MEASUREMENT REPORT

ČIVIJAŠKI HALFMARATHON

ŠABAC (SRB)

by Borut Podgornik
WA/AIMS course measurer

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SUMMARY OF MEASUREMENT ČIVIJAŠKI HALFMARATHON

Date of measurement: 11./12. 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 has 2 different parts: first part (from the start to app. 1,5km of basic lap and from app. 3,35km to the finish) there the whole width of the road is available to runners, the rest only right lane of the road is available to runners, so the organizer should provide fences, cones or similar to separate both lanes of the roads in this part towards both turns.

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 in both parts 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 new turning point 2 was designed, so that it was moved for appropriate lenght (= 22,59 m) onwards.

OVERVIEW OF THE MEASUREMENT PROCEDURE

Čivijaški halfmarathon in Šabac was a traditional event, but wasn't organized for the last 6 years. This year the organizer a local sports association »Fury runners« decided to make it happen again. The date of the event for this year is Sunday, 8th September with start at 10.00 in the morning. They have a competitive halfmarathon and also 7km + relays 3 x 7km in the program. Approximate number of participants will be according to their expectations around 500 in all events.

I found an appropriate place for calibration course along Savska street in N direction (pictures 1 to 7), not far away from the city center and start/finish line itself. Bicycle calibration was done before and after the measurement as a standard procedure on this course.

The measurement of the course was settled late in the evening as in that time the traffic usually is not very heavy. I started at already fixed starting point in Cara Dušana Road in city center (see pictures 8 to 10) accompanied with a car of the organizer in the front and police car in the back and made a ride in running direction all ther way throughout the whole lap. The course is in three laps with starting and finishing strait outside of the basic lap. So I made a first provisional mark A just after entering the basic lap. Then I continued app. for 1,5 km when out and back section started. This part I ride only on the right lane till Turn 1, where I made mark again and back to the bend into Svetogorska street. Then I continued all the way almost to the end of the basic lap, where I made a provisional mark B. The last part of basic lap was from that point to the finish line (the same as start line). At the end I made also a measurement between points B and A when running the 2nd and 3rd lap. Then I was making postcalibration after finishing and I calculated the measured distances and noticed that there was 135,58 m missing distance for the whole race course. The organizer decided to design a new turn 2 where we added this missing distances with having in mind that the runners run the whole course in 3 laps (see pictures 15 to 17 and measurement data sheet below). At the end I drove nails into a road at the start/finish line, Turn 1 and Turn 2 (see pictures below).

The organizer should put fences and/or cones on the out and back section and at the turns (see pictures below) to prevent short cut. The same should be done on some other bends, which is well seen on pictures below.

The course is on tarmac road all the way (see picture 19) and flat (see picture 20). The difference between the lowest (76 m) and the highest (86 m) point is 10 m. Start/finish point is at 80 m.

LIST OF THE STREETS AND ROADS for basic lap

STREET BY STREET	KM	LINES AVAILABLE
Cara Dušana	**START**	full
Masarikova	**1**	full
Pocerska		full
Pocerska		right
Kasarska	**2**	right
turn	**2,44**	right
Kasarska	**3**	right
Pocerska		right
Svetogorska	**4**	full
Svetogorska		right
turn	**4,22**	right
Svetogorska		right
Žike Popovića	**5**	full
Vojislava Ilića		full
Prote Smiljanića		full
Karađorđeva	**6**	full
Kneza Lazara		full
Kralja Dragutina		full
Kneza Miloša		full
Karađorđeva	**7**	full
Cara Dušana	**FINISH**	full

DETAILS OF THE CALIBRATION COURSE

1 Name of event: Čivijaški halfmarathon

2 City/town: Šabac, Serbia

3 Location of calibration course: on the left side of Savska street in N direction, start 4,92 m after near edge of drain cover just after crossroads to parking lot on the left side at the beginning of Savska street, parallel to STOP sign on the left side of the road (see pictures 1 to 3), finish between 1st and 2nd light pole on the right side, just after second crossroads to the right (see pictures 4 to 7).

