VTTA Standards and CTT Target Times

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28/11/2024

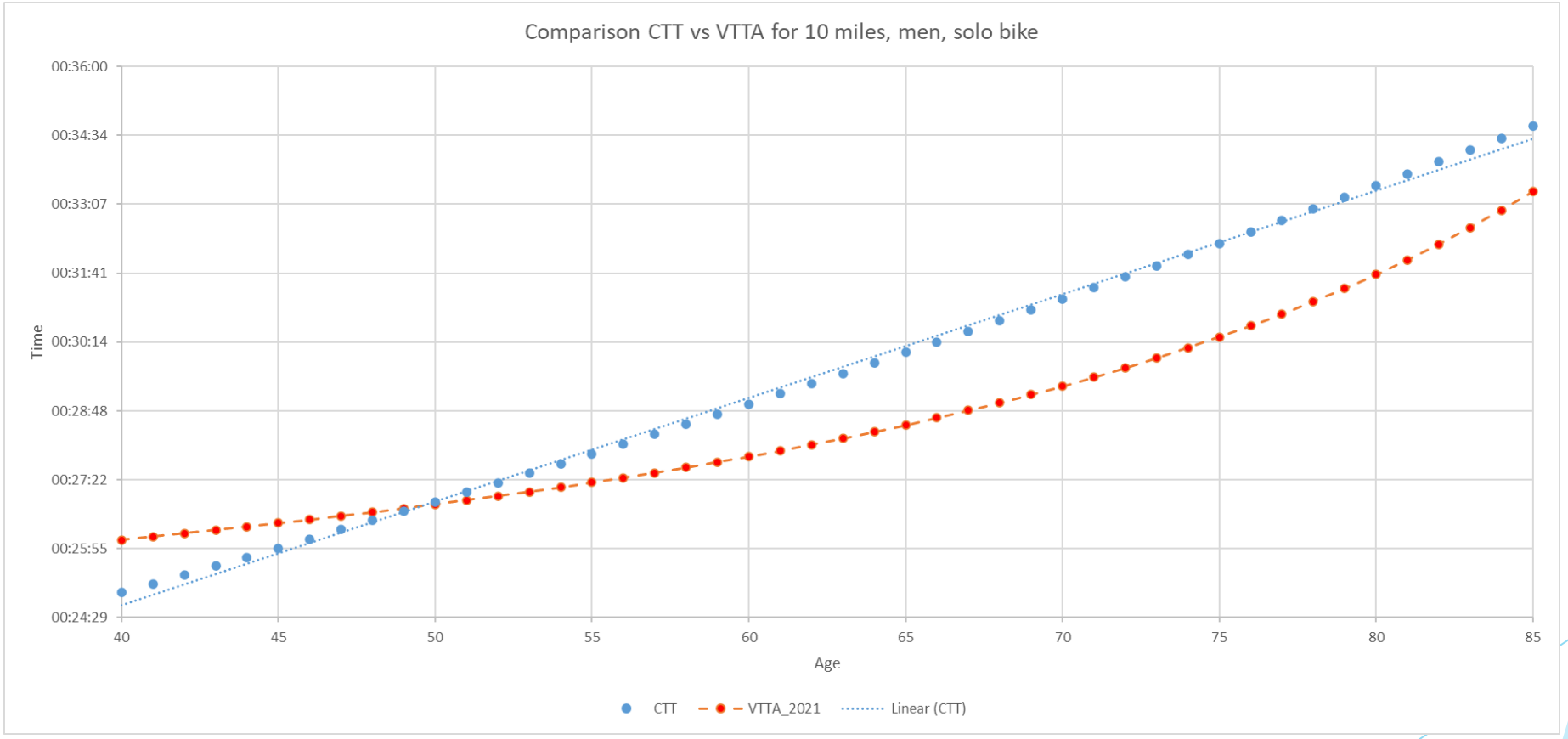
Introduction

- This presentation compares CTT target times with VTTA standards and makes recommendations for their use

