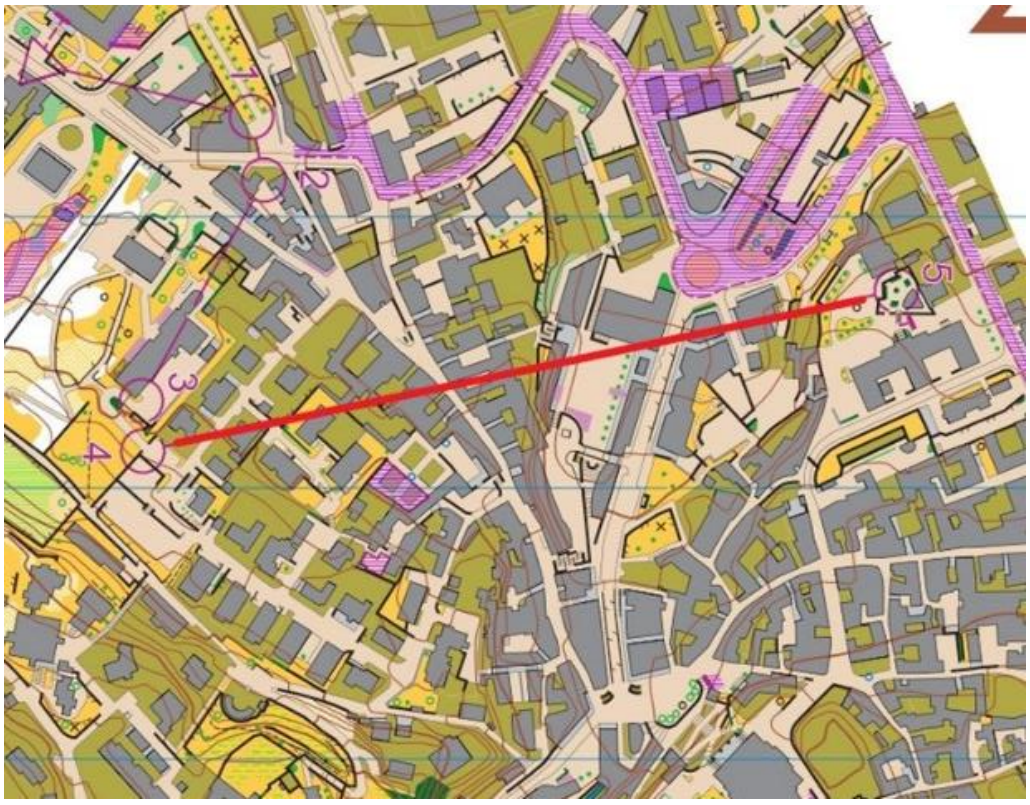
How is a good orienteering leg defined?

There are lot of possibilities, but in general, it offers either multiple route choices and/or challenging execution. It can be long or short but it requires perception and realisation of the best possible choice. A route choice leg is not designed well if everybody selects the same route to execute. Generally, elite orienteers can solve any kind of route choice problem correctly if it's in an urban environment which is mapped in a fair way. A well-planned leg is possible to be executed with information found on the map.

Thus, the course planner should plan legs where finding the fastest route choices by the competitors is challenging but not unfair.

Another measure of a course quality is that of how many **decision points** there are. A decision point is a place on the course where the runner has to choose which way to go – straight on, left, right, etc. – and the more frequent decision points are, the more the criterion that "the course should be set to require the athletes' full concentration throughout the race" is met.

The leg below firstly shows that a large number of route choices are possible and secondly that very many decisions are needed in the leg. Also, it's harder to find the best routes if the route choices have irregular shapes.



Other points

- Leaving a control at 180° or attacking a control from behind often cause trouble to orienteers.
- There might be a case that a leg is perfect only from one specific point to another.
- Diagonal legs across housing blocks are usually better than legs which go at right angles.
- Long legs are boring if there is little navigation needed. The leg below has some route choice but little or no concentration is needed for some 90% of its length. It is therefore a very poor leg!

- Legs with different height climb options also provide route choice (see below).

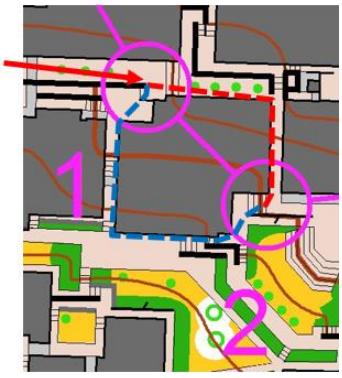
Using multi-storey buildings in course planning is to be avoided, if possible. One needs to be very careful using tunnels or car parks on different levels for example in order to be unambiguous, especially given the speed used in Sprint orienteering.