4 Length of calibration course: 300,00m

5 Date measured: 11. 4. 2024

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: Marko Panić, 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: Savska street

City/town and State: Šabac, Serbia

Date: 11. 4. 2024

Start time: 17.30 Finish time: 18.20

Pavement temperature: Start 22°C Finish 22°C Average 22°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 lengths		distance per tape length		partial tape length		measured 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	x	50,00m	+	0,002m	=	300,002m
# tape lengths		distance per tape length		partial tape length		measured distance

3 Average raw (uncorrected) measurement of course: 300,001m

4 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 [22 – 20])
Correction factor = 1,0000232
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

1,0000232	x	300,001m	=	300,0079600232
correction factor		avg. raw measurement		corrected measurement

6 I moved the finish mark for 0,8 cm backwards and drive PK nail into the road.

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

BICYCLE CALIBRATION DATA SHEET

Name of event: Čivijaški halfmarathon

Date of measurement : 11. 4. 2024

Name of measurer: Borut Podgornik

Length of calibration course: 300,00m

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

Ride	***Start Count***	***Finish count***	***Difference***
1	59000	62299	3299
2	62229	65596	3297
3	65596	68894	3298
4	68894	72193	3299

Time of day: 22.30 Temperature: 16°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 = 3298,25

Counts per km = pre-measurement average count x 1000/length of calibration course in metres
Working Constant = counts per km x 1.001 = **11.005,160833334**

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

Ride	***Start Count***	***Finish count***	***Difference***
1	70000	73298	3298
2	73298	76596	3298
3	76596	79894	3298
4	79894	83192	3298

Time of day: 00.00 Temperature: 15°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 = 3298

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

Finish Constant = counts per km x 1.001 = **11.004,326666666**

CONSTANT FOR THE DAY = the average of the working constant and the finish constant = **11.004,74375**

COURSE MEASUREMENT DATA SHEET

Name of event: Čivijaški halfmarathon

Name of measurer: Borut Podgornik

Date of measurement: 11./12. 4. 2024

Start time: 23.00 Temperature: 16°C

Finish time: 1.10 Temperature: 15°C

Constant for the Day: 11.004,74375 counts/km

MEASUREMENT DATA

Measured point	Counter reading	Cumulative counts	Cumulative distance in m	Adjustment in m
Start – on Cara Dušana street, parallel to 2nd small tree on the right side, 7,60 m after crossroads with Kneza Ive od Semberije street – see pictures 8 to 10	80000	00000	0,00	/
Point A (provisional) – on Masarikova street, just after crossroads with Karađorđeva street – see picture 10	81345	1345	122,22	/
Turn 1 – on Kasarska street, 8,40 m before concrete base of the last light pole on the left side (diagonal) before crossroads with Vuka Karađića Road, app. 10,5km before near edge of the last pedestrian crossing – see pictures 11 to 13	106813	26813	2436,49	/
Point B (provisional) – on Karađorđeva street, app. 50m before crossroads with Masarikova street – see picture 10	155939	75939	6900,56	/
Finish – on Cara Dušana street, parallel to 2nd small tree on the right side, 7,60 m after crossroads with Kneza Ive od Semberije street – see picture 14	158029	78029	7090,48	/
Point B (provisional) – on Karađorđeva street, app. 50m before crossroads with Masarikova street – see picture 10	60000	00000	0,00	/
Point A (provisional) – on Masarikova street, just after crossroads with Karađorđeva street – see picture 10	61735	1735	157,65	/

Point C (provisional) – on Svetogorska street, just before crossroads with Žike Popovića street – see picture 15	40000	00000	0,00	/
Point D (provisional) – on Žike Popovića street, just after crossroads with Svetogorska street – see picture 15	40306	306	27,80	/
Point D (provisional) – on Žike Popovića street, just after crossroads with Svetogorska street – see picture 15	40000	00000	0,00	/
Turn 2 – 5,18 m after far edge of drain cover in the middle of Svetogorska street, just after crossroads with Žike Popovića street – see pictures 16 and 17	40397	397	36,07	/
Point C (provisional) – on Svetogorska street, just before crossroads with Žike Popovića street – see picture 15	40803	803	72,97	/

RECAPITULATION OF MEASUREMENT

1. **Desired length of course**: 21,0975 km

   Length of course as measured:

