

2023 Season Hurdles Report

Hurdle Touchdown Times

Men's 110m Hurdles
Women's 100m Hurdles
Men's 400m Hurdles
Women's 400m Hurdles



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Todd Henson

2023 Season Hurdles Report

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Notes:

- The times listed as TV Analysis are taken from [youtube.com](https://www.youtube.com) videos and generally coming from Television broadcasts. These are not always the best angles or coverage for getting times. They are often trying to tell a story by focusing on one athlete, and sometimes while shifting camera angles an extra frame can get added or removed.
- Where times are taken from the first movement, instead of the gun, there is at least a ± 0.12 second difference/error. This will show up from the start to the first hurdle and then from hurdle 10 to the finish. The between hurdle intervals should be fairly consistent, but there is still the usual ± 0.03 second
- For Diamond League meetings, I have included the Diamond League race analysis data provided by Omega Timing. This is done with a timing chip on the back of the athletes bib number, and it set to the actual distance of the hurdle not the touchdown distance of the athlete. Does the time start on the gun or when the athlete passes the 0.0m mark? This is a question I am still hoping to find an answer to.
- Data errors, missing data, spelling mistakes, anything that need correction - please let me know. As always, I try to put together the most complete and accurate report possible.
- I have done the best I could, I hope people find it useful or at least interesting.

Men's 110m Hurdles

2023 Top 10 Times - Men's 110m Hurdles

Tinch, Cordell (USA) (2000)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 NCAA Division II National Championships (Pueblo, CO) (Altitude) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	27-May	time	2.50	3.50	4.50	5.48	6.46	7.44	8.41	9.43	10.43	11.46		12.87	5 / 1			
reaction time		interval	7 steps	1.00	1.00	0.98	0.98	0.98	0.97	1.02	1.00	1.03	1.41			2.98	2.93	3.05
wind	6.0 m/s	velocity	5.49	9.14	9.14	9.33	9.33	9.33	9.42	8.96	9.14	8.87	9.94	8.55		9.20	9.36	8.99
Parchment, Hansle (JAM) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Prefontaine Classic (Eugene, OR)													Omega Timing - diamond league race analysis					
date	17-Sep	time	2.47	3.50	4.48	5.47	6.45	7.42	8.40	9.40	10.40	11.41		12.93	5 / 1			
reaction time	0.168	interval	7 steps	1.03	0.98	0.99	0.98	0.97	0.98	1.00	1.00	1.01	1.52	PB		3.00	2.93	3.01
wind	0.9 m/s	velocity	5.55	8.87	9.33	9.23	9.33	9.42	9.33	9.14	9.14	9.05	9.22	8.51		9.14	9.36	9.11
Broadbell, Rasheed (JAM) (2000)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Jamaican National Championships (Kingston, JAM) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	9-Jul	time	2.50	3.55	4.55	5.53	6.53	7.53	8.50	9.50	10.48	11.48		12.94	3 / 1			
reaction time		interval	7 steps	1.05	1.00	0.98	1.00	1.00	0.97	1.00	0.98	1.00	1.46	PB		3.03	2.97	2.98
wind	0.7 m/s	velocity	5.49	8.70	9.14	9.33	9.14	9.14	9.42	9.14	9.33	9.14	9.60	8.50		9.05	9.23	9.20
Tinch, Cordell (USA) (2000)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Trackwired Arkansas Grand Prix (Fayetteville, AR) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	23-Jun	time	2.46	3.50	4.50	5.50	6.48	7.46	8.43	9.47	10.47	11.49		12.96	5 / 1			
reaction time		interval	7 steps	1.04	1.00	1.00	0.98	0.98	0.97	1.04	1.00	1.02	1.47	PB		3.04	2.93	3.06
wind	1.3 m/s	velocity	5.58	8.79	9.14	9.14	9.33	9.33	9.42	8.79	9.14	8.96	9.54	8.49		9.02	9.36	8.96
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	21-Aug	time	2.44	3.44	4.40	5.36	6.36	7.36	8.36	9.38	10.42	11.52		12.96	5 / 1			
reaction time	0.135	interval	7 steps	1.00	0.96	0.96	1.00	1.00	1.00	1.02	1.04	1.10	1.44			2.92	3.00	3.16
wind	0.0 m/s	velocity	5.62	9.14	9.52	9.52	9.14	9.14	9.14	8.96	8.79	8.31	9.74	8.49		9.39	9.14	8.68
Parchment, Hansle (JAM) (1990)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Xiamen Diamond League (Xiamen, CHN)													Omega Timing - diamond league race analysis					
date	2-Sep	time	2.40	3.40	4.40	5.40	6.40	7.40	8.40	9.40	10.40	11.40		12.96	5 / 1			
reaction time	0.163	interval	7 steps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56			3.00	3.00	3.00
wind	0.0 m/s	velocity	5.72	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14	8.99	8.49		9.14	9.14	9.14
Tinch, Cordell (USA) (2000)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 MIAA Championships (Jefferson City, MO) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	7-May	time	2.40	3.40	4.40	5.37	6.34	7.31	8.34	9.34	10.36	11.40		12.97	4 / 1			
reaction time		interval	7 steps	1.00	1.00	0.97	0.97	0.97	1.03	1.00	1.02	1.04	1.57			2.97	2.97	3.06
wind	3.0 m/s	velocity	5.72	9.14	9.14	9.42	9.42	9.42	8.87	9.14	8.96	8.79	8.93	8.48		9.23	9.23	8.96
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Meeting de Paris (Paris, FRA)													Omega Timing - diamond league race analysis					
date	9-Jun	time	2.30	3.30	4.28	5.25	6.24	7.23	8.24	9.26	10.30	11.36		12.98	6 / 1			
reaction time	0.157	interval	7 steps	1.00	0.98	0.97	0.99	0.99	1.01	1.02	1.04	1.06	1.62			2.95	2.99	3.12
wind	-0.5 m/s	velocity	5.97	9.14	9.33	9.42	9.23	9.23	9.05	8.96	8.79	8.62	8.65	8.47		9.29	9.17	8.79
Britt, Jamal (USA) (1998)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	21-May	time	2.50	3.52	4.53	5.53	6.52	7.52	8.53	9.55	10.60	11.65		12.99	6 / 1			
reaction time	0.124	interval	7 steps	1.02	1.01	1.00	0.99	1.00	1.01	1.02	1.05	1.05	1.34			3.03	3.00	3.12
wind	4.0 m/s	velocity	5.49	8.96	9.05	9.14	9.23	9.14	9.05	8.96	8.70	8.70	10.46	8.47		9.05	9.14	8.79
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Adidas Atlanta City Games (Atlanta, GA) (street) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	5-May	time	2.50	3.48	4.48	5.48	6.45	7.45	8.47	9.50	10.53	11.60		13.01	3 / 1			
reaction time	0.181	interval	7 steps	0.98	1.00	1.00	0.97	1.00	1.02	1.03	1.03	1.07	1.41			2.98	2.99	3.13
wind	0.0 m/s	velocity	5.49	9.33	9.14	9.14	9.42	9.14	8.96	8.87	8.87	8.54	9.94	8.46		9.20	9.17	8.76
Roberts, Daniel (USA) (1998)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	24-Jun	time	2.47	3.50	4.50	5.50	6.54	7.54	8.56	9.58	10.60	11.61		13.01	3 / 1			
reaction time	0.159	interval		1.03	1.00	1.00	1.04	1.00	1.02	1.02	1.02	1.01	1.40			3.03	3.06	3.05
wind	1.6 m/s	velocity	5.55	8.87	9.14	9.14	8.79	9.14	8.96	8.96	8.96	9.05	10.01	8.46		9.05	8.96	8.99
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 London Athletics Meet (London, GBR)													Omega Timing - diamond league race analysis					
date	23-Jul	time	2.36	3.35	4.33	5.30	6.29	7.28	8.29	9.32	10.37	11.43		13.01	5 / 1			
reaction time	0.165	interval	7 steps	0.99	0.98	0.97	0.99	0.99	1.01	1.03	1.05	1.06	1.58			2.94	2.99	3.14
wind	1.3 m/s	velocity	5.81	9.23	9.33	9.42	9.23	9.23	9.05	8.87	8.70	8.62	8.87	8.46		9.33	9.17	8.73
Zhoya, Sasha (FRA) (2002)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Heat 2 - 2023 French National Championships (Albi, FRA) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	29-Jul	time	2.52	3.56	4.58	5.56	6.52	7.52	8.52	9.52	10.54	11.58		13.01	6 / 1			
reaction time	0.173	interval	7 steps	1.04	1.02	0.98	0.96	1.00	1.00	1.00	1.02	1.04	1.43			3.04	2.96	3.06
wind	5.3 m/s	velocity	5.44	8.79	8.96	9.33	9.52	9.14	9.14	9.14	8.96	8.79	9.80	8.46		9.02	9.26	8.96
Zhoya, Sasha (FRA) (2002)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 French National Championships (Albi, FRA) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	29-Jul	time	2.50	3.54	4.54	5.52	6.50	7.50	8.52	9.52	10.54	11.58		13.01	6 / 1			
reaction time	0.187	interval	7 steps	1.04	1.00	0.98	0.98	1.00	1.02	1.00	1.02	1.04	1.43			3.02	3.00	3.06
wind	2.3 m/s	velocity	5.49	8.79	9.14	9.33	9.33	9.14	8.96	9.14	8.96	8.79	9.80	8.46		9.08	9.14	8.96
Holloway, Grant (USA) (1997)			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)													Henson (2023) - Athlete First: 2023 year end hurdle report					
date	21-Aug	time	2.44	3.44	4.42	5.40	6.38	7.38	8.40	9.42	10.46	11.53		13.02	5 / 1			
reaction time	0.137	interval	7 steps	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.04	1.07	1.49			2.96	3.00	3.13
wind	-0.2 m/s	velocity	5.62	9.14	9.33	9.33	9.33	9.14	8.96	8.96	8.79	8.54	9.41	8.45		9.26	9.14	8.76

2023 Prefontaine Classic (Eugene, OR)

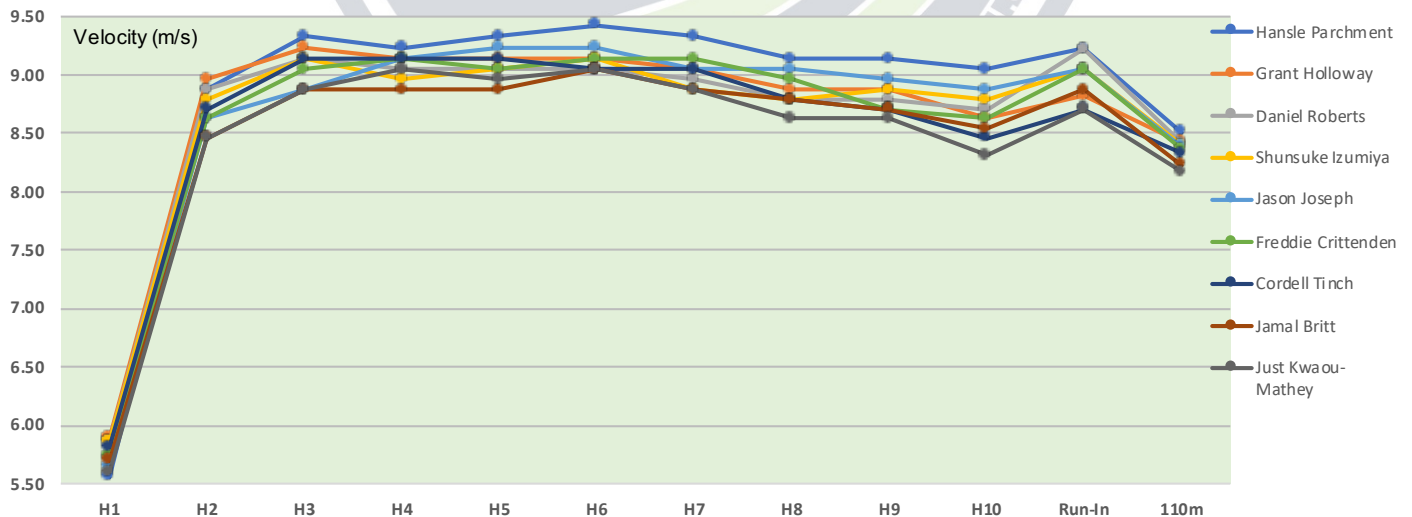
110m Hurdles

Date: 2023.09.17

Wind: 0.9 m/s

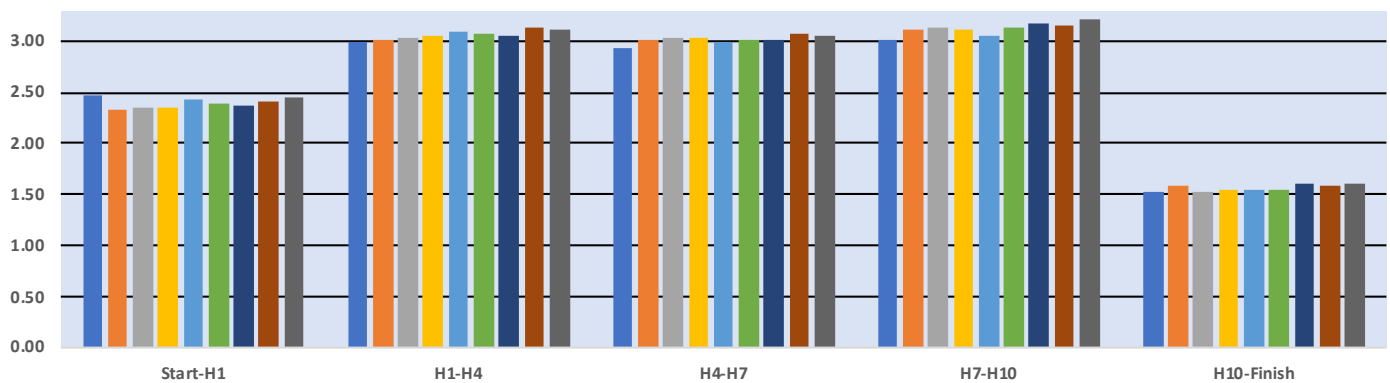
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time		2.47	3.50	4.48	5.47	6.45	7.42	8.40	9.40	10.40	11.41		12.93	5 / 1	3.00	2.93	3.01
	reaction time	0.168											1.52	PB				
	interval		7 steps	1.03	0.98	0.99	0.98	0.97	0.98	1.00	1.00	1.01	1.52					
	velocity		5.55	8.87	9.33	9.23	9.33	9.42	9.33	9.14	9.14	9.05	9.22	8.51		9.14	9.36	9.11
Holloway, Grant (USA) (1997)	time		2.33	3.35	4.34	5.34	6.34	7.34	8.35	9.38	10.41	11.47		13.06	6 / 2	3.01	3.01	3.12
	reaction time	0.153											1.59					
	interval		7 steps	1.02	0.99	1.00	1.00	1.00	1.01	1.03	1.03	1.06	1.59					
	velocity		5.89	8.96	9.23	9.14	9.14	9.14	9.05	8.87	8.87	8.62	8.82	8.42		9.11	9.11	8.79
Roberts, Daniel (USA) (1998)	time		2.34	3.37	4.37	5.38	6.39	7.40	8.42	9.46	10.50	11.55		13.07	3 / 3	3.04	3.04	3.13
	reaction time	0.149											1.52					
	interval			1.03	1.00	1.01	1.01	1.01	1.02	1.04	1.04	1.05	1.52					
	velocity		5.86	8.87	9.14	9.05	9.05	9.05	8.96	8.79	8.79	8.70	9.22	8.42		9.02	9.02	8.76
Izumiya, Shunsuke (JPN) (2000)	time		2.34	3.38	4.38	5.40	6.41	7.41	8.44	9.48	10.51	11.55		13.10	7 / 4	3.06	3.04	3.11
	reaction time	0.136											1.55					
	interval		7 steps	1.04	1.00	1.02	1.01	1.00	1.03	1.04	1.03	1.04	1.55					
	velocity		5.86	8.79	9.14	8.96	9.05	9.14	8.87	8.79	8.87	8.79	9.05	8.40		8.96	9.02	8.82
Joseph, Jason (SUI) (1998)	time		2.43	3.49	4.52	5.52	6.51	7.50	8.51	9.52	10.54	11.57		13.12	8 / 5	3.09	2.99	3.06
	reaction time	0.156											1.55					
	interval		7 steps	1.06	1.03	1.00	0.99	0.99	1.01	1.01	1.02	1.03	1.55					
	velocity		5.65	8.62	8.87	9.14	9.23	9.23	9.05	9.05	8.96	8.87	9.05	8.38		8.87	9.17	8.96
Crittenden, Freddie (USA) (1994)	time		2.39	3.45	4.46	5.46	6.47	7.47	8.47	9.49	10.54	11.60		13.15	4 / 6	3.07	3.01	3.13
	reaction time	0.146											1.55					
	interval			1.06	1.01	1.00	1.01	1.00	1.00	1.02	1.05	1.06	1.55					
	velocity		5.74	8.62	9.05	9.14	9.05	9.14	9.14	8.96	8.70	8.62	9.05	8.37		8.93	9.11	8.76
Tinch, Cordell (USA) (2000)	time		2.36	3.41	4.41	5.41	6.41	7.42	8.43	9.47	10.52	11.60		13.21	2 / 7	3.05	3.02	3.17
	reaction time	0.148											1.61					
	interval		7 steps	1.05	1.00	1.00	1.00	1.01	1.01	1.04	1.05	1.08	1.61					
	velocity		5.81	8.70	9.14	9.14	9.14	9.05	9.05	8.79	8.70	8.46	8.71	8.33		8.99	9.08	8.65
Britt, Jamal (USA) (1998)	time		2.41	3.49	4.52	5.55	6.58	7.59	8.62	9.66	10.71	11.78		13.36	9 / 8	3.14	3.07	3.16
	reaction time	0.140											1.58					
	interval		7 steps	1.08	1.03	1.03	1.03	1.01	1.03	1.04	1.05	1.07	1.58					
	velocity		5.69	8.46	8.87	8.87	8.87	9.05	8.87	8.79	8.70	8.54	8.87	8.23		8.73	8.93	8.68
Kwaou-Mathey, Just (FRA) (1999)	time		2.45	3.53	4.56	5.57	6.59	7.60	8.63	9.69	10.75	11.85		13.46	1 / 9	3.12	3.06	3.22
	reaction time	0.159											1.61					
	interval		7 steps	1.08	1.03	1.01	1.02	1.01	1.03	1.06	1.06	1.10	1.61					
	velocity		5.60	8.46	8.87	9.05	8.96	9.05	8.87	8.62	8.62	8.31	8.71	8.17		8.79	8.96	8.52



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 13:57) - diamond league race analysis

<https://www.omegaitiming.com/File/000203100102100101FFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=xZ-6oB0DqXs>

2023 Xiamen Diamond League (Xiamen, CHN)

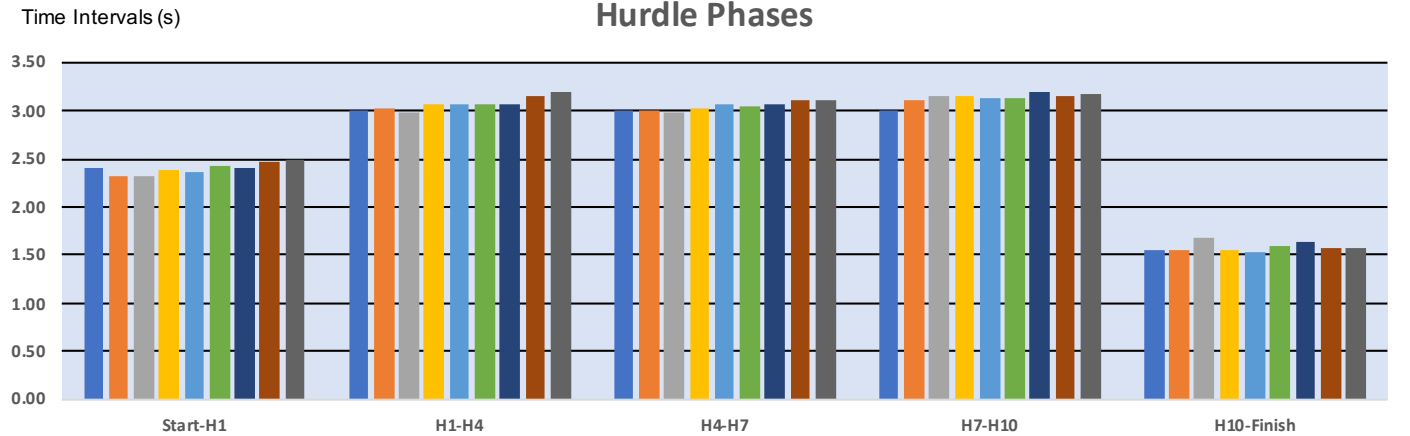
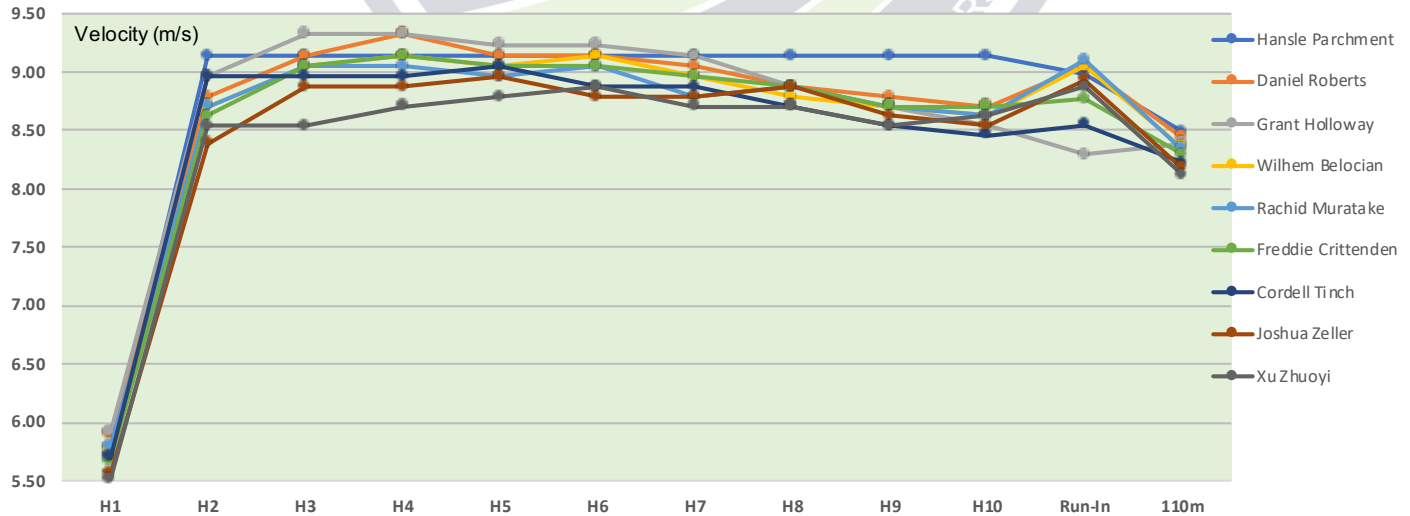
110m Hurdles

Date: 2023.09.02

Wind: 0.0 m/s

FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time		2.40	3.40	4.40	5.40	6.40	7.40	8.40	9.40	10.40	11.40		12.96	5 / 1			
	reaction time	0.163											1.56			3.00	3.00	3.00
	interval		7 steps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8.99	8.49		9.14	9.14	9.14
Roberts, Daniel (USA) (1998)	time		2.33	3.37	4.37	5.35	6.35	7.35	8.36	9.39	10.43	11.48		13.03	4 / 2			
	reaction time	0.140											1.55			3.02	3.01	3.12
	interval			1.04	1.00	0.98	1.00	1.00	1.01	1.03	1.04	1.05	9.05	8.44		9.08	9.11	8.79
Holloway, Grant (USA) (1997)	time		2.32	3.34	4.32	5.30	6.29	7.28	8.28	9.31	10.36	11.43		13.12	6 / 3			
	reaction time	0.141											1.69			2.98	2.98	3.15
	interval		7 steps	1.02	0.98	0.98	0.99	0.99	1.00	1.03	1.05	1.07	8.30	8.38		9.20	9.20	8.70
Belocian, Wilhem (FRA) (1995)	time		2.38	3.43	4.44	5.44	6.45	7.45	8.47	9.51	10.56	11.62		13.17	3 / 4			
	reaction time	0.130											1.55			3.06	3.03	3.15
	interval			1.05	1.01	1.00	1.01	1.00	1.02	1.04	1.05	1.06	9.05	8.35		8.96	9.05	8.70
Muratake, Rachid (JPN) (2002)	time		2.37	3.42	4.43	5.44	6.46	7.47	8.51	9.54	10.59	11.65		13.19	2 / 5			
	reaction time	0.153											1.54			3.07	3.07	3.14
	interval		7 steps	1.05	1.01	1.01	1.02	1.01	1.04	1.03	1.05	1.06	8.34	8.34		8.93	8.93	8.73
Crittenden, Freddie (USA) (1994)	time		2.42	3.48	4.49	5.49	6.50	7.51	8.53	9.56	10.61	11.66		13.26	7 / 6			
	reaction time	0.148											1.60			3.07	3.04	3.13
	interval			1.06	1.01	1.00	1.01	1.01	1.02	1.03	1.05	1.05	8.76	8.30		8.93	9.02	8.76
Tinch, Cordell (USA) (2000)	time		2.41	3.43	4.45	5.47	6.48	7.51	8.54	9.59	10.66	11.74		13.38	8 / 7			
	reaction time	0.170											1.64			3.06	3.07	3.20
	interval		7 steps	1.02	1.02	1.02	1.01	1.03	1.03	1.05	1.07	1.08	8.22	8.22		8.96	8.93	8.57
Pereira, Rafael (BRA) (1997)	0.130		no information available											13.42	10 / 8			
Zeller, Joshua (GBR) (2000)	time		2.47	3.56	4.59	5.62	6.64	7.68	8.72	9.75	10.81	11.88		13.45	1 / 9			
	reaction time	0.147											1.57			3.15	3.10	3.16
	interval			1.09	1.03	1.03	1.02	1.04	1.04	1.03	1.06	1.07	8.18	8.18		8.70	8.85	8.68
Xu Zhuoyi (CHN) (2003)	time		2.49	3.56	4.63	5.68	6.72	7.75	8.80	9.85	10.92	11.98		13.56	9 / 10			
	reaction time	0.166											1.58			3.19	3.12	3.18
	interval		7 steps	1.07	1.07	1.05	1.04	1.03	1.05	1.05	1.07	1.06	8.11	8.11		8.60	8.79	8.62



Source: Omega Timing (Sat 2 Sep 2023 21:02) - diamond league race analysis
<https://www.omegatiming.com/File/0002031101020C0101FFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=4K6le2LRwPI>

2023 Weltklasse (Zürich, SUI)

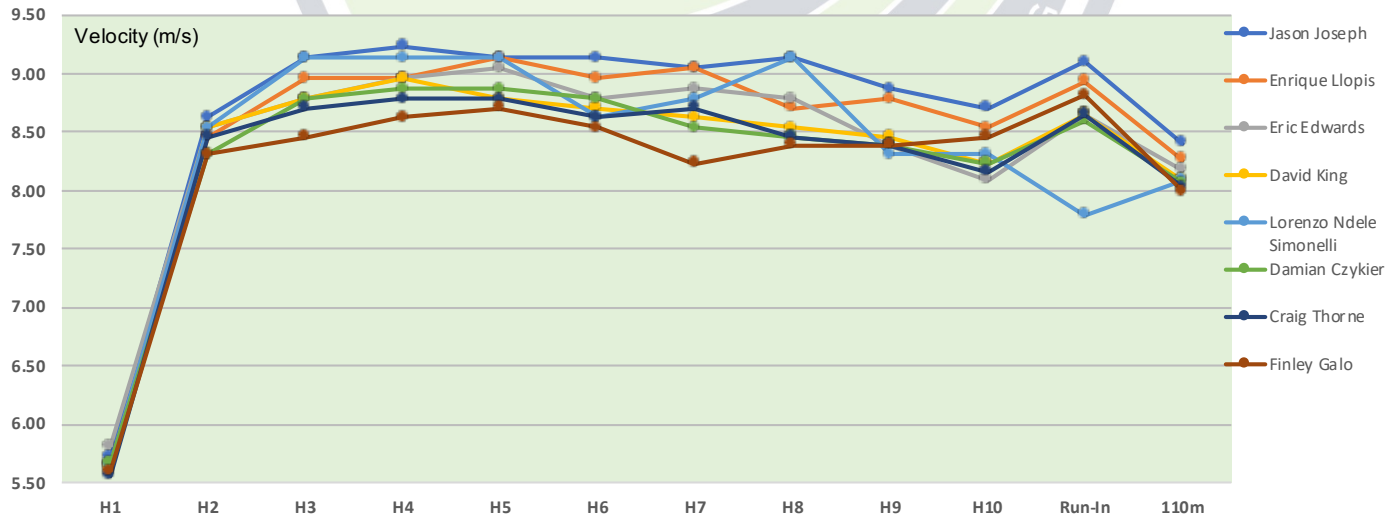
110m Hurdles

Date: 2023.08.31

Wind: -0.1 m/s

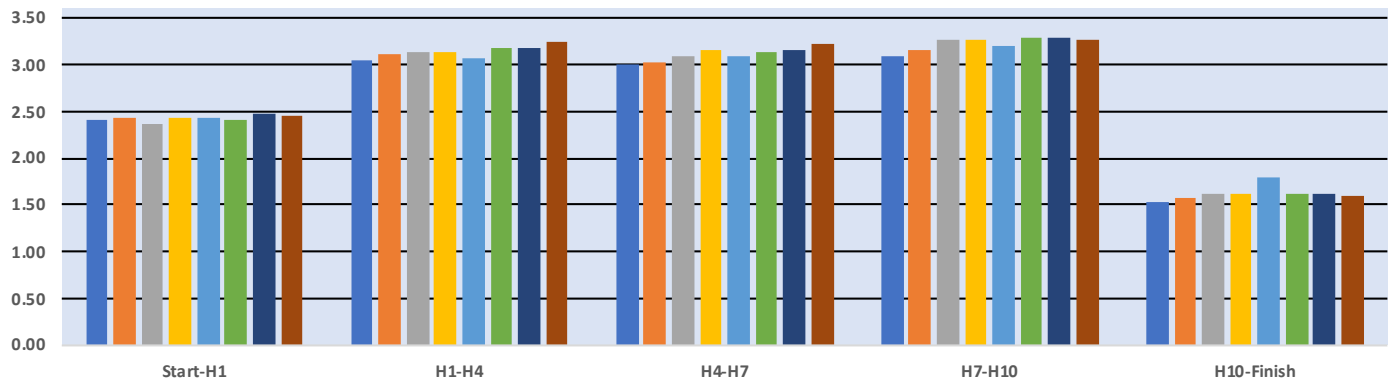
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Joseph, Jason (SUI) (1998)	reaction time	time	2.40	3.46	4.46	5.45	6.45	7.45	8.46	9.46	10.49	11.54		13.08	5 / 1	3.05	3.01	3.08
		interval	7 steps	1.06	1.00	0.99	1.00	1.00	1.01	1.00	1.03	1.05	1.54	NR PB				
		velocity	5.72	8.62	9.14	9.23	9.14	9.14	9.05	9.14	8.87	8.70	9.10	8.41				
Llopis, Enrique (ESP) (2000)	reaction time	time	2.43	3.51	4.53	5.55	6.55	7.57	8.58	9.63	10.67	11.74		13.31	3 / 2	3.12	3.03	3.16
		interval	7 steps	1.08	1.02	1.02	1.00	1.02	1.01	1.05	1.04	1.07	1.57					
		velocity	5.65	8.46	8.96	8.96	9.14	8.96	9.05	8.70	8.79	8.54	8.93	8.26				
Edwards, Eric (USA) (2000)	reaction time	time	2.36	3.43	4.47	5.49	6.50	7.54	8.57	9.61	10.70	11.83		13.45	6 / 3	3.13	3.08	3.26
		interval		1.07	1.04	1.02	1.01	1.04	1.03	1.04	1.09	1.13	1.62					
		velocity	5.81	8.54	8.79	8.96	9.05	8.79	8.87	8.79	8.39	8.09	8.65	8.18				
King, David (GBR) (1994)	reaction time	time	2.44	3.51	4.55	5.57	6.61	7.66	8.72	9.79	10.87	11.98		13.60	8 / 4	3.13	3.15	3.26
		interval	7 steps	1.07	1.04	1.02	1.04	1.05	1.06	1.07	1.08	1.11	1.62					
		velocity	5.62	8.54	8.79	8.96	8.79	8.70	8.62	8.54	8.46	8.23	8.65	8.09				
Simonelli, Lorenzo Ndele (ITA) (1994)	reaction time	time	2.43	3.50	4.50	5.50	6.50	7.56	8.60	9.60	10.70	11.80		13.60	4 / 5	3.07	3.10	3.20
		interval	7 steps	1.07	1.00	1.00	1.00	1.06	1.04	1.00	1.10	1.10	1.80					
		velocity	5.65	8.54	9.14	9.14	9.14	8.62	8.79	9.14	8.31	8.31	7.79	8.09				
Czykier, Damian (POL) (1992)	reaction time	time	2.42	3.52	4.56	5.59	6.62	7.66	8.73	9.81	10.90	12.01		13.64	7 / 6	3.17	3.14	3.28
		interval	7 steps	1.10	1.04	1.03	1.03	1.04	1.07	1.08	1.09	1.11	1.63					
		velocity	5.67	8.31	8.79	8.87	8.87	8.79	8.54	8.46	8.39	8.23	8.60	8.06				
Thorne, Craig (CAN) (2001)	reaction time	time	2.47	3.55	4.60	5.64	6.68	7.74	8.79	9.87	10.96	12.08		13.70	2 / 7	3.17	3.15	3.29
		interval		1.08	1.05	1.04	1.04	1.06	1.05	1.08	1.09	1.12	1.62					
		velocity	5.55	8.46	8.70	8.79	8.79	8.62	8.70	8.46	8.39	8.16	8.65	8.03				
Gaio, Finley (SUI) (1999)	reaction time	time	2.45	3.55	4.63	5.69	6.74	7.81	8.92	10.01	11.10	12.18		13.77	9 / 8	3.24	3.23	3.26
		interval	7 steps	1.10	1.08	1.06	1.05	1.07	1.11	1.09	1.09	1.08	1.59					
		velocity	5.60	8.31	8.46	8.62	8.70	8.54	8.23	8.39	8.39	8.46	8.82	7.99				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:01) - diamond league race analysis

<https://www.omegatiming.com/File/0002030D0102060101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=9wPn3xcHodI>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

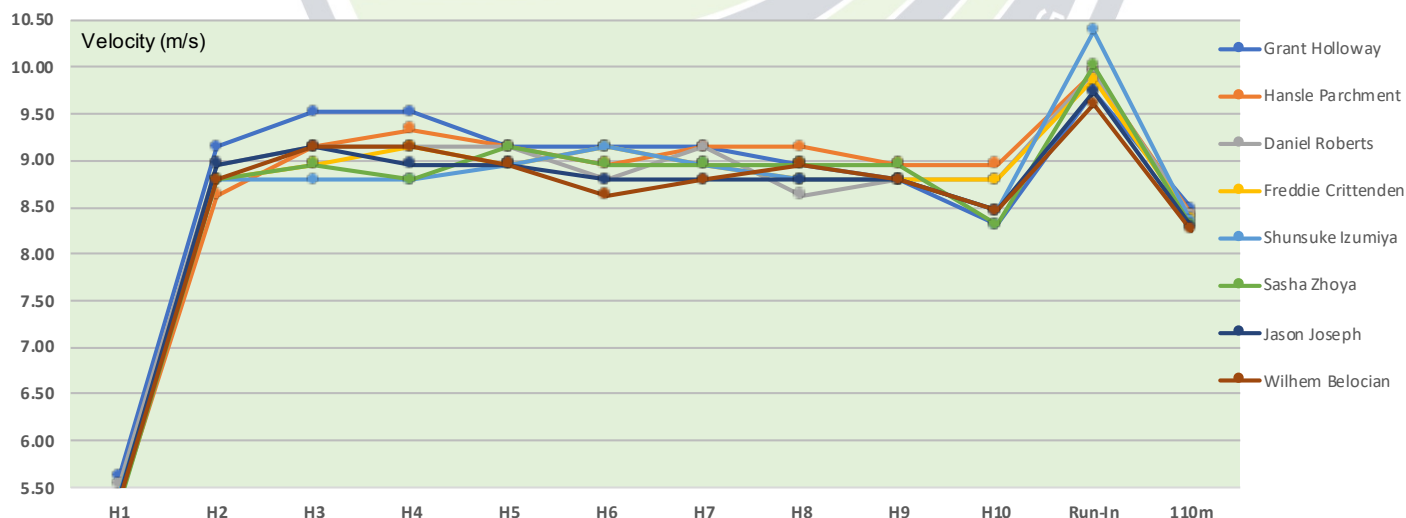
110m Hurdles

Date: 2023.08.21

Wind: 0.0 m/s

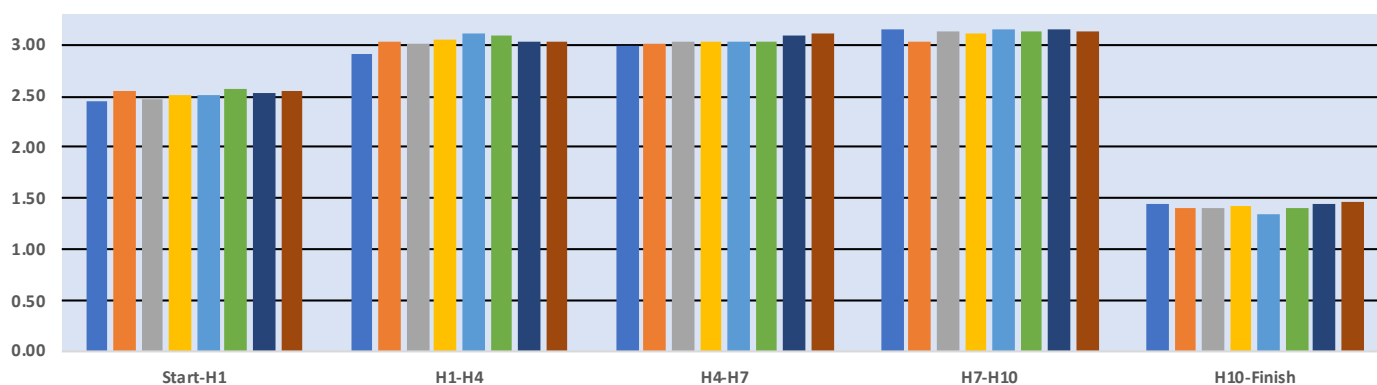
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.44	3.44	4.40	5.36	6.36	7.36	8.36	9.38	10.42	11.52		12.96	5 / 1			
	reaction time	0.135														2.92	3.00	3.16
	interval		7 steps	1.00	0.96	0.96	1.00	1.00	1.00	1.02	1.04	1.10	1.44			9.39	9.14	8.68
Parchment, Hansle (JAM) (1990)	time		2.56	3.62	4.62	5.60	6.60	7.62	8.62	9.62	10.64	11.66		13.07	8 / 2			
	reaction time	0.169														3.04	3.02	3.04
	interval		7 steps	1.06	1.00	0.98	1.00	1.02	1.00	1.00	1.02	1.02	1.41			9.02	9.08	9.02
Roberts, Daniel (USA) (1998)	time		2.48	3.50	4.50	5.50	6.50	7.54	8.54	9.60	10.64	11.68		13.09	3 / 3			
	reaction time	0.143														3.02	3.04	3.14
	interval			1.02	1.00	1.00	1.00	1.04	1.00	1.06	1.04	1.04	1.41			9.08	9.02	8.73
Crittenden, Freddie (USA) (1994)	time		2.52	3.56	4.58	5.58	6.60	7.60	8.62	9.66	10.70	11.74		13.16	4 / 4			
	reaction time	0.140														3.06	3.04	3.12
	interval			1.04	1.02	1.00	1.02	1.00	1.02	1.04	1.04	1.04	1.42			8.96	9.02	8.79
Izumiya, Shunsuke (JPN) (2000)	time		2.52	3.56	4.60	5.64	6.66	7.66	8.68	9.72	10.76	11.84		13.19	6 / 5			
	reaction time	0.143														3.12	3.04	3.16
	interval		7 steps	1.04	1.04	1.04	1.02	1.00	1.02	1.04	1.04	1.08	1.35			8.79	9.02	8.68
Zhoya, Sasha (FRA) (2002)	time		2.58	3.62	4.64	5.68	6.68	7.70	8.72	9.74	10.76	11.86		13.26	7 / 6			
	reaction time	0.166														3.10	3.04	3.14
	interval		7 steps	1.04	1.02	1.04	1.00	1.02	1.02	1.02	1.02	1.10	1.40			8.85	9.02	8.73
Joseph, Jason (SUI) (1998)	time		2.54	3.56	4.56	5.58	6.60	7.64	8.68	9.72	10.76	11.84		13.28	9 / 7			
	reaction time	0.143														3.04	3.10	3.16
	interval		7 steps	1.02	1.00	1.02	1.02	1.04	1.04	1.04	1.04	1.08	1.44			9.02	8.85	8.68
Belocian, Wilhem (FRA) (1995)	time		2.56	3.60	4.60	5.60	6.62	7.68	8.72	9.74	10.78	11.86		13.32	2 / 8			
	reaction time	0.158														3.04	3.12	3.14
	interval			1.04	1.00	1.00	1.02	1.06	1.04	1.02	1.04	1.08	1.46			9.02	8.79	8.73
	velocity		5.62	9.14	9.52	9.52	9.14	9.14	9.14	8.96	8.79	8.31	9.74	8.49				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ReedOS8lbY4>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

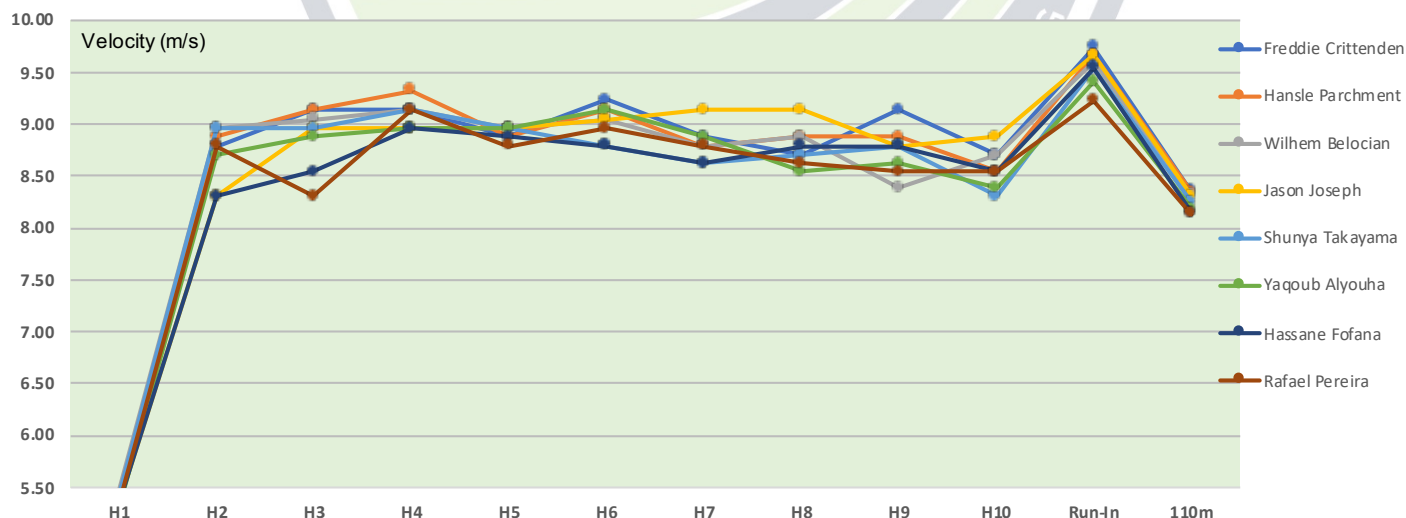
110m Hurdles

Date: 2023.08.21

Wind: -0.1 m/s

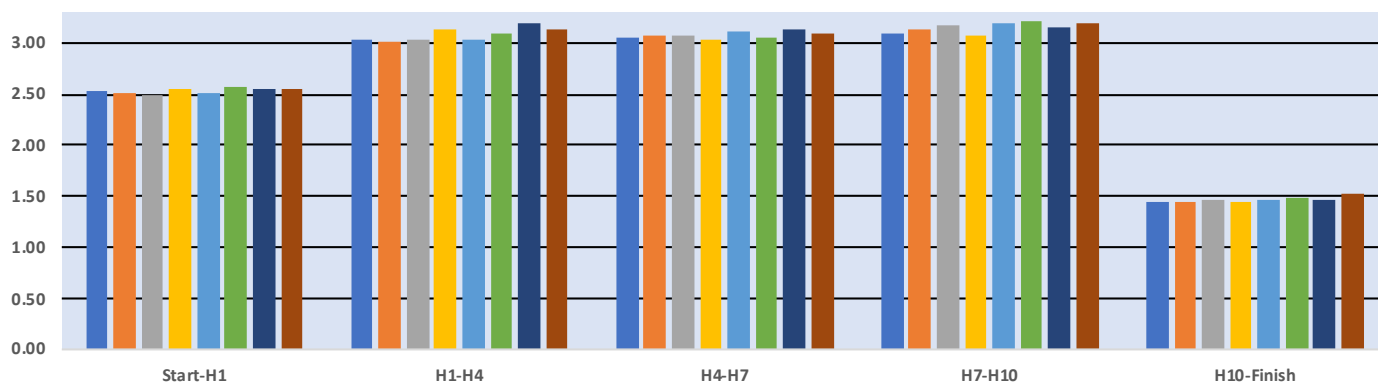
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Crittenden, Freddie (USA) (1994)	time	2.54	3.58	4.58	5.58	6.61	7.60	8.63	9.68	10.68	11.73		13.17	6 / 1			
	reaction time	0.156													3.04	3.05	3.10
	interval		1.04	1.00	1.00	1.03	0.99	1.03	1.05	1.00	1.05	1.44			9.02	8.99	8.85
Parchment, Hansle (JAM) (1990)	time	2.52	3.55	4.55	5.53	6.56	7.56	8.60	9.63	10.66	11.73		13.18	5 / 2			
	reaction time	0.138													3.01	3.07	3.13
	interval	7 steps	1.03	1.00	0.98	1.03	1.00	1.04	1.03	1.03	1.07	1.45			9.11	8.93	8.76
Belocian, Wilhem (FRA) (1995)	time	2.50	3.52	4.53	5.53	6.55	7.56	8.60	9.63	10.72	11.77		13.23	4 / 3			
	reaction time	0.140													3.03	3.07	3.17
	interval	7 steps	1.02	1.01	1.00	1.02	1.01	1.04	1.03	1.09	1.05	1.46			9.05	8.93	8.65
Joseph, Jason (SUI) (1998)	time	2.56	3.66	4.68	5.70	6.72	7.73	8.73	9.73	10.77	11.80		13.25	8 / 4			
	reaction time	0.163													3.14	3.03	3.07
	interval	7 steps	1.10	1.02	1.02	1.02	1.01	1.00	1.00	1.04	1.03	1.45			8.73	9.05	8.93
Takayama, Shunya (JPN) (1994)	time	2.52	3.54	4.56	5.56	6.58	7.62	8.68	9.73	10.77	11.87		13.34	7 / 5			
	reaction time	0.135													3.04	3.12	3.19
	interval	7 steps	1.02	1.02	1.00	1.02	1.04	1.06	1.05	1.04	1.10	1.47			9.02	8.79	8.60
Alyouha, Yaqoub (KUW) (1993)	time	2.58	3.63	4.66	5.68	6.70	7.70	8.73	9.80	10.86	11.95		13.44	2 / 6			
	reaction time	0.157													3.10	3.05	3.22
	interval	7 steps	1.05	1.03	1.03	1.02	1.00	1.03	1.07	1.06	1.09	1.49			8.85	8.99	8.52
Fofana, Hassane (ITA) (1992)	time	2.56	3.66	4.73	5.75	6.78	7.82	8.88	9.92	10.96	12.03		13.50	9 / 7			
	reaction time	0.147													3.19	3.13	3.15
	interval	7 steps	1.10	1.07	1.02	1.03	1.04	1.06	1.04	1.04	1.07	1.47			8.60	8.76	8.70
Pereira, Rafael (BRA) (1997)	time	2.56	3.60	4.70	5.70	6.74	7.76	8.80	9.86	10.93	12.00		13.52	3 / 8			
	reaction time	0.160													3.14	3.10	3.20
	interval	7 steps	1.04	1.10	1.00	1.04	1.02	1.04	1.06	1.07	1.07	1.52			8.73	8.85	8.57
	velocity	5.36	8.79	8.31	9.14	8.79	8.96	8.79	8.62	8.54	8.54	9.22	8.14				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=JAak2zqOPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

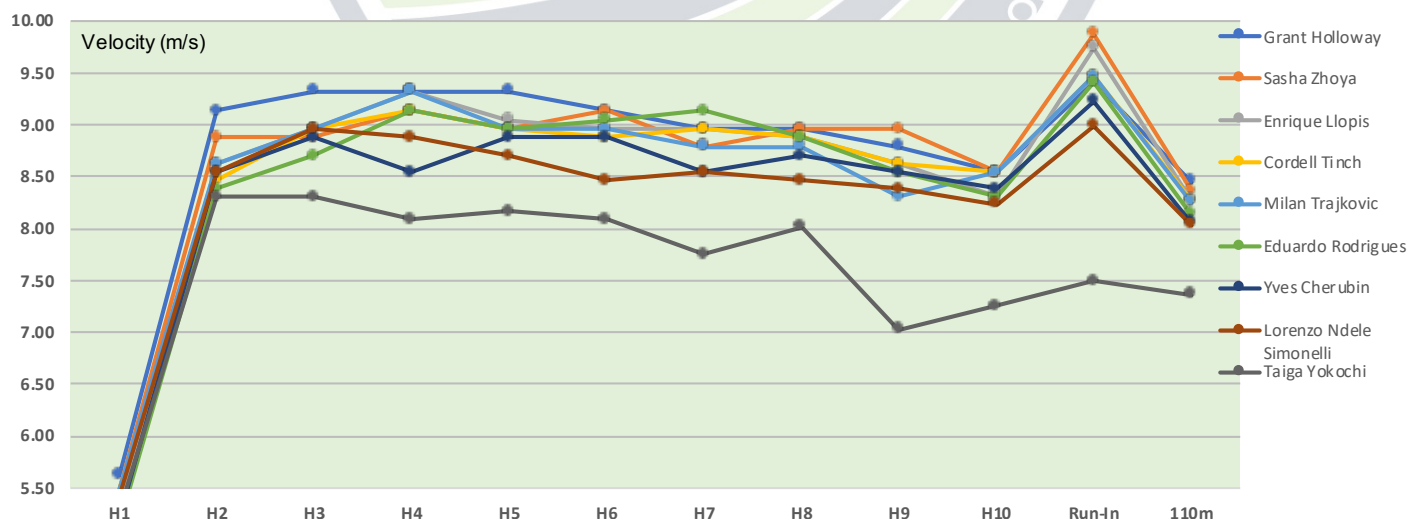
110m Hurdles

Date: 2023.08.21

Wind: -0.2 m/s

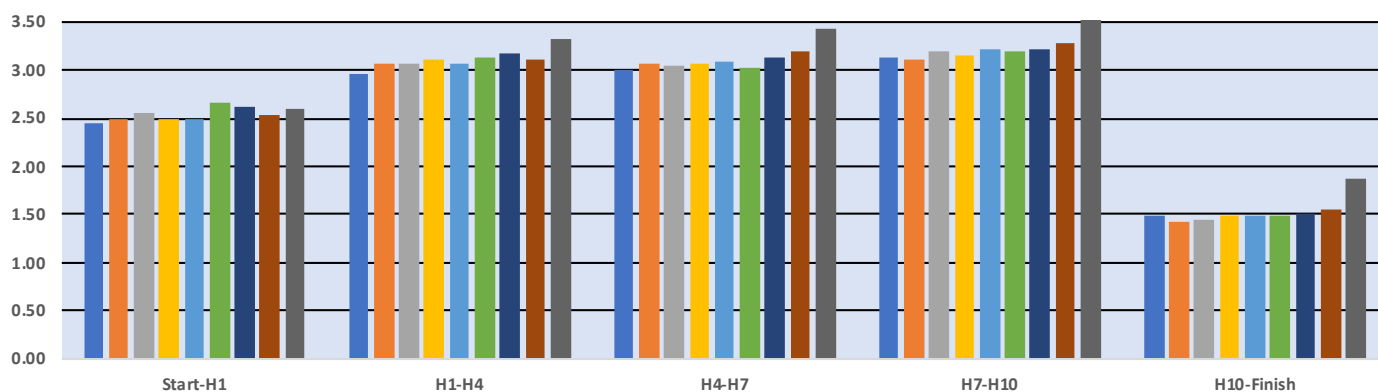
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.44	3.44	4.42	5.40	6.38	7.38	8.40	9.42	10.46	11.53		13.02	5 / 1			
	reaction time	0.137											1.49			2.96	3.00	3.13
	interval		7 steps	1.00	0.98	0.98	0.98	1.00	1.02	1.02	1.04	1.07	1.49			9.26	9.14	8.76
Zhoya, Sasha (FRA) (2002)	time		2.50	3.53	4.56	5.56	6.58	7.58	8.62	9.64	10.66	11.73		13.15	7 / 2			
	reaction time	0.129											1.42			3.06	3.06	3.11
	interval		7 steps	1.03	1.03	1.00	1.02	1.00	1.04	1.02	1.02	1.07	1.42			8.96	8.96	8.82
Llopis, Enrique (ESP) (2000)	time		2.56	3.62	4.64	5.62	6.63	7.65	8.67	9.70	10.76	11.86		13.30	6 / 3			
	reaction time	0.146											1.44			3.06	3.05	3.19
	interval		7 steps	1.06	1.02	0.98	1.01	1.02	1.03	1.06	1.10	1.10	1.44			8.96	8.99	8.60
Tinch, Cordell (USA) (2000)	time		2.50	3.58	4.60	5.60	6.62	7.65	8.67	9.70	10.76	11.83		13.31	3 / 4			
	reaction time	0.168											1.48			3.10	3.07	3.16
	interval		7 steps	1.08	1.02	1.00	1.02	1.03	1.02	1.03	1.06	1.07	1.48			8.85	8.93	8.68
Trajkovic, Milan (CYP) (1992)	time		2.50	3.56	4.58	5.56	6.58	7.60	8.64	9.68	10.78	11.85		13.33	4 / 5			
	reaction time	0.137											1.48			3.06	3.08	3.21
	interval		7 steps	1.06	1.02	0.98	1.02	1.02	1.04	1.04	1.10	1.07	1.48			8.96	8.90	8.54
Rodrigues, Eduardo (BRA) (1995)	time		2.66	3.75	4.80	5.80	6.82	7.83	8.83	9.86	10.93	12.03		13.52	8 / 6			
	reaction time	0.142											1.49			3.14	3.03	3.20
	interval		7 steps	1.09	1.05	1.00	1.02	1.01	1.00	1.03	1.07	1.10	1.49			8.73	9.05	8.57
Cherubin, Yves (HAI) (1999)	time		2.63	3.70	4.73	5.80	6.83	7.86	8.93	9.98	11.05	12.14		13.66	9 / 7			
	reaction time	0.178											1.52			3.17	3.13	3.21
	interval		7 steps	1.07	1.03	1.07	1.03	1.03	1.07	1.05	1.07	1.09	1.52			8.65	8.76	8.54
Simonelli, Lorenzo Ndele (ITA) (2002)	time		2.53	3.60	4.62	5.65	6.70	7.78	8.85	9.93	11.02	12.13		13.69	2 / 8			
	reaction time	0.151											1.56			3.12	3.20	3.28
	interval		7 steps	1.07	1.02	1.03	1.05	1.08	1.07	1.08	1.09	1.11	1.56			8.79	8.57	8.36
Yokochi, Taiga (JPN) (2000)	time		2.60	3.70	4.80	5.93	7.05	8.18	9.36	10.50	11.80	13.06		14.93	1 / 9			
	reaction time	0.173											1.87			3.33	3.43	3.70
	interval		7 steps	1.10	1.10	1.13	1.12	1.13	1.18	1.14	1.30	1.26	1.87			8.23	7.99	7.41



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JAqk2zgQPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

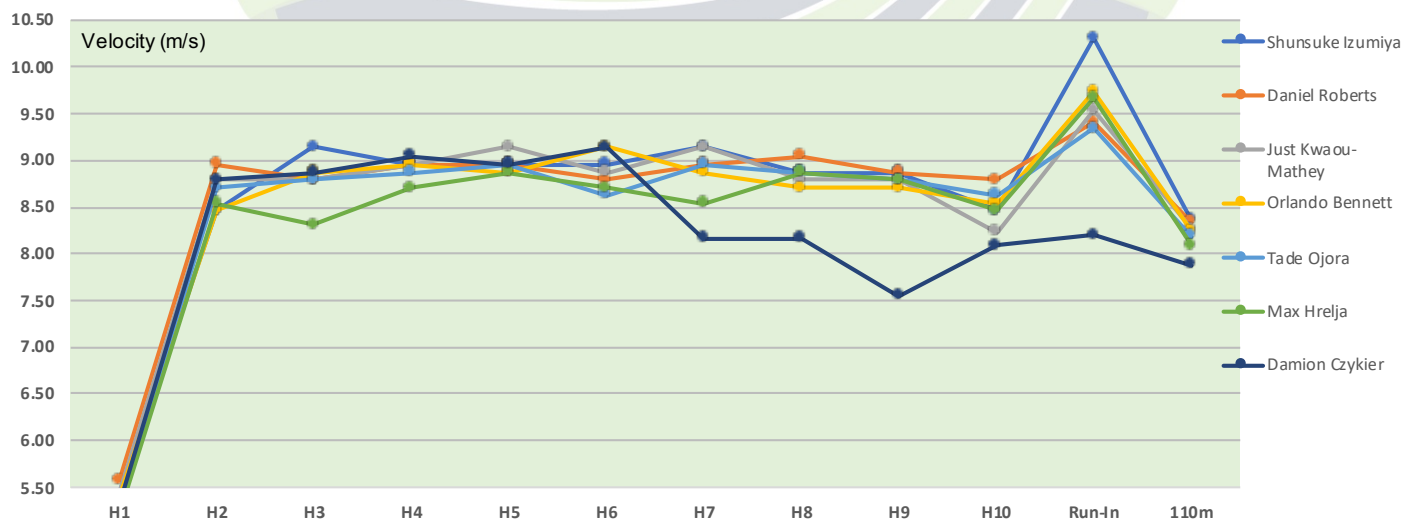
110m Hurdles

Date: 2023.08.21

Wind: -0.2 m/s

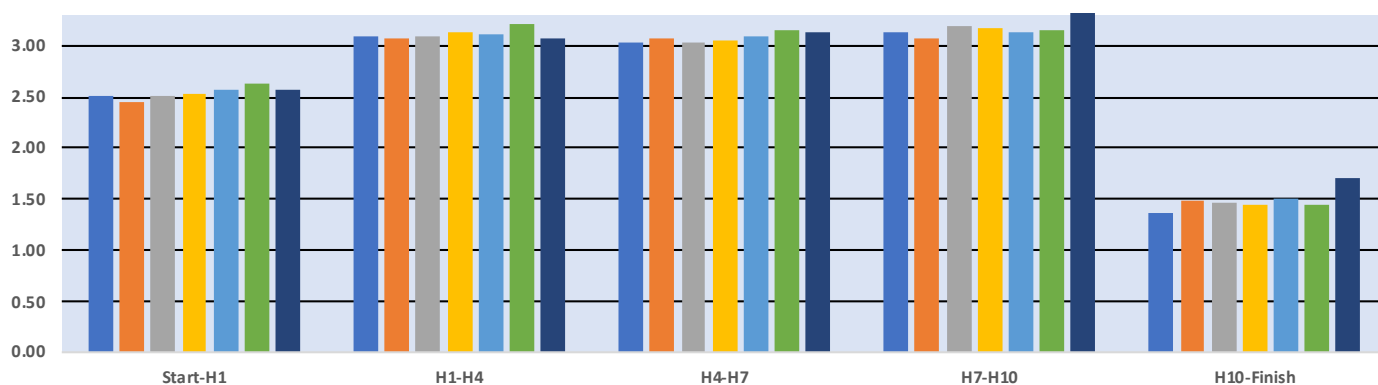
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Izumiya, Shunsuke (JPN) (2000)	time	2.52	3.60	4.60	5.62	6.64	7.66	8.66	9.69	10.72	11.80		13.16	6 / 1			
	reaction time	0.129													3.10	3.04	3.14
	interval		1.08	1.00	1.02	1.02	1.02	1.00	1.03	1.03	1.08	1.36			8.85	9.02	8.73
	velocity	5.44	8.46	9.14	8.96	8.96	8.96	9.14	8.87	8.87	8.46	10.31	8.36				
Roberts, Daniel (USA) (1998)	time	2.46	3.48	4.52	5.54	6.56	7.60	8.62	9.63	10.66	11.70		13.19	5 / 2			
	reaction time	0.144										1.49			3.08	3.08	3.08
	interval		1.02	1.04	1.02	1.02	1.04	1.02	1.01	1.03	1.04				8.90	8.90	8.90
	velocity	5.58	8.96	8.79	8.96	8.96	8.79	8.96	9.05	8.87	8.79	9.41	8.34				
Kwaou-Mathey, Just (FRA) (1999)	time	2.52	3.56	4.60	5.62	6.62	7.65	8.65	9.69	10.73	11.84		13.31	2 / 3			
	reaction time	0.165													3.10	3.03	3.19
	interval		1.04	1.04	1.02	1.00	1.03	1.00	1.04	1.04	1.11	1.47			8.85	9.05	8.60
	velocity	5.44	8.79	8.79	8.96	9.14	8.87	9.14	8.79	8.79	8.23	9.54	8.26				
Bennett, Orlando (JAM) (1999)	time	2.54	3.62	4.65	5.67	6.70	7.70	8.73	9.78	10.83	11.90		13.34	9 / 4			
	reaction time	0.144										1.44			3.13	3.06	3.17
	interval		1.08	1.03	1.02	1.03	1.00	1.03	1.05	1.05	1.07				8.76	8.96	8.65
	velocity	5.40			8.96	8.87	9.14	8.87	8.70	8.70	8.54	9.74	8.25				
Ojora, Tade (GBR) (1999)	time	2.58	3.63	4.67	5.70	6.72	7.78	8.80	9.83	10.87	11.93		13.43	7 / 5			
	reaction time	0.144													3.12	3.10	3.13
	interval		1.05	1.04	1.03	1.02	1.06	1.02	1.03	1.04	1.06	1.50			8.79	8.85	8.76
	velocity	5.32	8.70	8.79	8.87	8.96	8.62	8.96	8.87	8.79	8.62	9.35	8.19				
Hrelja, Max (SWE) (1998)	time	2.63	3.70	4.80	5.85	6.88	7.93	9.00	10.03	11.07	12.15		13.60	8 / 6			
	reaction time	0.162													3.22	3.15	3.15
	interval		1.07	1.10	1.05	1.03	1.05	1.07	1.03	1.04	1.08	1.45			8.52	8.70	8.70
	velocity	5.22	8.54	8.31	8.70	8.87	8.70	8.54	8.87	8.79	8.46	9.67	8.09				
Czykier, Damian (POL) (1992)	time	2.58	3.62	4.65	5.66	6.68	7.68	8.80	9.92	11.13	12.26		13.97	3 / 7			
	reaction time	0.162													3.08	3.14	3.46
	interval		1.04	1.03	1.01	1.02	1.00	1.12	1.12	1.21	1.13	1.71			8.90	8.73	7.92
	velocity	5.32	8.79	8.87	9.05	8.96	9.14	8.16	8.16	7.55	8.09	8.20	7.87				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JAqk2zqOPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

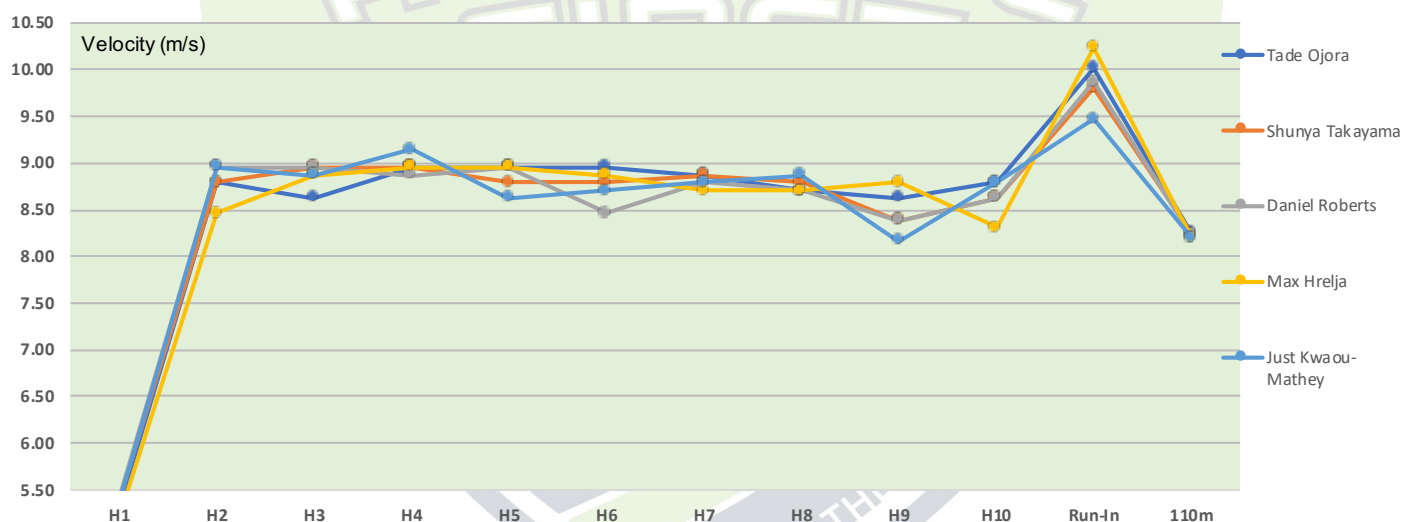
110m Hurdles

Date: 2023.08.20

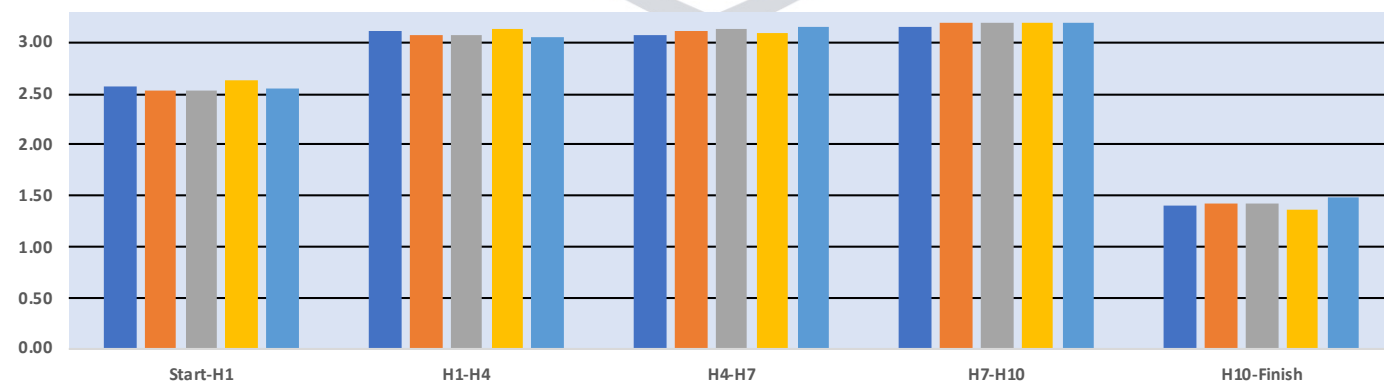
Wind: -0.9 m/s

Heat 5

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Ojora, Tade (GBR) (1999)	time		2.58	3.62	4.68	5.70	6.72	7.74	8.77	9.82	10.88	11.92		13.32	2 / 1			
	reaction time	0.148														3.12	3.07	3.15
	interval		7 steps	1.04	1.06	1.02	1.02	1.02	1.03	1.05	1.06	1.04	1.40			8.79	8.93	8.70
Takayama, Shunya (JPN) (1994)	time		2.54	3.58	4.60	5.62	6.66	7.70	8.73	9.77	10.86	11.92		13.35	9 / 2			
	reaction time	0.146														3.08	3.11	3.19
	interval			1.04	1.02	1.02	1.04	1.04	1.03	1.04	1.09	1.06	1.43			8.90	8.82	8.60
Roberts, Daniel (USA) (1998)	time		2.53	3.55	4.57	5.60	6.62	7.70	8.74	9.79	10.88	11.94		13.36	5 / 3			
	reaction time	0.155														3.07	3.14	3.20
	interval			1.02	1.02	1.03	1.02	1.08	1.04	1.05	1.09	1.06	1.42			8.93	8.73	8.57
Hrelja, Max (SWE) (1998)	time		2.63	3.71	4.74	5.76	6.78	7.81	8.86	9.91	10.95	12.05		13.42	7 / 4			
	reaction time	0.138														3.13	3.10	3.19
	interval		7 steps	1.08	1.03	1.02	1.02	1.03	1.05	1.05	1.04	1.10	1.37	PB		8.76	8.85	8.60
Kwaou-Mathey, Just (FRA) (1999)	time		2.55	3.57	4.60	5.60	6.66	7.71	8.75	9.78	10.90	11.94		13.42	3 / 5			
	reaction time	0.160														3.05	3.15	3.19
	interval		7 steps	1.02	1.03	1.00	1.06	1.05	1.04	1.03	1.12	1.04	1.48			8.99	8.70	8.60
	velocity		5.32	8.79	8.62	8.96	8.96	8.96	8.87	8.70	8.62	8.79	10.01	8.26				
			5.22	8.46	8.87	8.96	8.96	8.87	8.70	8.70	8.79	8.31	10.23	8.20				



Time Intervals (s)



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=W4r-yvIQ5wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

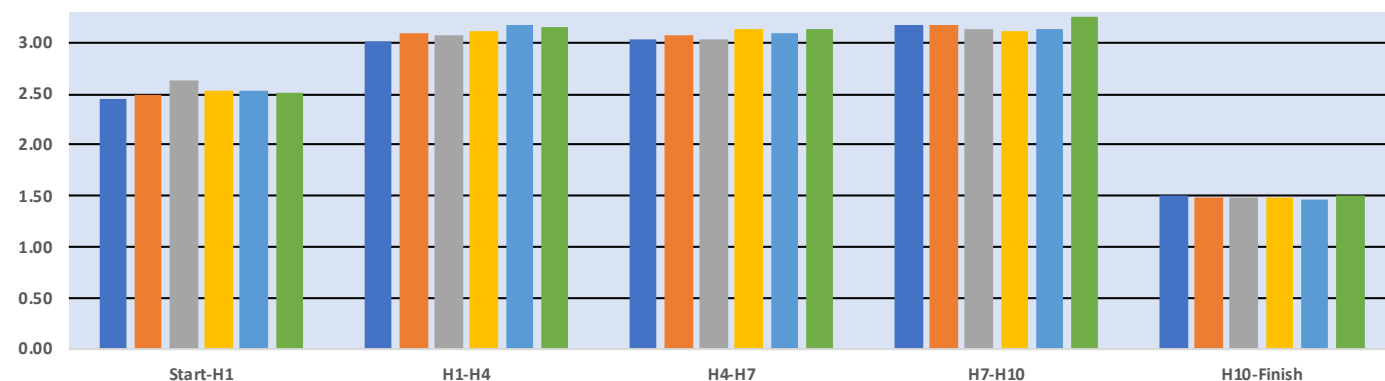
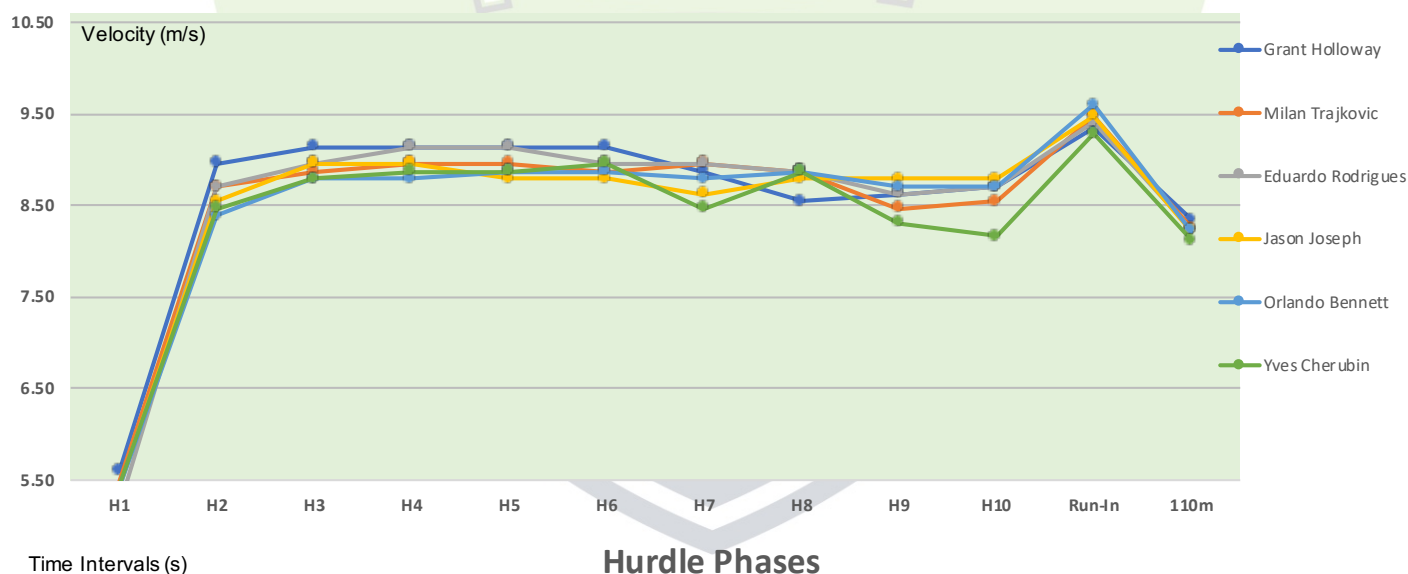
110m Hurdles

Date: 2023.08.20

Wind: -0.6 m/s

Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.45	3.47	4.47	5.47	6.47	7.47	8.50	9.57	10.63	11.68		13.18	5 / 1			
	reaction time	0.153													3.02	3.03	3.18
	interval	7 steps	1.02	1.00	1.00	1.00	1.00	1.03	1.07	1.06	1.05	1.50			9.08	9.05	8.62
Trajkovic, Milan (CYP) (1992)	time	2.50	3.55	4.58	5.60	6.62	7.65	8.67	9.70	10.78	11.85		13.33	4 / 2			
	reaction time	0.164													3.10	3.07	3.18
	interval	7 steps	1.05	1.03	1.02	1.02	1.03	1.02	1.03	1.08	1.07	1.48			8.85	8.93	8.62
Rodrigues, Eduardo (BRA) (1995)	time	2.63	3.68	4.70	5.70	6.70	7.72	8.74	9.77	10.83	11.88		13.37	1 / 3			
	reaction time	0.150													3.07	3.04	3.14
	interval	7 steps	1.05	1.02	1.00	1.00	1.02	1.02	1.03	1.06	1.05	1.49			8.93	9.02	8.73
Joseph, Jason (SUI) (1998)	time	2.53	3.60	4.62	5.64	6.68	7.72	8.78	9.82	10.86	11.90		13.38	2 / 4			
	reaction time	0.159													3.11	3.14	3.12
	interval	7 steps	1.07	1.02	1.02	1.04	1.04	1.06	1.04	1.04	1.04	1.48			8.82	8.73	8.79
Bennett, Orlando (JAM) (1999)	time	2.53	3.62	4.66	5.70	6.73	7.76	8.80	9.83	10.88	11.93		13.39	9 / 5			
	reaction time	0.140													3.17	3.10	3.13
	interval	7 steps	1.09	1.04	1.04	1.03	1.03	1.04	1.03	1.05	1.05	1.46			8.65	8.85	8.76
Cherubin, Yves (HAI) (1999)	time	2.52	3.60	4.64	5.67	6.70	7.72	8.80	9.83	10.93	12.05		13.56	6 / 6			
	reaction time	0.180													3.15	3.13	3.25
	interval	7 steps	1.08	1.04	1.03	1.03	1.02	1.08	1.03	1.10	1.12	1.51	PB		8.70	8.76	8.44
	velocity	5.60	8.96	9.14	9.14	9.14	9.14	8.87	8.54	8.62	8.70	9.35	8.35				
	velocity	5.49	8.70	8.87	8.96	8.96	8.87	8.96	8.87	8.46	8.54	9.47	8.25				
	velocity	5.22	8.70	8.96	9.14	9.14	8.96	8.96	8.87	8.62	8.70	9.41	8.23				
	velocity	5.42	8.54	8.96	8.96	8.79	8.79	8.62	8.79	8.79	8.79	9.47	8.22				
	velocity	5.42	8.39	8.79	8.79	8.87	8.87	8.79	8.87	8.70	8.70	9.60	8.22				
	velocity	5.44	8.46	8.79	8.87	8.87	8.96	8.46	8.87	8.31	8.16	9.28	8.11				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=W4r-yvIQ5wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

110m Hurdles

Date: 2023.08.20

Wind: 0.0 m/s

Heat 3

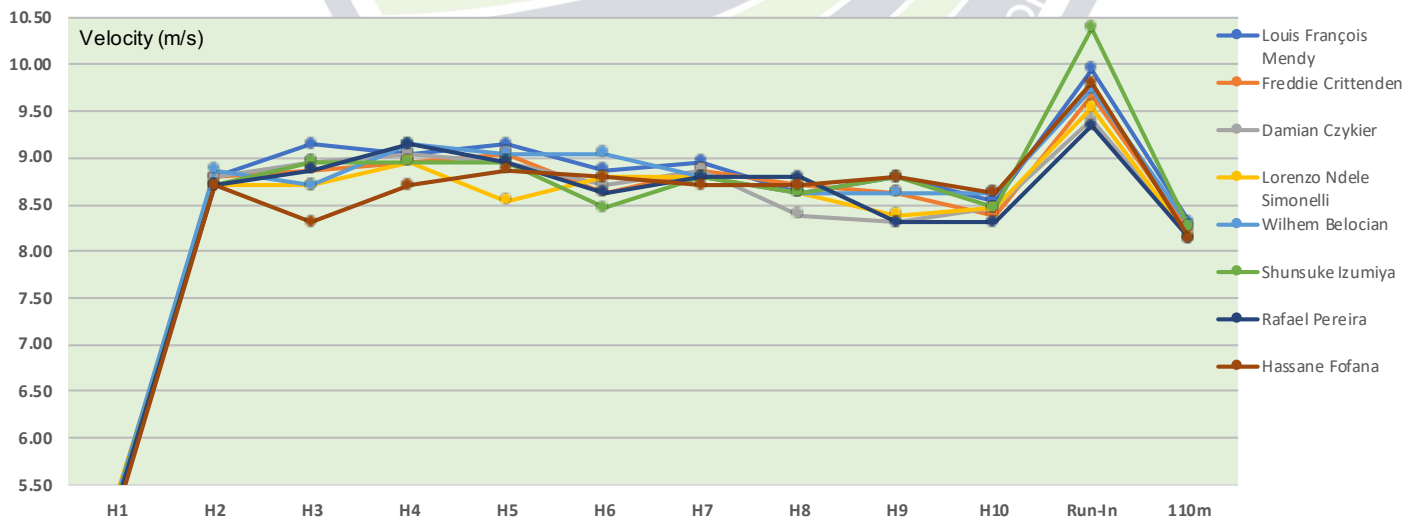
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Mendy, Louis François (SEN) (1999)	time	2.56	3.60	4.60	5.61	6.61	7.64	8.66	9.72	10.76	11.83		13.24	6 / 1	3.05	3.05	3.17
	reaction time	0.176															
	interval velocity		1.04	1.00	1.01	1.00	1.03	1.02	1.06	1.04	1.07	1.41					
Crittenden, Freddie (USA) (1994)	time	2.56	3.60	4.63	5.65	6.66	7.72	8.75	9.80	10.86	11.95		13.40	3 / 2	3.09	3.10	3.20
	reaction time	0.148															
	interval velocity		1.04	1.03	1.02	1.01	1.06	1.03	1.05	1.06	1.09	1.45					
Czykier, Damian (POL) (1992)	time	2.56	3.60	4.62	5.63	6.65	7.70	8.73	9.82	10.92	12.00		13.49	7 / 3	3.07	3.10	3.27
	reaction time	0.152															
	interval velocity		1.04	1.02	1.01	1.02	1.05	1.03	1.09	1.10	1.08	1.49					
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.53	3.58	4.63	5.65	6.72	7.76	8.80	9.86	10.95	12.03		13.50	4 / 4	3.12	3.15	3.23
	reaction time	0.152															
	interval velocity		1.05	1.05	1.02	1.07	1.04	1.04	1.06	1.09	1.08	1.47					
		5.42	8.70	8.70	8.96	8.54	8.79	8.79	8.62	8.39	8.46	9.54	8.15		8.79	8.70	8.49