As stated by ISSprOM, "Multilevel structures such as bridges, canopies, underpasses or underground buildings are common in urban areas. The cartographic representation of more than one level is quite difficult. Hence only the main 'running' level should be represented on the map. However, underground passages (e.g. underpasses, lighted tunnels) or overpasses (e.g. bridges), which are important for the competitors should be represented on the map. For difficult situations of multilevel representations it is recommended to show it in the bulletin."

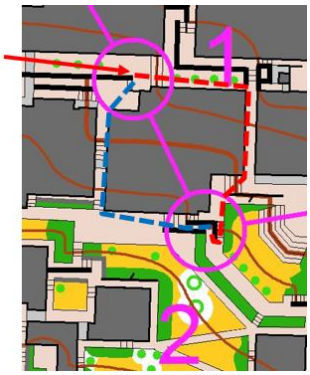
The fastest route should ideally not be the one which looks most obvious with a quick glance at the leg – but it must be possible to understand which route is fastest by careful considerations

There are different tricks to make a route choice look shorter than it actually is by shaping the line representing the leg on the map; test your balancing of the leg with another orienteer in order to understand it. The following example shows one solution:-

The first example (right) shows a leg where the clockwise route looks to be the obvious one (63m as opposed to 91m for the anti-clockwise route) especially as runners will be arriving at 1 from the west and will carry on in the same direction when they leave 1. It is a poor leg as a result as there is no route choice in practice.



Planning good legs involves much "nudging" of control circles in order to maximise the route choice challenge.



The second example (left) shows the effect of moving number 2 to the inside corner of an impassable wall. At first sight there seems to be little difference between the clockwise and anticlockwise routes but the extra direction changes involved in the former make it longer by 91m to 77m.

The leg is much improved by this, especially as a 145˚ change of direction is require on leaving 1, thus meeting the IOF criterion that "the most obvious way out from a control should not necessarily be the most favourable one". Dog legs can be good in Sprint planning!

Many competitors are afraid of S-shape route choices, use it to your advantage (while avoiding sharp corners)

Every route choice of a certain leg needs to be measured. The difference between them doesn't need to be any more than 20 metres or 4-5 seconds of time, a significant difference in the competition. Of course turns, stairs, surface and many other things need to be thought through by the competitor as well.

Combination of all legs will give an idea of how big an area needs to be reserved for the competition. The most demanding and best parts could be used several times during the course, if needed with a map change. The only thing that matters is how good the combination of different legs is. When touch-free punching is used, there will be a lot of difference if the competitor just runs through the control or turns around and starts the next leg from zero speed.

Do not use control sites, where "punching" through an impassable object (e.g. by leaning over a hedge) is possible.

Summary:

- should be in URBAN or PARK area (forest Sprint is simply not fair - with reference to how the terrain can be interpreted in the map; any forest orienteering also requires a "forest" navigation, which is different from the navigation at clearly defined or open areas)
- maximum SPEED (the runners should not be forced to walk; it should be possible to solve the problems while running fast)
- based on MANY ROUTE CHOICES, which are mostly elementary (right/left/straight); the long tricky complicated legs are often the best legs (see Appendix 1) - but must be carefully planned to eliminate the element of luck.
- CLEAR CONTROL SITES – control descriptions must be clear and unambiguous
- NO TRAPS by intention

Testing

All courses must be tested before the competition. This is to verify that everything is in order and works properly. Any kind of deviation or problem must be reported without delay, and a routine for handling possible last-minute problems must be tested and practised in advance. The courses must be tested on the same day of the week and at the same time as in the competition programme, to check for any possibility that traffic, parking vehicles, large number of pedestrians, etc. could interfere with route execution.

All possible forbidden short-cuts need to be identified, appropriately mapped, possibly taped or otherwise barred and closely supervised during the competition to reduce the risk of disqualifications.

The position of the arena is key when planning the event. Sprint races in town centres and urban areas will most probably need traffic regulation, requiring written agreements with authorities and/or landowners. These agreements should be made long before the competition, and also be very detailed about barriers, traffic directions etc. It is also very important to check in good time about any possible construction work, major road works or other activities that could affect the courses on the day of competition.

