



MEASUREMENT REPORT

OHRID TRČAT HALFMARATHON

OHRID (MKD)



by Borut Podgornik WA/AIMS course measurer

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SUMMARY OF MEASUREMENT OHRID TRČAT HALFMARATHON

Date of measurement: 19.4.2024

How many measurements of the course were made? 1

Name of measurer: Borut Podgornik

How much of the road width is available to runners throughout the length of the road race course?

The course starts in the city center and whole width of the roads is available to runnerrs (up to point A), then the runners have to run on Turistička Bulevard only on right 2 lanes where they will run back again (so 2 ways of traffic), this is up to point B (gate entrance to the stadium), then one lap at the track in running direction again to point B, then back to point A on Turistička Bulevard, further to point A' (left lane), then to point C (= Turn 1) and back to point A' (again two ways of traffic, still on Turistička Bulevard), from point A' till the finish line (over Turn 2) again the whole width of the roads is available to the runners (see pictures 31 to 33).

If the route at turns cannot be described as the "shortest possible route", explain what restrictions will apply, and how these will be enforced?

The course was measured as the shortest possible route on above described roads all the way.

Length of course after any adjustment: 21,0975 km

Difference between longest and shortest measurement: /

Which measurement was used to establish the final course length and WHY?

The final course length of the course was established after bicycle postcalibration and turning point 2 was moved for appropriate lenght onwards (= 50,10 m).

OVERVIEW OF THE MEASUREMENT PROCEDURE

Ohrid trčaT halfmarathon in Ohrid is a traditional event, organized this year for the 8th time in a row. The organizer is a local Athletic club Ohrid trčaT. The date of the event for this year is Sunday, 1st June with start at 8.15 in the morning and 9.00 for 5 km. They have a competitive halfmarathon in the program, but also non or let's say less competitive app. 5,3 km + halfmarathon relay. Approximate number of participants will be according to their expectations around 2300 in all events (400 – 500 in halfmarathon).

The organizer already made a measurement last year, but didn't have an appropriate certificate of measurement. So they decided to make the lenght of the course exactly measured once again and to get AIMS certificate for the course, that's why I have prepared this report in English and send it to AIMS together with aplication documents for certificate.

I found an appropriate place for calibration course on bike path beside Boulevard Turistichka in NW direction (pictures 1 to 5) not far away from the city center, so I didn't want to use already existed calibration course from last year. Bicycle calibration was done before and after the measurement as a standard procedure on this course.

The measurement of the course was settled early in the morning as in that time the traffic usually is not very heavy. I started at previous fixed starting line (see picture 7) accompanied with a car of the organizer in the back and biker in the front and made a ride in running direction. First section of measurement is where entire roads are available for running up to provisional point A (see picture 8). From there I made a ride in running direction towards stadium where two way of running traffic is going to happen. That's why I didn't measure backwards from point B to A as the distance is the same. Then I moved to point C, which should be fixed Turn 1 and measured backwards to point A again (and made a provisional point A' between) as this distance (from point C to point A') is running there and back and is the same lenght. Then I continued from point A' all the way to the finish line (and made a provisional point D, where we estimated the Turn 2). Then I was making postcalibration after finishing and calculated the measured distances and noticed that there was still 100,23 m missing distance. I went back to point D, where I made a provisional mark before and move this point for half of this missing distance onwards to get a correct lenght (PK nail).

The organizer should put fences and/or cones on the turns (see pictures below) to prevent short cut. The same should be done on some other bends or in the middle of the roads all the way to the turns, which is well seen on pictures below.

The course is on tarmac road all the way (except in the old town from the top downhill to the lake – app. 650m on old cablestones running spectacular literally through the houses - see pictures 22 to 27 and in the stadium where 1 lap is to be run in running direction on Mondo surface. There is one tough hilly section and one more moderate (see picture 34). The difference between the lowest (693 m) and the highest (742 m) point is 49 m. Start/finish point is at 693 m (lowest point).

