2014 CarbonTrikes Race SL comparison with 2011 Catrike 700.

I like both of these trikes and am really happy with the lighter CarbonTrikes. The primary difference is weight: the lowest ridable weight of the Catrike 700 is 36 lbs while the custom fabricated CarbonTrikes Race SL, weighed comparably, weighs 28 lbs. When I am on the trikes this is a weight difference of 5%.

There are a few other differences including front wheel size. But these are both trikes made to be fast and fun and the differences are not huge. I will start with subjective comparisons before presenting performance data.

To start, the CarbonTrikes is exquisitely made and looks absolutely gorgeous. (More photos are at https://www.flickr.com/photos/bayarearecumbents/sets/72157649875596090/). It cost 3X as much as the Catrike. The CarbonTrikes with its monocoque design has interior hidden cables and storage in the frame. A large part of the CarbonTrikes weight advantage comes from the carbon frame but some comes from lighter and more expensive components.

Steering. The CarbonTrikes has indirect steering and the Catrike has direct steering. In my riding I see no advantage to the indirect steering other than that the rear view mirror vibrates less. I suspect that if the CarbonTrikes were manufactured with direct steering it might lose another pound or two of weight, reduce complexity and get rid of one headset, gain a small amount of ground clearance, and lose a tiny amount of frontal area and associated drag. The CarbonTrikes

is specified to have a smaller turning circle but on my garage deck the Catrike has a smaller turning circle.

Chain management. The CarbonTrikes uses a tube to guide the chain while on my Catrike I replaced the tubes by a second set of idler pulleys. This makes the Catrike quieter when pedaling and helped the Catrike front derailleur shift better. (The CarbonTrikes has a different chain line and no shifting need for these pulleys.) I cannot determine if there is any performance advantage one way or the other.

Seats. The seats are quite different. The CarbonTrikes seat is narrower and something you sit *on* whereas the Catrike seat being wider and of mesh feels a bit more as if you are sitting *in* it. It is easier to lean in corners with the CarbonTrikes and I think this shows up in speed through technical downhill corners. Another difference is the seat angle. The two are similar for the bottom half of the seat back but the Catrike retains that 27 degree raked seat all the way up while the CarbonTrikes becomes much more upright at the top. I like the Catrike more reclined position better. My head and shoulders are an inch or a bit more higher on the CarbonTrikes. This may increase the frontal area and associated drag slightly on straight-line downhills where the Catrike appears slightly faster. Also, on the Catrike I can rear back with my shoulders and give an extra push on the pedals, somewhat similar to standing on a two-wheeler, that I cannot do on the CarbonTrikes.

Gearing. Both trikes have the same 50-39-24 front chain-rings. The Catrike has a 9-speed 11-34 cassette, the CarbonTrikes has a 10-speed 11-32 cassette. Not any significant difference but I prefer the 9-speed 11-34 cassette, better ratios and it possibly saves a few grams.

The rest of this document shows the three performance comparisons I have been able to make during the first few weeks of CarbonTrikes ownership. These are inevitably preliminary, particularly the comparisons of “best” times on various bikes, as I may be able to do a bit better when in peak form. In each case I give a quick summary to start and then detailed data for engineering types who may want it.

Overall summary: With the Catrike 700 I typically was at about 75% of my two-wheeler speed. With the CarbonTrikes Race SL this has improved to 78-80%. This may not sound like much but it means that a double century that took 14 hours on the two-wheeler might take 18½ hours on the Catrike and 17¾ hours on the CarbonTrikes, a 45-minute, significant difference.