TV requirements are a significant factor to be included when planning courses. The TV producer and the course planners must make contact at an early stage of the course planning procedure, otherwise the risk of having to reconsider a lot of the courses and chosen controls is very high. Camera sites, background, cabling and the position of the sun are factors of which most course planners have little or no experience. A close co-operation between the TV team and the course planner will ensure both fair courses and good TV productions.

There aren't too many restrictions to the shape of a Sprint orienteering course. If there are challenges with drawing the course it might be worth to consider a map exchange, probably in the arena passage.

The planned course is allowed to look "ugly" or awkward with its sharp angles and crossings but it must be clearly readable from the map. Keep in mind the option to turn the map over or exchange the map during competition if this helps and, if needed, it's important that the map indicates this clearly and that the final Bulletin explains this too. After a map exchange the next leg shouldn't be too challenging, so that it is possible for the competitors to keep full pace unless a compulsory route follows the exchange where it is possible for a competitor to read the next leg when it could be more challenging.

Artificial fences and taped forbidden areas

Sometimes there is a need for "terrain re-shaping" either to provide for a spectator area or for public protection or there might be also a need for "course tweaking" to make it more challenging.

Terrain can be shaped by 1) metallic or wooden/plastic fencing, and 2) taping a narrow passage closed or with a combination of the above methods.

The basic principle and a rule of thumb is that a competitor needs to be clear whether it is allowed to cross a feature shown on the map or not. Any ambiguous parts of the course should also be marshalled.

Each artificial shaping of the course needs to be thought through very carefully. Does it serve its purpose, is it needed for improving the course or for public safety or for a landowner's wish, etc? Remember that there is a greater risk to the event caused by the effort of building artificial boundaries, usually in the morning of the competition. They need to be inspected by controllers and the EA and the features need to be marshalled during the whole competition to check that they don't change.

Taped boundaries must be used round all feature that are marked as forbidden on the map but are not obvious in the terrain. If you think that taping is needed, then that is usually an indication that it is! Taping is needed if vegetation may be unclear (low bush, unmapped gap in a hedge, cut vegetation etc.). An unclear border or a very low impassable house fence also need taping to clarify that they can't be crossed. Just a reminder: make sure that the competition map matches any artificial feature in every detail.

The map extract shows one of many courses which went into some ornamental gardens near to the competition Finish, both the olive green flower bed colour and the impassable hedge symbol indicating that runners could not go straight between the controls.

Every boundary was taped beforehand to reinforce this and marshals were watching to note anyone attempting to go out of bounds.

It's interesting to note that out of bounds areas and impassable line features usually improve Sprint terrain as they enforce more route choice options.

Building an artificial feature needs to be prepared well advance, for example what is needed and how long it will take to build it.

Crossing a road is one of the problematic points of course planning. Competitor safety is paramount so the course has to be planned so that every crossing is considered safe. Planning legs so that runners cross a road diagonally helps with this aim.

Where competitors must cross at a specific place, it is of course mandatory for the map to clearly show where and how a crossing is sited. Make sure that there aren't competitors running in opposite directions at the same crossing.

Finalising the course design

Finalising the course design is a time-consuming task. Ideally, no changes to the map and the courses are made after finalising the course design. Before starting, it's good practice to once again check that distances between the controls obey the Competition Rules. It is advised to define control point codes for neighbouring controls as different as possible to avoid mis-punches.

Cutting control circles sensibly needs consideration of where competitors come from and which direction they are leaving. If there are something important under the circle, it needs to be cut. Control descriptions need to be accurate too. For example, does the description give the competitor the best picture of the place where the control is set. When circles are cut, there is time to consider every leg thoroughly and check whether or not lines between control circles also need to be cut. Again, nothing crucial should be hidden under course markings.

Control numbers must be logically positioned. Take great care about their placing on the map as confusion about route choice and, in particular about order of controls, if the control number is set to an incorrect position. This is sometimes not easy when the map is small and controls are close together. Check that numbers do not cover any important information on the map. ISSprOM 2019 allows the use of white borders around numbers. This is problematic if they cover unintentionally an allowed passageway somewhere in the map.

On the morning of the competition

In some areas, cycling through the area is a good way to check the controls for the course planner. Remember to book one for controllers too!

The course planner should not do any additional tasks during the competition day. The success of the whole competition relies on course planners' work from the first start to the last finish. You must keep your focus strictly on the courses, controls and the terrain. Before the competition day (e.g. previous day) the course planner must give maps and control descriptions to the Start personnel and course files are given to the IT services for the result system. Course planners must also let the Finish construction personnel know how they want to set the last control and compulsory route to the finish.