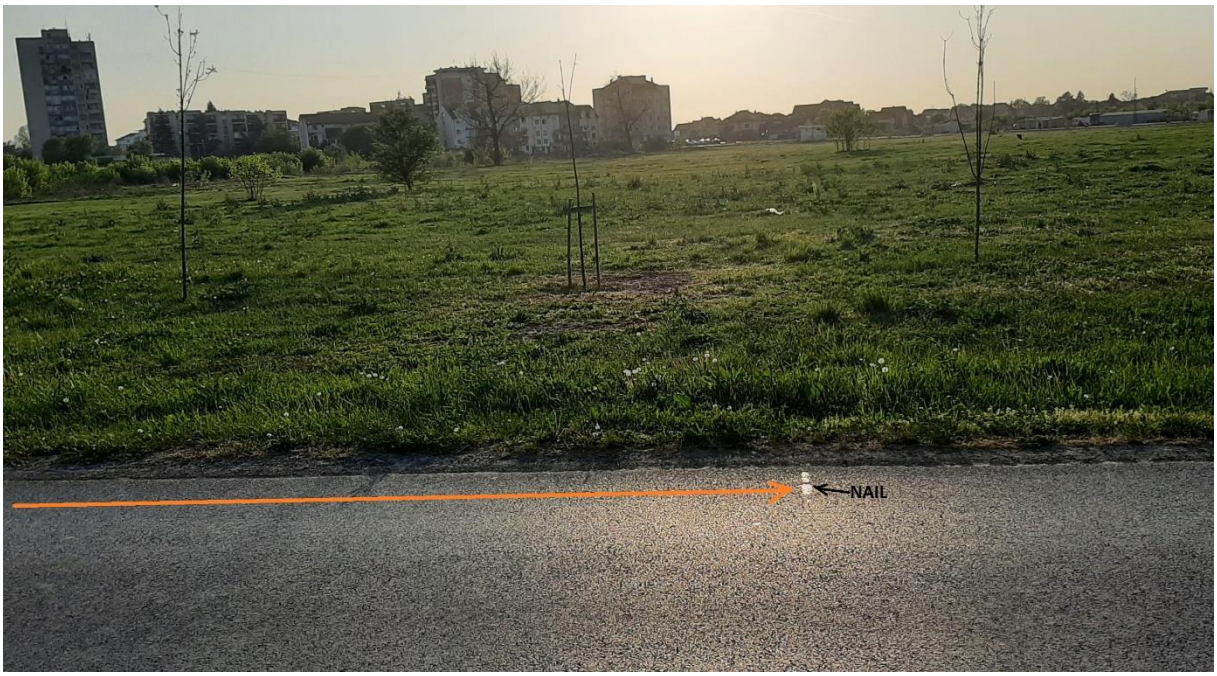
   Measured: Start – Finish + 2 x (Point B – Point A – Point B) = 7090,48 m + 2 x 6935,72 m = 20.961,92 m (= 135,58 m missing)
   Another Turn 2 was designed so that we added 22,59 m (missing distance divided by 6 = 3 laps there and back) to get a correct distance **21.097,50 m.**

CALIBRATION COURSE START side view – (picture 1)

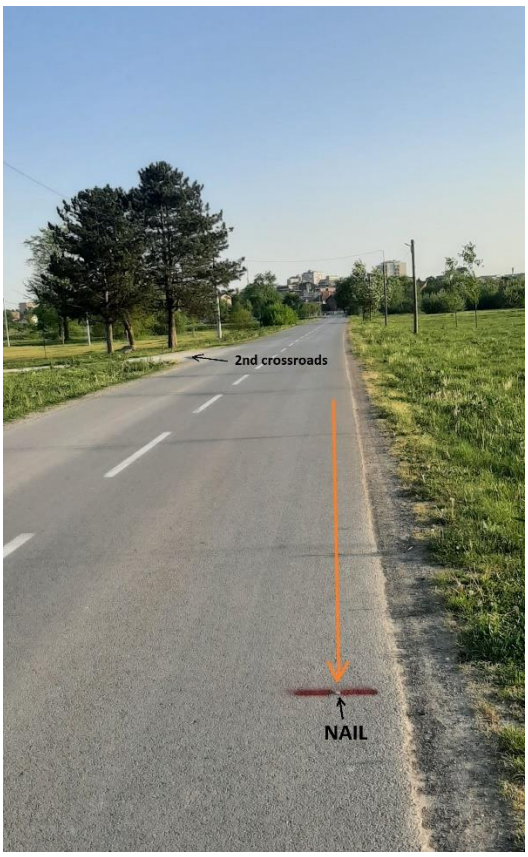
CALIBRATION COURSE START onwards – (picture 2)

CALIBRATION COURSE START backwards – (picture 3)

