

ISMTBOM update proposal v6 (Jan 16)

The MTBOC formed an ISMTBOM review group that were going to develop a proposal with updates to the current ISMTBOM. The review group looked at normal deviations within the current ISMTBOM, symbols that have been borrowed from other mapping specifications and other common issues with the current mapping standards. A special focus was set to how to map urban areas.

Explanation to proposal

Proposed (new) text/explanation

Important changes and explanations

Symbol dimensions and colours

Only symbols or text needing to be changed are shown in this proposal. The rest of the symbols and text are ok as they are. **Please note: symbol images shown in this text are not representative to scale nor the dimensions specified.**

The ISMTBOM review group proposes following changes to the ISMTBOM (Symbol examples are not drawn to scale):

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1. Introduction

No proposed changes

2. General requirements

2.1 Orienteering and the map

No proposed changes

2.2 Content

No proposed changes

2.3 Accuracy

Clarifying:

The general rule should be that competitors shall not perceive any inaccuracy in the map. The accuracy of the map as a whole depends upon the accuracy of measurement (position, height and shape) and the accuracy of drawing. Mappers need to pay especially attention to symbol 510 and 511 to show exact junction point and angle. All distinct junctions and crossings must be drawn solid in order to clarify the exact position and angle of the junction or crossing. This is valid also for dotted tracks.

2.4 Generalization and legibility

No proposed changes

3. Map specifications for Mountain Bike Orienteering

3.1.1 Scale and symbol sizes

Add: Sprint maps shall not exceed 250x300mm (according to rules) **(Would prefer 300mmx300mm)**

Add: Course marking symbols in section 4.8 (symbols: 701-706 and 840) shall not be enlarged from 1:15 000 size in other scales. Other overprint symbols shall be enlarged by 1.5x.

Add after the table: No deviations from the given dimensions within these specifications are permitted. It is however accepted that due to limitations in printing technology the final map symbol dimensions may vary up to +/-5%.

Dimensions in this book are given at the printed scale of 1:15 000 except for symbols in the sprint section 4.9 that are given at printed scale of 1:10 000 (this means no dimension change is required on any 1:10000, 1:7500 or 1:5000 sprint map).

All line widths and symbol dimensions must be kept strictly to their specified value. Certain minimum dimensions must also be observed. These are based on both printing technology and the need for legibility.

MINIMUM DIMENSIONS

- Shortest dashed and dotted path/track symbol: at least two dots/dashes
 - Very short sections of paths can be drawn with only 1 dash (symbol 831 or 832) for clarity in junctions etc.
- Minimum gap between parallel paths that do not connect: 1mm
- Minimum gap between paths ends/junction that do not connect: 5mm
- Minimum gap between buildings and other passable routes shall be 1mm.
- Smallest area of colour
 - Blue, green, grey or yellow full colour: 1 mm²
 - Orange full colour and black dot screen: 2 mm²
 - Blue, brown, green or yellow dot screen: 2 mm²

All features smaller than the dimensions above must be either exaggerated or omitted, depending on whether or not they are of significance to the competitor. When a feature is enlarged, neighbouring features must be displaced so that the correct relative positions are maintained.

3.1.2 Scale and symbol size for Masters

Young and ageing eyes have different needs to elite athletes. In order to accommodate these needs, different scales may be used for different age groups. Older eyes (40+) have a focal range 30-35cm with reading glasses. Unlike Foot Orienteering, the map in MTBO cannot be moved closer to the face and into the focal range. Instead the athlete must move their body to find the best reading position. It is therefore important that 40+ age classes receive an adjusted map, with a scale and symbol size better suited to their needs. It is recommended Master maps use 1:10000 for middle and long distance events; with 1:7500 and 1:5000 being used for terrain with a dense track network and/or sprint events.

Event Format	Elite Scale	Master scale	Master symbol size
Ultralong	1:20000	1:15000	1x
Long	1:15000	1:10000	1.5x
Middle	1:10000	1:10000/1:7500	1.5x
Sprint	1:7500/1:5000	1:7500/1:5000	1.5x

3.2 Contour interval

No proposed changes

3.3 Colours

No proposed changes

3.4 Printing and reproduction

Add: Desirable qualities for paper: easy to fold, easy to pierce with mapholder buttons, waterproof, not easily torn or adhesive to self/other materials, should retain correct colour, should not shrink or wrinkle when wet. Paper should not be less than 100gsm, and ideally more than 110gsm.