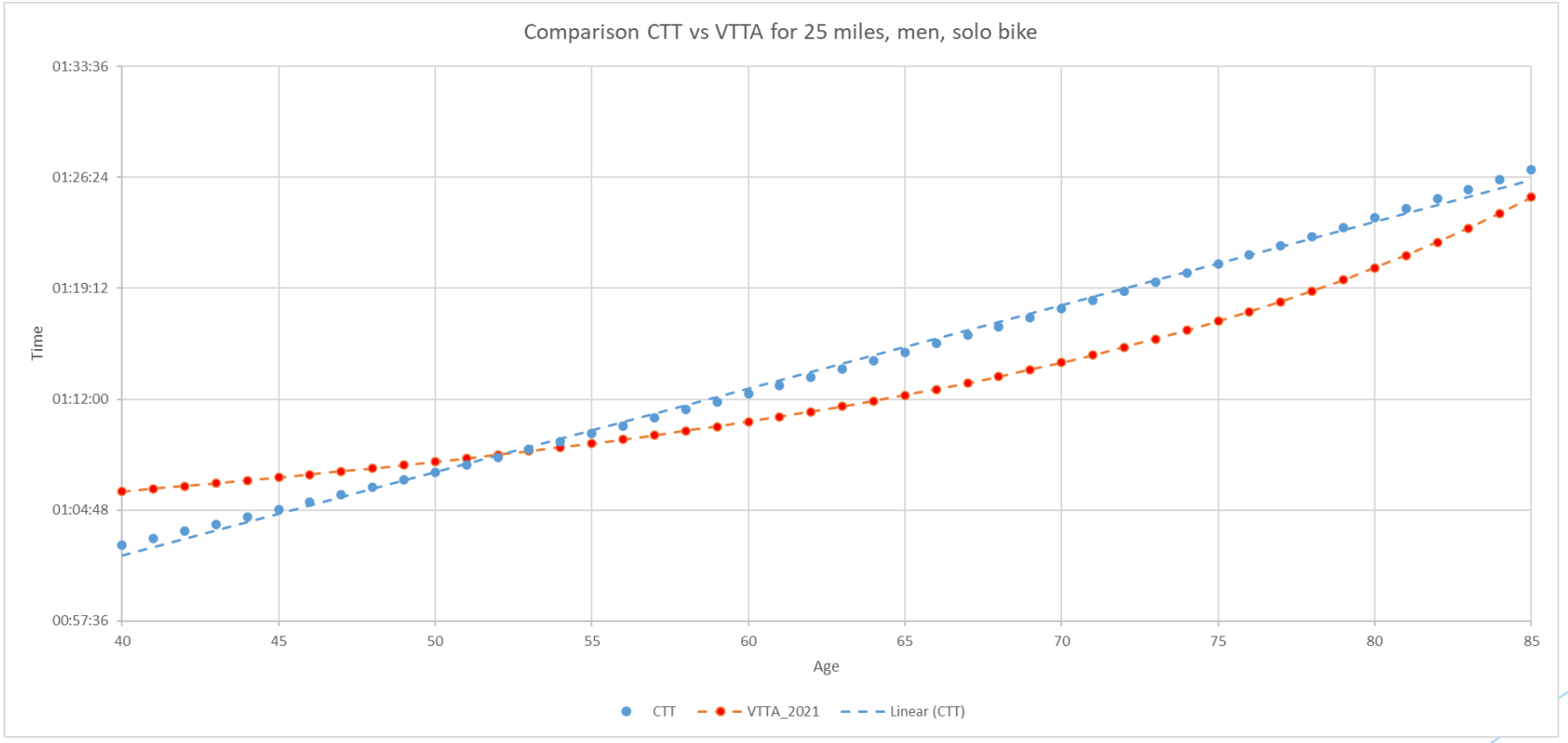
VTTA and CTT standards background

- The VTTA standards were in use for decades, the first revision was made in 2013, followed by updates in 2019, 2021 and 2024
- The VTTA database consist of 168,000 results from CTT time trials from 2013 to 2022. This database used to calculate the 2024 standards
- The VTTA standards are produced by selecting the best performances at each age (i.e. the top 10%) by male solo bike riders and fitting a curve to formulate the relation between their speed and age. From this formula the VTTA standards tables are generated
- Selection ensures we remove other factors that reduce speed: fitness, equipment, weather etc. Lots of factors can make riders go slow

Comparison of CTT target times and VTTA standards at 10 miles



Comparison of CTT target times and VTTA standards at 25 miles



Observations

- The CTT target times have an almost a straight-line relationship between age and time. This is not realistic, as age increases, time increases as a polynomial relationship, as is shown in the VTTA standards
- At 10 miles, compared with the VTTA standards, the CTT target times put riders under 50 at a disadvantage compared with VTTA standards
- At 25 miles, compared with the VTTA standards, the CTT target times put riders under 53 at a disadvantage compared with VTTA standards
- The CTT target times show faster time for 40-50/53 year olds because the VTTA standards are normalised to a male solo bike rider a time of 1:06:00 at 25 miles. This normalisation affects riders of all ages equally and does not affect the relative handicaps
- CTT target times are only quoted for whole number distances from 10 to 50 miles, whereas VTTA standards can be calculated for any distance event and time event