CALIBRATION COURSE FINISH side view – (picture 4)



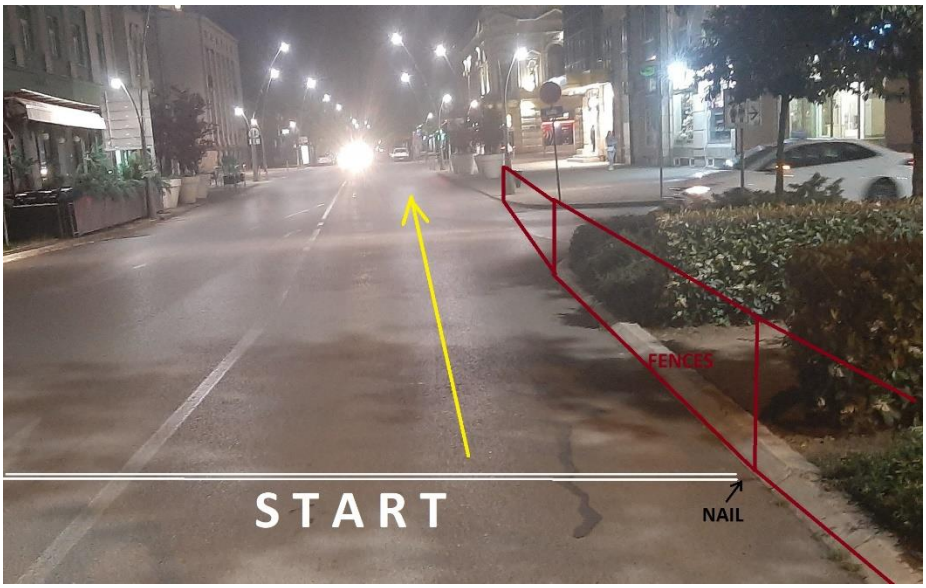
CALIBRATION COURSE FINISH backwards – (picture 5)



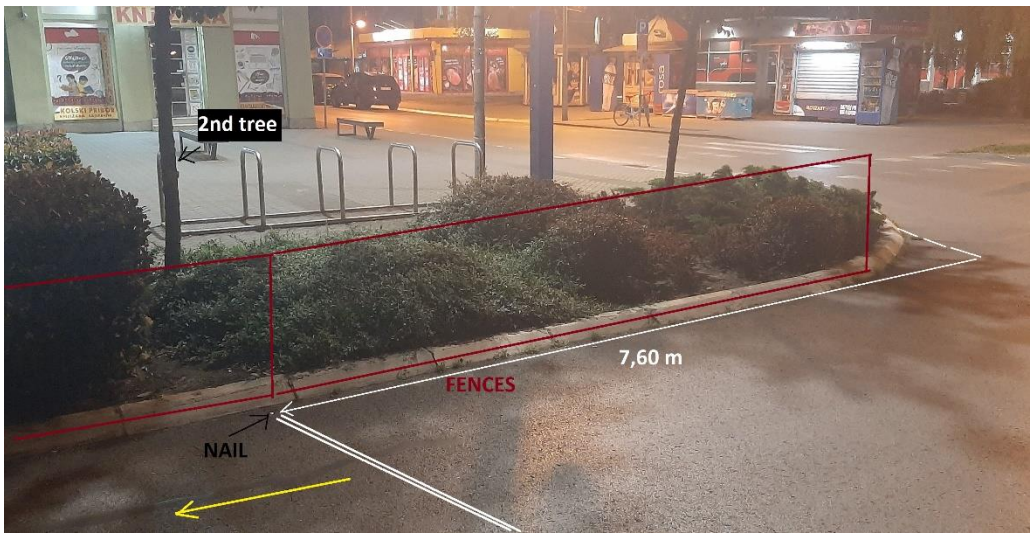
CALIBRATION COURSE FINISH onwards – (picture 6)

CALIBRATION COURSE FINISH backwards side view – (picture 7)