Controls, gates, fences and taping

It is good practice to do a check list for all last-minute work. This contains all the must-do tasks including checking the gates that remain open (or closed), taping etc. Any tasks which can be done on the previous day will relieve the pressure, but still must be checked during the competition day also! Taping often needs to be tightened for example.

Depending on the competition area, it helps to form teams consisting of 2-3 people to get the controls ready. It is good to have photos from every control showing exactly where course planners want flags and punching devices to be positioned. Running must be allowed from each side. The course construction team must prepare their work in advance, so that they have all the tools and materials (duct tape, nails, wood, etc.) needed with them. During the competition, at least one team is controlling the whole competition area by bicycles (?) helping to keep all the devices and control constructions in place. Remember, controls can't be moved or altered during the competition, otherwise it affects the fairness of the competition.

Course planners are in charge of all the work done so they need to be aware of any problems encountered during the process. Also, they need to be informed when everything is ready for the competition. Controllers must time their work accordingly during the competition day. The whole process must be completed at least one hour before the first start.

The control construction needs to be strong enough to last the whole competition without getting broken.

Taping must be visible and around 1 metre high and should be straight and well tightened. Without saying, taping as well as fences need to be accurately positioned to match where they are shown on the competition map.

Every control must be marshalled and this must be planned well before the competition so that everyone knows his/her task and how it is supposed to be done. They must be provided with a personal instruction including where the marshal should stand during the competition. Their tasks might vary - someone controls forbidden areas, some may assure safety and some assure that controls stay in place and upright. There could also be a combination of any of the previous.

It is crucial that the course planners give a brief to all of the personnel before the competition starts. It will motivate and guide personnel to do their job as well as possible too. Also, this is a good time to give any additional information regarding tasks after the competition.

All the marshals must be aware that their work might involve competitor disqualification. They'll be given a log sheet where they must put any breach of rules noticed during the competition. Photographic evidence may be needed in case of a dispute later on. There must be a common understanding about the Rules that can lead to competitor disqualification.

After the competition

It is good practice to have a plan regarding how to proceed after the competition. What is the schedule of getting everything to the Finish? Be aware that the organiser is responsible for all cleaning/tidying and will be measured by doing all that. No exceptions. Being a good organiser needs also feedback from competitors and it needs to be done some way. Are there any needs to prepare a route choice feedback from the competitors (RouteGadget or similar)?

Remember to give a positive feedback to your volunteers about the great work they've done!!!!

6. Planning for TV and GPS

GPS tracking for events with TV coverage

GPS-tracking must be offered during all World Class Events. As a check on signal reliability, the complete courses should be run through with a GPS-tracking unit of the type to be used in the competition during the planning phase.

1. Find out if there are areas where mobile data coverage is poor. Any areas with poor mobile coverage must be taken into account when planning TV-coverage. For example, plan not to show live GPS in these sections for individual start races. For Relays, this can be done by showing GPS with increased delay in these areas - but this has to be carefully planned, and ideally these areas should be avoided in the course-planning if possible.
2. Find out if there are GPS-inaccuracies around any of the control points. If there are large inaccuracies around control points, e.g. if the GPS tracks do not go through the centre of the control point, corrections can be made in some of the GPS-tracking software solutions for the TV-production.

When planning an interval-start Sprint competition, there will typically be two TV-sections around 1/3 and 2/3 (can be combined with arena passage) of the course. In addition, pictures from the last leg and finish

must be shown. Pictures from the Start area are usually shown at the beginning of the competition. But where action at the Finish is also happening, focus should be concentrated on the finish section.

Further information about this may be found in the WOC Manual chapter 33 and the IOF TV Manual at https://orienteering.sport/iof/communication/

7. Course planning and TV production

Close cooperation between the course planners and the production team is needed for a successful TV production.

The contact must be established as early as possible to avoid unnecessary (spoiled) work for the course planners. The TV producer will come up with special requirements which will clearly have an influence on the courses. As a course planner for a High Level Event, you have to realise that **"It is difficult to create the world's best course in a high level event with TV coverage"**. It is often a question of compromise. Normally you will not have the final ideas from the TV producer when you start planning your courses. However, you can consider general requirements from TV producers.

Pay attention regarding how to lay cables in the best way to all the places where you need pictures and intermediate times from the terrain (camera positions, time controls).

TV-legs need 3 controls as shown below.

