

Measurement report

Lammasmäe Eesti Ööjooks - Rakvere

21,1 km

Karen Aau
WA - AIMS B grade measurer
April 2025

GENERAL INFORMATION

Name of measurer: Karen Aau, B grade measurer

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Name of event: Lammasmäe Eesti Ööjooks - Rakvere

Location: Rakvere, Estonia

Race date: 07.06.2025

Distance: 21,1 km

Advertised race distance: not less than 21097,5 m

Race contact person: Marko Torm

Phone: +372 5336 4289

E-mail: marko@eestimaraton.ee

Description of the course

Type of course: mostly flat, some hills, lap

Race surface: asphalt

Separation: 0%

Altitude:

Start – 75 m, Finish 75 m

Highest point – 106 m, Lowest point – 78 m

Difference in elevation highest > lowest point – 28 m

Measurement details

Section of road available: Mostly entire width of road, except:

Pikk Street - driveway and pavement

DETAIL OF THE CALIBRATION COURSE

Date: 29.04.2025

Location of calibration course: pedestrian and cycling path next to Ringtee road, Rakvere, Estonia

Measure method: steel taped

Number of measurements: 2

Markers: nails

Start time: 18:15

Finish time: 19:00

Temperature: *Start* +12°C, *Finish* +12°C, *Average* +12 °C

MEASUREMENTS AND CALCULATIONS:

1 First measurement.

$$\frac{6}{\text{\# tape lengths}} \times \frac{49,9 \text{ m}}{\text{distance per tape length}} + \frac{0,6 \text{ m}}{\text{partial tape length}} = \frac{300 \text{ m}}{\text{measured distance}}$$

2 Second measurement.

$$\frac{6}{\text{\# tape lengths}} \times \frac{49,9 \text{ m}}{\text{distance per tape length}} + \frac{0,605 \text{ m}}{\text{partial tape length}} = \frac{300,005 \text{ m}}{\text{measured distance}}$$

3 Average raw (uncorrected) measurement of course 300,0025 m

4 Temperature correction.

$$\text{Correction factor} = 1 + (0.0000116 \times [12 - 20]) = \underline{0,9999072}$$

5 Multiply the temperature correction factor by the average raw measurement of the course

$$\frac{0,9999072}{\text{correction factor}} \times \frac{300,0025 \text{ m}}{\text{avg. raw measurement}} = \frac{299,975 \text{ m}}{\text{corrected measurement}}$$

6 Final (adjusted) length of calibration course: **300 m**

$$\underline{299,975 \text{ m} + 0,025 \text{ m} = 300 \text{ m}}$$

Summary: To get 300 m length calibration course, added 2,5 cm with steel tape.

BICYCLE CALIBRATION DATA SHEET

PRE-CALIBRATION:

Day: 29.04.2025

Time: 21.45

Temperature: +9°C

Start count	Finish count	Difference
54892	58198	3306
58198	61505	3307
61505	64811	3306
64811	68118	3307

Pre-measurement average count = $(3306+3307+3306+3307) / 4 = 3306,5$

Counts per km = $3306,5 \times 1000 / 300 = 11021,66666$

Working Constant = $11021,66666 \times 1,001 / 1000 = 11,03268832 \text{ c/m}$

POST-CALIBRATION:

Day: 30.04.2025

Time: 01.25

Temperature: +6°C

Start count	Finish count	Difference
217437	220744	3307
220744	224052	3308
224052	227359	3307
227359	230667	3308

Post-measurement average count = $(3307+3308+3307+3308) / 4 = 3307,5$

Counts per km = $3307,5 \times 1000 / 300 = 11025$

Working Constant = $11025 \times 1,001 / 1000 = 11,036025 \text{ c/m}$

CONSTANT FOR THE DAY = $(11,03268832 + 11,036025) / 2 = 11,03435666 \text{ c/m}$

COURSE MEASUREMENT DATA SHEET

Course has 2 laps. First lap is longer, second one shorter.

reading	counts	distance	adj.dist	location
1 st lap				
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
72088	0	0,0 m	0,0 m	START/Finish - at Kastani St (detailed sketch attached)
88964	16876	1529,4 m	0,0 m	P1 – wooden lp left hand before turn to Olevi St
102492	13528	2755,4 m	0,0 m	P2 – wooden lp left hand after turn to J.Kunderi St
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
106321	0	2755,4 m	0,0 m	P2 – wooden lp left hand after turn to J.Kunderi St
166984	60663	8253 m	0,0 m	P3 – pc sign postleft hand before turn to parking lot
169840	2856	8511,8 m	0,0 m	P4 – pc sign post right hand before Võidu St junction
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
--- adjustment here with steel tape adds 54,6 m ---				
214856	0	8511,8 m	0,0 m	P4 – pc sign post right hand before Võidu St junction
216321	1465	8644,6 m	8699,2 m	P5 – manhole cover edge after turn to Karja St
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
170272	0	8644,6 m	8699,2 m	P5 – manhole cover edge after turn to Karja St
196483	26211	11020 m	11074,6 m	START/Finish - at Kastani St (detailed sketch attached)
2 nd lap				
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
72088	0	11020 m	11074,6 m	START/Finish - at Kastani St (detailed sketch attached)
88964	16876	12549,4 m	12604 m	P1 – wooden lp left hand before turn to Olevi St
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
104397		12549,4 m	12604 m	P1 – wooden lp left hand before turn to Olevi St
106321	1924	12723,8 m	12778,4 m	P2 – wooden lp left hand after turn to J.Kunderi St
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
106321	0	12723,8 m	12778,4 m	P2 – wooden lp left hand after turn to J.Kunderi St
166984	60663	18221,4 m	18276 m	P3 – pc sign postleft hand before turn to parking lot
169840	2856	18480,2 m	18534,8 m	P4 – pc sign post right hand before Võidu St junction
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
--- adjustment here with steel tape adds 54,6 m ---				
214856	0	18480,2 m	18534,8 m	P4 – pc sign post right hand before Võidu St junction
216321	1465	18613 m	18722,2 m	P5 – manhole cover edge after turn to Karja St
<i>Measured in running direction, 29.04.2025, c=11,03435666 c/m</i>				
170272	0	18613 m	18722,2 m	P5 – manhole cover edge after turn to Karja St
196483	26211	20988,4 m	21097,6 m	START/Finish - at Kastani St (detailed sketch attached)