Date: 2023.08.20

Wind: 0.5 m/s

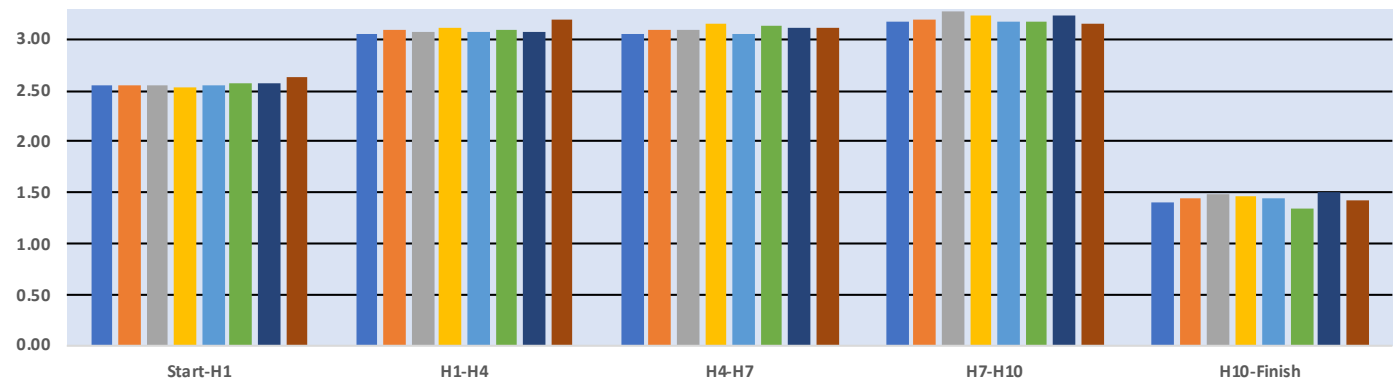
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Belocian, Wilhem (FRA) (1995)	time	2.55	3.58	4.63	5.63	6.64	7.65	8.69	9.75	10.81	11.87		13.31	9 / 1	3.08	3.06	3.18
	reaction time	0.156															
	interval velocity		1.03	1.05	1.00	1.01	1.01	1.04	1.06	1.06	1.06	1.44					
Izumiya, Shunsuke (JPN) (2000)	time	2.57	3.62	4.64	5.66	6.68	7.76	8.80	9.86	10.90	11.98		13.33	6 / 2	3.09	3.14	3.18
	reaction time	0.146															
	interval velocity		1.05	1.02	1.02	1.02	1.08	1.04	1.06	1.04	1.08	1.35					
Pereira, Rafael (BRA) (1997)	time	2.58	3.63	4.66	5.66	6.68	7.74	8.78	9.82	10.92	12.02		13.52	4 / 3	3.08	3.12	3.24
	reaction time	0.146															
	interval velocity		1.05	1.03	1.00	1.02	1.06	1.04	1.04	1.10	1.10	1.50					
Fofana, Hassane (ITA) (1992)	time	2.63	3.68	4.78	5.83	6.86	7.90	8.95	10.00	11.04	12.10		13.53	5 / 4	3.20	3.12	3.15
	reaction time	0.141															
	interval velocity		1.05	1.10	1.05	1.03	1.04	1.05	1.05	1.04	1.06	1.43					
		5.22	8.70	8.31	8.70	8.87	8.79	8.70	8.70	8.79	8.62	9.80	8.13		8.57	8.79	8.70



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=W4r-vyIQ5wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

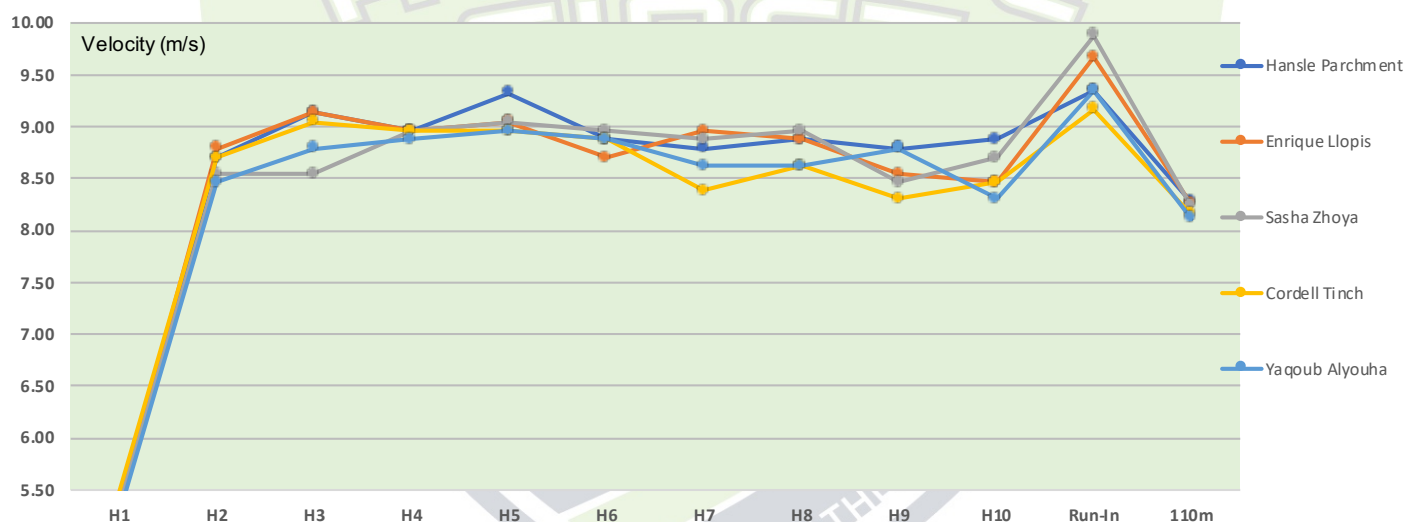
110m Hurdles

Date: 2023.08.20

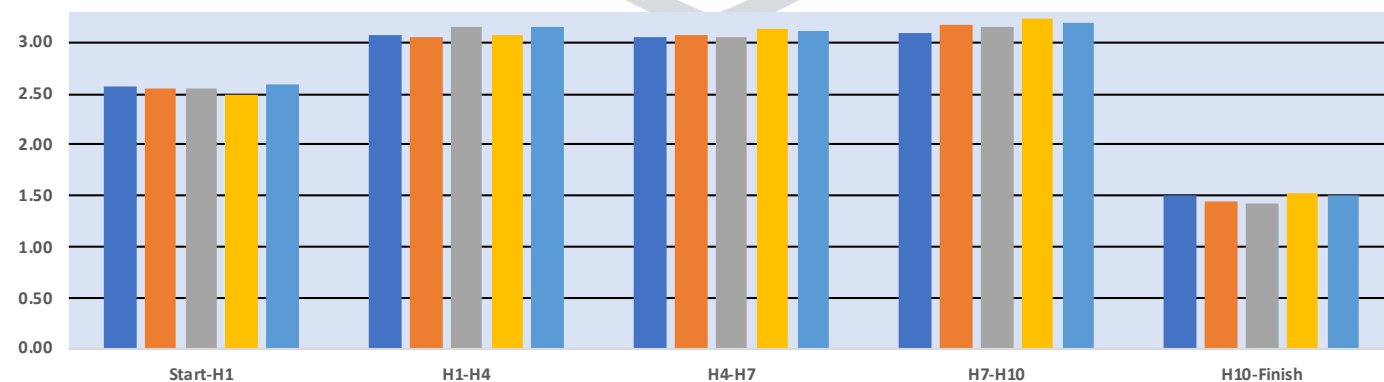
Wind: -0.3 m/s

Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Parchment, Hansle (JAM) (1990)	time	2.58	3.63	4.63	5.65	6.63	7.66	8.70	9.73	10.77	11.80		13.30	3 / 1			
	reaction time	0.195													3.07	3.05	3.10
	interval	7 steps	1.05	1.00	1.02	0.98	1.03	1.04	1.03	1.04	1.03	1.50			8.93	8.99	8.85
Llopis, Enrique (ESP) (2000)	time	2.56	3.60	4.60	5.62	6.63	7.68	8.70	9.73	10.80	11.88		13.33	2 / 2			
	reaction time	0.136													3.06	3.08	3.18
	interval	7 steps	1.04	1.00	1.02	1.01	1.05	1.02	1.03	1.07	1.08	1.45			8.96	8.90	8.62
Zhoya, Sasha (FRA) (2002)	time	2.56	3.63	4.70	5.72	6.73	7.75	8.78	9.80	10.88	11.93		13.35	7 / 3			
	reaction time	0.157													3.16	3.06	3.15
	interval	7 steps	1.07	1.07	1.02	1.01	1.02	1.03	1.02	1.08	1.05	1.42			8.68	8.96	8.70
Tinch, Cordell (USA) (2000)	time	2.50	3.55	4.56	5.58	6.60	7.63	8.72	9.78	10.88	11.96		13.49	9 / 4			
	reaction time	0.170													3.08	3.14	3.24
	interval	7 steps	1.05	1.01	1.02	1.02	1.03	1.09	1.06	1.10	1.08	1.53			8.90	8.73	8.46
Alyouha, Yaqoub (KUW) (1993)	time	2.60	3.68	4.72	5.75	6.77	7.80	8.86	9.92	10.96	12.06		13.56	1 / 5			
	reaction time	0.140													3.15	3.11	3.20
	interval	7 steps	1.08	1.04	1.03	1.02	1.03	1.06	1.06	1.04	1.10	1.50			8.70	8.82	8.57
	velocity	5.32	8.70	9.14	8.96	9.33	8.87	8.79	8.87	8.79	8.87	9.35	8.27				
		5.36	8.70	9.14	8.96	9.05	8.70	8.96	8.87	8.54	8.46	9.67	8.25				
		5.36	8.54	8.54	8.96	9.05	8.96	8.87	8.96	8.46	8.70	9.87	8.24				
		5.49	8.70	9.05	8.96	8.96	8.87	8.39	8.62	8.31	8.46	9.16	8.15				
		5.28	8.46	8.79	8.87	8.96	8.87	8.62	8.62	8.79	8.31	9.35	8.11				



Time Intervals (s)



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=W4r-yvIQ5wI&t=72s>

2023 French National Championships (Albi, FRA) (TV Analysis)

110m Hurdles

Date: 2023.07.29

Wind: 2.3 m/s

FINAL

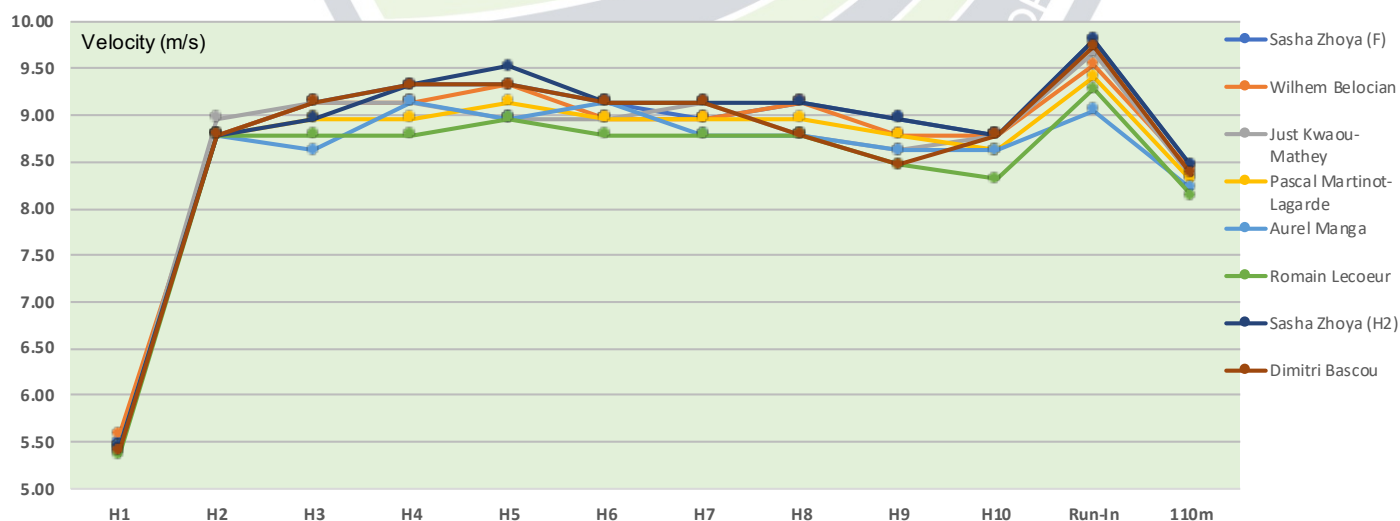
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time		2.50	3.54	4.54	5.52	6.50	7.50	8.52	9.52	10.54	11.58		13.01	6 / 1			
	reaction time	0.187														3.02	3.00	3.06
	interval velocity		7 steps	1.04	1.00	0.98	0.98	1.00	1.02	1.00	1.02	1.04	1.43			9.08	9.14	8.96
Belocian, Wilhem (FRA (1995)	time		2.46	3.50	4.50	5.50	6.48	7.50	8.52	9.52	10.56	11.60		13.07	5 / 2			
	reaction time	0.168														3.04	3.02	3.08
	interval velocity			1.04	1.00	1.00	0.98	1.02	1.02	1.00	1.04	1.04	1.47			9.02	9.08	8.90
Kwaou-Mathey, Just (FRA) (1999)	time		2.54	3.56	4.56	5.56	6.58	7.60	8.60	9.64	10.70	11.74		13.19	3 / 3			
	reaction time	0.206														3.02	3.04	3.14
	interval velocity		7 steps	1.02	1.00	1.00	1.02	1.02	1.00	1.04	1.06	1.04	1.45			9.08	9.02	8.73
Martinot-Lagarde, Pascal (FRA) (1991)	time		2.52	3.56	4.58	5.60	6.60	7.62	8.64	9.66	10.70	11.76		13.25	2 / 4			
	reaction time	0.180														3.08	3.04	3.12
	interval velocity		7 steps	1.04	1.02	1.02	1.00	1.02	1.02	1.02	1.04	1.06	1.49			8.90	9.02	8.79
Manga, Aurel (FRA) (1992)	time		2.52	3.56	4.62	5.62	6.64	7.64	8.68	9.72	10.78	11.84		13.39	7 / 5			
	reaction time	0.166														3.10	3.06	3.16
	interval velocity		7 steps	1.04	1.06	1.00	1.02	1.00	1.04	1.04	1.06	1.06	1.55			8.85	8.96	8.68
Lecoeur, Romain (FRA) (1997)	time		2.56	3.60	4.64	5.68	6.70	7.74	8.78	9.82	10.90	12.00		13.51	1 / 6			
	reaction time	0.203														3.12	3.10	3.22
	interval velocity		7 steps	1.04	1.04	1.04	1.02	1.04	1.04	1.04	1.08	1.10	1.51			8.79	8.85	8.52

Date: 2023.07.29

Wind: 5.3 m/s

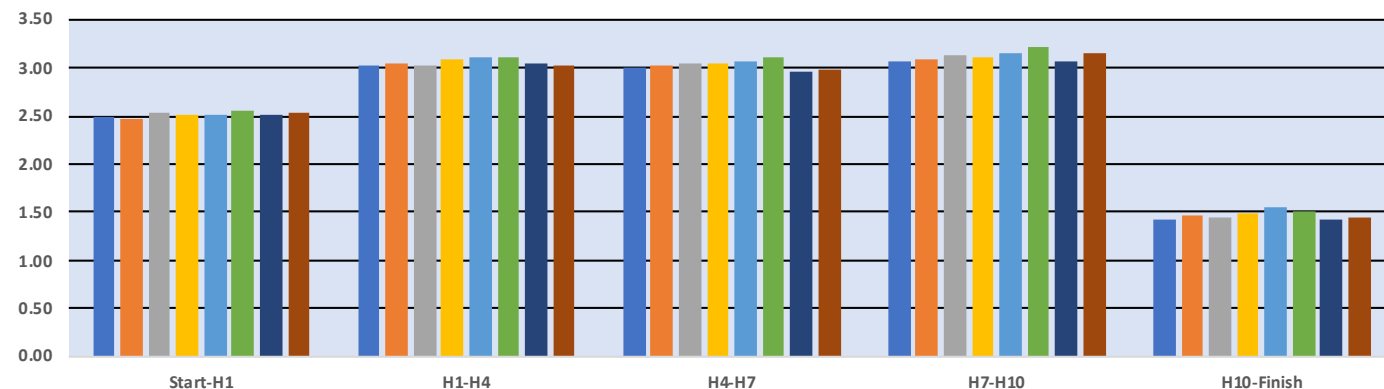
Heat 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time		2.52	3.56	4.58	5.56	6.52	7.52	8.52	9.52	10.54	11.58		13.01	6 / 1			
	reaction time	0.173														3.04	2.96	3.06
	interval		7 steps	1.04	1.02	0.98	0.96	1.00	1.00	1.00	1.02	1.04	1.43			9.02	9.26	8.96
Bascou, Dimitri (FRA) (1987)	time		2.54	3.58	4.58	5.56	6.54	7.54	8.54	9.58	10.66	11.70		13.14	3 / 2			
	reaction time	0.162														3.02	2.98	3.16
	interval		7 steps	1.04	1.00	0.98	0.98	1.00	1.00	1.04	1.08	1.04	1.44			9.08	9.20	8.68



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=naF7BuaQc6o>

2023 London Athletics Meet (London, GBR)

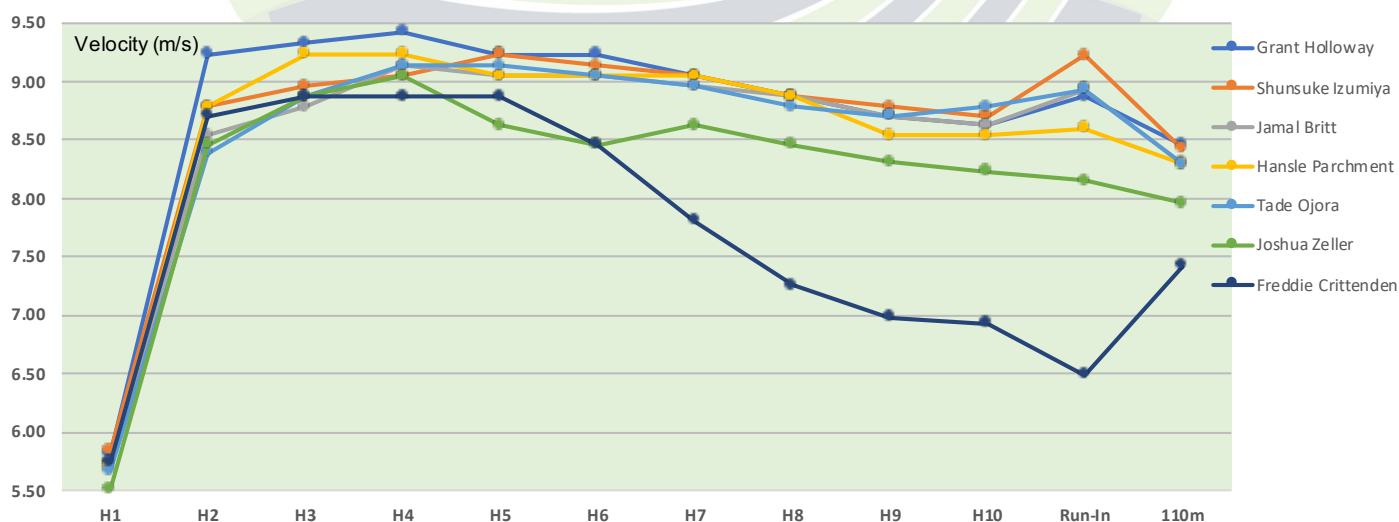
110m Hurdles

Date: 2023.07.23

Wind: 1.3 m/s

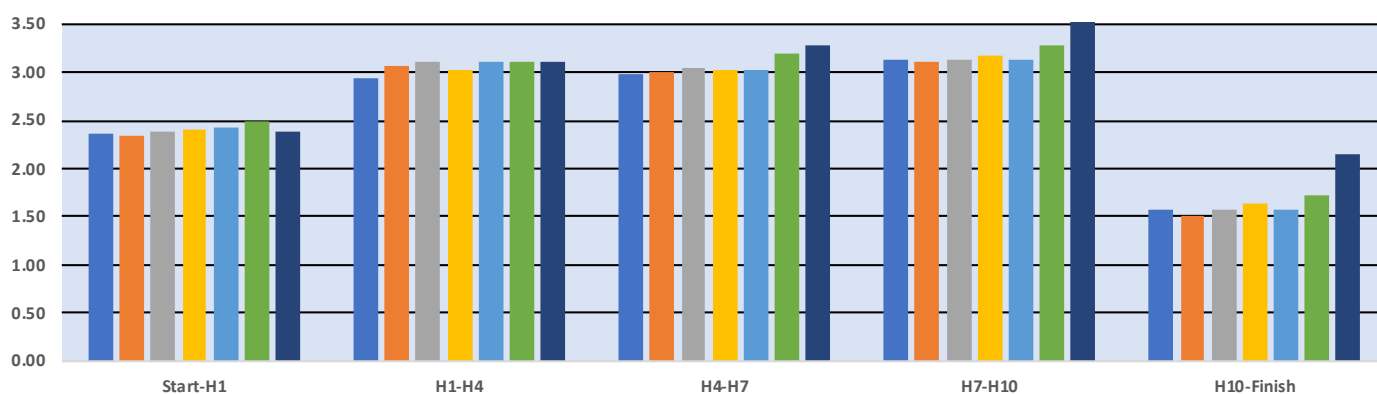
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.36	3.35	4.33	5.30	6.29	7.28	8.29	9.32	10.37	11.43		13.01	5 / 1			
	reaction time	0.165														2.94	2.99	3.14
	interval velocity		7 steps	0.99	0.98	0.97	0.99	0.99	1.01	1.03	1.05	1.06	1.58			9.33	9.17	8.73
Izumiya, Shunsuke (JPN) (2000)	time		2.35	3.39	4.41	5.42	6.41	7.41	8.42	9.45	10.49	11.54		13.06	3 / 2			
	reaction time	0.138														3.07	3.00	3.12
	interval velocity		5.84	8.79	8.96	9.05	9.23	9.14	9.05	8.87	8.79	8.70	9.22	8.42		8.93	9.14	8.79
Britt, Jamal (USA) (1998)	time		2.39	3.46	4.50	5.50	6.51	7.52	8.54	9.57	10.62	11.68		13.25	6 / 3			
	reaction time	0.145														3.11	3.04	3.14
	interval velocity		5.74	8.54	8.79	9.14	9.05	9.05	8.96	8.87	8.70	8.62	8.93	8.30		8.82	9.02	8.73
Parchment, Hansle (JAM) (1990)	time		2.41	3.45	4.44	5.43	6.44	7.45	8.46	9.49	10.56	11.63		13.26	4 / 4			
	reaction time	0.135														3.02	3.03	3.17
	interval velocity		5.69	8.79	9.23	9.23	9.05	9.05	9.05	8.87	8.54	8.54	8.60	8.30		9.08	9.05	8.65
Ojora, Tade (GBR) (1999)	time		2.42	3.51	4.54	5.54	6.54	7.55	8.57	9.61	10.66	11.70		13.27	8 / 5			
	reaction time	0.148														3.12	3.03	3.13
	interval velocity		5.67	8.39	8.87	9.14	9.14	9.05	8.96	8.79	8.70	8.79	8.93	8.29		8.79	9.05	8.76
Zeller, Joshua (GBR) (2000)	time		2.49	3.57	4.60	5.61	6.67	7.75	8.81	9.89	10.99	12.10		13.82	1 / 6			
	reaction time	0.144														3.12	3.20	3.29
	interval velocity		5.51	8.46	8.87	9.05	8.62	8.46	8.62	8.46	8.31	8.23	8.15	7.96		8.79	8.57	8.33
Crittenden, Freddie (USA) (1994)	time		2.39	3.44	4.47	5.50	6.53	7.61	8.78	10.04	11.35	12.67		14.83	2 / 7			
	reaction time	0.132														3.11	3.28	3.89
	interval velocity		5.74	8.70	8.87	8.87	8.87	8.46	7.81	7.25	6.98	6.92	6.49	7.42		8.82	8.36	7.05



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 23 Jul 2023 14:58) - diamond league race analysis

<https://www.omegatiming.com/File/0002030C01020C0101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=NX9GeRods4g>

2023 Kamila Skolimowska Memorial (Silesia, POL)

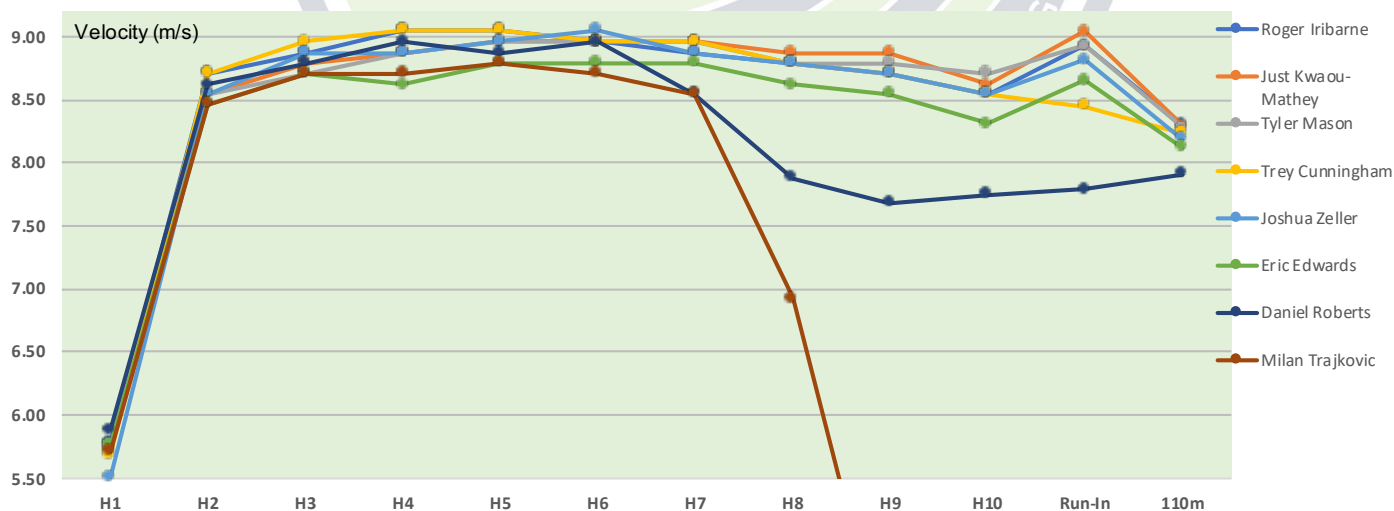
110m Hurdles

Date: 2023.07.16

Wind: 0.3 m/s

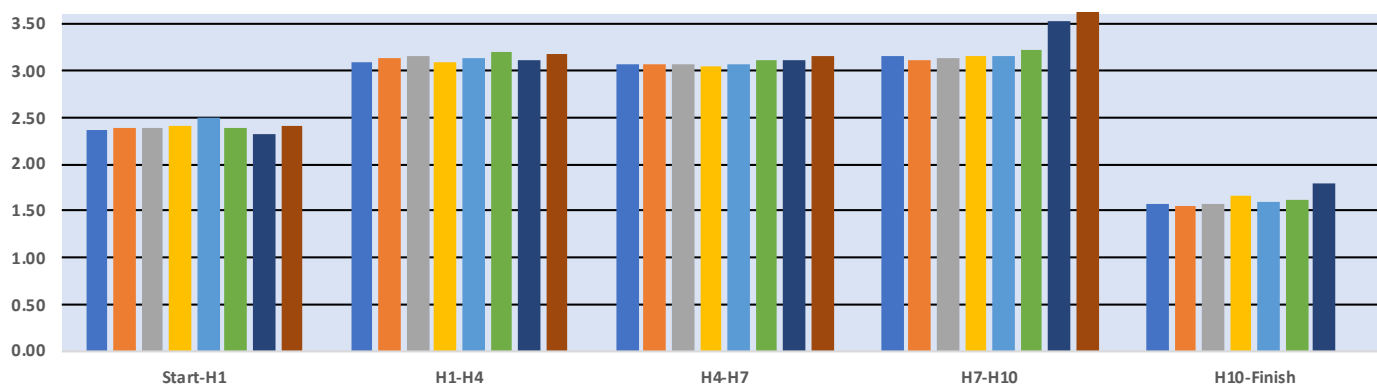
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Iribarne, Roger (CUB) (1996)	time	2.37	3.42	4.45	5.46	6.47	7.49	8.52	9.56	10.61	11.68		13.25	4 / 1			
	reaction time	0.147													3.09	3.06	3.16
	interval velocity	5.79	8.70	8.87	9.05	9.05	8.96	8.87	8.79	8.70	8.54	8.93	8.30		8.87	8.96	8.68
Kwaou-Mathey, Just (FRA) (1999)	time	2.39	3.46	4.50	5.53	6.55	7.57	8.59	9.62	10.65	11.71		13.26	7 / 2			
	reaction time	0.157													3.14	3.06	3.12
	interval velocity	5.74	8.54	8.79	8.87	8.96	8.96	8.96	8.87	8.87	8.62	9.05	8.30		8.73	8.96	8.79
Mason, Tyler (JAM) (1995)	time	2.38	3.45	4.50	5.53	6.55	7.57	8.59	9.63	10.67	11.72		13.29	5 / 3			
	reaction time	0.138													3.15	3.06	3.13
	interval velocity	5.76	8.54	8.70	8.87	8.96	8.96	8.96	8.79	8.79	8.70	8.93	8.28		8.70	8.96	8.76
Cunningham, Trey (USA) (1998)	time	2.41	3.46	4.48	5.49	6.50	7.52	8.54	9.58	10.63	11.70		13.36	3 / 4			
	reaction time	0.147													3.08	3.05	3.16
	interval velocity	5.69	8.70	8.96	9.05	9.05	8.96	8.96	8.79	8.70	8.54	8.45	8.23		8.90	8.99	8.68
Zeller, Joshua (GBR) (2000)	time	2.49	3.56	4.59	5.62	6.64	7.65	8.68	9.72	10.77	11.84		13.43	1 / 5			
	reaction time	0.158													3.13	3.06	3.16
	interval velocity	5.51	8.54	8.87	8.87	8.96	9.05	8.87	8.79	8.70	8.54	8.82	8.19		8.76	8.96	8.68
Edwards, Eric (USA) (2000)	time	2.38	3.46	4.51	5.57	6.61	7.65	8.69	9.75	10.82	11.92		13.54	9 / 6			
	reaction time	0.130													3.19	3.12	3.23
	interval velocity	5.76	8.46	8.70	8.62	8.79	8.79	8.79	8.62	8.54	8.31	8.65	8.12		8.60	8.79	8.49
Roberts, Daniel (USA) (1998)	time	2.33	3.39	4.43	5.45	6.48	7.50	8.57	9.73	10.92	12.10		13.90	6 / 7			
	reaction time	0.159													3.12	3.12	3.53
	interval velocity	5.89	8.62	8.79	8.96	8.87	8.96	8.54	7.88	7.68	7.75	7.79	7.91		8.79	8.79	7.77
Trajkovic, Milan (CYP) (1992)	time	2.40	3.48	4.53	5.58	6.62	7.67	8.74	10.06	12.38	20.77			8 / --			
	reaction time	0.159													3.18	3.16	12.03
	interval velocity	5.72	8.46	8.70	8.70	8.79	8.70	8.54	6.92	3.94	1.09				8.62	8.68	2.28



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 15:53) - diamond league race analysis

<https://www.omegatiming.com/File/0002030A0102040201FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 Kamila Skolimowska Memorial (Silesia, POL)

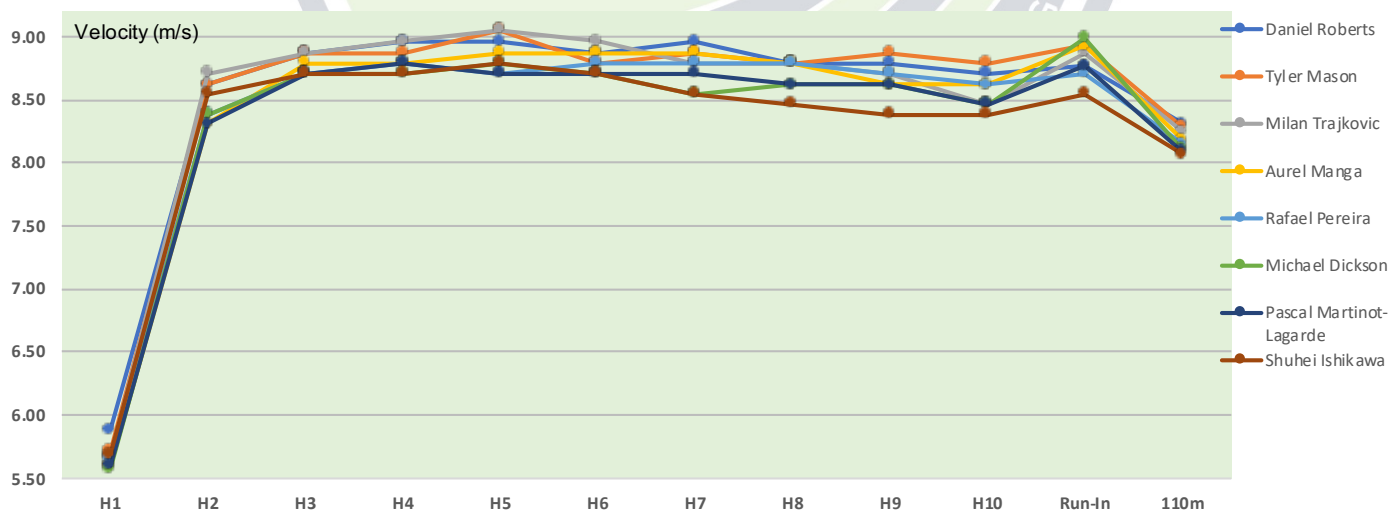
110m Hurdles

Date: 2023.07.16

Wind: -0.2 m/s

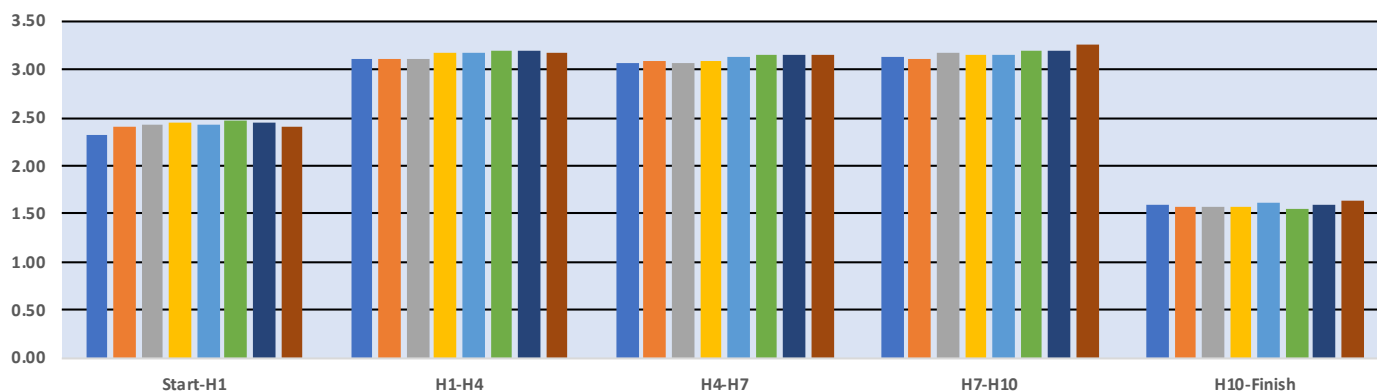
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time	2.33	3.39	4.42	5.44	6.46	7.49	8.51	9.55	10.59	11.64		13.24	5 / 1			
	reaction time	0.146													3.11	3.07	3.13
	interval		1.06	1.03	1.02	1.02	1.03	1.02	1.04	1.04	1.05	1.60			8.82	8.93	8.76
Mason, Tyler (JAM) (1995)	time	2.40	3.46	4.49	5.52	6.53	7.57	8.60	9.64	10.67	11.71		13.28	4 / 2			
	reaction time	0.152													3.12	3.08	3.11
	interval	7 steps	1.06	1.03	1.03	1.01	1.04	1.03	1.04	1.03	1.04	1.57			8.79	8.90	8.82
Trajkovic, Milan (CYP) (1992)	time	2.42	3.47	4.50	5.52	6.53	7.55	8.59	9.63	10.68	11.76		13.34	9 / 3			
	reaction time	0.160													3.10	3.07	3.17
	interval	7 steps	1.05	1.03	1.02	1.01	1.02	1.04	1.04	1.05	1.08	1.58			8.85	8.93	8.65
Manga, Aurel (FRA) (1992)	time	2.45	3.55	4.59	5.63	6.66	7.69	8.72	9.76	10.82	11.88		13.45	1 / 4			
	reaction time	0.156													3.18	3.09	3.16
	interval	7 steps	1.10	1.04	1.04	1.03	1.03	1.03	1.04	1.06	1.06	1.57			8.62	8.87	8.68
Pereira, Rafael (BRA) (1997)	time	2.43	3.52	4.57	5.61	6.66	7.70	8.74	9.78	10.83	11.89		13.50	7 / 5			
	reaction time	0.136													3.18	3.13	3.15
	interval		1.09	1.05	1.04	1.05	1.04	1.04	1.04	1.05	1.06	1.61			8.62	8.76	8.70
Dickson, Michael (USA) (1997)	time	2.46	3.55	4.60	5.65	6.69	7.74	8.81	9.87	10.93	12.01		13.57	8 / 6			
	reaction time	0.183													3.19	3.16	3.20
	interval	7 steps	1.09	1.05	1.05	1.04	1.05	1.07	1.06	1.06	1.08	1.56			8.60	8.68	8.57
Martino-Lagarde, Pascal (FRA) (1991)	time	2.45	3.55	4.60	5.64	6.69	7.74	8.79	9.85	10.91	11.99		13.59	3 / 7			
	reaction time	0.153													3.19	3.15	3.20
	interval	7 steps	1.10	1.05	1.04	1.05	1.05	1.05	1.06	1.06	1.08	1.60			8.60	8.70	8.57
Ishikawa, Shuhei (JPN) (1995)	time	2.41	3.48	4.53	5.58	6.62	7.67	8.74	9.82	10.91	12.00		13.64	2 / 8			
	reaction time	0.133													3.17	3.16	3.26
	interval	7 steps	1.07	1.05	1.05	1.04	1.05	1.07	1.08	1.09	1.09	1.64			8.65	8.68	8.41
	velocity		5.69	8.54	8.70	8.70	8.79	8.70	8.54	8.46	8.39	8.39	8.55				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 14:43) - diamond league race analysis

<https://www.omegatiming.com/File/0002030A0102040102FFFFFFFF4D.pdf>

Video: No Video Found

2023 Kamila Skolimowska Memorial (Silesia, POL)

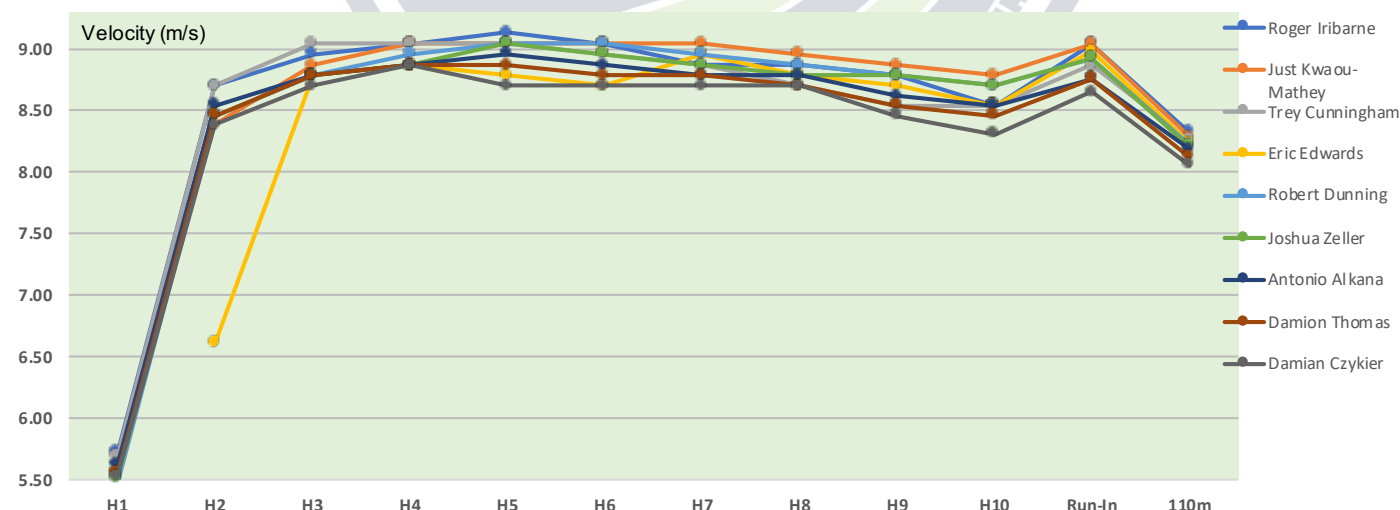
110m Hurdles

Date: 2023.07.16

Wind: 0.3 m/s

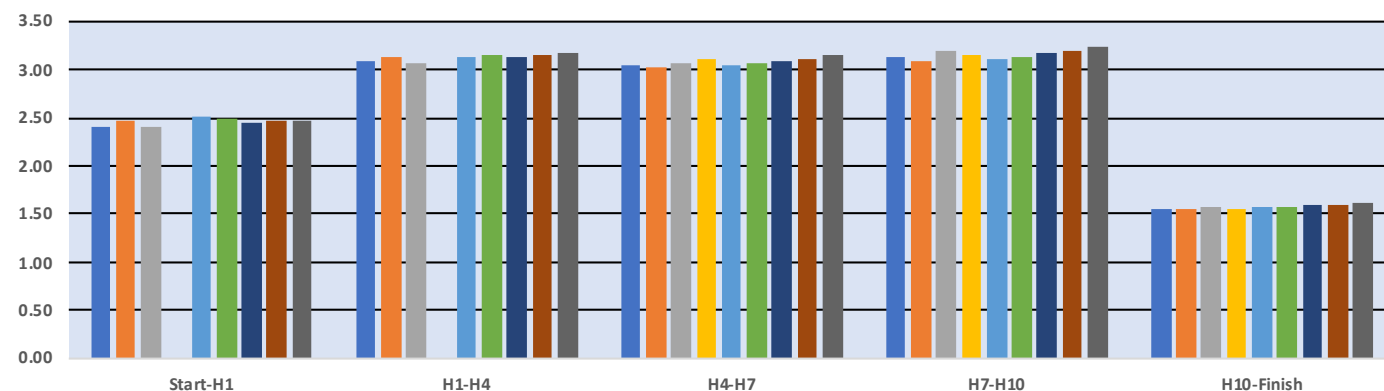
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Iribarne, Roger (CUB) (1996)	time	2.40	3.45	4.47	5.48	6.48	7.49	8.52	9.55	10.59	11.66		13.21	2 / 1	3.08	3.04	3.14
	reaction time	0.157															
	interval	7 steps	1.05	1.02	1.01	1.00	1.01	1.03	1.03	1.04	1.07	1.55	PB				
Kwaou-Mathey, Just (FRA) (1999)	time	2.47	3.56	4.59	5.60	6.61	7.62	8.63	9.65	10.68	11.72		13.27	6 / 2	3.13	3.03	3.09
	reaction time	0.169															
	interval	7 steps	1.09	1.03	1.01	1.01	1.01	1.01	1.02	1.03	1.04	1.55					
Cunningham, Trey (USA) (1998)	time	2.41	3.46	4.47	5.48	6.49	7.51	8.54	9.59	10.66	11.73		13.31	5 / 3	3.07	3.06	3.19
	reaction time	0.153															
	interval	7 steps	1.05	1.01	1.01	1.01	1.02	1.03	1.05	1.07	1.07	1.58					
Edwards, Eric (USA) (2000)	time		3.46	4.50	5.53	6.57	7.62	8.64	9.68	10.73	11.80		13.36	3 / 4		3.11	3.16
	reaction time	0.137															
	interval		1.04	1.03	1.04	1.05	1.02	1.04	1.05	1.07	1.56						
Dunning, Robert (USA) (1997)	time	2.51	3.59	4.63	5.65	6.66	7.67	8.69	9.72	10.76	11.81		13.38	4 / 5	3.14	3.04	3.12
	reaction time	0.140															
	interval	7 steps	1.08	1.04	1.02	1.01	1.01	1.02	1.03	1.04	1.05	1.57					
Zeller, Joshua (GBR) (2000)	time	2.49	3.57	4.61	5.64	6.65	7.67	8.70	9.74	10.78	11.83		13.40	8 / 6	3.15	3.06	3.13
	reaction time	0.156															
	interval		1.08	1.04	1.03	1.01	1.02	1.03	1.04	1.04	1.05	1.57					
Alkana, Antonio (RSA) (1990)	time	2.44	3.51	4.55	5.58	6.60	7.63	8.67	9.71	10.77	11.84		13.44	1 / 7	3.14	3.09	3.17
	reaction time	0.132															
	interval		1.07	1.04	1.03	1.02	1.03	1.04	1.04	1.06	1.07	1.60					
Thomas, Damion (JAM) (1999)	time	2.47	3.55	4.59	5.62	6.65	7.69	8.73	9.78	10.85	11.93		13.53	9 / 8	3.15	3.11	3.20
	reaction time	0.147															
	interval	7 steps	1.08	1.04	1.03	1.03	1.04	1.04	1.05	1.07	1.08	1.60					
Czykier, Damian (POL) (1992)	time	2.48	3.57	4.62	5.65	6.70	7.75	8.80	9.85	10.93	12.03		13.65	7 / 9	3.17	3.15	3.23
	reaction time	0.154															
	interval		1.09	1.05	1.03	1.05	1.05	1.05	1.05	1.08	1.10	1.62					
	velocity	5.53	8.39	8.70	8.87	8.70	8.70	8.70	8.70	8.46	8.31	8.65	8.06		8.65	8.70	8.49



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 16 Jul 2023 14:42) - diamond league race analysis

<https://www.omegatiming.com/File/0002030A0102040101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 USATF National Championships (Eugene, OR) (TV Analysis)

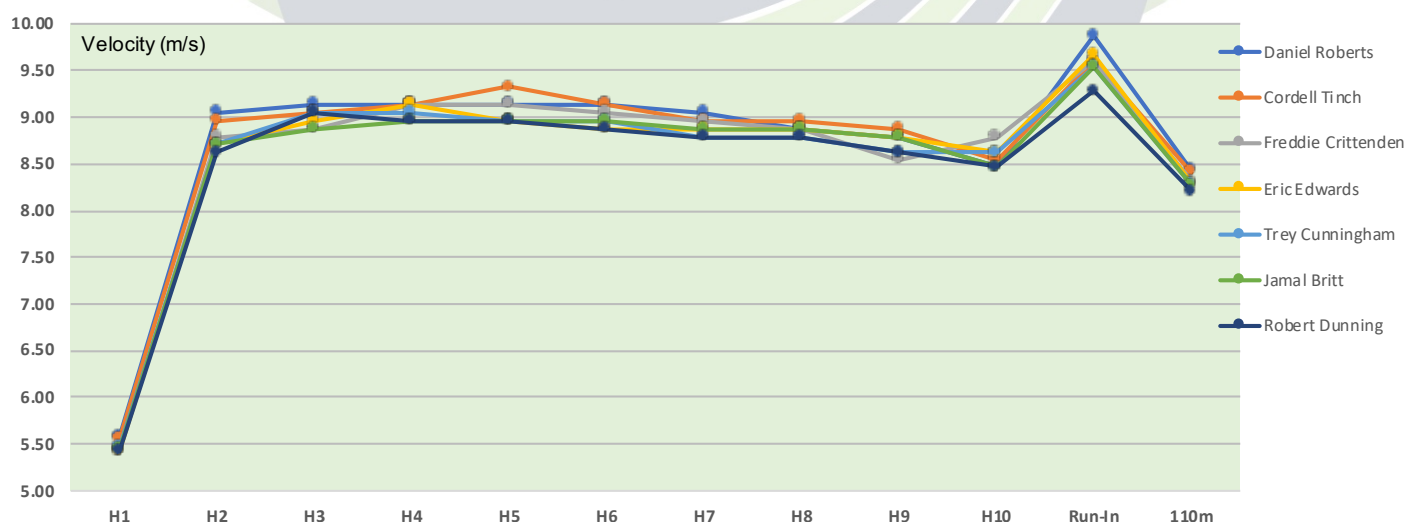
110m Hurdles

Date: 2023.07.09

Wind: -0.2 m/s

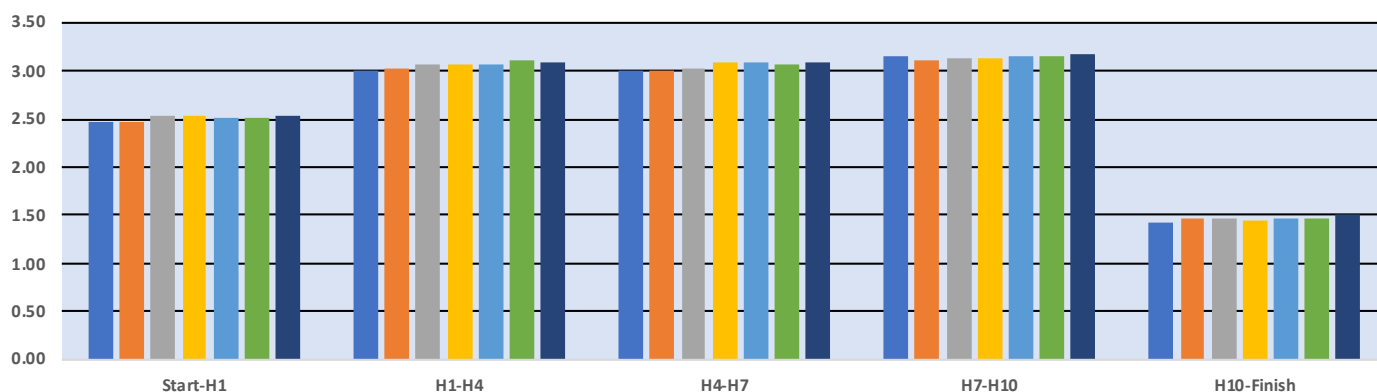
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time	2.46	3.47	4.47	5.47	6.47	7.47	8.48	9.51	10.55	11.63		13.05	6 / 1			
	reaction time														3.01	3.01	3.15
	interval		1.01	1.00	1.00	1.00	1.00	1.01	1.03	1.04	1.08	1.42			9.11	9.11	8.70
Tinch, Cordell (USA) (2000)	time	2.47	3.49	4.50	5.50	6.48	7.48	8.50	9.52	10.55	11.62		13.08	3 / 2			
	reaction time														3.03	3.00	3.12
	interval	7 steps	1.02	1.01	1.00	0.98	1.00	1.02	1.02	1.03	1.07	1.46			9.05	9.14	8.79
Crittenden, Freddie (USA) (1994)	time	2.53	3.57	4.60	5.60	6.60	7.61	8.63	9.66	10.73	11.77		13.23	7 / 3			
	reaction time														3.07	3.03	3.14
	interval		1.04	1.03	1.00	1.00	1.01	1.02	1.03	1.07	1.04	1.46			8.93	9.05	8.73
Edwards, Eric (USA) (2000)	time	2.53	3.58	4.60	5.60	6.62	7.65	8.68	9.71	10.75	11.81		13.26	1 / 4			
	reaction time														3.07	3.08	3.13
	interval		1.05	1.02	1.00	1.02	1.03	1.03	1.04	1.06	1.06	1.45			8.93	8.90	8.76
Cunningham, Trey (USA) (1998)	time	2.51	3.56	4.57	5.58	6.60	7.62	8.66	9.70	10.76	11.82		13.29	4 / 5			
	reaction time														3.07	3.08	3.16
	interval	7 steps	1.05	1.01	1.01	1.02	1.02	1.04	1.04	1.06	1.06	1.47			8.93	8.90	8.68
Britt, Jamal (USA) (1998)	time	2.52	3.57	4.60	5.62	6.64	7.66	8.69	9.72	10.76	11.84		13.31	8 / 6			
	reaction time														3.10	3.07	3.15
	interval	7 steps	1.05	1.03	1.02	1.02	1.02	1.03	1.03	1.04	1.08	1.47			8.85	8.93	8.70
Dunning, Robert (USA) (1997)	time	2.53	3.59	4.60	5.62	6.64	7.67	8.71	9.75	10.81	11.89		13.40	2 / 7			
	reaction time														3.09	3.09	3.18
	interval	7 steps	1.06	1.01	1.02	1.02	1.03	1.04	1.04	1.06	1.08	1.51			8.87	8.87	8.62
	velocity																
		5.58	9.05	9.14	9.14	9.14	9.14	9.05	8.87	8.79	8.46	9.87	8.43				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=NUzI-Bexx7b4>

2023 Jamaican National Championships (Kingston, JAM) (TV Analysis)

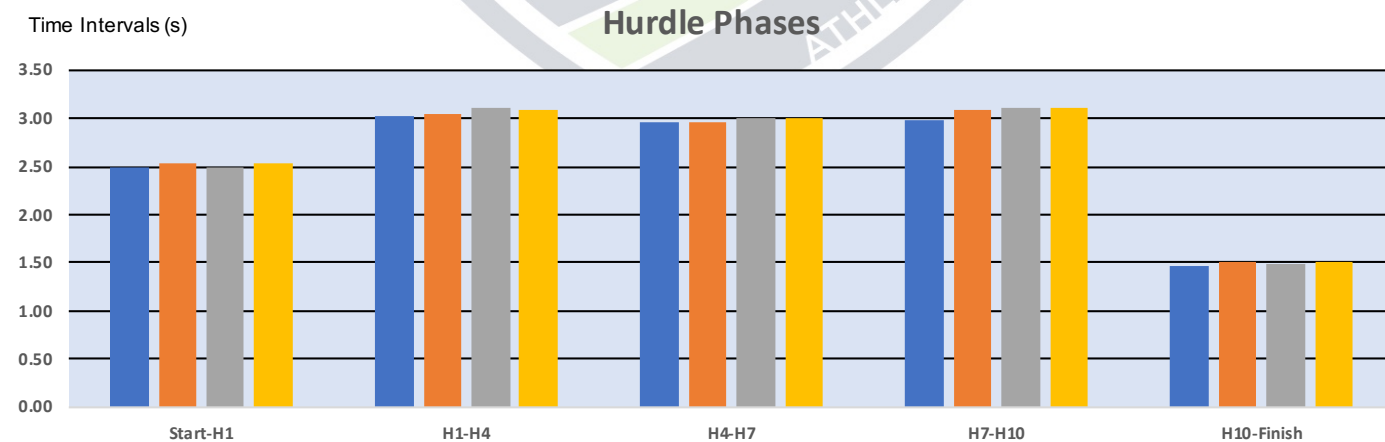
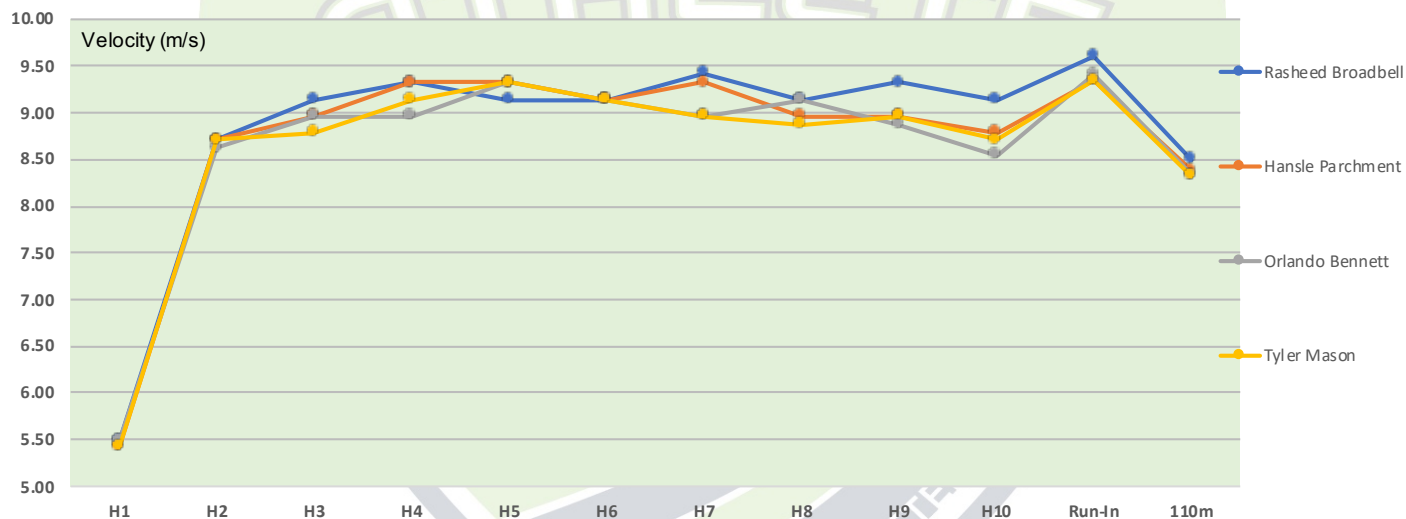
110m Hurdles

Date: 2023.07.09

Wind: 0.7 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Broadbell, Rasheed (JAM) (2000)	time	2.50	3.55	4.55	5.53	6.53	7.53	8.50	9.50	10.48	11.48		12.94	3 / 1			
	reaction time														3.03	2.97	2.98
	interval	7 steps	1.05	1.00	0.98	1.00	1.00	0.97	1.00	0.98	1.00	1.46	PB		9.05	9.23	9.20
Parchment, Hansle (JAM) (1990)	time	2.53	3.58	4.60	5.58	6.56	7.56	8.54	9.56	10.58	11.62		13.12	4 / 2			
	reaction time														3.05	2.96	3.08
	interval	7 steps	1.05	1.02	0.98	0.98	1.00	0.98	1.02	1.02	1.04	1.50			8.99	9.26	8.90
Bennett, Orlando (JAM) (1999)	time	2.50	3.56	4.58	5.60	6.58	7.58	8.60	9.60	10.63	11.70		13.19	6 / 3			
	reaction time														3.10	3.00	3.10
	interval		1.06	1.02	1.02	0.98	1.00	1.02	1.00	1.03	1.07	1.49			8.85	9.14	8.85
Mason, Tyler (JAM) (1995)	time	2.53	3.58	4.62	5.62	6.60	7.60	8.62	9.65	10.67	11.72		13.22	5 / 4			
	reaction time														3.09	3.00	3.10
	interval	7 steps	1.05	1.04	1.00	0.98	1.00	1.02	1.03	1.02	1.05	1.50			8.87	9.14	8.85
	velocity	5.49	8.70	9.14	9.33	9.14	9.14	9.42	9.14	9.33	9.14	9.60	8.50				



2023 Athletissima (Lausanne, SUI)

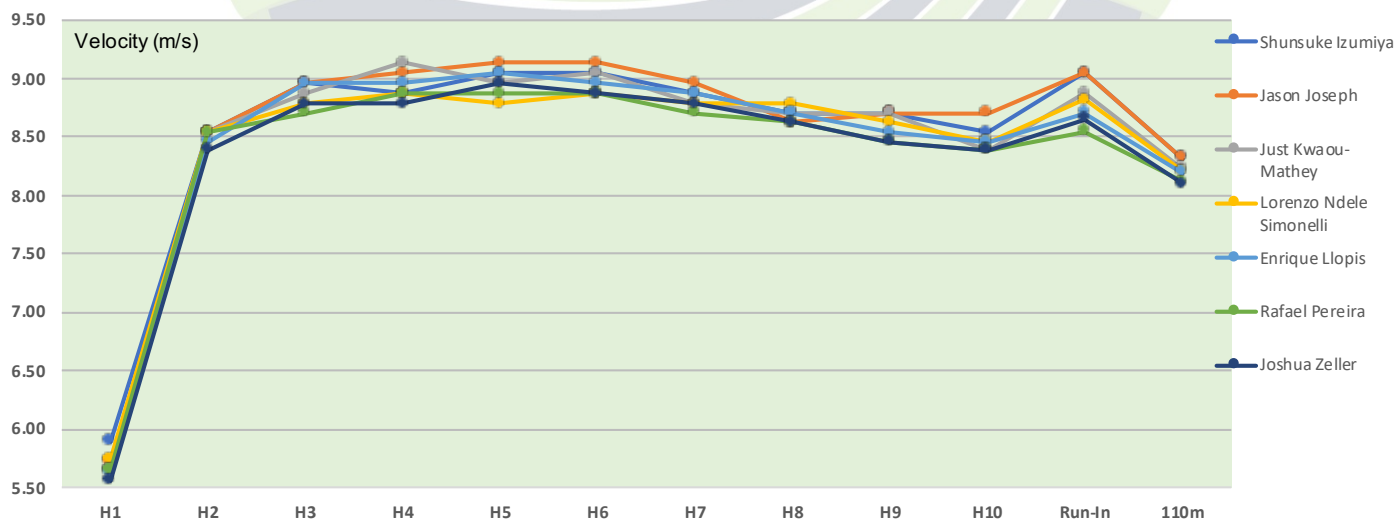
110m Hurdles

Date: 2023.06.30

Wind: -1.0 m/s

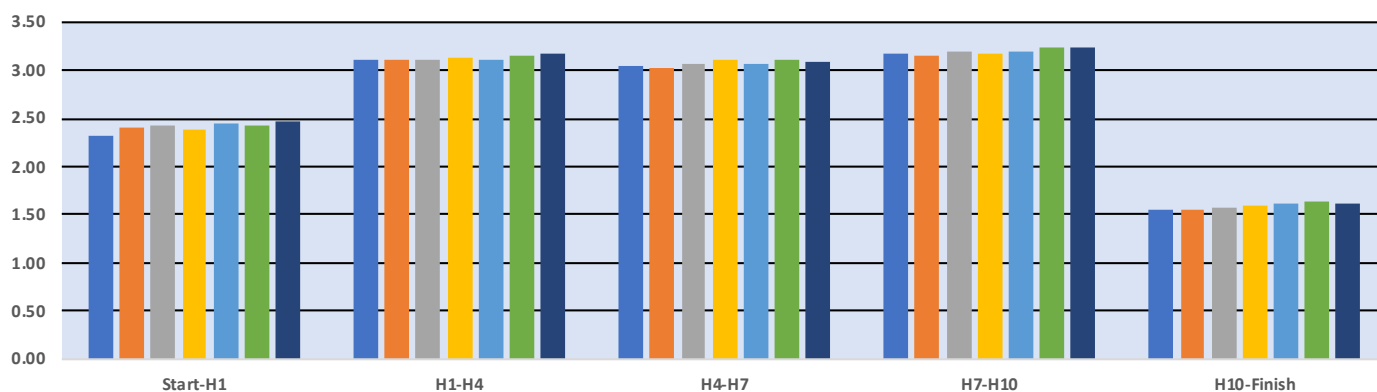
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Izumiya, Shunsuke (JPN) (2000)	time		2.33	3.40	4.42	5.45	6.46	7.47	8.50	9.55	10.60	11.67		13.22	4 / 1			
	reaction time	0.101											1.55			3.12	3.05	3.17
	interval velocity		7 steps	1.07	1.02	1.03	1.01	1.01	1.03	1.05	1.05	1.07	1.55			8.79	8.99	8.65
Joseph, Jason (SUI) (1998)	time		2.40	3.47	4.49	5.50	6.50	7.50	8.52	9.58	10.63	11.68		13.23	5 / 2			
	reaction time	0.153											1.55			3.10	3.02	3.16
	interval velocity		7 steps	1.07	1.02	1.01	1.00	1.00	1.02	1.06	1.05	1.05	1.55			8.85	9.08	8.68
Kwaou-Mathey, Just (FRA) (1999)	time		2.43	3.50	4.53	5.53	6.55	7.56	8.60	9.65	10.70	11.79		13.37	3 / 3			
	reaction time	0.134											1.58			3.10	3.07	3.19
	interval velocity		7 steps	1.07	1.03	1.00	1.02	1.01	1.04	1.05	1.05	1.09	1.58			8.85	8.93	8.60
Simonelli, Lorenzo Ndele (ITA) (2002)	time		2.39	3.46	4.50	5.53	6.57	7.60	8.64	9.68	10.74	11.82		13.41	1 / 4			
	reaction time	0.136											1.59			3.14	3.11	3.18
	interval velocity		7 steps	1.07	1.04	1.03	1.04	1.03	1.04	1.04	1.06	1.08	1.59			8.73	8.82	8.62
Llopis, Enrique (ESP) (2000)	time		2.44	3.52	4.54	5.56	6.57	7.59	8.62	9.67	10.74	11.82		13.43	7 / 5			
	reaction time	0.135											1.61			3.12	3.06	3.20
	interval velocity		7 steps	1.08	1.02	1.02	1.01	1.02	1.03	1.05	1.07	1.08	1.61			8.79	8.96	8.57
Pereira, Rafael (BRA) (1997)	time		2.43	3.50	4.55	5.58	6.61	7.64	8.69	9.75	10.83	11.92		13.56	2 / 6			
	reaction time	0.153											1.64			3.15	3.11	3.23
	interval velocity		7 steps	1.07	1.05	1.03	1.03	1.03	1.05	1.06	1.08	1.09	1.64			8.70	8.82	8.49
Zeller, Joshua (GBR) (2000)	time		2.47	3.56	4.60	5.64	6.66	7.69	8.73	9.79	10.87	11.96		13.58	8 / 7			
	reaction time	0.153											1.62			3.17	3.09	3.23
	interval velocity		7 steps	1.09	1.04	1.04	1.02	1.03	1.04	1.06	1.08	1.09	1.62			8.65	8.87	8.49



Time Intervals (s)

Hurdle Phases



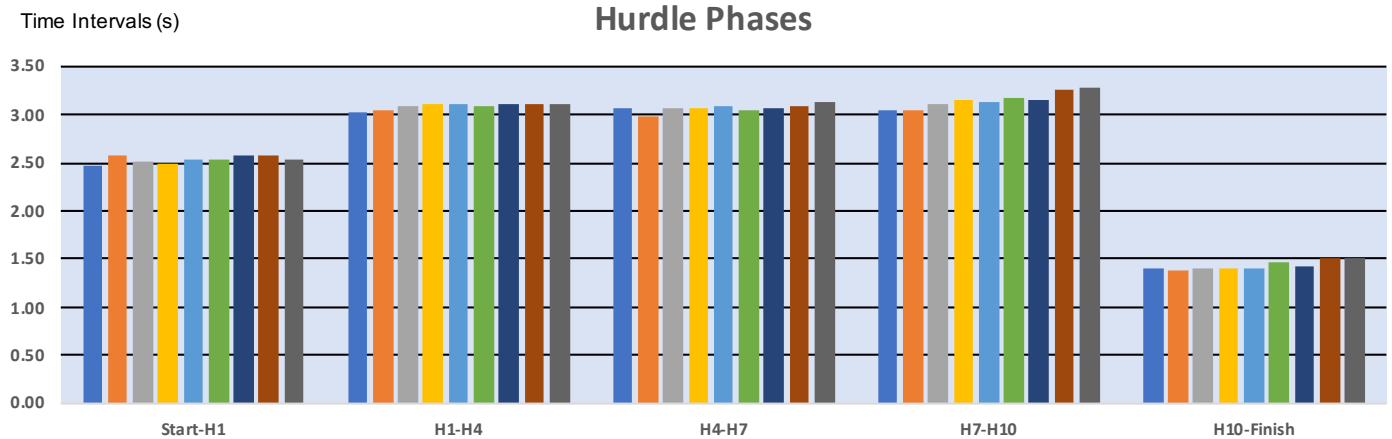
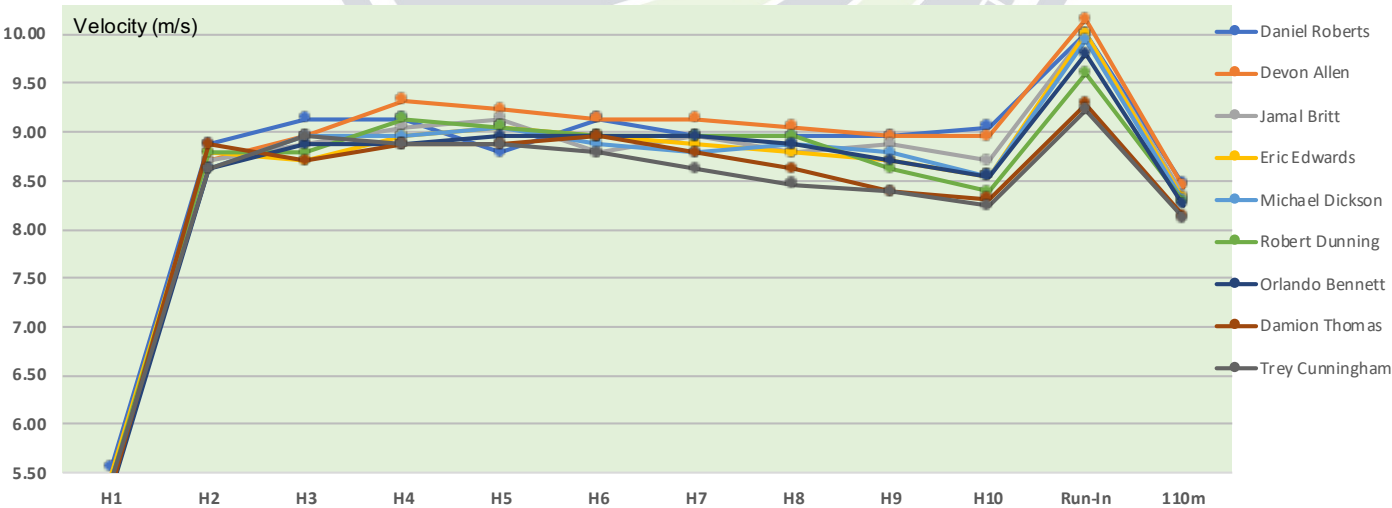
Source: Omega Timing (Fri 30 Jun 2023 20:23) - diamond league race analysis

<https://www.omegatiming.com/File/000203080102070101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=E-FSK01c-4Q>

Biomechanical Analysis

2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)

110m Hurdles			Date: 2023.06.24		Wind: 1.6 m/s												FINAL			
					H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time				2.47	3.50	4.50	5.50	6.54	7.54	8.56	9.58	10.60	11.61		13.01	3 / 1			
	reaction time	0.159																3.03	3.06	3.05
	interval				1.03	1.00	1.00	1.04	1.00	1.02	1.02	1.02	1.01	1.40				9.05	8.96	8.99
Allen, Devon (USA) (1994)	time				2.57	3.62	4.64	5.62	6.61	7.61	8.61	9.62	10.64	11.66		13.04	5 / 2			
	reaction time	0.173																3.05	2.99	3.05
	interval				7 steps	1.05	1.02	0.98	0.99	1.00	1.00	1.01	1.02	1.02	1.38			8.99	9.17	8.99
Britt, Jamal (USA) (1998)	time				2.52	3.57	4.60	5.61	6.61	7.65	8.67	9.71	10.74	11.79		13.19	7 / 3			
	reaction time	0.169																3.09	3.06	3.12
	interval				7 steps	1.05	1.03	1.01	1.00	1.04	1.02	1.04	1.03	1.05	1.40			8.87	8.96	8.79
Edwards, Eric (USA) (2000)	time				2.50	3.54	4.59	5.61	6.62	7.64	8.67	9.71	10.76	11.83		13.23	8 / 4			
	reaction time	0.127																3.11	3.06	3.16
	interval					1.04	1.05	1.02	1.01	1.02	1.03	1.04	1.05	1.07	1.40			8.82	8.96	8.68
Dickson, Michael (USA) (1997)	time				2.53	3.59	4.61	5.63	6.64	7.67	8.71	9.74	10.78	11.85		13.26	1 / 5			
	reaction time	0.212																3.10	3.08	3.14
	interval				7 steps	1.06	1.02	1.02	1.01	1.03	1.04	1.03	1.04	1.07	1.41			8.85	8.90	8.73
Dunning, Robert (USA) (1997)	time				2.53	3.57	4.61	5.61	6.62	7.64	8.66	9.68	10.74	11.83		13.29	6 / 6			
	reaction time	0.181																3.08	3.05	3.17
	interval				7 steps	1.04	1.04	1.00	1.01	1.02	1.02	1.02	1.06	1.09	1.46			8.90	8.99	8.65
Bennett, Orlando (JAM) (1999)	time				2.58	3.64	4.67	5.70	6.72	7.74	8.76	9.79	10.84	11.91		13.34	2 / 7			
	reaction time	0.150																3.12	3.06	3.15
	interval					1.06	1.03	1.03	1.02	1.02	1.02	1.03	1.05	1.07	1.43			8.79	8.96	8.70
Thomas, Damion (JAM) (1999)	time				2.57	3.60	4.65	5.68	6.71	7.73	8.77	9.83	10.92	12.02		13.53	9 / 8			
	reaction time	0.163																3.11	3.09	3.25
	interval				7 steps	1.03	1.05	1.03	1.03	1.02	1.04	1.06	1.09	1.10	1.51			8.82	8.87	8.44
Cunningham, Trey (USA) (1998)	time				2.53	3.59	4.61	5.64	6.67	7.71	8.77	9.85	10.94	12.05		13.57	4 / 9			
	reaction time	0.157																3.11	3.13	3.28
	interval				7 steps	1.06	1.02	1.03	1.03	1.04	1.06	1.08	1.09	1.11	1.52			8.82	8.76	8.36



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=eQerofUJi0c>

2023 NCAA Championships (Austin, TX) (TV Analysis)

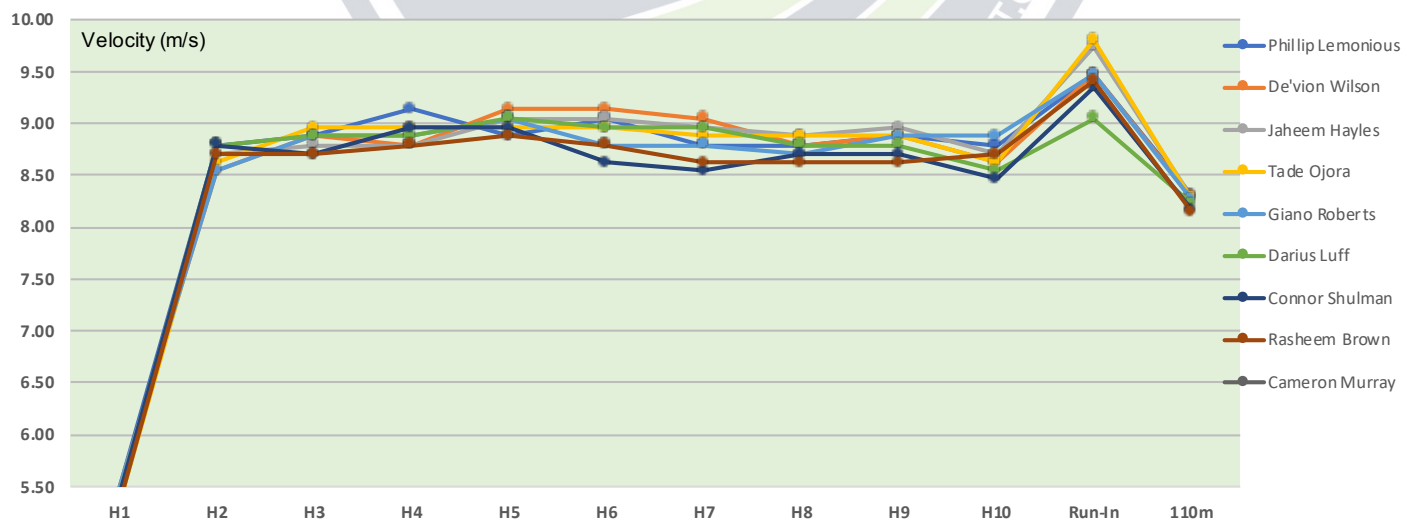
110m Hurdles

Date: 2023.06.09

Wind: 1.8 m/s

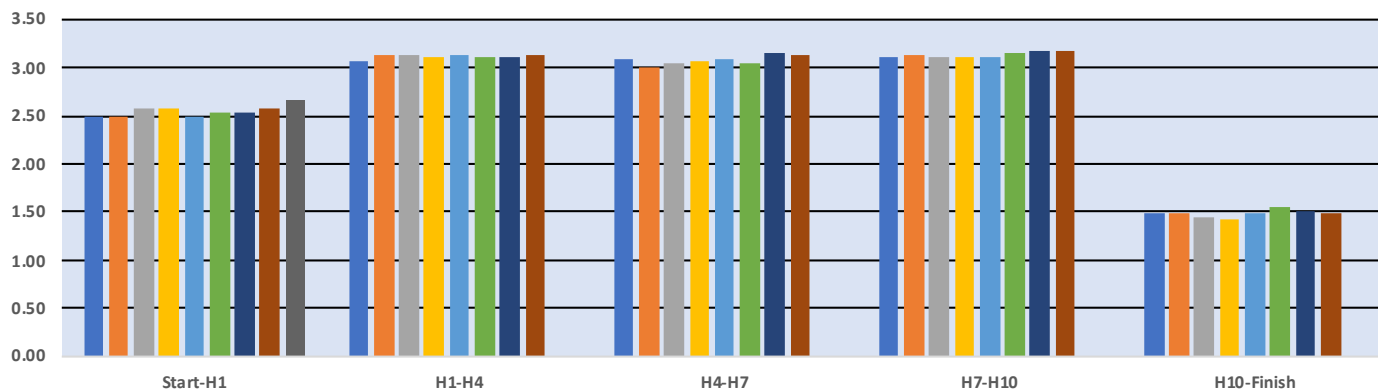
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Lemonious, Phillip (JAM) (1998)	time	2.50	3.54	4.57	5.57	6.60	7.61	8.65	9.69	10.72	11.76		13.24	5 / 1			
	reaction time														3.07	3.08	3.11
	interval	7 steps	1.04	1.03	1.00	1.03	1.01	1.04	1.04	1.03	1.04	1.48			8.93	8.90	8.82
Wilson, De'vion (USA) (2000)	time	2.50	3.57	4.60	5.64	6.64	7.64	8.65	9.69	10.72	11.78		13.26	2 / 2			
	reaction time														3.14	3.01	3.13
	interval	7 steps	1.07	1.03	1.04	1.00	1.00	1.01	1.04	1.03	1.06	1.48	PB		8.73	9.11	8.76
Hayles, Jaheem (JAM) (2001)	time	2.57	3.62	4.66	5.70	6.71	7.72	8.74	9.77	10.79	11.84		13.28	9 / 3			
	reaction time														3.13	3.04	3.10
	interval	5.34	8.70	8.79	8.79	9.05	9.05	8.96	8.87	8.96	8.70	9.74	PB		8.76	9.02	8.85
Ojora, Tade (GBR) (1999)	time	2.57	3.63	4.65	5.67	6.69	7.71	8.74	9.77	10.80	11.86		13.29	3 / 4			
	reaction time														3.10	3.07	3.12
	interval	7 steps	1.06	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.06	1.43	PB		8.85	8.93	8.79
Roberts, Giano (JAM) (2000)	time	2.50	3.57	4.60	5.63	6.64	7.68	8.72	9.77	10.80	11.83		13.31	7 / 5			
	reaction time														3.13	3.09	3.11
	interval	5.49	8.54	8.87	8.87	9.05	8.79	8.79	8.70	8.87	8.87	9.47	PB		8.76	8.87	8.82
Luff, Darius (USA) (2001)	time	2.53	3.57	4.60	5.63	6.64	7.66	8.68	9.72	10.76	11.83		13.38	8 / 6			
	reaction time														3.10	3.05	3.15
	interval	5.42	8.79	8.87	8.87	9.01	9.05	8.96	8.79	8.79	8.54	9.05	8.22		8.85	8.99	8.70
Shulman, Connor (USA) (2001)	time	2.53	3.57	4.62	5.64	6.66	7.72	8.79	9.84	10.89	11.97		13.47	6 / 7			
	reaction time														3.11	3.15	3.18
	interval	7 steps	1.04	1.05	1.02	1.02	1.06	1.07	1.05	1.05	1.08	1.50			8.82	8.70	8.62
Brown, Rasheem (CAY) (2000)	time	2.57	3.62	4.67	5.71	6.74	7.78	8.84	9.90	10.96	12.01		13.50	1 / 8			
	reaction time														3.14	3.13	3.17
	interval	5.34	8.70	8.70	8.79	8.87	8.79	8.62	8.62	8.62	8.70	9.41	PB		8.73	8.76	8.65
Murray, Cameron (USA) (1999)	time	2.67											dnf	4 / --			
	reaction time																
	interval	7 steps															
	velocity	5.14															