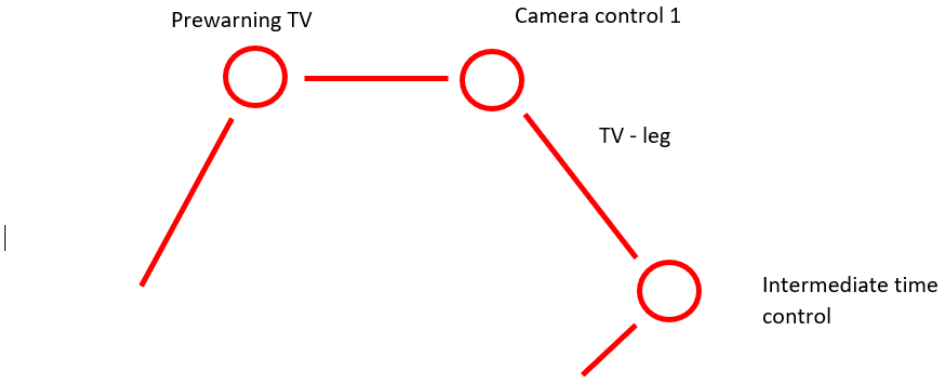


Figure 1. Section of orienteering course with respect to TV production

It is optimal to have the prewarning about 90 seconds before the runner appears in the first camera (should not be under 1 min or above 2.30). The TV sequence will normally last for 1 to 2 minutes. The example above shows that you can move a camera to a different control between the races to save resources (fewer cameras needed).

TV viewers should easily be able to distinguish between different legs where a course contains several TV legs.

Photo controls shouldn't be combined with TV-controls.

For optimal TV coverage it is better to have the Start in the arena and an arena passage during the race. This means that you need a quarantine zone close to the arena.

However, sporting fairness and terrain possibilities must be balanced against TV production. If necessary, the Start can be sited away from the arena, in which case you need TV-camera at the Start. Remember to find suitable routes for laying cables.

The table below shows the recommended number of TV sections related to the competition format. In addition, there should be cameras at the Start, at the arena passage and at the Finish.

There should be the same number of TV sections for both men and women. This means you must normally plan the same TV-sections for women and men, to save on resources and costs.

Type of course	Number of TV-sections out on the course	Remarks
Sprint	2-3	1-3 cameras on each section
Knock out Sprint	2-3	1-3 cameras on each section
Sprint relay	4-5	1-2 cameras on each section

Proposed number of TV – sections related to competition format.

The camera sections should be distributed as evenly as possible on the course. It is preferable to have more cameras towards the finish for Relays.

A TV-production can't be successful unless GPS tracking and timing can be a great part of what is shown on the screen.

Since several companies have to cooperate to give all necessary input to the production team during the race, you need a skilled (IT) coordinator in the organisation to check out the interfaces and make the agreements.

There will need to be several meetings and surveys well before the race date.

As a goal, the course planners must have the final agreements with the TV production team as soon as possible before the competition. The SEA must be involved as soon as possible into TV discussions.

8. Media and spectators

Media

Everyone is normally allowed to enter the competition area In Sprint competitions, so there are no restriction on where photographers can take pictures. However, the control marshals must still ensure that there is a clear way for the competitors to enter and exit the controls.

Spectators

Media and spectators are allowed everywhere in the competition terrain.

The course planner must keep in mind the fact that conditions might change with the spectators during the competition, when he/she plans the courses. At all times, the control marshals should ensure that there is a clear way for the competitors to enter and exit the controls.

There must be an arena passage to maintain spectator interest. The course planner must also consider if it is possible to have the Start at the arena. This gives an extra experience for media and spectators.

An alternative or a supplement to an arena passage is a spectator control which can be seen from the arena. The spectator control must be a split time control to simplify the speaker's job.

9. Managing a Course Planning Project

In the previous chapters, we have outlined the requirements for good courses, discussed how to set good courses and how the course should be adapted to the requirements of making the event friendly to TV-viewers, media and spectators.

However, a crucial prerequisite for being successful as a course planner is the course planner's ability to work with people fulfilling many other roles in the organisation and thus make sure high quality is preserved throughout by systematically removing any possible cause of failure.

Course planning as a process is prone to mistakes, so haste is the course planner's worst enemy. Starting early enough and taking as much time as needed is very crucial. Controllers and EAs need to evaluate early versions of courses also, so they must have enough time to do their important work.