Usability

- The VTTA standards have been criticised for the difficulty of calculating the plus value and its meaningfulness
- In contrast the CTT target times are simple to apply and understand
- In 2023 the VTTA introduced a new way of calculating and presenting results on standard: the “Age Adjustment” (AA), i.e. the amount of adjustment of the actual result depending on age, gender and machine type, and the “Age Adjusted Time”, i.e. the adjusted result for comparison and ranking amongst riders of varying age, gender and machine
- Age Adjustments can simply be subtracted from the actual time result, or added to the actual distance result, to get the Age Adjusted Time (AAT) or Age Adjusted Distance (AAD), so they are as simple to apply as CTT target times

Conclusions

- CTT target times do not model the age vs distance/time relationship correctly and are not the best choice for veterans handicapping compared with VTTA standards
- CTT target times do not model machine relationships and are not the best choice for veteran tricyclist handicapping compared with VTTA standards

Recommendations

- The CTT retires the CTT Target Time system
  - Target time documents removed from website
  - Statement that they have been withdrawn and that they should not be used for age adjusted racing
- The CTT adopts VTTA Age Adjustments
  - Statement that they have been adopted and that they should be used for age adjusted racing
  - The CTT puts summary information and links to the VTTA website to provide information for them

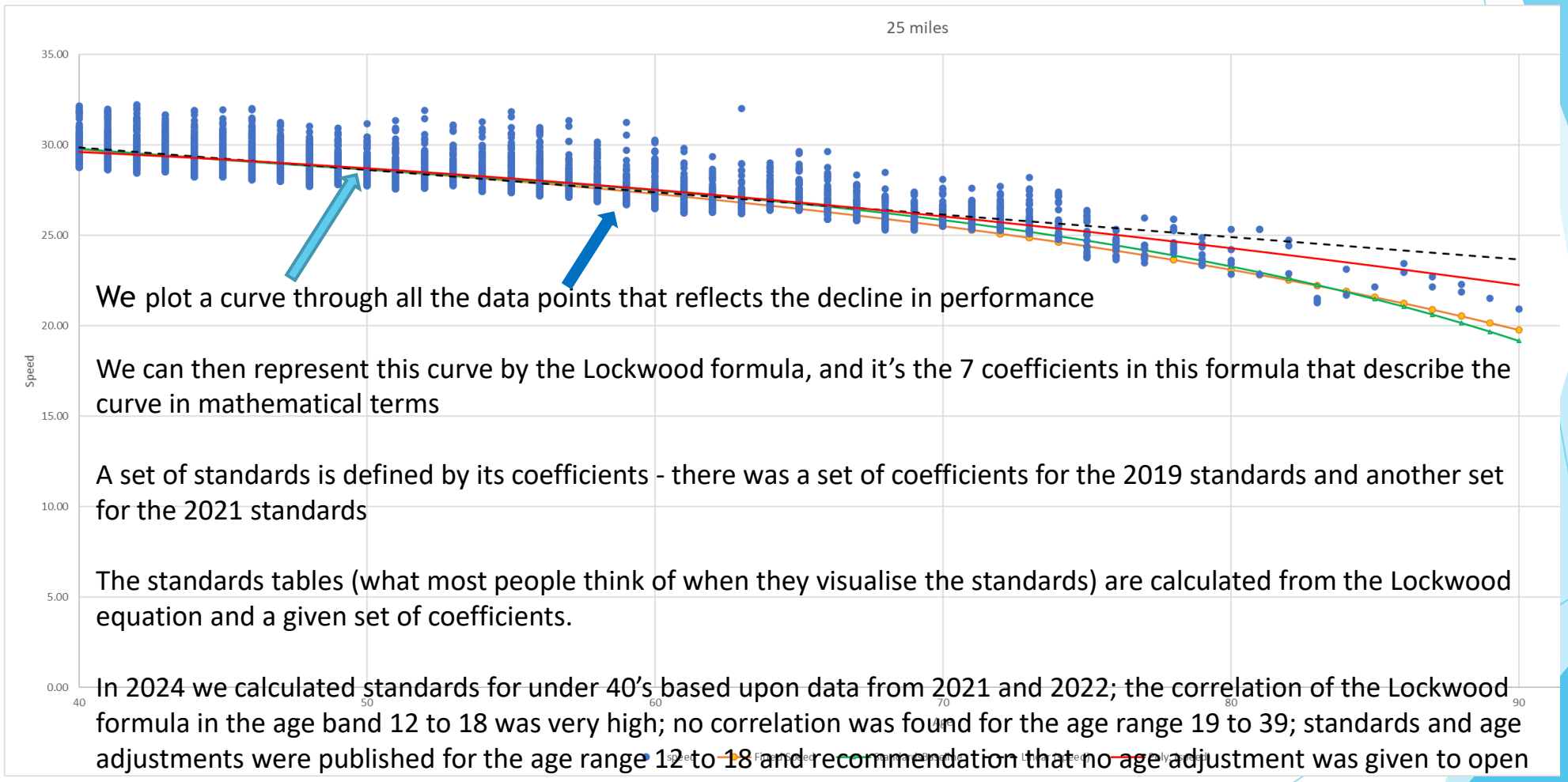
Background on VTTA standards

Fairness criteria for the VTTA standards

VTTA standards are only approved if they meet these criteria

- A broadly even spread of ages and men and women in the top places of VTTA events and competitions (relative to participation)
- The best riders in each age band achieve broadly similar AATs – the best riders in any age group should not require "superhuman" performances to achieve the AAT of the best riders in other age groups
- The age records for both men and women show broadly similar AATs

How are the VTTA Standards produced?



We plot a curve through all the data points that reflects the decline in performance

We can then represent this curve by the Lockwood formula, and it's the 7 coefficients in this formula that describe the curve in mathematical terms

A set of standards is defined by its coefficients - there was a set of coefficients for the 2019 standards and another set for the 2021 standards