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=J5li-ZfGDFE>

2023 Meeting de Paris (Paris, FRA)

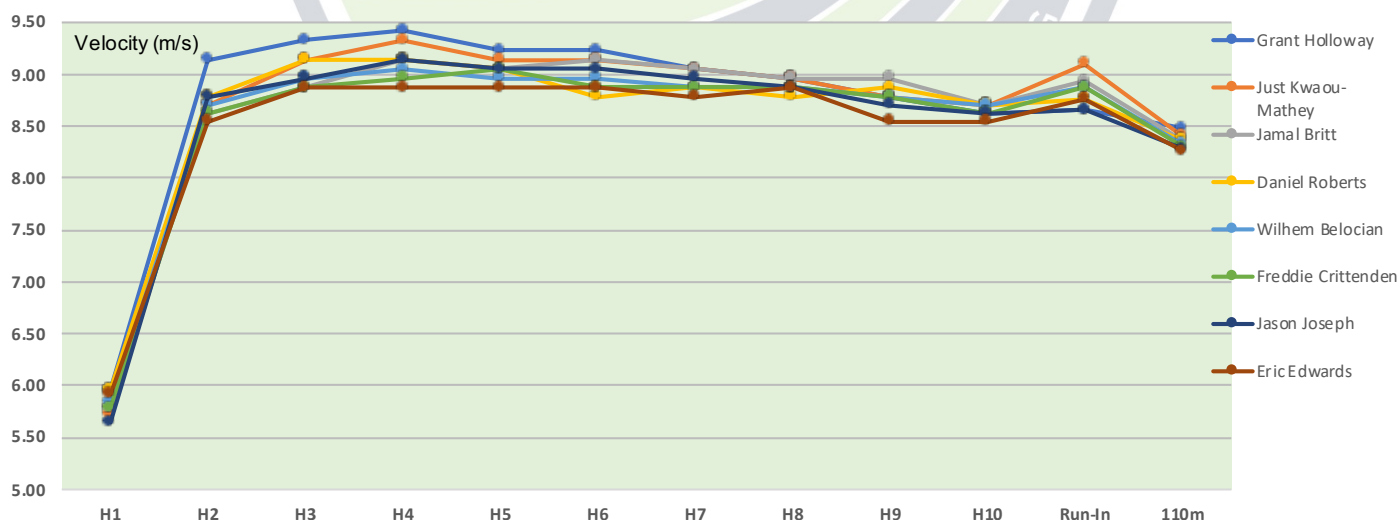
110m Hurdles

Date: 2023.06.09

Wind: -0.5 m/s

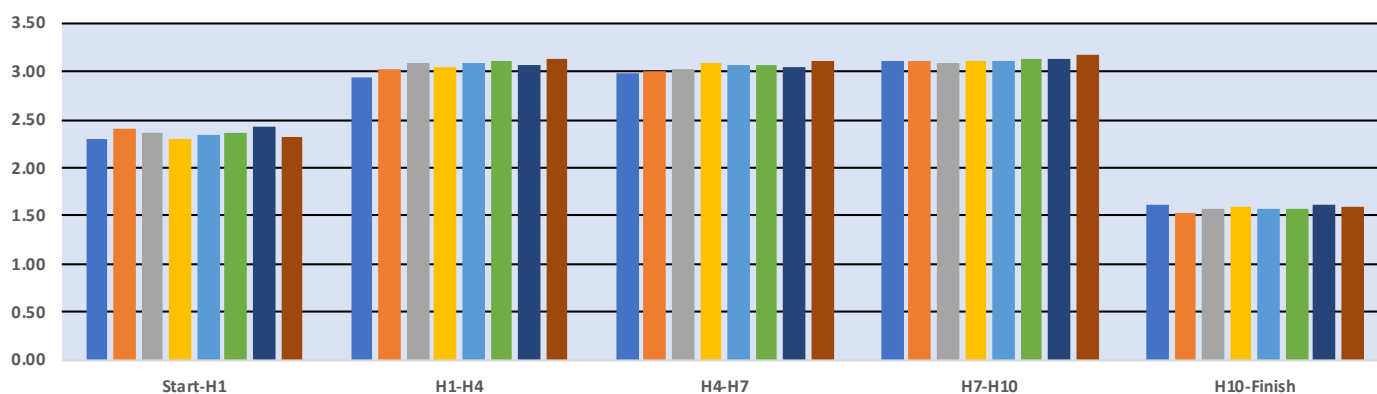
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.30	3.30	4.28	5.25	6.24	7.23	8.24	9.26	10.30	11.36		12.98	6 / 1			
	reaction time	0.157													2.95	2.99	3.12
	interval		7 steps	1.00	0.98	0.97	0.99	0.99	1.01	1.02	1.04	1.06	1.62		9.29	9.17	8.79
	velocity	5.97	9.14	9.33	9.42	9.23	9.23	9.05	8.96	8.79	8.62	8.65	8.47				
Kwaou-Mathey, Just (FRA) (1999)	time	2.40	3.45	4.45	5.43	6.43	7.43	8.44	9.46	10.50	11.55		13.09	7 / 2			
	reaction time	0.171													3.03	3.01	3.11
	interval		7 steps	1.05	1.00	1.00	1.00	1.01	1.02	1.04	1.05	1.54			9.05	9.11	8.82
	velocity	5.72	8.70	9.14	9.33	9.14	9.14	9.05	8.96	8.79	8.70	9.10	8.40				
Britt, Jamal (USA) (1998)	time	2.37	3.43	4.46	5.46	6.47	7.47	8.48	9.50	10.52	11.57		13.14	5 / 3			
	reaction time	0.141													3.09	3.02	3.09
	interval		7 steps	1.06	1.03	1.00	1.01	1.00	1.01	1.02	1.02	1.05	1.57		8.87	9.08	8.87
	velocity	5.79	8.62	8.87	9.14	9.05	9.14	9.05	8.96	8.96	8.70	8.93	8.37				
Roberts, Daniel (USA) (1998)	time	2.30	3.34	4.34	5.34	6.35	7.39	8.42	9.46	10.49	11.54		13.14	4 / 3			
	reaction time	0.154													3.04	3.08	3.12
	interval		1.04	1.00	1.00	1.01	1.04	1.03	1.04	1.03	1.05	1.60			9.02	8.90	8.79
	velocity	5.97	8.79	9.14	9.14	9.05	8.79	8.87	8.79	8.87	8.70	8.76	8.37				
Belocian, Wilhem (FRA) (1995)	time	2.35	3.40	4.42	5.43	6.45	7.47	8.50	9.53	10.57	11.62		13.20	8 / 5			
	reaction time	0.142													3.08	3.07	3.12
	interval		1.05	1.02	1.01	1.02	1.02	1.03	1.03	1.04	1.05	1.58			8.90	8.93	8.79
	velocity	5.84	8.70	8.96	9.05	8.96	8.96	8.87	8.87	8.79	8.70	8.87	8.33				
Crittenden, Freddie (USA) (1994)	time	2.37	3.43	4.46	5.48	6.49	7.52	8.55	9.58	10.62	11.68		13.26	2 / 6			
	reaction time	0.136													3.11	3.07	3.13
	interval		1.06	1.03	1.02	1.01	1.03	1.03	1.03	1.04	1.06	1.58			8.82	8.93	8.76
	velocity	5.79	8.62	8.87	8.96	9.05	8.87	8.87	8.87	8.79	8.62	8.87	8.30				
Joseph, Jason (SUI) (1998)	time	2.43	3.47	4.49	5.49	6.50	7.51	8.53	9.56	10.61	11.67		13.29	3 / 7			
	reaction time	0.195													3.06	3.04	3.14
	interval		7 steps	1.04	1.02	1.00	1.01	1.02	1.03	1.05	1.06	1.62			8.96	9.02	8.73
	velocity	5.65	8.79	8.96	9.14	9.05	9.05	8.96	8.87	8.70	8.62	8.65	8.28				
Edwards, Eric (USA) (2000)	time	2.32	3.39	4.42	5.45	6.48	7.51	8.55	9.58	10.65	11.72		13.32	1 / 8			
	reaction time	0.130													3.13	3.10	3.17
	interval		1.07	1.03	1.03	1.03	1.03	1.04	1.03	1.07	1.07	1.60			8.76	8.85	8.65
	velocity	5.91	8.54	8.87	8.87	8.87	8.87	8.79	8.87	8.54	8.54	8.76	8.26				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 9 Jun 2023 22:02) - diamond league race analysis

<https://www.omegatiming.com/File/000203060101050201FFFFFFFFFFFF4D.pdf>Video: https://www.youtube.com/watch?v=lr_NsqvV0-I

2023 Meeting de Paris (Paris, FRA)

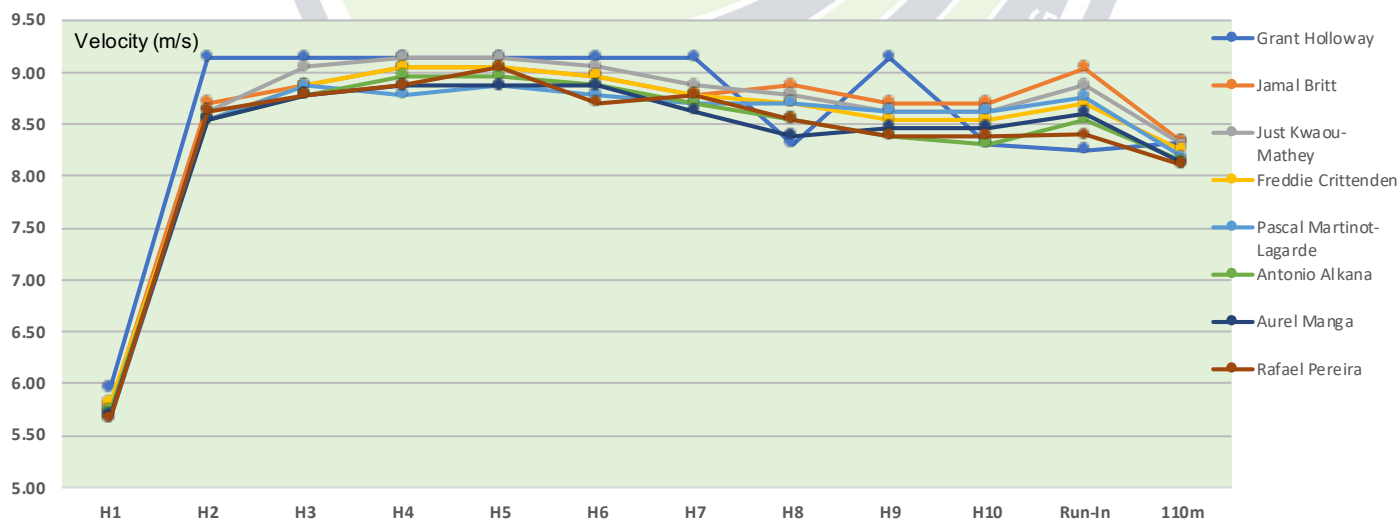
110m Hurdles

Date: 2023.06.09

Wind: -0.6 m/s

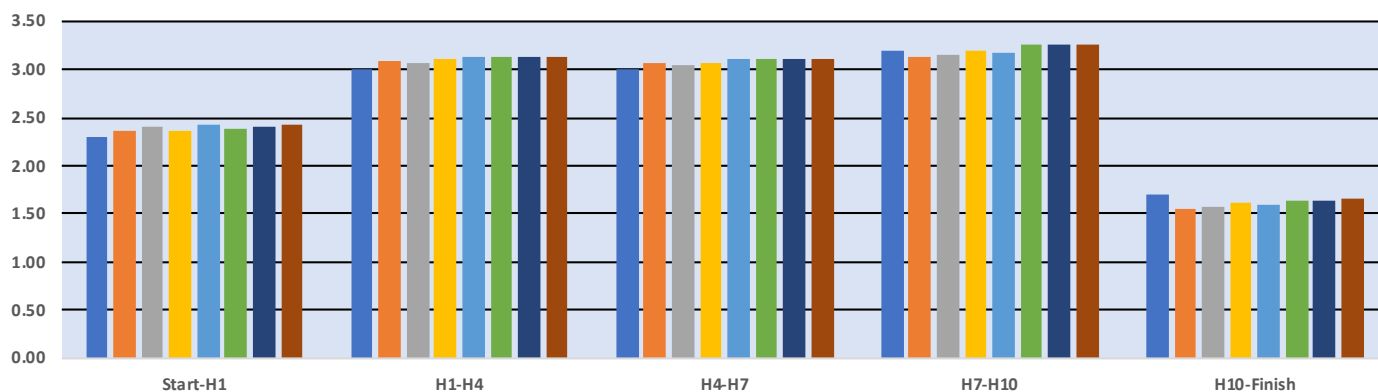
Heat 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.30	3.30	4.30	5.30	6.30	7.30	8.30	9.40	10.40	11.50		13.20	6 / 1			
	reaction time	0.147											1.70			3.00	3.00	3.20
	interval velocity		7 steps	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	1.10	8.25	8.33		9.14	9.14	8.57
Britt, Jamal (USA) (1998)	time		2.37	3.42	4.45	5.46	6.47	7.49	8.53	9.56	10.61	11.66		13.21	4 / 2			
	reaction time	0.136											1.55			3.09	3.07	3.13
	interval velocity		7 steps	1.05	1.03	1.01	1.01	1.02	1.04	1.03	1.05	1.05	9.05	8.33		8.87	8.93	8.76
Kwaou-Mathey, Just (FRA) (1999)	time		2.40	3.46	4.47	5.47	6.47	7.48	8.51	9.55	10.61	11.67		13.25	5 / 3			
	reaction time	0.171											1.58			3.07	3.04	3.16
	interval velocity		7 steps	1.06	1.01	1.00	1.00	1.01	1.03	1.04	1.06	1.06	8.87	8.30		8.93	9.02	8.68
Crittenden, Freddie (USA) (1994)	time		2.36	3.43	4.46	5.47	6.48	7.50	8.54	9.59	10.66	11.73		13.34	7 / 4			
	reaction time	0.136											1.61			3.11	3.07	3.19
	interval velocity			1.07	1.03	1.01	1.01	1.02	1.04	1.05	1.07	1.07	8.71	8.25		8.82	8.93	8.60
Martinot-Lagarde, Pascal (FRA) (1991)	time		2.42	3.49	4.52	5.56	6.59	7.63	8.68	9.73	10.79	11.85		13.45	3 / 5			
	reaction time	0.156											1.60			3.14	3.12	3.17
	interval velocity		7 steps	1.07	1.03	1.04	1.03	1.04	1.05	1.05	1.06	1.06	8.76	8.18		8.73	8.79	8.65
Alkana, Antonio (RSA) (1990)	time		2.39	3.46	4.50	5.52	6.54	7.57	8.62	9.69	10.78	11.88		13.52	2 / 6			
	reaction time	0.114											1.64			3.13	3.10	3.26
	interval velocity			1.07	1.04	1.02	1.02	1.03	1.05	1.07	1.09	1.10	8.55	8.14		8.76	8.85	8.41
Manga, Aurel (FRA) (1992)	time		2.41	3.48	4.52	5.55	6.58	7.61	8.67	9.76	10.84	11.92		13.55	1 / 7			
	reaction time	0.163											1.63			3.14	3.12	3.25
	interval velocity		7 steps	1.07	1.04	1.03	1.03	1.03	1.06	1.09	1.08	1.08	8.60	8.12		8.73	8.79	8.44
Pereira, Rafael (BRA) (1997)	time		2.42	3.48	4.52	5.55	6.56	7.61	8.65	9.72	10.81	11.90		13.57	8 / 8			
	reaction time	0.149											1.67			3.13	3.10	3.25
	interval velocity			1.06	1.04	1.03	1.01	1.05	1.04	1.07	1.09	1.09	8.40	8.11		8.76	8.85	8.44



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 9 Jun 2023 20:31) - diamond league race analysis

<https://www.omegatiming.com/File/000203060101050102FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 Meeting de Paris (Paris, FRA)

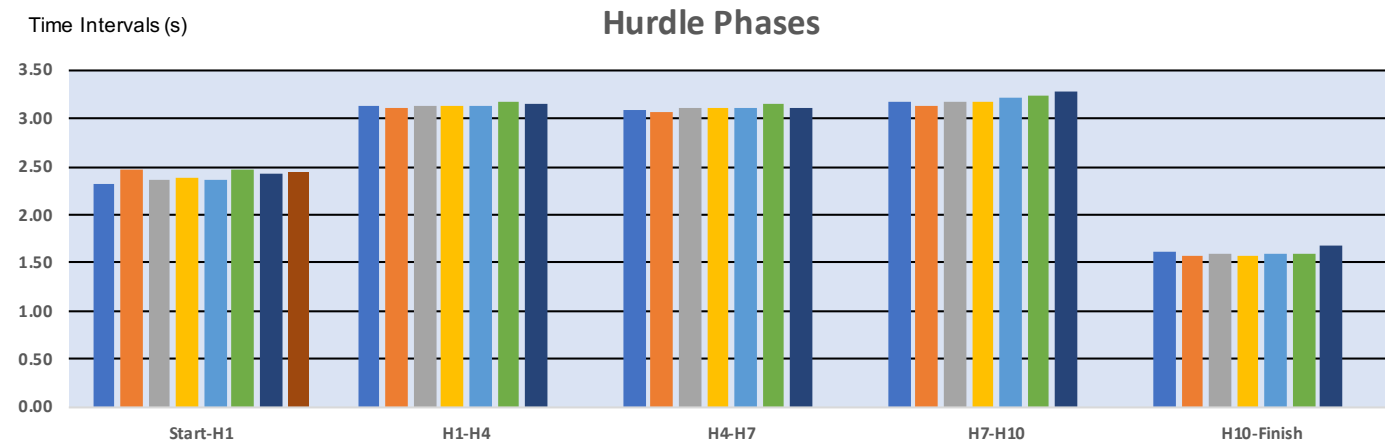
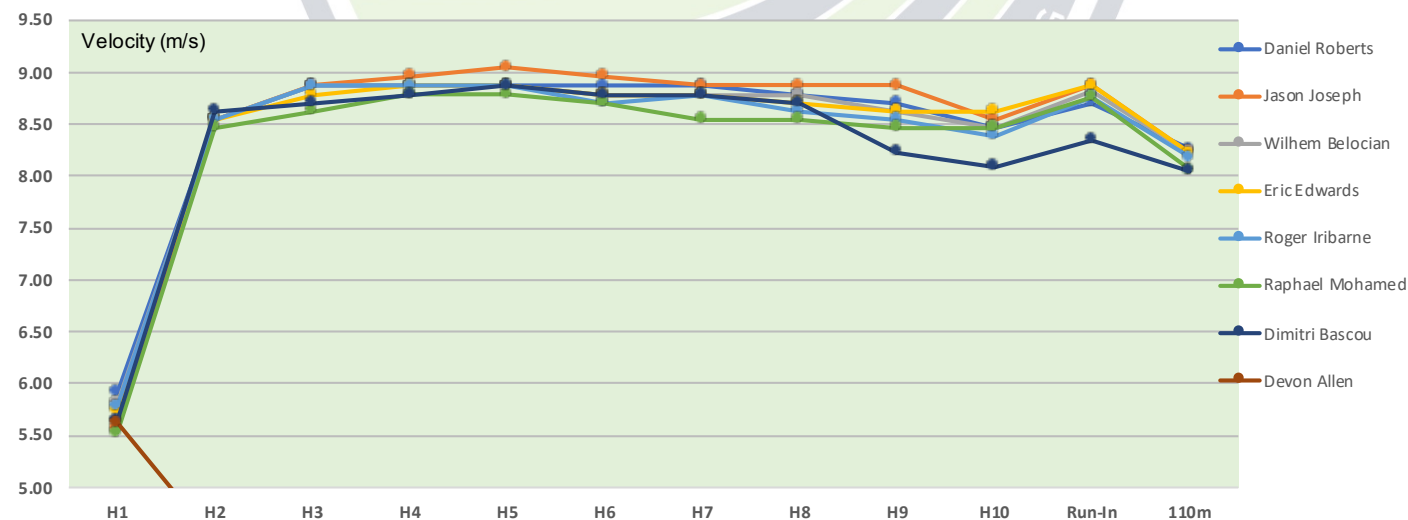
110m Hurdles

Date: 2023.06.09

Wind: -2.0 m/s

Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time	2.32	3.39	4.42	5.45	6.48	7.51	8.54	9.58	10.63	11.71		13.32	3 / 1			
	reaction time	0.153													3.13	3.09	3.17
	interval		1.07	1.03	1.03	1.03	1.03	1.03	1.04	1.05	1.08	1.61			8.76	8.87	8.65
Joseph, Jason (SUI) (1998)	time	2.47	3.54	4.57	5.59	6.60	7.62	8.65	9.68	10.71	11.78		13.36	4 / 2			
	reaction time	0.201													3.12	3.06	3.13
	interval		1.07	1.03	1.02	1.01	1.02	1.03	1.03	1.07	1.58				8.79	8.96	8.76
Belocian, Wilhem (FRA) (1995)	time	2.36	3.43	4.46	5.49	6.52	7.56	8.60	9.64	10.70	11.78		13.37	6 / 3			
	reaction time	0.129													3.13	3.11	3.18
	interval		1.07	1.03	1.03	1.03	1.04	1.04	1.04	1.06	1.08	1.59			8.76	8.82	8.62
Edwards, Eric (USA) (2000)	time	2.39	3.46	4.50	5.53	6.56	7.60	8.64	9.69	10.75	11.81		13.39	2 / 4			
	reaction time	0.149													3.14	3.11	3.17
	interval		1.07	1.04	1.03	1.03	1.04	1.04	1.05	1.06	1.06	1.58			8.73	8.82	8.65
Iribarne, Roger (CUB) (1996)	time	2.37	3.44	4.47	5.50	6.53	7.58	8.62	9.68	10.75	11.84		13.44	7 / 5			
	reaction time	0.152													3.13	3.12	3.22
	interval		1.07	1.03	1.03	1.03	1.05	1.04	1.06	1.07	1.09	1.60			8.76	8.79	8.52
Mohamed, Raphael (FRA) (1998)	time	2.48	3.56	4.62	5.66	6.70	7.75	8.82	9.89	10.97	12.05		13.65	1 / 6			
	reaction time	0.165													3.18	3.16	3.23
	interval		1.08	1.06	1.04	1.04	1.05	1.07	1.07	1.08	1.08	1.60			8.62	8.68	8.49
Bascou, Dimitri (FRA) (1987)	time	2.43	3.49	4.54	5.58	6.61	7.65	8.69	9.74	10.85	11.98		13.66	8 / 7			
	reaction time	0.162													3.15	3.11	3.29
	interval		1.06	1.05	1.04	1.03	1.04	1.04	1.05	1.11	1.13	1.68			8.70	8.82	8.33
Allen, Devon (USA) (1994)	time	2.44	4.48										dnf	5 / --			
	reaction time	0.140															
	interval		2.04														



Source: Omega Timing (Fri 9 Jun 2023 20:30) - diamond league race analysis

<https://www.omegatiming.com/File/000203060101050101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

2023 FBK Games (Hengelo, NED) (TV Analysis)

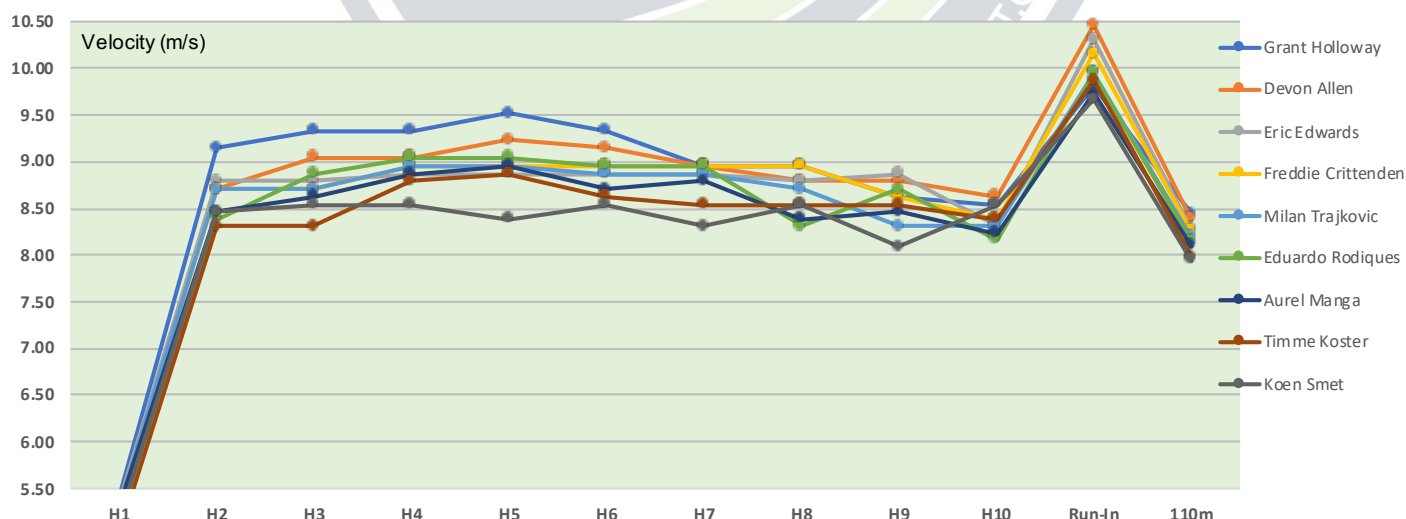
110m Hurdles

Date: 2023.06.04

Wind: 0.4 m/s

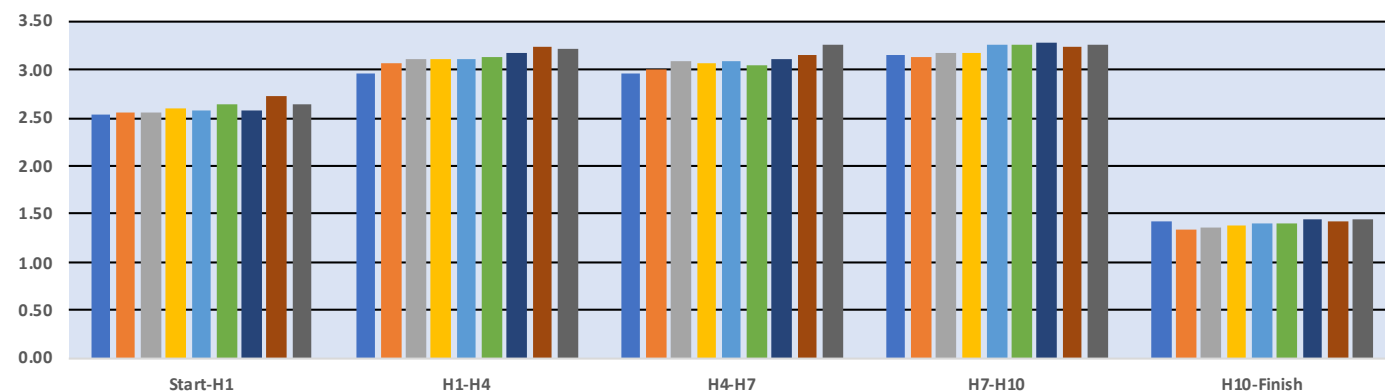
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.53	3.53	4.51	5.49	6.45	7.43	8.45	9.47	10.53	11.60		13.03	6 / 1			
	reaction time	0.187													2.96	2.96	3.15
	interval	7 steps	1.00	0.98	0.98	0.96	0.98	1.02	1.02	1.06	1.07	1.43			9.26	9.26	8.70
Allen, Devon (USA) (1994)	time	2.56	3.61	4.62	5.63	6.62	7.62	8.64	9.68	10.72	11.78		13.12	5 / 2			
	reaction time	0.137													3.07	3.01	3.14
	interval	7 steps	1.05	1.01	1.01	0.99	1.00	1.02	1.04	1.04	1.06	1.34			8.93	9.11	8.73
Edwards, Eric (USA) (2000)	time	2.56	3.60	4.64	5.67	6.70	7.73	8.76	9.80	10.83	11.93		13.29	3 / 3			
	reaction time	0.129													3.11	3.09	3.17
	interval	7 steps	1.04	1.04	1.03	1.03	1.03	1.03	1.04	1.03	1.10	1.36			8.82	8.87	8.65
Crittenden, Freddie (USA) (1994)	time	2.60	3.65	4.70	5.72	6.74	7.76	8.78	9.80	10.86	11.95		13.33	4 / 4			
	reaction time	0.145													3.12	3.06	3.17
	interval	7 steps	1.05	1.05	1.02	1.02	1.02	1.02	1.02	1.06	1.09	1.38			8.79	8.96	8.65
Trajkovic, Milan (CYP) (1992)	time	2.58	3.63	4.68	5.70	6.72	7.75	8.78	9.83	10.93	12.03		13.44	2 / 5			
	reaction time	0.117													3.12	3.08	3.25
	interval	7 steps	1.05	1.05	1.02	1.02	1.03	1.03	1.05	1.10	1.10	1.41			8.79	8.90	8.44
Rodrigues, Eduardo (BRA) (1995)	time	2.65	3.74	4.77	5.78	6.79	7.81	8.83	9.93	10.98	12.10		13.51	7 / 6			
	reaction time	0.149													3.13	3.05	3.27
	interval	7 steps	1.09	1.03	1.01	1.01	1.02	1.02	1.10	1.05	1.12	1.41			8.76	8.99	8.39
Manga, Aurel (FRA) (1992)	time	2.58	3.66	4.72	5.75	6.77	7.82	8.86	9.95	11.03	12.14		13.58	8 / 7			
	reaction time	0.151													3.17	3.11	3.28
	interval	7 steps	1.08	1.06	1.03	1.02	1.05	1.04	1.09	1.08	1.11	1.44			8.65	8.82	8.36
Koster, Timme (NED) (2002)	time	2.73	3.83	4.93	5.97	7.00	8.06	9.13	10.20	11.27	12.36		13.78	1 / 8			
	reaction time	0.157													3.24	3.16	3.23
	interval	7 steps	1.10	1.10	1.04	1.03	1.06	1.07	1.07	1.07	1.09	1.42			8.46	8.68	8.49
Smet, Koen (NED) (1992)	time	2.65	3.73	4.80	5.87	6.96	8.03	9.13	10.20	11.33	12.40		13.85	9 / 9			
	reaction time	0.147													3.22	3.26	3.27
	interval	7 steps	1.08	1.07	1.07	1.09	1.07	1.10	1.07	1.13	1.07	1.45			8.52	8.41	8.39



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1280 x 720 @ 30fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=s1vdEfroTLQ>

2023 Golden Gala Pietro Mennea (Firenze, ITA) (TV Analysis)

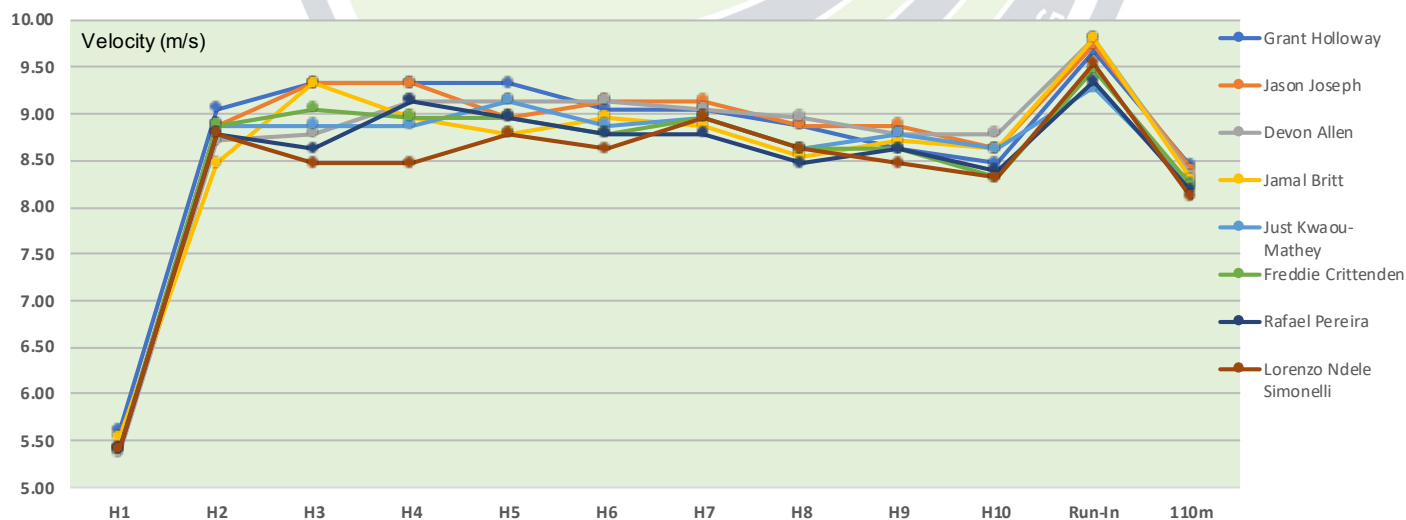
110m Hurdles

Date: 2023.06.02

Wind: -0.2 m/s

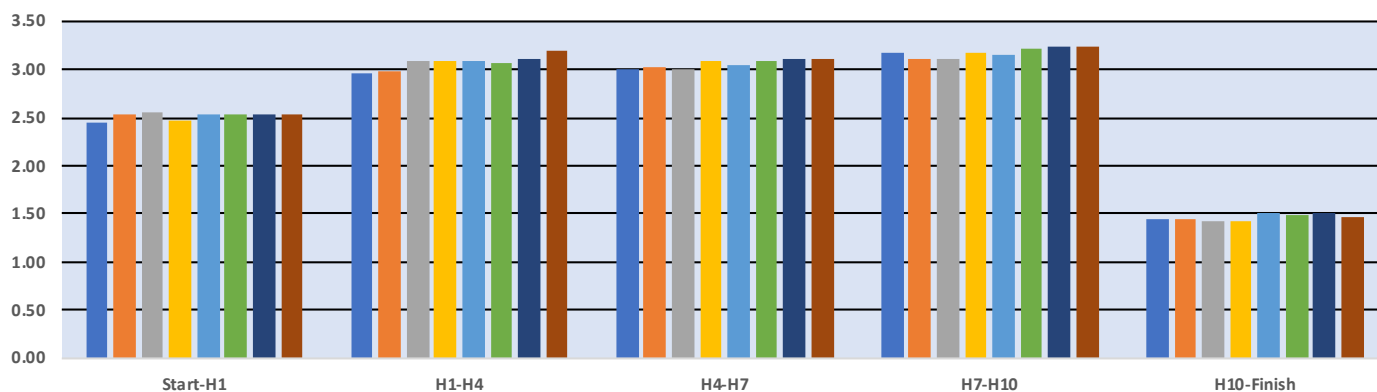
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time		2.45	3.46	4.44	5.42	6.40	7.41	8.42	9.45	10.51	11.59		13.04	6 / 1			
	reaction time	0.152											1.45			2.97	3.00	3.17
	interval		7 steps	1.01	0.98	0.98	0.98	1.01	1.01	1.03	1.06	1.08	1.45			9.23	9.14	8.65
Joseph, Jason (SUI) (1998)	time		2.53	3.56	4.54	5.52	6.54	7.54	8.54	9.57	10.60	11.66		13.10	3 / 2			
	reaction time	0.164											1.44			2.99	3.02	3.12
	interval		7 steps	1.03	0.98	0.98	1.02	1.00	1.00	1.03	1.03	1.06	1.44			9.17	9.08	8.79
Allen, Devon (USA) (1994)	time		2.56	3.61	4.65	5.65	6.65	7.65	8.66	9.68	10.72	11.76		13.19	5 / 3			
	reaction time	0.136											1.43			3.09	3.01	3.10
	interval		7 steps	1.05	1.04	1.00	1.00	1.00	1.01	1.02	1.04	1.04	1.43			8.87	9.11	8.85
Britt, Jamal (USA) (1998)	time		2.48	3.56	4.54	5.56	6.60	7.62	8.65	9.72	10.77	11.83		13.26	7 / 4			
	reaction time	0.134											1.43			3.08	3.09	3.18
	interval		7 steps	1.08	0.98	1.02	1.04	1.02	1.03	1.07	1.05	1.06	1.43			8.90	8.87	8.62
Kwaou-Mathey, Just (FRA) (1999)	time		2.54	3.57	4.60	5.63	6.63	7.66	8.68	9.74	10.78	11.84		13.35	1 / 5			
	reaction time	0.161											1.51			3.09	3.05	3.16
	interval		7 steps	1.03	1.03	1.03	1.00	1.03	1.02	1.06	1.04	1.06	1.51			8.87	8.99	8.68
Crittenden, Freddie (USA) (1994)	time		2.54	3.57	4.58	5.60	6.62	7.66	8.68	9.74	10.80	11.90		13.38	4 / 6			
	reaction time	0.132											1.48			3.06	3.08	3.22
	interval		7 steps	1.03	1.01	1.02	1.02	1.04	1.02	1.06	1.06	1.10	1.48			8.96	8.90	8.52
Pereira, Rafael (BRA) (1997)	time		2.54	3.58	4.64	5.64	6.66	7.70	8.74	9.82	10.88	11.97		13.47	2 / 7			
	reaction time	0.145											1.50			3.10	3.10	3.23
	interval		7 steps	1.04	1.06	1.00	1.02	1.04	1.04	1.08	1.06	1.09	1.50			8.85	8.85	8.49
Simonelli, Lorenzo Ndele (ITA) (2002)	time		2.54	3.58	4.66	5.74	6.78	7.84	8.86	9.92	11.00	12.10		13.57	8 / 8			
	reaction time	0.153											1.47			3.20	3.12	3.24
	interval		7 steps	1.04	1.08	1.08	1.04	1.06	1.02	1.06	1.08	1.10	1.47			8.57	8.79	8.46
	velocity		5.40	8.79	8.46	8.46	8.79	8.62	8.96	8.62	8.46	8.31	9.54	8.11				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=0onLK-sv6YQ>

2023 Meeting International Mohammed VI d'Athlétisme (Rabat, MAR)

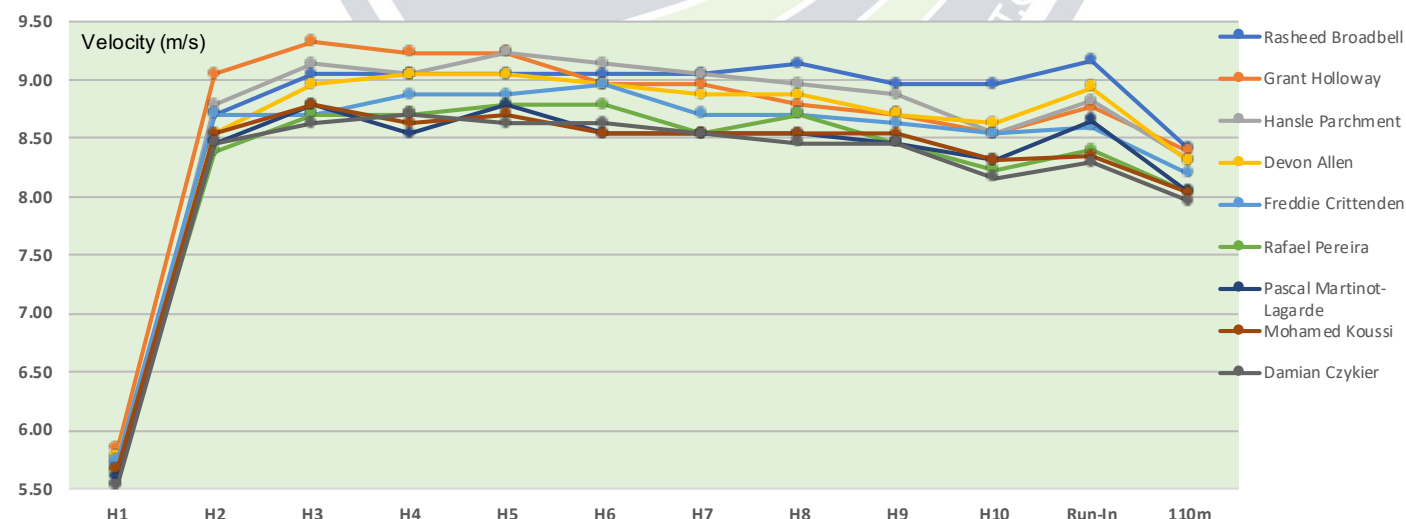
110m Hurdles

Date: 2023.05.28

Wind: -1.3 m/s

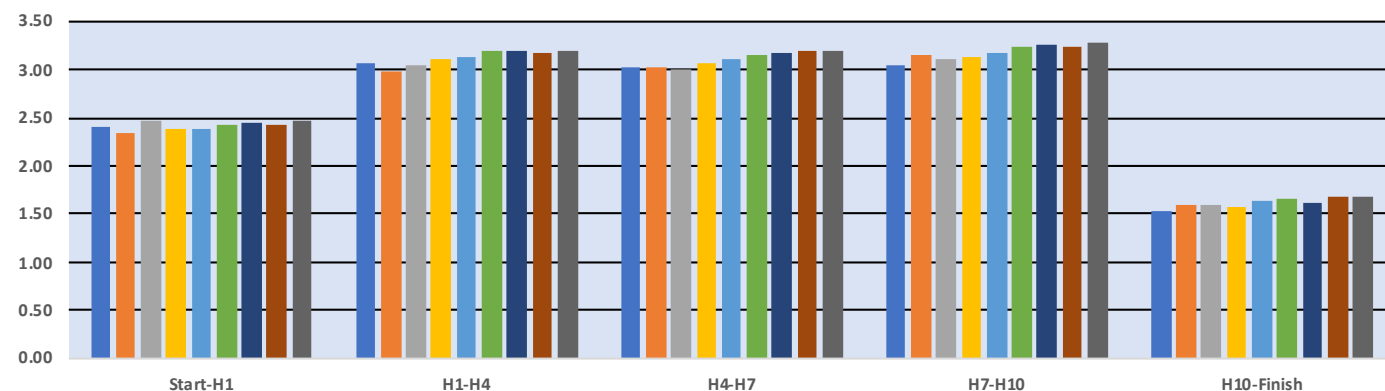
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Broadbell, Rasheed (JAM) (2000)	time	2.41	3.46	4.47	5.48	6.49	7.50	8.51	9.51	10.53	11.55		13.08	5 / 1			
	reaction time	0.161													3.07	3.03	3.04
	interval	7 steps	1.05	1.01	1.01	1.01	1.01	1.01	1.00	1.02	1.02	1.53			8.93	9.05	9.02
Holloway, Grant (USA) (1997)	time	2.35	3.36	4.34	5.33	6.32	7.34	8.36	9.40	10.45	11.52		13.12	6 / 2			
	reaction time	0.177													2.98	3.03	3.16
	interval	7 steps	1.01	0.98	0.99	0.99	1.02	1.02	1.04	1.05	1.07	1.60			9.20	9.05	8.68
Parchment, Hansle (JAM) (1990)	time	2.48	3.52	4.52	5.53	6.52	7.52	8.53	9.55	10.58	11.65		13.24	4 / 3			
	reaction time	0.157													3.05	3.00	3.12
	interval	7 steps	1.04	1.00	1.01	0.99	1.00	1.01	1.02	1.03	1.07	1.59			8.99	9.14	8.79
Allen, Devon (USA) (1994)	time	2.38	3.45	4.47	5.48	6.49	7.51	8.54	9.57	10.62	11.68		13.25	3 / 4			
	reaction time	0.152													3.10	3.06	3.14
	interval	7 steps	1.07	1.02	1.01	1.01	1.02	1.03	1.03	1.05	1.06	1.57			8.85	8.96	8.73
Crittenden, Freddie (USA) (1994)	time	2.39	3.44	4.49	5.52	6.55	7.57	8.62	9.67	10.73	11.80		13.43	7 / 5			
	reaction time	0.166													3.13	3.10	3.18
	interval	7 steps	1.05	1.05	1.03	1.03	1.02	1.05	1.05	1.06	1.07	1.63			8.76	8.85	8.62
Pereira, Rafael (BRA) (1997)	time	2.43	3.52	4.57	5.62	6.66	7.70	8.77	9.82	10.90	12.01		13.68	8 / 6			
	reaction time	0.165													3.19	3.15	3.24
	interval	7 steps	1.09	1.05	1.05	1.04	1.04	1.07	1.05	1.08	1.11	1.67			8.60	8.70	8.46
Martinot-Lagarde, Pascal (FRA) (1991)	time	2.45	3.53	4.57	5.64	6.68	7.75	8.82	9.89	10.97	12.07		13.69	2 / 7			
	reaction time	0.183													3.19	3.18	3.25
	interval	7 steps	1.08	1.04	1.07	1.04	1.07	1.07	1.07	1.08	1.10	1.62			8.60	8.62	8.44
Koussi, Mohamed (MAR) (1994)	time	2.42	3.49	4.53	5.59	6.64	7.71	8.78	9.85	10.92	12.02		13.70	1 / 8			
	reaction time	0.141													3.17	3.19	3.24
	interval	7 steps	1.07	1.04	1.06	1.05	1.07	1.07	1.07	1.07	1.10	1.68			8.65	8.60	8.46
Czykier, Damian (POL) (1992)	time	2.48	3.56	4.62	5.67	6.73	7.79	8.86	9.94	11.02	12.14		13.83	9 / 9			
	reaction time	0.193													3.19	3.19	3.28
	interval	7 steps	1.08	1.06	1.05	1.06	1.06	1.07	1.08	1.08	1.12	1.69			8.60	8.60	8.36
	time	2.48	3.56	4.62	5.67	6.73	7.79	8.86	9.94	11.02	12.14		13.83				
	reaction time	0.193															
	interval	7 steps	1.08	1.06	1.05	1.06	1.06	1.07	1.08	1.08	1.12	1.69					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 28 May 2023 19:39) - diamond league race analysis

<https://www.omegatiming.com/File/000203040102070101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=JCbmbbEMMdWU>

2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)

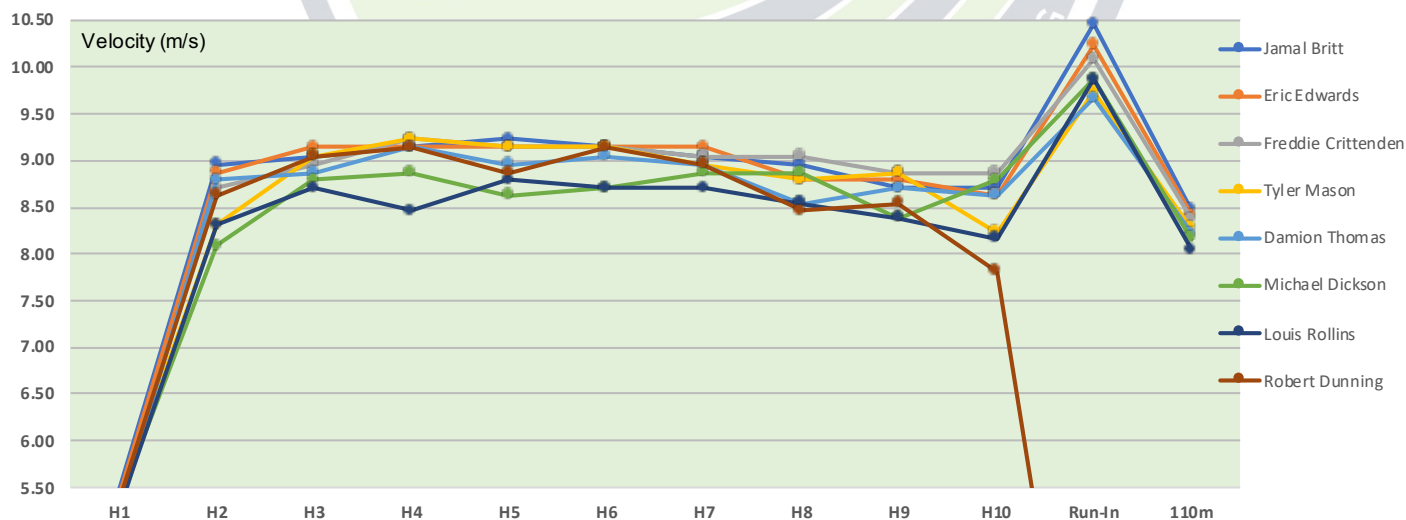
110m Hurdles

Date: 2023.05.21

Wind: 4.0 m/s

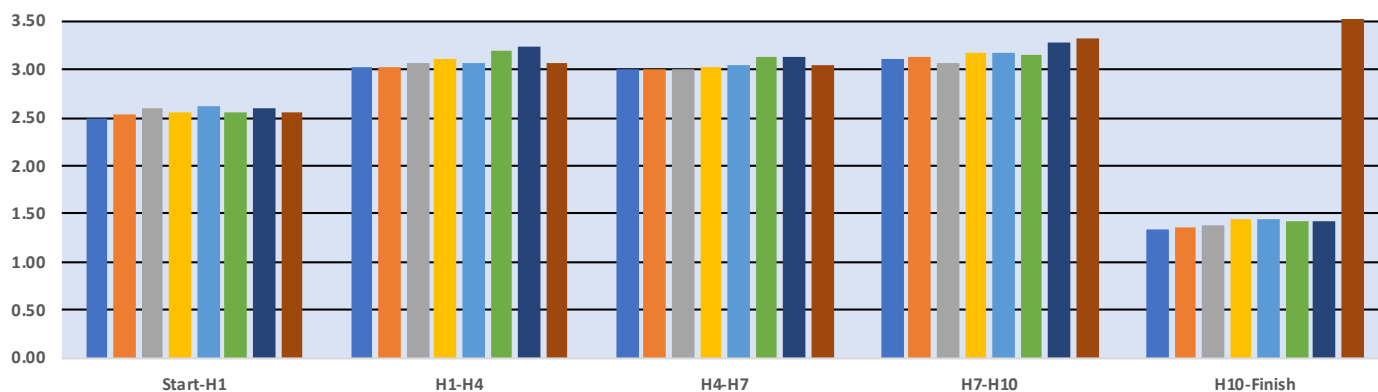
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Britt, Jamal (USA) (1998)	time		2.50	3.52	4.53	5.53	6.52	7.52	8.53	9.55	10.60	11.65		12.99	6 / 1			
	reaction time	0.124														3.03	3.00	3.12
	interval		7 steps	1.02	1.01	1.00	0.99	1.00	1.01	1.02	1.05	1.05	1.34			9.05	9.14	8.79
Edwards, Eric (USA) (2000)	time		2.53	3.56	4.56	5.56	6.56	7.56	8.56	9.60	10.64	11.70		13.07	2 / 2			
	reaction time	0.122														3.03	3.00	3.14
	interval			1.03	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.06	1.37			9.05	9.14	8.73
Crittenden, Freddie (USA) (1994)	time		2.60	3.65	4.67	5.66	6.66	7.66	8.67	9.68	10.71	11.74		13.13	4 / 3			
	reaction time	0.162														3.06	3.01	3.07
	interval			1.05	1.02	0.99	1.00	1.00	1.01	1.01	1.03	1.03	1.39			8.96	9.11	8.93
Mason, Tyler (JAM) (1995)	time		2.56	3.66	4.67	5.66	6.66	7.66	8.68	9.72	10.75	11.86		13.30	3 / 4			
	reaction time	0.155														3.10	3.02	3.18
	interval		7 steps	1.10	1.01	0.99	1.00	1.00	1.02	1.04	1.03	1.11	1.44			8.85	9.08	8.62
Thomas, Damion (JAM) (1999)	time		2.63	3.67	4.70	5.70	6.72	7.73	8.75	9.82	10.87	11.93		13.38	8 / 5			
	reaction time	0.166														3.07	3.05	3.18
	interval		7 steps	1.04	1.03	1.00	1.02	1.01	1.02	1.07	1.05	1.06	1.45			8.93	8.99	8.62
Dickson, Michael (USA) (1997)	time		2.56	3.69	4.73	5.76	6.82	7.87	8.90	9.93	11.02	12.06		13.48	7 / 6			
	reaction time	0.190														3.20	3.14	3.16
	interval		7 steps	1.13	1.04	1.03	1.06	1.05	1.03	1.03	1.09	1.04	1.42			8.57	8.73	8.68
Rollins, Louis (USA) (1996)	time		2.60	3.70	4.75	5.83	6.87	7.92	8.97	10.04	11.13	12.25		13.67	1 / 7			
	reaction time	0.179														3.23	3.14	3.28
	interval			1.10	1.05	1.08	1.04	1.05	1.05	1.07	1.09	1.12	1.42			8.49	8.73	8.36
Dunning, Robert (USA) (1997)	time		2.56	3.62	4.63	5.63	6.66	7.66	8.68	9.76	10.83	12.00		22.28	5 / 8			
	reaction time	0.152														3.07	3.05	3.32
	interval		7 steps	1.06	1.01	1.00	1.03	1.00	1.02	1.08	1.07	1.17	10.28			8.93	8.99	8.26
	velocity		5.36	8.62	9.05	9.14	8.87	9.14	8.96	8.46	8.54	7.81	1.36	4.94				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=84HALcmTowc>

2023 NCAA Division II National Championships (Pueblo, CO) (Altitude) (TV Analysis)

110m Hurdles

Date: 2023.05.27

Wind: 6.0 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.50	3.50	4.50	5.48	6.46	7.44	8.41	9.43	10.43	11.46		12.87	5 / 1			
	reaction time														2.98	2.93	3.05
	interval	7 steps	1.00	1.00	0.98	0.98	0.98	0.97	1.02	1.00	1.03	1.41			9.20	9.36	8.99
	velocity	5.49	9.14	9.14	9.33	9.33	9.33	9.42	8.96	9.14	8.87	9.94	8.55				

2023 Trackwired Arkansas Grand Prix (Fayetteville, AR) (TV Analysis)

Date: 2023.05.23

Wind: 1.3 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.46	3.50	4.50	5.50	6.48	7.46	8.43	9.47	10.47	11.49		12.96	5 / 1			
	reaction time														3.04	2.93	3.06
	interval	7 steps	1.04	1.00	1.00	0.98	0.98	0.97	1.04	1.00	1.02	1.47	PB		9.02	9.36	8.96
	velocity	5.58	8.79	9.14	9.14	9.33	9.33	9.42	8.79	9.14	8.96	9.54	8.49				
Ojora, Tade (GBR) (1999)	time	2.58	3.65	4.67	5.69	6.69	7.69	8.67	9.70	10.76	11.82		13.26	6 / 2			
	reaction time														3.11	2.98	3.15
	interval	7 steps	1.07	1.02	1.02	1.00	1.00	0.98	1.03	1.06	1.06	1.44	PB		8.82	9.20	8.70
	velocity	5.32	8.54	8.96	8.96	9.14	9.14	9.33	8.87	8.62	8.62	9.74	8.30				

2023 MIAA Championships (Jefferson City, MO) (TV Analysis)

Date: 2023.05.07

Wind: 3.0 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Tinch, Cordell (USA) (2000)	time	2.40	3.40	4.40	5.37	6.34	7.31	8.34	9.34	10.36	11.40		12.97	4 / 1			
	reaction time														2.97	2.97	3.06
	interval	7 steps	1.00	1.00	0.97	0.97	0.97	1.03	1.00	1.02	1.04	1.57			9.23	9.23	8.96
	velocity	5.72	9.14	9.14	9.42	9.42	9.42	8.87	9.14	8.96	8.79	8.93	8.48				

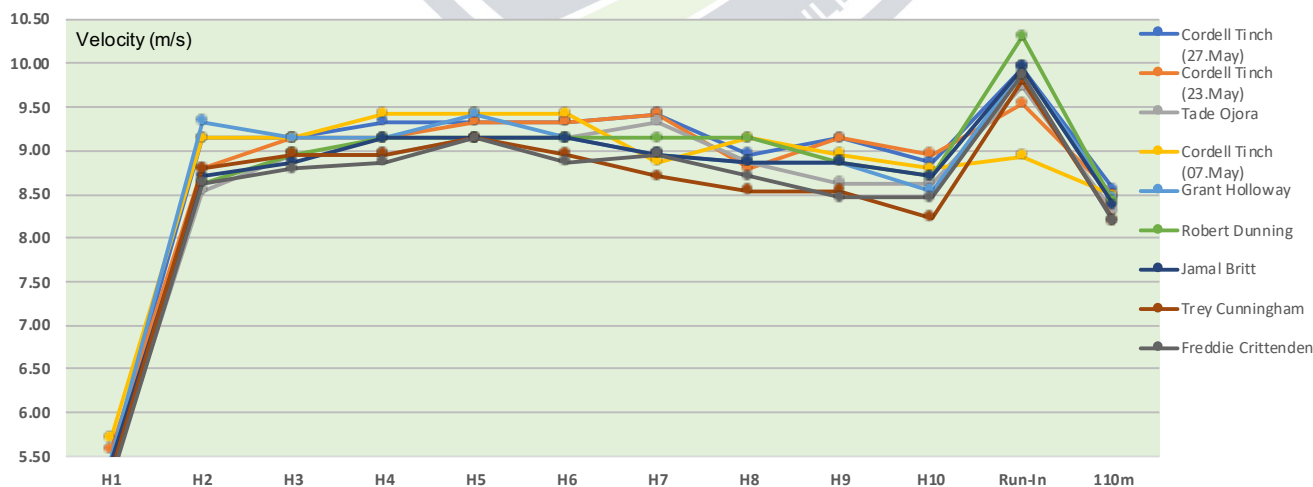
2023 Adidas Atlanta City Games (Atlanta, GA) (street) (TV Analysis)

Date: 2023.05.05

Wind: 0.0 m/s

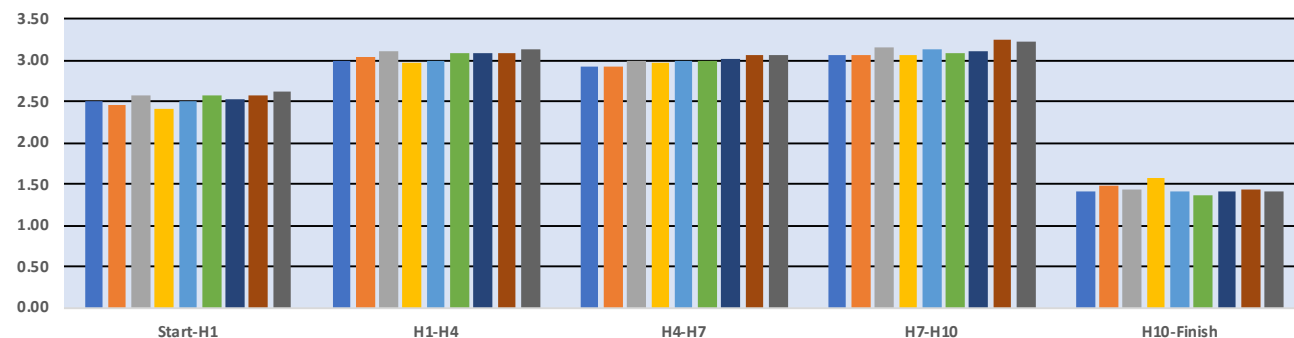
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.50	3.48	4.48	5.48	6.45	7.45	8.47	9.50	10.53	11.60		13.01	3 / 1			
	reaction time	0.181													2.98	2.99	3.13
	interval	7 steps	0.98	1.00	1.00	0.97	1.00	1.02	1.03	1.03	1.07	1.41			9.20	9.17	8.76
	velocity	5.49	9.33	9.14	9.14	9.42	9.14	8.96	8.87	8.87	8.54	9.94	8.46				
Dunning, Robert (USA) (1997)	time	2.57	3.63	4.65	5.65	6.65	7.65	8.65	9.65	10.68	11.73		13.09	1 / 2			
	reaction time	0.187													3.08	3.00	3.08
	interval	7 steps	1.06	1.02	1.00	1.00	1.00	1.00	1.03	1.05	1.36	PB			8.90	9.14	8.90
	velocity	5.34	8.62	8.96	9.14	9.14	9.14	9.14	9.14	8.87	8.70	10.31	8.40				
Britt, Jamal (USA) (1998)	time	2.52	3.57	4.60	5.60	6.60	7.60	8.62	9.65	10.68	11.73		13.14	4 / 3			
	reaction time	0.188													3.08	3.02	3.11
	interval	7 steps	1.05	1.03	1.00	1.00	1.00	1.02	1.03	1.03	1.05	1.41			8.90	9.08	8.82
	velocity	5.44	8.70	8.87	9.14	9.14	9.14	8.96	8.87	8.87	8.70	9.94	8.37				
Cunningham, Trey (USA) (1998)	time	2.58	3.62	4.64	5.66	6.66	7.68	8.73	9.80	10.87	11.98		13.41	2 / 4			
	reaction time	0.174													3.08	3.07	3.25
	interval	7 steps	1.04	1.02	1.02	1.00	1.02	1.05	1.07	1.07	1.11	1.43			8.90	8.93	8.44
	velocity	5.32	8.79	8.96	8.96	9.14	8.96	8.70	8.54	8.54	8.23	9.80	8.20				
Crittenden, Freddie (USA) (1994)	time	2.62	3.68	4.72	5.75	6.75	7.78	8.80	9.85	10.93	12.01		13.43	5 / 5			
	reaction time	0.159													3.13	3.05	3.21
	interval		1.06	1.04	1.03	1.00	1.03	1.02	1.05	1.08	1.08	1.42			8.76	8.99	8.54
	velocity	5.24	8.62	8.79	8.87	9.14	8.87	8.96	8.70	8.46	8.46	9.87	8.19				



Time Intervals (s)

Hurdle Phases



NCAA Division II National Championships

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: Gun Flash
 Source: <https://www.youtube.com/watch?v=4nMb81C6e24&t=3s>

Trackwired Arkansas Grand Prix

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movenet
 Source: https://www.youtube.com/watch?v=RmydlBb_7C0

MIAA Championships

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movenet
 Source: <https://www.youtube.com/shorts/jr1O7iX7SQg>

Adidas Atlanta City Games

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: Gun Flash
 Source: <https://www.youtube.com/watch?v=Nlrcyol0eY>

Women's 100m Hurdles

2023 Top 10 Times - Women's 100m Hurdles

Camacho-Quinn, Jasmine (PUR) (1996)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)																	
date	21-May	time	2.50	3.52	4.46	5.40	6.32	7.25	8.19	9.13	10.10	11.06					
reaction time	0.153	interval		1.02	0.94	0.94	0.92	0.93	0.94	0.94	0.97	0.96	1.11		2.90	2.79	2.87
wind	3.5 m/s	velocity	5.20	8.33	9.04	9.04	9.24	9.14	9.04	9.04	8.76	8.85	9.05	8.22	8.79	9.14	8.89
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.17 5 / 1																	
Harrison, Kendra (USA) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Heat 3 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	22-Aug	time	2.50	3.47	4.44	5.39	6.31	7.26	8.21	9.15	10.12	11.11					
reaction time	0.132	interval		0.97	0.97	0.95	0.92	0.95	0.95	0.94	0.97	0.99	1.13		2.89	2.82	2.90
wind	-0.2 m/s	velocity	5.20	8.76	8.76	8.95	9.24	8.95	8.95	9.04	8.76	8.59	8.89	8.17	8.82	9.04	8.79
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.24 4 / 1																	
Nugent, Ackera (JAM) (2002)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 NCAA Championships (Austin, TX) (TV Analysis)																	
date	10-Jun	time	2.44	3.42	4.39	5.32	6.27	7.20	8.15	9.10	10.09	11.08					
reaction time		interval		0.98	0.97	0.93	0.95	0.93	0.95	0.95	0.99	0.99	1.17		2.88	2.83	2.93
wind	3.8 m/s	velocity	5.33	8.67	8.76	9.14	8.95	9.14	8.95	8.95	8.59	8.59	8.59	8.16	8.85	9.01	8.70
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.25 6 / 1																	
Camacho-Quinn, Jasmine (PUR) (1996)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 UNF East Coast Relays (Jacksonville, FL) (TV Analysis)																	
date	29-Apr	time	2.56	3.60	4.56	5.50	6.43	7.35	8.30	9.25	10.20	11.20					
reaction time		interval		1.04	0.96	0.94	0.93	0.92	0.95	0.95	0.95	1.00	1.09		2.94	2.80	2.90
wind	3.2 m/s	velocity	5.08	8.17	8.85	9.04	9.14	9.24	8.95	8.95	8.95	8.50	9.22	8.14	8.67	9.11	8.79
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.29 5 / 1																	
Harrison, Kendra (USA) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																	
date	24-Jun	time	2.53	3.57	4.52	5.45	6.40	7.34	8.28	9.24	10.21	11.20					
reaction time	0.151	interval		1.04	0.95	0.93	0.95	0.94	0.94	0.96	0.97	0.99	1.09		2.92	2.83	2.92
wind	2.8 m/s	velocity	5.14	8.17	8.95	9.14	8.95	9.04	9.04	8.85	8.76	8.59	9.22	8.14	8.73	9.01	8.73
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.29 5 / 1																	
Johnson, Alaysha (USA) (1996)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																	
date	24-Jun	time	2.55	3.57	4.53	5.47	6.42	7.34	8.29	9.27	10.24	11.22					
reaction time	0.206	interval		1.02	0.96	0.94	0.95	0.92	0.95	0.98	0.97	0.98	1.08		2.92	2.82	2.93
wind	2.8 m/s	velocity	5.10	8.33	8.85	9.04	8.95	9.24	8.95	8.67	8.76	8.67	9.31	8.13	8.73	9.04	8.70
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.30 4 / 2																	
Ali, Nia (USA) (1988)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Herculis Meeting International d'Atlétisme (Monaco, MON)																	
date	21-Jul	time	2.40	3.42	4.39	5.35	6.30	7.25	8.20	9.15	10.13	11.11					
reaction time	0.153	interval		1.02	0.97	0.96	0.95	0.95	0.95	0.95	0.98	0.98	1.19		2.95	2.85	2.91
wind	0.6 m/s	velocity	5.42	8.33	8.76	8.85	8.95	8.95	8.95	8.95	8.67	8.67	8.45	8.13	8.64	8.95	8.76
Omega Timing - diamond league race analysis																	
5 / 1																	
PB																	
Armstrong, Alia (USA) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Heat 1 - 2023 SEC Championships (Baton Rouge, LA)																	
date	12-May	time															
reaction time		interval															
wind	2.2 m/s	velocity															
no information available																	
12.31																	
Camacho-Quinn, Jasmine (PUR) (1996)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF Los Angeles Grand Prix (Westwood, CA) (TV Analysis)																	
date	27-May	time	2.50	3.52	4.50	5.44	6.38	7.32	8.28	9.24	10.19	11.16					
reaction time	0.158	interval		1.02	0.98	0.94	0.94	0.94	0.96	0.96	0.95	0.97	1.15		2.94	2.84	2.88
wind	-0.2 m/s	velocity	5.20	8.33	8.67	9.04	9.04	9.04	8.85	8.85	8.95	8.76	8.74	8.12	8.67	8.98	8.85
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.31 5 / 1																	
Harrison, Kendra (USA) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Herculis Meeting International d'Atlétisme (Monaco, MON)																	
date	21-Jul	time	2.42	3.44	4.42	5.36	6.30	7.24	8.18	9.13	10.10	11.09					
reaction time	0.165	interval		1.02	0.98	0.94	0.94	0.94	0.94	0.95	0.97	0.99	1.22		2.94	2.82	2.91
wind	0.6 m/s	velocity	5.37	8.33	8.67	9.04	9.04	9.04	9.04	8.95	8.76	8.59	8.24	8.12	8.67	9.04	8.76
Omega Timing - diamond league race analysis																	
4 / 2																	
Russell, Masai (USA)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 NCAA Championships (Austin, TX) (TV Analysis)																	
date	10-Jun	time	2.44	3.44	4.47	5.45	6.40	7.35	8.30	9.26	10.22	11.20					
reaction time		interval		1.00	1.03	0.98	0.95	0.95	0.95	0.96	0.96	0.98	1.12		3.01	2.85	2.90
wind	3.8 m/s	velocity	5.33	8.50	8.25	8.67	8.95	8.95	8.95	8.85	8.85	8.67	8.97	8.12	8.47	8.95	8.79
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.32 4 / 2																	
Williams, Danielle (JAM) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)																	
date	24-Jun	time	2.47	3.50	4.46	5.42	6.37	7.31	8.26	9.22	10.21	11.21					
reaction time	0.331	interval		1.03	0.96	0.96	0.95	0.94	0.95	0.96	0.99	1.00	1.12		2.95	2.84	2.95
wind	2.8 m/s	velocity	5.26	8.25	8.85	8.85	8.95	9.04	8.95	8.85	8.59	8.50	8.97	8.11	8.64	8.98	8.64
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.33 3 / 3																	
Harrison, Kendra (USA) (1992)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Semi-Final 1 - 2023 World Athletics Championships (Budapest, HUN)																	
date	23-Aug	time	2.50	3.48	4.45	5.39	6.32	7.25	8.21	9.18	10.15	11.15					
reaction time	0.142	interval		0.98	0.97	0.94	0.93	0.93	0.96	0.97	0.97	1.00	1.18		2.89	2.82	2.94
wind	0.5 m/s	velocity	5.20	8.67	8.76	9.04	9.14	9.14	8.85	8.76	8.76	8.50	8.52	8.11	8.82	9.04	8.67
Henson (2023) - Athlete First: 2023 year end hurdle report																	
12.33 7 / 1																	
Amusan, Tobi (NGR) (1997)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
date	17-Sep	time	2.42	3.44	4.41	5.37	6.30	7.24	8.18	9.14	10.10	11.09					
reaction time	0.134	interval		1.02	0.97	0.96	0.93	0.94	0.94	0.96	0.96	0.99	1.24		2.95	2.81	2.91
wind	1.8 m/s	velocity	5.37	8.33	8.76	8.85	9.14	9.04	9.04	8.85	8.85	8.59	8.10	8.11	8.64	9.07	8.76
Omega Timing - diamond league race analysis																	
4 / 1																	

2023 Prefontaine Classic (Eugene, OR)

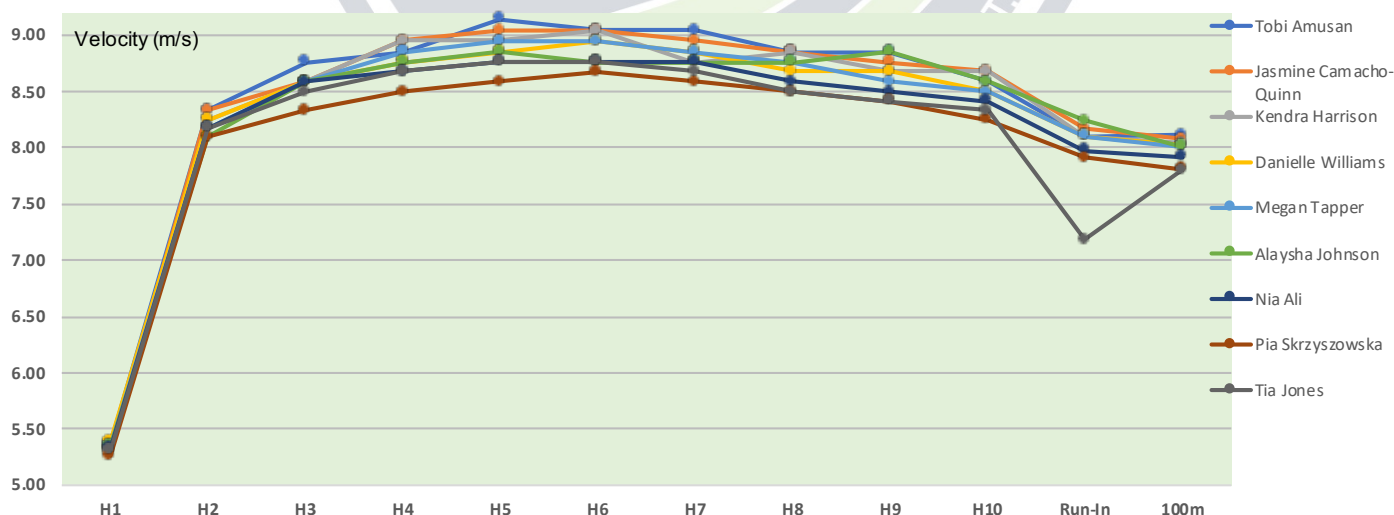
100m Hurdles

Date: 2023.09.17

Wind: 1.8 m/s

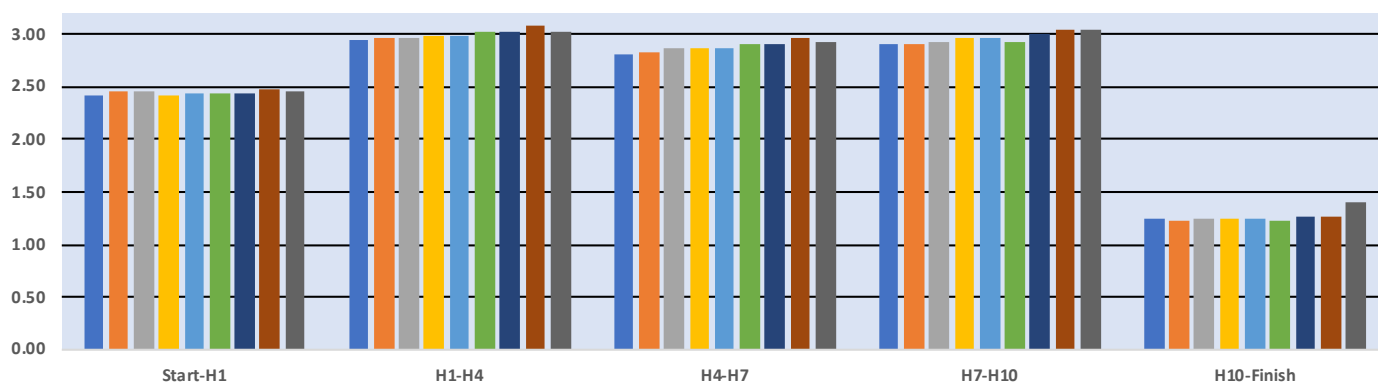
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time	2.42	3.44	4.41	5.37	6.30	7.24	8.18	9.14	10.10	11.09		12.33	4 / 1			
	reaction time	0.134										1.24			2.95	2.81	2.91
	interval velocity		1.02	0.97	0.96	0.93	0.94	0.94	0.96	0.96	0.99	1.24			8.64	9.07	8.76
Camacho-Quinn, Jasmine (PUR) (199)	time	2.45	3.47	4.46	5.41	6.35	7.29	8.24	9.20	10.17	11.15		12.38	5 / 2			
	reaction time	0.140										1.23			2.96	2.83	2.91
	interval velocity		1.02	0.99	0.95	0.94	0.94	0.95	0.96	0.97	0.98	1.23			8.61	9.01	8.76
Harrison, Kendra (USA) (1992)	time	2.45	3.48	4.47	5.42	6.37	7.31	8.28	9.24	10.22	11.20		12.44	6 / 3			
	reaction time	0.166										1.24			2.97	2.86	2.92
	interval velocity		1.03	0.99	0.95	0.95	0.94	0.97	0.96	0.98	0.98	1.24			8.59	8.92	8.73
Williams, Danielle (JAM) (1992)	time	2.41	3.44	4.43	5.40	6.36	7.31	8.27	9.25	10.23	11.23		12.47	3 / 4			
	reaction time	0.140										1.24			2.99	2.87	2.96
	interval velocity		1.03	0.99	0.97	0.96	0.95	0.96	0.98	0.98	1.00	1.24			8.53	8.89	8.61
Tapper, Megan (JAM) (1994)	time	2.43	3.47	4.46	5.42	6.37	7.32	8.28	9.25	10.24	11.24		12.48	9 / 5			
	reaction time	0.148										1.24			2.99	2.86	2.96
	interval velocity		1.04	0.99	0.96	0.95	0.95	0.96	0.97	0.99	1.00	1.24			8.53	8.92	8.61
Johnson, Alaysha (USA) (1996)	time	2.43	3.48	4.47	5.44	6.40	7.37	8.34	9.31	10.27	11.26		12.48	7 / 6			
	reaction time	0.152										1.22			3.01	2.90	2.92
	interval velocity		1.05	0.99	0.97	0.96	0.97	0.97	0.97	0.96	0.99	1.22			8.47	8.79	8.73
Ali, Nia (USA) (1988)	time	2.44	3.48	4.47	5.45	6.42	7.39	8.36	9.35	10.35	11.36		12.62	2 / 7			
	reaction time	0.153										1.26			3.01	2.91	3.00
	interval velocity		1.04	0.99	0.98	0.97	0.97	0.97	0.99	1.00	1.01	1.26			8.47	8.76	8.50
Skrzysowska, Pia (POL) (2001)	time	2.47	3.52	4.54	5.54	6.53	7.51	8.50	9.50	10.51	11.54		12.81	1 / 8			
	reaction time	0.140										1.27			3.07	2.96	3.04
	interval velocity		1.05	1.02	1.00	0.99	0.98	0.99	1.00	1.01	1.03	1.27			8.31	8.61	8.39
Jones, Tia (USA) (2000)	time	2.45	3.49	4.49	5.47	6.44	7.41	8.39	9.39	10.40	11.42		12.82	8 / 9			
	reaction time	0.140										1.40			3.02	2.92	3.03
	interval velocity		1.04	1.00	0.98	0.97	0.97	0.98	1.00	1.01	1.02	1.40			8.44	8.73	8.42



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 14:08) - diamond league race analysis

<https://www.omegatiming.com/File/000203100101100101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=3FicMlUJs9k>

2023 Xiamen Diamond League (Xiamen, CHN)

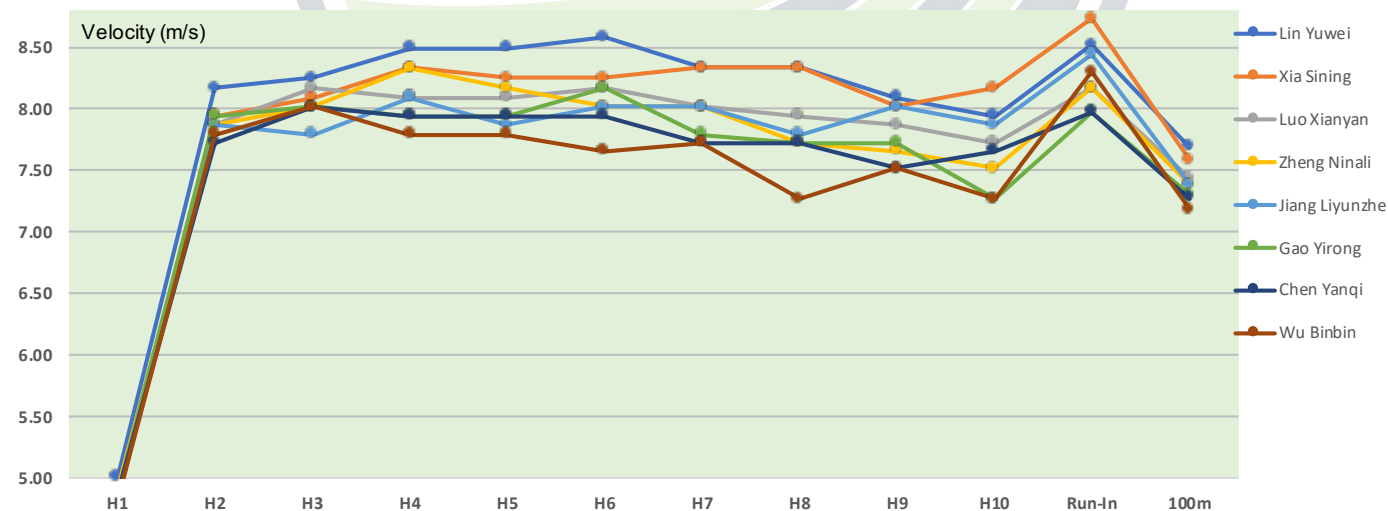
100m Hurdles

Date: 2023.09.02

Wind: 0.1 m/s

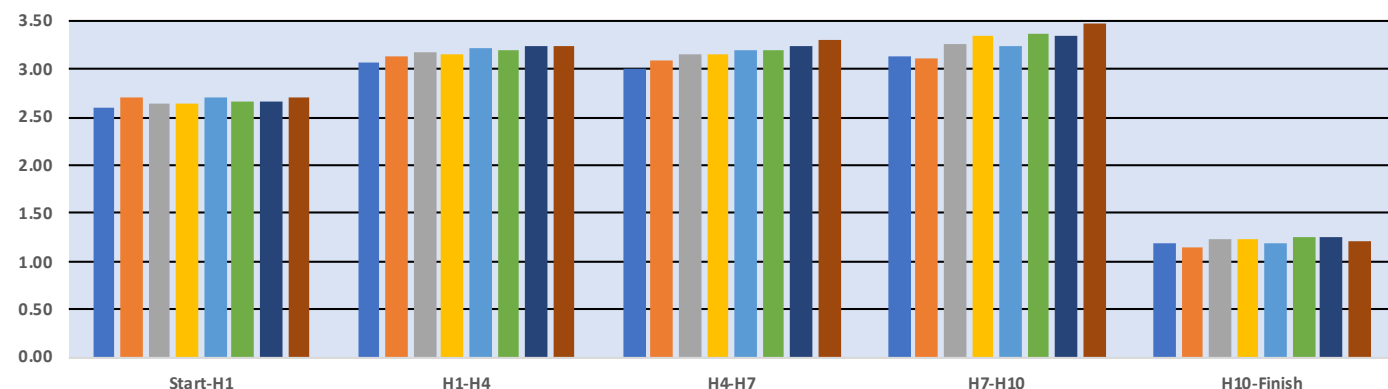
National FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Lin Yuwei (CHN) (1999)	time		2.60	3.64	4.67	5.67	6.67	7.66	8.68	9.70	10.75	11.82		13.00	5 / 1			
	reaction time	0.139											1.18			3.07	3.01	3.14
	interval			1.04	1.03	1.00	1.00	0.99	1.02	1.02	1.05	1.07	1.18			8.31	8.47	8.12
Xia Sining (CHN) (2003)	time		2.70	3.77	4.82	5.84	6.87	7.90	8.92	9.94	11.00	12.04		13.19	6 / 2			
	reaction time	0.158											1.15			3.14	3.08	3.12
	interval			1.07	1.05	1.02	1.03	1.03	1.02	1.02	1.06	1.04	1.15			8.12	8.28	8.17
Luo Xianyan (CHN) (1997)	time		2.65	3.73	4.77	5.82	6.87	7.91	8.97	10.04	11.12	12.22		13.45	7 / 3			
	reaction time	0.158											1.23			3.17	3.15	3.25
	interval			1.08	1.04	1.05	1.05	1.04	1.06	1.07	1.08	1.10	1.23			8.04	8.10	7.85
Zheng Ninali (CHN) (1998)	time		2.65	3.73	4.79	5.81	6.85	7.91	8.97	10.07	11.18	12.31		13.54	2 / 4			
	reaction time	0.169											1.23			3.16	3.16	3.34
	interval			1.08	1.06	1.02	1.04	1.06	1.06	1.10	1.11	1.13	1.23			8.07	8.07	7.63
Jiang Liyunzhe (CHN) (2002)	time		2.70	3.78	4.87	5.92	7.00	8.06	9.12	10.21	11.27	12.35		13.54	4 / 5			
	reaction time	0.155											1.19			3.22	3.20	3.23
	interval			1.08	1.09	1.05	1.08	1.06	1.06	1.09	1.06	1.08	1.19			7.92	7.97	7.89
Gao Yirong (CHN) (2004)	time		2.67	3.74	4.80	5.87	6.94	7.98	9.07	10.17	11.27	12.44		13.70	8 / 6			
	reaction time	0.161											1.26			3.20	3.20	3.37
	interval			1.07	1.06	1.07	1.07	1.04	1.09	1.10	1.10	1.17	1.26			7.97	7.97	7.57
Chen Yanqi (CHN) (2006)	time		2.67	3.77	4.83	5.90	6.97	8.04	9.14	10.24	11.37	12.48		13.74	9 / 7			
	reaction time	0.154											1.26	PB		3.23	3.24	3.34
	interval			1.10	1.06	1.07	1.07	1.07	1.10	1.10	1.13	1.11	1.26			7.89	7.87	7.63
Wu Binbin (CHN) (2006)	time		2.70	3.79	4.85	5.94	7.03	8.14	9.24	10.41	11.54	12.71		13.92	3 / 8			
	reaction time	0.159											1.21			3.24	3.30	3.47
	interval			1.09	1.06	1.09	1.09	1.11	1.10	1.17	1.13	1.17	1.21			7.87	7.73	7.35



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1080 @ 30fps
 Timing From: First Movement
 Sources: Video from Coach