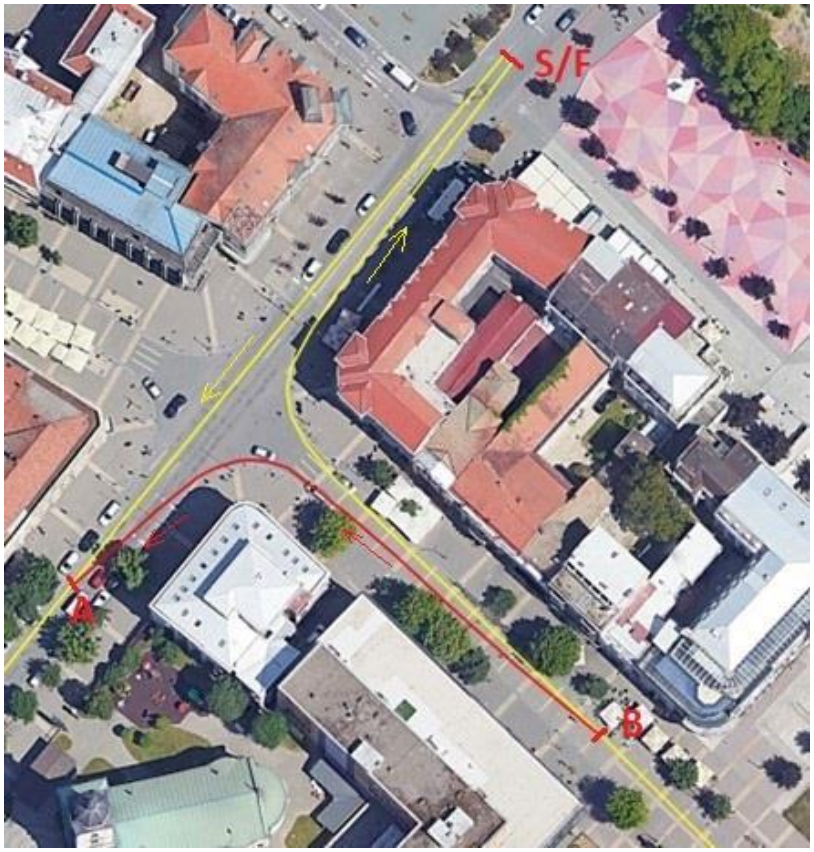
START onwards – (picture 8)



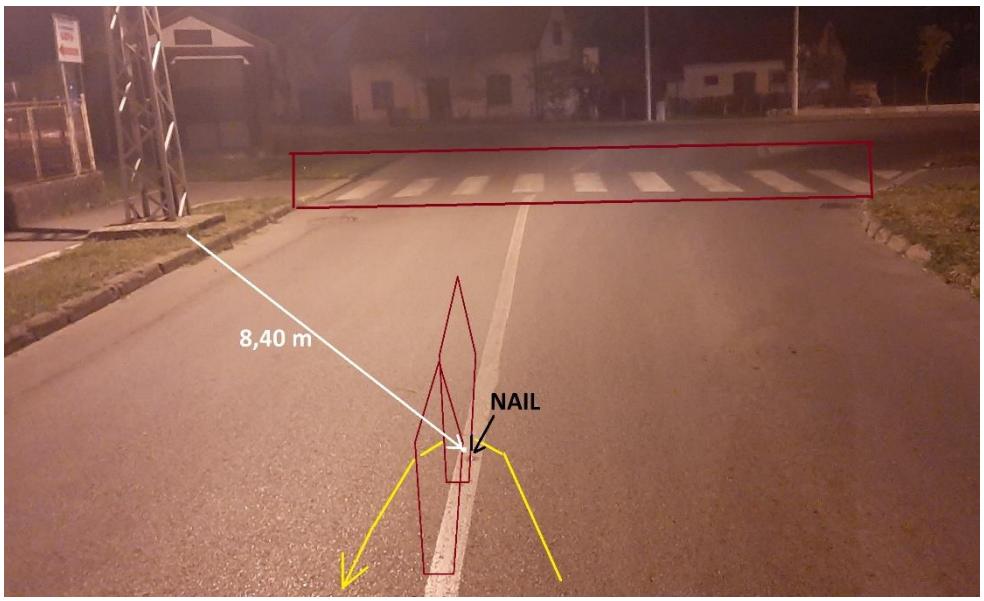
START side view – (picture 9)