3.5 Off-track travel

New section:

Due to different national laws and environmental issues, off-track travel may be restricted in competitions. When off-track travel is not allowed this means the athlete is not allowed to pass through the terrain, neither riding on the bike or on foot. The organisers can allow crossing the terrain next to the bike, but this has to be well informed in bulletins etc.

So far, no good way of mapping off-track travel has been found. Due to this the organizer always has to inform competitors (in bulletin, Team Officials meeting etc.) where riding is allowed. Tracks symbols (4.1) are normally allowed to ride, unless they are marked on the map accordingly to show travel is forbidden. All symbols showing riding is forbidden e.g. Out-of-bounds area (709), or forbidden to cross e.g. forbidden route (711) will always be forbidden, regardless of whether off track travel is permitted or not.

If off-track travel is generally forbidden in the terrain, symbol 839 and 839.3 may be used to show areas where this off-track riding is temporarily allowed.

If off-track travel is allowed in most of the terrain, but only smaller sections are not allowed symbol 709 (out-of-bounds area) shall be used.

4. Explanations of symbols (MTBO)

4.1 Track symbols

Track symbols are features that can be seen as “on-track” and are always allowed to ride if no other overprint symbols show otherwise. These symbols are of main importance for deciding route choices and for navigation. Symbols 501,502,503,503.1 shall be drawn to scale in sprint maps. A track or path drawn on the map shall represent the rideable area. If the track or path visibly appears much wider than the rideable area, symbol 401 open land, 403 rough open land or 839.2 open land permitted to ride (depending on national rules), can be drawn in addition to clearly represent the appearance on the ground.

This new category is proposed to clarify which symbols that are meant as rideable and will make it easier to localize the symbols in the specifications. This will also clarify when shortcutting is not allowed as only the symbols in this category are allowed to ride on. This category is the most important in MTBO and should therefore be first in the map specifications. In this category also all existing symbols that should be moved here are mentioned. If the change of category is not accepted by MC the proposed new symbols should still be considered included in the ISMTBOM in another category.

501 – Motorway

Moved to track symbol category. No change to symbol

502 – Major road

Moved to track symbol category. No change to symbol

Min width: 0.8mm

503 – Minor road

Moved to track symbol category. No change to symbol

Min width: 0.6mm

831 – Track: fast riding

Moved to track symbol category. No change to symbol Width 0.6mm

832 – Path: fast riding

Moved to track symbol category. No change to symbol Width 0.4mm

833 – Track: medium riding

Moved to track symbol category.

Dash dimension: Width 0.6mm, length 3.0mm, gap 0.8mm

834 – Path: medium riding

Moved to track symbol category.

Dash dimension: Width 0.4mm, length 3.0mm, gap 0.7mm

835 – Track: slow riding



Moved to track symbol category.

Dash dimension: Width 0.6mm, length 1.2mm, gap 0.6mm

836 – Path: slow riding



Moved to track symbol category.

Dash dimension: Width 0.4mm, length 1.2mm, gap 0.5mm

837 – Track: difficult riding



Colour: black.

Dimension: Width 0.6mm, length 0.6mm, gap 0.5mm

Moved to track symbol category.

838 – Path: difficult riding



Colour: black.

Colour: black.

Dimension: Width 0.4mm, length 0.4mm, gap 0.4mm

Moved to track symbol category.

833-838: In terrains with many singletracks, e.g. bike parks and mtb trails, the gap between dashes may be reduced to 0.5mm on tracks and paths with many tight corners, so as to clearly show the nature of the trail: twisting trail with many corners and direction changes, possibly occurring in a small area.

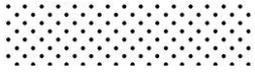
839 – Open land, permitted to ride

An area of grassland that is permitted to ride, when off-track riding is otherwise forbidden. The permitted area should have obvious borders or be marked in the terrain.