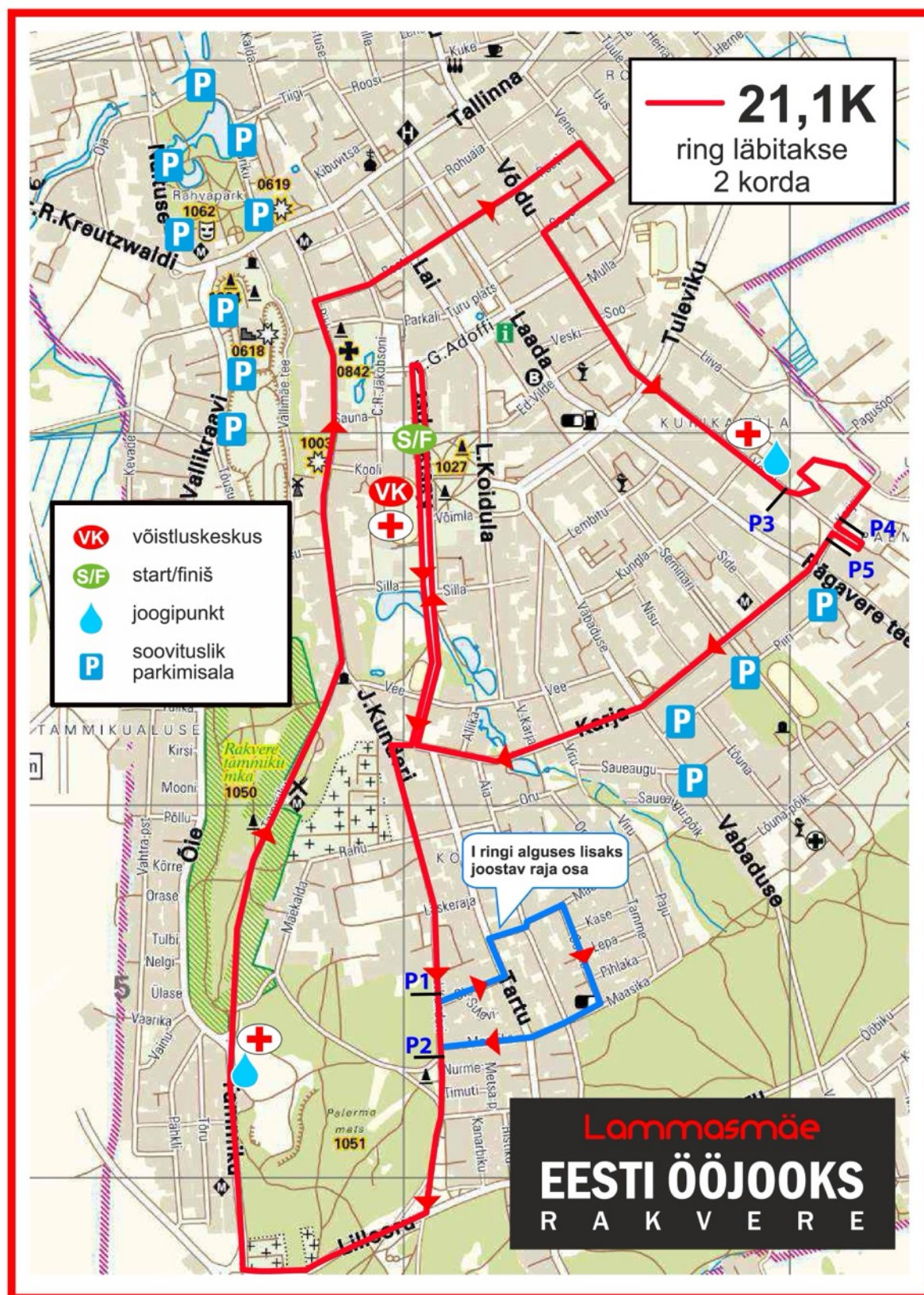
Note any adjustments made to the course after measurement:

Adjustment made between P4 – P5 (moved turnaround point and added 27,3 m with steel tape. Turnaround will be 180 degrees, as there was no room to make more logical turnaround)

CALIBRATION COURSE – 300 m



COURSE



START LINE / FINISH LINE



21,1K
ring läbitakse
2 korda

Legend:

- VK** võistluskeskus
- S/F** start/finiš
- joogipunkt
- P** soovituslik parkimisala

APPENDIX 4

I ringi alguses lisaks joostav raja osa

Lammasmäe EESTI ÖÖJOOKS RAKVERE

APPENDIX 1



APPENDIX 3



APPENDIX 4



APPENDIX 5



An aerial photograph of a road intersection. A red line with arrows indicates a path along the road. A blue dot on the red line is labeled "7,5m from the manhole cover edge". The road is labeled "Võidu" and "Karia". There are buildings, a parking lot with cars, and a large pile of debris in the background. The text "Maa- ja Ruumilinet 2025" is visible in the bottom left corner.

APPENDIX 7