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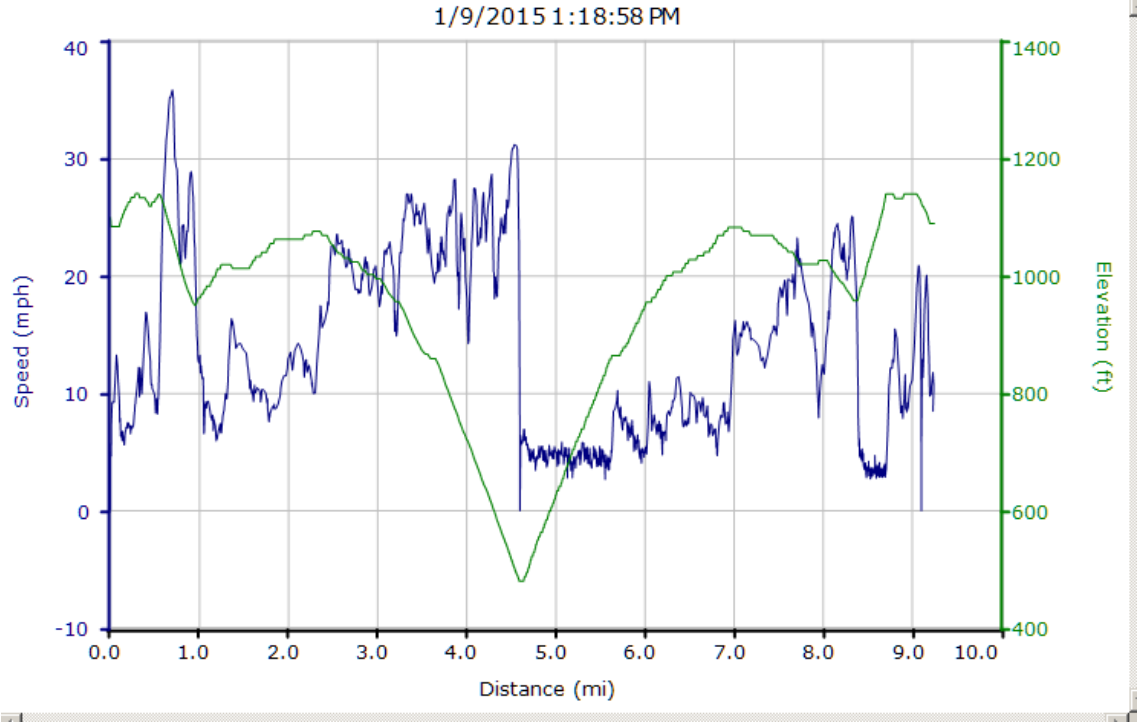
Wildcat Canyon, Berkeley, CA, up-and-down, back-to-back comparison.

Distance: 9.2 miles
Climb: 1025 ft.
Catrike 700 time: 56:24
CarbonTrikes Race SL time: 53:28
Time ratio: 94.8%

Elevation profile (green) and CarbonTrikes speed (blue).



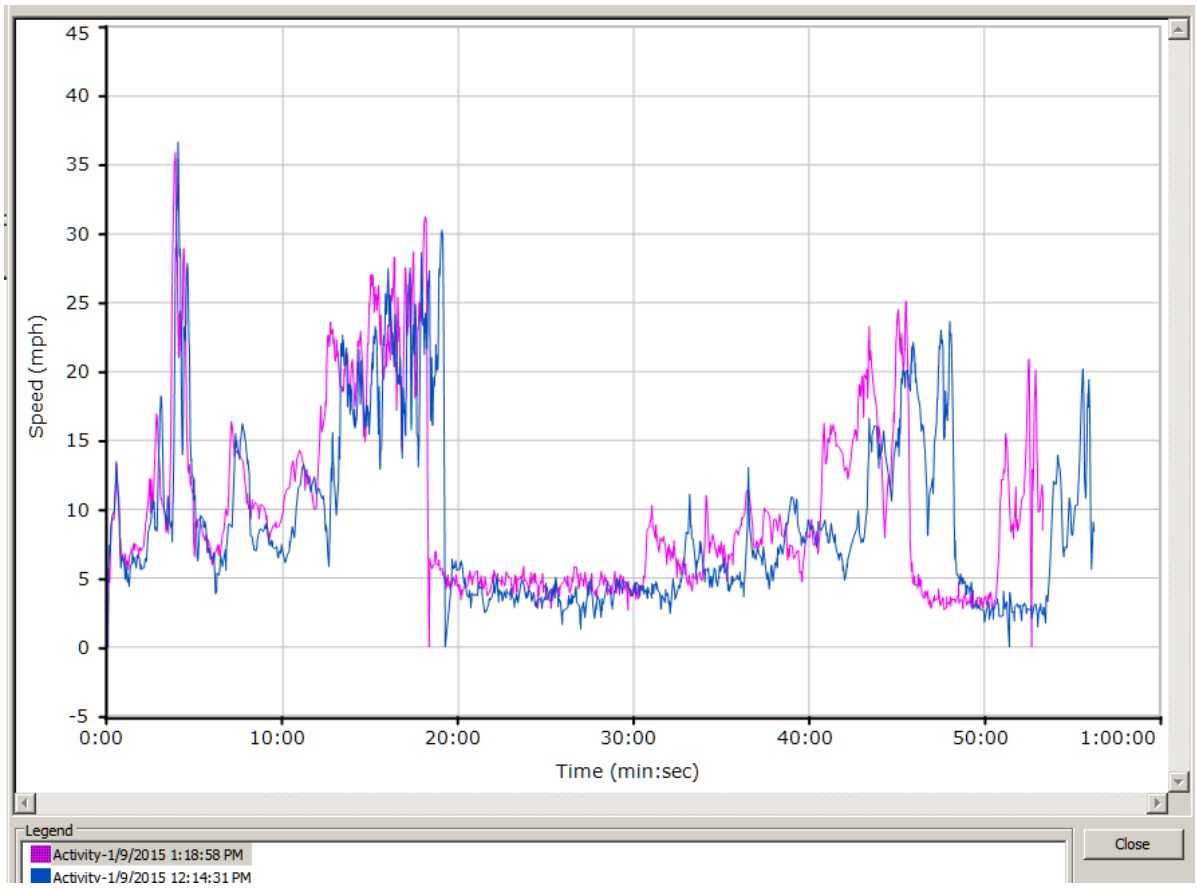
Catrike 700 data.