The standards tables (what most people think of when they visualise the standards) are calculated from the Lockwood equation and a given set of coefficients.

In 2024 we calculated standards for under 40's based upon data from 2021 and 2022; the correlation of the Lockwood formula in the age band 12 to 18 was very high; no correlation was found for the age range 19 to 39; standards and age adjustments were published for the age range 12 to 18 and recommendation that no age adjustment was given to open riders aged 19 to 39 and a fixed age adjustment was given to females in that age range.

Age Records on Age Adjustment

Fair handicaps should make the handicap results of age records the same

	Record	2021 AAT	Record	2021 AAT	Record	2021 AAT	Record	2021 AAT	Record	2021 AAT
Age Band	**10**	**10**	**25**	**25**	**50**	**50**	**100**	**100**	**12**	**12**
40-49	00:17:47	00:17:43	00:46:35	00:46:13	01:35:13	01:33:16	03:18:54	03:13:35	313.87	322.91
50-59	00:18:02	00:17:17	00:47:01	00:44:38	01:39:14	01:33:08	03:30:34	03:17:57	293.76	321.29
60-69	00:19:40	00:17:55	00:49:34	00:45:02	01:43:20	01:33:41	03:39:03	03:17:06	275.06	306.26
70-79	00:20:21	00:16:33	00:53:11	00:44:48	01:50:56	01:33:00	03:58:46	03:09:41	247.96	298.45
80-89	00:22:56	00:17:23	00:59:13	00:43:53	02:05:24	01:34:03	04:33:53	03:20:26	212.96	294.97
90-99	00:28:24	00:18:44	01:11:42	00:46:12						
Correlation	0.92	0.01	0.94	-0.11	0.90	0.28	0.95	0.37	-0.98	-0.76

- The table shows the best age records in each age band at each distance/time
- The AAT value is the record as if it was set by a 40 year old male bike rider
- There is a high correlation in the record with age (nearly 1), as expected
- We are aiming for zero variation in AAT with age (as measured by having near zero correlation between age and age adjusted result)

VTTA process for keeping standards up to date

- Every year we get the 20k new results from the CTT which we add to our database
- We process the results from the last 10 year's worth of data and calculate new standards
- New standards are implemented if they pass all of the criteria below:
  - Results of past races comply with the fairness criteria (slide 3)
  - Correlation between age and speed is at least 98%
- The benefit of this new approach is that:
  - Standards will be up to date and therefore ensure fair competition on handicap
  - Changes in standards year on year will be small and easier to accommodate
  - Large changes, which result from making changes every several years and can be disruptive, will be avoided

Thank you!