Colour: Orange (60% magenta, 100% yellow)

Often the organiser needs the athletes to cross open fields even when off-track riding is forbidden. For example at arena passing, through a park or to the finish line. Symbol may be used as an area symbol or line symbol such as 509.1





839.3 - Forested area, permitted to ride

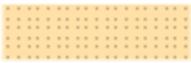
An area of terrain with a dense track network or little ground vegetation where riding everywhere is allowed. Predominant track/paths going through this area shall be shown to aid navigation. The permitted area should have obvious borders or be marked in the terrain.

Colour: Black

Dimensions: Dots 0.35mm, distance 0.9 mm, angle 45degree

New symbol.

211 - Open sandy ground



An area of soft sandy or soft gravelled ground where cycling is difficult or impossible.

Colour: black and yellow 50% (see 403).

Dimension: Diameter 0.2mm, distance 0.6mm.

Old symbol with new definition and classification. Although there may be potential for confusion between 839.3 and 211, the overall concept is: black dot pattern = permitted to ride'.



841 - One way compulsory

For use on tracks and paths where it is only allowed to ride in one direction, for example on mountain bike singletracks. The frequency of chevron arrows depends on the overall length of track/path in question. At minimum, there should be one at the start, after each adjoining junction, and at the end.

Colour: Upper purple

Dimension: 0.35mm line width, 2.5mm height, 45 degrees

New symbol

529 – Paved and gravel area



A paved/gravel area is an area with a firm level surface such as asphalt, tiles, hard gravel, concrete or the like. It should be bordered (or framed) by the symbol step or edge of paved and gravel areas (529.1). Distinct differences within the paved area can be represented with the symbol step or edge of paved area (529.1), if they serve navigation.

Colour: 50%

Same symbol, but with change to 529.1

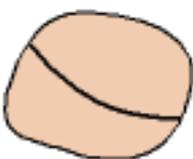
529.1 - Step or edge of paved and gravel areas

A step or an edge of a paved area.

Colour: black.

Dimension: 0.14mm

Changed definition.



529.3 – Stairs

A flight of stairs in the terrain. Use symbol 843, dangerous object, at the top of the stairs if they are especially dangerous



Colour: black, with 30% brown fill

Dimension: Width 0.6mm, line width 0.14mm, distance between stairs 0.5mm

Added new symbol, 2x thicker lines than FootO sprint maps to make it possible to read.

4.2 Landforms

109 – Erosion Gully

An erosion gully or trench. Minimum depth 1.0m

Width: 0.35mm



4.3 Rocks and Boulders

No proposed changes

Move 211 Sandy ground to Track section (4.1)

4.4 Water and Marsh

No proposed changes

4.5 Vegetation

In terrain where off-track travel is allowed the representation of vegetation both has a navigational purpose and for deciding route choices. If off-track travel is forbidden the representation of vegetation is of importance to the competitor only for navigational purposes, not for route choices. This is important to have in mind when surveying the map. For example, if the forest is dense on one side of the path and sparse on the other, this presents navigation and positioning information.

It should also be noted that the foot orienteering symbols 414 and 416 (cultivation boundaries) should be omitted since they may cause confusion with some of the symbols used for tracks and paths.

COLOUR

The basic principle is as follows:

white represents forest with good visibility. If off track travel is permitted, white forest should have a speed of equivalent to that of symbols 835/836.

yellow represents open areas divided into several categories after its rideability and vegetation. For open land the riding speed should be equivalent to symbols 833/834.

green represents the density of the forest and is clearly difficult to pass, either on or off the bike.

401 - Open land with good rideability

Open parkland, meadows, grassland, etc. without trees. Rideability equivalent to symbols 833/834. If yellow coloured areas become dominant, a screen (75 %) instead of full yellow may be used.

Colour: yellow.

Change to definition, same symbol.



402 - Open land with scattered trees. Good rideability

Parkland with scattered trees that allows a riding speed equivalent to symbols 833/834. Individual trees may only be shown if they are distinct from their surroundings (418/419) and when shortcutting is permitted, to provide a navigation feature or control point. This symbol should be used to generalise the terrain.

Colour: yellow 100%

Dimension: diameter 0.4mm, distance 0.5mm

Change to definition, same symbol.