Name	Total Distance	Total Time	Avg Pace	Avg Speed	Max Speed	Total Calories	Total Ascent	Total Descent
1/9/2015 12:14:31 PM	9.14 mi	56:24.06	6:10 /mi	9.7 mph	37.1 mph	425 cal	1053 ft	1042 ft
Lap 1 - 12:14:31 PM	2.20 mi	12:08.02	5:32 /mi	10.9 mph	37.1 mph	89 cal	202 ft	229 ft
Lap 2 - 12:26:46 PM	2.36 mi	7:07.53	3:01 /mi	19.9 mph	30.3 mph	73 cal	17 ft	610 ft
Lap 3 - 12:33:54 PM	2.38 mi	24:00.18	10:04 /mi	6.0 mph	17.1 mph	163 cal	621 ft	1 ft
Lap 4 - 12:58:03 PM	2.19 mi	13:08.33	6:00 /mi	10.0 mph	23.7 mph	100 cal	214 ft	201 ft

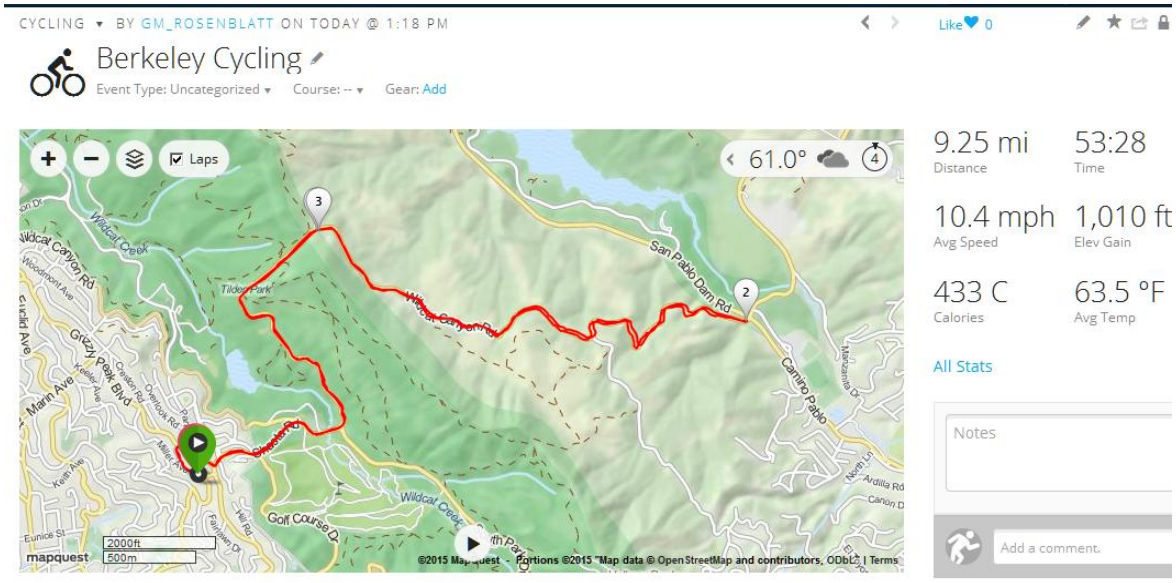
CarbonTrikes Race SL data

Name	Total Distance	Total Time	Avg Pace	Avg Speed	Max Speed	Total Calories	Total Ascent	Total Descent
1/9/2015 1:18:58 PM	9.25 mi	53:27.98	5:47 /mi	10.4 mph	35.9 mph	433 cal	1014 ft	1019 ft
Lap 1 - 1:18:58 PM	2.20 mi	11:24.40	5:10 /mi	11.6 mph	35.9 mph	92 cal	204 ft	229 ft