2023 Weltklasse (Zürich, SUI)

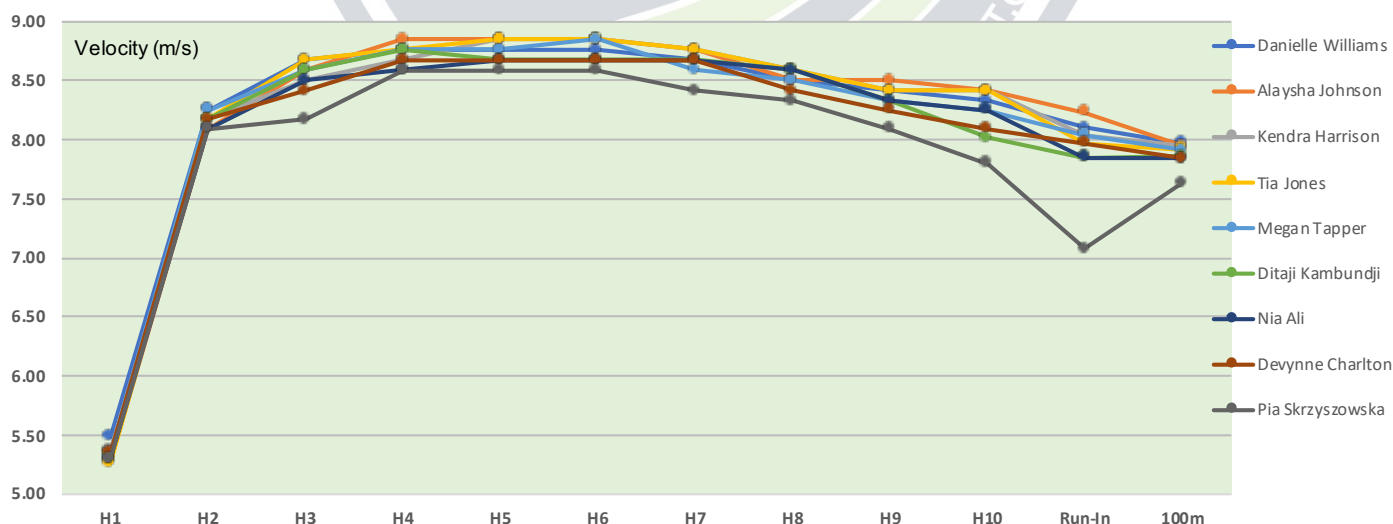
100m Hurdles

Date: 2023.08.31

Wind: -0.2 m/s

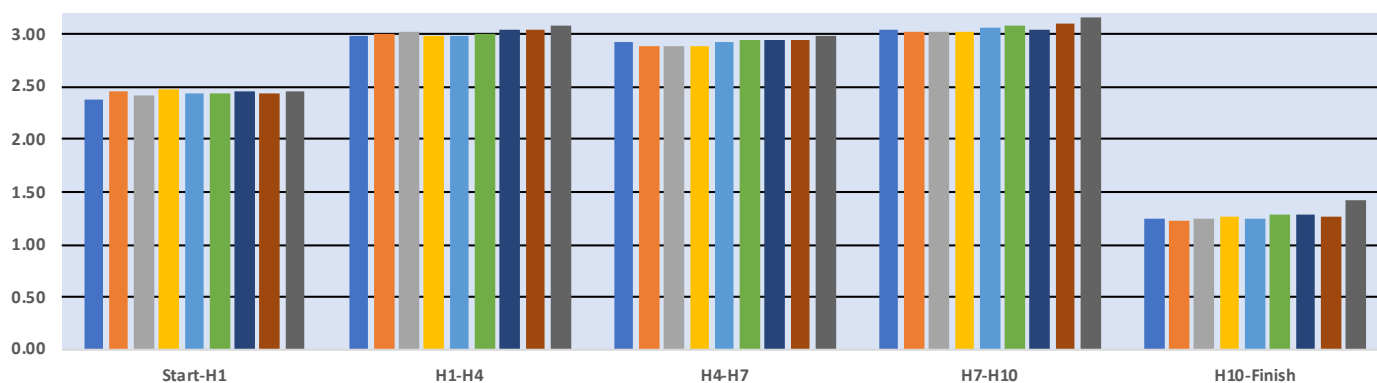
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Williams, Danielle (JAM) (1992)	time	2.37	3.40	4.38	5.35	6.32	7.29	8.27	9.27	10.28	11.30		12.54	3 / 1			
	reaction time	0.122										1.24			2.98	2.92	3.03
	interval velocity		1.03	0.98	0.97	0.97	0.97	0.98	1.00	1.01	1.02	1.24			8.56	8.73	8.42
Johnson, Alaysha (USA) (1996)	time	2.46	3.51	4.50	5.46	6.42	7.38	8.35	9.35	10.35	11.36		12.58	7 / 2			
	reaction time	0.151										1.22			3.00	2.89	3.01
	interval velocity		1.05	0.99	0.96	0.96	0.96	0.97	1.00	1.00	1.01	1.22			8.50	8.82	8.47
Harrison, Kendra (USA) (1992)	time	2.42	3.46	4.46	5.44	6.40	7.36	8.33	9.32	10.33	11.34		12.59	5 / 3			
	reaction time	0.145										1.25			3.02	2.89	3.01
	interval velocity		1.04	1.00	0.98	0.96	0.96	0.97	0.99	1.01	1.01	1.25			8.44	8.82	8.47
Jones, Tia (USA) (2000)	time	2.47	3.51	4.49	5.46	6.42	7.38	8.35	9.34	10.35	11.36		12.62	6 / 4			
	reaction time	0.150										1.26			2.99	2.89	3.01
	interval velocity		1.04	0.98	0.97	0.96	0.96	0.97	0.99	1.01	1.01	1.26			8.53	8.82	8.47
Tapper, Megan (JAM) (1994)	time	2.43	3.46	4.45	5.42	6.39	7.35	8.34	9.34	10.36	11.39		12.64	8 / 5			
	reaction time	0.150										1.25			2.99	2.92	3.05
	interval velocity		1.03	0.99	0.97	0.97	0.96	0.99	1.00	1.02	1.03	1.25			8.53	8.73	8.36
Kambundji, Ditaji (SUI) (2002)	time	2.44	3.48	4.47	5.44	6.42	7.40	8.38	9.37	10.39	11.45		12.73	2 / 6			
	reaction time	0.122										1.28			3.00	2.94	3.07
	interval velocity		1.04	0.99	0.97	0.98	0.98	0.98	0.99	1.02	1.06	1.28			8.50	8.67	8.31
Ali, Nia (USA) (1988)	time	2.45	3.50	4.50	5.49	6.47	7.45	8.43	9.42	10.44	11.47		12.75	4 / 7			
	reaction time	0.165										1.28			3.04	2.94	3.04
	interval velocity		1.05	1.00	0.99	0.98	0.98	0.98	0.99	1.02	1.03	1.28			8.39	8.67	8.39
Charlton, Devynne (BAH) (1995)	time	2.43	3.47	4.48	5.46	6.44	7.42	8.40	9.41	10.44	11.49		12.75	1 / 8			
	reaction time	0.152										1.26			3.03	2.94	3.09
	interval velocity		1.04	1.01	0.98	0.98	0.98	0.98	1.01	1.03	1.05	1.26			8.42	8.67	8.25
Skrzysowska, Pia (POL) (2001)	time	2.45	3.50	4.54	5.53	6.52	7.51	8.52	9.54	10.59	11.68		13.10	9 / 9			
	reaction time	0.134										1.42			3.08	2.99	3.16
	interval velocity		1.05	1.04	0.99	0.99	0.99	1.01	1.02	1.05	1.09	1.42			8.28	8.53	8.07



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 21:40) - diamond league race analysis

<https://www.omegatiming.com/File/0002030D01010E0101EEEEEEEEEEEE4D.pdf>Video: <https://www.youtube.com/watch?v=0RN5j9bhKXU>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

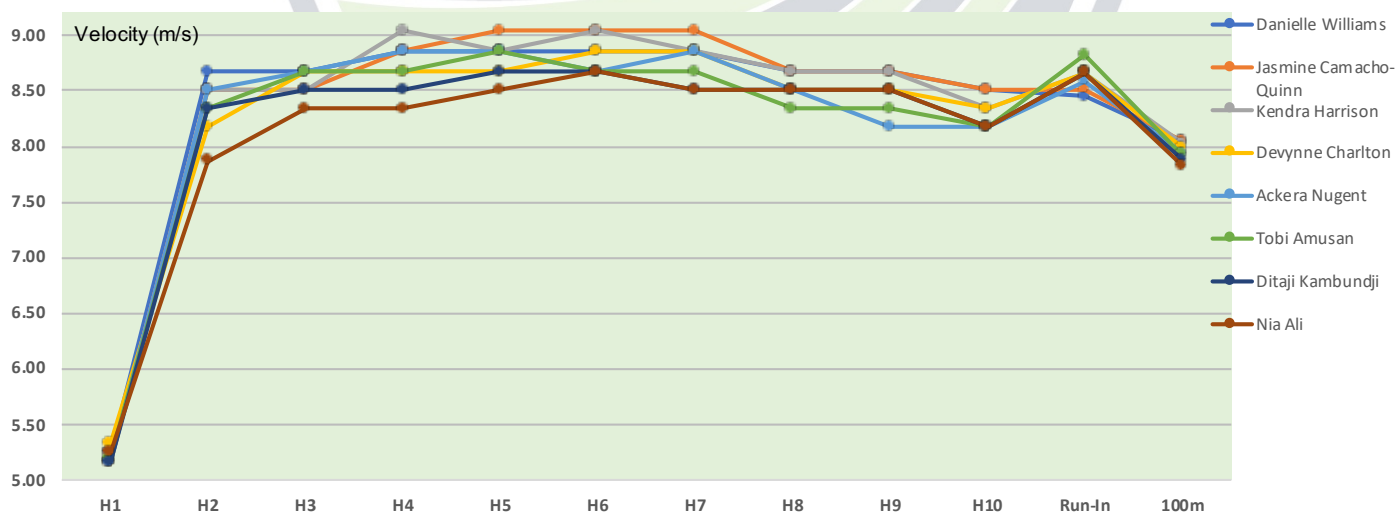
100m Hurdles

Date: 2023.08.24

Wind: -0.2 m/s

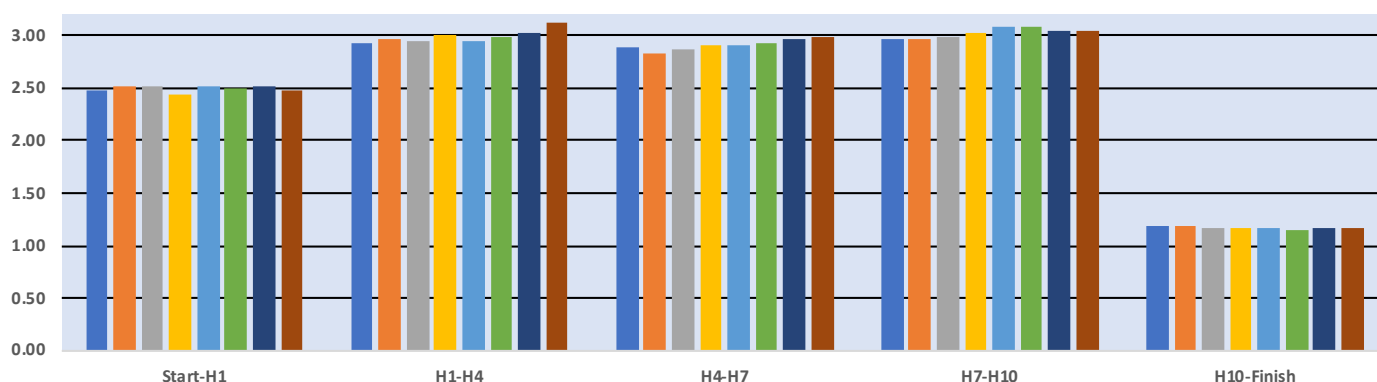
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Williams, Danielle (JAM) (1992)	time	2.48	3.46	4.44	5.40	6.36	7.32	8.28	9.26	10.24	11.24		12.43	2 / 1			
	reaction time	0.132										1.19			2.92	2.88	2.96
	interval		0.98	0.98	0.96	0.96	0.96	0.96	0.98	0.98	1.00	1.19			8.73	8.85	8.61
Camacho-Quinn, Jasmine (PUR) (199)	time	2.52	3.52	4.52	5.48	6.42	7.36	8.30	9.28	10.26	11.26		12.44	7 / 2			
	reaction time	0.164										1.18			2.96	2.82	2.96
	interval		1.00	1.00	0.96	0.94	0.94	0.94	0.98	0.98	1.00	1.18			8.61	9.04	8.61
Harrison, Kendra (USA) (1992)	time	2.52	3.52	4.52	5.46	6.42	7.36	8.32	9.30	10.28	11.30		12.46	4 / 3			
	reaction time	0.155										1.16			2.94	2.86	2.98
	interval		1.00	1.00	0.94	0.96	0.94	0.96	0.98	0.98	1.02	1.16			8.67	8.92	8.56
Charlton, Devynne (BAH) (1995)	time	2.44	3.48	4.46	5.44	6.42	7.38	8.34	9.34	10.34	11.36		12.52	6 / 4			
	reaction time	0.149										1.16			3.00	2.90	3.02
	interval		1.04	0.98	0.98	0.98	0.96	0.96	1.00	1.00	1.02	1.16			8.50	8.79	8.44
Nugent, Ackera (JAM) (2002)	time	2.52	3.52	4.50	5.46	6.42	7.40	8.36	9.36	10.40	11.44		12.61	8 / 5			
	reaction time	0.135										1.17			2.94	2.90	3.08
	interval		1.00	0.98	0.96	0.96	0.98	0.96	1.00	1.04	1.04	1.17			8.67	8.79	8.28
Amusan, Tobi (NGR) (1997)	time	2.50	3.52	4.50	5.48	6.44	7.42	8.40	9.42	10.44	11.48		12.62	5 / 6			
	reaction time	0.152										1.14			2.98	2.92	3.08
	interval		1.02	0.98	0.98	0.96	0.98	0.98	1.02	1.02	1.04	1.14			8.56	8.73	8.28
Kambundji, Ditaji (SUI) (2002)	time	2.52	3.54	4.54	5.54	6.52	7.50	8.50	9.50	10.50	11.54		12.70	9 / 7			
	reaction time	0.140										1.16			3.02	2.96	3.04
	interval		1.02	1.00	1.00	0.98	0.98	1.00	1.00	1.00	1.04	1.16			8.44	8.61	8.39
Ali, Nia (USA) (1988)	time	2.48	3.56	4.58	5.60	6.60	7.58	8.58	9.58	10.58	11.62		12.78	3 / 8			
	reaction time	0.159										1.16			3.12	2.98	3.04
	interval		1.08	1.02	1.02	1.00	0.98	1.00	1.00	1.00	1.04	1.16			8.17	8.56	8.39
	velocity	5.24	8.67	8.67	8.85	8.85	8.85	8.85	8.67	8.67	8.50	8.45	8.05				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ZP37H2mcdkI>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

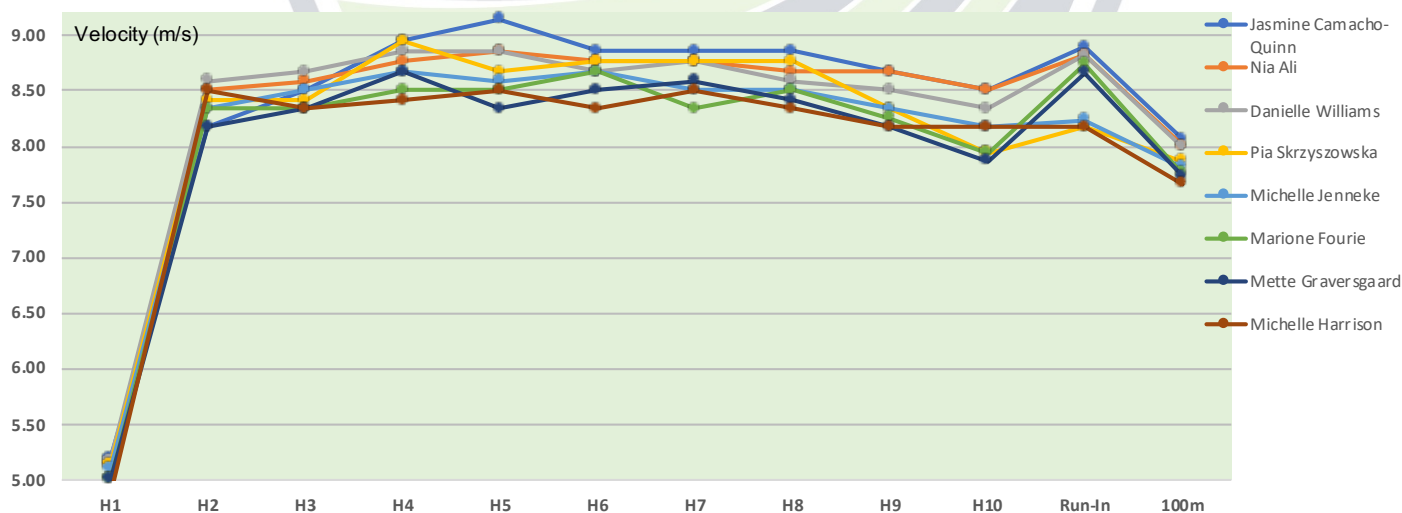
100m Hurdles

Date: 2023.08.23

Wind: -0.4 m/s

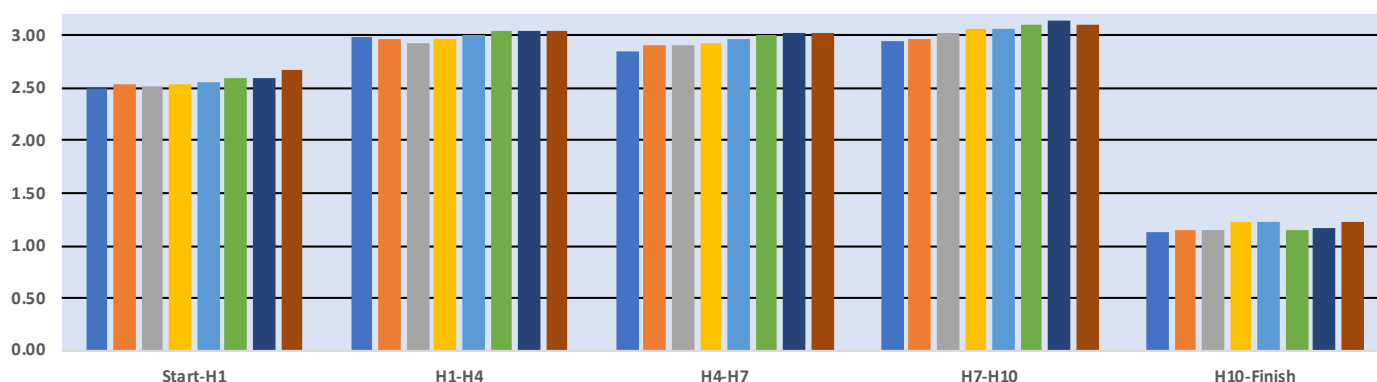
Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.50	3.54	4.54	5.49	6.42	7.38	8.34	9.30	10.28	11.28		12.41	5 / 1			
	reaction time	0.138											1.13			2.99	2.85	2.94
	interval velocity		5.20	8.17	8.50	8.95	9.14	8.85	8.85	8.85	8.67	8.50	8.89	8.06		8.53	8.95	8.67
Ali, Nia (USA) (1988)	time		2.53	3.53	4.52	5.49	6.45	7.42	8.39	9.37	10.35	11.35		12.49	6 / 2			
	reaction time	0.156											1.14			2.96	2.90	2.96
	interval velocity		5.14	8.50	8.59	8.76	8.85	8.76	8.76	8.67	8.67	8.50	8.82	8.01		8.61	8.79	8.61
Williams, Danielle (JAM) (1992)	time		2.51	3.50	4.48	5.44	6.40	7.38	8.35	9.34	10.34	11.36		12.50	4 / 3			
	reaction time	0.133											1.14			2.93	2.91	3.01
	interval velocity		5.18	8.59	8.67	8.85	8.85	8.67	8.76	8.59	8.50	8.33	8.82	8.00		8.70	8.76	8.47
Skrzysowska, Pia (POL) (2001)	time		2.53	3.54	4.55	5.50	6.48	7.45	8.42	9.39	10.41	11.48		12.71	7 / 4			
	reaction time	0.136											1.23			2.97	2.92	3.06
	interval velocity		5.14	8.42	8.42	8.95	8.67	8.76	8.76	8.76	8.33	7.94	8.17	7.87		8.59	8.73	8.33
Jenneke, Michelle (AUS) (1993)	time		2.55	3.57	4.57	5.55	6.54	7.52	8.52	9.52	10.54	11.58		12.80	3 / 5			
	reaction time	0.146											1.22			3.00	2.97	3.06
	interval velocity		5.10	8.33	8.50	8.67	8.59	8.67	8.50	8.50	8.33	8.17	8.24	7.81		8.50	8.59	8.33
Fourie, Marione (RSA) (2002)	time		2.60	3.62	4.64	5.64	6.64	7.62	8.64	9.64	10.67	11.74		12.89	8 / 6			
	reaction time	0.158											1.15			3.04	3.00	3.10
	interval velocity		5.00	8.33	8.33	8.50	8.50	8.67	8.33	8.50	8.25	7.94	8.74	7.76		8.39	8.50	8.23
Graversgaard, Mette (DEN) (1995)	time		2.60	3.64	4.66	5.64	6.66	7.66	8.65	9.66	10.70	11.78		12.94	9 / 7			
	reaction time	0.163											1.16			3.04	3.01	3.13
	interval velocity		5.00	8.17	8.33	8.67	8.33	8.50	8.59	8.42	8.17	7.87	8.66	7.73		8.39	8.47	8.15
Harrison, Michelle (CAN) (1992)	time		2.67	3.67	4.69	5.70	6.70	7.72	8.72	9.74	10.78	11.82		13.05	2 / 8			
	reaction time	0.158											1.23			3.03	3.02	3.10
	interval velocity		4.87	8.50	8.33	8.42	8.50	8.33	8.50	8.33	8.17	8.17	8.17	7.66		8.42	8.44	8.23



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=Dl7mFHJLP8>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

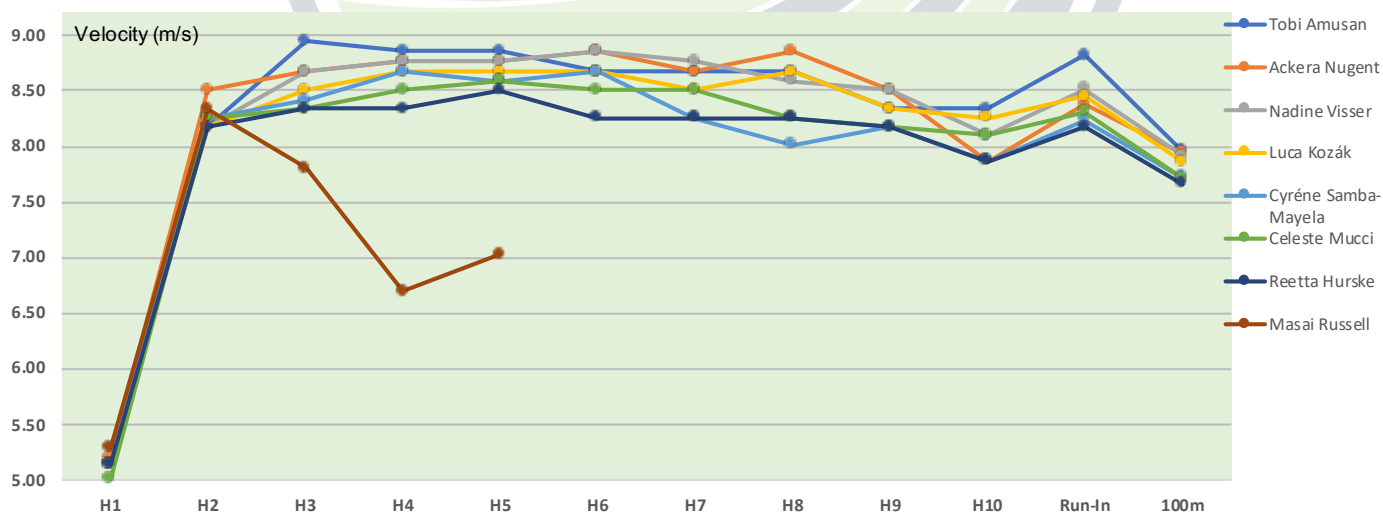
100m Hurdles

Date: 2023.08.23

Wind: -0.7 m/s

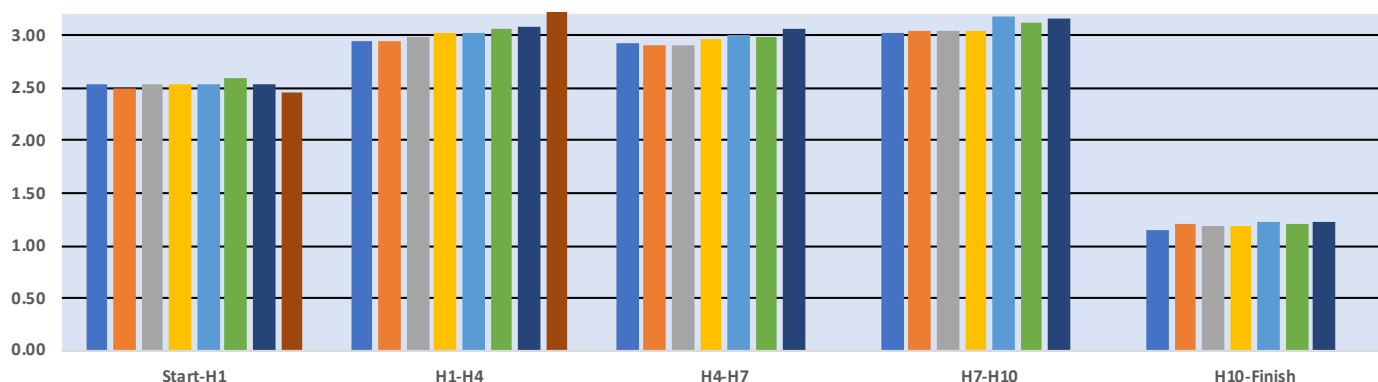
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time		2.53	3.57	4.52	5.48	6.44	7.42	8.40	9.38	10.40	11.42		12.56	7 / 1			
	reaction time	0.155											1.14			2.95	2.92	3.02
	interval velocity		5.14	8.17	8.95	8.85	8.85	8.67	8.67	8.67	8.33	8.33	8.82	7.96		8.64	8.73	8.44
Nugent, Ackera (JAM) (2002)	time		2.50	3.50	4.48	5.45	6.42	7.38	8.36	9.32	10.32	11.40		12.60	5 / 2			
	reaction time	0.130											1.20			2.95	2.91	3.04
	interval velocity		5.20	8.50	8.67	8.76	8.76	8.85	8.67	8.85	8.50	7.87	8.38	7.94		8.64	8.76	8.39
Visser, Nadine (NED) (1995)	time		2.53	3.57	4.55	5.52	6.49	7.45	8.42	9.41	10.41	11.46		12.64	6 / 3			
	reaction time	0.131											1.18			2.99	2.90	3.04
	interval velocity		5.14	8.17	8.67	8.76	8.76	8.85	8.76	8.59	8.50	8.10	8.52	7.91		8.53	8.79	8.39
Kozák, Luca (HUN) (1996)	time		2.53	3.57	4.57	5.55	6.53	7.51	8.51	9.49	10.51	11.54		12.73	3 / 4			
	reaction time	0.142											1.19			3.02	2.96	3.03
	interval velocity		5.14	8.17	8.50	8.67	8.67	8.67	8.50	8.67	8.33	8.25	8.45	7.86		8.44	8.61	8.42
Samba-Mayela, Cyréna (FRA) (2000)	time		2.53	3.56	4.57	5.55	6.54	7.52	8.55	9.61	10.65	11.73		12.95	8 / 5			
	reaction time	0.170											1.22			3.02	3.00	3.18
	interval velocity		5.14	8.25	8.42	8.67	8.59	8.67	8.25	8.02	8.17	7.87	8.24	7.72		8.44	8.50	8.02
Mucci, Celeste (AUS) (1999)	time		2.60	3.63	4.65	5.65	6.64	7.64	8.64	9.67	10.71	11.76		12.97	2 / 6			
	reaction time	0.175											1.21			3.05	2.99	3.12
	interval velocity		5.00	8.25	8.33	8.50	8.59	8.50	8.50	8.25	8.17	8.10	8.31	7.71		8.36	8.53	8.17
Hurske, Reetta (FIN) (1995)	time		2.53	3.57	4.59	5.61	6.61	7.64	8.67	9.70	10.74	11.82		13.05	9 / 7			
	reaction time	0.137											1.23			3.08	3.06	3.15
	interval velocity		5.14	8.17	8.33	8.33	8.50	8.25	8.25	8.25	8.17	7.87	8.17	7.66		8.28	8.33	8.10
Russell, Masai (USA) (2000)	time		2.46	3.48	4.57	5.84	7.05							dnf	4 / --			
	reaction time	0.152														3.38		
	interval velocity		5.28	8.33	7.80	6.69	7.02									7.54		



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=QbrXXlQ-IDY>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

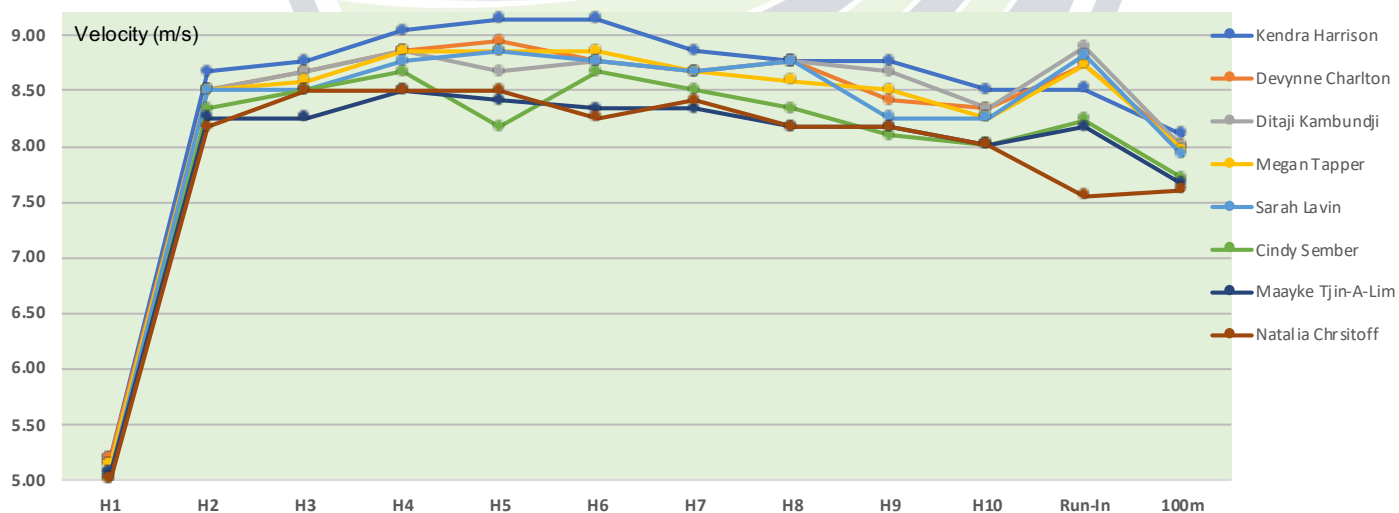
100m Hurdles

Date: 2023.08.23

Wind: 0.5 m/s

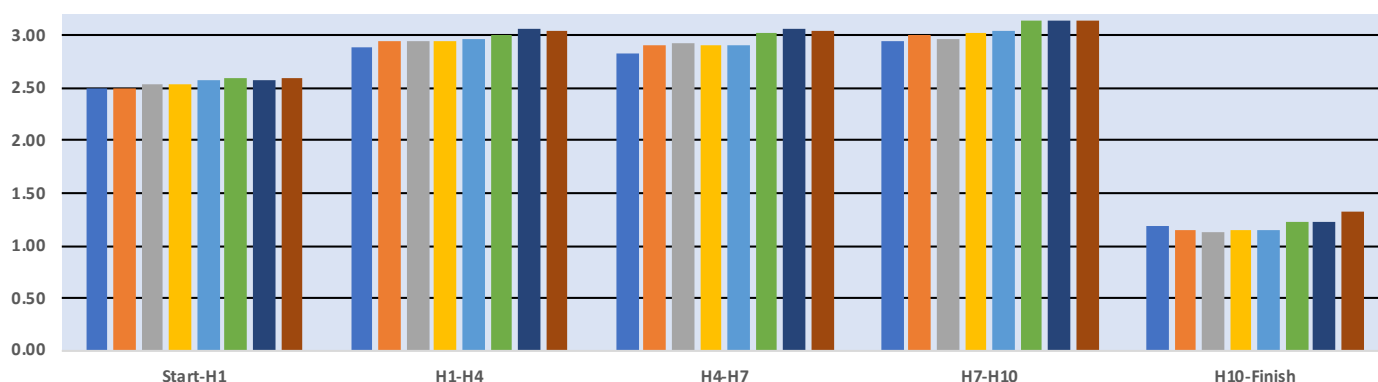
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.50	3.48	4.45	5.39	6.32	7.25	8.21	9.18	10.15	11.15		12.33	7 / 1			
	reaction time	0.142													2.89	2.82	2.94
	interval velocity		0.98	0.97	0.94	0.93	0.93	0.96	0.97	0.97	1.00	1.18			8.82	9.04	8.67
Charlton, Devynne (BAH) (1995)	time	2.50	3.50	4.48	5.44	6.39	7.36	8.34	9.31	10.32	11.34		12.49	6 / 2			
	reaction time	0.177													2.94	2.90	3.00
	interval velocity		1.00	0.98	0.96	0.95	0.97	0.98	0.97	1.01	1.02	1.15			8.67	8.79	8.50
Kambundji, Ditaji (SUI) (2002)	time	2.53	3.53	4.51	5.47	6.45	7.42	8.40	9.37	10.35	11.37		12.50	3 / 3			
	reaction time	0.141													2.94	2.93	2.97
	interval velocity		1.00	0.98	0.96	0.98	0.97	0.98	0.97	0.98	1.02	1.13			8.67	8.70	8.59
Tapper, Megan (JAM) (1994)	time	2.53	3.53	4.52	5.48	6.44	7.40	8.38	9.37	10.37	11.40		12.55	5 / 4			
	reaction time	0.162													2.95	2.90	3.02
	interval velocity		1.00	0.99	0.96	0.96	0.96	0.98	0.99	1.00	1.03	1.15			8.64	8.79	8.44
Lavin, Sarah (IRL) (1994)	time	2.57	3.57	4.57	5.54	6.50	7.47	8.45	9.42	10.45	11.48		12.62	4 / 5			
	reaction time	0.139													2.97	2.91	3.03
	interval velocity		1.00	1.00	0.97	0.96	0.97	0.98	0.97	1.03	1.03	1.14	NR		8.59	8.76	8.42
Sember, Cindy (GBR) (1994)	time	2.60	3.62	4.62	5.60	6.64	7.62	8.62	9.64	10.69	11.75		12.97	8 / 6			
	reaction time	0.167													3.00	3.02	3.13
	interval velocity		1.02	1.00	0.98	1.04	0.98	1.00	1.02	1.05	1.06	1.22			8.50	8.44	8.15
Tjin-A-Lim, Maayke (NED) (1998)	time	2.57	3.60	4.63	5.63	6.64	7.66	8.68	9.72	10.76	11.82		13.05	2 / 7			
	reaction time	0.135													3.06	3.05	3.14
	interval velocity		1.03	1.03	1.00	1.01	1.02	1.02	1.04	1.04	1.06	1.23			8.33	8.36	8.12
Christofi, Natalia (CYP) (1997)	time	2.60	3.64	4.64	5.64	6.64	7.67	8.68	9.72	10.76	11.82		13.15	9 / 8			
	reaction time	0.155													3.04	3.04	3.14
	interval velocity		1.04	1.00	1.00	1.00	1.03	1.01	1.04	1.04	1.06	1.33			8.39	8.39	8.12



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=fdoMsTTIQIQ>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

100m Hurdles

Date: 2023.08.22

Wind: 0.4 m/s

Heat 5

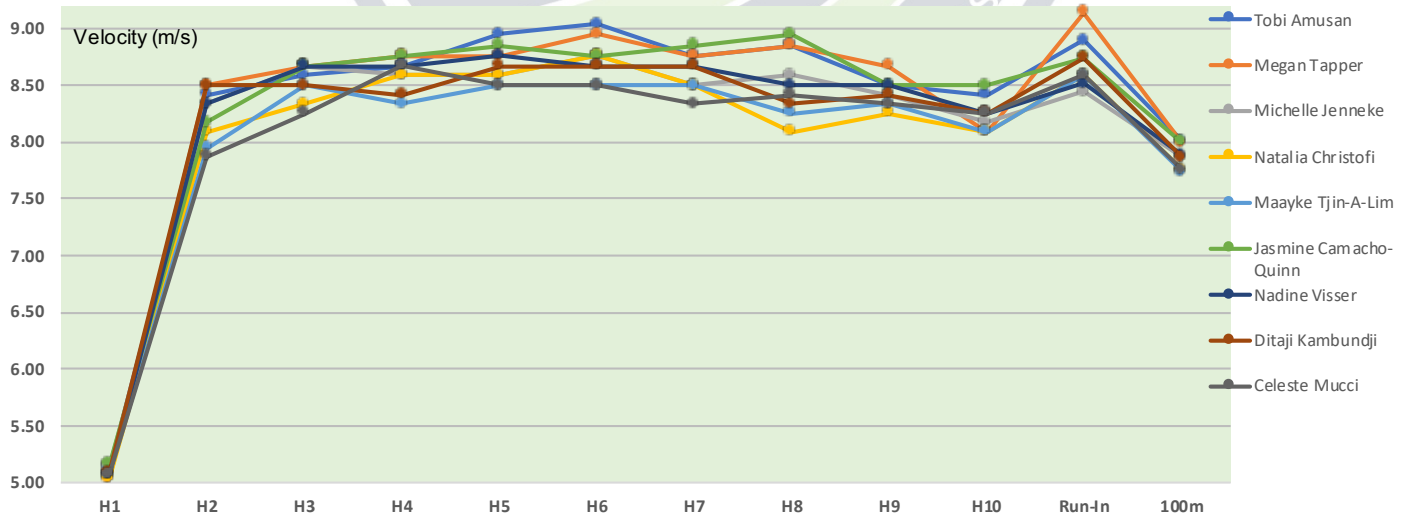
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time		2.54	3.55	4.54	5.52	6.47	7.41	8.38	9.34	10.34	11.35		12.48	4 / 1			
	reaction time	0.149											1.13			2.98	2.86	2.97
	interval velocity		5.12	8.42	8.59	8.67	8.95	9.04	8.76	8.85	8.50	8.42	8.89	8.01		8.56	8.92	8.59
Tapper, Megan (JAM) (1994)	time		2.58	3.58	4.56	5.53	6.50	7.45	8.42	9.38	10.36	11.41		12.51	3 / 2			
	reaction time	0.168											1.10			2.95	2.89	2.99
	interval velocity		5.04	8.50	8.67	8.76	8.76	8.95	8.76	8.85	8.67	8.10	9.14	7.99		8.64	8.82	8.53
Jenneke, Michelle (AUS) (1993)	time		2.53	3.55	4.53	5.52	6.51	7.48	8.48	9.47	10.48	11.52		12.71	5 / 3			
	reaction time	0.156											1.19			2.99	2.96	3.04
	interval velocity		5.14	8.33	8.67	8.59	8.59	8.76	8.50	8.59	8.42	8.17	8.45	7.87		8.53	8.61	8.39
Christofi, Natalia (CYP) (1997)	time		2.58	3.63	4.65	5.64	6.63	7.60	8.60	9.65	10.68	11.73		12.90	7 / 4			
	reaction time	0.147											1.17			3.06	2.96	3.13
	interval velocity		5.04	8.10	8.33	8.59	8.59	8.76	8.50	8.10	8.25	8.10	8.59	7.75		8.33	8.61	8.15
Tjin-A-Lim, Maayke (NED) (1998)	time		2.56	3.63	4.63	5.65	6.65	7.65	8.65	9.68	10.70	11.75		12.92	2 / 5			
	reaction time	0.155											1.17			3.09	3.00	3.10
	interval velocity		5.08	7.94	8.50	8.33	8.50	8.50	8.50	8.25	8.33	8.10	8.59	7.74		8.25	8.50	8.23

Date: 2023.08.22

Wind: 0.0 m/s

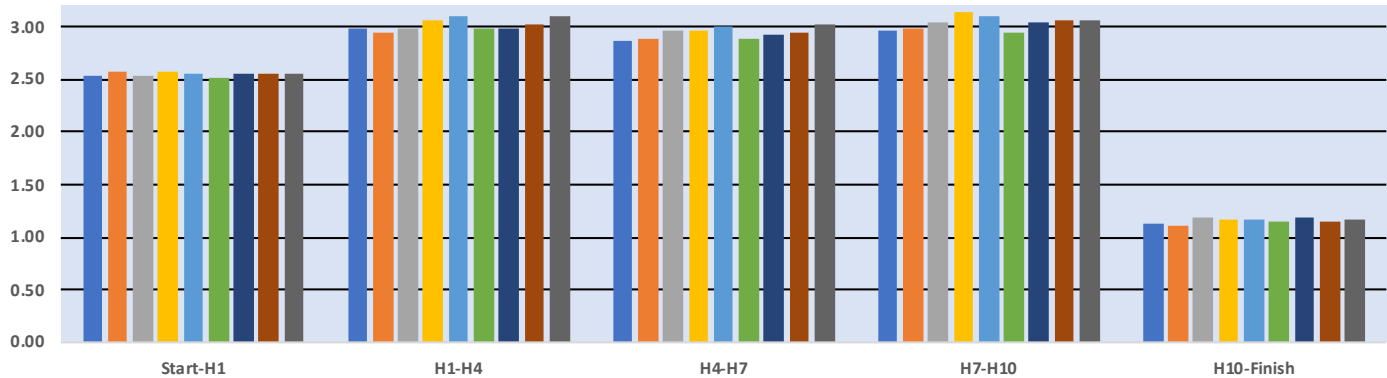
Heat 4

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.52	3.56	4.54	5.51	6.47	7.44	8.40	9.35	10.35	11.35		12.50	9 / 1			
	reaction time	0.160											1.15			2.99	2.89	2.95
	interval velocity		5.16	8.17	8.67	8.76	8.85	8.76	8.85	8.95	8.50	8.50	8.74	8.00		8.53	8.82	8.64
Visser, Nadine (NED) (1995)	time		2.56	3.58	4.56	5.54	6.51	7.49	8.47	9.47	10.47	11.50		12.68	4 / 2			
	reaction time	0.146											1.18			2.98	2.93	3.03
	interval velocity		5.08	8.33	8.67	8.67	8.76	8.67	8.67	8.50	8.50	8.25	8.52	7.89		8.56	8.70	8.42
Kambundji, Ditaji (SUI) (2002)	time		2.55	3.55	4.55	5.56	6.54	7.52	8.50	9.52	10.53	11.56		12.71	2 / 3			
	reaction time	0.145											1.15			3.01	2.94	3.06
	interval velocity		5.10	8.50	8.50	8.42	8.67	8.67	8.67	8.33	8.42	8.25	8.74	7.87		8.47	8.67	8.33
Mucci, Celeste (AUS) (1999)	time		2.56	3.64	4.67	5.65	6.65	7.65	8.67	9.68	10.70	11.73		12.90	3 / 4			
	reaction time	0.171											1.17			3.09	3.02	3.06
	interval velocity		5.08	7.87	8.25	8.67	8.50	8.50	8.33	8.42	8.33	8.25	8.59	7.75		8.25	8.44	8.33



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: https://www.youtube.com/watch?v=j_2pRKl4xA&t=195s

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

100m Hurdles

Date: 2023.08.22

Wind: 0.1 m/s

Heat 3

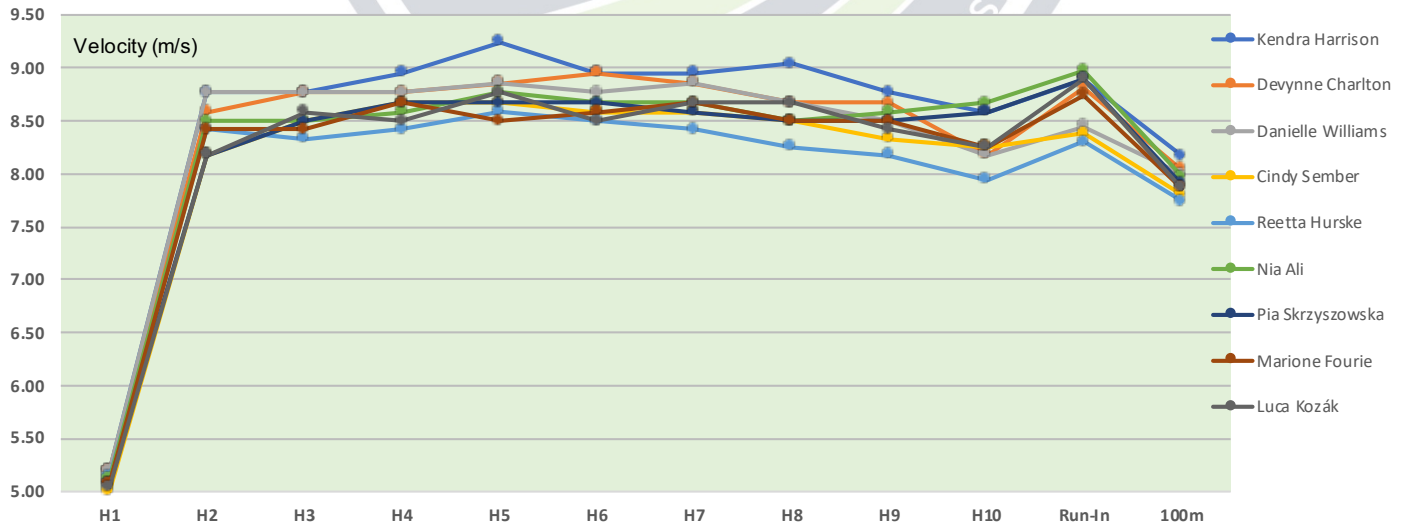
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time		2.50	3.47	4.44	5.39	6.31	7.26	8.21	9.15	10.12	11.11		12.24	4 / 1			
	reaction time	0.155		0.97	0.97	0.95	0.92	0.95	0.95	0.94	0.97	0.99	1.13			2.89	2.82	2.90
	velocity		5.20	8.76	8.76	8.95	9.24	8.95	8.95	9.04	8.76	8.59	8.89	8.17		8.82	9.04	8.79
Charlton, Devynne (BAH) (1995)	time		2.50	3.49	4.46	5.43	6.39	7.34	8.30	9.28	10.26	11.30		12.44	9 / 2			
	reaction time	0.159		0.99	0.97	0.97	0.96	0.95	0.96	0.98	0.98	1.04	1.14			2.93	2.87	3.00
	interval velocity		5.20	8.59	8.76	8.76	8.85	8.95	8.85	8.67	8.67	8.17	8.82	8.04		8.70	8.89	8.50
Williams, Danielle (JAM) (1992)	time		2.50	3.47	4.44	5.41	6.37	7.34	8.30	9.28	10.28	11.32		12.51	3 / 3			
	reaction time	0.116		0.97	0.97	0.97	0.96	0.97	0.96	0.98	1.00	1.04	1.19			2.91	2.89	3.02
	interval velocity		5.20	8.76	8.76	8.76	8.85	8.76	8.85	8.67	8.50	8.17	8.45	7.99		8.76	8.82	8.44
Sember, Cindy (GBR) (1994)	time		2.60	3.64	4.64	5.62	6.60	7.59	8.58	9.58	10.60	11.63		12.83	8 / 4			
	reaction time	0.173		1.04	1.00	0.98	0.98	0.99	0.99	1.00	1.02	1.03	1.20			3.02	2.96	3.05
	interval velocity		5.00	8.17	8.50	8.67	8.67	8.59	8.59	8.50	8.33	8.25	8.38	7.79		8.44	8.61	8.36
Hurske, Reetta (FIN) (1995)	time		2.53	3.54	4.56	5.57	6.56	7.56	8.57	9.60	10.64	11.71		12.92	1 / 5			
	reaction time	0.140		1.01	1.02	1.01	0.99	1.00	1.01	1.03	1.04	1.07	1.21			3.04	3.00	3.14
	interval velocity		5.14	8.42	8.33	8.42	8.59	8.50	8.42	8.25	8.17	7.94	8.31	7.74		8.39	8.50	8.12

Date: 2023.08.22

Wind: 0.0 m/s

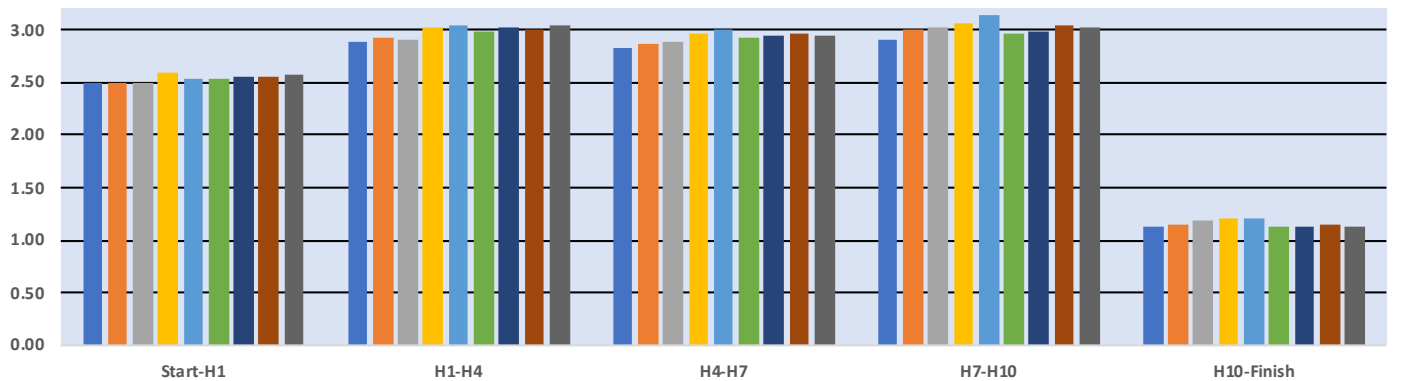
Heat 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time		2.54	3.54	4.54	5.53	6.50	7.48	8.46	9.46	10.45	11.43		12.55	5 / 1			
	reaction time	0.142		1.00	1.00	0.99	0.97	0.98	0.98	1.00	0.99	0.98	1.12			2.99	2.93	2.97
	interval velocity		5.12	8.50	8.50	8.59	8.76	8.67	8.67	8.50	8.59	8.67	8.97	7.97		8.53	8.70	8.59
Skrzysowska, Pia (POL) (2001)	time		2.56	3.60	4.60	5.58	6.56	7.54	8.53	9.53	10.53	11.52		12.65	4 / 2			
	reaction time	0.142		1.04	1.00	0.98	0.98	0.98	0.99	1.00	1.00	0.99	1.13			3.02	2.95	2.99
	interval velocity		5.08	8.17	8.50	8.67	8.67	8.67	8.59	8.50	8.50	8.59	8.89	7.91		8.44	8.64	8.53
Fourie, Marione (RSA) (2002)	time		2.56	3.57	4.58	5.56	6.56	7.55	8.53	9.53	10.53	11.56		12.71	2 / 3			
	reaction time	0.164		1.01	1.01	0.98	1.00	0.99	0.98	1.00	1.03	1.15				3.00	2.97	3.03
	interval velocity		5.08	8.42	8.42	8.67	8.50	8.59	8.67	8.50	8.50	8.25	8.74	7.87		8.50	8.59	8.42
Kozák, Luca (HUN) (1996)	time		2.58	3.62	4.61	5.61	6.58	7.58	8.56	9.54	10.55	11.58		12.71	6 / 3			
	reaction time	0.149		1.04	0.99	1.00	0.97	1.00	0.98	0.98	1.01	1.03	1.13			3.03	2.95	3.02
	interval velocity		5.04	8.17	8.59	8.50	8.76	8.50	8.67	8.67	8.42	8.25	8.89	7.87		8.42	8.64	8.44



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: https://www.youtube.com/watch?v=j_2pRKl4xA&t=195s

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

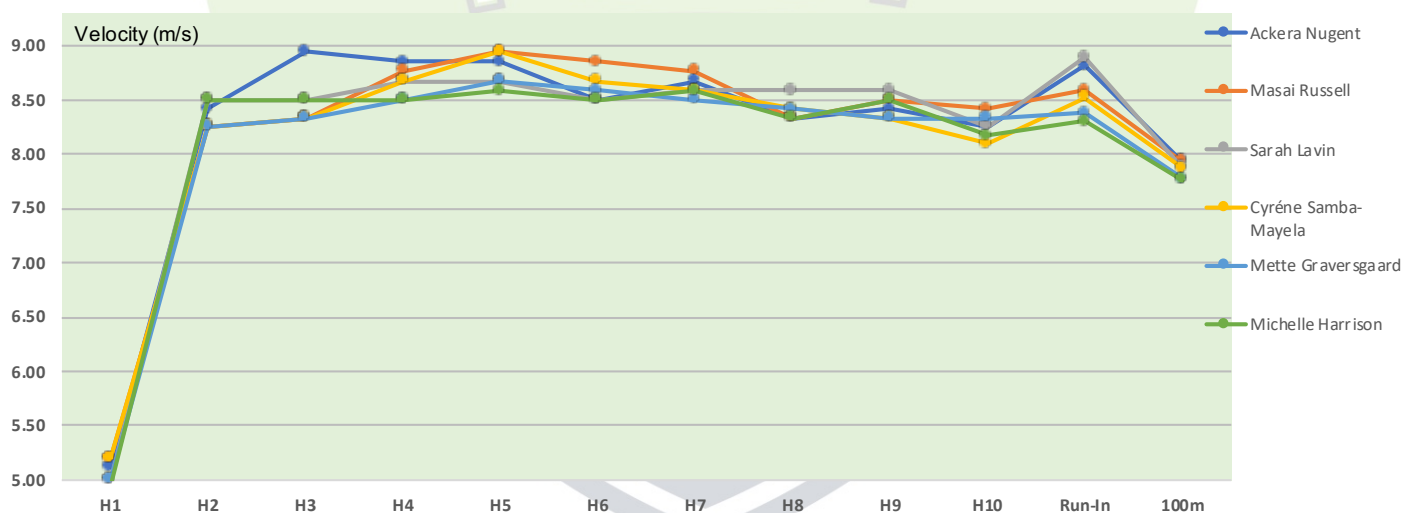
100m Hurdles

Date: 2023.08.22

Wind: 0.1 m/s

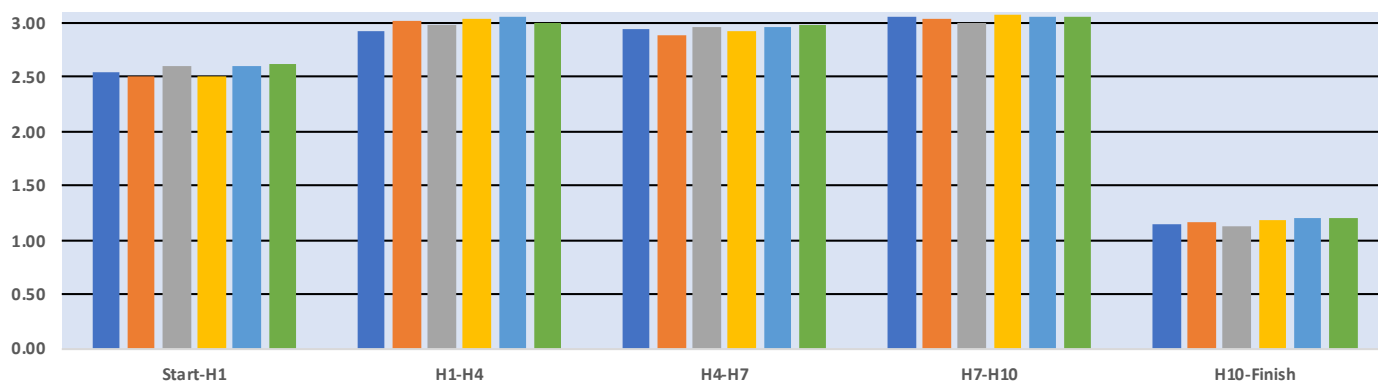
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nugent, Ackera (JAM) (2002)	time	2.54	3.55	4.50	5.46	6.42	7.42	8.40	9.42	10.43	11.46		12.60	7 / 1			
	reaction time	0.134													2.92	2.94	3.06
	interval velocity		1.01	0.95	0.96	0.96	1.00	0.98	1.02	1.01	1.03	1.14			8.73	8.67	8.33
Russell, Masai (USA) (2000)	time	2.50	3.53	4.55	5.52	6.47	7.43	8.40	9.42	10.42	11.43		12.60	6 / 2			
	reaction time	0.164													3.02	2.88	3.03
	interval velocity		1.03	1.02	0.97	0.95	0.96	0.97	1.02	1.00	1.01	1.17			8.44	8.85	8.42
Lavin, Sarah (IRL) (1994)	time	2.60	3.60	4.60	5.58	6.56	7.56	8.55	9.54	10.53	11.56		12.69	2 / 3			
	reaction time	0.139													2.98	2.97	3.01
	interval velocity		1.00	1.00	0.98	0.98	1.00	0.99	0.99	0.99	1.03	1.13			8.56	8.59	8.47
Samba-Mayela, Cyréna (FRA) (2000)	time	2.50	3.53	4.55	5.53	6.48	7.46	8.45	9.46	10.48	11.53		12.71	9 / 4			
	reaction time	0.144													3.03	2.92	3.08
	interval velocity		1.03	1.02	0.98	0.95	0.98	0.99	1.01	1.02	1.05	1.18			8.42	8.73	8.28
Graversgaard, Mette (DEN) (1995)	time	2.60	3.63	4.65	5.65	6.63	7.62	8.62	9.63	10.65	11.67		12.87	5 / 5			
	reaction time	0.166													3.05	2.97	3.05
	interval velocity		1.03	1.02	1.00	0.98	0.99	1.00	1.01	1.02	1.02	1.20			8.36	8.59	8.36
Harrison, Michelle (CAN) (1992)	time	2.63	3.63	4.63	5.63	6.62	7.62	8.61	9.63	10.63	11.67		12.88	8 / 6			
	reaction time	0.152													3.00	2.98	3.06
	interval velocity		1.00	1.00	1.00	0.99	1.00	0.99	1.02	1.00	1.04	1.21			8.50	8.56	8.33



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=i_2oeRKl4xA&t=195s

2023 Herculis Meeting International d'Athlétisme (Monaco, MON)

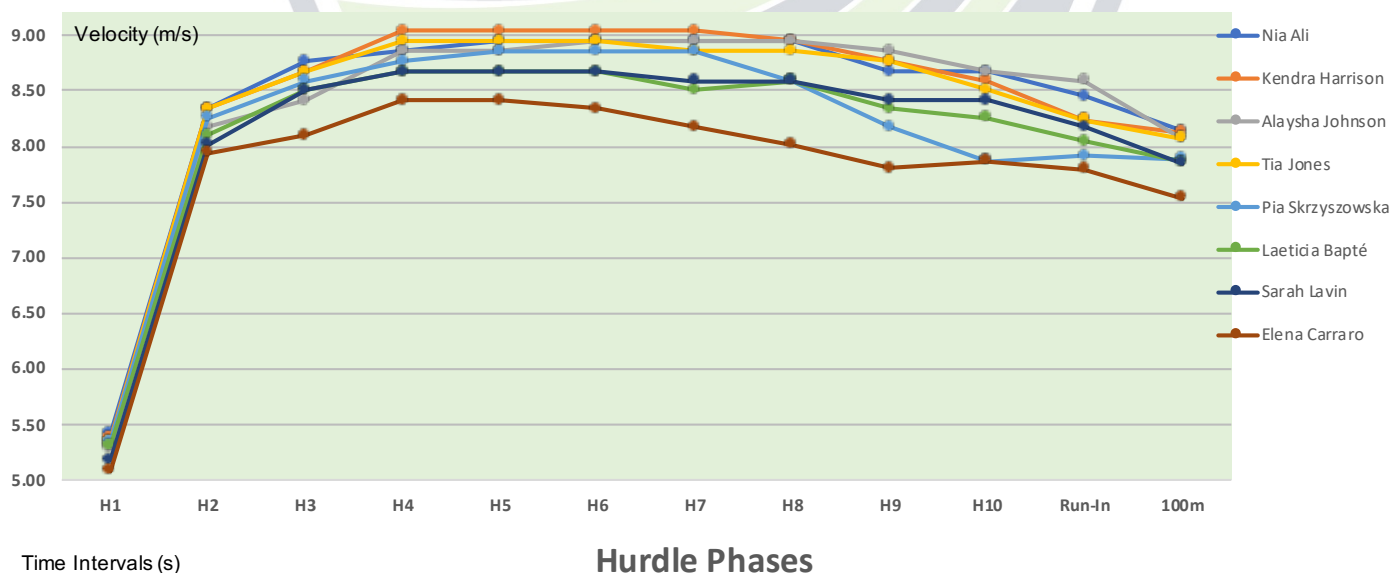
100m Hurdles

Date: 2023.07.21

Wind: 0.6 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.40	3.42	4.39	5.35	6.30	7.25	8.20	9.15	10.13	11.11		12.30	5 / 1			
	reaction time	0.153											PB		2.95	2.85	2.91
	interval		1.02	0.97	0.96	0.95	0.95	0.95	0.95	0.98	0.98	1.19	8.13		8.64	8.95	8.76
	velocity	5.42	8.33	8.76	8.85	8.95	8.95	8.95	8.95	8.67	8.67	8.45	8.13				
Harrison, Kendra (USA) 1992	time	2.42	3.44	4.42	5.36	6.30	7.24	8.18	9.13	10.10	11.09		12.31	4 / 2			
	reaction time	0.165										1.22			2.94	2.82	2.91
	interval		1.02	0.98	0.94	0.94	0.94	0.94	0.95	0.97	0.99	1.22	8.12		8.67	9.04	8.76
	velocity	5.37	8.33	8.67	9.04	9.04	9.04	9.04	8.95	8.76	8.59	8.24	8.12				
Johnson, Alaysha (USA) (1996)	time	2.46	3.50	4.51	5.47	6.43	7.38	8.33	9.28	10.24	11.22		12.39	2 / 3			
	reaction time	0.172										1.17			3.01	2.86	2.89
	interval		1.04	1.01	0.96	0.96	0.95	0.95	0.95	0.96	0.98	1.17	8.07		8.47	8.92	8.82
	velocity	5.28	8.17	8.42	8.85	8.85	8.95	8.95	8.95	8.85	8.67	8.59	8.07				
Jones, Tia (USA) (2000)	time	2.43	3.45	4.43	5.38	6.33	7.28	8.24	9.20	10.17	11.17		12.39	7 / 4			
	reaction time	0.156										1.22			2.95	2.86	2.93
	interval		1.02	0.98	0.95	0.95	0.95	0.96	0.96	0.97	1.00	1.22	8.07		8.64	8.92	8.70
	velocity	5.35	8.33	8.67	8.95	8.95	8.95	8.85	8.85	8.76	8.50	8.24	8.07				
Skrzysowska, Pia (POL) (2001)	time	2.43	3.46	4.45	5.42	6.38	7.34	8.30	9.29	10.33	11.41		12.68	3 / 5			
	reaction time	0.125										1.27			2.99	2.88	3.11
	interval		1.03	0.99	0.97	0.96	0.96	0.96	0.99	1.04	1.08	1.27	7.89		8.53	8.85	8.20
	velocity	5.35	8.25	8.59	8.76	8.85	8.85	8.85	8.59	8.17	7.87	7.91	7.89				
Bapté, Laetitia (FRA) (1999)	time	2.45	3.50	4.50	5.48	6.46	7.44	8.44	9.43	10.45	11.48		12.73	1 / 6			
	reaction time	0.153										1.25	PB		3.03	2.96	3.04
	interval		1.05	1.00	0.98	0.98	0.98	1.00	0.99	1.02	1.03	1.25	7.86		8.42	8.61	8.39
	velocity	5.31	8.10	8.50	8.67	8.67	8.67	8.50	8.59	8.33	8.25	8.04	7.86				
Lavin, Sarah (IRL) (1994)	time	2.51	3.57	4.57	5.55	6.53	7.51	8.50	9.49	10.50	11.51		12.74	6 / 7			
	reaction time	0.156										1.23			3.04	2.95	3.01
	interval		1.06	1.00	0.98	0.98	0.98	0.99	0.99	1.01	1.01	1.23	7.85		8.39	8.64	8.47
	velocity	5.18	8.02	8.50	8.67	8.67	8.67	8.59	8.59	8.42	8.42	8.17	7.85				
Carraro, Elena (ITA) (2001)	time	2.56	3.63	4.68	5.69	6.70	7.72	8.76	9.82	10.91	11.99		13.28	8 / 8			
	reaction time	0.172										1.29			3.13	3.07	3.23
	interval		1.07	1.05	1.01	1.01	1.02	1.04	1.06	1.09	1.08	1.29	7.53		8.15	8.31	7.89
	velocity	5.08	7.94	8.10	8.42	8.42	8.33	8.17	8.02	7.80	7.87	7.79	7.53				



Source: Omega Timing (Fri 21 Jul 2023 20:52) - diamond league race analysis
<https://www.omegatiming.com/File/0002030B0101050101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=it5-iiFFPa4>

2023 Kamila Skolimowska Memorial (Silesia, POL)

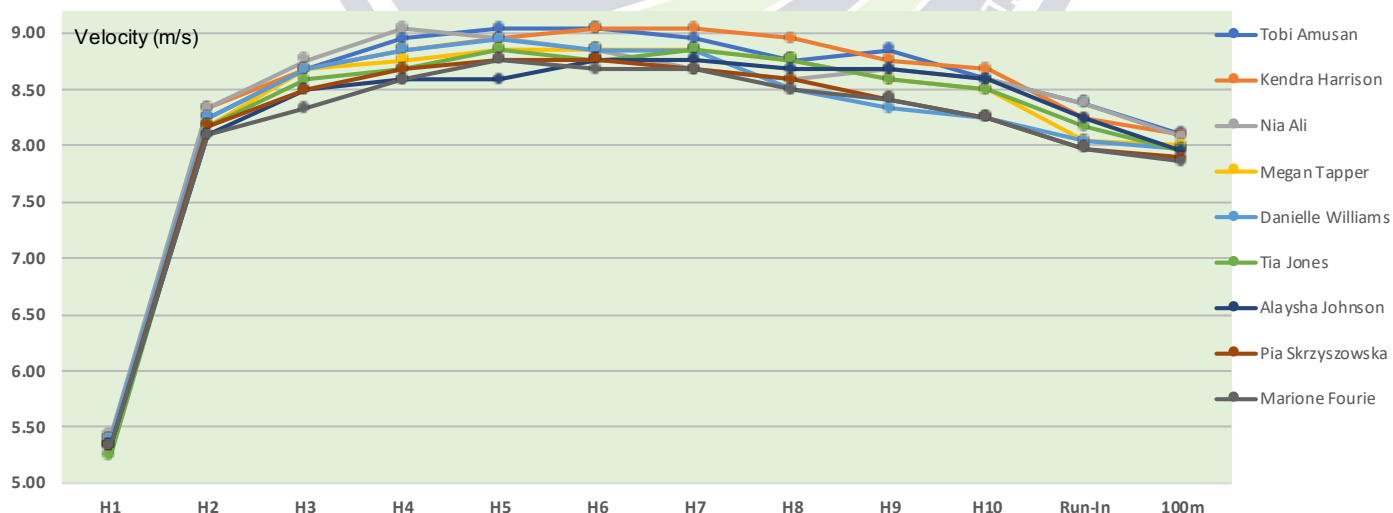
100m Hurdles

Date: 2023.07.16

Wind: 0.9 m/s

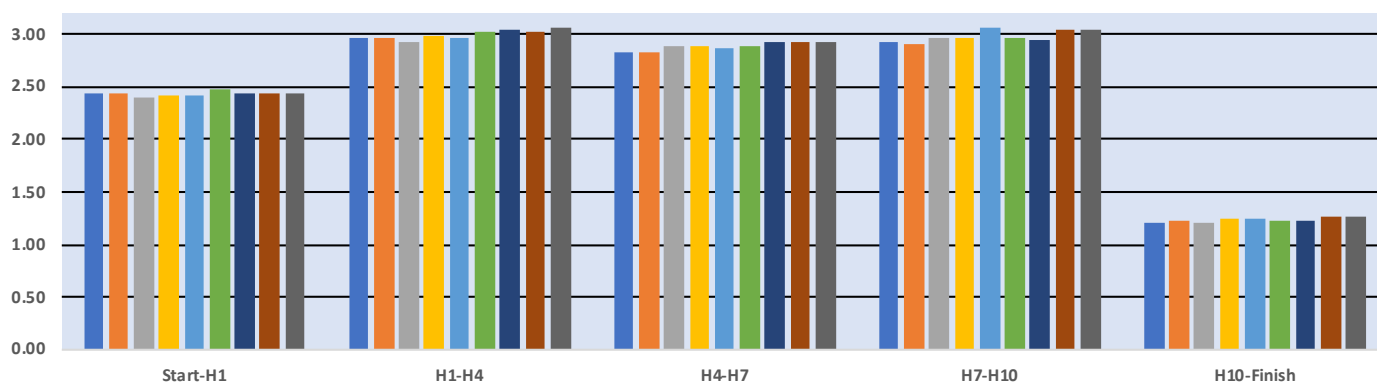
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time		2.43	3.46	4.44	5.39	6.33	7.27	8.22	9.19	10.15	11.14		12.34	5 / 1			
	reaction time	0.146														2.96	2.83	2.92
	interval			1.03	0.98	0.95	0.94	0.94	0.95	0.97	0.96	0.99	1.20			8.61	9.01	8.73
Harrison, Kendra (USA) (1992)	time		2.44	3.46	4.44	5.40	6.35	7.29	8.23	9.18	10.15	11.13		12.35	4 / 2			
	reaction time	0.161														2.96	2.83	2.90
	interval			1.02	0.98	0.96	0.95	0.94	0.95	0.97	0.98	1.22				8.61	9.01	8.79
Ali, Nia (USA) (1988)	time		2.40	3.42	4.39	5.33	6.28	7.24	8.22	9.21	10.19	11.18		12.38	6 / 3			
	reaction time	0.162														2.93	2.89	2.96
	interval			1.02	0.97	0.94	0.95	0.96	0.98	0.99	0.98	0.99	1.20			8.70	8.82	8.61
Tapper, Megan (JAM) (1994)	time		2.41	3.45	4.43	5.40	6.36	7.32	8.28	9.25	10.24	11.24		12.49	8 / 4			
	reaction time	0.150														2.99	2.88	2.96
	interval			1.04	0.98	0.97	0.96	0.96	0.97	0.99	1.00	1.25				8.53	8.85	8.61
Williams, Danielle (JAM) (1992)	time		2.41	3.44	4.42	5.38	6.33	7.29	8.25	9.25	10.27	11.30		12.55	9 / 5			
	reaction time	0.141														2.97	2.87	3.05
	interval			1.03	0.98	0.96	0.95	0.96	0.96	1.00	1.02	1.03	1.25			8.59	8.89	8.36
Jones, Tia (USA) (2000)	time		2.48	3.52	4.51	5.49	6.45	7.42	8.38	9.35	10.34	11.34		12.57	2 / 6			
	reaction time	0.175														3.01	2.89	2.96
	interval			1.04	0.99	0.98	0.96	0.97	0.96	0.97	0.99	1.00	1.23			8.47	8.82	8.61
Johnson, Alaysha (USA) (1996)	time		2.44	3.49	4.49	5.48	6.47	7.44	8.41	9.39	10.37	11.36		12.58	3 / 7			
	reaction time	0.151														3.04	2.93	2.95
	interval			1.05	1.00	0.99	0.99	0.97	0.97	0.98	0.98	0.99	1.22			8.39	8.70	8.64
Skrzysowska, Pia (POL) (2001)	time		2.44	3.48	4.48	5.46	6.43	7.40	8.38	9.37	10.38	11.41		12.67	7 / 8			
	reaction time	0.130														3.02	2.92	3.03
	interval			1.04	1.00	0.98	0.97	0.97	0.98	0.99	1.01	1.03	1.26			8.44	8.73	8.42
Fourie, Marione (RSA) (2002)	time		2.44	3.49	4.51	5.50	6.47	7.45	8.43	9.43	10.44	11.47		12.73	1 / 9			
	reaction time	0.148														3.06	2.93	3.04
	interval			1.05	1.02	0.99	0.97	0.98	0.98	1.00	1.01	1.03	1.26			8.33	8.70	8.39



Time Intervals (s)

Hurdle Phases

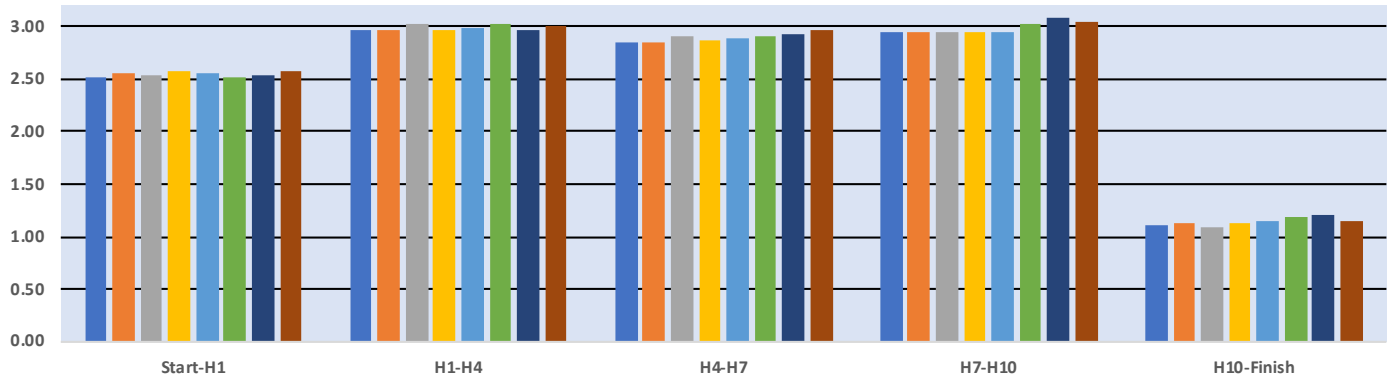
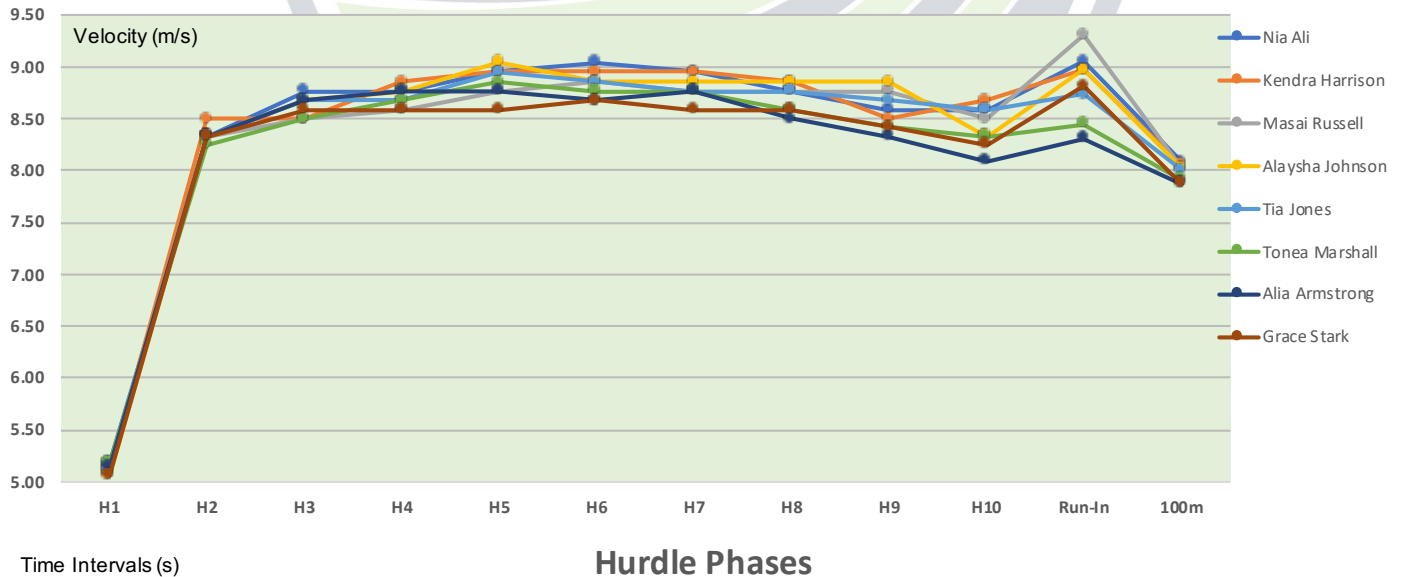


Source: Omega Timing (Sun 16 Jul 2023 16:50) - diamond league race analysis

<https://www.omegatiming.com/File/0002030A0101080101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=7rhVdx1Ja3I>

2023 USATF National Championships (Eugene, OR) (TV Analysis)

100m Hurdles		Date: 2023.07.08		Wind: 0.4 m/s										FINAL			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time	2.51	3.53	4.50	5.47	6.42	7.36	8.31	9.28	10.27	11.26		12.37	4 / 1			
	reaction time											1.11			2.96	2.84	2.95
	interval		1.02	0.97	0.97	0.95	0.94	0.95	0.97	0.99	0.99	1.11			8.61	8.98	8.64
Harrison, Kendra (USA) 1992	time	2.55	3.55	4.55	5.51	6.46	7.41	8.36	9.32	10.32	11.30		12.42	6 / 2			
	reaction time											1.12			2.96	2.85	2.94
	interval		1.00	1.00	0.96	0.95	0.95	0.95	0.96	1.00	0.98	1.12			8.61	8.95	8.67
Russell, Masai (USA) (2000)	time	2.53	3.55	4.55	5.54	6.51	7.47	8.44	9.41	10.38	11.38		12.46	2 / 3			
	reaction time											1.08			3.01	2.90	2.94
	interval		1.02	1.00	0.99	0.97	0.96	0.97	0.97	0.97	1.00	1.08			8.47	8.79	8.67
Johnson, Alaysha (USA) (1996)	time	2.57	3.59	4.57	5.54	6.48	7.44	8.40	9.36	10.32	11.34		12.46	3 / 4			
	reaction time											1.12			2.97	2.86	2.94
	interval		1.02	0.98	0.97	0.94	0.96	0.96	0.96	0.96	1.02	1.12			8.59	8.92	8.67
Jones, Tia (USA) (2000)	time	2.55	3.57	4.55	5.53	6.48	7.44	8.41	9.38	10.36	11.35		12.50	7 / 5			
	reaction time											1.15			2.98	2.88	2.94
	interval		1.02	0.98	0.98	0.95	0.96	0.97	0.97	0.98	0.99	1.15			8.56	8.85	8.67
Marshall, Tonea (USA) (1998)	time	2.51	3.54	4.54	5.52	6.48	7.45	8.42	9.41	10.42	11.44		12.63	5 / 6			
	reaction time											1.19			3.01	2.90	3.02
	interval		1.03	1.00	0.98	0.96	0.97	0.97	0.99	1.01	1.02	1.19			8.47	8.79	8.44
Armstrong, Alia (USA) (2000)	time	2.53	3.55	4.53	5.50	6.47	7.45	8.42	9.42	10.44	11.49		12.70	1 / 7			
	reaction time											1.21			2.97	2.92	3.07
	interval		1.02	0.98	0.97	0.97	0.98	0.97	1.00	1.02	1.05	1.21			8.59	8.73	8.31
Stark, Grace (USA) (2001)	time	2.57	3.59	4.58	5.57	6.56	7.54	8.53	9.52	10.53	11.56		12.70	8 / 8			
	reaction time											1.14			3.00	2.96	3.03
	interval		1.02	0.99	0.99	0.99	0.98	0.99	0.99	1.01	1.03	1.14			8.50	8.61	8.42



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=TTtFtFDEd00&t=2s>

2023 Bauhaus Galan (Stockholm, SWE)

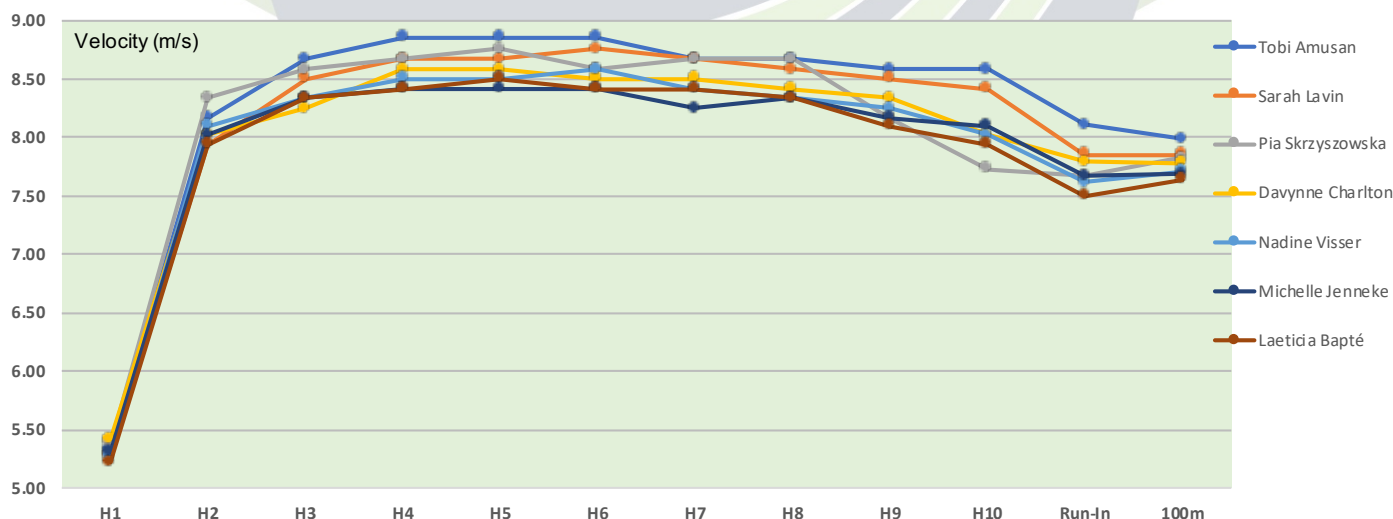
100m Hurdles

Date: 2023.07.02

Wind: 0.9 m/s

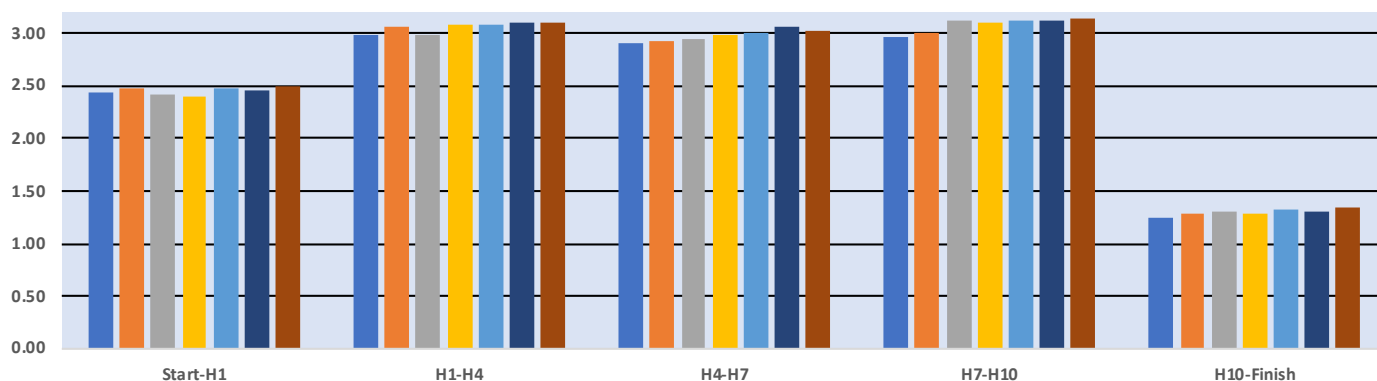
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Amusan, Tobi (NGR) (1997)	time		2.44	3.48	4.46	5.42	6.38	7.34	8.32	9.30	10.29	11.28		12.52	4 / 1			
	reaction time	0.145														2.98	2.90	2.96
	interval			1.04	0.98	0.96	0.96	0.96	0.98	0.98	0.99	0.99	1.24			8.56	8.79	8.61
Lavin, Sarah (IRL) (1994)	time		2.47	3.54	4.54	5.52	6.50	7.47	8.45	9.44	10.44	11.45		12.73	1 / 2			
	reaction time	0.139														3.05	2.93	3.00
	interval			1.07	1.00	0.98	0.98	0.97	0.98	0.99	1.00	1.01	1.28	PB		8.36	8.70	8.50
Skrzysowska, Pia (POL) (2001)	time		2.42	3.44	4.43	5.41	6.38	7.37	8.35	9.33	10.37	11.47		12.78	5 / 3			
	reaction time	0.132														2.99	2.94	3.12
	interval			1.02	0.99	0.98	0.97	0.99	0.98	0.98	1.04	1.10	1.31			8.53	8.67	8.17
Charlton, Devynne (BAH) (1995)	time		2.40	3.46	4.49	5.48	6.47	7.47	8.47	9.48	10.50	11.56		12.85	3 / 4			
	reaction time	0.141														3.08	2.99	3.09
	interval			1.06	1.03	0.99	0.99	1.00	1.00	1.01	1.02	1.06	1.29			8.28	8.53	8.25
Visser, Nadine (NED) (1995)	time		2.47	3.52	4.54	5.54	6.54	7.53	8.54	9.56	10.59	11.65		12.97	6 / 5			
	reaction time	0.149														3.07	3.00	3.11
	interval			1.05	1.02	1.00	1.00	0.99	1.01	1.02	1.03	1.06	1.32			8.31	8.50	8.20
Hurske, Reetta (FIN) (1995)	time		2.47	3.52	4.54	5.54	6.54	7.53	8.54	9.56	10.59	11.65		12.97	6 / 5			
	reaction time	0.149														3.07	3.00	3.11
	interval			1.05	1.02	1.00	1.00	0.99	1.01	1.02	1.03	1.06	1.32			8.31	8.50	8.20
Jenneke, Michelle (AUS) (1993)	time		2.45	3.51	4.53	5.54	6.55	7.56	8.59	9.61	10.65	11.70		13.01	7 / 7			
	reaction time	0.145														3.09	3.05	3.11
	interval			1.06	1.02	1.01	1.01	1.01	1.03	1.02	1.04	1.05	1.31			8.25	8.36	8.20
Bapté, Laetitia (FRA) (1999)	time		2.49	3.56	4.58	5.59	6.59	7.60	8.61	9.63	10.68	11.75		13.09	8 / 8			
	reaction time	0.171														3.10	3.02	3.14
	interval			1.07	1.02	1.01	1.00	1.01	1.01	1.02	1.05	1.07	1.34			8.23	8.44	8.12
	velocity		5.22	7.94	8.33	8.42	8.50	8.42	8.42	8.33	8.10	7.94	7.50	7.64				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 19:04) - diamond league race analysis