403 - Rough open with reduced rideability

Heath, moorland, felled areas, newly planted areas (trees lower than ca. 1 m) or other generally open land with rough ground vegetation, heather or tall grass. Rideability equivalent to symbols 835/836 and 837/838.

Colour: yellow 50%

Change to definition, same symbol.



404 - Rough open land with scattered trees. Very reduced rideability

Scattered trees in rough open land, typically long grass areas where riding speed is equivalent to symbols 835/836 and 837/838. It is not recommended to add individual trees, unless they are exceptionally distinct from surroundings (418/419) and provide a navigation feature or control point, when shortcutting is permitted.

Colour: yellow 50%, white

Dimension: diameter 0.55mm, distance 0.7mm

Change to definition, same symbol.



405 - Forest: good visibility, normal off-track rideability

Typically open forest for the terrain, where travel across allows the equivalent speed of symbols 835/836 by bike or running with bike.

Colour: white

Change to definition, same symbol.



406 - Forest: reduced visibility, difficult/impassable rideability

Dense forest with low visibility. If shortcutting is permitted, the speed to bike or run through should be difficult or impossible forcing the competitor to dismount.

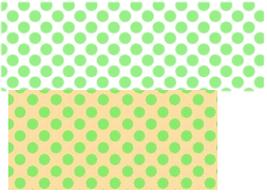
Colour: green 30 %

Change to definition, same symbol.



407.1 – Undergrowth: good visibility, reduced off-track rideability

An area of dense undergrowth but otherwise good visibility (brambles, heather, low bushes, cut branches etc), which reduces off-track rideability to difficult or impossible requiring the competitor to dismount. Symbol should only be used when off-track riding is allowed.



Colour: green 50%

Dimension: diameter 0.55mm, distance 0.7mm

New symbol. Much needed symbol between 405 and 406 when off-track riding is permitted

418, 419, ~~420~~ - Special vegetation features

418 – vegetation feature - undefined

419 - Large distinct tree that is immediately identifiable and can be used for control points.

Colour: green

Take away 420 and put into sprint standards



509.1 Narrow ride, impossible riding

Non-rideable, overgrown, narrow forest rides shall be represented. They may be represented to scale.

Colour: yellow (50%). Dimension 0.6mm minimum width

New symbol. It is of great importance to know if the narrow ride will be rideable or not.



509.2 Narrow ride, medium riding

Rides and extraction lanes with a surface that allows a riding speed equivalent to symbols 833/834. They may be represented to scale.

Colour: yellow (100%). Dimension 0.6mm minimum width

New symbol. It is of great importance to know if the narrow ride will be rideable or not.



527 – Settlement (Forbidden to enter)

Houses and gardens and other built up areas. Buildings and other significant features within a settlement must be shown.

Road entrances shall be represented when all access is forbidden providing they aid navigation. Viable routes with forbidden access shall be removed from the area except for the entrance and exit.

A permitted route shall be represented by a continuous road or track symbol throughout the area.

Colour: Yellow 100 Green 50



4.6 Man-made features

515 – Railway (forbidden)

519 - Passable stone wall

A stone wall less than 1.0m, that is allowed and possible to cross.

Colour: 70% grey

Dimension: 0.21mm baseline, 0.75mm circle diameter, distance between circles 3.0mm

New symbol. To make it possible for the athlete to understand if a stone wall is passable or not

521 - Uncrossable stone wall (Forbidden to cross)

A stone wall of any height that is forbidden to cross. A high stone wall >1.0m. shall always be marked as forbidden since it poses a danger/significant time loss to cross for the athlete.

Colour: 70% grey

Dimension: 0.35mm baseline, 0.75mm circle diameter, distance between circles 0.84mm, distance between circle groups 3.0mm

It is forbidden to cross an impassable stone wall.

Competitors violating this rule will be disqualified.

Same symbol, means now impassable. To use 707 – Uncrossable boundary to show all forbidden stone walls on a map may be very chaotic.

522 - Crossable fence

A fence less than 1.0m high that is allowed and possible to cross.