LIST OF THE STREETS AND ROADS

STREET BY STREET	KM	LINES AVAILABLE
Kej Makedonija	START	full
Makedonski Prosvetiteli		right
Partizanska		full
Jane Sandanski	1	full
Dimitar Vlahov		full
Makedonski Prosvetiteli	2	full
Boulevard Turistichka	3	right
Approach Stadium	4	full
Stadium track		full
Approach Stadium		full
Boulevard Turistichka	5, 6, 7, 8	left
Turn 1	8,1	left
Boulevard Turistichka	9	right
Abas Emin		full
Kiril i Metodij	10	full
Ilindenska		full
Kosta Abrash	11	full
Kej Makedonija	12	full
Studenchishta	13	right
Naum Ohridski	14, 15, 16	full
Turn 2	16,65	right
Naum Ohridski	17	full
Studenchishta	18	left
Kej Makedonija	19	full
Jane Sandanski		full
Dimitar Vlahov	20	full
Makedonski Prosvetiteli		right
Kej Makedonija	21	full
Kej Makedonija	FINISH	full

DETAILS OF THE CALIBRATION COURSE

- 1 Name of event: Ohrid TrčaT halfmarathon
- 2 City/town: Ohrid, North Macedonia

3 Location of calibration course: on bicycle path beside Bulevard Turistichka in NW direction (left side), start 16,20 m behind far edge of pedestrian crossing on Turistichka Bulevard, parallel 2,00 m after city light pole No. 147 on right side of the Bulevard (see pictures 1 to 3), finish 2,86 m behind far edge of drain cover parallel to pedestrian crossing over Bulevard just before roundabout (see pictures 4 and 5).

- 4 Length of calibration course: 300,00m
- 5 Date measured: 18. 4. 2025
- 6 Method used to measure calibration course: 50m steel tape (20°C, 50N)
- 7 How many times did you measure the calibration course? 2x
- 8 Measurement team leader: Borut Podgornik
- 9 Address of team leader: Staneta Severja 14, 2000 Maribor, Slovenia
- 10 Phone contact of team leader: +386 41 664412
- 11 Email address of team leader: borut.podgornik@triera.net
- 12 List names and duties of team members: Ivan Cvetkovski, assistant
- 13 Is the calibration course: STRAIGHT? YES PAVED? YES
- 14 How are the start and finish points marked? PK nails

15 Are the start and finish points located in the road where a bicycle wheel can touch them? YES

- 16 Number of full tape lengths 6 Total length: 6 x 50m = 300m
- 17 A picture of calibration course:



STEEL TAPING DATA SHEET (for measuring a calibration course)

Name of calibration course: Boulevard Turistichka

City/town and State: Ohrid, North Macedonia

Date: 18. 4. 2025

Start time: 16.30 Finish time: 17.20

Pavement temperature:Start16°CFinish16°CAverage16°C(thermometer shaded from direct sun)

Measurements and calculations:

1 First measurement. This establishes tentative start and finish marks which should not be changed until the final adjustment on line 6 below.

6 x 50,00m + / = 300,00m # tape distance per partial tape measured lengths tape length length distance

2 Second measurement. This checks the distance between the SAME tentative start and finish points marked in the first measurement, but use new intermediate taping points.

6	х	50,00m	+	0,007m	=	300,007m
# tape		distance per	F	oartial tape	m	easured
lengths		tape length		length	d	istance

3 Average raw (uncorrected) measurement of course: 300,0035m

Temperature correction. Use the average pavement temperature during measurement. Work out answer to at least seven digits beyond the decimal point.
Correction factor = 1.0000000 + (.0000116 x [16 - 20])
Correction factor = 0,9999536
NOTE: For temperatures below 20C, factor is less than one
For temperatures above 20C, factor is greater than one

- 5 Multiply the temperature correction factor by the average raw measurement of the course 0,9999536 x 300,0035m = 299,9895798376 correction factor avg. raw measurement corrected measurement
- 6 I moved the finish mark for 1,1 cm onwards and drive PK nail into the road.

Final (adjusted) length of calibration course 300,00m

BICYCLE CALIBRATION DATA SHEET

Name of event: Ohrid TrčaT halfmarathon

Date of measurement: 19.4.2025

Name of measurer: Borut Podgornik

Length of calibration course: 300,00m

PRE-CALIBRATION - ride the calibration course four times, recording data as follows:

<u>Ride</u>	Start Count	Finish count	Difference
1	17000	20319	3319
2	20319	23639,5	3320,5
3	23639,5	26958,5	3319
4	26958,5	30279	3320,5

Time of day: 3.45 Temperature: 8°C

WORKING CONSTANT = number of counts in one kilometre, calculated from the pre-measurement average count, and multiplied by 1.001 – the "short course prevention factor"

Pre-measurement average count = 3319,75

Counts per km = pre-measurement average count x 1000/length of calibration course in metres Working Constant = counts per km x 1.001 = 11.076,899166666

POST-CALIBRATION - ride the calibration course four times, recording data as follows:

<u>Ride</u>	<u>Start Count</u>	<u>Finish count</u>	<u>Difference</u>
1	10000	13320	3320
2	13320	16640	3320
3	16640	19960	3320
4	19960	23279	3319