Lap 2 - 1:30:33 PM	2.39 mi	6:55.33	2:54 /mi	20.7 mph	31.2 mph	79 cal	9 ft	600 ft
Lap 3 - 1:37:28 PM	2.43 mi	22:36.32	9:18 /mi	6.5 mph	16.6 mph	163 cal	604 ft	1 ft
Lap 4 - 2:00:13 PM	2.23 mi	12:31.94	5:38 /mi	10.7 mph	25.1 mph	99 cal	196 ft	190 ft

Time comparison: Catrike (blue) vs. CarbonTrikes (red).



Map of route showing splits. Lap 1: start to #3. Lap 2: #3 to #2. Lap 3: #2 to #3. Lap 4: #3 to start.

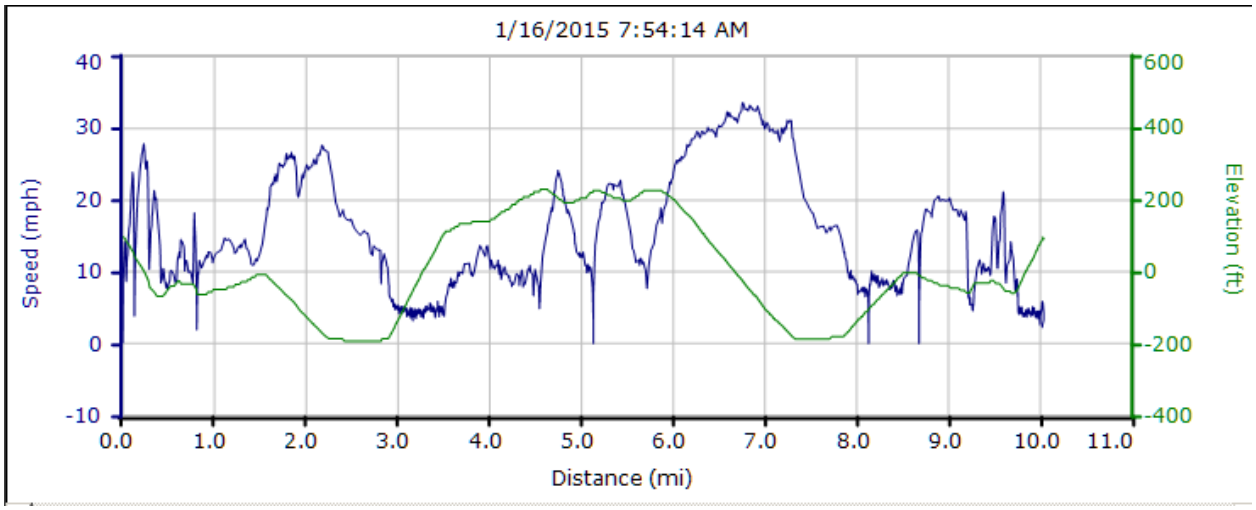


I did this same route in October 2011 to compare a Catrike 700 with a Catrike Pocket/Speed and the 700 time was 95% of the Pocket/Speed time even though the Pocket/Speed was 2 lbs lighter.

Torrey Pines climb, Del Mar, CA, best times comparison.

Distance: 10.0 miles
Climb: 950 ft.
Best Catrike 700 time: 52:22 (9-May-2012)
Best CarbonTrikes Race SL time: 50:12 (16-Jan-2015)
Time ratio: 95.9%

Elevation profile (green) and CarbonTrikes speed (blue).