<https://www.omegatiming.com/File/0002030901010A0101FFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=zGzRL6GAP8>

2023 Bauhaus Galan (Stockholm, SWE)

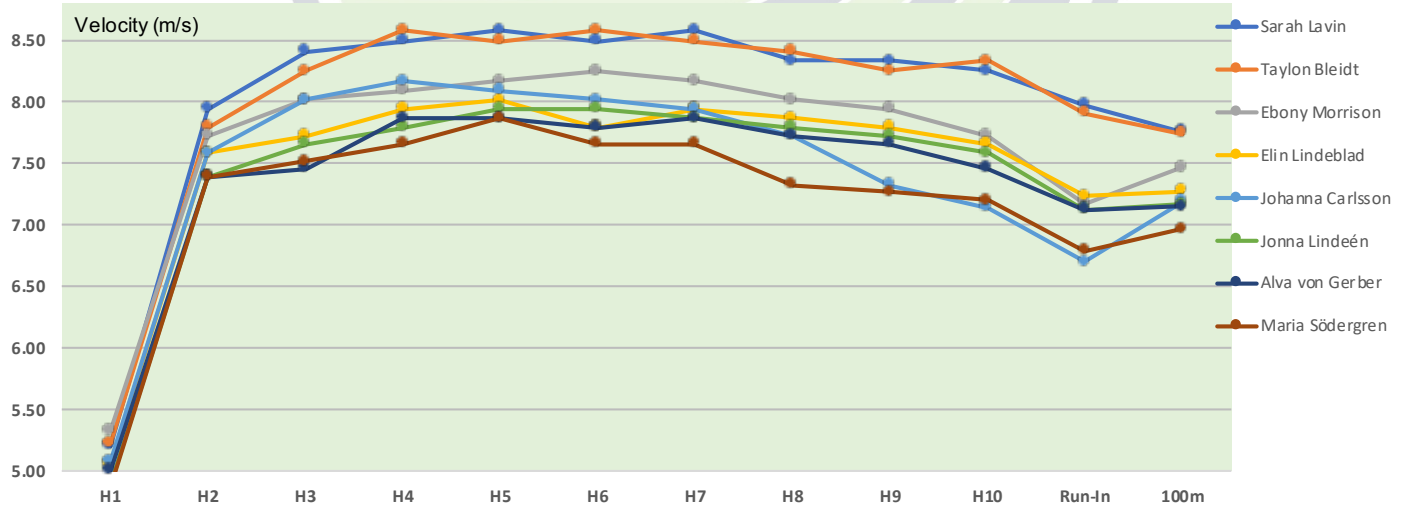
100m Hurdles

Date: 2023.07.02

Wind: 0.6 m/s

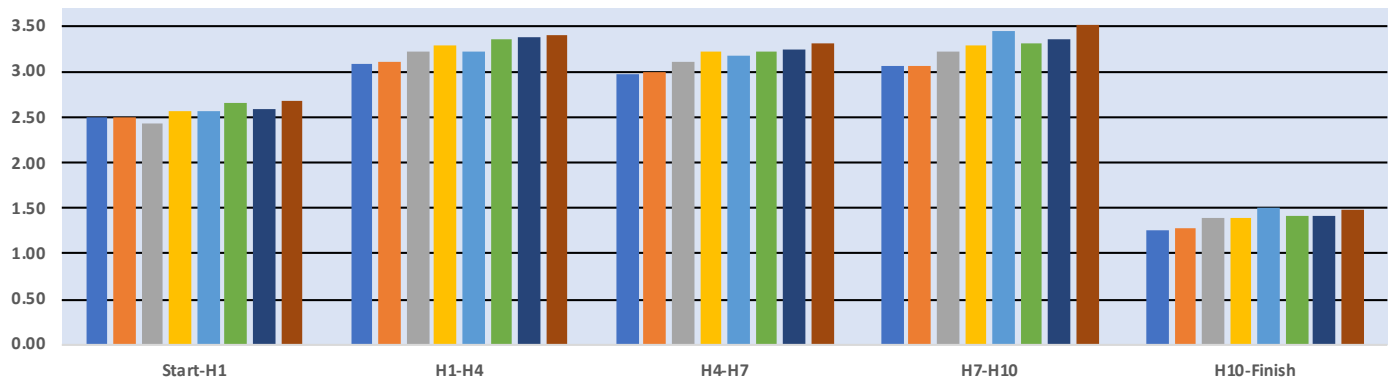
National FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Lavin, Sarah (IRL) (1994)	time	2.50	3.57	4.58	5.58	6.57	7.57	8.56	9.58	10.60	11.63		12.89	3 / 1			
	reaction time	0.140													3.08	2.98	3.07
	interval		1.07	1.01	1.00	0.99	1.00	0.99	1.02	1.02	1.03	1.26			8.28	8.56	8.31
Bieldt, Taylon (RSA) (1998)	time	2.49	3.58	4.61	5.60	6.60	7.59	8.59	9.60	10.63	11.65		12.92	4 / 2			
	reaction time	0.141													3.11	2.99	3.06
	interval		1.09	1.03	0.99	1.00	0.99	1.00	1.01	1.03	1.02	1.27			8.20	8.53	8.33
Morrison, Ebony (LBR) (1994)	time	2.44	3.54	4.60	5.65	6.69	7.72	8.76	9.82	10.89	11.99		13.39	6 / 3			
	reaction time	0.137													3.21	3.11	3.23
	interval		1.10	1.06	1.05	1.04	1.03	1.04	1.06	1.07	1.10	1.40			7.94	8.20	7.89
Lindeblad, Elin (SWE) (1995)	time	2.57	3.69	4.79	5.86	6.92	8.01	9.08	10.16	11.25	12.36		13.75	5 / 4			
	reaction time	0.140													3.29	3.22	3.28
	interval		1.12	1.10	1.07	1.06	1.09	1.07	1.08	1.09	1.11	1.39			7.75	7.92	7.77
Carlsson, Johanna (SWE) (1994)	time	2.56	3.68	4.74	5.78	6.83	7.89	8.96	10.06	11.22	12.41		13.91	1 / 5			
	reaction time	0.149													3.22	3.18	3.45
	interval		1.12	1.06	1.04	1.05	1.06	1.07	1.10	1.16	1.19	1.50			7.92	8.02	7.39
Lindeén, Jonna (SWE) (1996)	time	2.66	3.81	4.92	6.01	7.08	8.15	9.23	10.32	11.42	12.54		13.95	7 / 6			
	reaction time	0.195													3.35	3.22	3.31
	interval		1.15	1.11	1.09	1.07	1.07	1.08	1.09	1.10	1.12	1.41			7.61	7.92	7.70
von Gerber, Alva (SWE) (2000)	time	2.60	3.75	4.89	5.97	7.05	8.14	9.22	10.32	11.43	12.57		13.98	2 / 7			
	reaction time	0.141													3.37	3.25	3.35
	interval		1.15	1.14	1.08	1.08	1.09	1.08	1.10	1.11	1.14	1.41			7.57	7.85	7.61
Södergren, Maria (SWE) (1998)	time	2.67	3.82	4.95	6.06	7.14	8.25	9.36	10.52	11.69	12.87		14.35	8 / 8			
	reaction time	0.140													3.39	3.30	3.51
	interval		1.15	1.13	1.11	1.08	1.11	1.11	1.16	1.17	1.18	1.48			7.52	7.73	7.26
	velocity		5.20	7.94	8.42	8.50	8.59	8.50	8.33	8.33	8.25	7.98	7.76				
			5.22	7.80	8.25	8.59	8.50	8.59	8.50	8.42	8.25	8.33	7.91				
			5.33	7.73	8.02	8.10	8.17	8.25	8.17	8.02	7.94	7.73	7.18				
			5.06	7.59	7.73	7.94	8.02	7.80	7.94	7.87	7.80	7.66	7.23				
			5.08	7.59	8.02	8.17	8.10	8.02	7.94	7.73	7.33	7.14	6.70				
			4.89	7.39	7.66	7.80	7.94	7.87	7.80	7.73	7.59	7.13	7.17				
			5.00	7.39	7.46	7.87	7.87	7.80	7.87	7.73	7.66	7.46	7.13				
			4.87	7.39	7.52	7.66	7.87	7.66	7.66	7.33	7.26	7.20	6.79				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 16:36) - diamond league race analysis
<https://www.omegatiming.com/File/000203090101030101FFFFFFFFF4D.pdf>

Video: No Video Found

2023 Athletissima (Lausanne, SUI)

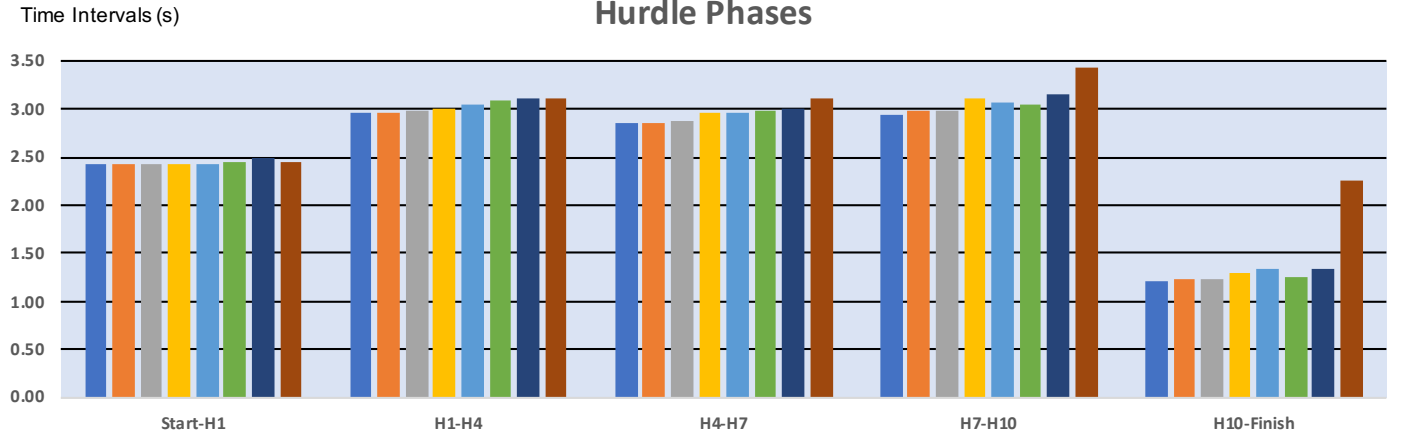
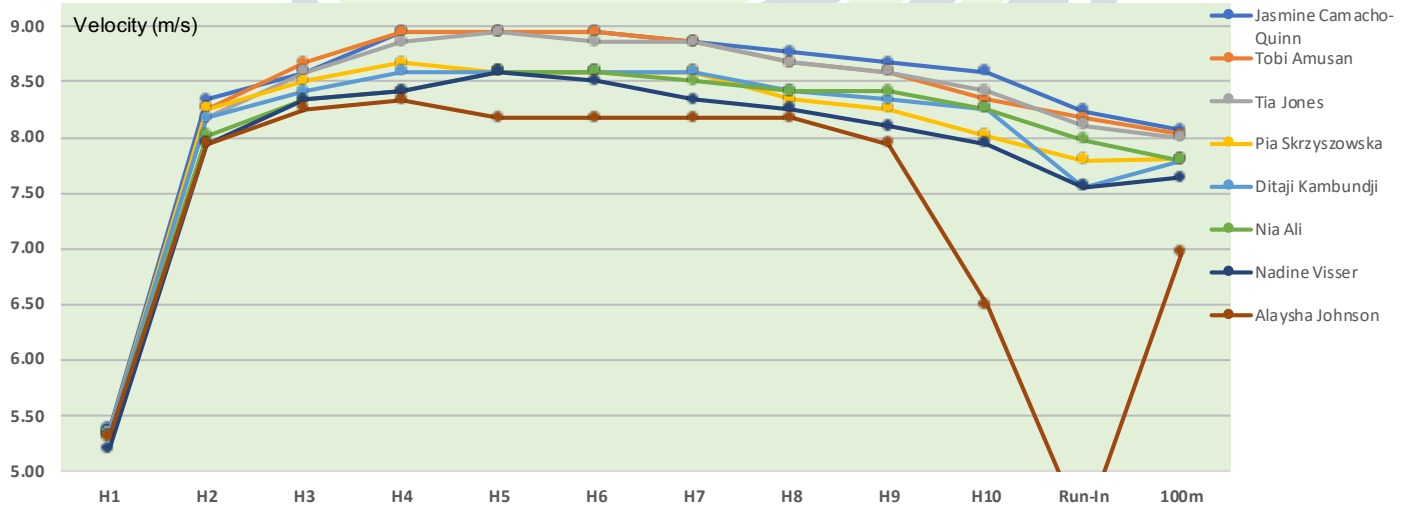
100m Hurdles

Date: 2023.06.30

Wind: -1.4 m/s

FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time		2.42	3.44	4.43	5.38	6.33	7.28	8.24	9.21	10.19	11.18		12.40	5 / 1			
	reaction time	0.139											1.22			2.96	2.86	2.94
	interval velocity		5.37	8.33	8.59	8.95	8.95	8.95	8.85	8.76	8.67	8.59	8.24	8.06		8.61	8.92	8.67
Amusan, Tobi (NGR) (1997)	time		2.43	3.46	4.44	5.39	6.34	7.29	8.25	9.23	10.22	11.24		12.47	4 / 2			
	reaction time	0.133											1.23			2.96	2.86	2.99
	interval velocity		5.35	8.25	8.67	8.95	8.95	8.95	8.85	8.67	8.59	8.33	8.17	8.02		8.61	8.92	8.53
Jones, Tia (USA) (2000)	time		2.43	3.47	4.46	5.42	6.37	7.33	8.29	9.27	10.26	11.27		12.51	3 / 3			
	reaction time	0.139											1.24			2.99	2.87	2.98
	interval velocity		5.35	8.17	8.59	8.85	8.95	8.85	8.85	8.67	8.59	8.42	8.10	7.99		8.53	8.89	8.56
Skrzysowska, Pia (POL) (2001)	time		2.43	3.46	4.46	5.44	6.43	7.42	8.41	9.43	10.46	11.52		12.81	8 / 4			
	reaction time	0.139											1.29			3.01	2.97	3.11
	interval velocity		5.35	8.25	8.50	8.67	8.59	8.59	8.59	8.33	8.25	8.02	7.79	7.81		8.47	8.59	8.20
Kambundji, Ditaji (SUI) (2002)	time		2.43	3.47	4.48	5.47	6.46	7.45	8.44	9.45	10.47	11.50		12.83	7 / 5			
	reaction time	0.142											1.33			3.04	2.97	3.06
	interval velocity		5.35	8.17	8.42	8.59	8.59	8.59	8.59	8.42	8.33	8.25	7.56	7.79		8.39	8.59	8.33
Ali, Nia (USA) (1988)	time		2.45	3.51	4.53	5.54	6.53	7.52	8.52	9.53	10.54	11.57		12.83	2 / 6			
	reaction time	0.154											1.26			3.09	2.98	3.05
	interval velocity		5.31	8.02	8.33	8.42	8.59	8.59	8.50	8.42	8.42	8.25	7.98	7.79		8.25	8.56	8.36
Visser, Nadine (NED) (1995)	time		2.50	3.57	4.59	5.60	6.59	7.59	8.61	9.64	10.69	11.76		13.09	1 / 7			
	reaction time	0.182											1.33			3.10	3.01	3.15
	interval velocity		5.20	7.94	8.33	8.42	8.59	8.50	8.33	8.25	8.10	7.94	7.56	7.64		8.23	8.47	8.10
Johnson, Alaysha (USA) (1996)	time		2.45	3.52	4.55	5.57	6.61	7.65	8.69	9.73	10.80	12.11		14.36	6 / 8			
	reaction time	0.139											2.25			3.12	3.12	3.42
	interval velocity		5.31	7.94	8.25	8.33	8.17	8.17	8.17	8.17	7.94	6.49	4.47	6.96		8.17	8.17	7.46



Source: Omega Timing (Fri 30 Jun 2023 21:22) - diamond league race analysis
<https://www.omegatiming.com/File/0002030801010C0101FFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=BMdhfl3hvAA>

2023 USATF New York City Grand Prix (Randalls Island, NY) (TV Analysis)

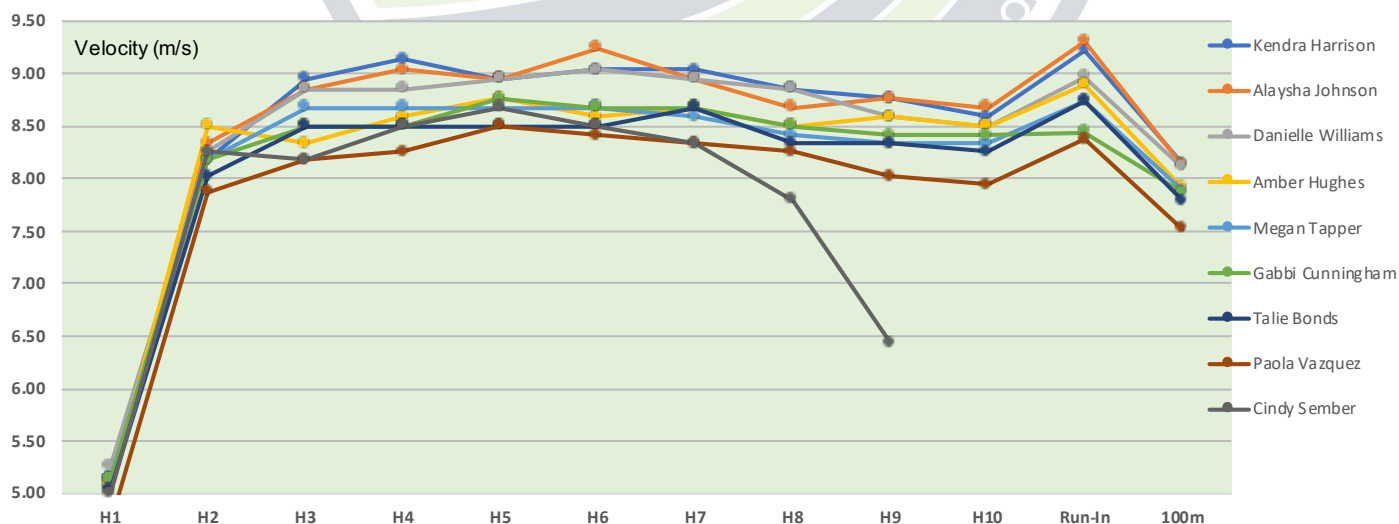
100m Hurdles

Date: 2023.06.24

Wind: 2.8 m/s

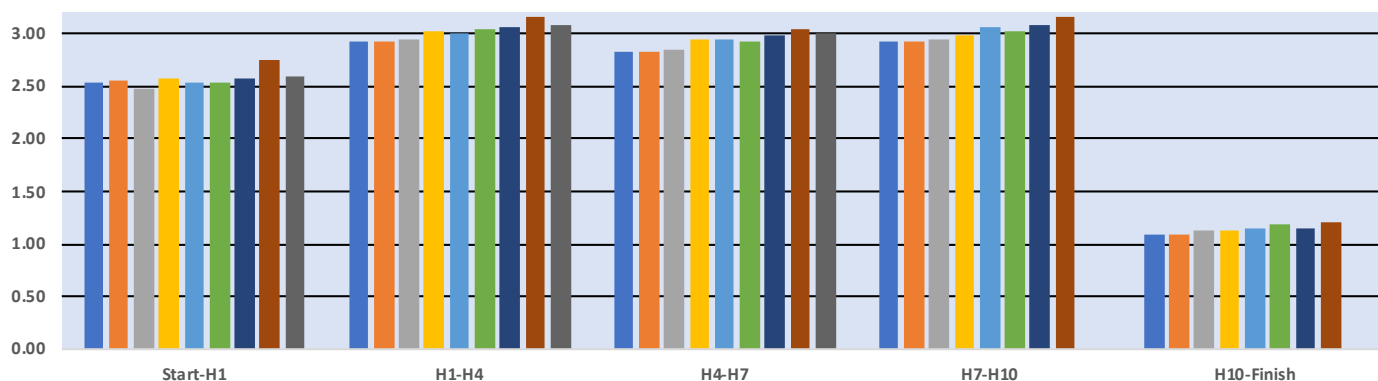
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.53	3.57	4.52	5.45	6.40	7.34	8.28	9.24	10.21	11.20		12.29	5 / 1			
	reaction time	0.151													2.92	2.83	2.92
	interval		1.04	0.95	0.93	0.95	0.94	0.94	0.96	0.97	0.99	1.09			8.73	9.01	8.73
Johnson, Alaysha (USA) (1996)	time	2.55	3.57	4.53	5.47	6.42	7.34	8.29	9.27	10.24	11.22		12.30	4 / 2			
	reaction time	0.206													2.92	2.82	2.93
	interval		1.02	0.96	0.94	0.95	0.92	0.95	0.98	0.97	0.98	1.08			8.73	9.04	8.70
Williams, Danielle (JAM) (1992)	time	2.47	3.50	4.46	5.42	6.37	7.31	8.26	9.22	10.21	11.21		12.33	3 / 3			
	reaction time	0.331													2.95	2.84	2.95
	interval		1.03	0.96	0.96	0.95	0.94	0.95	0.96	0.99	1.00	1.12			8.64	8.98	8.64
Hughes, Amber (USA) (1994)	time	2.57	3.57	4.59	5.58	6.55	7.54	8.52	9.52	10.51	11.51		12.64	2 / 4			
	reaction time	0.147													3.01	2.94	2.99
	interval		1.00	1.02	0.99	0.97	0.99	0.98	1.00	0.99	1.00	1.13			8.47	8.67	8.53
Tapper, Megan (JAM) (1994)	time	2.53	3.57	4.55	5.53	6.51	7.49	8.48	9.49	10.51	11.53		12.68	6 / 5			
	reaction time	0.216													3.00	2.95	3.05
	interval		1.04	0.98	0.98	0.98	0.98	0.99	1.01	1.02	1.02	1.15			8.50	8.64	8.36
Cunningham, Gabbi (USA) (1998)	time	2.53	3.57	4.57	5.57	6.54	7.52	8.50	9.50	10.51	11.52		12.71	1 / 6			
	reaction time	0.506													3.04	2.93	3.02
	interval		1.04	1.00	1.00	0.97	0.98	0.98	1.00	1.01	1.01	1.19			8.39	8.70	8.44
Bonds, Talie (USA) (1998)	time	2.58	3.64	4.64	5.64	6.64	7.64	8.62	9.64	10.66	11.69		12.84	8 / 7			
	reaction time	0.164													3.06	2.98	3.07
	interval		1.06	1.00	1.00	1.00	1.00	0.98	1.02	1.02	1.03	1.15			8.33	8.56	8.31
Vazquez, Paola (PUR) (1998)	time	2.75	3.83	4.87	5.90	6.90	7.91	8.93	9.96	11.02	12.09		13.29	9 / 8			
	reaction time	0.251													3.15	3.03	3.16
	interval		1.08	1.04	1.03	1.00	1.01	1.02	1.03	1.06	1.07	1.20			8.10	8.42	8.07
Sember, Cindy (GBR) (1994)	time	2.60	3.63	4.67	5.67	6.65	7.65	8.67	9.76	11.08			dnf	7 / --			
	reaction time	0.201													3.07	3.00	-8.67
	interval		1.03	1.04	1.00	0.98	1.00	1.02	1.09	1.32					8.31	8.50	-2.94



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=IAQgl_hhCgIQ&t=5s

2023 NCAA Championships (Austin, TX) (TV Analysis)

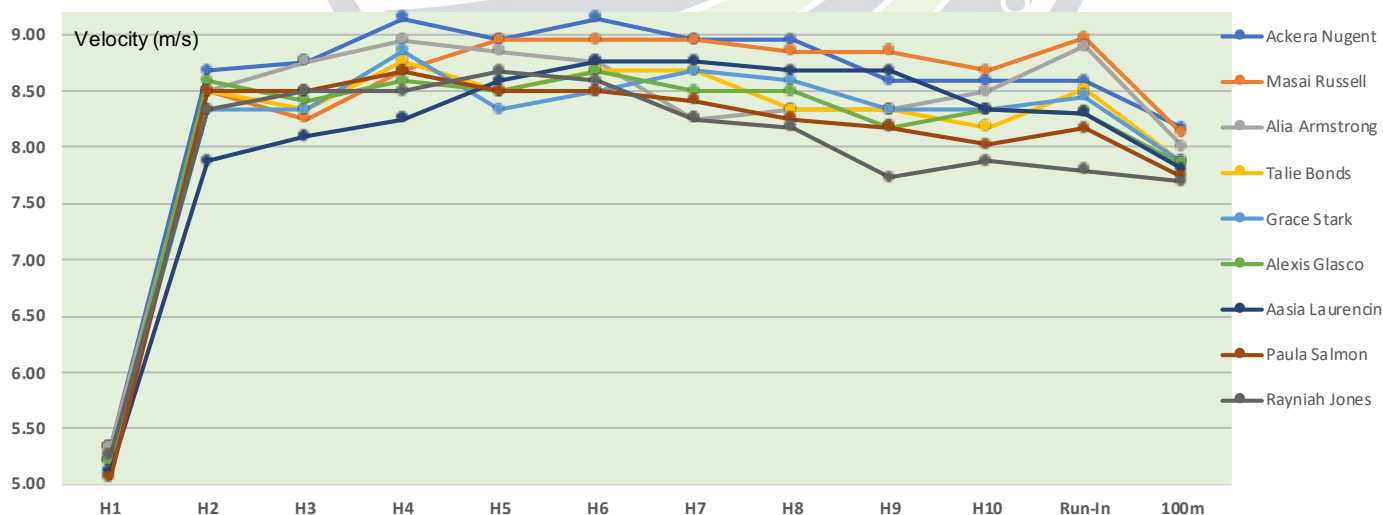
100m Hurdles

Date: 2023.06.10

Wind: 3.8 m/s

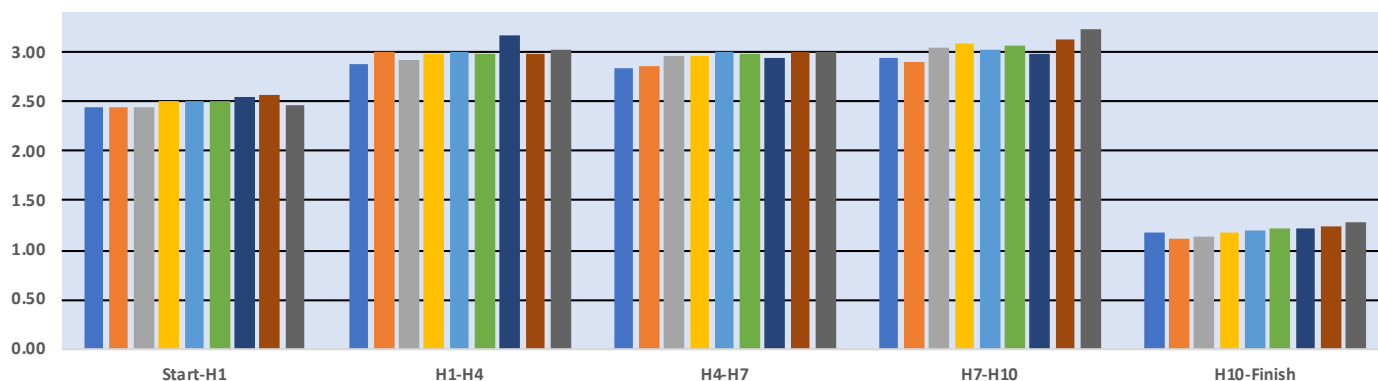
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nugent, Ackera (JAM) (2002)	time	2.44	3.42	4.39	5.32	6.27	7.20	8.15	9.10	10.09	11.08		12.25	6 / 1			
	reaction time		0.98	0.97	0.93	0.95	0.93	0.95	0.95	0.99	0.99	1.17			2.88	2.83	2.93
	velocity	5.33	8.67	8.76	9.14	8.95	9.14	8.95	8.95	8.59	8.59	8.59	8.16		8.85	9.01	8.70
Russell, Masai (USA) (2000)	time	2.44	3.44	4.47	5.45	6.40	7.35	8.30	9.26	10.22	11.20		12.32	4 / 2			
	reaction time		1.00	1.03	0.98	0.95	0.95	0.95	0.96	0.96	0.98	1.12			3.01	2.85	2.90
	velocity	5.33	8.50	8.25	8.67	8.95	8.95	8.95	8.85	8.85	8.67	8.97	8.12		8.47	8.95	8.79
Armstrong, Alia (USA) (2000)	time	2.44	3.44	4.41	5.36	6.32	7.29	8.32	9.34	10.36	11.36		12.49	5 / 3			
	reaction time		1.00	0.97	0.95	0.96	0.97	1.03	1.02	1.02	1.00	1.13			2.92	2.96	3.04
	velocity	5.33	8.50	8.76	8.95	8.85	8.76	8.25	8.33	8.33	8.50	8.89	8.01		8.73	8.61	8.39
Bonds, Talie (USA) (1998)	time	2.50	3.50	4.52	5.49	6.49	7.47	8.45	9.47	10.49	11.53		12.71	7 / 4			
	reaction time		1.00	1.02	0.97	1.00	0.98	0.98	1.02	1.02	1.04	1.18			2.99	2.96	3.08
	velocity	5.20	8.50	8.33	8.76	8.50	8.67	8.67	8.33	8.33	8.17	8.52	7.87		8.53	8.61	8.28
Stark, Grace (USA) (2001)	time	2.50	3.52	4.54	5.50	6.52	7.52	8.50	9.49	10.51	11.53		12.72	2 / 5			
	reaction time		1.02	1.02	0.96	1.02	1.00	0.98	0.99	1.02	1.02	1.19			3.00	3.00	3.03
	velocity	5.20	8.33	8.33	8.85	8.33	8.50	8.67	8.59	8.33	8.33	8.45	7.86		8.50	8.50	8.42
Glasco, Alexis (USA) (2002)	time	2.50	3.49	4.50	5.49	6.49	7.47	8.47	9.47	10.51	11.53		12.74	3 / 6			
	reaction time		0.99	1.01	0.99	1.00	0.98	1.00	1.00	1.04	1.02	1.21			2.99	2.98	3.06
	velocity	5.20	8.59	8.42	8.59	8.50	8.67	8.50	8.50	8.17	8.33	8.31	7.85		8.53	8.56	8.33
Laurencin, Aasia (USA) (2002)	time	2.54	3.62	4.67	5.70	6.69	7.66	8.63	9.61	10.59	11.61		12.82	9 / 7			
	reaction time		1.08	1.05	1.03	0.99	0.97	0.97	0.98	0.98	1.02	1.21			3.16	2.93	2.98
	velocity	5.12	7.87	8.10	8.25	8.59	8.76	8.76	8.67	8.67	8.33	8.31	7.80		8.07	8.70	8.56
Salmon, Paula (USA) (1999)	time	2.57	3.57	4.57	5.55	6.55	7.55	8.56	9.59	10.63	11.69		12.92	1 / 8			
	reaction time		1.00	1.00	0.98	1.00	1.00	1.01	1.03	1.04	1.06	1.23			2.98	3.01	3.13
	velocity	5.06	8.50	8.50	8.67	8.50	8.50	8.42	8.25	8.17	8.02	8.17	7.74		8.56	8.47	8.15
Jones, Rayniah (USA) (2001)	time	2.47	3.49	4.49	5.49	6.47	7.46	8.49	9.53	10.63	11.71		13.00	8 / 9			
	reaction time		1.02	1.00	1.00	0.98	0.99	1.03	1.04	1.10	1.08	1.29			3.02	3.00	3.22
	velocity	5.26	8.33	8.50	8.50	8.67	8.59	8.25	8.17	7.73	7.87	7.79	7.69		8.44	8.50	7.92



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=-fk3TRv0s5c>

2023 FBK Games (Hengelo, NED)

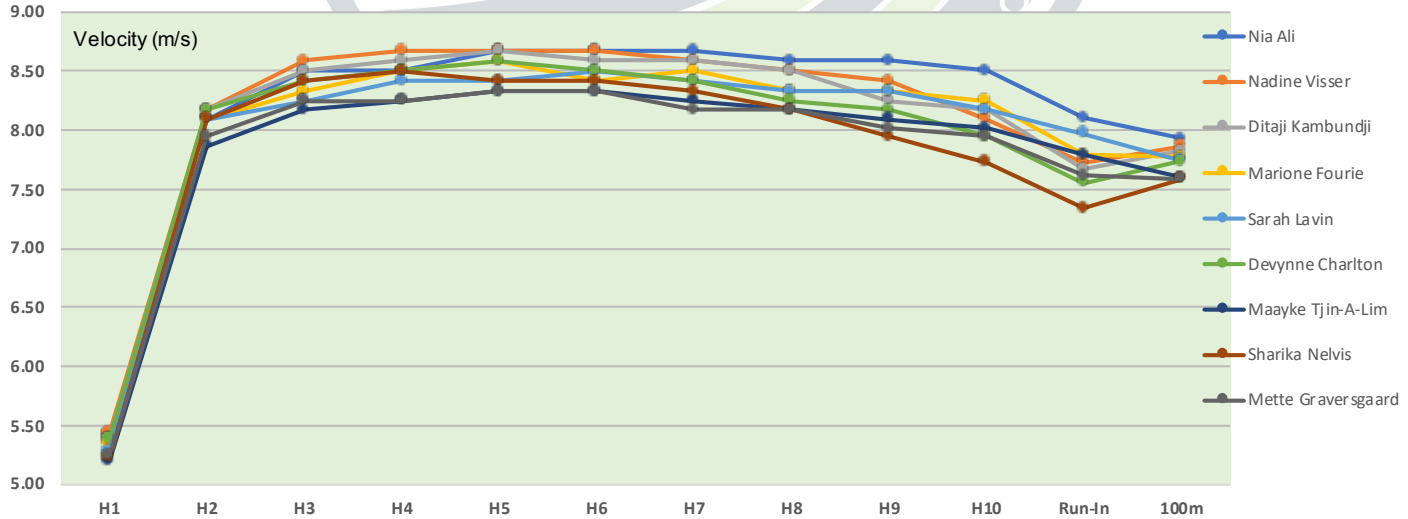
100m Hurdles

Date: 2023.06.04

Wind: 0.2 m/s

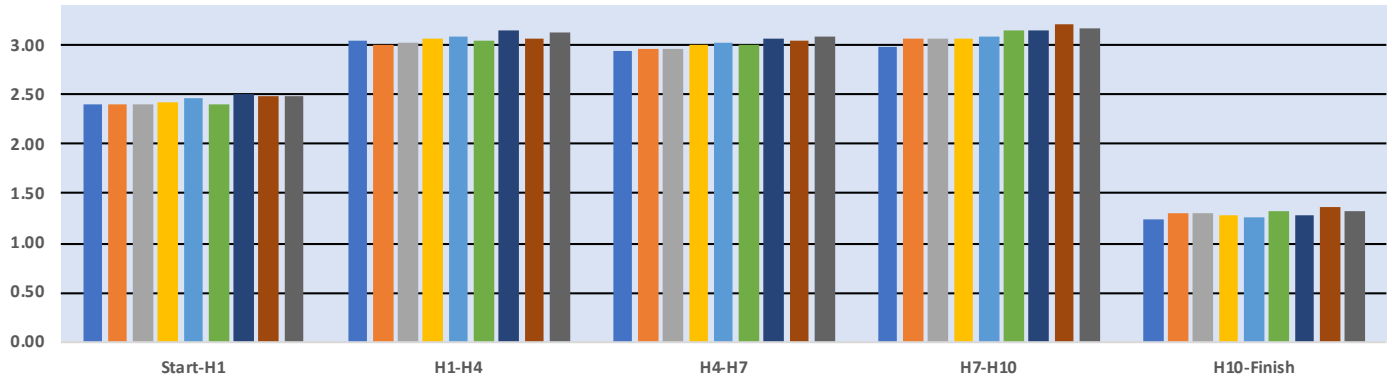
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Ali, Nia (USA) (1988)	time		2.40	3.45	4.45	5.45	6.43	7.41	8.39	9.38	10.37	11.37		12.61	5 / 1	3.05	2.94	2.98
	reaction time	0.156											1.24					
	interval velocity		5.42	8.10	8.50	8.50	8.67	8.67	8.67	8.59	8.59	8.50	8.10	7.93				8.36
Visser, Nadine (NED) (1995)	time		2.39	3.43	4.42	5.40	6.38	7.36	8.35	9.35	10.36	11.41		12.71	4 / 2	3.01	2.95	3.06
	reaction time	0.133											1.30					
	interval velocity		5.44	8.17	8.59	8.67	8.67	8.67	8.59	8.50	8.42	8.10	7.73	7.87				8.47
Kambundji, Ditaji (SUI) (2002)	time		2.41	3.45	4.45	5.44	6.42	7.41	8.40	9.40	10.43	11.47		12.78	7 / 3	3.03	2.96	3.07
	reaction time	0.134											1.31					
	interval velocity		5.39	8.17	8.50	8.59	8.67	8.59	8.59	8.50	8.25	8.17	7.67	7.82				8.42
Fourie, Marione (RSA) (2002)	time		2.43	3.48	4.50	5.50	6.49	7.50	8.50	9.52	10.54	11.57		12.86	8 / 4	3.07	3.00	3.07
	reaction time	0.143											1.29	=PB				
	interval velocity		5.35	8.10	8.33	8.50	8.59	8.42	8.50	8.33	8.33	8.25	7.79	7.78				8.31
Lavin, Sarah (IRL) (1994)	time		2.46	3.51	4.54	5.55	6.56	7.56	8.57	9.59	10.61	11.65		12.91	1 / 5	3.09	3.02	3.08
	reaction time	0.139											1.26					
	interval velocity		5.28	8.10	8.25	8.42	8.42	8.50	8.42	8.33	8.33	8.17	7.98	7.75				8.25
Charlton, Devynne (BAH) (1995)	time		2.41	3.45	4.46	5.46	6.45	7.45	8.46	9.49	10.53	11.60		12.93	6 / 6	3.05	3.00	3.14
	reaction time	0.155											1.33					
	interval velocity		5.39	8.17	8.42	8.50	8.59	8.50	8.42	8.25	8.17	7.94	7.56	7.73				8.36
Tjin-A-Lim, Maayke (NED) (1998)	time		2.50	3.58	4.62	5.65	6.67	7.69	8.72	9.76	10.81	11.87		13.16	2 / 7	3.15	3.07	3.15
	reaction time	0.149											1.29					
	interval velocity		5.20	7.87	8.17	8.25	8.33	8.33	8.25	8.17	8.10	8.02	7.79	7.60				8.10
Nelvis, Sharika (USA) (1990)	time		2.49	3.54	4.55	5.55	6.56	7.57	8.59	9.63	10.70	11.80		13.17	9 / 8	3.06	3.04	3.21
	reaction time	0.142											1.37					
	interval velocity		5.22	8.10	8.42	8.50	8.42	8.42	8.33	8.17	7.94	7.73	7.34	7.59				8.33
Graversgaard, Mette (DEN) (1995)	time		2.48	3.55	4.58	5.61	6.63	7.65	8.69	9.73	10.79	11.86		13.18	3 / 9	3.13	3.08	3.17
	reaction time	0.132											1.32					
	interval velocity		5.24	7.94	8.25	8.25	8.33	8.33	8.17	8.17	8.02	7.94	7.61	7.59				8.15



Time Intervals (s)

Hurdle Phases



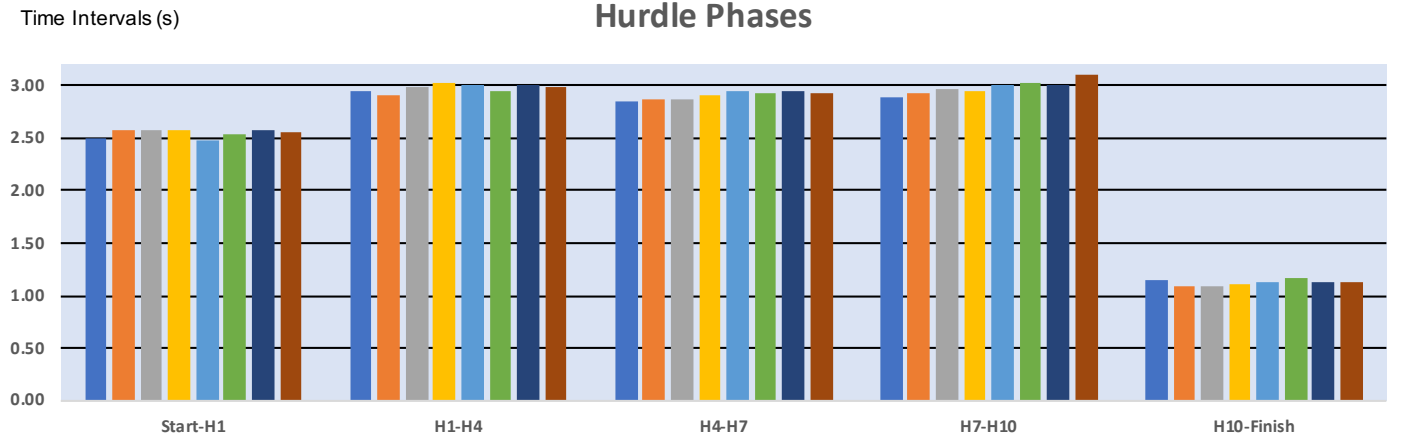
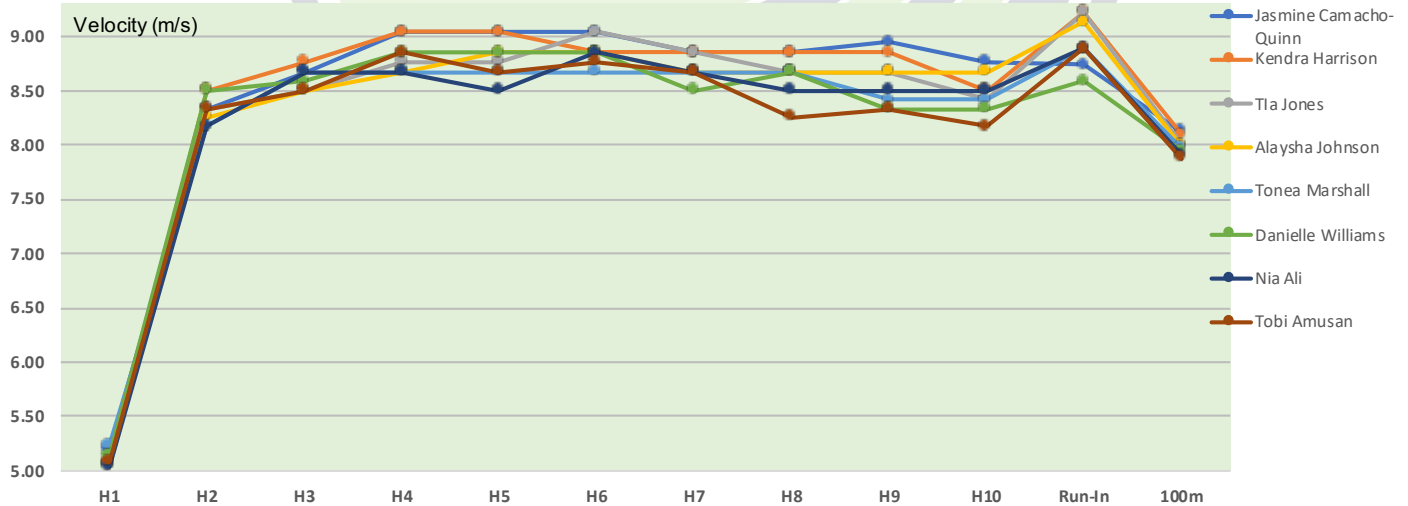
Source: Omega Timing (Sun 4 Jun 2023 18:16) - continental tour race analysis
<https://www.omegatiming.com/File/0002030101010A0101FFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=s1vdEfrTLQ>

Biomechanical Analysis

2023 USATF Los Angeles Grand Prix (Westwood, CA) (TV Analysis)

100m Hurdles				Date: 2023.05.27	Wind: -0.2 m/s		FINAL													
				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10	
Camacho-Quinn, Jasmine (PUR) (199	time			2.50	3.52	4.50	5.44	6.38	7.32	8.28	9.24	10.19	11.16		12.31	5 / 1				
	reaction time	0.158			1.02	0.98	0.94	0.94	0.94	0.96	0.96	0.95	0.97	1.15				2.94	2.84	2.88
	interval velocity		5.20	8.33	8.67	9.04	9.04	9.04	8.85	8.85	8.95	8.76	8.74	8.12				8.67	8.98	8.85
Harrison, Kendra (USA) (1992)	time			2.57	3.57	4.54	5.48	6.42	7.38	8.34	9.30	10.26	11.26		12.35	6 / 2				
	reaction time	0.207			1.00	0.97	0.94	0.94	0.96	0.96	0.96	0.96	1.00	1.09				2.91	2.86	2.92
	interval velocity		5.06	8.50	8.76	9.04	9.04	8.85	8.85	8.85	8.85	8.85	8.50	9.22	8.10				8.76	8.92
Jones, Tia (USA) (2000)	time			2.58	3.60	4.60	5.57	6.54	7.48	8.44	9.42	10.40	11.41		12.50	7 / 3				
	reaction time	0.186			1.02	1.00	0.97	0.97	0.94	0.96	0.98	0.98	1.01	1.09				2.99	2.87	2.97
	interval velocity		5.04	8.33	8.50	8.76	8.76	9.04	8.85	8.67	8.67	8.42	9.22	8.00				8.53	8.89	8.59
Johnson, Alaysha (USA) (1996)	time			2.57	3.60	4.60	5.58	6.54	7.50	8.48	9.46	10.44	11.42		12.52	2 / 4				
	reaction time	0.178			1.03	1.00	0.98	0.96	0.96	0.98	0.98	0.98	0.98	1.10				3.01	2.90	2.94
	interval velocity		5.06	8.25	8.50	8.67	8.85	8.85	8.67	8.67	8.67	8.67	8.67	9.14	7.99				8.47	8.79
Marshall, Tanea (USA) (1998)	time			2.48	3.52	4.50	5.48	6.46	7.44	8.42	9.40	10.41	11.42		12.55	8 / 5				
	reaction time	0.202			1.04	0.98	0.98	0.98	0.98	0.98	0.98	1.01	1.01	1.13				3.00	2.94	3.00
	interval velocity		5.24	8.17	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.42	8.42	8.89	7.97				8.50	8.67
Williams, Danielle (JAM) (1992)	time			2.53	3.53	4.52	5.48	6.44	7.40	8.40	9.38	10.40	11.42		12.59	1 / 6				
	reaction time	0.437			1.00	0.99	0.96	0.96	0.96	1.00	0.98	1.02	1.02	1.17				2.95	2.92	3.02
	interval velocity		5.14	8.50	8.59	8.85	8.85	8.85	8.50	8.67	8.33	8.33	8.59	7.94				8.64	8.73	8.44
Ali, Nia (USA) (1988)	time			2.58	3.62	4.60	5.58	6.58	7.54	8.52	9.52	10.52	11.52		12.65	3 / 7				
	reaction time	0.185			1.04	0.98	0.98	1.00	0.96	0.98	1.00	1.00	1.00	1.13				3.00	2.94	3.00
	interval velocity		5.04	8.17	8.67	8.67	8.50	8.85	8.67	8.50	8.50	8.50	8.89	7.91				8.50	8.67	8.50
Amusan, Tobi (NGR) (1997)	time			2.56	3.58	4.58	5.54	6.52	7.49	8.47	9.50	10.52	11.56		12.69	4 / 8				
	reaction time	0.184			1.02	1.00	0.96	0.98	0.97	0.98	1.03	1.02	1.04	1.13				2.98	2.93	3.09
	interval velocity		5.08	8.33	8.50	8.85	8.67	8.76	8.67	8.25	8.33	8.17	8.89	7.88				8.56	8.70	8.25



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=RAivxrcYsv0>

2023 USATF Bermuda Grand Prix (Devonshire, BER) (TV Analysis)

100m Hurdles

Date: 2023.05.21

Wind: 3.5 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.50	3.52	4.46	5.40	6.32	7.25	8.19	9.13	10.10	11.06		12.17	5 / 1			
	reaction time	0.153															
	interval		1.02	0.94	0.94	0.92	0.93	0.94	0.94	0.97	0.96	1.11			2.90	2.79	2.87
	velocity	5.20	8.33	9.04	9.04	9.24	9.14	9.04	9.04	8.76	8.85	9.05	8.22		8.79	9.14	8.89
Williams, Danielle (JAM) (1992)	time	2.53	3.54	4.50	5.46	6.39	7.34	8.29	9.27	10.25	11.26		12.38	4 / 2			
	reaction time	0.521															
	interval		1.01	0.96	0.96	0.93	0.95	0.95	0.98	0.98	1.01	1.12			2.93	2.83	2.97
	velocity	5.14	8.42	8.85	8.85	9.14	8.95	8.95	8.67	8.67	8.42	8.97	8.08		8.70	9.01	8.59
Marshall, Tonea (USA) (1998)	time	2.50	3.52	4.49	5.46	6.42	7.37	8.32	9.29	10.26	11.26		12.39	3 / 3			
	reaction time	0.176															
	interval		1.02	0.97	0.97	0.96	0.95	0.95	0.97	0.97	1.00	1.13			2.96	2.86	2.94
	velocity	5.20	8.33	8.76	8.76	8.85	8.95	8.95	8.76	8.76	8.50	8.89	8.07		8.61	8.92	8.67
Tapper, Megan (JAM) (1994)	time	2.53	3.54	4.49	5.44	6.39	7.37	8.34	9.32	10.33	11.35		12.47	6 / 4			
	reaction time	0.183															
	interval		1.01	0.95	0.95	0.95	0.98	0.97	0.98	1.01	1.02	1.12			2.91	2.90	3.01
	velocity	5.14	8.42	8.95	8.95	8.95	8.67	8.76	8.67	8.42	8.33	8.97	8.02		8.76	8.79	8.47

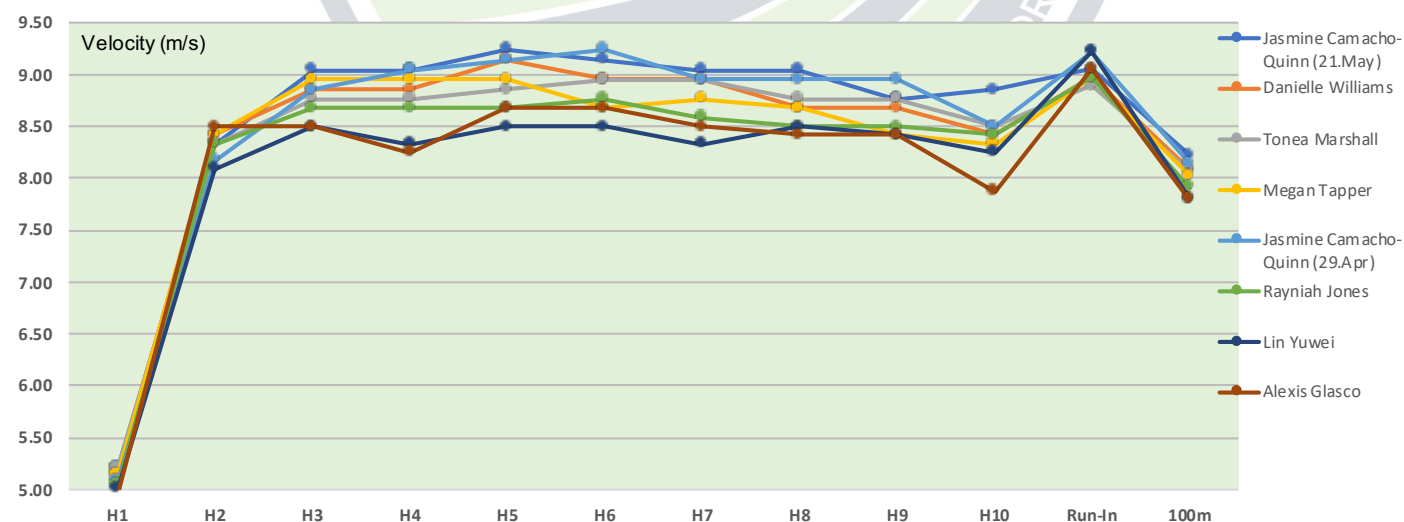
2023 UNF East Coast Relays (Jacksonville, FL)

Date: 2023.04.29

Wind: 3.2 m/s

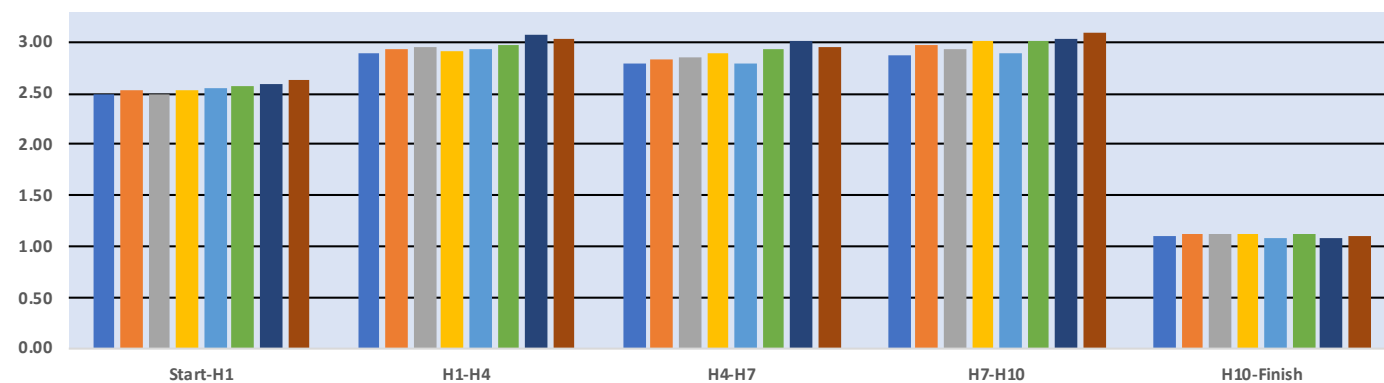
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.56	3.60	4.56	5.50	6.43	7.35	8.30	9.25	10.20	11.20		12.29	5 / 1			
	reaction time																
	interval		1.04	0.96	0.94	0.93	0.92	0.95	0.95	0.95	1.00	1.09			2.94	2.80	2.90
	velocity	5.08	8.17	8.85	9.04	9.14	9.24	8.95	8.95	8.95	8.50	9.22	8.14		8.67	9.11	8.79
Jones, Rayniah (USA) (2001)	time	2.58	3.60	4.58	5.56	6.54	7.51	8.50	9.50	10.50	11.51		12.63	6 / 2			
	reaction time																
	interval		1.02	0.98	0.98	0.98	0.97	0.99	1.00	1.00	1.01	1.12			2.98	2.94	3.01
	velocity	5.04	8.33	8.67	8.67	8.67	8.76	8.59	8.50	8.50	8.42	8.97	7.92		8.56	8.67	8.47
Lin Yuwei (CHN) (1999)	time	2.60	3.65	4.65	5.67	6.67	7.67	8.69	9.69	10.70	11.73		12.82	4 / 3			
	reaction time																
	interval		1.05	1.00	1.02	1.00	1.00	1.02	1.00	1.01	1.03	1.09			3.07	3.02	3.04
	velocity	5.00	8.10	8.50	8.33	8.50	8.50	8.33	8.50	8.42	8.25	9.22	7.80		8.31	8.44	8.39
Glasco, Alexis (USA) (2002)	time	2.63	3.63	4.63	5.66	6.64	7.62	8.62	9.63	10.64	11.72		12.83	3 / 4			
	reaction time																
	interval		1.00	1.00	1.03	0.98	0.98	1.00	1.01	1.01	1.08	1.11			3.03	2.96	3.10
	velocity	4.94	8.50	8.50	8.25	8.67	8.67	8.50	8.42	8.42	7.87	9.05	7.79		8.42	8.61	8.23



Time Intervals (s)

Hurdle Phases



USATF Bermuda Grand Prix

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=K9o370IAArM>

UNF East Coast Relays

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Sources: <https://www.youtube.com/watch?v=vZXqgX3f96w>
Video from Coach - 1080 @ 30fps

2023 Doha Diamond League (Doha, QAT) (TV Analysis)

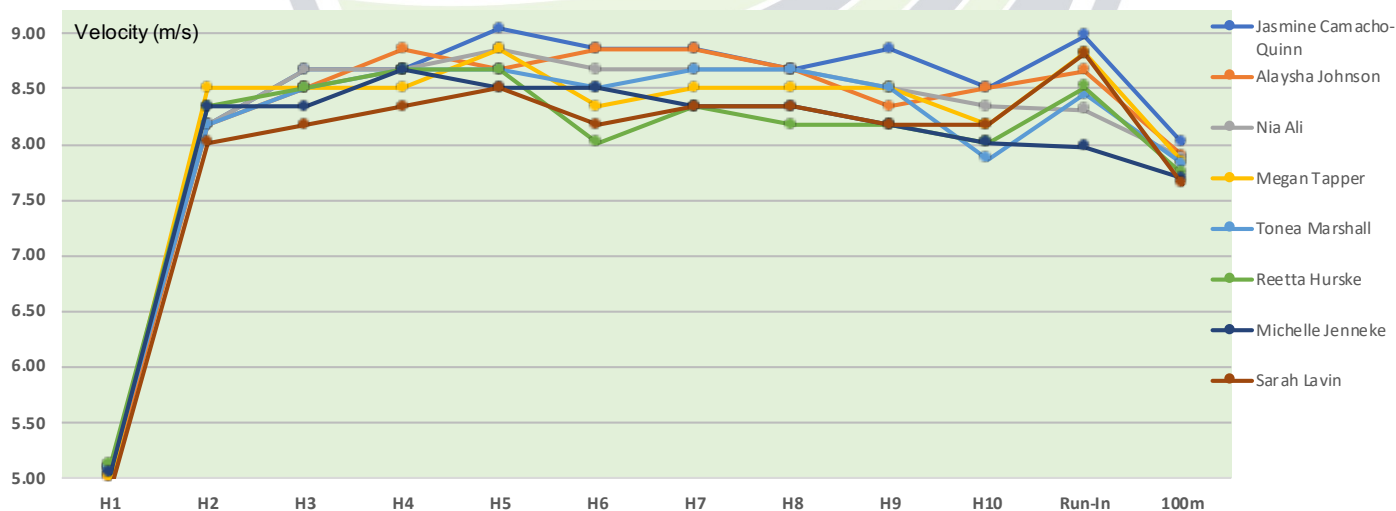
100m Hurdles

Date: 2023.05.05

Wind: 1.1 m/s

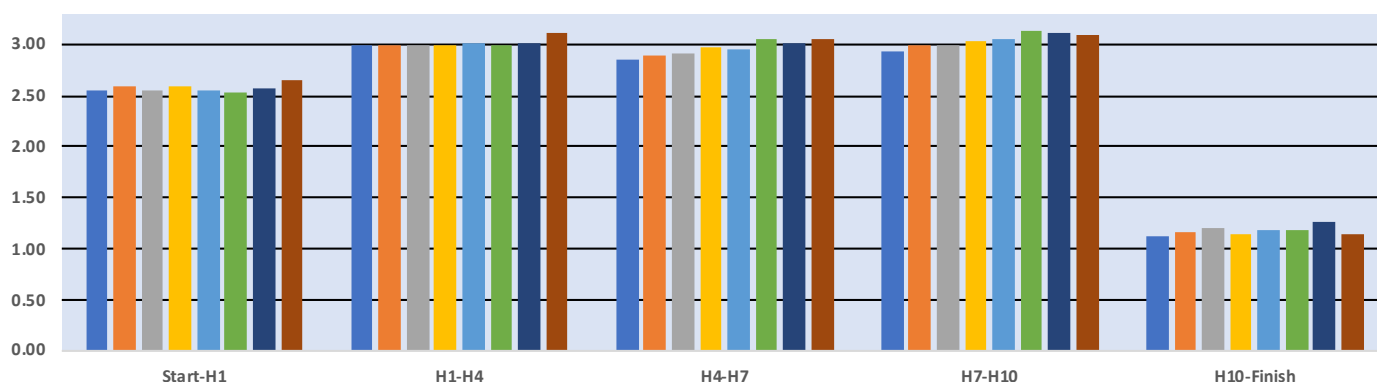
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199 time)	reaction time	0.148																
	interval																	
	velocity		5.08	8.17	8.67	8.67	9.04	8.85	8.85	8.67	8.85	8.50	8.97	8.01		3.00	2.86	2.94
Johnson, Alaysha (USA) (1996 time)	reaction time	0.165																
	interval																	
	velocity		5.00	8.17	8.50	8.85	8.67	8.85	8.85	8.67	8.33	8.50	8.66	7.90		3.00	2.90	3.00
Ali, Nia (USA) (1988 time)	reaction time	0.167																
	interval																	
	velocity		5.08	8.17	8.67	8.67	8.85	8.67	8.67	8.67	8.50	8.33	8.31	7.88		3.00	2.92	3.00
Tapper, Megan (JAM) (1994 time)	reaction time	0.163																
	interval																	
	velocity		5.00	8.50	8.50	8.50	8.85	8.33	8.50	8.50	8.50	8.50	8.17	8.82		3.00	2.98	3.04
Marshall, Tanea (USA) (1998 time)	reaction time	0.129																
	interval																	
	velocity		5.08	8.17	8.50	8.67	8.67	8.50	8.67	8.67	8.50	7.87	8.45	7.82		3.02	2.96	3.06
Hurske, Reetta (FIN) (1995 time)	reaction time	0.132																
	interval																	
	velocity		5.12	8.33	8.50	8.67	8.67	8.02	8.33	8.17	8.17	8.02	8.52	7.74		3.00	3.06	3.14
Jenneke, Michelle (AUS) (1993 time)	reaction time	0.154																
	interval																	
	velocity		5.04	8.33	8.33	8.67	8.50	8.50	8.33	8.33	8.17	8.02	7.98	7.69		3.02	3.02	3.12
Lavin, Sarah (IRL) (1994 time)	reaction time	0.137																
	interval																	
	velocity		4.89	8.02	8.17	8.33	8.50	8.17	8.33	8.33	8.17	8.17	8.82	7.65		3.12	3.06	3.10



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=9exSPMzGN2w>

Men's 400m Hurdles

2023 Top 10 Times - Men's 400m Hurdles

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)																	
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
date	16-Sep	time	5.74	9.40	13.10	16.86	20.68	24.61	28.60	32.70	36.97	41.36					
reaction time	0.154	interval	3.66	3.70	3.76	3.82	3.93	3.99	4.10	4.27	4.39	5.03					
		velocity	7.84	9.56	9.46	9.31	9.16	8.91	8.77	8.54	8.20	7.97	7.95	8.62		11.12	11.74
H1 lead leg	R	strides	20	13	13	12	12	13	13	13	13	13	17	152		9.44	8.94
																8.23	8.23
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 Herculis Meeting International d'Athlétisme (Monaco, MON)																	
date	21-Jul	time	5.55	9.05	12.62	16.26	20.02	23.95	28.03	32.24	36.65	41.21					
reaction time	0.146	interval	3.50	3.57	3.64	3.76	3.93	4.08	4.21	4.41	4.56	5.30					
		velocity	8.11	10.00	9.80	9.62	9.31	8.91	8.58	8.31	7.94	7.68	7.55	8.60		10.71	11.77
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	17.7	156.7		9.80	8.92
																7.97	7.97
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
date	16-Sep	time	5.59	9.17	12.80	16.46	20.22	24.10	28.12	32.37	36.62	41.18					
reaction time	0.135	interval	3.58	3.63	3.66	3.76	3.88	4.02	4.25	4.25	4.56	5.35					
		velocity	8.05	9.78	9.64	9.56	9.31	9.02	8.71	8.24	8.24	7.68	7.48	8.60		10.87	11.66
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	157		9.66	9.01
																8.04	8.04
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 Bislett Games (Oslo, NOR)																	
date	15-Jun	time	5.59	9.16	12.76	16.41	20.17	24.05	28.07	32.27	36.63	41.20					
reaction time	0.162	interval	3.57	3.60	3.65	3.76	3.88	4.02	4.20	4.36	4.57	5.32					
		velocity	8.05	9.80	9.72	9.59	9.31	9.02	8.71	8.33	8.03	7.66	7.52	8.60		10.82	11.66
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	17.7	156.7		9.70	9.01
																8.00	8.00
Benjamin, Rai (USA) (1997)																	
FINAL - 2023 USATF National Championships (Eugene, OR) (TV Analysis)																	
date	9-Jul	time	5.81	9.44	13.14	16.92	20.75	24.70	28.69	32.76	37.00	41.47					
reaction time		interval	3.63	3.70	3.78	3.83	3.95	3.99	4.07	4.24	4.47	5.15					
		velocity	7.75	9.64	9.46	9.26	9.14	8.86	8.77	8.60	8.25	7.83	7.77	8.58		11.11	11.77
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	17	154		9.45	8.92
																8.22	8.22
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 Norwegian National Championships (Jessheim, NOR)																	
date	6-Jul	time															
reaction time		interval	no information available														
		velocity															
H1 lead leg		strides															
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	23-Aug	time	5.81	9.46	12.90	16.52	20.29	24.25	28.29	32.50	36.93	41.61					
reaction time	0.171	interval	3.65	3.44	3.62	3.77	3.96	4.04	4.21	4.43	4.68	5.28					
		velocity	7.75	9.59	10.17	9.67	9.28	8.84	8.66	8.31	7.90	7.48	7.58	8.53		10.71	11.77
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	157		9.80	8.92
																7.88	7.88
Warholm, Karsten (NOR) (1996)																	
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	21-Aug	time	5.77	9.44	13.08	16.61	20.42	24.36	28.42	32.63	37.25	41.97					
reaction time	0.162	interval	3.67	3.64	3.53	3.81	3.94	4.06	4.21	4.62	4.72	5.12					
		velocity	7.80	9.54	9.62	9.92	9.19	8.88	8.62	8.31	7.58	7.42	7.81	8.49		10.84	11.81
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	15	15	17	158		9.69	8.89
																7.75	7.75
Benjamin, Rai (USA) (1997)																	
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	21-Aug	time	5.77	9.54	13.08	16.92	20.82	24.82	28.93	33.21	37.61	42.14					
reaction time	0.169	interval	3.77	3.54	3.84	3.90	4.00	4.11	4.28	4.40	4.53	5.10					
		velocity	7.80	9.28	9.89	9.11	8.97	8.75	8.52	8.18	7.95	7.73	7.84	8.47		11.15	12.01
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16.5	153.5		9.42	8.74
																7.95	7.95
McMaster, Kyrone (IVB) (1997)																	
FINAL - 2023 P-T-S Meeting (Banská Bystrica, SVK) (TV Analysis)																	
date	20-Jul	time	5.78	9.32	13.00	16.78	20.66	24.66	28.80	33.10	37.58	42.12					
reaction time	0.210	interval	3.54	3.68	3.78	3.88	4.00	4.14	4.30	4.48	4.54	5.14					
		velocity	7.79	9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46		11.00	12.02
H1 lead leg	L	strides		13	13	13	13	13	14	14	14	14	17.2	138.2		9.55	8.74
																7.88	7.88
McMaster, Kyrone (IVB) (1997)																	
FINAL - 2023 Weltklasse (Zürich, SUI)																	
date	31-Aug	time	5.56	9.05	12.66	16.39	20.25	24.26	28.39	32.72	37.25	41.90					
reaction time	0.149	interval	3.49	3.61	3.73	3.86	4.01	4.13	4.33	4.53	4.65	5.37					
		velocity	8.09	10.03	9.70	9.38	9.07	8.73	8.47	8.08	7.73	7.53	7.45	8.46		10.83	12.00
H1 lead leg	L	strides	21	13	13	13	13	13	13	14	14	14	17.2	158.2		9.70	8.75
																7.77	7.77
Warholm, Karsten (NOR) (1996)																	
FINAL - 2023 Weltklasse (Zürich, SUI)																	
date	31-Aug	time	5.63	9.23	12.94	16.69	20.55	24.50	28.55	32.78	37.30	41.91					
reaction time	0.169	interval	3.60	3.71	3.75	3.86	3.95	4.05	4.23	4.52	4.61	5.39					
		velocity	7.99	9.72	9.43	9.33	9.07	8.86	8.64	8.27	7.74	7.59	7.42	8.46		11.06	11.86
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	15	15	18	159		9.49	8.85
																7.86	7.86
McMaster, Kyrone (IVB) (1997)																	
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
date	16-Sep	time	5.58	9.11	12.71	16.42	20.29	24.26	28.35	32.59	37.11	41.75					
reaction time	0.133	interval	3.53	3.60	3.71	3.87	3.97	4.09	4.24	4.52	4.64	5.56					
		velocity	8.06	9.92	9.72	9.43	9.04	8.82	8.56	8.25	7.74	7.54	7.19	8.45		10.84	11.93
H1 lead leg	L	strides	21	13	13	12	13	13	13	13	14	14	17	156		9.69	8.80
																7.84	7.84
Clarke, Roshawn (JAM) (2004)																	
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	21-Aug	time	5.77	9.48	13.08	16.61	20.42	24.49	28.66	33.01	37.54	42.14					
reaction time	0.198	interval	3.71	3.60	3.53	3.81	4.07	4.17	4.35	4.53	4.60	5.20					
		velocity	7.80	9.43	9.72	9.92	9.19	8.60	8.39	8.05	7.73	7.61	7.69	8.45		10.84	12.05
H1 lead leg	R	strides	21	13	13	13	13	14	14	15	15	15	18.5	164.5		9.69	8.71

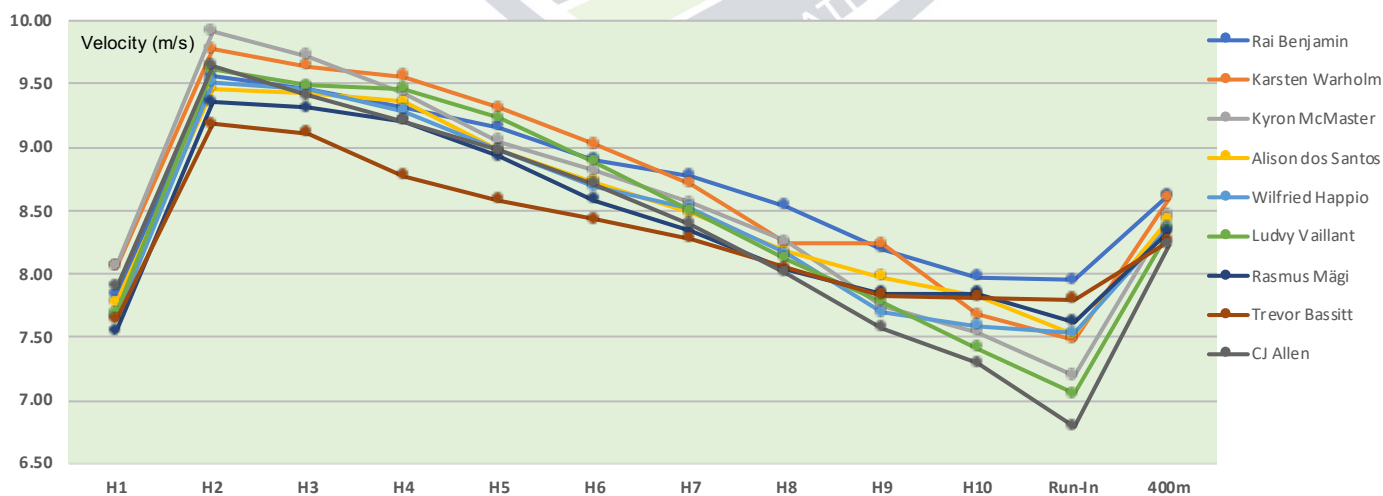
2023 Prefontaine Classic (Eugene, OR)

Men's 400m Hurdles

Date 2023.09.16

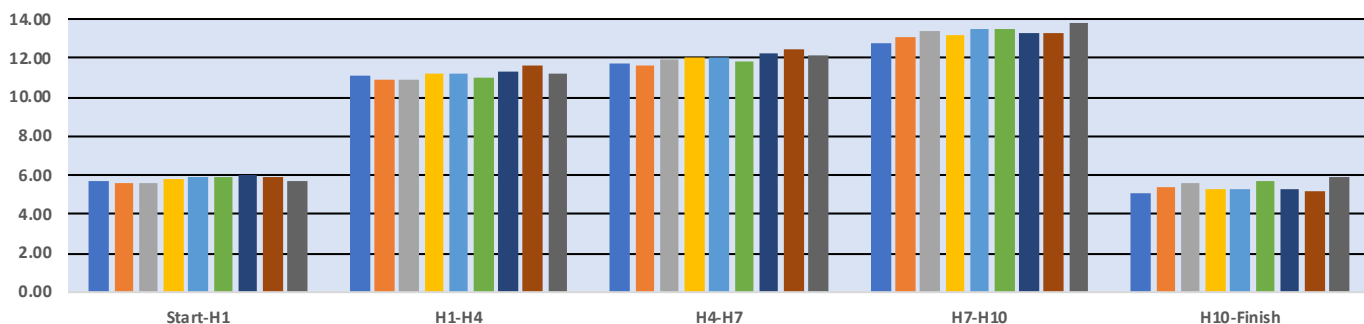
FINAL

					H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time				5.74	9.40	13.10	16.86	20.68	24.61	28.60	32.70	36.97	41.36		46.39	5 / 1			
	reaction time	0.154																11.12	11.74	12.76
	interval				7.84	3.66	3.70	3.76	3.82	3.93	3.99	4.10	4.27	4.39	5.03			9.44	8.94	8.23
	velocity																			
Warholm, Karsten (NOR) (1996)	time				5.59	9.17	12.80	16.46	20.22	24.10	28.12	32.37	36.62	41.18		46.53	7 / 2			
	reaction time	0.135																10.87	11.66	13.06
	interval				8.05	3.58	3.63	3.66	3.76	3.88	4.02	4.25	4.25	4.56	5.35			9.66	9.01	8.04
	velocity																			
McMaster, Kyrn (IVB) (1997)	time				5.58	9.11	12.71	16.42	20.29	24.26	28.35	32.59	37.11	41.75		47.31	6 / 3			
	reaction time	0.133																10.84	11.93	13.40
	interval				8.06	3.53	3.60	3.71	3.87	3.97	4.09	4.24	4.52	4.64	5.56			9.69	8.80	7.84
	velocity																			
dos Santos, Alison (BRA) (2000)	time				5.79	9.49	13.20	16.94	20.84	24.85	28.98	33.26	37.65	42.12		47.44	4 / 4			
	reaction time	0.172																11.15	12.04	13.14
	interval				7.77	3.70	3.71	3.74	3.90	4.01	4.13	4.28	4.39	4.47	5.32			9.42	8.72	7.99
	velocity																			
Happio, Wilfried (FRA) (1998)	time				5.88	9.56	13.26	17.03	20.93	24.96	29.07	33.36	37.91	42.52		47.83	3 / 5			
	reaction time	0.173																11.15	12.04	13.45
	interval				7.65	3.68	3.70	3.77	3.90	4.03	4.11	4.29	4.55	4.61	5.31			9.42	8.72	7.81
	velocity																			
Vaillant, Ludvy (FRA) (1995)	time				5.85	9.49	13.18	16.88	20.67	24.61	28.73	33.04	37.54	42.26		47.93	1 / 6			
	reaction time	0.138																11.03	11.85	13.53
	interval				7.69	3.64	3.69	3.70	3.79	3.94	4.12	4.31	4.50	4.72	5.67			9.52	8.86	7.76
	velocity																			
Mägi, Rasmus (EST) (1992)	time				5.96	9.70	13.46	17.26	21.18	25.26	29.46	33.82	38.28	42.74		47.99	9 / 7			
	reaction time	0.155																11.30	12.20	13.28
	interval				7.55	3.74	3.76	3.80	3.92	4.08	4.20	4.36	4.46	4.46	5.25			9.29	8.61	7.91
	velocity																			
Bassitt, Trevor (USA) (1998)	time				5.89	9.70	13.54	17.53	21.61	25.76	29.99	34.34	38.81	43.29		48.42	8 / 8			
	reaction time	0.154																11.64	12.46	13.30
	interval				7.64	3.81	3.84	3.99	4.08	4.15	4.23	4.35	4.47	4.48	5.13			9.02	8.43	7.89
	velocity																			
Allen, CJ (USA) (1995)	time				5.70	9.33	13.05	16.85	20.75	24.77	28.94	33.31	37.93	42.73		48.62	2 / 9			
	reaction time	0.137																11.15	12.09	13.79
	interval				7.89	3.63	3.72	3.80	3.90	4.02	4.17	4.37	4.62	4.80	5.89			9.42	8.68	7.61
	velocity																			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:15) - diamond league race analysis

<https://www.omegatiming.com/File/0002030D0102070101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=4S5SKwasIRs>

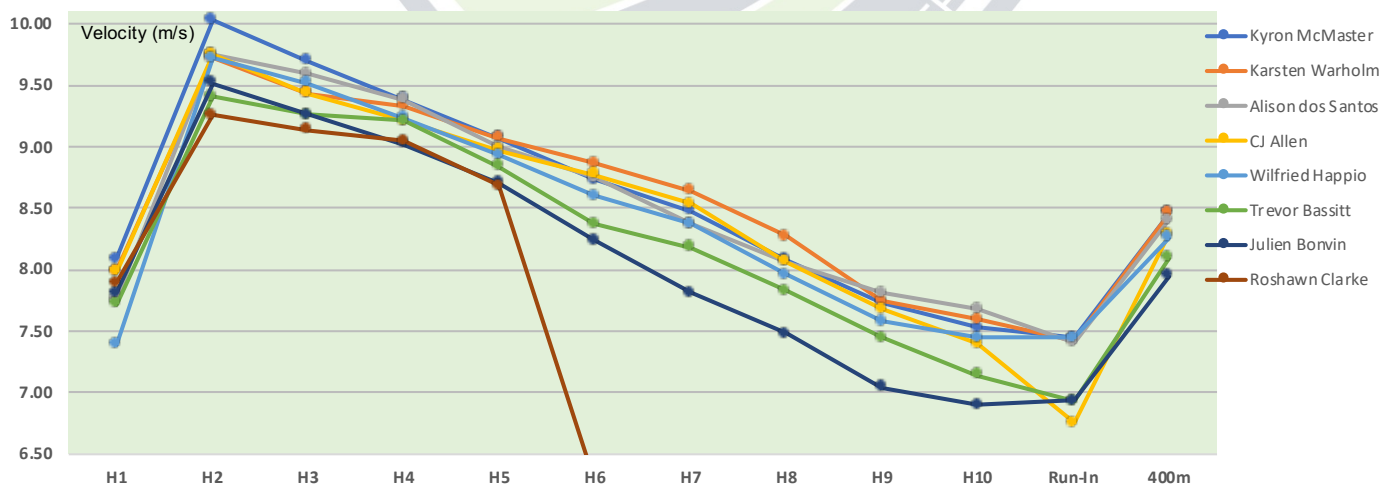
2023 Weltklasse (Zürich, SU)