Time of day: 6.15

Temperature: 5°C

FINISH CONSTANT = number of counts in one kilometre, calculated from the post-measurement average count, and multiplied by 1.001 – the "short course prevention factor"

Post-measurement average count = 3319,75

Counts per km = post-measurement average count x 1000/length of calibration course in metres

Finish Constant = counts per km x 1.001 = **11.076,899166666**

CONSTANT FOR THE DAY = the average of the working constant and the finish constant = **11.076,899166666**

COURSE MEASUREMENT DATA SHEET

Name of event: Ohrid trčaT halfmarathon

Name of measurer: Borut Podgornik

Date of measurement: 19. 4. 2025

Start time: 4.05 Temperature: 7°C

Finish time: 6.45 Temperature: 5°C

Constant for the Day: 11.076,899166666 counts/km

MEASUREMENT DATA

Measured point	Counter reading	Cumulative counts	Cumulative distance in m	Adjustment in m
Start – in front of House No. 10 on Kej Makedonija, 2,00 m after light pole on the right side – see pictures 6 and 7	42000	00000	0.00	/
Point A (provisional) — just after roundabout on Boulevard Turistichka - see picture 8	65453	23453	2.117,29	/
Point B (provisional) – at the gate to the stadium – see picture 9	86535	44535	4.020,53	/
Point B (provisional) – see picture 9	91208	49208	4.442,39	/
Point C = Turn 1 – 6,50 m before ending a green zone in the middle of Boulevard Turistichka, just before crossroads to St.Erasmus Hospital - see pictures 10 to 13	33000	00000	0,00	/
Point A' (provisional) — just before turning right from Boulevard Turistichka to Abas Emin street - see picture 8	49076	16076	1.451,30	/
Point A (provisional) — see picture 8	52490	19490	1.759,51	/
Point A' (provisional) — see picture 8	56000	00000	0,00	/
Point D (provisional) – on the Road to Hotel Park Lakeside Ohrid – see picture 14	134142	78142	7.054,50	/
Finish - in front of House No. 10 on Kej Makedonija, 2,00 m before light pole on the right side – see pictures 6 and 15	182729	126729	11.440,83	/

RECAPITULATION OF MEASUREMENT

1. Desired length of course: 21,0975 km

Length of course as measured:

(Start to Point A) + (Point A to Point B) + (Point B to point B – on the track) + (Point B to Point A) + (Point A to Point A') + 2 x (Point A' to Point C) + (Point A' to Point D) + (Point D to Finish) = 2.117,29 m + 1.903,24 m + 421,86 m + 1.903,24 m + 308,21 m + (2 x 1.451,30 m) + 7.054,50 m + 4.386,33 m = 20.997,27 m (= 100,23m missing)

Turn 2 was moved for half of this distance onwards = 50,11 m (see pictures 16 to 18) to get a correct distance **21.097,50 m**.

CALIBRATION COURSE START side view – (picture 1)



CALIBRATION COURSE START onwards – (picture 2)



CALIBRATION COURSE START backwards – (picture 3)



CALIBRATION COURSE FINISH side view – (picture 4)



CALIBRATION COURSE FINISH backwards – (picture 5)



START side view – (picture 6)



START onwards – (picture 7)



POINTS A and A' – (picture 8)





POINT C = TURN 1 aerial view – (picture 10)



POINT C = TURN 1 onwards – (picture 11)



POINT C = TURN 1 backwards - (picture 12)



POINT C = TURN 1 side view – (picture 13)



POINT D aerial view – (picture 14)



FINISH onwards – (picture 15)



TURN 2 backwards – (picture 16)



TURN 2 onwards – (picture 17)



TURN 2 side view – (picture 18)



DETAIL CITY CENTER – (picture 19)



STADIUM backwards – (picture 20)



STADIUM onwards – (picture 21)



GATE ON THE TOP OF THE HILL – (picture 22)



BEHIND THE GATES – (picture 23)



DOWNHILL on CABLESTONES – (picture 24)



DETAIL I old town – (picture 25)



DETAIL II old town – (picture 26)



DETAIL III old town – (picture 27)



TOWARDS PROMENADE I – (picture 28)



TOWARDS PROMENADE II – (picture 29)



TOWARDS PROMENADE III – (picture 30)



THE COURSE HALFMARATHON with points A – D – (picture 31)



THE COURSE UPPER PART – (picture 32)



THE COURSE BOTTOM PART – (picture 33)



ELEVATION PROFILE – (picture 34)



Maribor, 20th April 2025

Report prepared by: Borut Podgornik