Other comparisons for this route:
Best Catrike Pocket/Speed time: 62:48 (16-Jan-2011)
Best Habanero road bike time: 39:03 (6-Sep-2008)

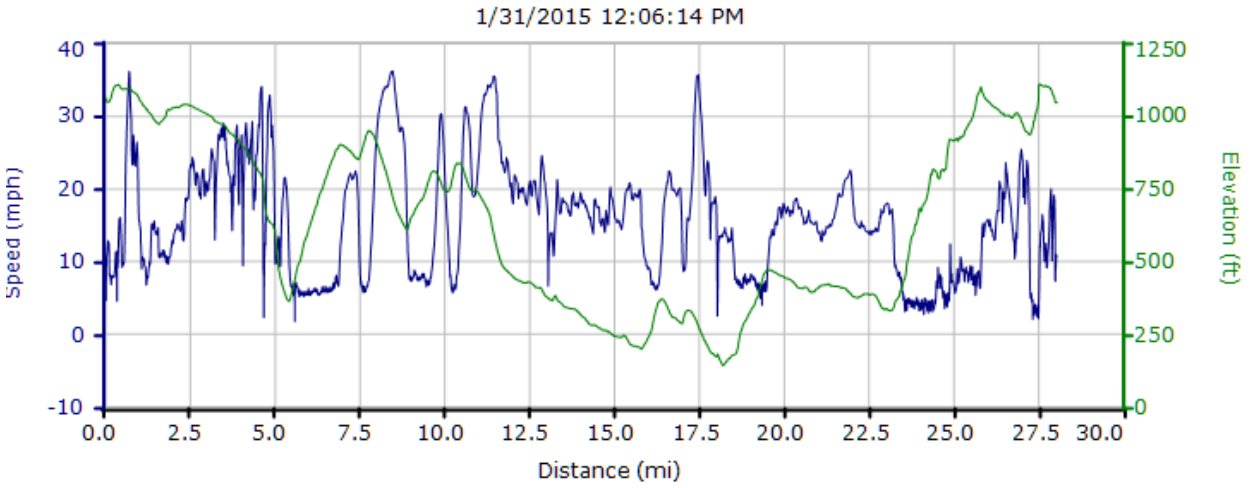
Percentages of best two-wheeler speed:
Catrike Pocket/Speed: 62%
Catrike 700: 75%
CarbonTrikes Race SL: 78%

“The Bears” loop, Contra Costa County, CA best times comparison.

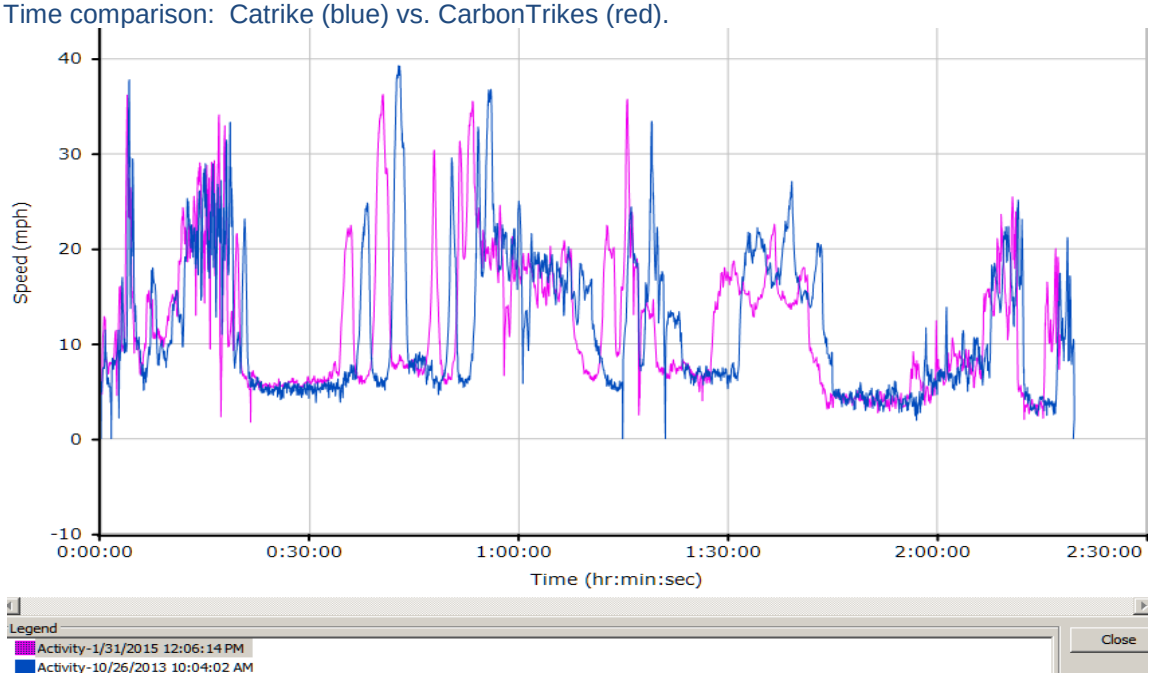
Distance: 28.0 miles
Climb: 2575 ft.
Catrike 700 time: 2:20 (26-Oct-2013)
CarbonTrikes Race SL time: 2:18 (31-Jan-2015)
Time ratio: 98.7%

The close times almost surely reflect a difference in conditioning. The good news is how quickly I set a personal best trike record with the new CarbonTrikes. More comparisons and discussion follow the graphs.

