Analysis of changes to Wroxton Motocross track over time using Sketchandcalc software

The *Sketchandcalc* app (www.Skethandcalc.com) makes it possible to analyse an aerial photograph and, providing you have a reliable scale, it can calculate distances and areas within that photograph and compare them over time with other photographs of the same site.

Three photographs of the Wroxton Motocross track have been analysed using this software: - **a Google Earth photograph from 2009**; by comparing this photograph with the Ordnance Survey map of January 2011, it is clear that the track layout by August of 2010 was very close to the one featured in the 2009 photograph

- an aerial photograph from May 2016, showing changes that had taken place before August 2016

- a drone photograph taken in September 2020, showing how the track looks today

At the end of this report, the methodology used to ensure accuracy of the analysis is set out.

Three aspects of the track were analysed:

- changes over time in the area of land upon which the track is situated
- changes over time at the start of the track
- changes over time in the average width of the track

CHANGES IN LAND AREA

The *Sketchandcalc* analysis shows that, between the 2009 photograph and the 2020 photograph, there has been a significant enlargement to the area of land upon which the track is situated. In 2009 the site was 59870 square metres in area:



By May 2016, it had grown to 69742 square metres:



By September 2020, the site had grown again, this time to 78587 square metres.



This means that the site area grew by almost 16.45% from 2009 to 2016, 12.68% from 2016 to 2020 and by almost a third - 31.26% - from 2009 to this year.

CHANGES AT THE START OF THE TRACK

The only way to increase the maximum number of riders in a race at the track is to widen the funnel-shaped start, located right at the top of the photographs.

In 2009, the width of start was 39.38 metres wide:



By 2016, it had grown to 44.25 metres:



This is an increase in the width of the starting line of almost an eighth - 12.37%.

The start remains that size today:



CHANGES IN THE WIDTH OF THE TRACK

Measurements were taken of the track width approximately every 50 metres and then averaged.

In 2009, the track was, on average, 11.08 metres wide:



By 2016, the track had widened to an average of 11.51 metres:



And by this year the average width had grown again - to 12.15 metres:



This means that the track grew in width by 3.88% from 2009 to 2016, by 5.56% from 2016 to 2020, and by almost a tenth (9.66%) over the last ten years.

CONCLUSION

In her submission, the landowner, Sandra Kerwood says, 'A small number of changes and improvements are made to the track each year but the basic construction remains the same.'

Brian Pounder, who runs the Banbury Motocross Club, says 'Since 2007 we have made a small number of changes and improvements to the track that exists on the site.'

Neither of these assertions are born out by this analysis, because:

- the site area has grown
- the width of the start so crucial to allow more riders to take part in each race has grown
- the width of the track has grown

Roger Corke September 28, 2020

METHODOLOGY

THE PHOTOGRAPHS

The 2009 and 2016 photographs were chosen because they fall just before the key dates upon which the applicants rely – August 2010 and August 2016.

The 2009 Google Earth photograph was taken in May of that year:



There are no aerial photographs available for 2010 but a new Ordnance Survey map was produced in January 2011:



... and if you superimpose the 2009 aerial photograph of the track over the 2011 map, they match perfectly:



It is therefore reasonable to use the 2009 photograph to represent how the track looked in August 2010.

THE SCALE

To use the Sketchandcalc software, it is necessary to provide an accurate scale. Google Maps took another aerial photograph of the site in 2017 and published a 50m scale along with it.



By putting that 50m scale into the *Sketchandcalc* software (the pink line below the scale):



it is possible to set a scale for this photograph and measure the distance between any two points on that photograph or calculate how many square meters there are in a particular area.

None of the other photographs contain a scale and the site has changed so dramatically in the last ten years that there were no features on it that had stayed the same throughout and could be used as a point of reference.

However, there are two trees, just off the site, that feature in all the photographs. Using the 50m scale on the 2017 photograph, it is possible for the *Sketchandcalc* software to measure the distance between the centre of these two trees. They are 354.95 metres apart.



Then it was just a case of importing the 2009, 2016 and 2020 photographs into the software and setting the scale by reference to the centres of the two trees being 354.95 metres apart:



From now on, any distance in the three photographs would be measured using exactly the same scale.

THE WIDTH OF THE TRACK

The average width of the track was calculated by taking measurements every 50 metres:



Because *Sketchandcalc* only measures in straight lines, it was impossible to be exact about the 50m distances on the curves but the same method was used for all three maps, so any minor errors were averaged out.

There are more readings for 2016 and 2020 because the track had grown significantly longer by then.

The measurements were as follows:

2009	2016	2020
39.38	44.23	45.13
17.58	21.23	25.35
20.05	11.26	12.22
8.16	13.22	9.13
10.62	14.63	11.6
7.55	10.74	9.53
10.82	12.35	10.19
10.03	10.07	9.99
7.26	8.7	9.6
6.73	9.08	10.01
7.59	9.8	8.14
8.01	12.16	10.98
9.63	10.22	14.55

AVERAGE	11.08	11.51	12.15
TOTAL	343.46	425.69	510.6
			10.73
			13.52
			10.89
			10.64
			11.04
		16.53	15.99
		12.35	13.38
		8.73	15.12
		8.37	9.47
		7.45	13.02
		8.61	13.03
	10.18	6.53	7.95
	18.73	10.37	8.99
	9.9	10.91	11.03
	8.96	9.54	9.88
	8.2	9.78	12.97
	10.53	10.39	11.2
	6.93	11.12	11.52
	6.74	9.08	10.85
	8.65	12.26	11.42
	8.67	10.52	10.56
	12.07	10.69	10.34
	12.24	8.76	9.09
	8.71	9.01	12.01
	8.85	7.46	9.06
	10.27	8.98	9.74
	12.04	8.83	8.88
	9.15	12.18	9.54
	9.23	9.55	12.32

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