Men's 400m Hurdles

Date 2023.08.31

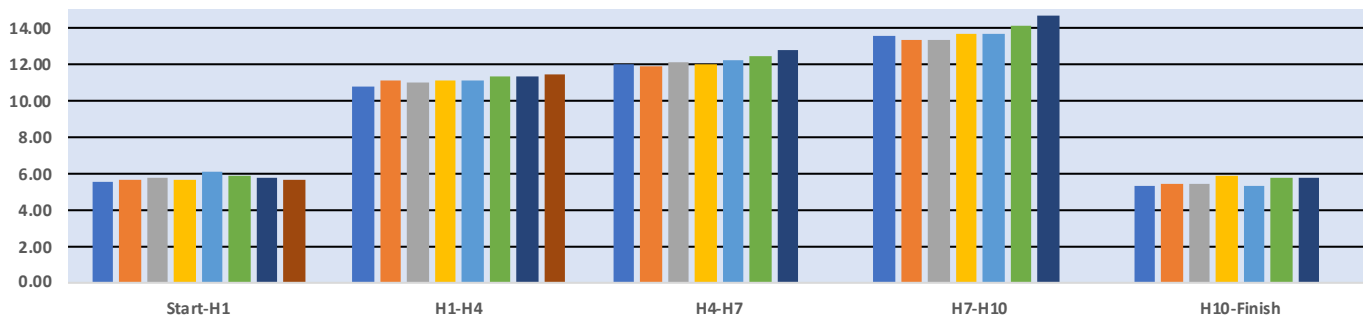
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		5.56	9.05	12.66	16.39	20.25	24.26	28.39	32.72	37.25	41.90		47.27	6 / 1			
	reaction time	0.149																
	interval		8.09	3.49	3.61	3.73	3.86	4.01	4.13	4.33	4.53	4.65	5.37			10.83	12.00	13.51
	velocity		8.09	10.03	9.70	9.38	9.07	8.73	8.47	8.08	7.73	7.53	7.45	8.46		9.70	8.75	7.77
Warholm, Karsten (NOR) (1996)	time		5.63	9.23	12.94	16.69	20.55	24.50	28.55	32.78	37.30	41.91		47.30	7 / 2			
	reaction time	0.169																
	interval		7.99	3.60	3.71	3.75	3.86	3.95	4.05	4.23	4.52	4.61	5.39			11.06	11.86	13.36
	velocity		7.99	9.72	9.43	9.33	9.07	8.86	8.64	8.27	7.74	7.59	7.42	8.46		9.49	8.85	7.86
dos Santos, Alison (BRA) (2000)	time		5.80	9.39	13.04	16.77	20.66	24.66	28.84	33.18	37.66	42.22		47.62	5 / 3			
	reaction time	0.162																
	interval		7.76	3.59	3.65	3.73	3.89	4.00	4.18	4.34	4.48	4.56	5.40			10.97	12.07	13.38
	velocity		7.76	9.75	9.59	9.38	9.00	8.75	8.37	8.06	7.81	7.68	7.41	8.40		9.57	8.70	7.85
Allen, CJ (USA) (1995)	time		5.64	9.23	12.94	16.74	20.64	24.63	28.73	33.07	37.63	42.36		48.28	3 / 4			
	reaction time	0.141																
	interval		7.98	3.59	3.71	3.80	3.90	3.99	4.10	4.34	4.56	4.73	5.92			11.10	11.99	13.63
	velocity		7.98	9.75	9.43	9.21	8.97	8.77	8.54	8.06	7.68	7.40	6.76	8.29		9.46	8.76	7.70
Happio, Wilfried (FRA) (1998)	time		6.09	9.69	13.37	17.16	21.08	25.15	29.33	33.73	38.35	43.05		48.42	2 / 5			
	reaction time	0.469																
	interval		7.39	3.60	3.68	3.79	3.92	4.07	4.18	4.40	4.62	4.70	5.37			11.07	12.17	13.72
	velocity		7.39	9.72	9.51	9.23	8.93	8.60	8.37	7.95	7.58	7.45	7.45	8.26		9.49	8.63	7.65
Bassitt, Trevor (USA) (1998)	time		5.83	9.55	13.33	17.13	21.09	25.27	29.55	34.02	38.72	43.62		49.39	8 / 6			
	reaction time	0.171																
	interval		7.72	3.72	3.78	3.80	3.96	4.18	4.47	4.70	4.90	5.77				11.30	12.42	14.07
	velocity		7.72	9.41	9.26	9.21	8.84	8.37	8.18	7.83	7.45	7.14	6.93	8.10		9.29	8.45	7.46
Bonvin, Julien (SUI) (1999)	time		5.76	9.44	13.22	17.10	21.12	25.37	29.85	34.53	39.50	44.57		50.34	1 / 7			
	reaction time	0.149																
	interval		7.81	3.68	3.78	3.88	4.02	4.25	4.48	4.68	4.97	5.07	5.77			11.34	12.75	14.72
	velocity		7.81	9.51	9.26	9.02	8.71	8.24	7.81	7.48	7.04	6.90	6.93	7.95		9.26	8.24	7.13
Clarke, Roshawn (JAM) (2004)	time		5.70	9.48	13.31	17.18	21.21	26.79						dnf	4 / --			
	reaction time	0.175																
	interval		7.89	3.78	3.83	3.87	4.03	5.58								11.48		
	velocity		7.89	9.26	9.14	9.04	8.68	6.27								9.15		
	H1 lead leg	L	21	13	13	13	13	13	13	14	14	14	17.2	158.2				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 31 Aug 2023 20:15) - diamond league race analysis

<https://www.omegatiming.com/File/0002030D0102070101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=4S5SKwasIRs>

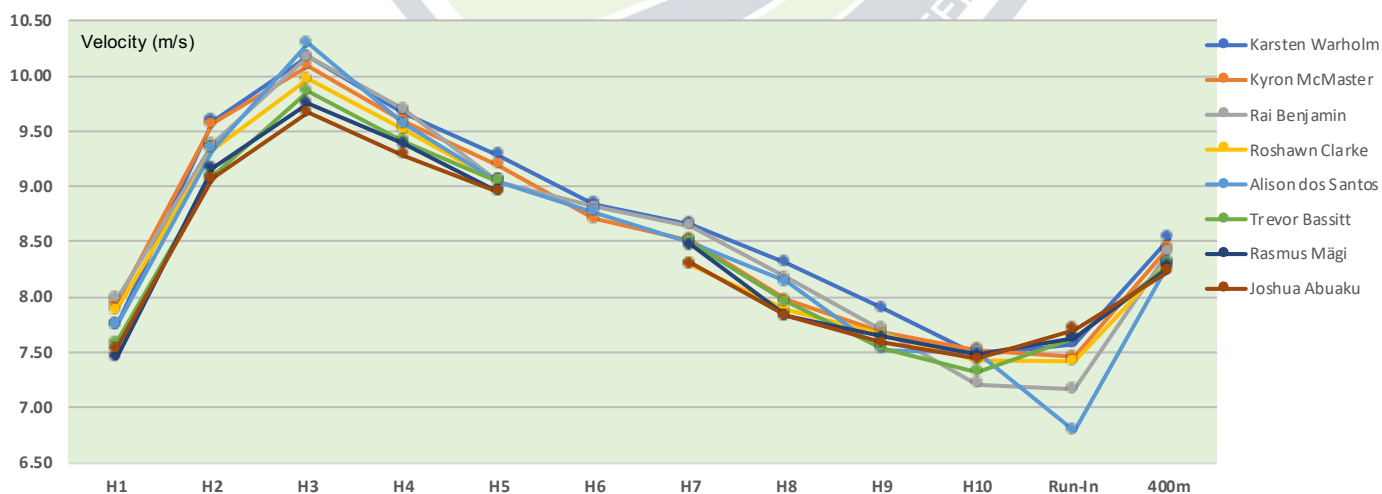
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.23

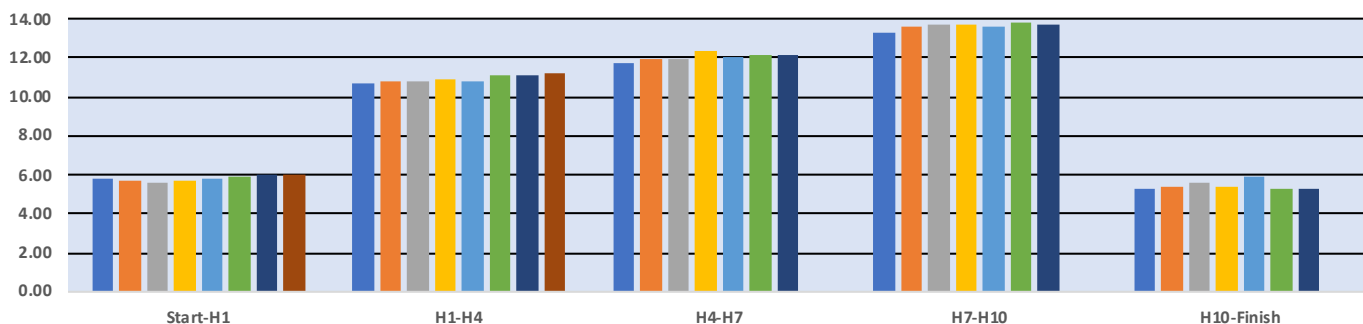
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.81	9.46	12.90	16.52	20.29	24.25	28.29	32.50	36.93	41.61		46.89	7 / 1			
	reaction time	0.171																
	interval		7.75	3.65	3.44	3.62	3.77	3.96	4.04	4.21	4.43	4.68	5.28			10.71	11.77	13.32
	velocity		7.75	9.59	10.17	9.67	9.28	8.84	8.66	8.31	7.90	7.48	7.58	8.53		9.80	8.92	7.88
McMaster, Kyron (IVB) (1997)	time		5.67	9.33	12.80	16.45	20.26	24.28	28.39	32.78	37.33	41.98		47.34	8 / 2			
	reaction time	0.151																
	interval		7.94	3.66	3.47	3.65	3.81	4.02	4.11	4.39	4.55	4.65	5.36			10.78	11.94	13.59
	velocity		7.94	9.56	10.09	9.59	9.19	8.71	8.52	7.97	7.69	7.53	7.46	8.45		9.74	8.79	7.73
Benjamin, Rai (USA) (1997)	time		5.64	9.37	12.81	16.42	20.29	24.26	28.31	32.59	37.13	41.98		47.56	6 / 3			
	reaction time	0.168																
	interval		7.98	3.73	3.44	3.61	3.87	3.97	4.05	4.28	4.54	4.85	5.58			10.78	11.89	13.67
	velocity		7.98	9.38	10.17	9.70	9.04	8.82	8.64	8.18	7.71	7.22	7.17	8.41		9.74	8.83	7.68
Clarke, Roshawn (JAM) (2004)	time		5.71	9.46	12.97	16.65	20.52		28.96	33.40	37.97	42.68		48.07	5 / 4			
	reaction time	0.164																
	interval		7.88	3.75	3.51	3.68	3.87		8.44	4.44	4.57	4.71	5.39			10.94	12.31	13.72
	velocity		7.88	9.33	9.97	9.51	9.04		8.29	7.88	7.66	7.43	7.42	8.32		9.60	8.53	7.65
dos Santos, Alison (BRA) (2000)	time		5.81	9.56	12.96	16.62	20.49	24.48	28.60	32.90	37.55	42.21		48.10	9 / 5			
	reaction time	0.164																
	interval		7.75	3.75	3.40	3.66	3.87	3.99	4.12	4.30	4.65	4.66	5.89			10.81	11.98	13.61
	velocity		7.75	9.33	10.29	9.56	9.04	8.77	8.50	8.14	7.53	7.51	6.79	8.32		9.71	8.76	7.71
Bassitt, Trevor (USA) (1998)	time		5.93	9.78	13.33	17.05	20.92		29.16	33.56	38.20	42.98		48.22	3 / 6			
	reaction time	0.164																
	interval		7.59	3.85	3.55	3.72	3.87		8.24	4.40	4.64	4.78	5.24			11.12	12.11	13.82
	velocity		7.59	9.09	9.86	9.41	9.04		8.50	7.95	7.54	7.32	7.63	8.30		9.44	8.67	7.60
Mägi, Rasmus (EST) (1992)	time		6.04	9.86	13.45	17.18	21.09		29.36	33.83	38.41	43.09		48.33	4 / 7			
	reaction time	0.161																
	interval		7.45	3.82	3.59	3.73	3.91		8.27	4.47	4.58	4.68	5.24			11.14	12.18	13.73
	velocity		7.45	9.16	9.75	9.38	8.95		8.46	7.83	7.64	7.48	7.63	8.28		9.43	8.62	7.65
Abuaku, Joshua (GER) (1996)	time		5.97	9.83	13.45	17.22	21.13		29.56	34.03	38.64	43.34		48.53	2 / 8			
	reaction time	0.156																
	interval		7.54	3.86	3.62	3.77	3.91		8.43	4.47	4.61	4.70	5.19			11.25	12.34	13.78
	velocity		7.54	9.07	9.67	9.28	8.95		8.30	7.83	7.59	7.45	7.71	8.24		9.33	8.51	7.62



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=kW3kfam5DrM>

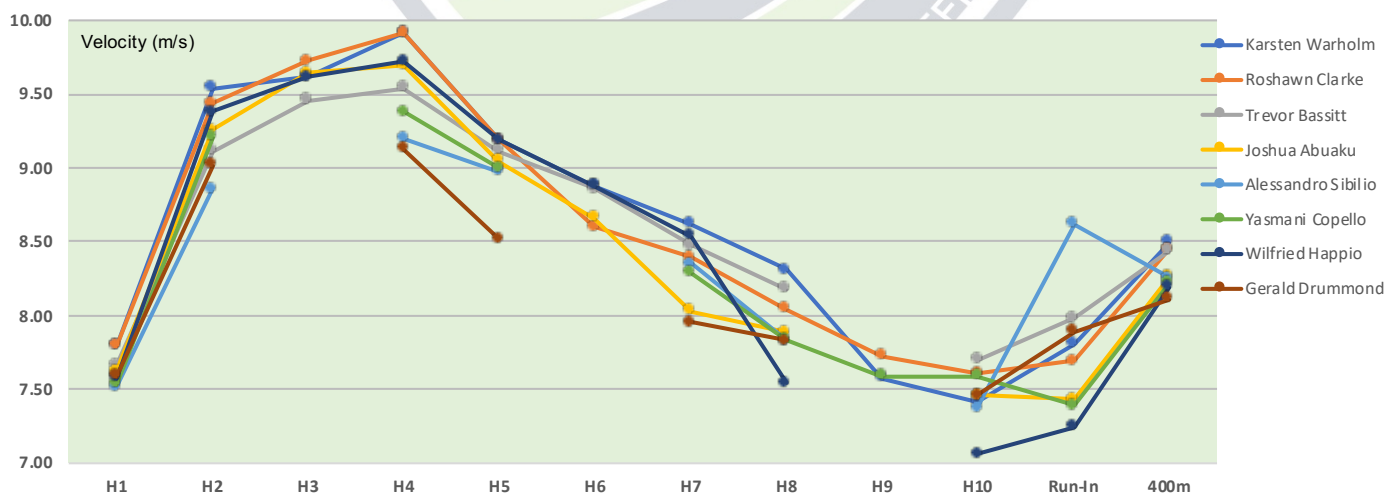
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.21

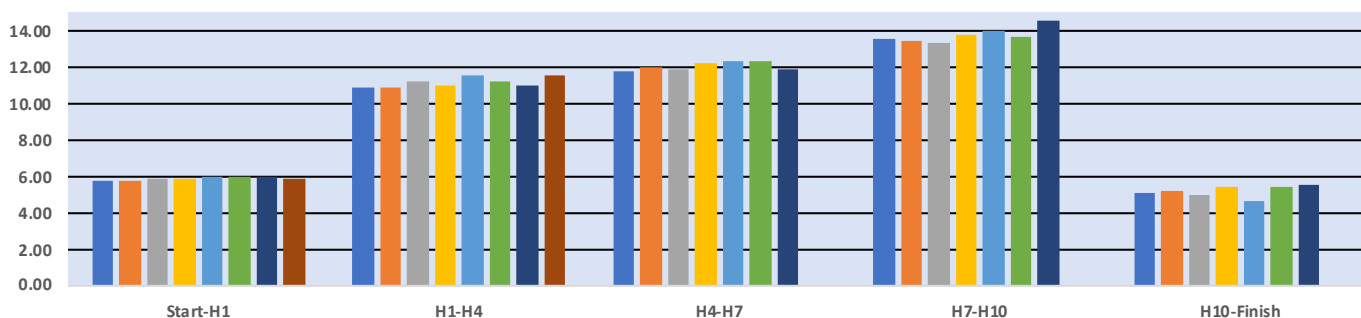
Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.77	9.44	13.08	16.61	20.42	24.36	28.42	32.63	37.25	41.97		47.09	5 / 1			
	reaction time	0.162											5.12			10.84	11.81	13.55
	interval		7.80	3.67	3.64	3.53	3.81	3.94	4.06	4.21	4.62	4.72	7.81	8.49		9.69	8.89	7.75
	velocity																	
Clarke, Roshawn (JAM) (2004)	time		5.77	9.48	13.08	16.61	20.42	24.49	28.66	33.01	37.54	42.14		47.34	7 / 2			
	reaction time	0.198											5.20			10.84	12.05	13.48
	interval		7.80	3.71	3.60	3.53	3.81	4.07	4.17	4.35	4.53	4.60	7.69	8.45		9.69	8.71	7.79
	velocity																	
Bassitt, Trevor (USA) (1998)	time		5.87	9.71	13.41	17.08	20.92	24.87	29.00	33.28		42.37		47.38	9 / 3			
	reaction time	0.187											5.01			11.21	11.92	13.37
	interval		7.67	3.84	3.70	3.67	3.84	3.95	4.13	4.28		9.09	7.98	8.44		9.37	8.81	7.85
	velocity																	
Abuaku, Joshua (GER) (1996)	time		5.90	9.68	13.31	16.92	20.79	24.83	29.19	33.63		43.01		48.39	8 / 4			
	reaction time	0.179											5.38			11.02	12.27	13.82
	interval		7.63	3.78	3.63	3.61	3.87	4.04	4.36	4.44		9.38	7.43	8.27		9.53	8.56	7.60
	velocity																	
Sibilio, Alessandro (ITA) (1999)	time		5.99	9.94		17.55	21.45		29.83	34.30		43.79		48.43	2 / 5			
	reaction time	0.152											4.64			11.56	12.28	13.96
	interval		7.51	3.95		7.61	3.90		8.38	4.47		9.49	8.62	8.26		9.08	8.55	7.52
	velocity																	
Copello, Yasmani (TUR) (1987)	time		5.97	9.77		17.23	21.12		29.57	34.03		43.25		48.66	3 / 6			
	reaction time	0.220											5.41			11.26	12.34	13.68
	interval		7.54	3.80		7.46	3.89		8.45	4.46		9.59	7.39	8.22		9.33	8.51	7.67
	velocity																	
Happio, Wilfried (FRA) (1998)	time		5.94	9.67	13.31	16.91	20.72	24.66	28.76	33.40		43.31		48.83	6 / 7			
	reaction time	0.176											5.52			10.97	11.85	14.55
	interval		7.58	3.73	3.64	3.60	3.81	3.94	4.10	4.64		9.91	7.25	8.19		9.57	8.86	7.22
	velocity																	
Drummond, Gerald (CRC) (1994)	time		5.93	9.81		17.48	21.59		30.39	34.86		44.24		49.31	4 / 8			
	reaction time	0.169											5.07			11.55	12.91	13.85
	interval		7.59	3.88		7.67	4.11		8.80	4.47		9.38	7.89	8.11		9.09	8.13	7.58
	velocity																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=fP1CbXQ3e44>

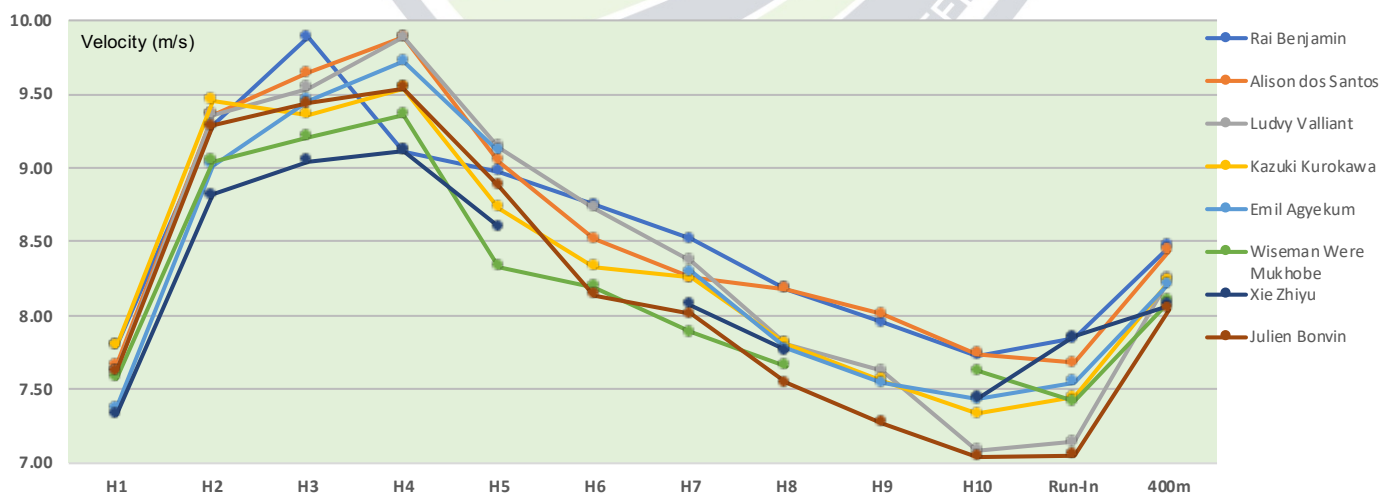
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Date 2023.08.21

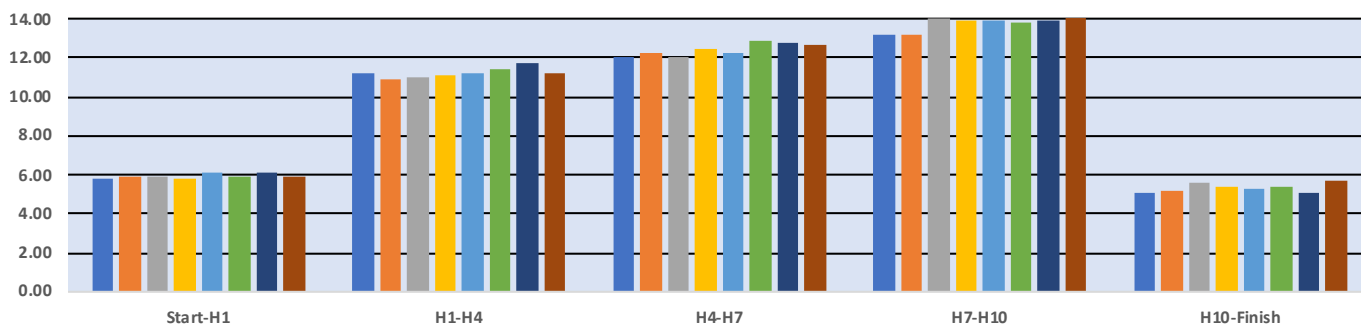
Semi-Final 2

				H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time			5.77	9.54	13.08	16.92	20.82	24.82	28.93	33.21	37.61	42.14		47.24	7 / 1			
	reaction time	0.169	interval		3.77	3.54	3.84	3.90	4.00	4.11	4.28	4.40	4.53	5.10			11.15	12.01	13.21
	velocity			7.80	9.28	9.89	9.11	8.97	8.75	8.52	8.18	7.95	7.73	7.84	8.47		9.42	8.74	7.95
	H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16.5	153.5				
dos Santos, Alison (BRA) (2000)	time			5.87	9.61	13.24	16.78	20.65	24.76	29.00	33.28	37.65	42.17		47.38	8 / 2			
	reaction time	0.182	interval		3.74	3.63	3.54	3.87	4.11	4.24	4.28	4.37	4.52	5.21			10.91	12.22	13.17
	velocity			7.67	9.36	9.64	9.89	9.04	8.52	8.25	8.18	8.01	7.74	7.68	8.44		9.62	8.59	7.97
	H1 lead leg	L	strides	20	13	12	12	12	13	13	13	13	13	16.2	150.2				
Vaillant, Ludvy (FRA) (1995)	time			5.90	9.64	13.31	16.85	20.68	24.69	28.87	33.35	37.94	42.88		48.48	6 / 3			
	reaction time	0.194	interval		3.74	3.67	3.54	3.83	4.01	4.18	4.48	4.59	4.94	5.60			10.95	12.02	14.01
	velocity			7.63	9.36	9.54	9.89	9.14	8.73	8.37	7.81	7.63	7.09	7.14	8.25		9.59	8.74	7.49
	H1 lead leg	R	strides	21	13	13	13	13	13	14	14	14	15	18	161				
Kurokawa, Kazuki (JPN) (2001)	time			5.77	9.47	13.21	16.88	20.89	25.09	29.33	33.81	38.44	43.21		48.58	5 / 4			
	reaction time	0.144	interval		3.70	3.74	3.67	4.01	4.20	4.24	4.48	4.63	4.77	5.37	PB		11.11	12.45	13.88
	velocity			7.80	9.46	9.36	9.54	8.73	8.33	8.25	7.81	7.56	7.34	7.45	8.23		9.45	8.43	7.56
	H1 lead leg	L	strides	21	13	13	13	13	14	14	15	15	15	19	165				
Agyekum, Emil (GER) (1999)	time			6.10	9.98	13.68	17.28	21.12		29.56	34.06	38.70	43.41		48.71	3 / 5			
	reaction time	0.196	interval		3.88	3.80	3.74	4.20	4.27	4.44	4.57	4.64	4.71	5.30	PB		11.18	12.28	13.85
	velocity			7.38	9.02	9.46	9.72	9.11		8.29	7.78	7.54	7.43	7.55	8.21		9.39	8.55	7.58
	H1 lead leg	L	strides	21	13	13	13	13			14	15	15	18	135				
Mukhobe, Wiseman Were (KEN) (1999)	time			5.94	9.81	13.61	17.35	21.55	25.82	30.26	34.83		44.01		49.40	9 / 6			
	reaction time	0.196	interval		3.87	3.80	3.74	4.20	4.27	4.44	4.57		9.18	5.39			11.41	12.91	13.75
	velocity			7.58	9.04	9.21	9.36	8.33	8.20	7.88	7.66		7.63	7.42	8.10		9.20	8.13	7.64
	H1 lead leg	R	strides	22	14	14	13	14	14	15				19	125				
Xie Zhiyu (CHN) (2000)	time			6.14	10.11	13.98	17.82	21.89		30.56	35.07		44.48		49.57	2 / 7			
	reaction time	0.189	interval		3.97	3.87	3.84	4.07		8.67	4.51		9.41	5.09			11.68	12.74	13.92
	velocity			7.33	8.82	9.04	9.11	8.60		8.07	7.76		7.44	7.86	8.07		8.99	8.24	7.54
	H1 lead leg	L	strides	21		13	13	13			14			17	91				
Bonvin, Julien (SUI) (1999)	time			5.90	9.67	13.38	17.05	20.99	25.29	29.66	34.30	39.11	44.08		49.75	4 / 8			
	reaction time	0.175	interval		3.77	3.71	3.67	3.94	4.30	4.37	4.64	4.81	4.97	5.67			11.15	12.61	14.42
	velocity			7.63	9.28	9.43	9.54	8.88	8.14	8.01	7.54	7.28	7.04	7.05	8.04		9.42	8.33	7.28
	H1 lead leg	L	strides	20	13	13	13	13	14	14	15	15		18	148				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=0yCaWW-JaR08>

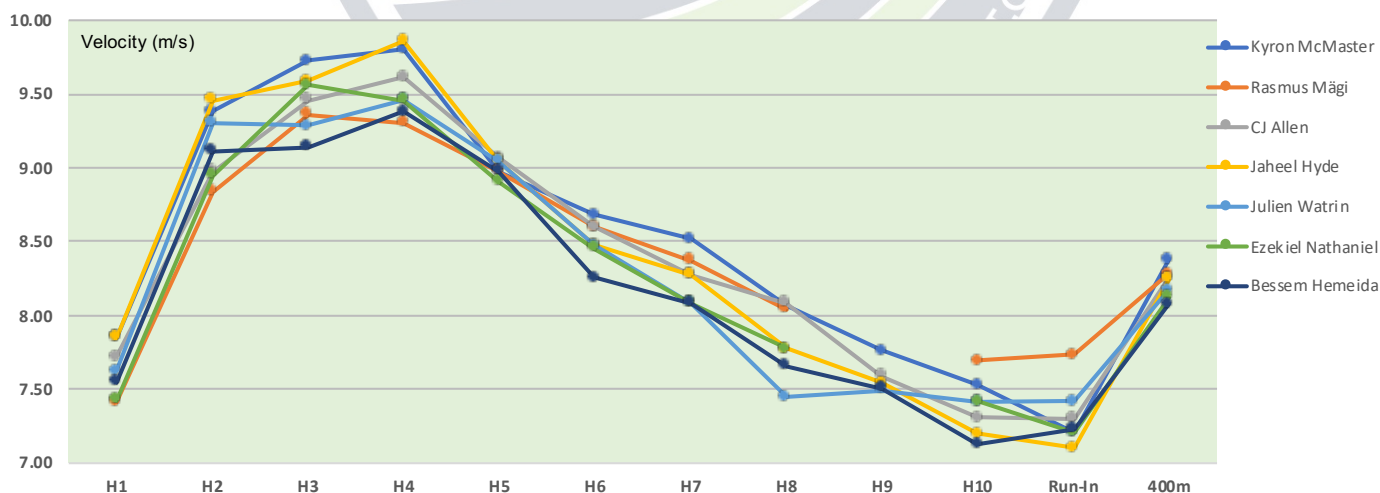
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.21

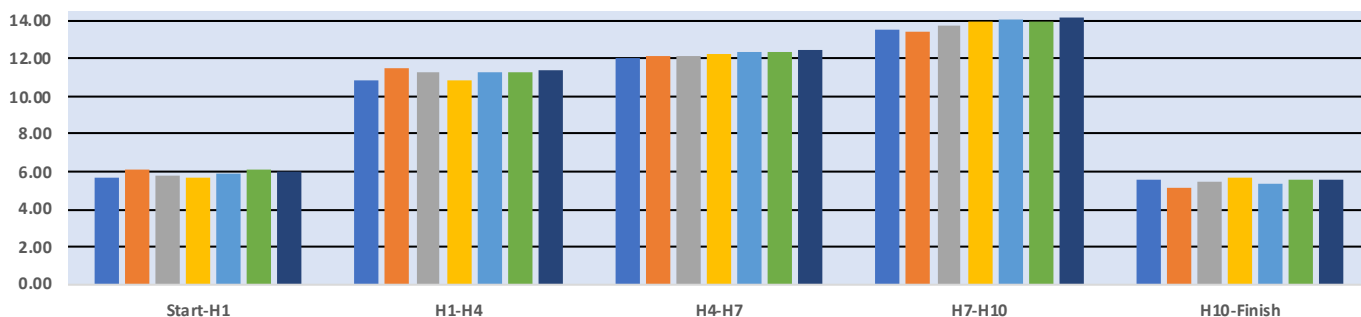
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		5.73	9.46	13.06	16.63	20.53	24.56	28.67	33.01	37.52	42.17		47.72	8 / 1			
	reaction time	0.168																
	interval		7.85	3.73	3.60	3.57	3.90	4.03	4.11	4.34	4.51	4.65	5.55			10.90	12.04	13.50
	velocity		7.85	9.38	9.72	9.80	8.97	8.68	8.52	8.06	7.76	7.53	7.21	8.38		9.63	8.72	7.78
Mägi, Rasmus (EST) (1992)	time		6.07	10.03	13.77	17.53	21.43	25.50	29.68	34.03		43.13		48.30	7 / 2			
	reaction time	0.180																
	interval		7.41	3.96	3.74	3.76	3.90	4.07	4.18	4.35		9.10	5.17			11.46	12.15	13.45
	velocity		7.41	8.84	9.36	9.31	8.97	8.60	8.37	8.05		7.69	7.74	8.28		9.16	8.64	7.81
Allen, CJ (USA) (1995)	time		5.83	9.73	13.43	17.07	20.93	25.00	29.23	33.56	38.17	42.96		48.44	6 / 3			
	reaction time	0.152																
	interval		7.72	3.90	3.70	3.64	3.86	4.07	4.23	4.33	4.61	4.79	5.48			11.24	12.16	13.73
	velocity		7.72	8.97	9.46	9.62	9.07	8.60	8.27	8.08	7.59	7.31	7.30	8.26		9.34	8.63	7.65
Hyde, Jaheel (JAM) (1997)	time		5.73	9.43	13.08	16.63	20.50	24.63	28.86	33.36	38.00	42.86		48.49	5 / 4			
	reaction time	0.150																
	interval		7.85	3.70	3.65	3.55	3.87	4.13	4.23	4.50	4.64	4.86	5.63			10.90	12.23	14.00
	velocity		7.85	9.46	9.59	9.86	9.04	8.47	8.27	7.78	7.54	7.20	7.10	8.25		9.63	8.59	7.50
Watrin, Julien (BEL) (1992)	time		5.90	9.66	13.43	17.13	21.00	25.13	29.46	34.16	38.83	43.55		48.94	3 / 5			
	reaction time	0.205																
	interval		7.63	3.76	3.77	3.70	3.87	4.14	4.33	4.70	4.67	4.72	5.39			11.23	12.33	14.09
	velocity		7.63	9.31	9.28	9.46	9.04	8.47	8.08	7.45	7.49	7.42	7.42	8.17		9.35	8.52	7.45
Nathaniel, Ezekiel (NGR) (2003)	time		6.06	9.97	13.63	17.33	21.26	25.40	29.73	34.23		43.67		49.22	9 / 6			
	reaction time	0.209																
	interval		7.43	3.91	3.66	3.70	3.93	4.14	4.33	4.50		9.44	5.55			11.27	12.40	13.94
	velocity		7.43	8.95	9.56	9.46	8.91	8.45	8.08	7.78		7.42	7.21	8.13		9.32	8.47	7.53
Hemeida, Bassem (QAT) (2000)	time		5.96	9.80	13.63	17.36	21.26	25.50	29.83	34.40	39.06	43.97		49.50	4 / 7			
	reaction time	0.172																
	interval		7.55	3.84	3.83	3.73	3.90	4.24	4.33	4.57	4.66	4.91	5.53			11.40	12.47	14.14
	velocity		7.55	9.11	9.14	9.38	8.97	8.25	8.08	7.66	7.51	7.13	7.23	8.08		9.21	8.42	7.43



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=JAqk2zqOPzA>

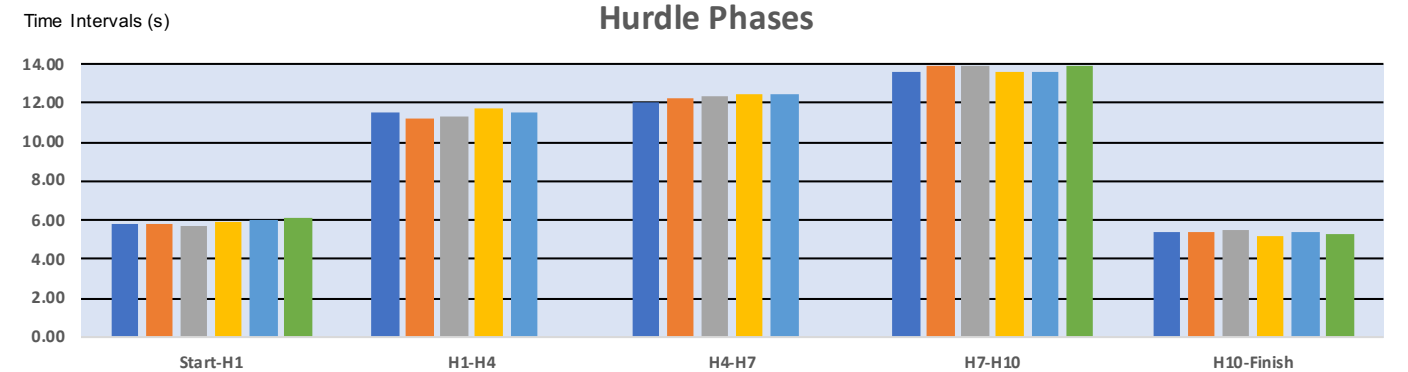
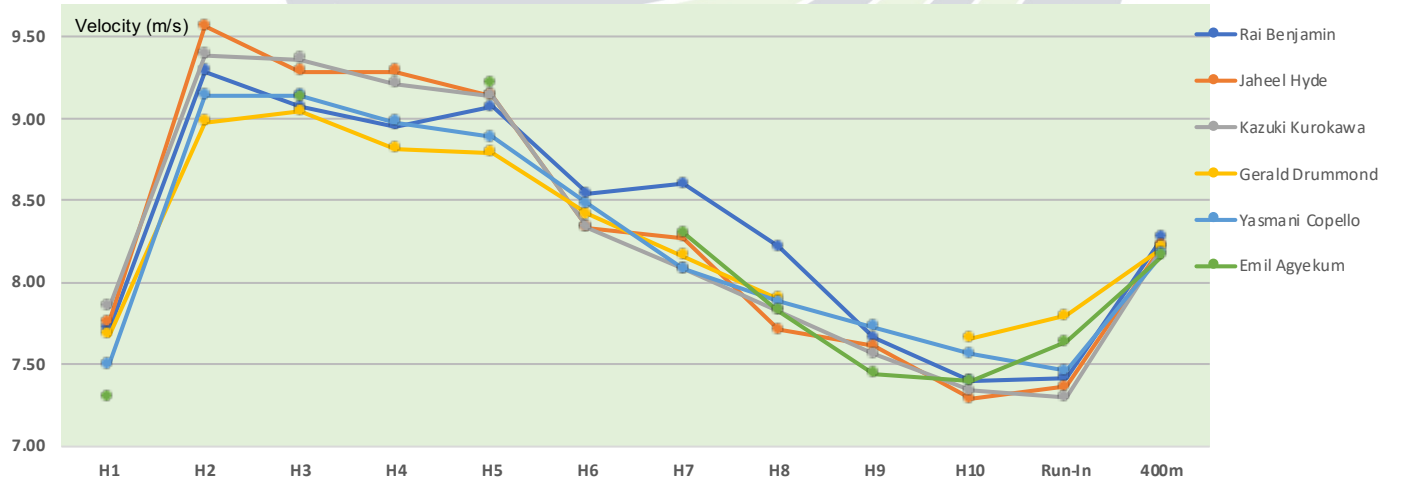
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

Heat 5

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.83	9.60	13.46	17.37	21.23	25.33	29.40	33.66	38.23	42.96		48.35	5 / 1			
	reaction time	0.176																
	interval		7.72	3.77	3.86	3.91	3.86	4.10	4.07	4.26	4.57	4.73	5.39			11.54	12.03	13.56
	velocity		7.72	9.28	9.07	8.95	9.07	8.54	8.60	8.22	7.66	7.40	7.42	8.27		9.10	8.73	7.74
Hyde, Jaheel (JAM) (1997)	time		5.80	9.46	13.23	17.00	20.83	25.03	29.26	33.80	38.40	43.20		48.63	9 / 2			
	reaction time	0.182																
	interval		7.76	3.66	3.77	3.77	3.83	4.20	4.23	4.54	4.60	4.80	5.43			11.20	12.26	13.94
	velocity		7.76	9.56	9.28	9.28	9.14	8.33	8.27	7.71	7.61	7.29	7.37	8.23		9.38	8.56	7.53
Kurokawa, Kazuki (JPN) (2001)	time		5.73	9.46	13.20	17.00	20.83	25.03	29.36	33.83	38.46	43.23		48.71	3 / 3			
	reaction time	0.158																
	interval		7.85	3.73	3.74	3.80	3.83	4.20	4.33	4.47	4.63	4.77	5.48			11.27	12.36	13.87
	velocity		7.85	9.38	9.36	9.21	9.14	8.33	8.08	7.83	7.56	7.34	7.30	8.21		9.32	8.50	7.57
Drummond, Gerald (CRC) (1994)	time		5.86	9.76	13.63	17.60	21.58	25.74	30.03	34.46		43.60		48.73	8 / 4			
	reaction time	0.220																
	interval		7.68	3.90	3.87	3.97	3.98	4.16	4.29	4.43		9.14	5.13			11.74	12.43	13.57
	velocity		7.68	8.97	9.04	8.82	8.79	8.41	8.16	7.90		7.66	7.80	8.21		8.94	8.45	7.74
Copello, Yasmani (TUR) (1987)	time		6.00	9.83	13.66	17.56	21.50	25.63	29.96	34.40	38.93	43.56		48.92	6 / 5			
	reaction time	0.244																
	interval		7.50	3.83	3.83	3.90	3.94	4.13	4.33	4.44	4.53	4.63	5.36			11.56	12.40	13.60
	velocity		7.50	9.14	9.14	8.97	8.88	8.47	8.08	7.88	7.73	7.56	7.46	8.18		9.08	8.47	7.72
Agyekum, Emil (GER) (1999)	time		6.16		13.83		21.43		29.86	34.33	39.03	43.76		49.00	1 / 6			
	reaction time	0.232																
	interval				7.67		7.60		8.43	4.47	4.70	4.73	5.24					13.90
	velocity				9.13		9.21		8.30	7.83	7.45	7.40	7.63	8.16				7.55
	H1 lead leg	R						13		14	15	15	18	95				
	strides		20															



Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps
Timing From: First Movement
Source: <https://www.youtube.com/watch?v=W4r-vvIQ5wI&t=72s>

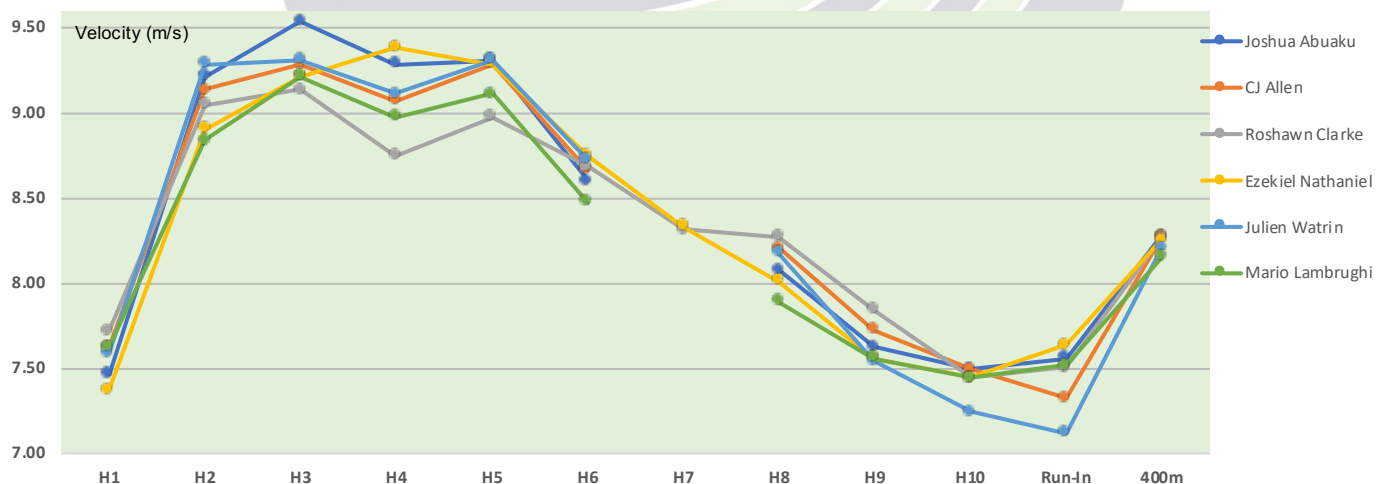
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

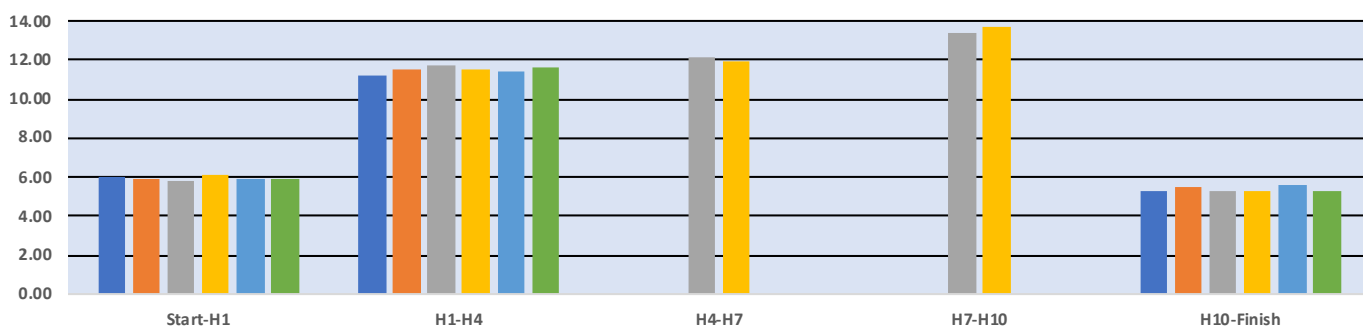
Heat 4

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Abuaku, Joshua (GER) (1996)	time		6.03	9.83	13.50	17.27	21.03	25.10		33.77	38.36	43.03		48.32	5 / 1			
	reaction time	0.207								8.67	4.59	4.67	5.29	PB		11.24		
	interval		7.46	9.21	9.54	9.28	9.31	8.60		8.07	7.63	7.49	7.56	8.28		9.34		
	velocity																	
Allen, CJ (USA) (1995)	time		5.90	9.73	13.50	17.36	21.13	25.17		33.70	38.23	42.90		48.36	9 / 2			
	reaction time	0.167								8.53	4.53	4.67	5.46			11.46		
	interval		7.63	9.14	9.28	9.07	9.28	8.66		8.21	7.73	7.49	7.33	8.27		9.16		
	velocity																	
Clarke, Roshawn (JAM) (2004)	time		5.83	9.70	13.53	17.53	21.43	25.46	29.67	33.90	38.36	43.06		48.39	3 / 3			
	reaction time	0.183								4.21	4.23	4.46	4.70	5.33		11.70	12.14	13.39
	interval		7.72	9.04	9.14	8.75	8.97	8.68	8.31	8.27	7.85	7.45	7.50	8.27		8.97	8.65	7.84
	velocity																	
Nathaniel, Ezekiel (NGR) (2003)	time		6.10	10.03	13.83	17.56	21.33	25.33	29.53	33.90	38.53	43.23		48.47	8 / 4			
	reaction time	0.210								4.37	4.63	4.70	5.24			11.46	11.97	13.70
	interval		7.38	8.91	9.21	9.38	9.28	8.75	8.33	8.01	7.56	7.45	7.63	8.25		9.16	8.77	7.66
	velocity																	
Watrin, Julien (BEL) (1992)	time		5.93	9.70	13.46	17.30	21.06	25.07		33.63	38.27	43.10		48.72	6 / 5			
	reaction time	0.230								8.56	4.64	4.83	5.62			11.37		
	interval		7.59	9.28	9.31	9.11	9.31	8.73		8.18	7.54	7.25	7.12	8.21		9.23		
	velocity																	
Lambrugh, Mario (ITA) (1992)	time		5.90	9.86	13.66	17.56	21.40	25.53		34.40	39.03	43.73		49.05	1 / 6			
	reaction time	0.129								8.87	4.63	4.70	5.32			11.66		
	interval		7.63	8.84	9.21	8.97	9.11	8.47		7.89	7.56	7.45	7.52	8.15		9.01		
	velocity																	
	H1 lead leg	R	22	14	14	14	14	14			15	15	18.5	140.5				
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=W4r-vvIQ5wI&t=72s>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

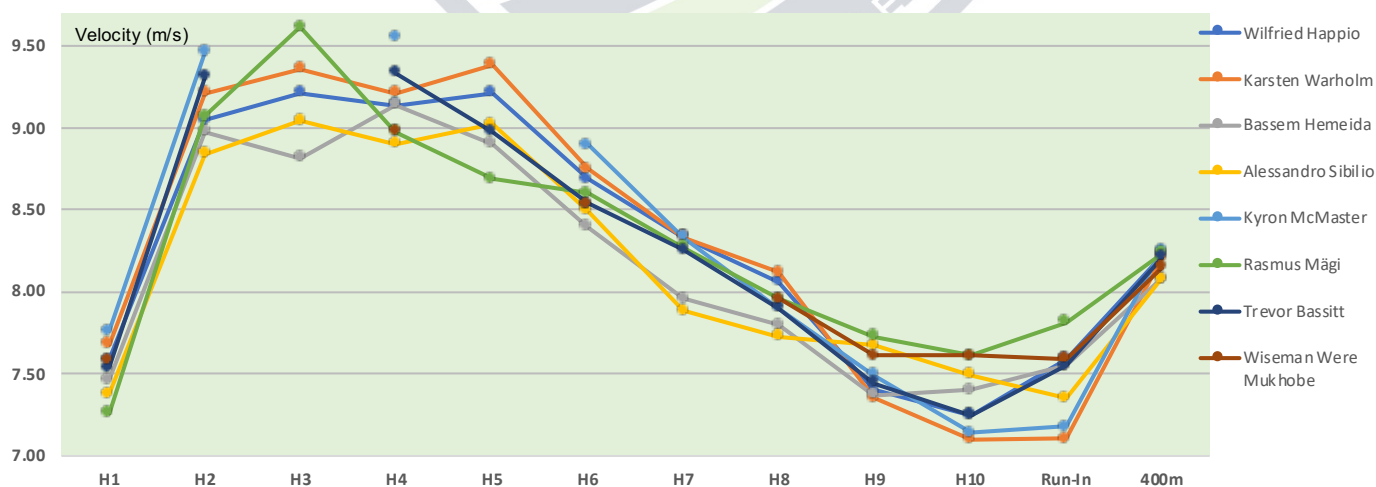
Heat 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Happio, Wilfried (FRA) (1998)	time		5.93	9.80	13.60	17.43	21.23	25.26	29.46	33.80	38.53	43.36		48.63	4 / 1			
	reaction time	0.172														11.50	12.03	13.90
	interval		7.59	9.04	9.21	9.14	9.21	8.68	8.33	8.06	7.40	7.25	7.59	8.23		9.13	8.73	7.55
	velocity																	
Warholm, Karsten (NOR) (1996)	time		5.86	9.66	13.40	17.20	20.93	24.93	29.13	33.44	38.20	43.13		48.76	3 / 2			
	reaction time	0.166														11.34	11.93	14.00
	interval		7.68	9.21	9.36	9.21	9.38	8.75	8.33	8.12	7.35	7.10	7.10	8.20		9.26	8.80	7.50
	velocity																	
Hemeida, Bassem (QAT) (2000)	time		6.03	9.93	13.90	17.73	21.66	25.83	30.23	34.72	39.47	44.20		49.50	2 / 3			
	reaction time	0.156														11.70	12.50	13.97
	interval		7.46	8.97	8.82	9.14	8.91	8.39	7.95	7.80	7.37	7.40	7.55	8.08		8.97	8.40	7.52
	velocity																	
Sibilio, Alessandro (ITA) (1999)	time		6.10	10.06	13.93	17.86	21.74	25.86	30.30	34.83	39.39	44.06		49.50	5 / 4			
	reaction time	0.178														11.76	12.44	13.76
	interval		7.38	8.84	9.04	8.91	9.02	8.50	7.88	7.73	7.68	7.49	7.35	8.08		8.93	8.44	7.63
	velocity																	

Date 2023.08.20

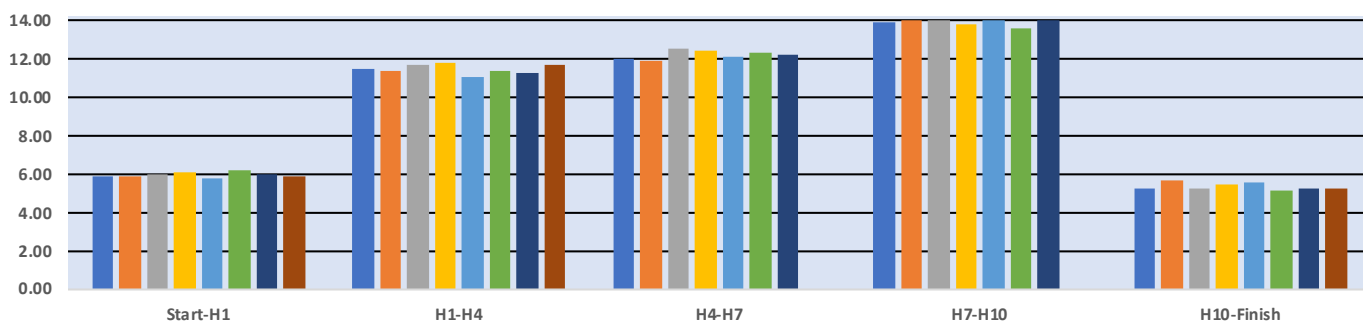
Heat 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		5.80	9.50		16.83		24.70	28.90	33.33	38.00	42.90		48.47	4 / 1			
	reaction time	0.156														11.03	12.07	14.00
	interval		7.76	9.46		7.33		7.87	4.20	4.43	4.67	4.90	5.57	8.25		9.52	8.70	7.50
	velocity																	
Mägi, Rasmus (EST) (1992)	time		6.20	10.06	13.70	17.60	21.63	25.70	29.93	34.33	38.86	43.46		48.58	7 / 2			
	reaction time	0.205														11.40	12.33	13.53
	interval		7.26	9.07	9.62	8.97	8.68	8.60	8.27	7.95	7.73	7.61	7.81	8.23		9.21	8.52	7.76
	velocity																	
Bassitt, Trevor (USA) (1998)	time		5.97	9.73		17.23	21.13	25.23	29.47	33.90	38.60	43.43		48.73	8 / 3			
	reaction time	0.164														11.26	12.24	13.96
	interval		7.54	9.31		9.33	8.97	8.54	8.25	7.90	7.45	7.25	7.55	8.21		9.33	8.58	7.52
	velocity																	
Mukhobe, Wiseman Were (KEN) (199)	time		5.93			17.63		25.83		34.63	39.23	43.83		49.10	1 / 4			
	reaction time	0.199														11.70		
	interval		7.59			11.70		8.20		8.80	4.60	4.60	5.27	8.15		8.97		
	velocity																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Heat 3 - Gun Flash

Heat 2 - First Movement

Source: <https://www.youtube.com/watch?v=W4r-vvIQ5wI&t=72s>

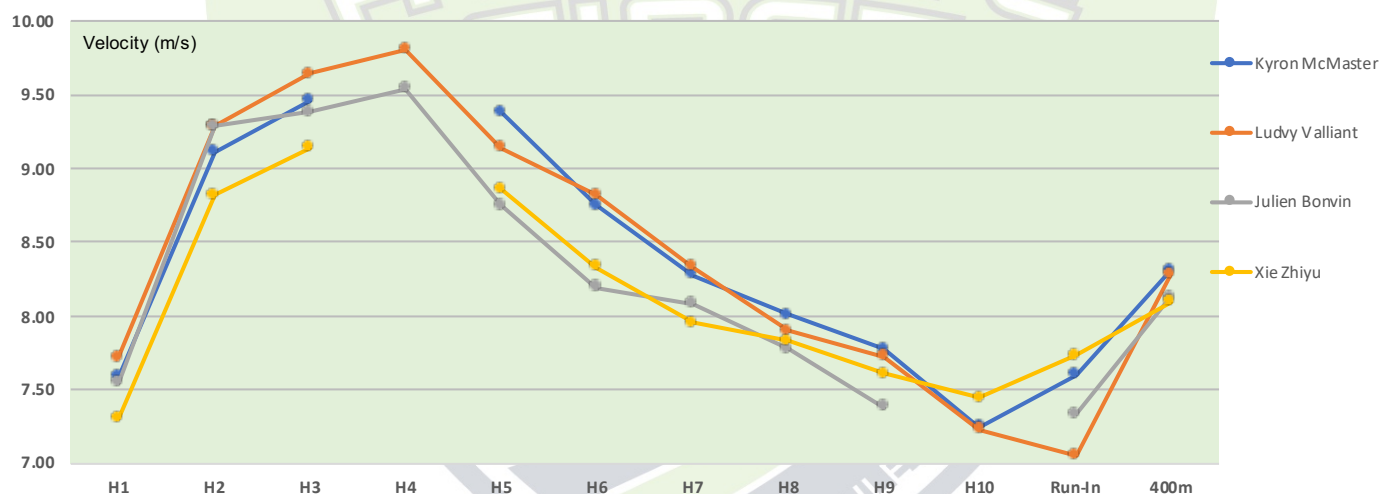
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Men's 400m Hurdles

Date 2023.08.20

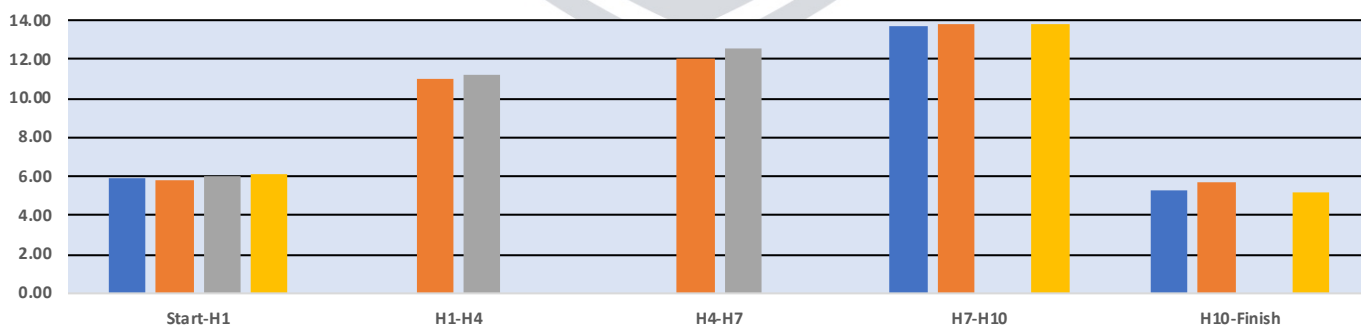
Heat 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
dos Santos, Alison (BRA) (2000)	time		5.93	9.77	13.47		20.93	24.93	29.16	33.53	38.03	42.86		48.12	2 / 1			
	reaction time	0.167																13.70
	interval		7.59	9.11	9.46		9.38	8.75	8.27	8.01	7.78	7.25	7.60	8.31				7.66
Vaillant, Ludvy (FRA) (1995)	time		5.83	9.60	13.23	16.80	20.63	24.60	28.80	33.23	37.76	42.60		48.27	3 / 2			
	reaction time	0.182																13.80
	interval		7.72	9.28	9.64	9.80	9.14	8.82	8.33	7.90	7.73	7.05	8.29			10.97	12.00	7.61
Bonvin, Julien (SUI) (1999)	time		5.96	9.73	13.46	17.13	21.13	25.40	29.73	34.23	38.97			49.19	5 / 3			
	reaction time	0.188																13.77
	interval		7.55	9.28	9.38	9.54	8.75	8.20	8.08	7.78	7.38		10.22	8.13		11.17	12.60	7.63
Xie Zhiyu (CHN) (2000)	time		6.16	10.13	13.96		21.86	26.06	30.46	34.93	39.53	44.23		49.40	8 / 4			
	reaction time	0.207																13.77
	interval		7.31	8.82	9.14		8.86	8.33	7.95	7.83	7.61	7.45	7.74	8.10				7.63
	H1 lead leg	L	21	13	13		13	14	14	14	14		17	119				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=W4r-yvIQ5wI&t=72s>

2023 Herculis Meeting International d'Athlétisme (Monaco, MON)

Men's 400m Hurdles

Date 2023.07.21

FINAL

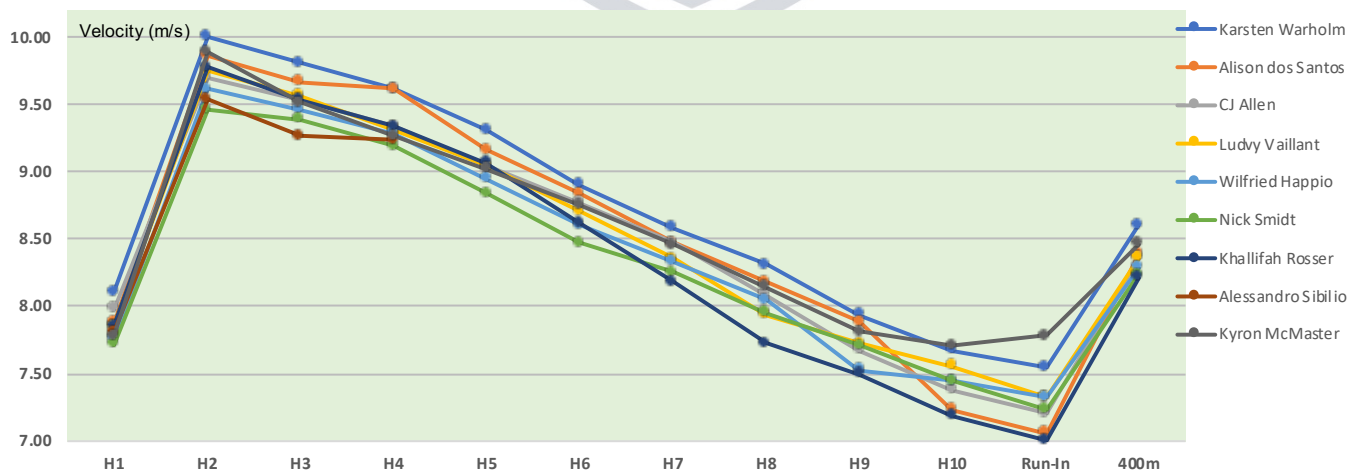
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.55	9.05	12.62	16.26	20.02	23.95	28.03	32.24	36.65	41.21		46.51	7 / 1			
	reaction time	0.146		3.50	3.57	3.64	3.76	3.93	4.08	4.21	4.41	4.56	5.30			10.71	11.77	13.18
	interval															9.80	8.92	7.97
	velocity		8.11	10.00	9.80	9.62	9.31	8.91	8.58	8.31	7.94	7.68	7.55	8.60				
dos Santos, Alison (BRA) (2000)	time		5.71	9.26	12.88	16.52	20.34	24.30	28.43	32.71	37.15	41.99		47.66	6 / 2			
	reaction time	0.169		3.55	3.62	3.64	3.82	3.96	4.13	4.28	4.44	4.84	5.67			10.81	11.91	13.56
	interval			9.86	9.67	9.62	9.16	8.84	8.47	8.18	7.88	7.23	7.05	8.39		9.71	8.82	7.74
	velocity		7.88	9.75	9.56	9.33	9.04	8.77	8.35	7.94	7.73	7.56	7.33	8.36				
Allen, CJ (USA) (1995)	time		5.64	9.25	12.92	16.67	20.54	24.53	28.66	32.99	37.55	42.29		47.84	5 / 3			
	reaction time	0.148		3.61	3.67	3.75	3.87	3.99	4.13	4.33	4.56	4.74	5.55			11.03	11.99	13.63
	interval			9.70	9.54	9.33	9.04	8.77	8.47	8.08	7.68	7.38	7.21	8.36		9.52	8.76	7.70
	velocity		7.98	9.70	9.54	9.33	9.04	8.77	8.47	8.08	7.68	7.38	7.21	8.36				
Vaillant, Ludvy (FRA) (1995)	time		5.73	9.32	12.98	16.74	20.61	24.63	28.82	33.23	37.76	42.39		47.85	2 / 4			
	reaction time	0.158		3.59	3.66	3.76	3.87	4.02	4.19	4.41	4.53	4.63	5.46			11.01	12.08	13.57
	interval			9.75	9.56	9.31	9.04	8.71	8.35	7.94	7.73	7.56	7.33	8.36		9.54	8.69	7.74
	velocity		7.85	9.75	9.56	9.31	9.04	8.71	8.35	7.94	7.73	7.56	7.33	8.36				
Happio, Wilfried (FRA) (1998)	time		5.80	9.44	13.14	16.91	20.82	24.89	29.09	33.44	38.09	42.79		48.25	4 / 5			
	reaction time	0.149		3.64	3.70	3.77	3.91	4.07	4.20	4.35	4.65	4.70	5.46			11.11	12.18	13.70
	interval			9.62	9.46	9.28	8.95	8.60	8.33	8.05	7.53	7.45	7.33	8.29		9.45	8.62	7.66
	velocity		7.76	9.62	9.46	9.28	8.95	8.60	8.33	8.05	7.53	7.45	7.33	8.29				
Smidt, Nick (NED) (1997)	time		5.83	9.53	13.26	17.07	21.03	25.16	29.40	33.80	38.34	43.04		48.57	8 / 6			
	reaction time	0.167		3.70	3.73	3.81	3.96	4.13	4.24	4.40	4.54	4.70	5.53			11.24	12.33	13.64
	interval			9.46	9.38	9.19	8.84	8.47	8.25	7.95	7.71	7.45	7.23	8.24		9.34	8.52	7.70
	velocity		7.72	9.46	9.38	9.19	8.84	8.47	8.25	7.95	7.71	7.45	7.23	8.24				
Rosser, Khallifah (USA) (1995)	time		5.73	9.31	12.98	16.73	20.59	24.65	28.93	33.46	38.13	43.00		48.71	1 / 7			
	reaction time	0.172		3.58	3.67	3.75	3.86	4.06	4.28	4.53	4.67	4.87	5.71			11.00	12.20	14.07
	interval			9.78	9.54	9.33	9.07	8.62	8.18	7.73	7.49	7.19	7.01	8.21		9.55	8.61	7.46
	velocity		7.85	9.78	9.54	9.33	9.07	8.62	8.18	7.73	7.49	7.19	7.01	8.21				
Sibilio, Alessandro (ITA) (1999)	time		5.76	9.43	13.21	17.00								dnf	3 / --			
	reaction time	0.126		3.67	3.78	3.79										11.24		
	interval			9.54	9.26	9.23										9.34		
	velocity		7.81	9.54	9.26	9.23												
McMaster, Kyron (IVB) (1997)	time		5.78	9.32	13.00	16.78	20.66	24.66	28.80	33.10	37.58	42.12		47.26	6 / 1			
	reaction time	0.210		3.54	3.68	3.78	3.88	4.00	4.14	4.30	4.48	4.54	5.14			11.00	12.02	13.32
	interval			9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46		9.55	8.74	7.88
	velocity		7.79	9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46				
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	

2023 P-T-S Meeting (Banská Bystrica, SVK) (TV Analysis)

Date 2023.07.20

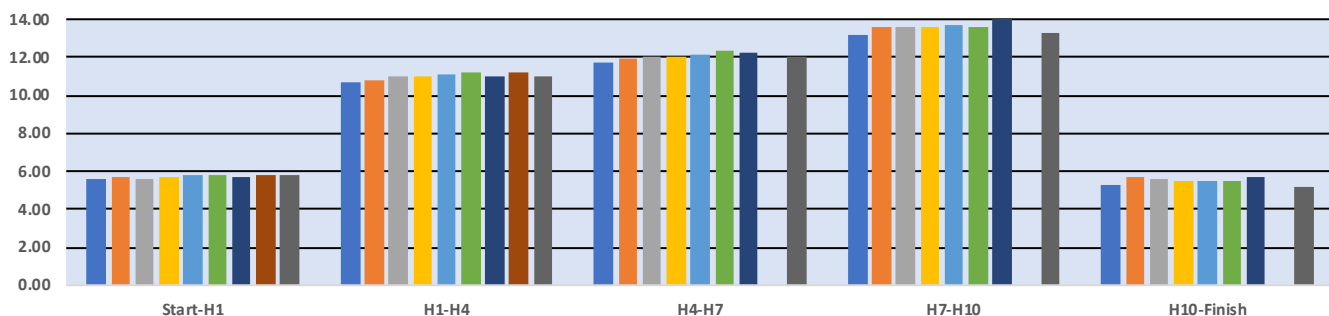
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McMaster, Kyron (IVB) (1997)	time		5.78	9.32	13.00	16.78	20.66	24.66	28.80	33.10	37.58	42.12		47.26	6 / 1			
	reaction time	0.210		3.54	3.68	3.78	3.88	4.00	4.14	4.30	4.48	4.54	5.14			11.00	12.02	13.32
	interval			9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46		9.55	8.74	7.88
	velocity		7.79	9.89	9.51	9.26	9.02	8.75	8.45	8.14	7.81	7.71	7.78	8.46				
H1 lead leg	time																	
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Herculis Meeting International d'Athlétisme

P-T-S Meeting

Source: Omega Timing (Fri 21 Jul 2023 20:09) - diamond league race analysis

Evaluated with: ObjectusVideo
Quality & Frame Rate: 1920 x 1080 @ 30fps<https://www.omegatiming.com/File/0002030B0102040101FFFFFFFFFFFF4D.pdf>

Timing From: Gun Flash

Video: <https://www.youtube.com/watch?v=ICT3lqsBSLQ>Source: <https://www.youtube.com/watch?v=mV7VwTdbu7s>

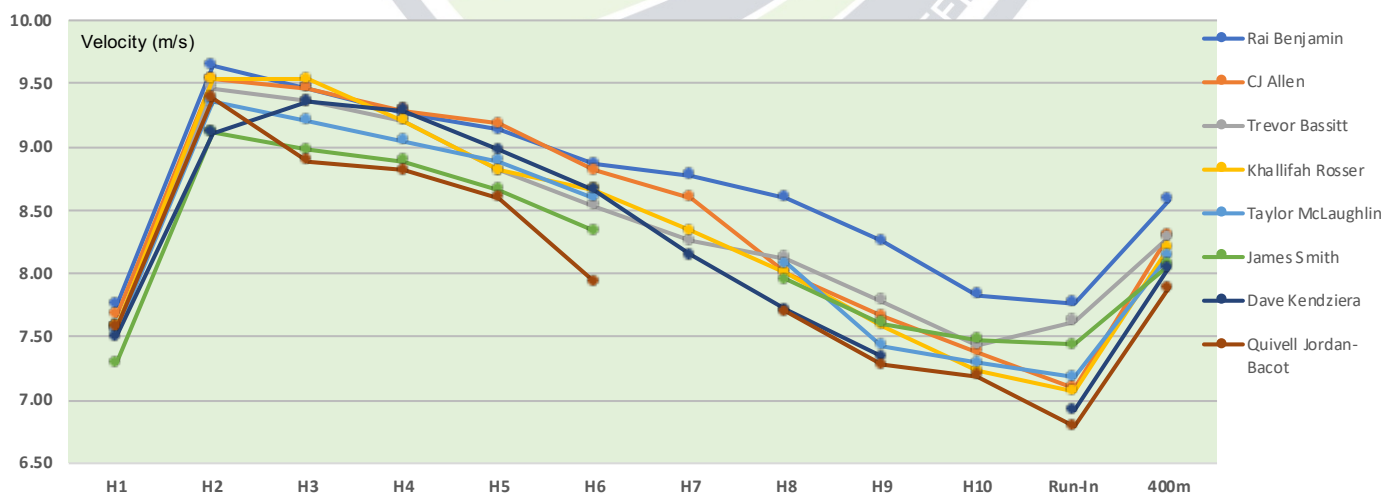
2023 USATF National Championships (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2023.07.09

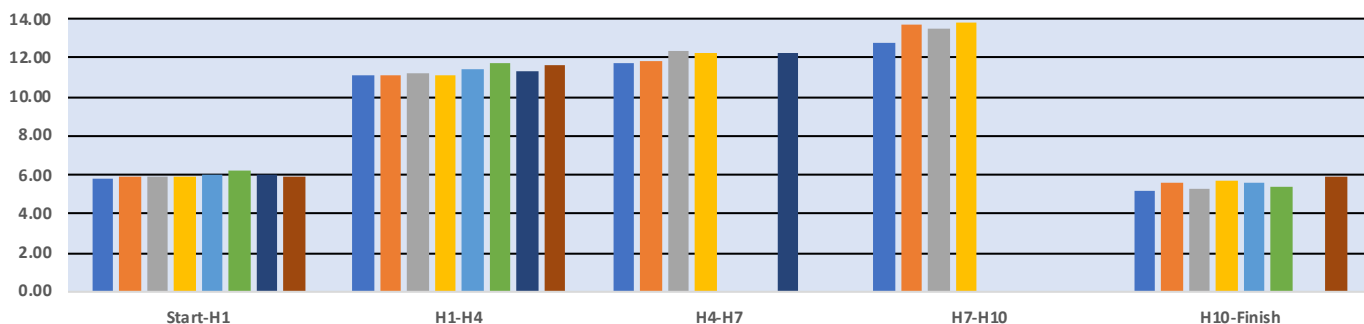
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.81	9.44	13.14	16.92	20.75	24.70	28.69	32.76	37.00	41.47		46.62	5 / 1			
	reaction time												5.15			11.11	11.77	12.78
	interval velocity		7.75	9.64	9.46	9.26	9.14	8.86	8.77	8.60	8.25	7.83	7.77	8.58		9.45	8.92	8.22
	H1 lead leg	R	20	13	13	13	13	13	13	13	13	13	17	154				
Allen, CJ (USA) (1995)	time		5.87	9.54	13.24	17.01	20.82	24.79	28.86	33.23	37.80	42.54		48.18	4 / 2			
	reaction time												5.64			11.14	11.85	13.68
	interval velocity		7.67	9.54	9.46	9.28	9.19	8.82	8.60	8.01	7.66	7.38	7.09	8.30		9.43	8.86	7.68
	H1 lead leg	L	20	13	13	13	13	13	13	13	14	14	17.7	156.7				
Bassitt, Trevor (USA) (1998)	time		5.94	9.64	13.38	17.18	21.15	25.25	29.49	33.80	38.30	43.01		48.26	6 / 3			
	reaction time												5.25			11.24	12.31	13.52
	interval velocity		7.58	9.46	9.36	9.21	8.82	8.54	8.25	8.12	7.78	7.43	7.62	8.29		9.34	8.53	7.77
	H1 lead leg	R	20	13	13	12	12	13	13	13	14	14	17	154				
Rosser, Khallifah (USA) (1995)	time		5.94	9.61	13.28	17.08	21.05	25.09	29.29	33.66	38.27	43.11		48.77	7 / 4			
	reaction time												5.66			11.14	12.21	13.82
	interval velocity		7.58	9.54	9.54	9.21	8.82	8.66	8.33	8.01	7.59	7.23	7.07	8.20		9.43	8.60	7.60
	H1 lead leg	R	21	13	13	13	13	13	13	14	14	15	18	160				
McLaughlin, Taylor (USA) (1997)	time		5.97	9.71	13.51	17.38	21.32	25.39		34.06	38.77	43.57		49.14	1 / 5			
	reaction time									8.67	4.71	4.80	5.57			11.41		
	interval velocity		7.54	9.36	9.21	9.04	8.88	8.60		8.07	7.43	7.29	7.18	8.14		9.20		
	H1 lead leg	R	21	13	13	13	13	13			15	15	18	134				
Smith, James (USA) (2000)	time		6.17	10.01	13.91	17.85	21.89	26.09		34.90	39.50	44.18		49.56	3 / 6			
	reaction time									8.81	4.60	4.68	5.38			11.68		
	interval velocity		7.29	9.11	8.97	8.88	8.66	8.33		7.95	7.61	7.48	7.43	8.07		8.99		
	H1 lead leg	L	21	13	13	13	13				15	15		103				
Kendziera, Dave (USA) (1994)	time		6.00	9.84	13.58	17.35	21.25	25.29	29.59	34.13	38.90			49.74	8 / 7			
	reaction time												10.84			11.35	12.24	
	interval velocity		7.50	9.11	9.36	9.28	8.97	8.66	8.14	7.71	7.34		6.92	8.04		9.25	8.58	
	H1 lead leg	L	21	14	13	13	13		14	14	15			117				
Jordan-Bacot, Quivell (USA) (1999)	time		5.94	9.67	13.61	17.58	21.65	26.06		35.16	39.97	44.84		50.73	2 / 8			
	reaction time									9.10	4.81	4.87	5.89			11.64		
	interval velocity		7.58	9.38	8.88	8.82	8.60	7.94		7.69	7.28	7.19	6.79	7.88		9.02		
	H1 lead leg	L	21	13	13	13	13				15	15		103				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=kPW-B3T5nAA>

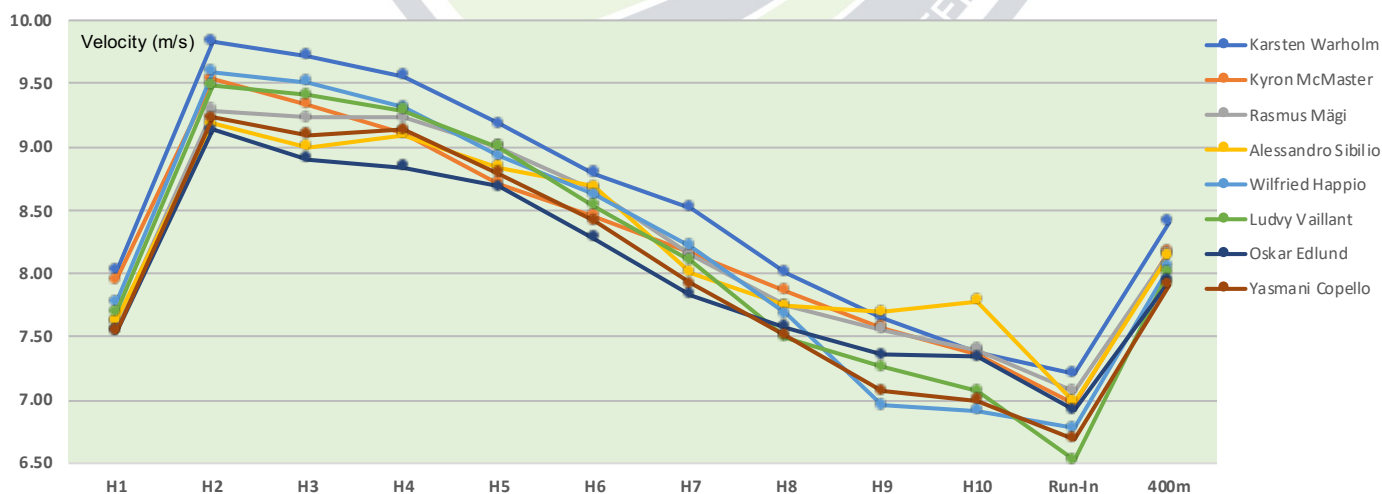
2023 Bauhaus Galan (Stockholm, SWE)

Men's 400m Hurdles

Date 2023.07.02

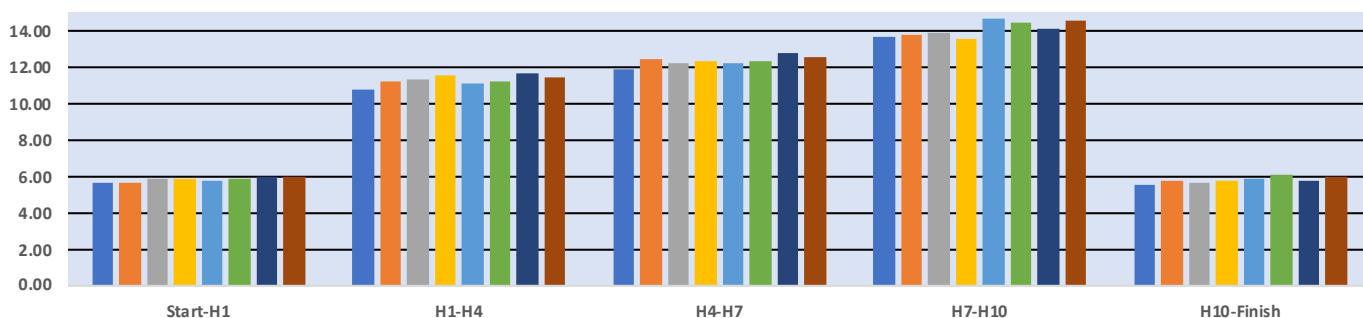
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.61	9.17	12.77	16.43	20.24	24.22	28.33	32.70	37.28	42.02		47.57	8 / 1			
	reaction time	0.156											5.55			10.82	11.90	13.69
	interval		8.02	3.56	3.60	3.66	3.81	3.98	4.11	4.37	4.58	4.74	7.21	8.41		9.70	8.82	7.67
	velocity																	
McMaster, Kyron (IVB) (1997)	time		5.66	9.33	13.08	16.92	20.94	25.08	29.37	33.82	38.44	43.20		48.94	7 / 2			
	reaction time	0.147											5.74			11.26	12.45	13.83
	interval		7.95	3.67	3.75	3.84	4.02	4.14	4.29	4.45	4.62	4.76	6.97	8.17		9.33	8.43	7.59
	velocity																	
Mägi, Rasmus (EST) (1992)	time		5.92	9.69	13.48	17.27	21.16	25.20	29.50	34.02	38.65	43.38		49.04	3 / 3			
	reaction time	0.165											5.66			11.35	12.23	13.88
	interval		7.60	3.77	3.79	3.79	3.89	4.04	4.30	4.52	4.63	4.73	7.07	8.16		9.25	8.59	7.56
	velocity																	
Sibilio, Alessandro (ITA) (1999)	time		5.90	9.71	13.60	17.45	21.41	25.44	29.81	34.33	38.88	43.38		49.11	5 / 4			
	reaction time	0.150											5.73			11.55	12.36	13.57
	interval		7.63	3.81	3.89	3.85	3.96	4.03	4.37	4.52	4.55	4.50	6.98	8.14		9.09	8.50	7.74
	velocity																	
Happio, Wilfried (FRA) (1998)	time		5.79	9.44	13.12	16.88	20.80	24.86	29.12	33.68	38.71	43.77		49.67	6 / 5			
	reaction time	0.151											5.90			11.09	12.24	14.65
	interval		7.77	3.65	3.68	3.76	3.89	4.06	4.26	4.56	5.03	5.06	6.78	8.05		9.47	8.58	7.17
	velocity																	
Vaillant, Ludvy (FRA) (1995)	time		5.85	9.54	13.26	17.03	20.92	25.02	29.34	34.01	38.83	43.78		49.91	4 / 6			
	reaction time	0.199											6.13			11.18	12.31	14.44
	interval		7.69	3.69	3.72	3.77	3.89	4.10	4.32	4.67	4.82	4.95	6.53	8.01		9.39	8.53	7.27
	velocity																	
Edlund, Oskar (SWE) (2002)	time		5.97	9.80	13.73	17.69	21.72	25.95	30.42	35.04	39.80	44.57		50.35	1 / 7			
	reaction time	0.177											5.78			11.72	12.73	14.15
	interval		7.54	3.83	3.93	3.96	4.03	4.23	4.47	4.62	4.76	4.77	6.92	7.94		8.96	8.25	7.42
	velocity																	
Copello, Yasmani (TUR) (1987)	time		5.97	9.76	13.61	17.44	21.42	25.58	30.00	34.66	39.61	44.61		50.59	2 / 8			
	reaction time	0.186											5.98			11.47	12.56	14.61
	interval		7.54	3.79	3.85	3.83	3.98	4.16	4.42	4.66	4.95	5.00	6.69	7.91		9.15	8.36	7.19
	velocity																	



Time Intervals (s)

Hurdle Phases

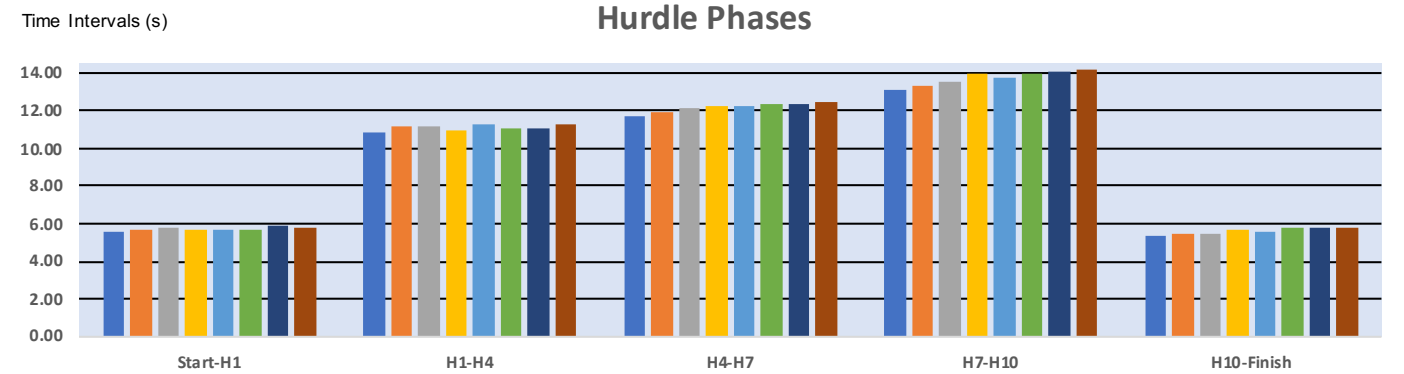
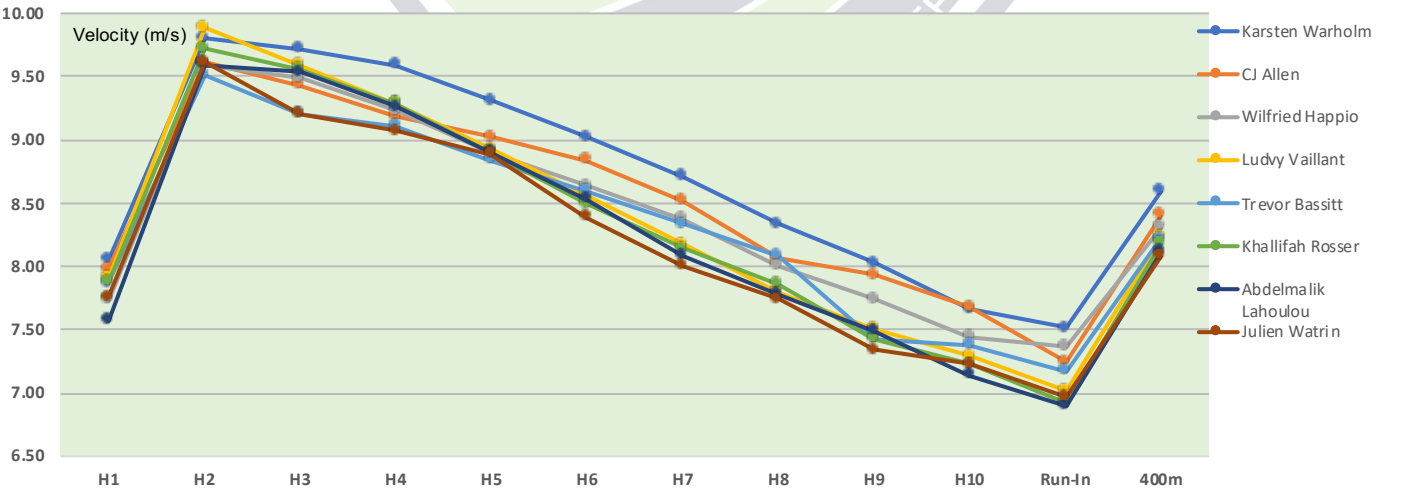