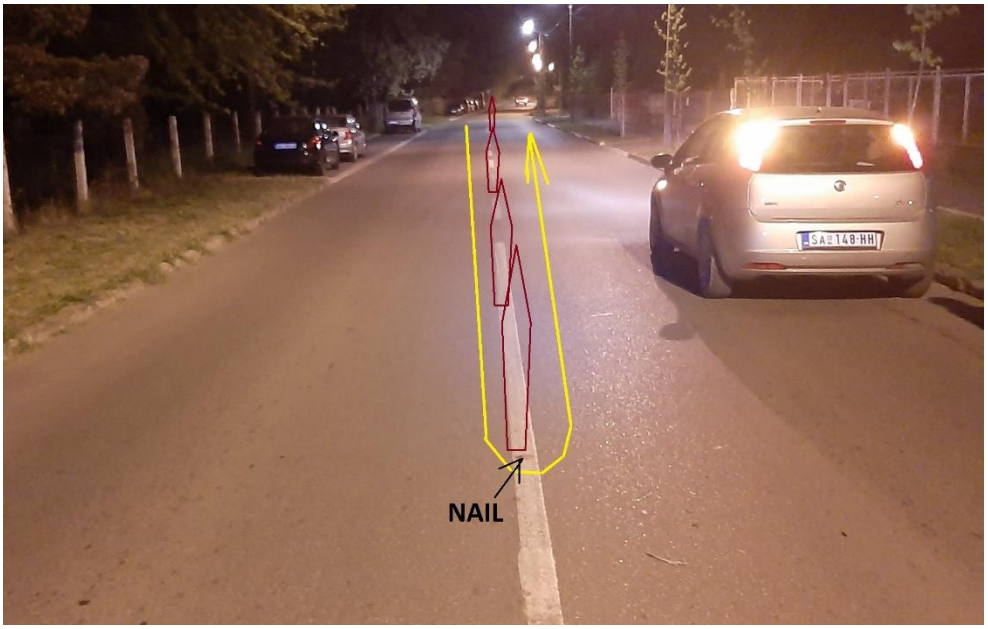
START/FINISH, POINT A and POINT B aerial view – (picture 10)



TURN 1 onwards – (picture 11)

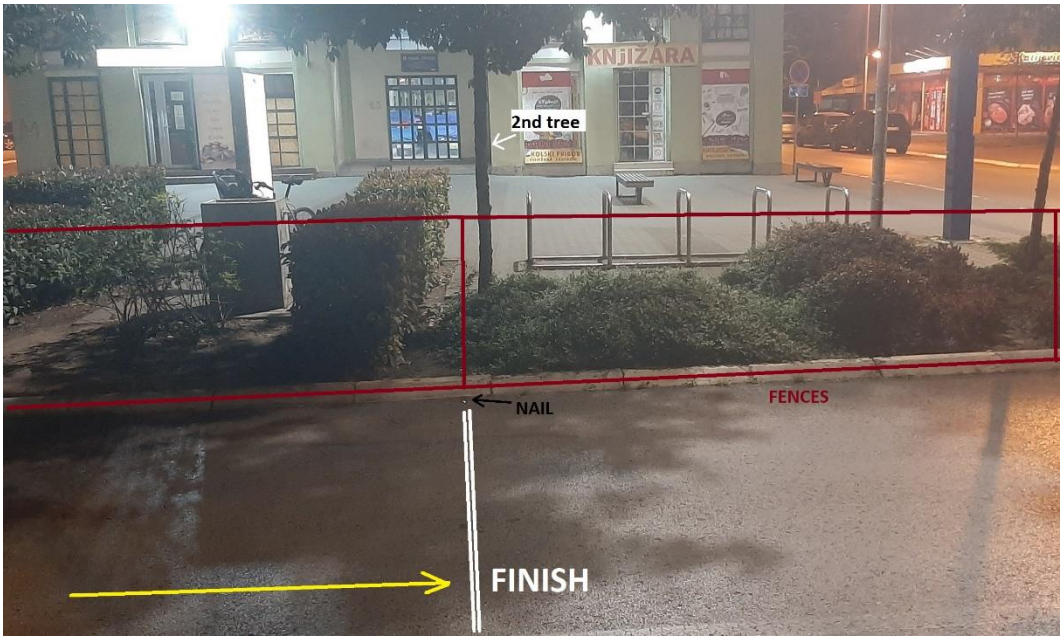


TURN 1 backwards – (picture 12)