Colour: 70% grey

Dimension: baseline 0.21mm, tag length 0.7mm, tag thickness 0.17mm, distance between tags 3.0mm

New symbol. To make it possible for the athlete to understand if a fence is passable or not

524 - Uncrossable fence (Forbidden to cross)

A fence of any height that is forbidden to cross. A high fence >1.0m should be marked as forbidden since it poses a danger/significant time loss to cross for the athlete.

Colour: 70% grey

Dimension: baseline 0.35mm, tag length 0.7mm, tag thickness 0.17mm, distance between tags 0.72, distance between tag groups 3.0mm

It is forbidden to cross an impassable fence or railing!

Competitors violating this rule will be disqualified.

Same symbol, means now impassable. To use 707 – Uncrossable boundary to show all forbidden fences on a map may be very chaotic.

533 - Pipeline

A pipeline that is easy for athletes to cross over (or under), which doesn't require significant time loss.

Dimension: As per ISMTBOM but with single chevron and line widths of 0.14mm.

534 - Uncrossable Pipeline (Forbidden to cross)

A pipeline of any height that is forbidden to cross.

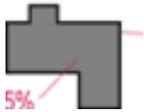
Dimension: As per 2010 ISMTBOM.

526 - Building

A building is shown with its ground plan as so far as the scale permits. There should be a 0.1mm 100% black bounding line around buildings to improve clarity and legibility from other colour tones.

Colour: 70% black, 100%black bounding line

A thin black line around houses will distinguish them from the symbols around and making the map better readable. Even though black is reserved for track symbols, this line is so thin it should not cause problems.



4.7 Technical symbols

No proposed changes

4.8 Overprinting symbols

Overprinting symbol shall not be increased in size or dimension from 1:15000 symbol set.

7xx – Control Code

3-79

Control code shall use Arial with a height of 4mm. Both control number and code shall be bordered with a small white borderline to improve legibility if necessary.

707 - Uncrossable boundary (Forbidden to cross)

A boundary that is not permitted to cross. Due to similarities between 707 and 843, this symbol should not be used as a single, stand alone straight line across a track or paved area or along the length of an uncrossable feature. If a section of track shall not be used by competitors, symbol 844 or 711 should be used.

Colour: upper purple.

Dimension: width 0.8mm

It is forbidden to cross an out-of-bounds area!

Competitors violating this rule will be disqualified.

Clarification to definition, recommended use



709 - Out of bounds area (Forbidden to cross)

An out-of-bounds area is shown with vertical stripes. A bounding line should be drawn if the area is marked with tapes in the terrain. If off-track riding is



forbidden or there are other natural boundaries only track symbols leading into the forbidden area need to be marked when the bounding line is shown. The areas that may be dangerous to competitors shall be presented by this symbol.

Colour: purple.

Dimension: line thickness 0.25mm, line space 0.6mm, bounding line 0.25mm.

It is forbidden to cross an out-of-bounds area!

Competitors violating this rule will be disqualified.

Clarification to definition, recommended use

714 - Temporary construction, closed area or outside restaurant (forbidden to cross)

Obvious temporary constructions like platforms for spectators and speaker, closed area for spectators, outside restaurant areas, etc. shall be represented in plan shape. Must be distinctly visible on the ground

Colour: purple 50%.

It is forbidden to enter a temporary construction or closed area!

Competitors violating this rule will be disqualified.

Added new symbol



4.9 Additional sprint symbols

For maps to be used in for sprint distance the following symbols can also be used. Dimensions in this section are given at the printed scale of 1:5 000, 1:7 500 and 1:10 000.

4.9.1 Track symbols

529.2 Paved area - urban



On sprint maps (urban areas) paved roads (501, 502 and 503) and paved areas shall be drawn to scale with 30% brown. Gravel areas (urban) shall be drawn with 50% brown (529.0). For forest sprint races, or maps with sections of forest, 50% brown may be used in the non-urban areas for all asphalt surfaces.

A paved area is an area with a firm level surface such as asphalt, tiles, concrete or the like. It should be bordered (or framed) by the symbol step or edge of paved and gravel areas (529.1). Distinct differences within the paved area can be represented with the symbol step or edge of paved area (529.1), if they serve navigation.