These roles must be well defined in the organisation

- Course Planner as described in section 3
- The course controller, who acts as a coach and a challenger in the early phases of the work and an independent controller and/or monitor of the controlling work in the later phases of the work. This role may be undertaken by a National Controller, a Day controller or a third person. But for one specific race this role must be clearly allocated to one single person
- Test runner – A skilled orienteer running the course long time before the competition with the aim of giving feedback to the course planner about things that worked well and things that could be improved – and feedback as to whether the winning time is expected to be met.
- Check runner - A skilled orienteer running the course with the actual competition map in the early morning of the race day (after the e-card readers have been placed) looking for everything that might not be correct. Calls the Course Planner immediately if something is wrong.
- Event Adviser role – as a minimum (IOF Competition Rule 31.8), the EA
    - approves the courses after assessing their quality, including degree of difficulty, control siting and equipment, chance factors and map correctness
    - checks any course splitting method and course combinations
- The National Controller assists the Event Adviser (31.4) and the way in which the EA liaises with the planning team needs to be established at an early stage.

The Course Planner and the Course Controller work together throughout the project, whereas Test runners and Check runners are called upon at specific times.

The key element of course planning is to start early enough and allocate sufficient time for the work. The *Course Planning Project Management Tool* is an Excel workbook that is recommended for all course planners to use. It includes a Timing-sheet with a list of actions to be managed from the early start until the event is over. Many roles in addition to those above are found in the sheet. The Course planner should identify the owners of those roles in due time before the activity is to be done.

The *Course Planning Project Management Tool* has several tabs in the workbook. When using these tabs consistently, the Course Planner and the Course controller have a common framework for making sure that all issues are dealt with.

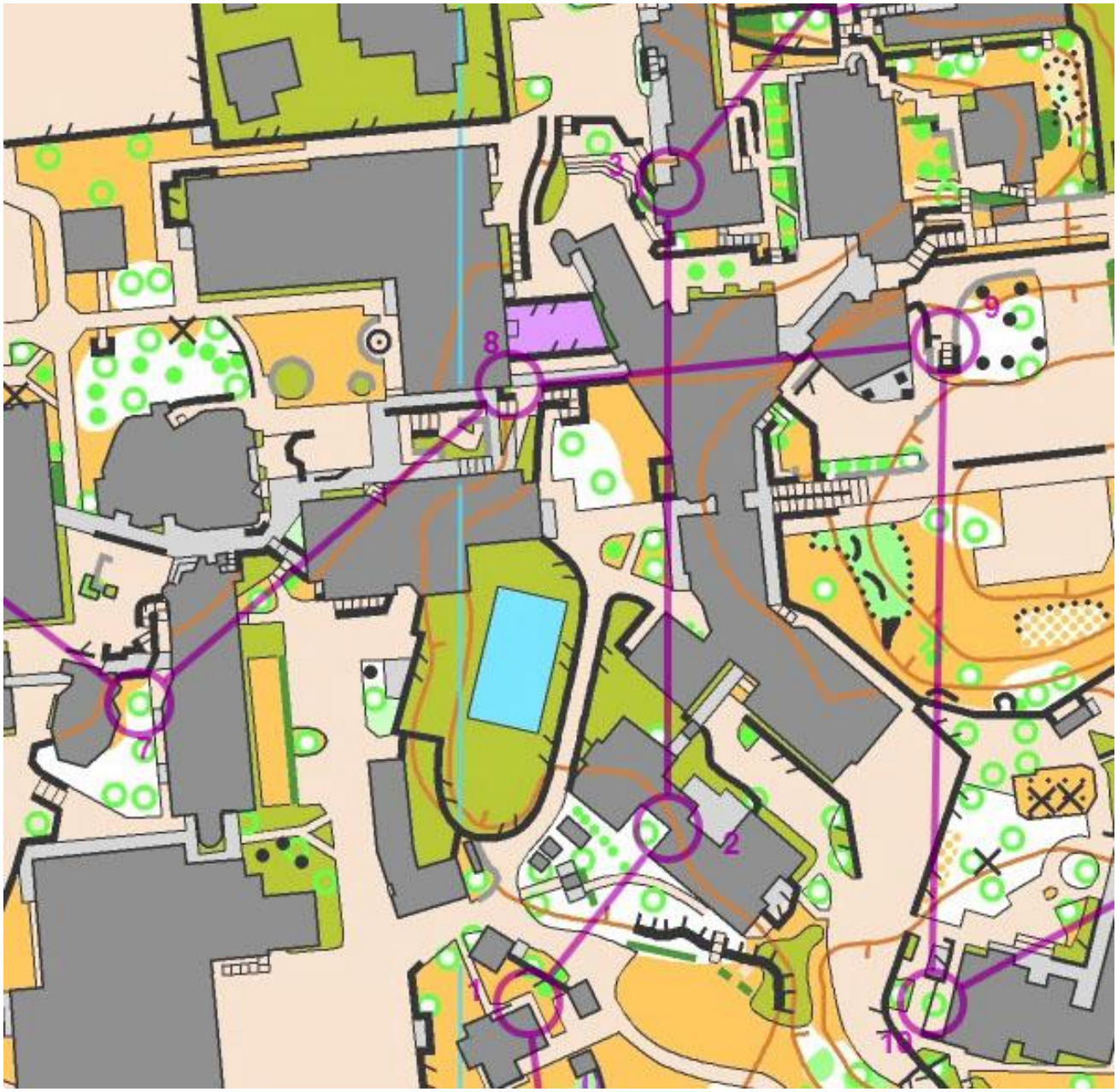
In the Timing-tab of the tool, the first column indicates before which of the SEA visits in a HLE, the task is scheduled to have been performed. Ideally, the SEA will take out the checklist during his/her visit and receive verification and proof that the tasks have been completed.