Source: Omega Timing (Sun 2 Jul 2023 19:36) - diamond league race analysis

<https://www.omegatiming.com/File/0002030901020B0101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=SBKIT2SBLzY>

2023 Bislett Games (Oslo, NOR)

Men's 400m Hurdles		Date 2023.06.15										FINAL						
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time		5.59	9.16	12.76	16.41	20.17	24.05	28.07	32.27	36.63	41.20		46.52	7 / 1			
	reaction time	0.162																
	interval			3.57	3.60	3.65	3.76	3.88	4.02	4.20	4.36	4.57	5.32			10.82	11.66	13.13
	velocity		8.05	9.80	9.72	9.59	9.31	9.02	8.71	8.33	8.03	7.66	7.52	8.60		9.70	9.01	8.00
H1 lead leg	L		20	13	13	13	13	13	13	13	13	15	17.7	156.7				
Allen, CJ (USA) (1995)	time		5.64	9.28	12.99	16.80	20.68	24.64	28.75	33.09	37.50	42.06		47.58	6 / 2			
	reaction time	0.170																
	interval			3.64	3.71	3.81	3.88	3.96	4.11	4.34	4.41	4.56	5.52	PB		11.16	11.95	13.31
	velocity		7.98	9.62	9.43	9.19	9.02	8.84	8.52	8.06	7.94	7.68	7.25	8.41		9.41	8.79	7.89
H1 lead leg	L		22	13	13	13	13	13	14	14	14	14	17	160				
Happio, Wilfried (FRA) (1998)	time		5.82	9.47	13.16	16.95	20.88	24.93	29.11	33.48	38.00	42.70		48.13	5 / 3			
	reaction time	0.159																
	interval			3.65	3.69	3.79	3.93	4.05	4.18	4.37	4.52	4.70	5.43			11.13	12.16	13.59
	velocity		7.73	9.59	9.49	9.23	8.91	8.64	8.37	8.01	7.74	7.45	7.37	8.31		9.43	8.63	7.73
H1 lead leg	L		20			13	13	13			13	15	17	104				
Vaillant, Ludvy (FRA) (1995)	time		5.69	9.23	12.88	16.65	20.57	24.66	28.94	33.43	38.09	42.89		48.59	2 / 4			
	reaction time	0.155																
	interval			3.54	3.65	3.77	3.92	4.09	4.28	4.49	4.66	4.80	5.70			10.96	12.29	13.95
	velocity		7.91	9.89	9.59	9.28	8.93	8.56	8.18	7.80	7.51	7.29	7.02	8.23		9.58	8.54	7.53
H1 lead leg	R		21			13	13	13			14	14	17.7	105.7				
Bassitt, Trevor (USA) (1998)	time		5.72	9.40	13.20	17.04	21.00	25.07	29.27	33.60	38.31	43.05		48.63	4 / 5			
	reaction time	0.185																
	interval			3.68	3.80	3.84	3.96	4.07	4.20	4.33	4.71	4.74	5.58			11.32	12.23	13.78
	velocity		7.87	9.51	9.21	9.11	8.84	8.60	8.33	8.08	7.43	7.38	7.17	8.23		9.28	8.59	7.62
H1 lead leg	R		20			13	13	13			14	13		86				
Rosser, Khallifah (USA) (1995)	time		5.71	9.31	12.97	16.74	20.67	24.79	29.09	33.54	38.25	43.09		48.87	3 / 6			
	reaction time	0.172																
	interval			3.60	3.66	3.77	3.93	4.12	4.30	4.45	4.71	4.84	5.78			11.03	12.35	14.00
	velocity		7.88	9.72	9.56	9.28	8.91	8.50	8.14	7.87	7.43	7.23	6.92	8.18		9.52	8.50	7.50
H1 lead leg	R		21			13	13	13			15	15		90				
Lahoulou, Abdelmalik (ALG) (1992)	time		5.94	9.59	13.26	17.04	20.97	25.07	29.40	33.90	38.57	43.47		49.27	8 / 7			
	reaction time	0.178																
	interval			3.65	3.67	3.78	3.93	4.10	4.33	4.50	4.67	4.90	5.80			11.10	12.36	14.07
	velocity		7.58	9.59	9.54	9.26	8.91	8.54	8.08	7.78	7.49	7.14	6.90	8.12		9.46	8.50	7.46
H1 lead leg	L		22	13	13	13	13	14			15			103				
Watrin, Julien (BEL) (1992)	time		5.80	9.44	13.24	17.10	21.04	25.21	29.58	34.10	38.87	43.71		49.45	1 / 8			
	reaction time	0.209																
	interval			3.64	3.80	3.86	3.94	4.17	4.37	4.52	4.77	4.84	5.74			11.30	12.48	14.13
	velocity		7.76	9.62	9.21	9.07	8.88	8.39	8.01	7.74	7.34	7.23	6.97	8.09		9.29	8.41	7.43
H1 lead leg	R		20			13	13	15			14	15		90				



Source: Omega Timing (Thu 15 Jun 2023 21:44) - diamond league race analysis
<https://www.omegatiming.com/File/0002030701010D0101FFFFFFFFFFFF4D.pdf>
Video: <https://www.youtube.com/watch?v=q8ZUH-drYes>

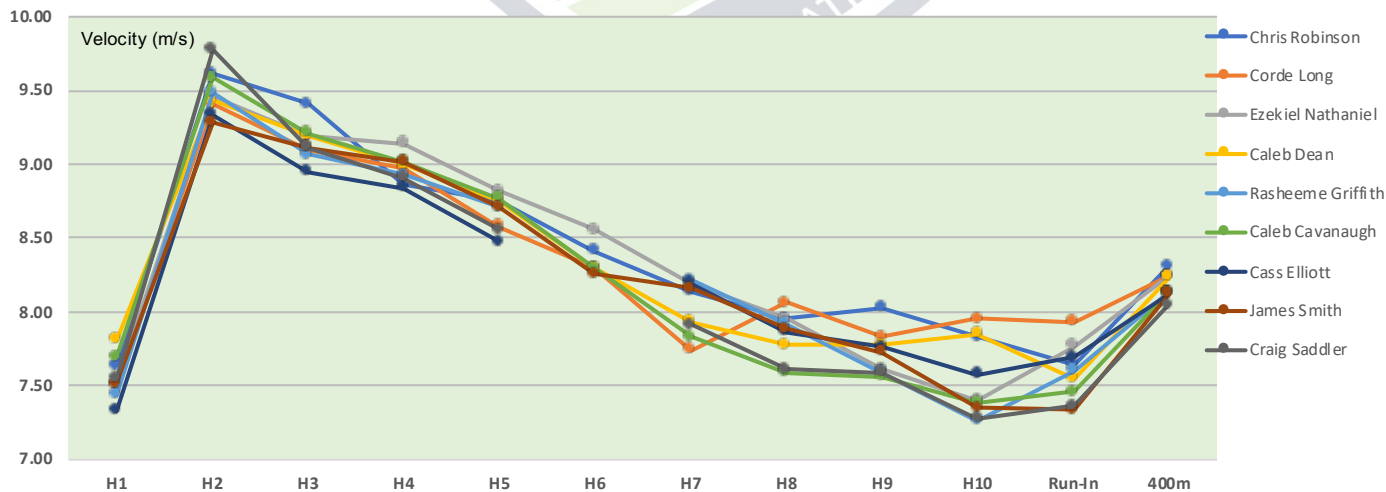
2023 NCAA Championships (Austin, TX) (TV Analysis)

Men's 400m Hurdles

Date 2023.06.09

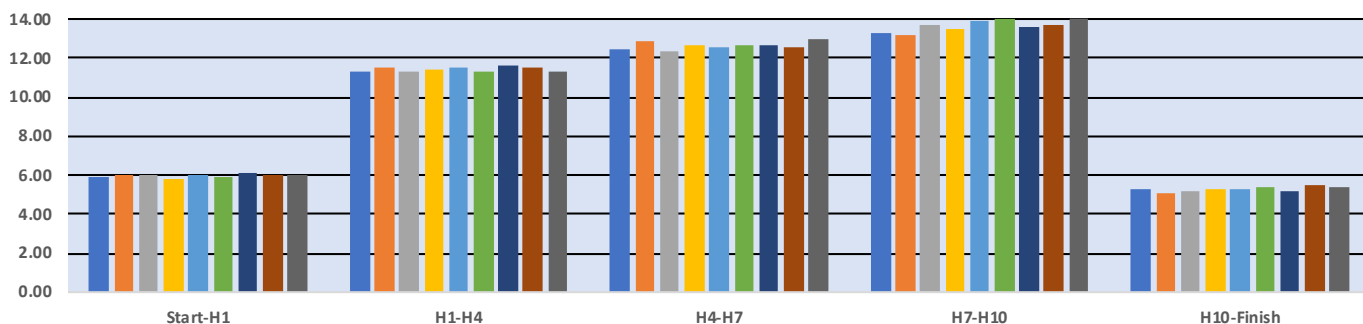
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Robinson, Chris (USA) (2001)	time		5.89	9.53	13.25	17.20	21.20	25.36	29.66	34.06	38.42	42.89		48.12	6 / 1			
	reaction time																	
	interval			3.64	3.72	3.95	4.00	4.16	4.30	4.40	4.36	4.47	5.23	PB		11.31	12.46	13.23
	velocity		7.64	9.62	9.41	8.86	8.75	8.41	8.14	7.95	8.03	7.83	7.65	8.31		9.28	8.43	7.94
Long, Corde (USA) (2002)	time		5.99	9.71	13.56	17.46	21.54	25.76	30.28	34.62	39.09	43.49		48.53	5 / 2			
	reaction time																	
	interval			3.72	3.85	3.90	4.08	4.22	4.52	4.34	4.47	4.40	5.04	PB		11.47	12.82	13.21
	velocity		7.51	9.41	9.09	8.97	8.58	8.29	7.74	8.06	7.83	7.95	7.94	8.24		9.15	8.19	7.95
Nathaniel, Ezekiel (NGR) (2003)	time		5.99	9.69	13.50	17.33	21.30	25.39	29.66	34.06	38.66	43.39		48.54	8 / 3			
	reaction time																	
	interval			3.70	3.81	3.83	3.97	4.09	4.27	4.40	4.60	4.73	5.15			11.34	12.33	13.73
	velocity		7.51	9.46	9.19	9.14	8.82	8.56	8.20	7.95	7.61	7.40	7.77	8.24		9.26	8.52	7.65
Dean, Caleb (USA) (2001)	time		5.76	9.47	13.28	17.17	21.17	25.39	29.80	34.30	38.80	43.26		48.56	7 / 4			
	reaction time																	
	interval			3.71	3.81	3.89	4.00	4.22	4.41	4.50	4.50	4.46	5.30			11.41	12.63	13.46
	velocity		7.81	9.43	9.19	9.00	8.75	8.29	7.94	7.78	7.78	7.85	7.55	8.24		9.20	8.31	7.80
Griffith, Rasheeme (BAR) (2000)	time		6.05	9.74	13.60	17.52	21.54		30.06	34.48	39.09	43.91		49.17	3 / 5			
	reaction time																	
	interval			3.69	3.86	3.92	4.02		8.52	4.42	4.61	4.82	5.26			11.47	12.54	13.85
	velocity		7.44	9.49	9.07	8.93	8.71		8.22	7.92	7.59	7.26	7.60	8.14		9.15	8.37	7.58
Cavanaugh, Caleb (USA) (2001)	time		5.85	9.50	13.30	17.18	21.17	25.39	29.86	34.47	39.10	43.84		49.20	9 / 6			
	reaction time																	
	interval			3.65	3.80	3.88	3.99	4.22	4.47	4.61	4.63	4.74	5.36			11.33	12.68	13.98
	velocity		7.69	9.59	9.21	9.02	8.77	8.29	7.83	7.59	7.56	7.38	7.46	8.13		9.27	8.28	7.51
Elliott, Cass (USA) (2000)	time		6.14	9.89	13.80	17.76	21.89		30.43	34.88	39.39	44.01		49.21	2 / 7			
	reaction time																	
	interval			3.75	3.91	3.96	4.13		8.54	4.45	4.51	4.62	5.20			11.62	12.67	13.58
	velocity		7.33	9.33	8.95	8.84	8.47		8.20	7.87	7.76	7.58	7.69	8.13		9.04	8.29	7.73
Smith, James (USA) (2000)	time		5.99	9.76	13.60	17.48	21.50	25.74	30.03	34.47	39.00	43.76		49.21	4 / 8			
	reaction time																	
	interval			3.77	3.84	3.88	4.02	4.24	4.29	4.44	4.53	4.76	5.45	PB		11.49	12.55	13.73
	velocity		7.51	9.28	9.11	9.02	8.71	8.25	8.16	7.88	7.73	7.35	7.34	8.13		9.14	8.37	7.65
Saddler, Craig (USA)	time		5.96	9.54	13.38	17.31	21.40		30.25	34.85	39.46	44.27		49.70	1 / 9			
	reaction time																	
	interval			3.58	3.84	3.93	4.09		8.85	4.60	4.61	4.81	5.43			11.35	12.94	14.02
	velocity		7.55	9.78	9.11	8.91	8.56		7.91	7.61	7.59	7.28	7.37	8.05		9.25	8.11	7.49
	H1 lead leg	R																
	strides		21	13	13	13	13	13	14	14	15	14	17.7	157.7				
	H1 lead leg	L																
	strides		21	13	13	13	13	13	14	14	14	13	16.7	157.7				
	H1 lead leg	R																
	strides		21	13	13	13	13	13	13	13	13	14	14	17.7				
	H1 lead leg	R																
	strides		21	13	13	13	13	13	14	14	15	14	18.2	161.2				
	H1 lead leg	L																
	strides		21	13	13	13	13	13	14	14	15	15	18	147				
	H1 lead leg	R																
	strides		20	13	13	13	13	13	15	15	15	15	17.7	162.7				
	H1 lead leg	L																
	strides		21	14	14	14	14			15	15	16	18.5	141.5				
	H1 lead leg	L																
	strides		21	13	13	13	13	14	14	15	15	15	18.2	164.2				
	H1 lead leg	R																
	strides		21	13	13	13	13			15	15	15	17	135				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=0E8BFbQS0ao>

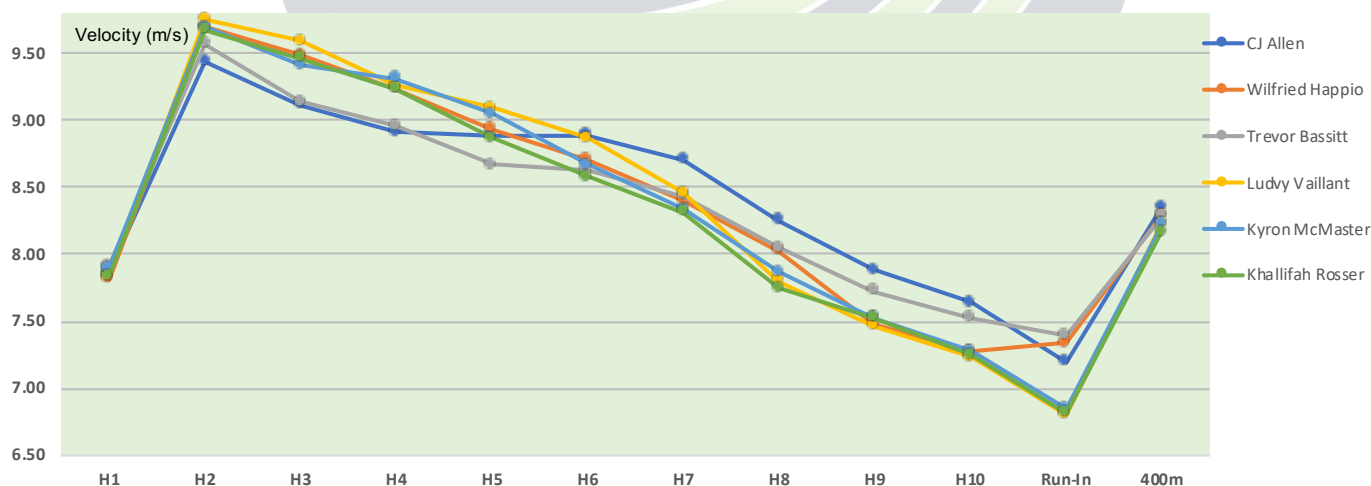
2023 Meeting de Paris (Paris, FRA)

400m Hurdles

Date: 2023.06.09

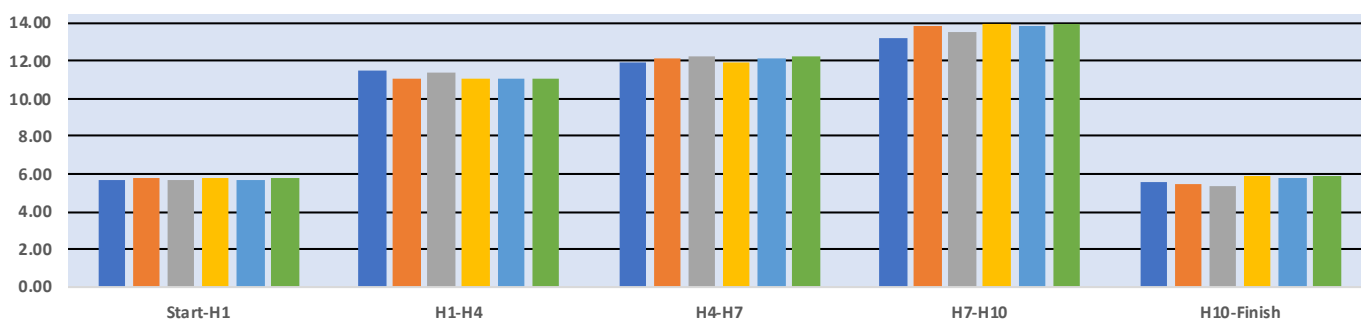
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Allen, CJ (USA) (1995)	time		5.72	9.43	13.27	17.20	21.14	25.08	29.10	33.34	37.78	42.36		47.92	7 / 1			
	reaction time	0.138														11.48	11.90	13.26
	interval		7.87	3.71	3.84	3.93	3.94	3.94	4.02	4.24	4.44	4.58	5.56			9.15	8.82	7.92
	velocity																	
Happio, Wilfried (FRA) (1998)	time		5.76	9.37	13.06	16.85	20.77	24.79	28.96	33.32	38.00	42.81		48.26	6 / 2			
	reaction time	0.156														11.09	12.11	13.85
	interval		7.81	3.61	3.69	3.79	3.92	4.02	4.17	4.36	4.68	4.81	5.45			9.47	8.67	7.58
	velocity																	
Bassitt, Trevor (USA) (1998)	time		5.69	9.35	13.18	17.09	21.13	25.19	29.34	33.69	38.22	42.87		48.28	4 / 3			
	reaction time	0.164														11.40	12.25	13.53
	interval		7.91	3.66	3.83	3.91	4.04	4.06	4.15	4.35	4.53	4.65	5.41			9.21	8.57	7.76
	velocity																	
Vaillant, Ludvy (FRA) (1995)	time		5.74	9.33	12.98	16.76	20.61	24.56	28.70	33.19	37.88	42.72		48.60	2 / 4			
	reaction time	0.153														11.02	11.94	14.02
	interval		7.84	3.59	3.65	3.78	3.85	3.95	4.14	4.49	4.69	4.84	5.88			9.53	8.79	7.49
	velocity																	
McMaster, Kyron (IVB) (1997)	time		5.70	9.31	13.03	16.79	20.66	24.70	28.90	33.35	38.00	42.81		48.65	8 / 5			
	reaction time	0.157														11.09	12.11	13.91
	interval		7.89	3.61	3.72	3.76	3.87	4.04	4.20	4.45	4.65	4.81	5.84			9.47	8.67	7.55
	velocity																	
Rosser, Khallifah (USA) (1995)	time		5.74	9.36	13.06	16.85	20.80	24.88	29.09	33.61	38.26	43.09		48.96	3 / 6			
	reaction time	0.143														11.11	12.24	14.00
	interval		7.84	3.62	3.70	3.79	3.95	4.08	4.21	4.52	4.65	4.83	5.87			9.45	8.58	7.50
	velocity																	



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 09 Jun 2023 21:07) - diamond league race analysis

<https://www.omegatiming.com/File/000203060101080101EEEEEEEEEE4D.pdf>Video: https://www.youtube.com/watch?v=teHrleAkm_8

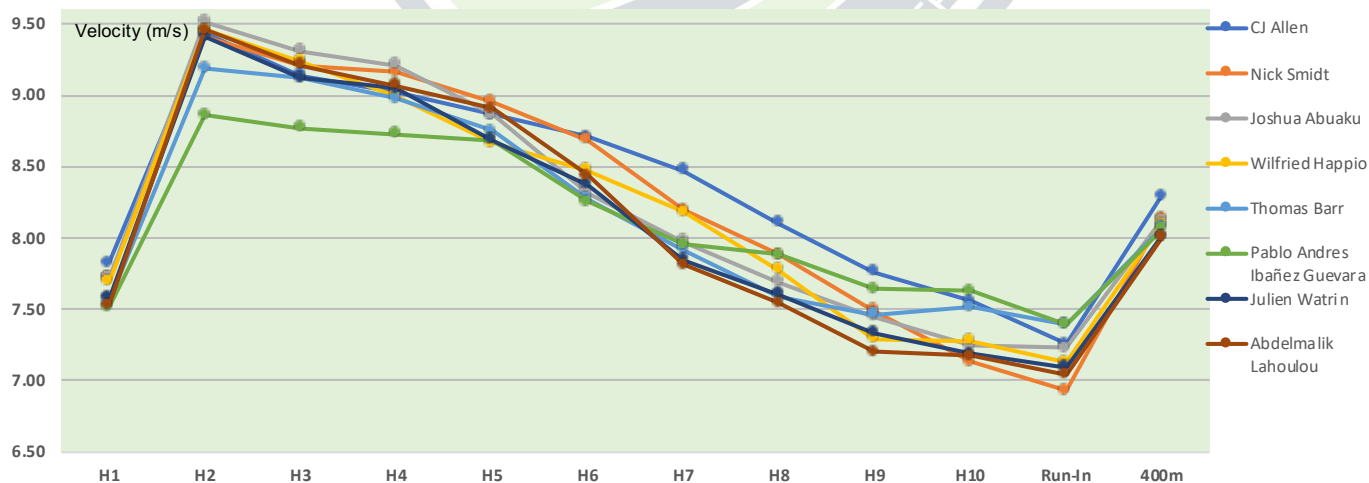
2023 FBK Games (Hengelo, NED)

Men's 400m Hurdles

Date 2023.06.04

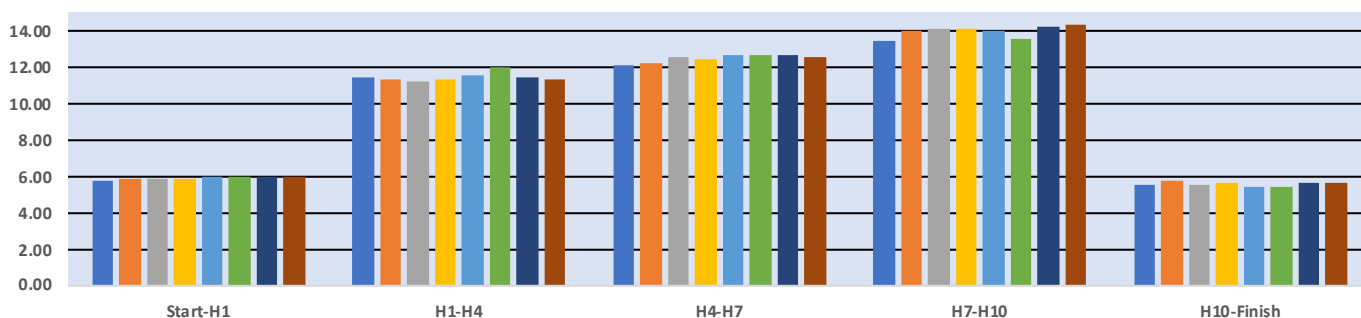
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Allen, CJ (USA) (1995)	time		5.75	9.46	13.29	17.17	21.12	25.14	29.27	33.59	38.10	42.73		48.24	6 / 1			
	reaction time	0.166														11.42	12.10	13.46
	interval		7.83	3.71	3.83	3.88	3.95	4.02	4.13	4.32	4.51	4.63	5.51			9.19	8.68	7.80
	velocity																	
Smidt, Nick (NED) (1997)	time		5.83	9.55	13.35	17.17	21.08	25.11	29.38	33.82	38.49	43.40		49.17	5 / 2			
	reaction time	0.186														11.34	12.21	14.02
	interval		7.72	3.72	3.80	3.82	3.91	4.03	4.27	4.44	4.67	4.91	5.77			9.26	8.60	7.49
	velocity																	
Abuaku, Joshua (GER) (1996)	time		5.83	9.51	13.27	17.07	21.02	25.23	29.62	34.17	38.87	43.70		49.23	8 / 3			
	reaction time	0.207														11.24	12.55	14.08
	interval		7.72	3.68	3.76	3.80	3.95	4.21	4.39	4.55	4.70	4.83	5.53			9.34	8.37	7.46
	velocity																	
Happio, Wilfried (FRA) (1998)	time		5.85	9.55	13.34	17.23	21.27	25.40	29.68	34.18	38.98	43.79		49.40	7 / 4			
	reaction time	0.158														11.38	12.45	14.11
	interval		7.69	3.70	3.79	3.89	4.04	4.13	4.28	4.50	4.80	4.81	5.61			9.23	8.43	7.44
	velocity																	
Barr, Thomas (IRL) (1992)	time		5.95	9.76	13.60	17.50	21.50	25.73	30.15	34.76	39.45	44.11		49.52	2 / 5			
	reaction time	0.167														11.55	12.65	13.96
	interval		7.56	3.81	3.84	3.90	4.00	4.23	4.40	4.61	4.69	4.66	5.41			9.09	8.30	7.52
	velocity																	
Ibañez Guevara, Pablo Andres (ESA)	time		5.99	9.94	13.93	17.94	21.97	26.21	30.61	35.05	39.63	44.22		49.63	3 / 6			
	reaction time	0.156														11.95	12.67	13.61
	interval		7.51	3.95	3.99	4.01	4.03	4.24	4.40	4.44	4.58	4.59	5.41			8.79	8.29	7.71
	velocity																	
Watrin, Julien (BEL) (1992)	time		5.94	9.66	13.50	17.37	21.40	25.58	30.04	34.64	39.41	44.28		49.92	4 / 7			
	reaction time	0.242														11.43	12.67	14.24
	interval		7.58	3.72	3.84	3.87	4.03	4.18	4.46	4.60	4.77	4.87	5.64			9.19	8.29	7.37
	velocity																	
Lahoulou, Abdelmalik (ALG) (1992)	time		5.98	9.68	13.48	17.34	21.27	25.42	29.90	34.54	39.40	44.28		49.96	1 / 8			
	reaction time	0.173														11.36	12.56	14.38
	interval		7.53	3.70	3.80	3.86	3.93	4.15	4.48	4.64	4.86	4.88	5.68			9.24	8.36	7.30
	velocity																	
H1 lead leg	time		21	13	13	13	13	13	13	14	14	14	17	158				
	interval																	
	velocity																	
	strides																	



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 4 Jun 2023 19:46) - continental tour race analysis

<https://www.omegatiming.com/File/000203010102090101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=s1vdEfr0TL0>

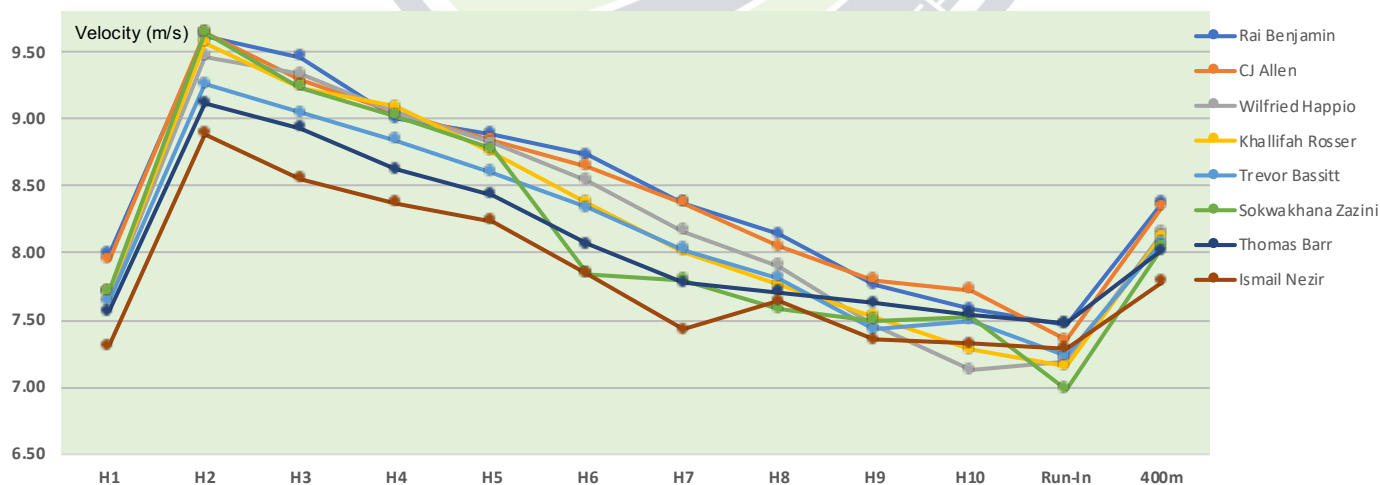
2023 Doha Diamond League (Doha, QAT)

Men's 400m Hurdles

Date 2023.05.05

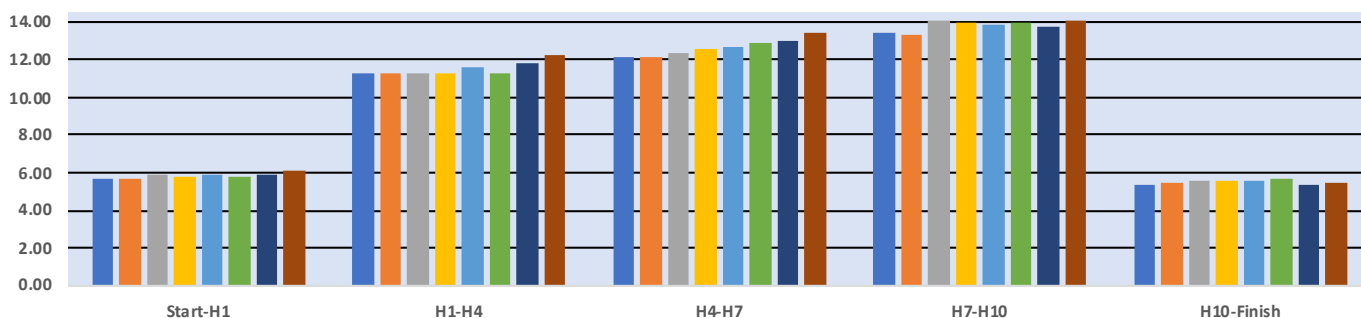
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Benjamin, Rai (USA) (1997)	time		5.63	9.27	12.97	16.86	20.80	24.81	28.99	33.29	37.80	42.42		47.78	6 / 1			
	reaction time	0.169																
	interval		7.99	3.64	3.70	3.89	3.94	4.01	4.18	4.30	4.51	4.62	5.36			11.23	12.13	13.43
	velocity		7.99	9.62	9.46	9.00	8.88	8.73	8.37	8.14	7.76	7.58	7.46	8.37		9.35	8.66	7.82
Allen, CJ (USA) (1995)	time		5.66	9.29	13.06	16.93	20.89	24.94	29.12	33.47	37.96	42.49		47.93	3 / 2			
	reaction time	0.144																
	interval		7.95	3.63	3.77	3.87	3.96	4.05	4.18	4.35	4.49	4.53	5.44			11.27	12.19	13.37
	velocity		7.95	9.64	9.28	9.04	8.84	8.64	8.37	8.05	7.80	7.73	7.35	8.35		9.32	8.61	7.85
Happio, Wilfried (FRA) (1998)	time		5.85	9.55	13.30	17.17	21.14	25.24	29.53	33.96	38.65	43.56		49.12	5 / 3			
	reaction time	0.156																
	interval		7.69	3.70	3.75	3.87	3.97	4.10	4.29	4.43	4.69	4.91	5.56			11.32	12.36	14.03
	velocity		7.69	9.46	9.33	9.04	8.82	8.54	8.16	7.90	7.46	7.13	7.19	8.14		9.28	8.50	7.48
Rosser, Khalifah (USA) (1995)	time		5.84	9.50	13.29	17.14	21.14	25.32	29.69	34.20	38.85	43.66		49.25	4 / 4			
	reaction time	0.161																
	interval		7.71	3.66	3.79	3.85	4.00	4.18	4.37	4.51	4.65	4.81	5.59			11.30	12.55	13.97
	velocity		7.71	9.56	9.23	9.09	8.75	8.37	8.01	7.76	7.53	7.28	7.16	8.12		9.29	8.37	7.52
Bassitt, Trevor (USA) (1998)	time		5.89	9.67	13.54	17.50	21.57	25.77	30.13	34.61	39.32	43.99		49.52	7 / 5			
	reaction time	0.158																
	interval		7.64	3.78	3.87	3.88	4.07	4.20	4.36	4.48	4.71	4.67	5.53			11.61	12.63	13.86
	velocity		7.64	9.26	9.04	8.84	8.60	8.33	8.03	7.81	7.43	7.49	7.23	8.08		9.04	8.31	7.58
Zazini, Sokwakhana (RSA) (2000)	time		5.83	9.46	13.25	17.13	21.12	25.58	30.07	34.69	39.36	44.01		49.74	1 / 6			
	reaction time	0.170																
	interval		7.72	3.63	3.79	3.88	3.99	4.46	4.49	4.62	4.67	4.65	5.73			11.30	12.94	13.94
	velocity		7.72	9.64	9.23	9.02	8.77	7.85	7.80	7.58	7.49	7.53	6.98	8.04		9.29	8.11	7.53
Barr, Thomas (IRL) (1992)	time		5.95	9.79	13.71	17.77	21.92	26.26	30.76	35.30	39.89	44.53		49.88	8 / 7			
	reaction time	0.159																
	interval		7.56	3.84	3.92	4.06	4.15	4.34	4.50	4.54	4.59	4.64	5.35			11.82	12.99	13.77
	velocity		7.56	9.11	8.93	8.62	8.43	8.06	7.78	7.71	7.63	7.54	7.48	8.02		8.88	8.08	7.63
Nezir, Ismail (TUR) (2003)	time		6.16	10.10	14.19	18.37	22.62	27.08	31.79	36.37	41.13	45.91		51.40	2 / 8			
	reaction time	0.195																
	interval		7.31	3.94	4.09	4.18	4.25	4.46	4.71	4.58	4.76	4.78	5.49			12.21	13.42	14.12
	velocity		7.31	8.88	8.56	8.37	8.24	7.85	7.43	7.64	7.35	7.32	7.29	7.78		8.60	7.82	7.44



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 05 May 2023 19:39) - diamond league race analysis

https://doha.diamondleague.com/live/libjs/jqueryuniversalcomponents/modules/pdfviewer/viewer.html?file=https://livecache.sportresult.com/node/binaryData/ATH_PROD/DOHA2023/PDF_ATHM400MHURDDJAMOND---FNI-000100---C78.PDF?n=kCqW/SIqdtTgezKCaQ4ypcRIQWY=
Video: <https://www.youtube.com/watch?v=AQhvsxQ05mU>

Women's 400m Hurdles

Biomechanical Analysis

2023 Top 10 Times - Women's 400m Hurdles

Bol, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10
FINAL - 2023 London Athletics Meet (London, GBR)																	
date	23-Jul	time	6.25	10.26	14.30	18.43	22.65	27.05	31.58	36.26	41.09	45.88		51.45	6 / 1		
reaction time	0.187	interval		4.01	4.04	4.13	4.22	4.40	4.53	4.68	4.83	4.79	5.57	AR PB		12.18	13.15
		velocity	7.20	8.73	8.66	8.47	8.29	7.95	7.73	7.48	7.25	7.31	7.18	7.77		8.62	7.98
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170			7.34
Bol, Femke (NED) (2000)																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	24-Aug	time	6.37	10.44	14.41	18.41	22.66	27.03	31.53	36.24	41.07	46.01		51.70	6 / 1		
reaction time	0.202	interval		4.07	3.97	4.00	4.25	4.37	4.50	4.71	4.83	4.94	5.69			12.04	13.12
		velocity	7.06	8.60	8.82	8.75	8.24	8.01	7.78	7.43	7.25	7.09	7.03	7.74		8.72	8.00
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			7.25
Bol, Femke (NED) (2000)																	
FINAL - 2023 Prefontaine Classic (Eugene, OR)																	
date	17-Sep	time	6.25	10.32	14.46	18.63	22.96	27.45	32.03	36.74	41.54	46.44		51.98	6 / 1		
reaction time	0.158	interval		4.07	4.14	4.17	4.33	4.49	4.58	4.71	4.80	4.90	5.54			12.38	13.40
		velocity	7.20	8.60	8.45	8.39	8.08	7.80	7.64	7.43	7.29	7.14	7.22	7.70		8.48	7.84
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	169.2			7.29
Bol, Femke (NED) (2000)																	
FINAL - 2023 Memorial van Damme (Brussels, BEL)																	
date	8-Sep	time	6.27	10.23	14.33	18.52	22.83	27.32	32.00	36.77	41.61	46.55		52.11	5 / 1		
reaction time	0.203	interval		3.96	4.10	4.19	4.31	4.49	4.68	4.77	4.84	4.94	5.56			12.25	13.48
		velocity	7.18	8.84	8.54	8.35	8.12	7.80	7.48	7.34	7.23	7.09	7.19	7.68		8.57	7.79
H1 lead leg	L	strides		14	14	14	14	14	14	15	15	15	18.2	147.2			7.22
Bol, Femke (NED) (2000)																	
FINAL - 2023 Bislett Games (Oslo, NOR)																	
date	15-Jun	time	6.29	10.36	14.52	18.74	23.05	27.48	32.11	36.92	41.78	46.69		52.30	5 / 1		
reaction time	0.172	interval		4.07	4.16	4.22	4.31	4.43	4.63	4.81	4.86	4.91	5.61			12.45	13.37
		velocity	7.15	8.60	8.41	8.29	8.12	7.90	7.56	7.28	7.20	7.13	7.13	7.65		8.43	7.85
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			7.20
Bol, Femke (NED) (2000)																	
FINAL - 2023 Golden Gala Pietro Mennea (Firenze, ITA)																	
date	2-Jun	time	6.27	10.35	14.48	18.63	22.90	27.28	31.96	36.76	41.63	46.64		52.43	6 / 1		
reaction time	0.170	interval		4.08	4.13	4.15	4.27	4.38	4.68	4.80	4.87	5.01	5.79			12.36	13.33
		velocity	7.18	8.58	8.47	8.43	8.20	7.99	7.48	7.29	7.19	6.99	6.91	7.63		8.50	7.88
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170			7.15
Bol, Femke (NED) (2000)																	
FINAL - 2023 Athletissima (Lausanne, SUI)																	
date	30-Jun	time	6.14	10.09	14.11	18.16	22.38	26.76	31.43	36.35	41.36	46.61		52.76	5 / 1		
reaction time	0.169	interval		3.95	4.02	4.05	4.22	4.38	4.67	4.92	5.01	5.25	6.15			12.02	13.27
		velocity	7.33	8.86	8.71	8.64	8.29	7.99	7.49	7.11	6.99	6.67	6.50	7.58		8.74	7.91
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19.7	170.7			6.92
Bol, Femke (NED) (2000)																	
FINAL - 2023 Galà Dei Castelli (Bellinzona, ITA) (TV Analysis)																	
date	4-Sep	time	6.36	10.52	14.68	18.92	23.28	27.80	32.48	37.32	42.28	47.28		52.79	4 / 1		
reaction time		interval		4.16	4.16	4.24	4.36	4.52	4.68	4.84	4.96	5.00	5.51			12.56	13.56
		velocity	7.08	8.41	8.41	8.25	8.03	7.74	7.48	7.23	7.06	7.00	7.26	7.58		8.36	7.74
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	169.2			7.09
Little, Shamier (USA) (1995)																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	24-Aug	time	6.24	10.41	14.58	18.68	23.02	27.46	31.96	36.64	41.54	46.81		52.80	5 / 2		
reaction time	0.181	interval		4.17	4.17	4.10	4.34	4.44	4.50	4.68	4.90	5.27	5.99			12.44	13.28
		velocity	7.21	8.39	8.39	8.54	8.06	7.88	7.78	7.48	7.14	6.64	6.68	7.58		8.44	7.91
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	15	16	20	164			7.07
Little, Shamier (USA) (1995)																	
Semi-Final 3 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	22-Aug	time	6.17	10.14	14.28	18.52	22.92	27.42	32.03	36.80	41.86	46.95		52.81	8 / 1		
reaction time	0.212	interval		3.97	4.14	4.24	4.40	4.50	4.61	4.77	5.06	5.09	5.86			12.35	13.51
		velocity	7.29	8.82	8.45	8.25	7.95	7.78	7.59	7.34	6.92	6.88	6.83	7.57		8.50	7.77
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2			7.04
Clayton, Rushell (JAM) (1992)																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	24-Aug	time	6.31	10.39	14.42	18.36	22.59	27.06	31.63	36.43	41.47	46.68		52.81	8 / 3		
reaction time	0.147	interval		4.08	4.03	3.94	4.23	4.47	4.57	4.80	5.04	5.21	6.13	PB		12.05	13.27
		velocity	7.13	8.58	8.68	8.88	8.27	7.83	7.66	7.29	6.94	6.72	6.53	7.57		8.71	7.91
H1 lead leg	L	strides	22	14	14	14	14	15	15	15	16	16	20	175			6.98
Bol, Femke (NED) (2000)																	
Semi-Final 2 - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	22-Aug	time	6.31	10.44	14.45	18.45	22.75	27.20	31.79	36.57	41.60	46.71		52.95	8 / 1		
reaction time	0.199	interval		4.13	4.01	4.00	4.30	4.45	4.59	4.78	5.03	5.11	6.24			12.14	13.34
		velocity	7.13	8.47	8.73	8.75	8.14	7.87	7.63	7.32	6.96	6.85	6.41	7.55		8.65	7.87
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.5	169.5			7.04
Adekoya, Kemi (BRN) (1993)																	
FINAL - 2023 World Athletics Championships (Budapest, HUN) (TV Analysis)																	
date	24-Aug	time	6.34	10.41	14.48	18.55	22.82	27.23	31.73	36.64	41.74	47.18		53.09	7 / 4		
reaction time	0.207	interval		4.07	4.07	4.07	4.27	4.41	4.50	4.91	5.10	5.44	5.91	AR		12.21	13.18
		velocity	7.10	8.60	8.60	8.60	8.20	7.94	7.78	7.13	6.86	6.43	6.77	7.53		8.60	7.97
H1 lead leg	R	strides	23	15	15	15	15	15	15	16	16	17	20	182			6.80
Bol, Femke (NED) (2000)																	
FINAL - 2023 IFAM Oordegem (Oordegem, BEL) (TV Analysis)																	
date	27-May	time	6.40	10.53	14.73	19.03	23.40	27.96	32.67	37.43		47.63		53.12	6 / 1		
reaction time		interval		4.13	4.20	4.30	4.37	4.56	4.71	4.76		10.20	5.49			12.63	13.64
		velocity	7.03	8.47	8.33	8.14	8.01	7.68	7.43	7.35		6.86	7.29	7.53		8.31	7.70
H1 lead leg	L	strides	22	14	14	14	14	14	14	15		16	19	156			7.02

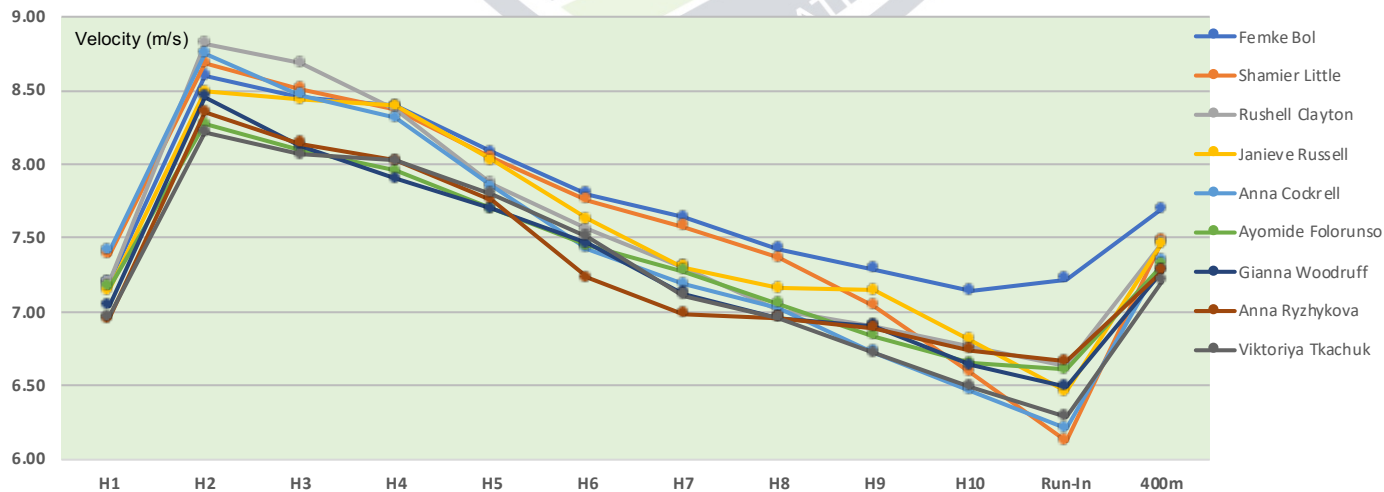
2023 Prefontaine Classic (Eugene, OR)

Women's 400m Hurdles

Date 2023.09.17

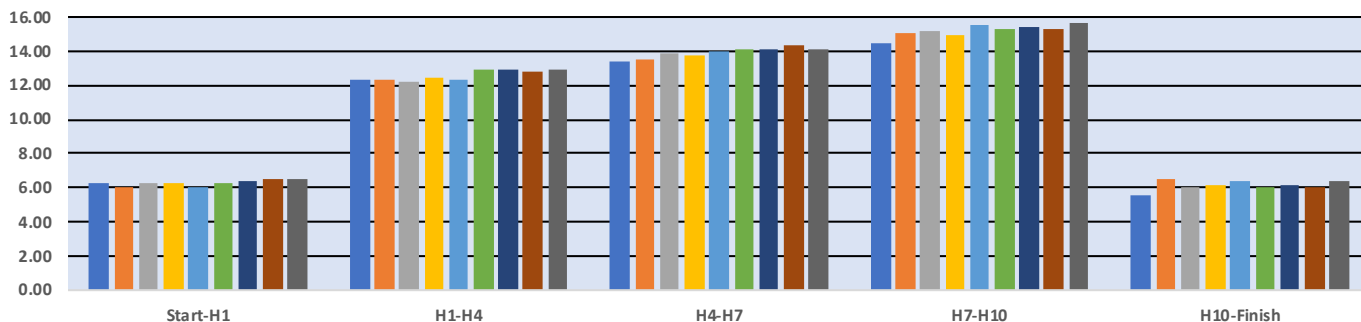
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.25	10.32	14.46	18.63	22.96	27.45	32.03	36.74	41.54	46.44		51.98	6 / 1			
	reaction time	0.158																
	interval		7.20	4.07	4.14	4.17	4.33	4.49	4.58	4.71	4.80	4.90	5.54			12.38	13.40	14.41
	velocity		7.20	8.60	8.45	8.39	8.08	7.80	7.64	7.43	7.29	7.14	7.22	7.70		8.48	7.84	7.29
	H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	18.2	169.2				
Little, Shamier (USA) (1995)	time		6.09	10.12	14.23	18.41	22.76	27.27	31.89	36.64	41.61	46.92		53.45	5 / 2			
	reaction time	0.169																
	interval		7.39	4.03	4.11	4.18	4.35	4.51	4.62	4.75	4.97	5.31	6.53			12.32	13.48	15.03
	velocity		7.39	8.68	8.52	8.37	8.05	7.76	7.58	7.37	7.04	6.59	6.13	7.48		8.52	7.79	6.99
	H1 lead leg	R	23	15	15	14	14	15	15	15	16	16	20	178				
Clayton, Rushell (JAM) (1992)	time		6.25	10.22	14.25	18.43	22.88	27.51	32.30	37.29	42.36	47.53		53.56	7 / 3			
	reaction time	0.138																
	interval		7.20	3.97	4.03	4.18	4.45	4.63	4.79	4.99	5.07	5.17	6.03			12.18	13.87	15.23
	velocity		7.20	8.82	8.68	8.37	7.87	7.56	7.31	7.01	6.90	6.77	6.63	7.47		8.62	7.57	6.89
	H1 lead leg	L	22	14	14	14	14	15	16	16	16	16	19	176				
Russell, Janieve (JAM) (1993)	time		6.30	10.42	14.57	18.74	23.10	27.69	32.48	37.37	42.27	47.41		53.60	3 / 4			
	reaction time	0.140																
	interval		7.14	4.12	4.15	4.17	4.36	4.59	4.79	4.89	4.90	5.14	6.19			12.44	13.74	14.93
	velocity		7.14	8.50	8.43	8.39	8.03	7.63	7.31	7.16	7.14	6.81	6.46	7.46		8.44	7.64	7.03
	H1 lead leg	R	23	15			15	15	16	16	16	16	20	152				
Cockrell, Anna (USA) (1997)	time		6.07	10.07	14.20	18.41	22.87	27.58	32.45	37.43	42.63	48.04		54.48	4 / 5			
	reaction time	0.139																
	interval		7.41	4.00	4.13	4.21	4.46	4.71	4.87	4.98	5.20	5.41	6.44			12.34	14.04	15.59
	velocity		7.41	8.75	8.47	8.31	7.85	7.43	7.19	7.03	6.73	6.47	6.21	7.34		8.51	7.48	6.74
	H1 lead leg	R	22	14			14	15	15	15	15	16		126				
Folorunso, Ayomide (ITA) (1996)	time		6.28	10.51	14.83	19.23	23.78	28.48	33.29	38.25	43.37	48.63		54.68	8 / 6			
	reaction time	0.182																
	interval		7.17	4.23	4.32	4.40	4.55	4.70	4.81	4.96	5.12	5.26	6.05			12.95	14.06	15.34
	velocity		7.17	8.27	8.10	7.95	7.69	7.45	7.28	7.06	6.84	6.65	6.61	7.32		8.11	7.47	6.84
	H1 lead leg	L	23	15	15	15	16	16	16	16				132				
Woodruff, Gianna (PAN) (1993)	time		6.39	10.53	14.84	19.27	23.82	28.51	33.42	38.45	43.52	48.79		54.95	2 / 7			
	reaction time	0.192																
	interval		7.04	4.14	4.31	4.43	4.55	4.69	4.91	5.03	5.07	5.27	6.16			12.88	14.15	15.37
	velocity		7.04	8.45	8.12	7.90	7.69	7.46	7.13	6.96	6.90	6.64	6.49	7.28		8.15	7.42	6.83
	H1 lead leg	L	22	14			15	15	15			17		98				
Ryzhykova, Anna (UKR) (1989)	time		6.47	10.66	14.96	19.32	23.83	28.67	33.68	38.71	43.79	48.98		54.98	1 / 8			
	reaction time	0.166																
	interval		6.96	4.19	4.30	4.36	4.51	4.84	5.01	5.03	5.08	5.19	6.00			12.85	14.36	15.30
	velocity		6.96	8.35	8.14	8.03	7.76	7.23	6.99	6.96	6.89	6.74	6.67	7.28		8.17	7.31	6.86
	H1 lead leg	R	22	14			14	15	15			15		95				
Tkachuk, Viktoriya (UKR) (1994)	time		6.46	10.72	15.06	19.42	23.91	28.57	33.49	38.52	43.73	49.12		55.48	9 / 9			
	reaction time	0.218																
	interval		6.97	4.26	4.34	4.36	4.49	4.66	4.92	5.03	5.21	5.39	6.36			12.96	14.07	15.63
	velocity		6.97	8.22	8.06	8.03	7.80	7.51	7.11	6.96	6.72	6.49	6.29	7.21		8.10	7.46	6.72
	H1 lead leg	L	22	15	15	15	15	15	16	16				129				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 17 Sep 2023 13:09) - diamond league race analysis

<https://www.omegatiming.com/File/002031001010C0101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=IE2u03IMAaU>

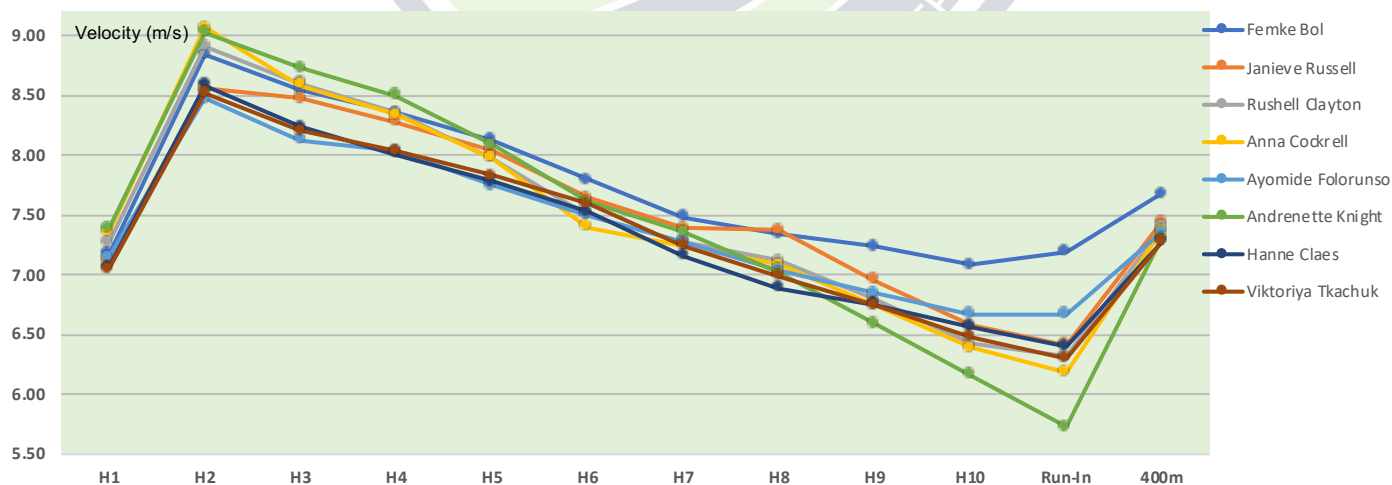
2023 Memorial van Damme (Brussels, BEL)

Women's 400m Hurdles

Date 2023.09.08

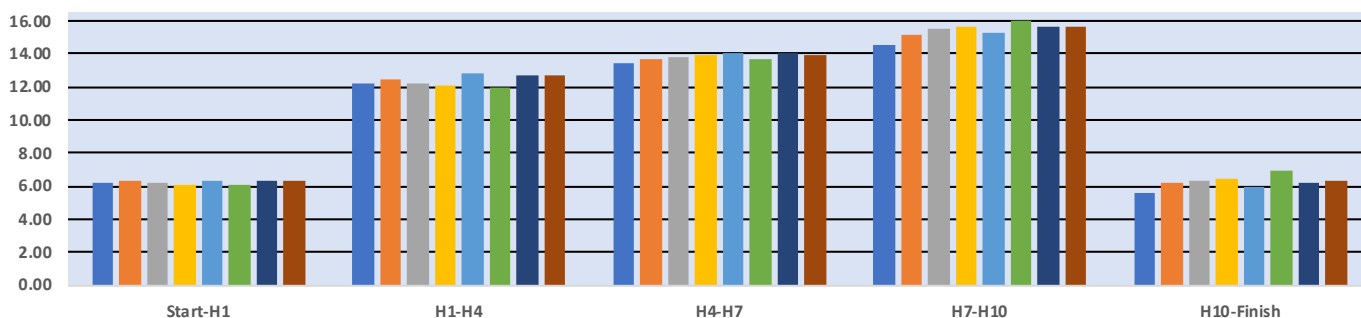
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.27	10.23	14.33	18.52	22.83	27.32	32.00	36.77	41.61	46.55		52.11	5 / 1			
	reaction time	0.203																
	interval			3.96	4.10	4.19	4.31	4.49	4.68	4.77	4.84	4.94	5.56			12.25	13.48	14.55
	velocity		7.18	8.84	8.54	8.35	8.12	7.80	7.48	7.34	7.23	7.09	7.19	7.68		8.57	7.79	7.22
	H1 lead leg	L												18.2	169.2			
Russell, Janieve (JAM) (1993)	time		6.33	10.42	14.55	18.78	23.14	27.72	32.46	37.21	42.24	47.56		53.80	7 / 2			
	reaction time	0.153																
	interval			4.09	4.13	4.23	4.36	4.58	4.74	4.75	5.03	5.32	6.24			12.45	13.68	15.10
	velocity		7.11	8.56	8.47	8.27	8.03	7.64	7.38	7.37	6.96	6.58	6.41	7.43		8.43	7.68	6.95
	H1 lead leg	R												20	154			
Clayton, Rushell (JAM) (1992)	time		6.19	10.12	14.19	18.38	22.77	27.44	32.25	37.17	42.32	47.77		54.10	6 / 3			
	reaction time	0.141																
	interval			3.93	4.07	4.19	4.39	4.67	4.81	4.92	5.15	5.45	6.33			12.19	13.87	15.52
	velocity		7.27	8.91	8.60	8.35	7.97	7.49	7.28	7.11	6.80	6.42	6.32	7.39		8.61	7.57	6.77
	H1 lead leg	L												16	175.5			
Cockrell, Anna (USA) (1997)	time		6.12	9.98	14.06	18.26	22.65	27.38	32.21	37.15	42.34	47.82		54.29	2 / 4			
	reaction time	0.218																
	interval			3.86	4.08	4.20	4.39	4.73	4.83	4.94	5.19	5.48	6.47			12.14	13.95	15.61
	velocity		7.35	9.07	8.58	8.33	7.97	7.40	7.25	7.09	6.74	6.39	6.18	7.37		8.65	7.53	6.73
	H1 lead leg	R												19.7	145.7			
Folorunso, Ayomide (ITA) (1996)	time		6.29	10.42	14.73	19.09	23.61	28.28	33.09	38.06	43.17	48.42		54.42	8 / 5			
	reaction time	0.213																
	interval			4.13	4.31	4.36	4.52	4.67	4.81	4.97	5.11	5.25	6.00			12.80	14.00	15.33
	velocity		7.15	8.47	8.12	8.03	7.74	7.49	7.28	7.04	6.85	6.67	6.67	7.35		8.20	7.50	6.85
	H1 lead leg	L												20	155			
Knight, Andrenette (JAM) (1996)	time		6.09	9.97	13.98	18.10	22.43	27.03	31.79	36.78	42.09	47.77		54.75	3 / 6			
	reaction time	0.153																
	interval			3.88	4.01	4.12	4.33	4.60	4.76	4.99	5.31	5.68	6.98			12.01	13.69	15.98
	velocity		7.39	9.02	8.73	8.50	8.08	7.61	7.35	7.01	6.59	6.16	5.73	7.31		8.74	7.67	6.57
	H1 lead leg	R												20.2	156.2			
Claes, Hanne (BEL) (1991)	time		6.37	10.45	14.70	19.07	23.57	28.22	33.11	38.19	43.37	48.70		54.95	4 / 7			
	reaction time	0.205																
	interval			4.08	4.25	4.37	4.50	4.65	4.89	5.08	5.18	5.33	6.25			12.70	14.04	15.59
	velocity		7.06	8.58	8.24	8.01	7.78	7.53	7.16	6.89	6.76	6.57	6.40	7.28		8.27	7.48	6.74
	H1 lead leg	R												21	185			
Tkachuk, Viktoriya (UKR) (1994)	time		6.38	10.49	14.76	19.12	23.59	28.20	33.03	38.04	43.23	48.63		54.98	1 / 8			
	reaction time	0.217																
	interval			4.11	4.27	4.36	4.47	4.61	4.83	5.01	5.19	5.40	6.35			12.74	13.91	15.60
	velocity		7.05	8.52	8.20	8.03	7.83	7.59	7.25	6.99	6.74	6.48	6.30	7.28		8.24	7.55	6.73
	H1 lead leg	L												20.5	152.5			



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 8 Sep 2023 20:53) - diamond league race analysis

<https://www.omegatiming.com/File/0002030F0101100101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=2rc5yOA4lHl>

2023 Galà Dei Castelli (Bellinzona, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2023.09.04

FINAL

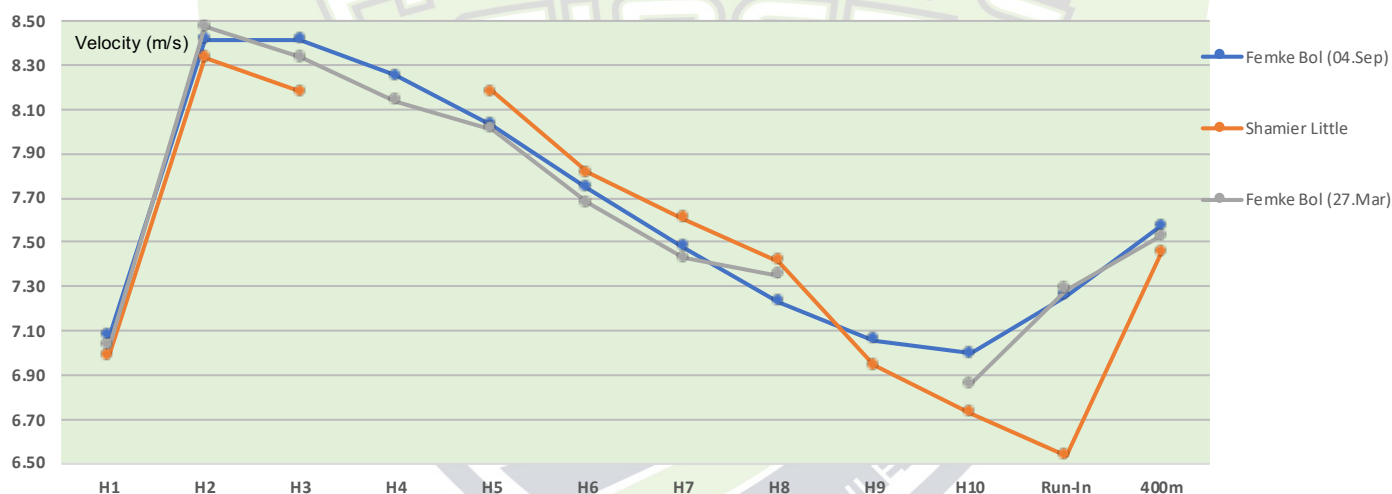
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time	6.36	10.52	14.68	18.92	23.28	27.80	32.48	37.32	42.28	47.28		52.79	4 / 1			
	reaction time																
	interval		4.16	4.16	4.24	4.36	4.52	4.68	4.84	4.96	5.00	5.51			12.56	13.56	14.80
	velocity	7.08	8.41	8.41	8.25	8.03	7.74	7.48	7.23	7.06	7.00	7.26	7.58		8.36	7.74	7.09
	H1 lead leg	L	22	14	14	14	14	14	15	15	15	18.2	169.2				
Little, Shamier (USA) (1995)	time	6.44	10.64	14.92		23.48	27.96	32.56	37.28	42.32	47.52		53.64	5 / 2			
	reaction time																
	interval		4.20	4.28		8.56	4.48	4.60	4.72	5.04	5.20	6.12					14.96
	velocity	6.99	8.33	8.18		8.18	7.81	7.61	7.42	6.94	6.73	6.54	7.46				7.02
	H1 lead leg	R	23	15	15		15	15	15	16	16	20	150				

2023 IFAM Oordegem (Oordegem, BEL) (TV Analysis)

Date 2023.05.27

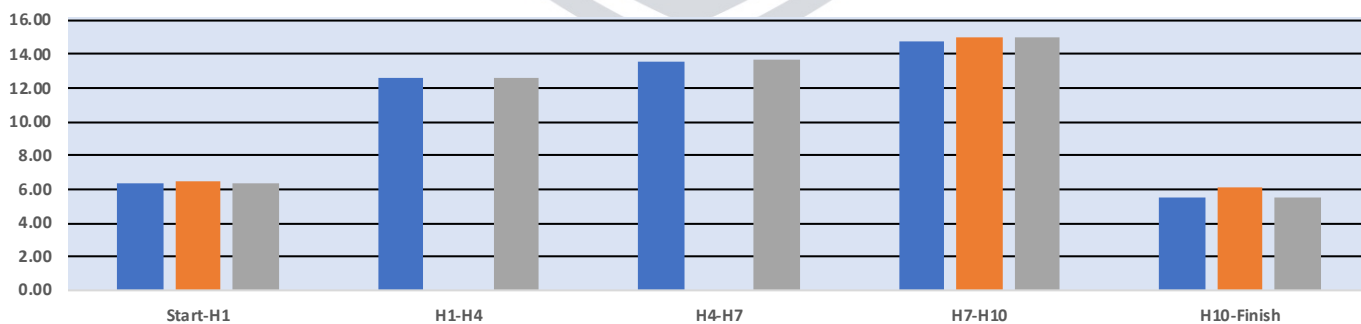
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time	6.40	10.53	14.73	19.03	23.40	27.96	32.67	37.43		47.63		53.12	6 / 1			
	reaction time																
	interval		4.13	4.20	4.30	4.37	4.56	4.71	4.76		10.20	5.49			12.63	13.64	14.96
	velocity	7.03	8.47	8.33	8.14	8.01	7.68	7.43	7.35		6.86	7.29	7.53		8.31	7.70	7.02
	H1 lead leg	L	22	14	14	14	14	14	15		16	19	156				



Time Intervals (s)

Hurdle Phases



Galà Dei Castelli

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=HJ_Inh7Sq2B8

IFAM Oordegem

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=TIVzHU0zaCs>

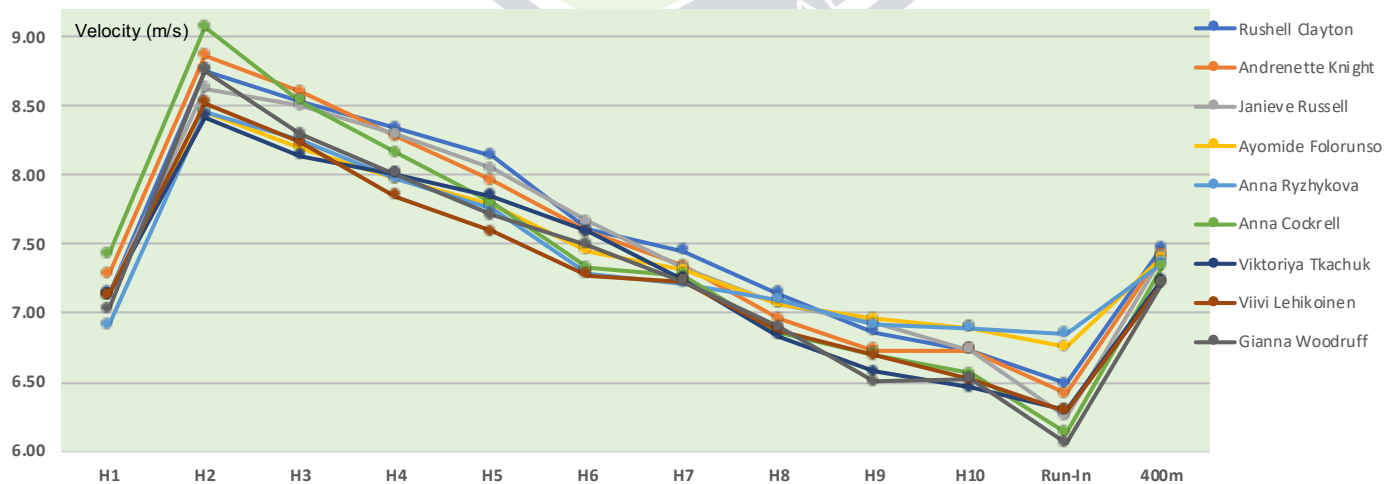
2023 Xiamen Diamond League (Xiamen, CHN)

Women's 400m Hurdles

Date 2023.09.02

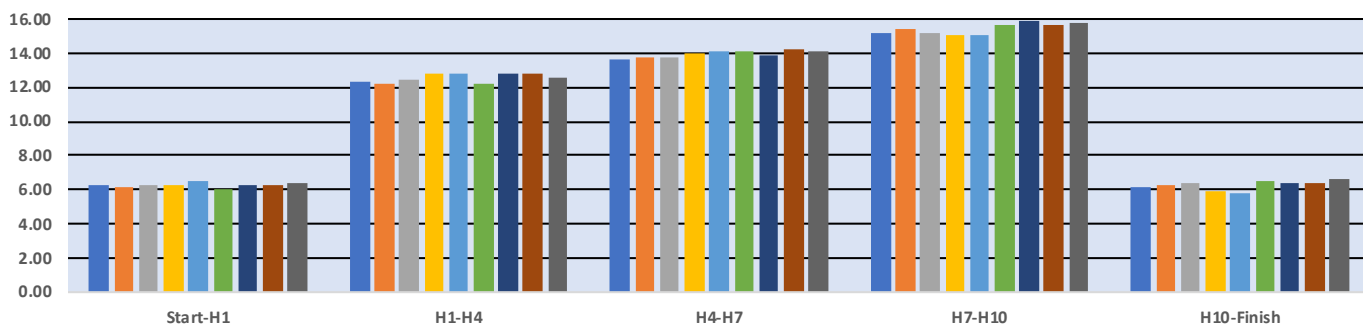
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clayton, Rushell (JAM) (1992)	time		6.30	10.30	14.40	18.60	22.90	27.50	32.20	37.10	42.20	47.40		53.56	5 / 1			
	reaction time	0.138																
	interval			4.00	4.10	4.20	4.30	4.60	4.70	4.90	5.10	5.20	6.16			12.30	13.60	15.20
	velocity		7.14	8.75	8.54	8.33	8.14	7.61	7.45	7.14	6.86	6.73	6.49	7.47		8.54	7.72	6.91
Knight, Andrenette (JAM) (1996)	time		6.18	10.13	14.20	18.43	22.83	27.44	32.21	37.24	42.44	47.64		53.87	7 / 2			
	reaction time	0.162																
	interval			3.95	4.07	4.23	4.40	4.61	4.77	5.03	5.20	5.20	6.23			12.25	13.78	15.43
	velocity		7.28	8.86	8.60	8.27	7.95	7.59	7.34	6.96	6.73	6.73	6.42	7.43		8.57	7.62	6.80
Russell, Janieve (JAM) (1993)	time		6.31	10.37	14.49	18.71	23.06	27.63	32.41	37.36	42.41	47.61		54.01	6 / 3			
	reaction time	0.173																
	interval			4.06	4.12	4.22	4.35	4.57	4.78	4.95	5.05	5.20	6.40			12.40	13.70	15.20
	velocity		7.13	8.62	8.50	8.29	8.05	7.66	7.32	7.07	6.93	6.73	6.25	7.41		8.47	7.66	6.91
Folorunso, Ayomide (ITA) (1996)	time		6.31	10.45	14.72	19.11	23.61	28.31	33.10	38.05	43.08	48.16		54.08	3 / 4			
	reaction time	0.185																
	interval			4.14	4.27	4.39	4.50	4.70	4.79	4.95	5.03	5.08	5.92			12.80	13.99	15.06
	velocity		7.13	8.45	8.20	7.97	7.78	7.45	7.31	7.07	6.96	6.89	6.76	7.40		8.20	7.51	6.97
Ryzhykova, Anna (UKR) (1989)	time		6.51	10.65	14.89	19.28	23.79	28.59	33.44	38.37	43.43	48.51		54.35	1 / 5			
	reaction time	0.157																
	interval			4.14	4.24	4.39	4.51	4.80	4.85	4.93	5.06	5.08	5.84			12.77	14.16	15.07
	velocity		6.91	8.45	8.25	7.97	7.76	7.29	7.22	7.10	6.92	6.89	6.85	7.36		8.22	7.42	6.97
Cockrell, Anna (USA) (1997)	time		6.06	9.92	14.02	18.31	22.80	27.58	32.39	37.49	42.71	48.04		54.56	4 / 6			
	reaction time	0.182																
	interval			3.86	4.10	4.29	4.49	4.78	4.81	5.10	5.22	5.33	6.52			12.25	14.08	15.65
	velocity		7.43	9.07	8.54	8.16	7.80	7.32	7.28	6.86	6.70	6.57	6.13	7.33		8.57	7.46	6.71
Tkachuk, Viktoriya (UKR) (1994)	time		6.31	10.47	14.77	19.14	23.60	28.21	33.04	38.16	43.48	48.90		55.25	8 / 7			
	reaction time	0.201																
	interval			4.16	4.30	4.37	4.46	4.61	4.83	5.12	5.32	5.42	6.35			12.83	13.90	15.86
	velocity		7.13	8.41	8.14	8.01	7.85	7.59	7.25	6.84	6.58	6.46	6.30	7.24		8.18	7.55	6.62
Lehikoinen, Viivi (FIN) (1999)	time		6.31	10.42	14.67	19.13	23.74	28.55	33.39	38.48	43.71	49.08		55.44	2 / 8			
	reaction time	0.215																
	interval			4.11	4.25	4.46	4.61	4.81	4.84	5.09	5.23	5.37	6.36			12.82	14.26	15.69
	velocity		7.13	8.52	8.24	7.85	7.59	7.28	7.23	6.88	6.69	6.52	6.29	7.22		8.19	7.36	6.69
Woodruff, Gianna (PAN) (1993)	time		6.40	10.40	14.62	18.99	23.53	28.20	33.04	38.11	43.49	48.85		55.45	9 / 9			
	reaction time	0.219																
	interval			4.00	4.22	4.37	4.54	4.67	4.84	5.07	5.38	5.36	6.60			12.59	14.05	15.81
	velocity		7.03	8.75	8.29	8.01	7.71	7.49	7.23	6.90	6.51	6.53	6.06	7.21		8.34	7.47	6.64



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 2 Sep 2023 20:32) - diamond league race analysis

<https://www.omegatiming.com/File/0002031101010C0101FFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=uvCey9Wu7zc>

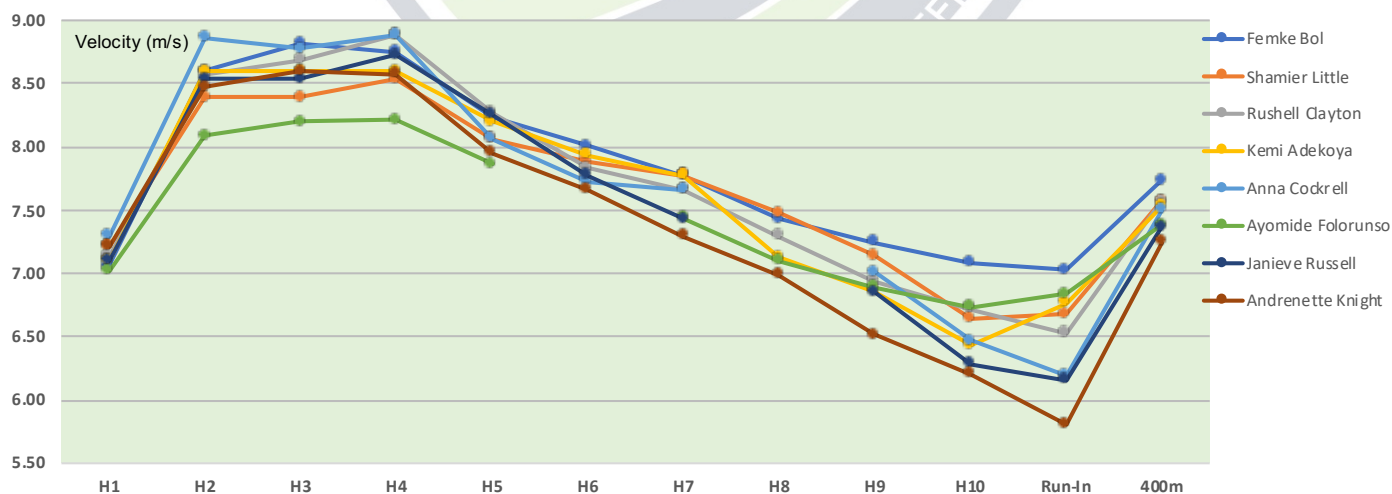
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.24

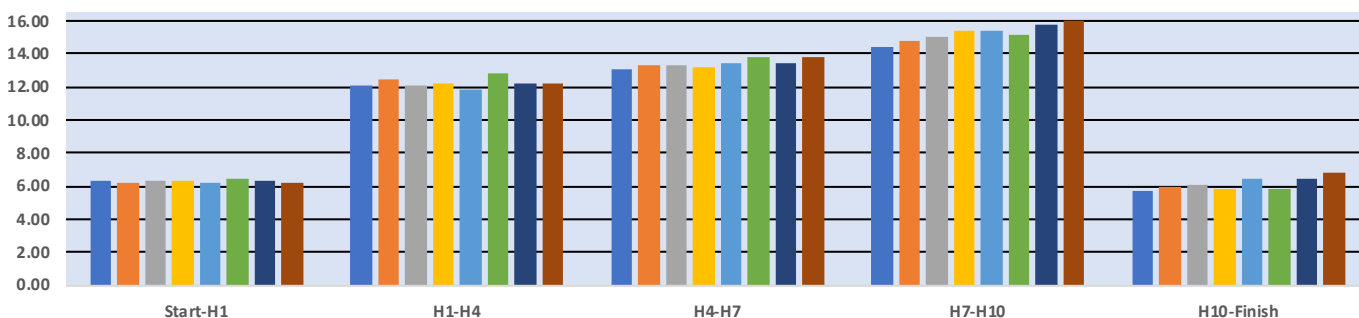
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.37	10.44	14.41	18.41	22.66	27.03	31.53	36.24	41.07	46.01		51.70	6 / 1			
	reaction time	0.202	interval															
			velocity	7.06	4.07	3.97	4.00	4.25	4.37	4.71	4.83	4.94	5.69			12.04	13.12	14.48
			strides	22	14	14	14	14	14	15	15	15	18.5	169.5		8.72	8.00	7.25
	H1 lead leg	L																
Little, Shamier (USA) (1995)	time		6.24	10.41	14.58	18.68	23.02	27.46	31.96	36.64	41.54	46.81		52.80	5 / 2			
	reaction time	0.181	interval															
			velocity	7.21	4.17	4.17	4.10	4.34	4.44	4.50	4.68	4.90	5.99			12.44	13.28	14.85
			strides	23	15	15	15	15	15	15	15	16	20	164		8.44	7.91	7.07
	H1 lead leg	R																
Clayton, Rushell (JAM) (1992)	time		6.31	10.39	14.42	18.36	22.59	27.06	31.63	36.43	41.47	46.68		52.81	8 / 3			
	reaction time	0.147	interval															
			velocity	7.13	4.08	4.03	3.94	4.23	4.47	4.57	4.80	5.04	6.13	PB		12.05	13.27	15.05
			strides	22	14	14	14	14	15	15	15	16	20	175		8.71	7.91	6.98
	H1 lead leg	L																
Adekoya, Kemi (BRN) (1993)	time		6.34	10.41	14.48	18.55	22.82	27.23	31.73	36.64	41.74	47.18		53.09	7 / 4			
	reaction time	0.207	interval															
			velocity	7.10	4.07	4.07	4.07	4.27	4.41	4.50	4.91	5.10	5.91	AR		12.21	13.18	15.45
			strides	23	15	15	15	15	15	15	16	16	20	182		8.60	7.97	6.80
	H1 lead leg	R																
Cockrell, Anna (USA) (1997)	time		6.17	10.12	14.11	18.05	22.39	26.92	31.49		41.47	46.88		53.34	9 / 5			
	reaction time	0.189	interval															
			velocity	7.29	3.95	3.99	3.94	4.34	4.53	4.57	9.98	5.41	6.46	PB		11.88	13.44	15.39
			strides	22	14	14	14	14	15	15		16	20	144		8.84	7.81	6.82
	H1 lead leg	R																
Folorunso, Ayomide (ITA) (1996)	time		6.41	10.74	15.01	19.27	23.72		33.13	38.06	43.14	48.34		54.19	2 / 6			
	reaction time	0.192	interval															
			velocity	7.02	4.33	4.27	4.26	4.45		9.41	4.93	5.08	5.85			12.86	13.86	15.21
			strides	23	15	15	15	16	16			16	17	153		8.16	7.58	6.90
	H1 lead leg	L																
Russell, Janieve (JAM) (1993)	time		6.34	10.44	14.54	18.55	22.79	27.29	32.00		42.21	47.78		54.28	3 / 7			
	reaction time	0.152	interval															
			velocity	7.10	4.10	4.10	4.01	4.24	4.50	4.71	10.21	5.57	6.50			12.21	13.45	15.78
			strides	23	15	15	15	15	16	16		17	20.5	136.5		8.60	7.81	6.65
	H1 lead leg	R																
Knight, Andrenette (JAM) (1996)	time		6.24	10.37	14.44	18.52	22.92	27.49	32.29	37.30	42.67	48.31		55.20	4 / 8			
	reaction time	0.158	interval															
			velocity	7.21	4.13	4.07	4.08	4.40	4.57	4.80	5.01	5.37	6.89			12.28	13.77	16.02
			strides	23	15	15	15	15	16	16		17	20.7	153.7		8.55	7.63	6.55
	H1 lead leg	R																