501 – Motorway shall always be drawn to scale

502 – Major road shall be drawn to scale, but no smaller than minimum width: 1.2mm (on maps with scale larger than 1:10000)

503 – Minor road shall be drawn to scale, but no smaller than minimum width: 0.9mm (on maps with scale larger than 1:10000)

Sidewalk/pavement – Shall be drawn to scale, but not smaller than minimum width: 0.6mm (on maps with scale larger than 1:10000)

Please note: It is advisable to use the paved area symbol in urban areas for bike paths. In forested areas, bike paths may be drawn using symbols 831/832.

Colour: brown 30% (paved area) / 50% (gravel)

Added new special sprint symbol since this gives the athlete better impression of the terrain.

4.9.2 Landforms

103 – Form line

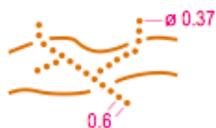
An intermediate contour line to be used to give more information about the shape of the ground, where it will aid navigation. Only one form line may be used between neighbouring contours.

110 - Small erosion gully

A small erosion gully or trench which is a significant aid to navigation, where riders should not need to dismount. Minimum depth is 0.5 m.

Colour: brown.

Dimension: diameter 0.37mm, distance 0.6



Added new special sprint symbol. May be useful for security, navigational aid and control point

112 - Small knoll

A small obvious mound or rocky knoll which cannot be drawn to scale with a contour (101) or index contour (102). The height of the knoll should be a minimum of 1 m from the surrounding ground. Small knolls shall only be drawn if they aid navigation for the competitor.

Colour: brown.

Dimension: diameter 0.75mm

Added new special sprint symbol. May be useful as navigational aid and control point

4.9.3 Rocks and Boulders

No extra symbols needed

4.9.4 Water and Marsh

No extra symbols needed

4.9.5 Vegetation

420 - Special vegetation feature

Small individual tree or bush, can be used to show trees that line pavements/roads etc in paved areas. Recommended for use where space is tight and the need for clarity takes precedence.

Colour: Green

Dimension: diameter 0.75mm

Moved to special sprint symbol. Hard to see in the other scales where symbol 418 and 419 are better but may be useful when on detailed sprint maps if the space is limited as navigational aid and control point

421 – Forbidden vegetation (Forbidden to enter)

An area of vegetation which is forbidden to enter, due to forbidden access (flowerbed etc) or because it may constitute a danger to the competitor.

Colour: green 100%

It is forbidden to enter forbidden vegetation!

Competitors violating this rule will be disqualified.

New symbol. May be used as an alternative to 528.1 to draw flowerbeds clearly to avoid legibility issues with 528.1 and other colours.

421.1 - Impassable hedge (Forbidden to cross)

Hedges are forbidden to cross. A hedge of any height, which is distinct in the terrain and provides an important navigational feature.

Colour: green,

Dimension: 0.5mm width

It is forbidden to cross an impassable hedge!

Competitors violating this rule will be disqualified.

Much needed new special sprint symbol. Useful to show forbidden hedges, as navigational aid and control point

4.9.6 Man-made features

526.2 – Canopy



A canopy is a building construction (with a roof), normally supported by pillars, poles or walls, such as passages, gangways, courts, bus stops, gas stations or garages. Drawn with 0.1mm black borderline

Small passable parts of buildings, which cannot easily be crossed by competitors, shall not be represented on the map and shall be closed during the competition.

Colour: black 30%

Added new special sprint symbol. Useful to show route choices, as navigational aid and control point. Large barriers in a canopy shall be shown as 526.0 Building.

4.9.7 Technical symbols

No extra symbols needed

4.9.8 Overprinting symbols

No extra symbols needed

Appendix 1

This section contains symbol options for further testing. Dimensions are listed for 1:15000.

508.1 – Indistinct track or path

An indistinct track or path that is possible to ride, but hard to identify and/or follow in the terrain. The symbol can also be used on sections of a track or path that is less distinct in the terrain.

Colour: Orange (60% magenta, 100% yellow)

Line width: 0.6mm

508.2 – Indistinct track or path

An indistinct track or path that is possible to ride, but hard to identify and/or follow in the terrain. The symbol can also be used on sections of a track or path that is less distinct in the terrain.



Colour: Black

Line width: 0.55mm, Circle Diameter: 0.55mm, Gap (two dots): 0.7mm, Gap (main length a): 2.00mm