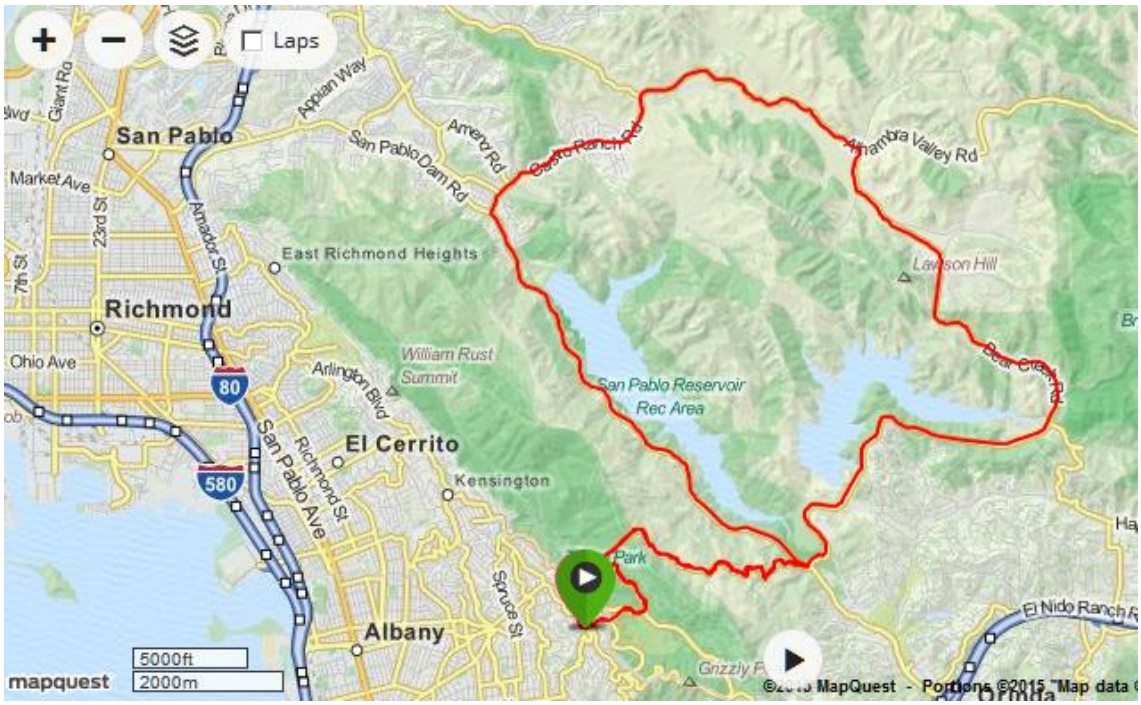
Elevation profile (green) and CarbonTrikes speed (blue).



Time comparison: Catrike (blue) vs. CarbonTrikes (red).



Map of route. The first and last 4.5 miles, up to the loop, repeat the Wildcat Canyon climb.



More comparisons:

Bike	Habanero Road Bike	CarbonTrikes Race SL	Catrike 700	Catrike Pocket/Speed
Date	24-Mar-2005	31-Jan-2015	26-Oct-2013	6-Feb-2011
Time	1:51:07	2:17:54	2:19:45	2:43:45
Average speed (mph)	15.25	12.20	12.03	10.30
Percent of Habanero speed	100%	80.0%	78.8%	67.5%
Time to mile 7, first summit of "Papa Bear"	28:00	34:33	37:04	--
Percent of Habanero speed	100%	81.0%	75.5%	--

The last comparison shows the time taken to go down the 2.5 mile technical descent of Wildcat Canyon and the 2 mile steady climb up "Papa Bear". These last data, with the marked difference between the Catrike 700 and the CarbonTrikes, strongly suggest that the close overall times between the two trikes on the longer distance reflect conditioning. The CarbonTrikes speed being 7% faster than the Catrike 700 on this hilly segment (and 81% of my best two-wheeler speed) is encouraging.