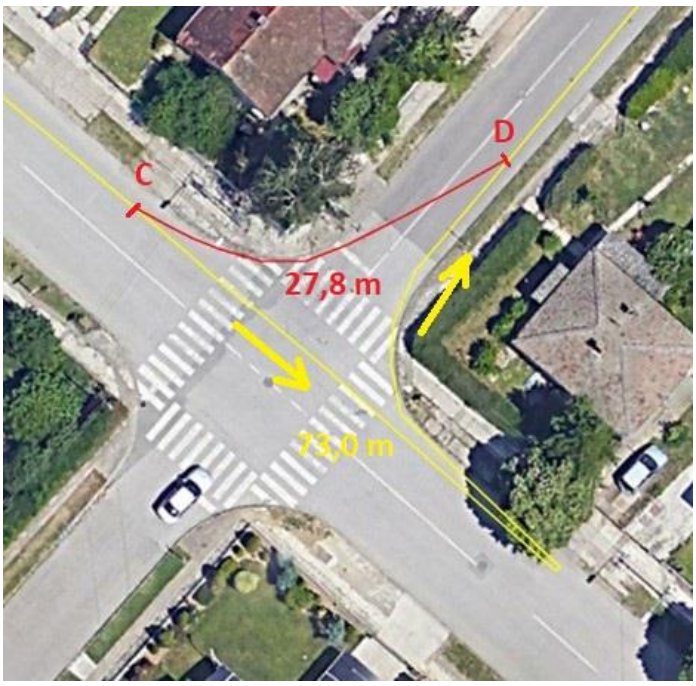


TURN 1 aerial view – (picture 13)

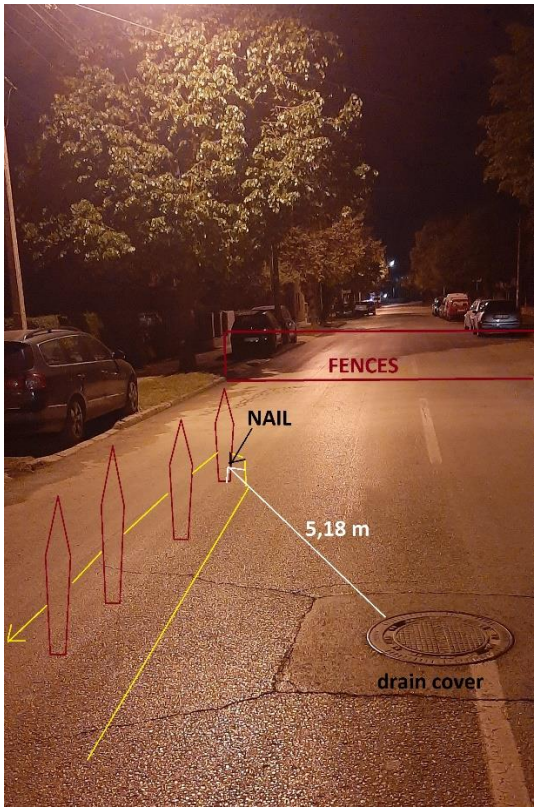
FINISH – (picture 14)



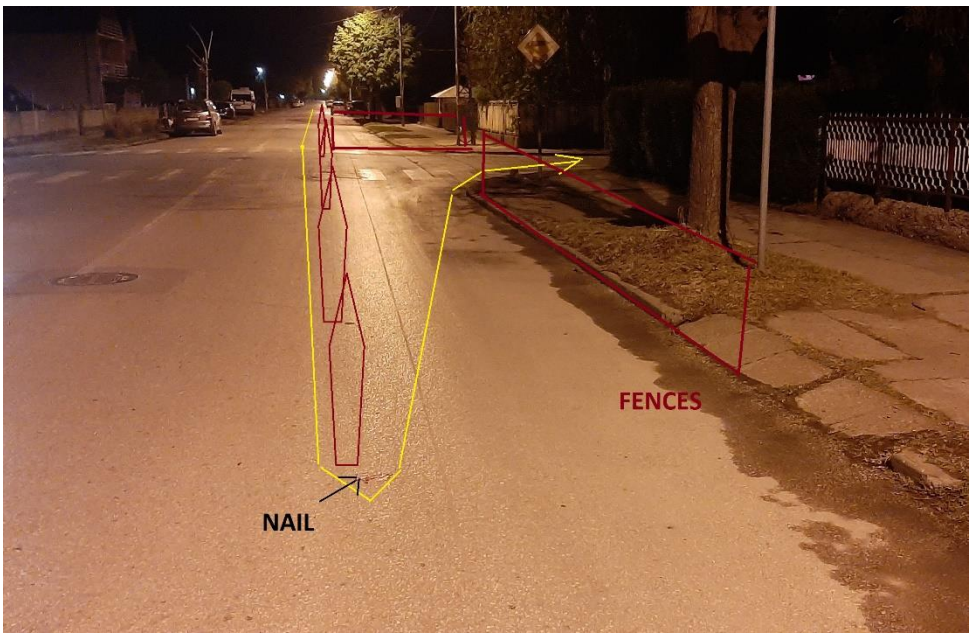
POINTS C and D aerial view – (picture 15)