Checklist for a course planner

- Obtain at the beginning permissions to use the terrain and the competition centre area
- schedule of mapping and printing of courses
- inform controllers and EAs of any plans and changes concerning the competition
- know the Rules of Orienteering
- don't try to do everything on your own. Create a good, hard-working team
- make detailed schedule of everything to be done
- make a theme map of planned corridors based on discussions with landowners
- abandon areas that are not suitable
- find usable control points and design courses supporting the competition format
- have regular meetings with your team to update any information
- get all the information and files that IT needs to them early enough
- name someone to help IT during the competition
- give your input to design of the competition centre
- define special controls (media, VIP, split times, refreshments, first aid, …)
- check control points equipment well before the competition
- be responsible for control positioning and structures
- make sure there are plenty of punching units
- organise checking of EVERY printed map and control description
- test all the connection devices which are needed during the competition
- organise control point checking and supervising during the competition
- organise compulsory route, crossing and passage marking
- make a plan about what needs to be done after the competition

Appendix 1: “The long tricky complicated legs are often the best legs”

… but must be carefully planned to eliminate the element of luck.



Legs 2 to 3 and 8 to 9 are highly technical and involve detailed map reading to find the optimal routes. Is it good luck or good judgement which helps the runner find these? Good judgement is the answer here!

Appendix 2: How to judge Sprint course quality

Whether you're the planner, controller or competitor, your enjoyment of any Sprint race depends more upon its quality than on anything else; but what do we mean by "quality"? The answer lies in two factors – terrain and planning.

Assuming that the selected terrain is of appropriate standard, well planned Sprint courses usually have the following features:

- *Average leg lengths must be short, 120m to 180m being typical.*
- *Have frequent changes of direction (small crossover loops are good).*
- *Long legs may be set, as long as their execution involves a high rate of decision making along the way.*
- *Dog legs can provide good challenges too; but avoid the possibility that they may cause clashes between incoming and outgoing runners if space is restricted.*
- *Aim to make every leg pose a route choice challenge, especially in urban terrain. Control sites will often have to be positioned with great care in order to achieve this.*

But how easy is it for planners and controllers to check whether these aims are achieved? Some sort of quality measure would be helpful so the following scale has been devised as a rough check and considers the merit or otherwise of each leg on a Sprint course:

Points	Urban	Non Urban
0	Little or no route choice	Simple leg with minimal navigation needed
1	Two similar routes, easy to identify	Easy route choice leg with little technical detail
2	Several possible routes, or one longer route which is complex to execute – thinking needed	Route choices not immediately obvious and/or some technical challenge
3	Complex route choice/detailed navigation needed – many decision points	Complex route choice/detailed navigation needed

The table describes how the technical challenge of each leg can be quantified on a four point scale (0 to 3). Urban and non-Urban have different types of challenge so the table is divided into two columns accordingly. Examples of scoring are given overleaf.

The next step is to add the "marks" for each leg to arrive at a grand total for the course. The bigger the sum, the "better" the course – a rash statement possibly, but one with a good deal of truth in it as a large sum comes from both leg quantity and leg quality.

A good Sprint course should have a large number of legs ("average leg lengths must be short") and it will have much route choice and change of direction too, so both leg quantity and leg quality are involved. Hence the total mark for a course gives a good measure of its overall quality.

A total score of over 20 correlates well with courses which are rated as enjoyable and challenging. Under 15 and the course will probably not be.