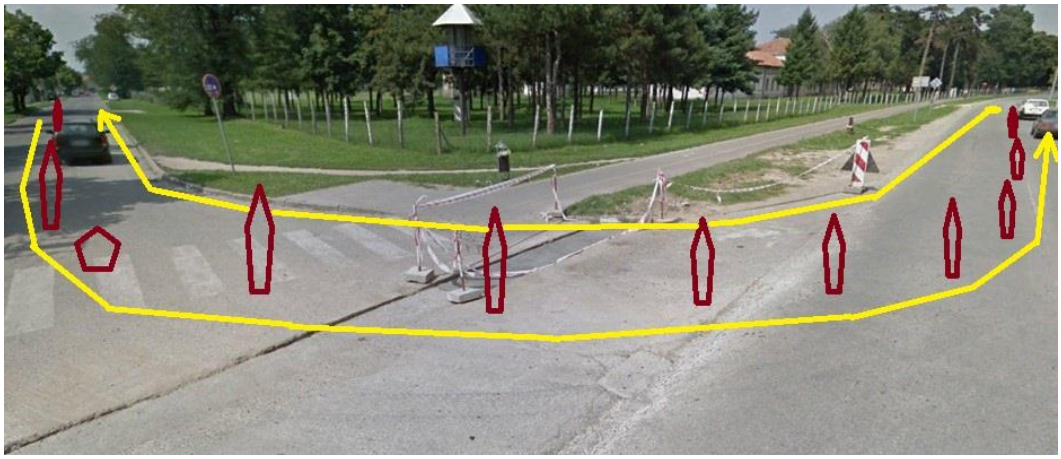
TURN 2 onwards – (picture 16)



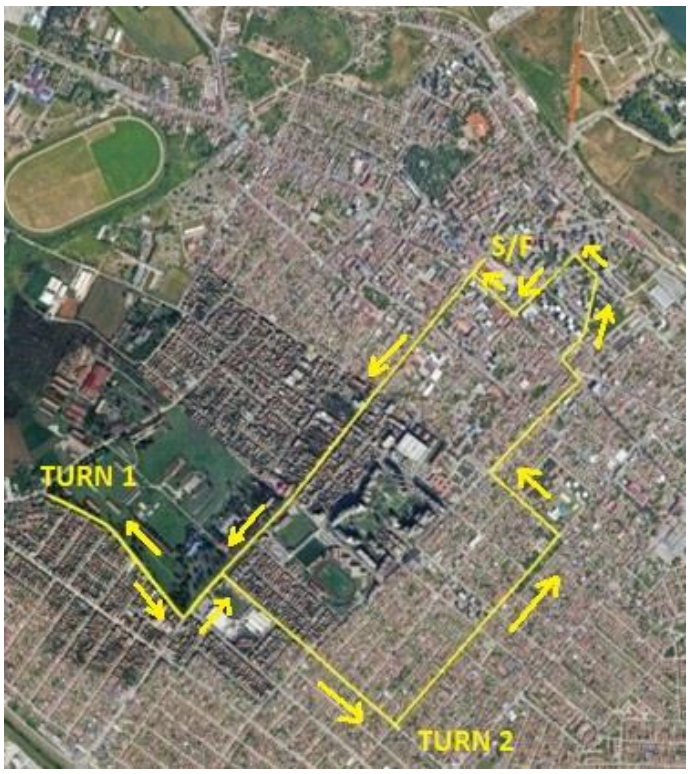
TURN 2 backwards – (picture 17)



BEND FROM POCERSKA TO KASARSKA STREET – (picture 18)



THE COURSE HALFMARATHON – basic lap – (picture 19)



ELEVATION PROFILE HALFMARATHON (basic lap) – (picture 20)

Maribor, 16th April 2024

Report prepared by: Borut Podgornik

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ROAD RACE COURSE MEASURER
In cooperation with AIMS