So, how can this tool be used? Firstly, planners can rate each course they produce to maximise their scores (obviously, where a suite of courses of different lengths is being planned e.g. for a WMOC, scores must be adjusted pro rata by length before comparing them).

And of course, controllers and Event Advisers can use the tool to judge courses for quality, armed with a quantitative way of advising planners on possible improvements.

Examples of each quality are given next (for Urban only):-

Quality 0 example (12 – 13)

"Little or no route choice"

Quality 1 example (9 – 10)

"Two similar routes, easy to identify"

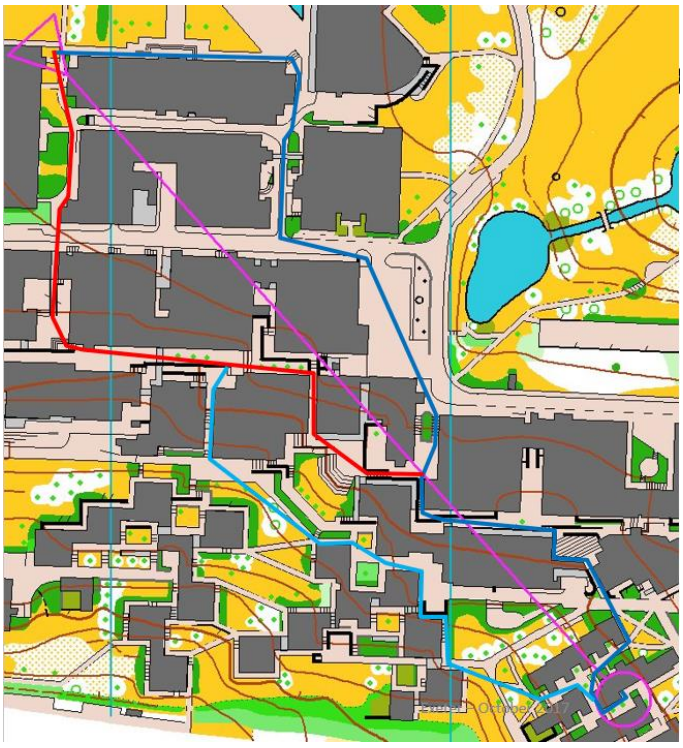
(left or right of the building just south of 10)

This is at the top end of the quality 1 category

Quality 2 examples (13 – 14 and 14 – 15)

"Several possible routes, or one longer route which is complex to execute – thinking needed"

Quality 3 example (Start – 1)



"Complex route choice/detailed navigation needed – many decision points"

Appendix 3: Background notes on Qualification for Knock Out Sprint races

Firstly 3 parallel heats are organised with an interval start of 1 or 1.5 minutes with estimated winning times of 8-10 minutes. The courses for the parallel heats must be as nearly as possible of the same length and standard.

For IOF events, the starting order in each qualification heat shall be in the order of the Sprint world ranking published at noon on the day before the first competition with the leading runners starting first.

- The first 12 placed runners in each heat will qualify for the quarter-finals.
- There are 6 quarter-finals with 6 runners in each. Winning time 6-8 minutes. Same course for men and women.
- In the elimination rounds, the competitors start together (mass start); the first across the finish line is the winner. A Finish line judge rules on the final placings based on the order that the competitors' chests cross the Finish line.
- The 3 leading runners in each quarterfinal qualifies for the semi-finals.
- There are 3 semi-finals with 6 runners each. Winning time 6-8 minutes. Same course for men and women.
- The 2 leading runners in the each semi-final qualifies for the final. Winning time 6-8 minutes. Same course for men and women.
- If there are fewer than 45 entered for the competition, the number of qualification heats may be reduced and the number of knock-out stages may be reduced. Consult IOF Competition Rule 12.26.

Day timetable

The Qualification race starts in the morning at 9:00 at the latest and 10:00 at the latest for the second class. Depending on the location of the quarter-finals, they can be scheduled either:

Directly after the Qualification race, if the Qualification Race arena is used, or in the afternoon, just before the semi-finals and the Final, if one arena is used for all the elimination rounds.

Quarter-finals have gaps of preferably 5 (or possibly 10) minutes between each heat.

Either way, there should be a lunch break (preferably 4 hours) for the athletes, either before the quarter-finals (if the 3 elimination rounds share the same arena) or after the quarter-finals (if only the semi-finals and the final are run from the same arena).

The break for the Athletes between the quarter-finals and the semi-finals must be at least 55 minutes.

The break for the athletes between the semi-finals and the final shall be at least 20 minutes.

After the lunch break, the starting order of the two classes may be changed.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