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=0DLYOvN1tU&t=26s>

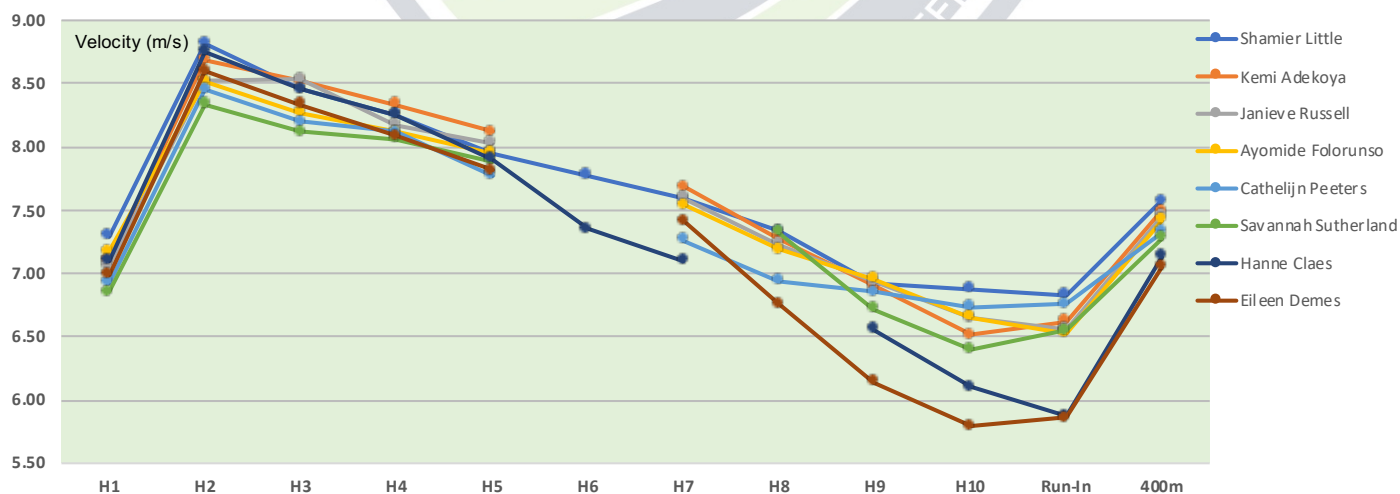
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

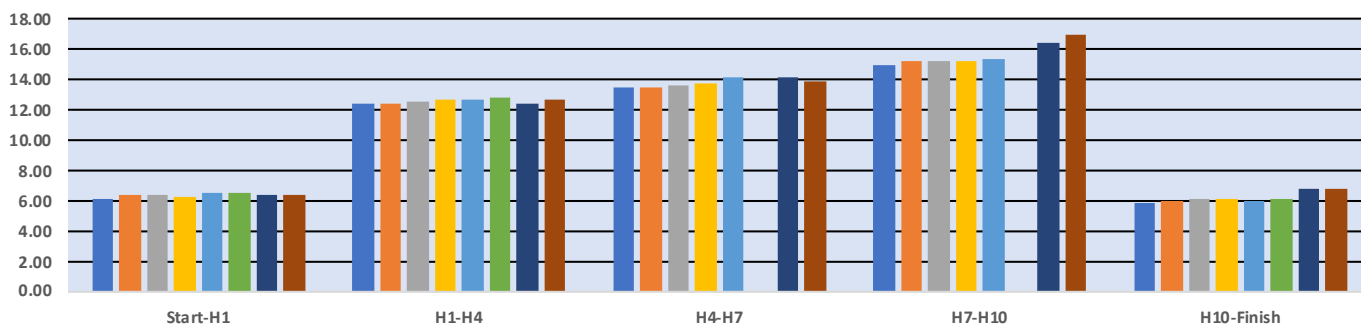
Semi-Final 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time		6.17	10.14	14.28	18.52	22.92	27.42	32.03	36.80	41.86	46.95		52.81	8 / 1			
	reaction time	0.212																
	interval		7.29	3.97	4.14	4.24	4.40	4.50	4.61	4.77	5.06	5.09	5.86			12.35	13.51	14.92
	velocity		7.29	8.82	8.45	8.25	7.95	7.78	7.59	7.34	6.92	6.88	6.83	7.57		8.50	7.77	7.04
Adekoya, Kemi (BRN) (1993)	time		6.34	10.37	14.48	18.68	22.99		32.10	36.91	41.98	47.35		53.39	6 / 2			
	reaction time	0.195																
	interval		7.10	4.03	4.11	4.20	4.31		9.11	4.81	5.07	5.37	6.04	AR		12.34	13.42	15.25
	velocity		7.10	8.68	8.52	8.33	8.12		7.68	7.28	6.90	6.52	6.62	7.49		8.51	7.82	6.89
Russell, Janieve (JAM) (1993)	time		6.37	10.48	14.58	18.86	23.22		32.43	37.27	42.32	47.59		53.69	7 / 3			
	reaction time	0.180																
	interval		7.06	4.11	4.10	4.28	4.36		9.21	4.84	5.05	5.27	6.10			12.49	13.57	15.16
	velocity		7.06	8.52	8.54	8.18	8.03		7.60	7.23	6.93	6.64	6.56	7.45		8.41	7.74	6.93
Folorunso, Ayomide (ITA) (1996)	time		6.27	10.38	14.61	18.92	23.32		32.60	37.47	42.50	47.76		53.89	5 / 4			
	reaction time	0.190																
	interval		7.18	4.11	4.23	4.31	4.40		9.28	4.87	5.03	5.26	6.13	NR		12.65	13.68	15.16
	velocity		7.18	8.52	8.27	8.12	7.95		7.54	7.19	6.96	6.65	6.53	7.42		8.30	7.68	6.93
Peeters, Cathelijn (NED) (1996)	time		6.50	10.64	14.91	19.22	23.72		33.36	38.40	43.51	48.71		54.63	4 / 5			
	reaction time	0.248																
	interval		6.92	4.14	4.27	4.31	4.50		9.64	5.04	5.11	5.20	5.92			12.72	14.14	15.35
	velocity		6.92	8.45	8.20	8.12	7.78		7.26	6.94	6.85	6.73	6.76	7.32		8.25	7.43	6.84
Sutherland, Savannah (CAN) (2003)	time		6.57	10.77	15.08	19.42	23.86		38.20	43.41	48.88			54.99	2 / 6			
	reaction time	0.214																
	interval		6.85	4.20	4.31	4.34	4.44		14.34	5.21	5.47	6.11				12.85		
	velocity		6.85	8.33	8.12	8.06	7.88		7.32	6.72	6.40	6.55	7.27			8.17		
Claes, Hanne (BEL) (1991)	time		6.34	10.34	14.48	18.72	23.15	27.91	32.84		43.51	49.25		56.06	9 / 7			
	reaction time	0.208																
	interval		7.10	4.00	4.14	4.24	4.43	4.76	4.93		10.67	5.74	6.81			12.38	14.12	16.41
	velocity		7.10	8.75	8.45	8.25	7.90	7.35	7.10		6.56	6.10	5.87	7.14		8.48	7.44	6.40
Demes, Eileen (GER) (1997)	time		6.44	10.51	14.71	19.04	23.52		32.96	38.14	43.84	49.88		56.71	3 / 8			
	reaction time	0.166																
	interval		6.99	4.07	4.20	4.33	4.48		9.44	5.18	5.70	6.04	6.83			12.60	13.92	16.92
	velocity		6.99	8.60	8.33	8.08	7.81		7.42	6.76	6.14	5.79	5.86	7.05		8.33	7.54	6.21



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=rgF4xRAp0a>

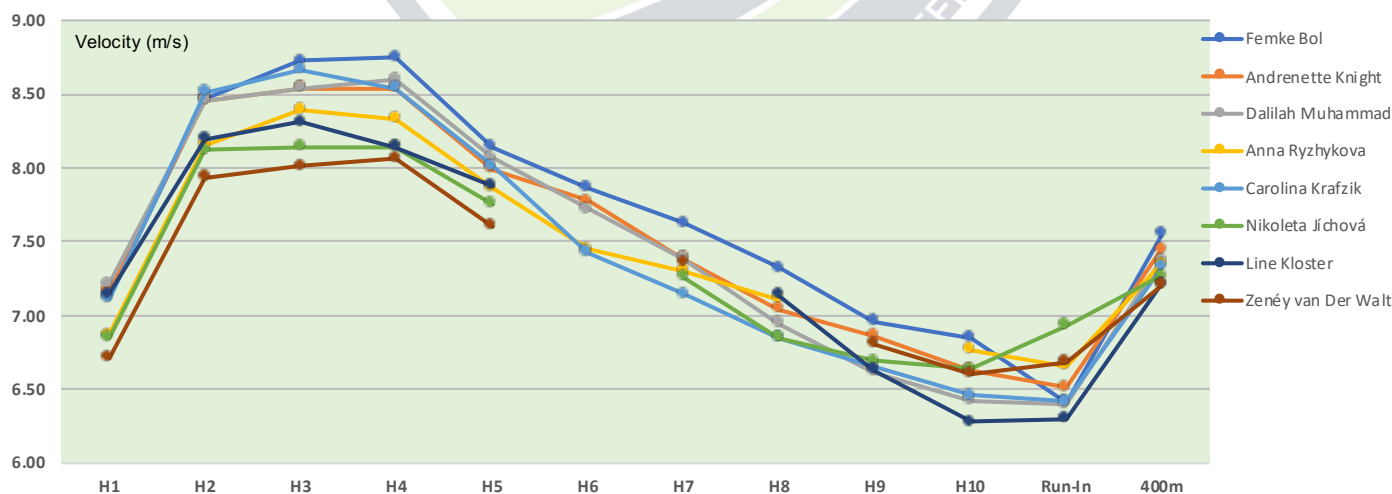
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

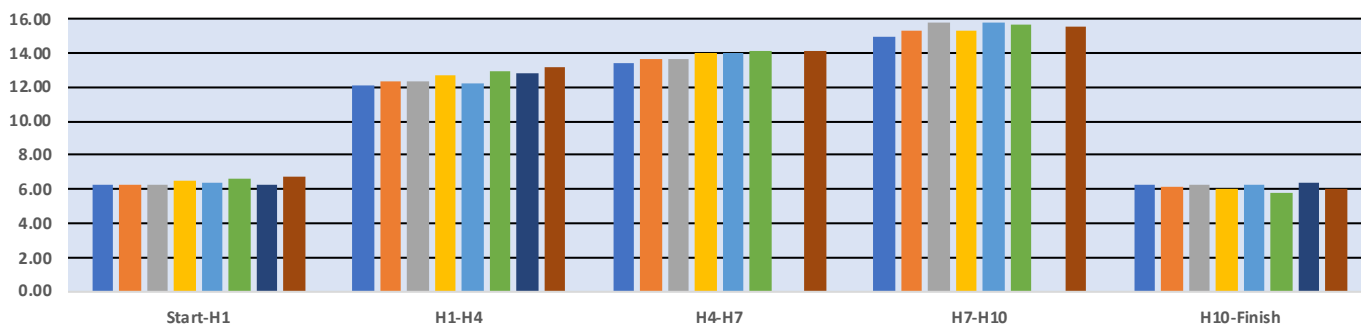
Semi-Final 2

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.31	10.44	14.45	18.45	22.75	27.20	31.79	36.57	41.60	46.71		52.95	8 / 1			
	reaction time	0.199																
	interval		7.13	4.13	4.01	4.00	4.30	4.45	4.59	4.78	5.03	5.11	6.24			12.14	13.34	14.92
	velocity		7.13	8.47	8.73	8.75	8.14	7.87	7.63	7.32	6.96	6.85	6.41	7.55		8.65	7.87	7.04
	H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	18.5	169.5				
Knight, Andrenette (JAM) (1996)	time		6.27	10.41	14.51	18.61	22.99	27.49	32.23	37.20	42.30	47.58		53.72	7 / 2			
	reaction time	0.163																
	interval		7.18	4.14	4.10	4.10	4.38	4.50	4.74	4.97	5.10	5.28	6.14			12.34	13.62	15.35
	velocity		7.18	8.45	8.54	8.54	7.99	7.78	7.38	7.04	6.86	6.63	6.51	7.45		8.51	7.71	6.84
	H1 lead leg	R	23	15	15	15	15	15	15	16	16	17	20	182				
Muhammad, Dalilah (USA) (1990)	time		6.24	10.38	14.48	18.55	22.89	27.42	32.16	37.20	42.49	47.94		54.19	6 / 3			
	reaction time	0.169																
	interval		7.21	4.14	4.10	4.07	4.34	4.53	4.74	5.04	5.29	5.45	6.25			12.31	13.61	15.78
	velocity		7.21	8.45	8.54	8.60	8.06	7.73	7.38	6.94	6.62	6.42	6.40	7.38		8.53	7.71	6.65
	H1 lead leg	R	22	14	14	15	15	15	15	15	16	16	19.7	176.7				
Ryzhykova, Anna (UKR) (1989)	time		6.55	10.84	15.01	19.21	23.66	28.36	33.15	38.07		48.41		54.42	9 / 4			
	reaction time	0.186																
	interval		6.87	4.29	4.17	4.20	4.45	4.70	4.79	4.92		10.34	6.01			12.66	13.94	15.26
	velocity		6.87	8.16	8.39	8.33	7.87	7.45	7.31	7.11		6.77	6.66	7.35		8.29	7.53	6.88
	H1 lead leg	R	22	14	14	14	14	15	15	15		15	19.2	157.2				
Krafzik, Carolina (GER) (1995)	time		6.33	10.44	14.48	18.58	22.95	27.66	32.56	37.67	42.93	48.35		54.58	5 / 5			
	reaction time	0.192																
	interval		4.11	4.04	4.10	4.37	4.71	4.90	5.11	5.26	5.42	6.23				12.25	13.98	15.79
	velocity		7.11	8.52	8.66	8.54	8.01	7.43	7.14	6.85	6.65	6.46	6.42	7.33		8.57	7.51	6.65
	H1 lead leg	L	23	15	15	15	15	17	17	17	17	17	21.7	189.7				
Jichová, Nikoleta (CZE) (2000)	time		6.57	10.88	15.18	19.48	23.99		33.63	38.74	43.97	49.24		55.01	4 / 6			
	reaction time	0.229																
	interval		4.31	4.30	4.30	4.30	4.61		9.64	5.11	5.23	5.27	5.77			12.91	14.15	15.61
	velocity		6.85	8.12	8.14	8.14	7.76		7.26	6.85	6.69	6.64	6.93	7.27		8.13	7.42	6.73
	H1 lead leg	R	22	15	15	15	15			16	16	16	20.7	150.7				
Kloster, Line (NOR) (1990)	time		6.30	10.57	14.78	19.08	23.52			38.23	43.51	49.08		55.43	2 / 7			
	reaction time	0.152																
	interval		4.27	4.21	4.30	4.44				14.71	5.28	5.57	6.35			12.78		
	velocity		7.14	8.20	8.31	8.14	7.88			7.14	6.63	6.28	6.30	7.22		8.22		
	H1 lead leg	R	22	14	14	15	15			16	16	17	20	149				
van Der Walt, Zenéy (RSA) (2000)	time		6.70	11.11	15.48	19.82	24.42		33.93		44.21	49.51		55.49	3 / 8			
	reaction time	0.212																
	interval		4.41	4.37	4.34	4.60			9.51		10.28	5.30	5.98			13.12	14.11	15.58
	velocity		6.72	7.94	8.01	8.06	7.61		7.36		6.81	6.60	6.69	7.21		8.00	7.44	6.74
	H1 lead leg	L	23	15	15	15	15			16		16	19.5	134.5				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=XuWVBzvZ5ZA>

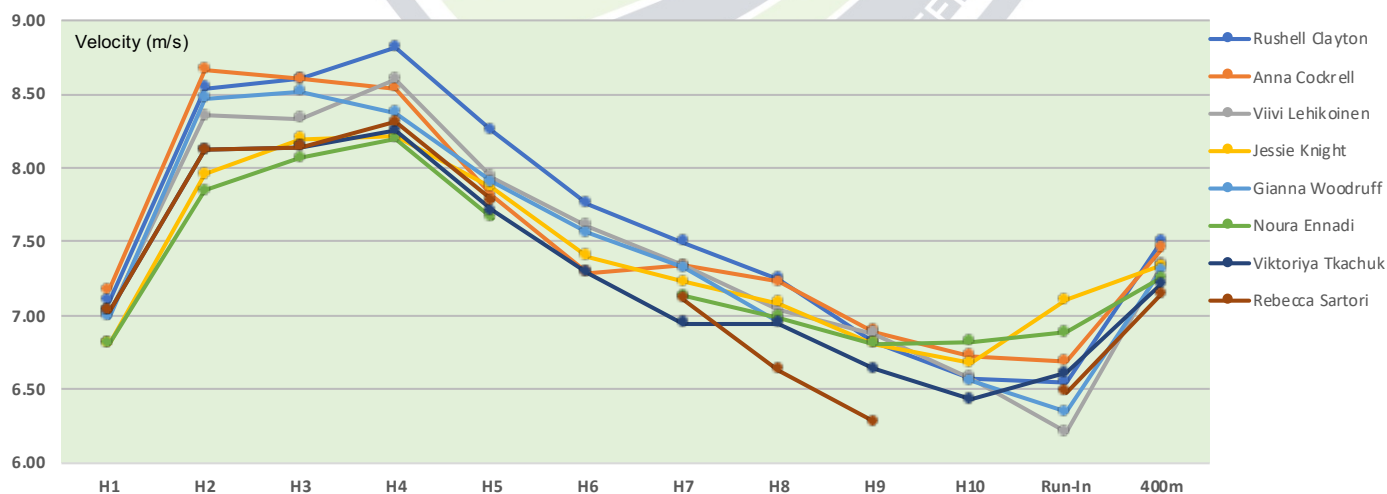
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.22

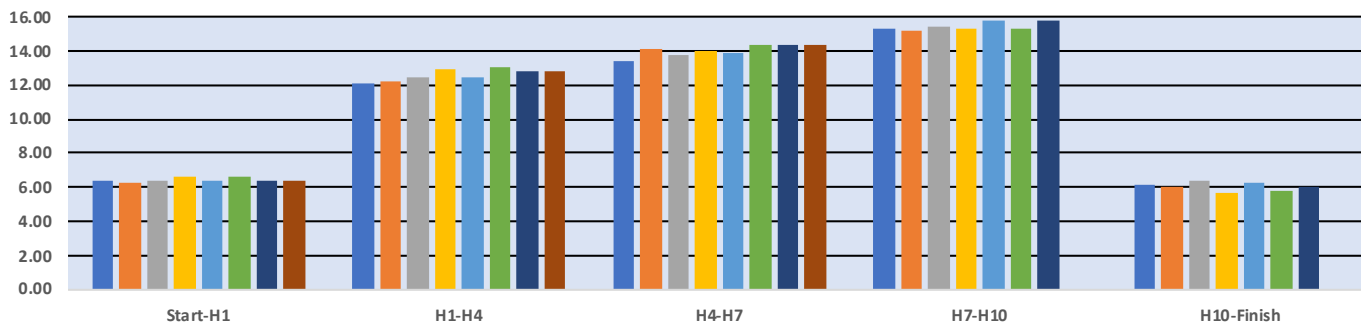
Semi-Final 1

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clayton, Rushell (JAM) (1992)	time		6.34	10.44	14.51	18.48	22.72	27.23	31.90	36.73	41.86	47.19		53.30	5 / 1			
	reaction time	0.190																
	interval		7.10	4.10	4.07	3.97	4.24	4.51	4.67	4.83	5.13	5.33	6.11	PB		12.14	13.42	15.29
	velocity		7.10	8.54	8.60	8.82	8.25	7.76	7.49	7.25	6.82	6.57	6.55	7.50		8.65	7.82	6.87
Cockrell, Anna (USA) (1997)	time		6.27	10.31	14.38	18.48	22.96	27.76	32.53	37.37	42.45	47.65		53.63	7 / 2			
	reaction time	0.199																
	interval		7.18	4.04	4.07	4.10	4.48	4.80	4.77	4.84	5.08	5.20	5.98	PB		12.21	14.05	15.12
	velocity		7.18	8.66	8.60	8.54	7.81	7.29	7.34	7.23	6.89	6.73	6.69	7.46		8.60	7.47	6.94
Lehikoinen, Viivi (FIN) (1999)	time		6.42	10.61	14.81	18.88	23.29	27.89	32.66	37.63	42.72	48.04		54.48	4 / 3			
	reaction time	0.200																
	interval		7.01	4.19	4.20	4.07	4.41	4.60	4.77	4.97	5.09	5.32	6.44			12.46	13.78	15.38
	velocity		7.01	8.35	8.33	8.60	7.94	7.61	7.34	7.04	6.88	6.58	6.21	7.34		8.43	7.62	6.83
Knight, Jessie (GBR) (1994)	time		6.61	11.01	15.28	19.54	23.99	28.72	33.56	38.50	43.64	48.88		54.51	8 / 4			
	reaction time	0.187																
	interval		6.81	4.40	4.27	4.26	4.45	4.73	4.84	4.94	5.14	5.24	5.63			12.93	14.02	15.32
	velocity		6.81	7.95	8.20	8.22	7.87	7.40	7.23	7.09	6.81	6.68	7.10	7.34		8.12	7.49	6.85
Woodruff, Gianna (PAN) (1993)	time		6.44	10.57	14.68	18.86	23.29	27.92	32.70	37.73		48.41		54.71	9 / 5			
	reaction time	0.208																
	interval		4.13	4.11	4.18	4.43	4.63	4.78	5.03			10.68	6.30			12.42	13.84	15.71
	velocity		6.99	8.47	8.52	8.37	7.90	7.56	7.32	6.96		6.55	6.35	7.31		8.45	7.59	6.68
Ennadi, Noura (MAR) (1999)	time		6.61	11.07	15.41	19.68	24.25		34.06	39.07	44.21	49.34		55.15	2 / 6			
	reaction time	0.184																
	interval		4.46	4.34	4.27	4.57			9.81	5.01	5.14	5.13	5.81			13.07	14.38	15.28
	velocity		6.81	7.85	8.06	8.20	7.66		7.14	6.99	6.81	6.82	6.88	7.25		8.03	7.30	6.87
Tkachuk, Viktoriya (UKR) (1994)	time		6.40	10.71	15.01	19.25	23.79	28.59	33.63	38.67	43.94	49.38		55.43	6 / 7			
	reaction time	0.209																
	interval		7.03	4.31	4.30	4.24	4.54	4.80	5.04	5.04	5.27	5.44	6.05			12.85	14.38	15.75
	velocity		7.03	8.12	8.14	8.25	7.71	7.29	6.94	6.94	6.64	6.43	6.61	7.22		8.17	7.30	6.67
Sartori, Rebecca (ITA) (1997)	time		6.40	10.71	15.01	19.22	23.72		33.56	38.84	44.41			55.98	3 / 8			
	reaction time	0.213																
	interval		7.03	4.31	4.30	4.21	4.50		9.84	5.28	5.57		11.57			12.82	14.34	
	velocity		7.03	8.12	8.14	8.31	7.78		7.11	6.63	6.28		6.48	7.15		8.19	7.32	
	H1 lead leg	L	22	15	15	15	15		17	17	17	17		133				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=Y6Gs0m1edYI>

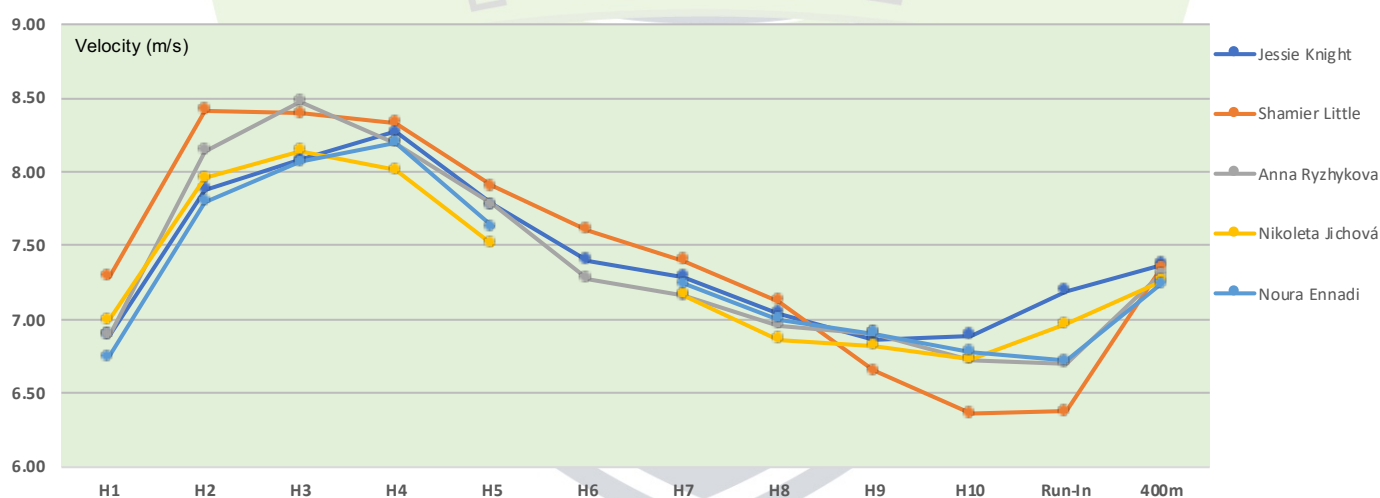
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

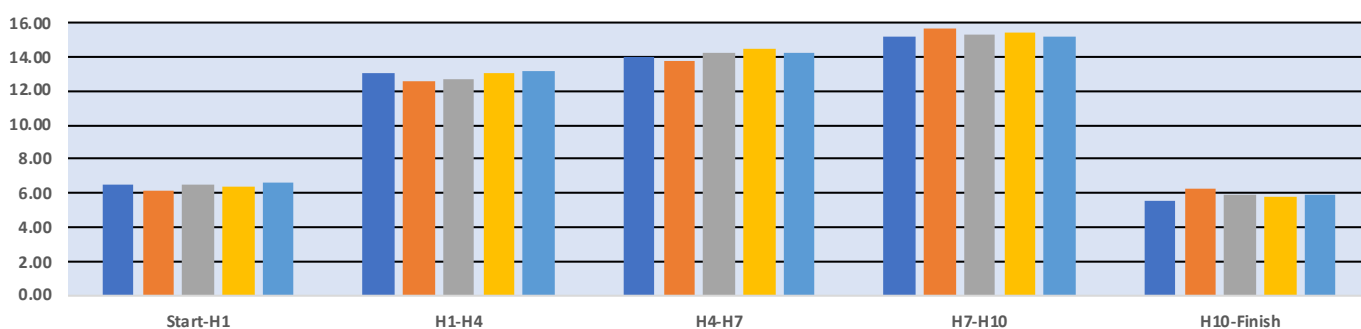
Heat 5

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Knight, Jessie (GBR) (1994)	time		6.53	10.97	15.30	19.53	24.03	28.76	33.56	38.53	43.63	48.71		54.27	8 / 1			
	reaction time	0.161																
	interval		6.89	4.44	4.33	4.23	4.50	4.73	4.80	4.97	5.10	5.08	5.56			13.00	14.03	15.15
	velocity		7.89	7.88	8.08	8.27	7.78	7.40	7.29	7.04	6.86	6.89	7.19	7.37		8.08	7.48	6.93
Little, Shamier (USA) (1995)	time		6.17	10.33	14.50	18.70	23.13	27.73	32.46	37.37	42.63	48.13		54.40	4 / 2			
	reaction time	0.215																
	interval		7.29	4.16	4.17	4.20	4.43	4.60	4.73	4.91	5.26	5.50	6.27			12.53	13.76	15.67
	velocity		8.41	8.39	8.33	7.90	7.61	7.40	7.13	6.65	6.36	6.38	7.35			8.38	7.63	6.70
Ryzhykova, Anna (UKR) (1989)	time		6.53	10.83	14.96	19.23	23.73	28.54	33.43	38.46	43.53	48.73		54.70	7 / 3			
	reaction time	0.186																
	interval		6.89	4.30	4.13	4.27	4.50	4.81	4.89	5.03	5.07	5.20	5.97			12.70	14.20	15.30
	velocity		8.14	8.47	8.20	7.78	7.28	7.16	6.96	6.90	6.73	6.73	6.70	7.31		8.27	7.39	6.86
Jíchová, Nikoleta (CZE) (2000)	time		6.43	10.83	15.13	19.50	24.16		33.93	39.03	44.16	49.36		55.10	3 / 4			
	reaction time	0.206							9.77	5.10	5.13	5.20	5.74			13.07	14.43	15.43
	interval		7.00	7.95	8.14	8.01	7.51		7.16	6.86	6.82	6.73	6.97	7.26		8.03	7.28	6.80
	velocity		22	15	15	15	15		16	17	17	17	21	153				
Ennadi, Noura (MAR) (1999)	time		6.67	11.16	15.50	19.77	24.36		34.03	39.03	44.10	49.26		55.21	2 / 5			
	reaction time	0.178							9.67	5.00	5.07	5.16	5.95			13.10	14.26	15.23
	interval		6.75	7.80	8.06	8.20	7.63		7.24	7.00	6.90	6.78	6.72	7.25		8.02	7.36	6.89
	velocity		24		15	15	15		17	17	17	17	20	140				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JAqk2zgQPzA>

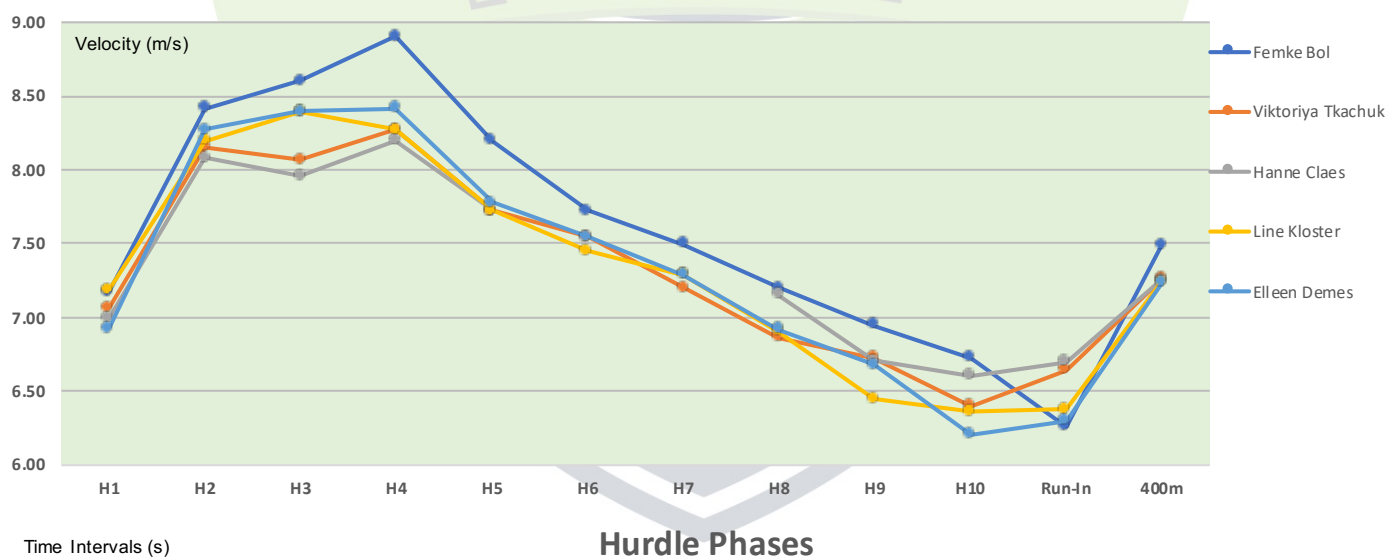
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

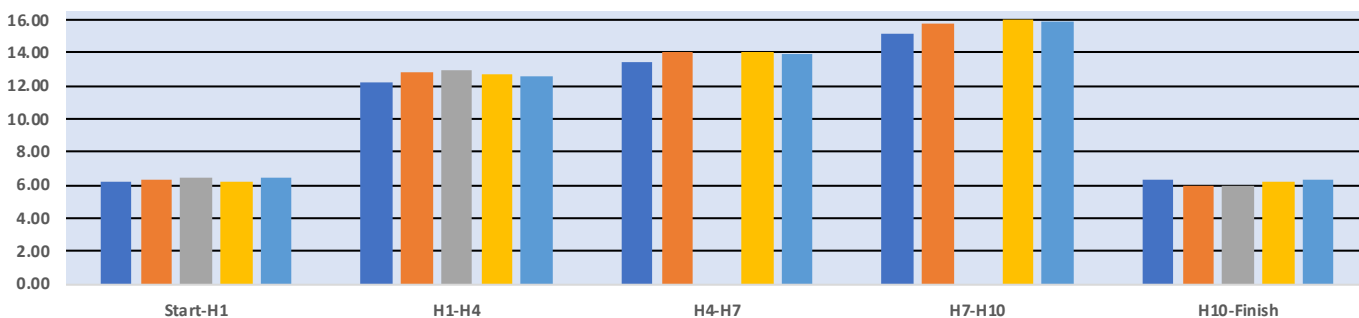
Heat 4

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.27	10.43	14.50	18.43	22.70	27.23	31.90	36.76	41.80	47.00		53.39	4 / 1			
	reaction time	0.206														12.16	13.47	15.10
	interval		7.18	4.16	4.07	3.93	4.27	4.53	4.67	4.86	5.04	5.20	6.39			8.63	7.80	6.95
	velocity																	
	H1 lead leg	L	22	14	14	14	14	15	15	15	15	15	18.5	171.5				
Tkachuk, Viktoriya (UKR) (1994)	time		6.37	10.66	15.00	19.23	23.76	28.40	33.26	38.36	43.56	49.03		55.05	6 / 2			
	reaction time	0.201														12.86	14.03	15.77
	interval		7.06	4.29	4.34	4.23	4.53	4.64	4.86	5.10	5.20	5.47	6.02			8.16	7.48	6.66
	velocity																	
	H1 lead leg	L	22	15	15	15	15	15	16	16	16	17	20	182				
Claes, Hanne (BEL) (1991)	time		6.43	10.76	15.16	19.43	23.96			38.64	43.86	49.16		55.13	1 / 3			
	reaction time	0.193								14.68	5.22	5.30	5.97			13.00		
	interval		7.00	4.33	4.40	4.27	4.53			7.15	6.70	6.60	6.70	7.26		8.08		
	velocity																	
	H1 lead leg	R	23	8.08	7.95	8.20	7.73	15			17	17	20.5	137.5				
Kloster, Line (NOR) (1990)	time		6.26	10.53	14.70	18.93	23.46	28.16	32.96	38.03	43.46	48.96		55.23	9 / 4			
	reaction time	0.170								5.07	5.43	5.50	6.27			12.67	14.03	16.00
	interval		7.19	4.27	4.17	4.23	4.53	4.70	4.80	5.06	5.24	5.64	6.35			8.29	7.48	6.56
	velocity																	
	H1 lead leg	R	22	14	14	15	15	15	15	16	16	16	19.5	176.5				
Demes, Eileen (GER) (1997)	time		6.50	10.73	14.90	19.06	23.56	28.20	33.00	38.06	43.30	48.94		55.29	5 / 5			
	reaction time	0.169								5.24	5.64	6.35	PB			12.56	13.94	15.94
	interval		6.92	8.27	8.39	8.41	7.78	7.54	7.29	6.92	6.68	6.21	6.30	7.23		8.36	7.53	6.59
	velocity																	
	H1 lead leg	R	22	14	14	14	15	15	15	16	16	17	20	178				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JAqk2zgQPzA>

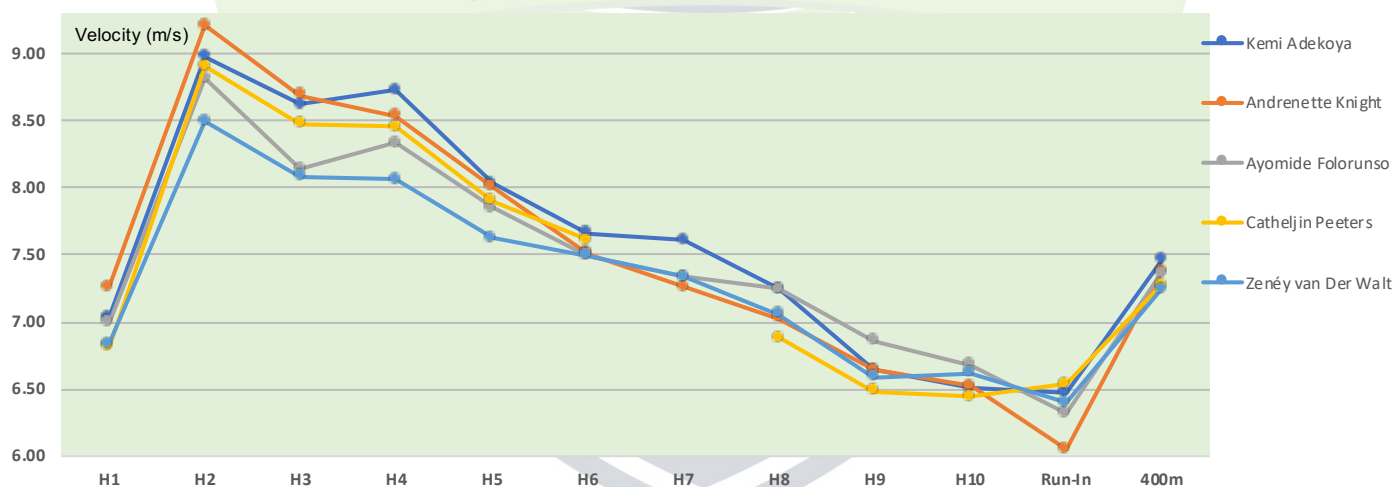
2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

Women's 400m Hurdles

Date 2023.08.21

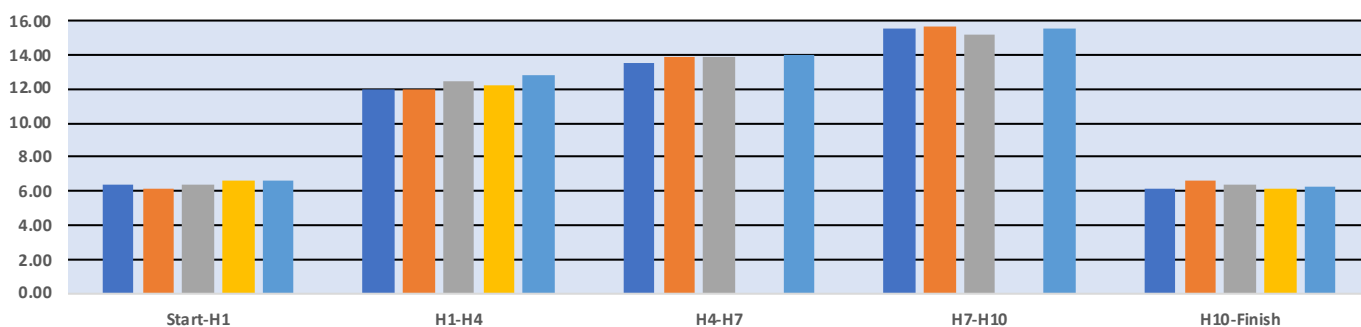
Heat 3

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Adekoya, Kemi (BRN) (1993)	time		6.40	10.30	14.36	18.37	22.73	27.30	31.90	36.73	42.00	47.38		53.56	8 / 1			
	reaction time	0.191																
	interval		7.03	3.90	4.06	4.01	4.36	4.57	4.60	4.83	5.27	5.38	6.18	AR		11.97	13.53	15.48
	velocity		8.97	8.62	8.73	8.03	7.66	7.61	7.25	6.64	6.51	6.47	7.47			8.77	7.76	6.78
Knight, Andrenette (JAM) (1996)	time		6.20	10.00	14.03	18.13	22.50	27.16	31.98	36.96	42.23	47.60		54.21	5 / 2			
	reaction time	0.165																
	interval		7.26	3.80	4.03	4.10	4.37	4.66	4.82	4.98	5.27	5.37	6.61			11.93	13.85	15.62
	velocity		9.21	8.68	8.54	8.01	7.51	7.26	7.03	6.64	6.52	6.05	7.38			8.80	7.58	6.72
Folorunso, Ayomide (ITA) (1996)	time		6.43	10.40	14.70	18.90	23.36	28.03	32.80	37.63	42.73	47.97		54.30	9 / 3			
	reaction time	0.189																
	interval		7.00	3.97	4.30	4.20	4.46	4.67	4.77	4.83	5.10	5.24	6.33			12.47	13.90	15.17
	velocity		8.82	8.14	8.33	7.85	7.49	7.34	7.25	6.86	6.68	6.32	7.37			8.42	7.55	6.92
Peeters, Cathelijn (NED) (1996)	time		6.60	10.53	14.66	18.80	23.23	27.83		38.00	43.40	48.83		54.95	2 / 4			
	reaction time	0.247								10.17	5.40	5.43	6.12			12.20		
	interval		6.82	3.93	4.13	4.14	4.43	4.60		6.88	6.48	6.45	6.54	7.28		8.61		
	velocity		8.91	8.47	8.45	7.90	7.61		6.88	6.48	6.45	6.54	7.28					
van Der Walt, Zenéy (RSA) (2000)	time		6.58	10.70	15.03	19.37	23.96	28.63	33.40	38.36	43.67	48.96		55.21	7 / 5			
	reaction time	0.203																
	interval		4.12	4.33	4.34	4.59	4.67	4.77	4.96	5.31	5.29	6.25				12.79	14.03	15.56
	velocity		8.84	8.50	8.08	8.06	7.63	7.49	7.34	7.06	6.59	6.62	6.40	7.25		8.21	7.48	6.75
	H1 lead leg	R	23	15	15	15	15	15	15	16	17	17	19.5	182.5				
	H1 lead leg	R	23	15	15	15	15	16	16	16	17	16	20	184				
	H1 lead leg	L	23	15	15	15	16	16	16	16	16	17	20.2	185.2				
	H1 lead leg	R	22	15	15	15	155		16	17	17	19.7	291.7					
	H1 lead leg	L	23	15	15	15	15	15	15	16	16	16	19.2	180.2				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=JAqk2zgQPzA>

2023 World Athletics Championships (Budapest, HUN) (TV Analysis)

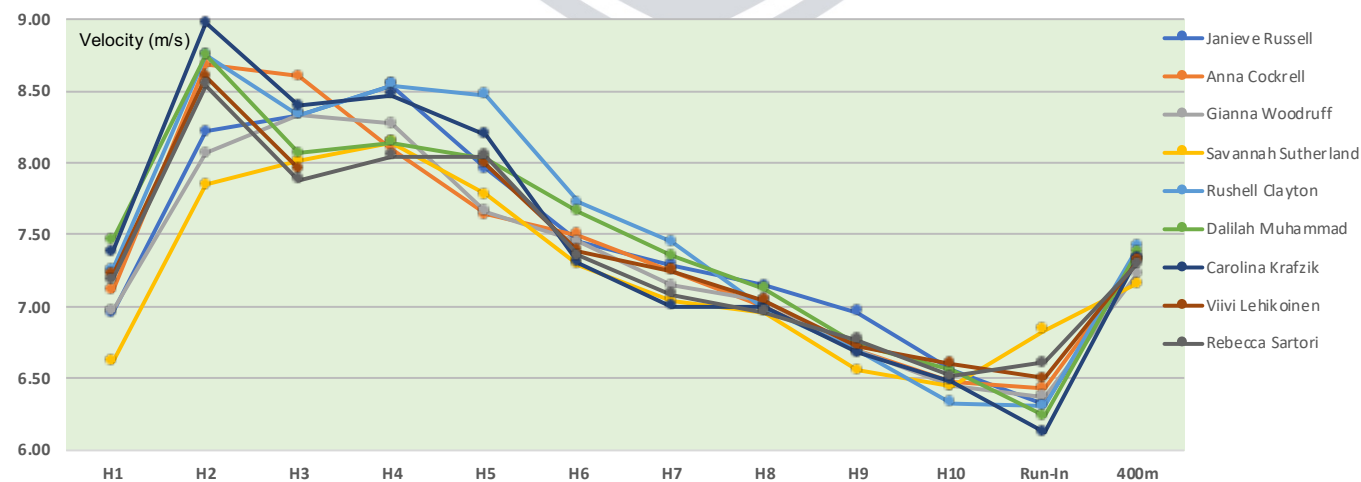
Women's 400m Hurdles

Date 2023.08.21

															Heat 2			
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Russell, Janieve (JAM) (1993)	time		6.47	10.73	14.93	19.03	23.43	28.13	32.93	37.83	42.86	48.20		54.53	4 / 1			
	reaction time	0.164																
	interval			4.26	4.20	4.10	4.40	4.70	4.80	4.90	5.03	5.34	6.33			12.56	13.90	15.27
	velocity		6.96	8.22	8.33	8.54	7.95	7.45	7.29	7.14	6.96	6.55	6.32	7.34		8.36	7.55	6.88
Cockrell, Anna (USA) (1997)	time		6.33	10.36	14.43	18.75	23.33	28.00	32.83	37.83	43.06	48.46		54.68	9 / 2			
	reaction time	0.211																
	interval			4.03	4.07	4.32	4.58	4.67	4.83	5.00	5.23	5.40	6.22			12.42	14.08	15.63
	velocity		7.11	8.68	8.60	8.10	7.64	7.49	7.25	7.00	6.69	6.48	6.43	7.32		8.45	7.46	6.72
Woodruff, Gianna (PAN) (1993)	time		6.46	10.80	15.00	19.23	23.80	28.50	33.40	38.37	43.60	49.03		55.31	2 / 3			
	reaction time	0.171																
	interval			4.34	4.20	4.23	4.57	4.70	4.90	4.97	5.23	5.43	6.28			12.77	14.17	15.63
	velocity		6.97	8.06	8.33	8.27	7.66	7.45	7.14	7.04	6.69	6.45	6.37	7.23		8.22	7.41	6.72
Sutherland, Savannah (CAN) (2003)	time		6.80	11.26	15.63	19.93	24.43	29.23	34.20	39.23	44.57	50.00		55.85	5 / 4			
	reaction time	0.227																
	interval			4.46	4.37	4.30	4.50	4.80	4.97	5.03	5.34	5.43	5.85			13.13	14.27	15.80
	velocity		6.62	7.85	8.01	8.14	7.78	7.29	7.04	6.96	6.55	6.45	6.16	7.16		8.00	7.36	6.65

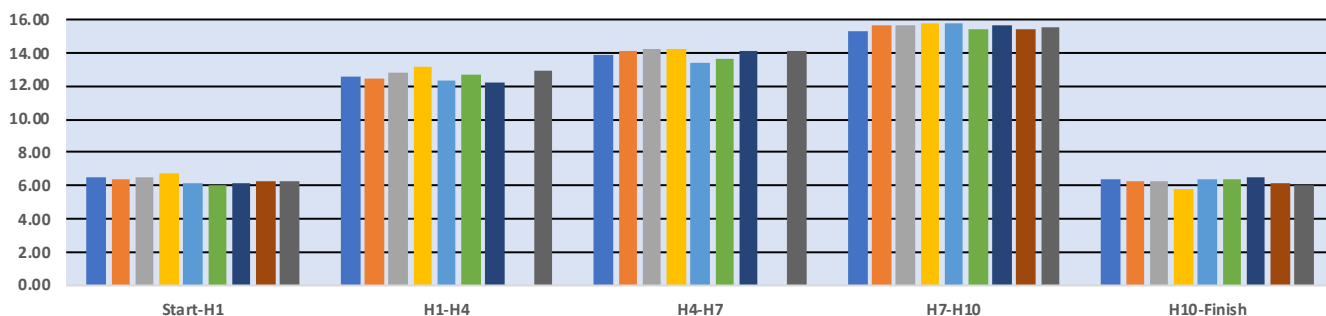
Date 2023.08.21

															Heat 1			
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clayton, Rushell (JAM) (1992)	time		6.20	10.20	14.40	18.50	22.63	27.16	31.86	36.87	42.10	47.63		53.97	3 / 1			
	reaction time	0.156																
	interval			4.00	4.20	4.10	4.13	4.53	4.70	5.01	5.23	5.53	6.34			12.30	13.36	15.77
	velocity		7.26	8.75	8.33	8.54	8.47	7.73	7.45	6.99	6.69	6.33	6.31	7.41		8.54	7.86	6.66
Muhammad, Dalilah (USA) (1990)	time		6.03	10.03	14.37	18.67	23.03	27.60	32.36	37.27	42.46	47.80		54.21	5 / 2			
	reaction time	0.156																
	interval			4.00	4.34	4.30	4.36	4.57	4.76	4.91	5.19	5.34	6.41			12.64	13.69	15.44
	velocity		7.46	8.75	8.06	8.14	8.03	7.66	7.35	7.13	6.74	6.55	6.24	7.38		8.31	7.67	6.80
Krafzik, Carolina (GER) (1995)	time		6.10	10.00	14.17	18.30	22.57	27.36	32.36	37.36	42.60	48.00		54.53	8 / 3			
	reaction time	0.190																
	interval			3.90	4.17	4.13	4.27	4.79	5.00	5.00	5.24	5.40	6.53			12.20	14.06	15.64
	velocity		7.38	8.97	8.39	8.47	8.20	7.31	7.00	7.00	6.68	6.48	6.13	7.34		8.61	7.47	6.71
Lehikoinen, Viivi (FIN) (1999)	time		6.23	10.30	14.70		23.46	28.20	33.03	38.00	43.20	48.50		54.65	2 / 4			
	reaction time	0.181																
	interval			4.07	4.40		8.76	4.74	4.83	4.97	5.20	5.30	6.15					15.47
	velocity		7.22	8.60	7.95		7.99	7.38	7.25	7.04	6.73	6.60	6.50	7.32				6.79
Sartori, Rebecca (ITA) (1997)	time		6.26	10.36	14.80	19.15	23.50	28.26	33.20	38.23	43.40	48.77		54.82	4 / 5			
	reaction time	0.203																
	interval			4.10	4.44	4.35	4.35	4.76	4.94	5.03	5.17	5.37	6.05	PB		12.89	14.05	15.57
	velocity		7.19	8.54	7.88	8.05	8.05	7.35	7.09	6.96	6.77	6.52	6.61	7.30		8.15	7.47	6.74



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: Gun Flash
 Source: <https://www.youtube.com/watch?v=JAqk2zgQPzA>

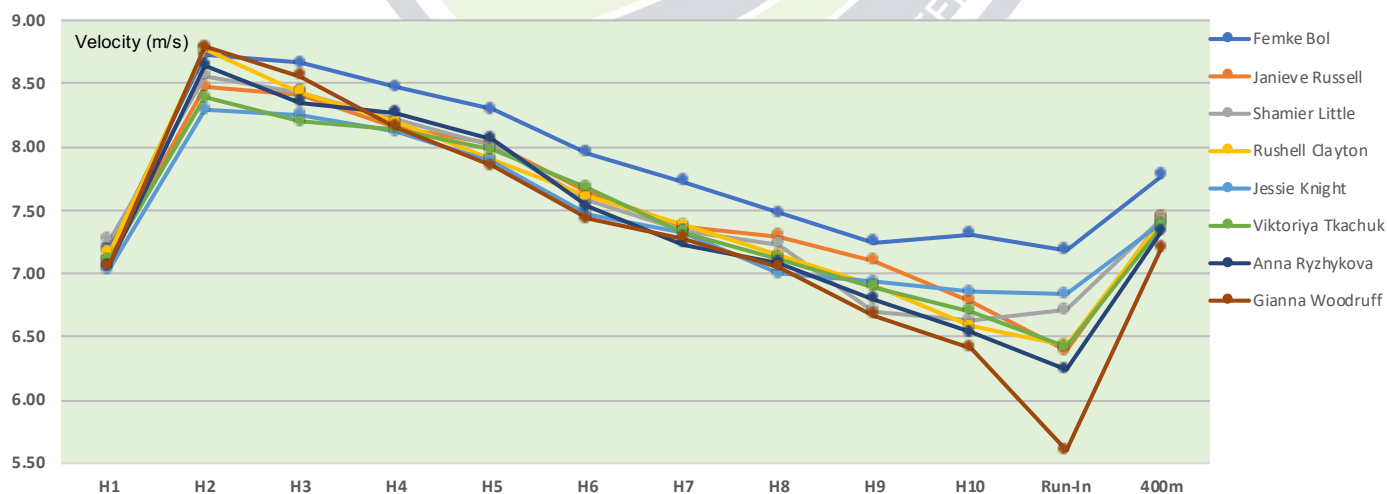
2023 London Athletics Meet (London, GBR)

Women's 400m Hurdles

Date 2023.07.23

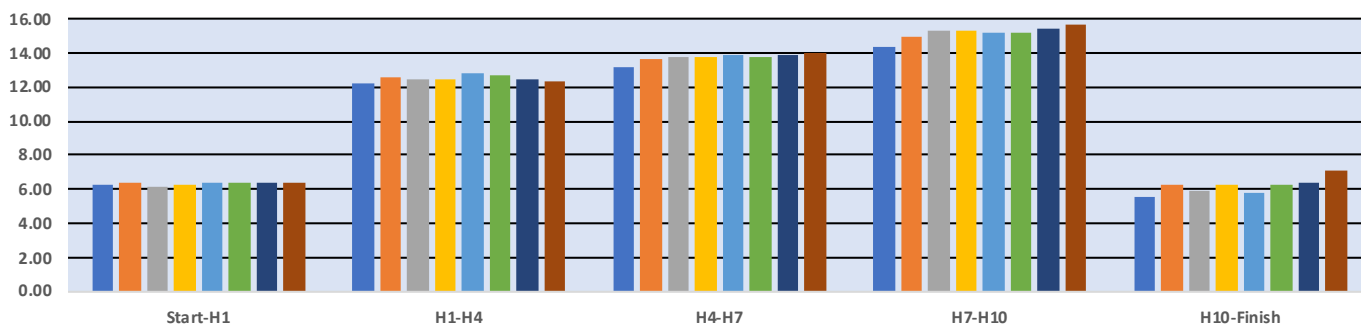
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.25	10.26	14.30	18.43	22.65	27.05	31.58	36.26	41.09	45.88		51.45	6 / 1			
	reaction time	0.187																
	interval velocity		7.20	8.01	8.66	8.43	8.22	8.40	8.53	8.68	8.83	8.79	5.57	AR PB		12.18	13.15	14.30
Russell, Janieve (JAM) (1993)	time		6.33	10.46	14.62	18.91	23.27	27.85	32.60	37.40	42.33	47.49		53.75	5 / 2			
	reaction time	0.148																
	interval velocity		7.11	8.47	8.41	8.16	8.03	7.64	7.37	7.29	7.10	6.78	6.39	7.44		12.58	13.69	14.89
Little, Shamier (USA) (1995)	time		6.20	10.29	14.44	18.70	23.07	27.69	32.46	37.30	42.52	47.80		53.76	4 / 3			
	reaction time	0.174																
	interval velocity		7.26	8.56	8.43	8.22	8.01	7.58	7.34	7.23	6.70	6.63	6.71	7.44		12.50	13.76	15.34
Clayton, Rushell (JAM) (1992)	time		6.28	10.27	14.42	18.69	23.12	27.72	32.46	37.36	42.43	47.75		53.97	3 / 4			
	reaction time	0.131																
	interval velocity		7.17	8.77	8.43	8.20	7.90	7.61	7.38	7.14	6.90	6.58	6.43	7.41		12.41	13.77	15.29
Knight, Jessie (GBR) (1994)	time		6.40	10.62	14.86	19.17	23.61	28.30	33.08	38.08	43.13	48.24		54.09	7 / 5			
	reaction time	0.182																
	interval velocity		7.03	8.29	8.25	8.12	7.88	7.46	7.32	7.00	6.93	6.85	6.84	7.40		12.77	13.91	15.16
Tkachuk, Viktoriya (UKR) (1994)	time		6.33	10.50	14.77	19.07	23.46	28.02	32.80	37.72	42.80	48.02		54.25	2 / 6			
	reaction time	0.152																
	interval velocity		7.11	8.39	8.20	8.14	7.97	7.68	7.32	7.11	6.89	6.70	6.42	7.37		12.74	13.73	15.22
Ryzhykova, Anna (UKR) (1989)	time		6.37	10.42	14.61	18.84	23.18	27.83	32.67	37.61	42.76	48.12		54.53	1 / 7			
	reaction time	0.166																
	interval velocity		7.06	8.64	8.35	8.27	8.06	7.53	7.23	7.09	6.80	6.53	6.24	7.34		12.47	13.83	15.45
Woodruff, Gianna (PAN) (1993)	time		6.37	10.35	14.44	18.73	23.19	27.90	32.71	37.67	42.92	48.38		55.52	8 / 8			
	reaction time	0.201																
	interval velocity		7.06	8.79	8.56	8.16	7.85	7.43	7.28	7.06	6.67	6.41	5.60	7.20		12.36	13.98	15.67



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 23 Jul 2023 14:08) - diamond league race analysis

<https://www.omegatiming.com/File/0002030C0101070101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=LkXU5aPIE5A>

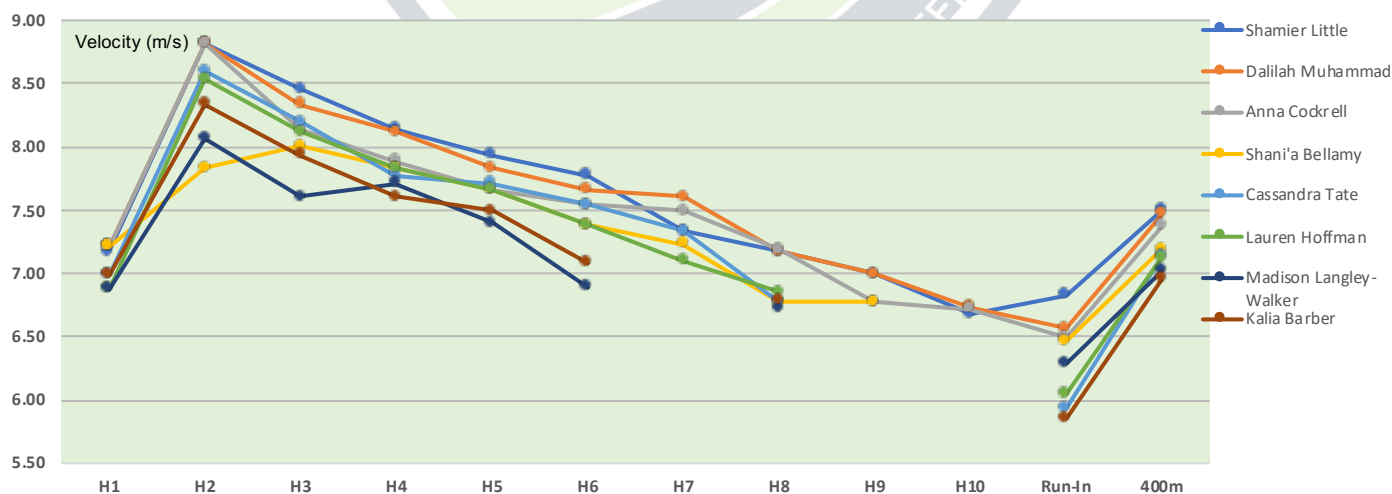
2023 USATF National Championships (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2023.07.09

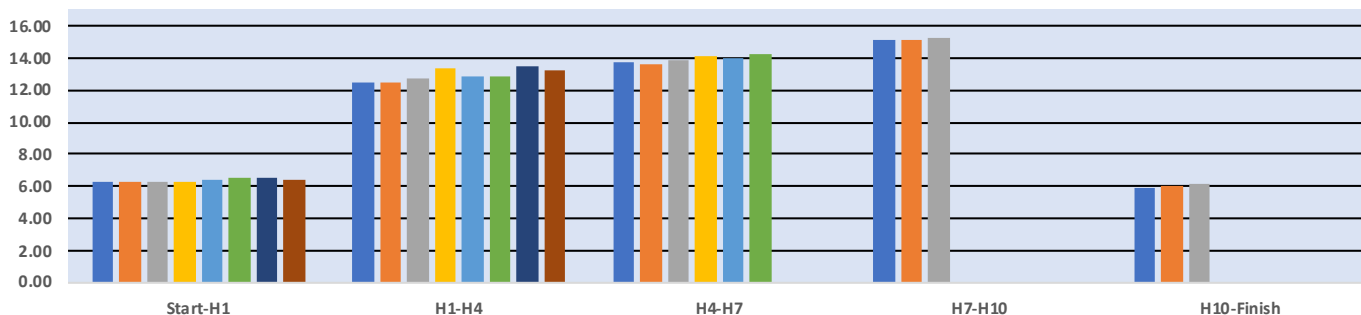
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time		6.27	10.24	14.38	18.68	23.09	27.59	32.36	37.24	42.24	47.48		53.34	5 / 1			
	reaction time																	
	interval			3.97	4.14	4.30	4.41	4.50	4.77	4.88	5.00	5.24	5.86			12.41	13.68	15.12
	velocity		7.18	8.82	8.45	8.14	7.94	7.78	7.34	7.17	7.00	6.68	6.83	7.50		8.46	7.68	6.94
Muhammad, Dalilah (USA) (1990)	H1 lead leg	R																
	strides		23	15	15	15	15	15	16	16	16	16	20.2	182.2				
	time		6.24	10.21	14.41	18.72	23.19	27.76	32.36	37.24	42.24	47.44		53.53	4 / 2			
	reaction time																	
Cockrell, Anna (USA) (1997)	interval			3.97	4.20	4.31	4.47	4.57	4.60	4.88	5.00	5.20	6.09			12.48	13.64	15.08
	velocity		7.21	8.82	8.33	8.12	7.83	7.66	7.61	7.17	7.00	6.73	6.57	7.47		8.41	7.70	6.96
	H1 lead leg	R																
	strides		22	15	15	15	15	15	15	15	16	16	19.5	178.5				
Bellamy, Shani'a (USA) (2002)	time		6.24	10.21	14.51	18.95	23.52	28.16	32.83	37.70	42.87	48.08		54.24	6 / 3			
	reaction time																	
	interval			3.97	4.30	4.44	4.57	4.64	4.67	4.87	5.17	5.21	6.16			12.71	13.88	15.25
	velocity		7.21	8.82	8.14	7.88	7.66	7.54	7.49	7.19	6.77	6.72	6.49	7.37		8.26	7.56	6.89
Tate, Cassandra (USA) (1990)	H1 lead leg	R																
	strides		22	14	14	14	14	15	15	15	16	16	20	175				
Hoffman, Lauren (USA) (1999)	time		6.24	10.71	15.08	19.55	24.12	28.86	33.70	38.87	44.04			55.64	3 / 4			
	reaction time																	
	interval			4.47	4.37	4.47	4.57	4.74	4.84	5.17	5.17		11.60			13.31	14.15	
	velocity		7.21	7.83	8.01	7.83	7.66	7.38	7.23	6.77	6.77		6.47	7.19		7.89	7.42	
Langley-Walker, Madison (USA) (1993)	H1 lead leg	L																
	strides		23	15	15	15	15	15	15	16	16		114					
Barber, Kaila (USA) (1993)	time		6.44	10.51	14.78	19.28	23.82	28.46	33.23	38.40				56.09	7 / 5			
	reaction time																	
	interval			4.07	4.27	4.50	4.54	4.64	4.77	5.17			17.69			12.84	13.95	
	velocity		6.99	8.60	8.20	7.78	7.71	7.54	7.34	6.77			5.94	7.13		8.18	7.53	
Hoffman, Lauren (USA) (1999)	H1 lead leg	R																
	strides		22	14	14	15	15	15	15	15			125					
Langley-Walker, Madison (USA) (1993)	time		6.54	10.64	14.95	19.42	23.99	28.73	33.66	38.77				56.13	8 / 6			
	reaction time																	
	interval			4.10	4.31	4.47	4.57	4.74	4.93	5.11			17.36			12.88	14.24	
	velocity		6.88	8.54	8.12	7.83	7.66	7.38	7.10	6.85			6.05	7.13		8.15	7.37	
Barber, Kaila (USA) (1993)	H1 lead leg	L																
	strides		23	15	15	16	16	16	18	18			137					
Langley-Walker, Madison (USA) (1993)	time		6.54	10.88	15.48	20.02	24.75	29.83		40.24				56.94	2 / 7			
	reaction time																	
	interval			4.34	4.60	4.54	4.73	5.08		10.41			16.70			13.48		
	velocity		6.88	8.06	7.61	7.71	7.40	6.89		6.72			6.29	7.02		7.79		
Barber, Kaila (USA) (1993)	H1 lead leg	R																
	strides		24	16	17	16	16						89					
Barber, Kaila (USA) (1993)	time		6.44	10.64	15.05	19.65	24.32	29.26		39.57				57.51	1 / 8			
	reaction time																	
	interval			4.20	4.41	4.60	4.67	4.94		10.31			17.94			13.21		
	velocity		6.99	8.33	7.94	7.61	7.49	7.09		6.79			5.85	6.96		7.95		
Barber, Kaila (USA) (1993)	H1 lead leg	R																
	strides		23	15	15	15	15				17		100					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=QdxnFlek1vE>

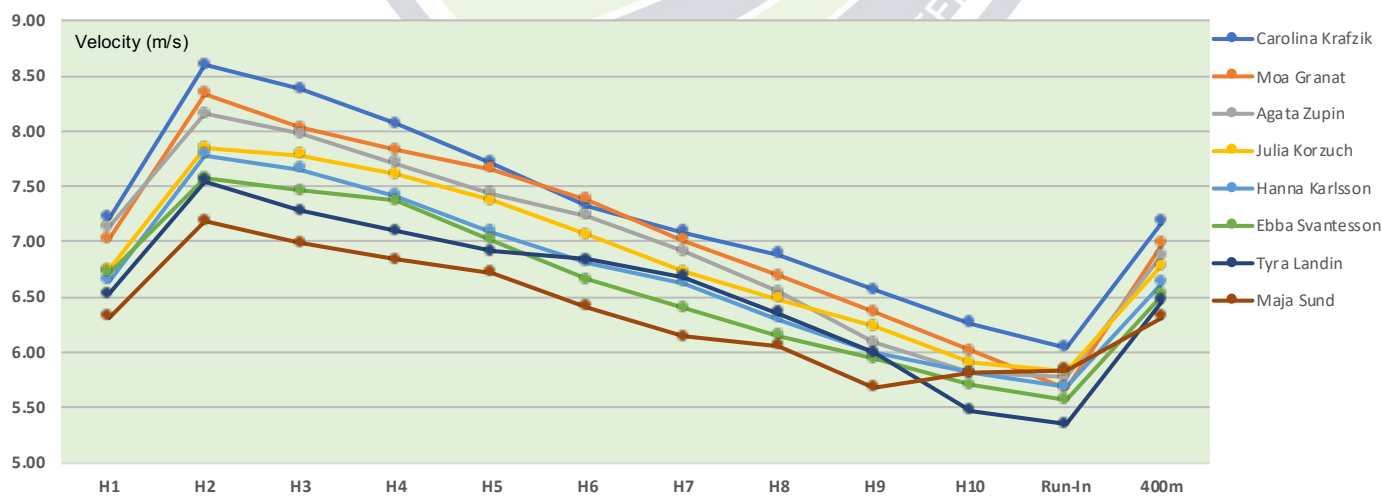
2023 Bauhaus Galan (Stockholm, SWE)

Women's 400m Hurdles

Date 2023.07.02

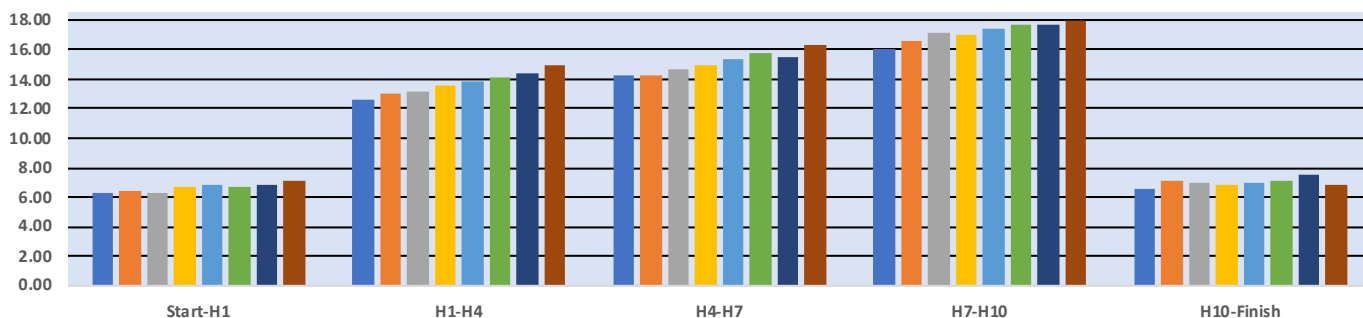
National FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Krafzik, Carolina (GER) (1995)	time		6.24	10.31	14.49	18.83	23.37	28.15	33.09	38.17	43.50	49.09		55.71	5 / 1			
	reaction time	0.178																
	interval		7.21	8.60	8.37	8.06	7.71	7.32	7.09	6.89	6.57	6.26	6.04			12.59	14.26	16.00
	velocity													7.18		8.34	7.36	6.56
Granat, Moa (SWE) (2004)	time		6.41	10.61	14.97	19.44	24.01	28.75	33.74	38.97	44.47	50.29		57.34	4 / 2			
	reaction time	0.144																
	interval		7.02	8.33	8.03	7.83	7.66	7.38	7.01	6.69	6.36	6.01	5.67			13.03	14.30	16.55
	velocity													6.98		8.06	7.34	6.34
Zupin, Agata (SLO) (1998)	time		6.31	10.60	14.99	19.53	24.24	29.08	34.14	39.49	45.24	51.26		58.18	7 / 3			
	reaction time	0.164																
	interval		7.13	8.16	7.97	7.71	7.43	7.23	6.92	6.54	6.09	5.81	5.78			13.22	14.61	17.12
	velocity													6.88		7.94	7.19	6.13
Korzuch, Julia (POL) (1995)	time		6.67	11.13	15.63	20.23	24.98	29.94	35.14	40.54	46.15	52.08		58.94	3 / 4			
	reaction time	0.138																
	interval		6.75	7.85	7.78	7.61	7.37	7.06	6.73	6.48	6.24	5.90	5.83			13.56	14.91	16.94
	velocity													6.79		7.74	7.04	6.20
Karlsson, Hanna (SWE) (2003)	time		6.77	11.27	15.84	20.56	25.50	30.64	35.92	41.48	47.32	53.34		60.37	6 / 5			
	reaction time	0.163																
	interval		6.65	7.78	7.66	7.42	7.09	6.81	6.63	6.29	5.99	5.81	5.69			13.79	15.36	17.42
	velocity													6.63		7.61	6.84	6.03
Svantesson, Ebba (SWE) (1997)	time		6.70	11.32	16.01	20.76	25.75	31.01	36.48	42.17	48.06	54.20		61.38	2 / 6			
	reaction time	0.176																
	interval		6.72	7.58	7.46	7.37	7.01	6.65	6.40	6.15	5.94	5.70	5.57			14.06	15.72	17.72
	velocity													6.52		7.47	6.68	5.93
Landin, Tyra (SWE) (2002)	time		6.89	11.53	16.34	21.27	26.33	31.45	36.69	42.20	48.04	54.43		61.90	8 / 7			
	reaction time	0.174																
	interval		6.53	7.54	7.28	7.10	6.92	6.84	6.68	6.35	5.99	5.48	5.35			14.38	15.42	17.74
	velocity													6.46		7.30	6.81	5.92
Sund, Maja (SWE) (2001)	time		7.12	11.99	17.00	22.12	27.33	32.79	38.49	44.26	50.42	56.44		63.29	1 / 8			
	reaction time	0.171																
	interval		6.32	7.19	6.99	6.84	6.72	6.41	6.14	6.07	5.68	5.81	5.84			15.00	16.37	17.95
	velocity													6.32		7.00	6.41	5.85



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 2 Jul 2023 17:07) - diamond league race analysis

<https://www.omegatiming.com/File/000203090101040101FFFFFFFFFFFF4D.pdf>

Video: No Video Found

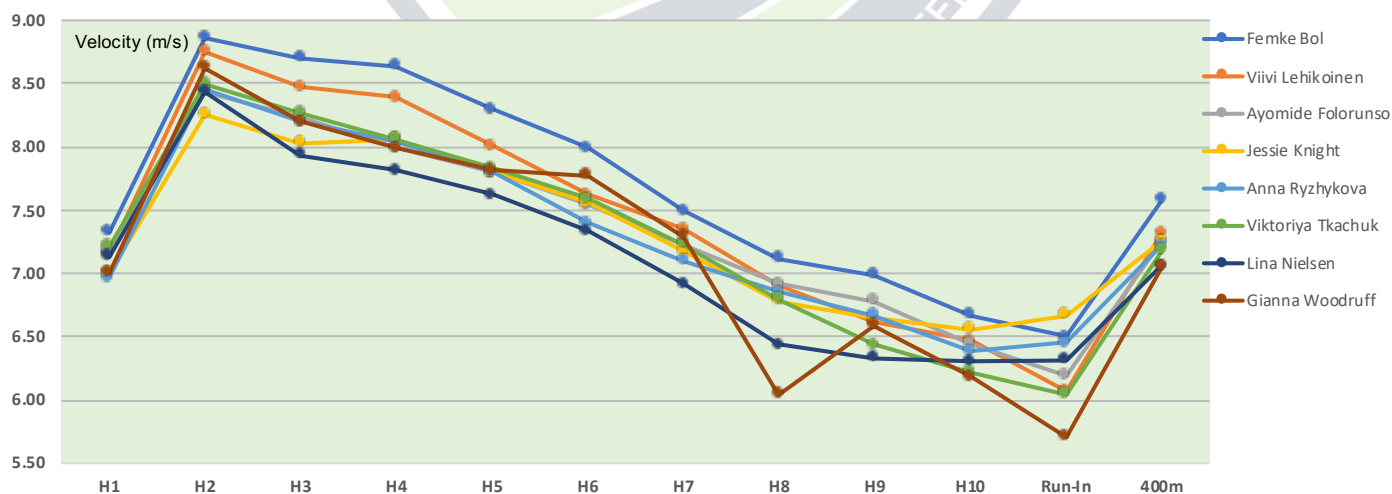
2023 Athletissima (Lausanne, SUI)

Women's 400m Hurdles

Date 2023.06.30

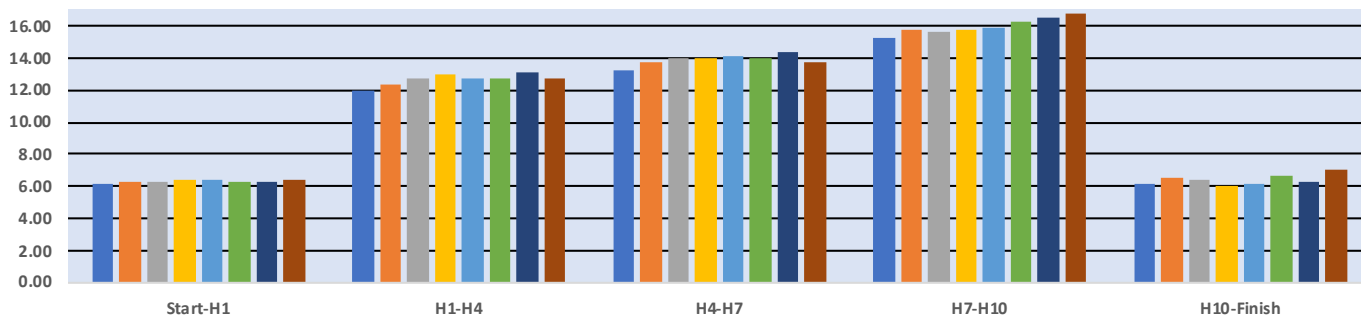
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.14	10.09	14.11	18.16	22.38	26.76	31.43	36.35	41.36	46.61		52.76	5 / 1			
	reaction time	0.169														12.02	13.27	15.18
	interval		7.33	3.95	4.02	4.05	4.22	4.38	4.67	4.92	5.01	5.25	6.15			8.74	7.91	6.92
	velocity																	
Lehikoinen, Viivi (FIN) (1999)	time		6.29	10.29	14.42	18.59	22.96	27.55	32.31	37.38	42.67	48.08		54.67	4 / 2			
	reaction time	0.208														12.30	13.72	15.77
	interval		7.15	4.00	4.13	4.17	4.37	4.59	4.76	5.07	5.29	5.41	6.59			8.54	7.65	6.66
	velocity																	
Folorunso, Ayomide (ITA) (1996)	time		6.26	10.41	14.66	19.04	23.53	28.17	33.01	38.07	43.23	48.66		55.12	8 / 3			
	reaction time	0.222														12.78	13.97	15.65
	interval		7.19	4.15	4.25	4.38	4.49	4.64	4.84	5.06	5.16	5.43	6.46			8.22	7.52	6.71
	velocity																	
Knight, Jessie (GBR) (1994)	time		6.42	10.66	15.02	19.36	23.85	28.48	33.36	38.52	43.79	49.13		55.13	3 / 4			
	reaction time	0.178														12.94	14.00	15.77
	interval		7.01	4.24	4.36	4.34	4.49	4.63	4.88	5.16	5.27	5.34	6.00			8.11	7.50	6.66
	velocity																	
Ryzhykova, Anna (UKR) (1989)	time		6.46	10.60	14.87	19.22	23.71	28.44	33.37	38.48	43.73	49.21		55.41	2 / 5			
	reaction time	0.175														12.76	14.15	15.84
	interval		6.97	4.14	4.27	4.35	4.49	4.73	4.93	5.11	5.25	5.48	6.20			8.23	7.42	6.63
	velocity																	
Tkachuk, Viktoriya (UKR) (1994)	time		6.24	10.36	14.59	18.93	23.40	28.01	32.85	38.00	43.44	49.07		55.69	7 / 6			
	reaction time	0.196														12.69	13.92	16.22
	interval		7.21	4.12	4.23	4.34	4.47	4.61	4.84	5.15	5.44	5.63	6.62			8.27	7.54	6.47
	velocity																	
Nielsen, Lina (GBR) (1996)	time		6.31	10.46	14.87	19.35	23.94	28.71	33.77	39.21	44.74	50.29		56.62	1 / 7			
	reaction time	0.141														13.04	14.42	16.52
	interval		7.13	4.15	4.41	4.48	4.59	4.77	5.06	5.44	5.53	5.55	6.33			8.05	7.28	6.36
	velocity																	
Woodruff, Gianna (PAN) (1993)	time		6.42	10.48	14.75	19.13	23.61	28.11	32.91	38.70	44.01	49.67		56.68	6 / 8			
	reaction time	0.227														12.71	13.78	16.76
	interval		7.01	4.06	4.27	4.38	4.48	4.50	4.80	5.79	5.31	5.66	7.01			8.26	7.62	6.26
	velocity																	
	time																	
	reaction time																	
	interval																	
	velocity																	



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 30 Jun 2023 21:36) - diamond league race analysis

<https://www.omegatiming.com/File/0002030801010D0101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=PIDYWraVBoQ>

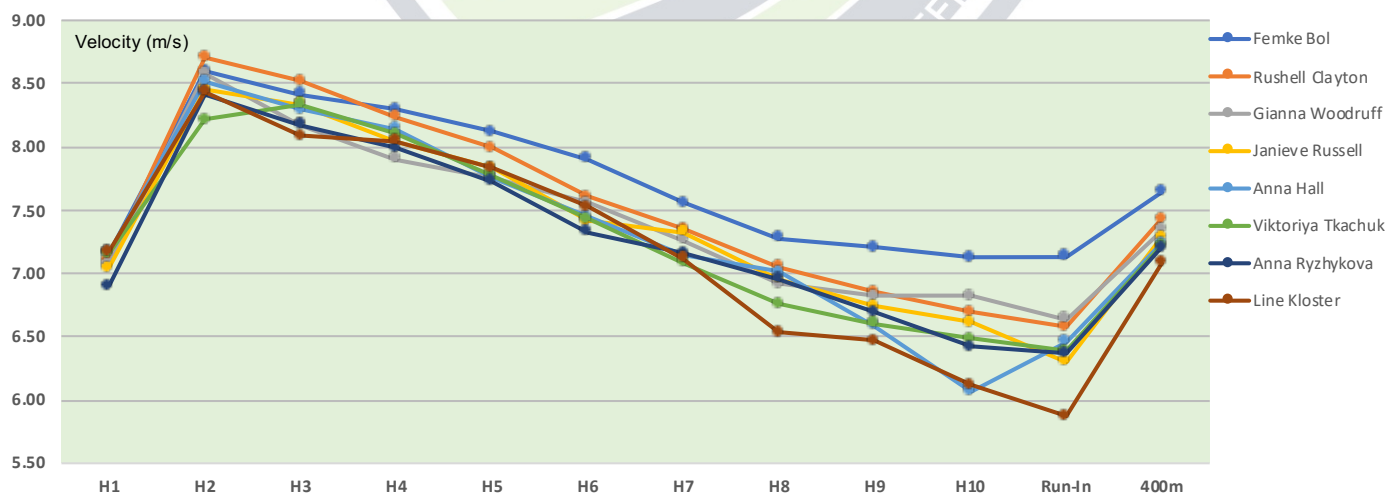
2023 Bislett Games (Oslo, NOR)

Women's 400m Hurdles

Date 2023.06.15

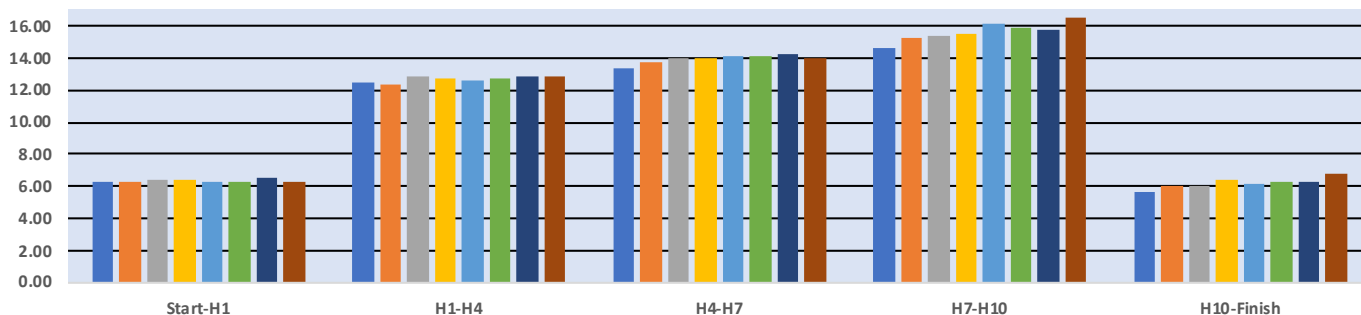
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time		6.29	10.36	14.52	18.74	23.05	27.48	32.11	36.92	41.78	46.69		52.30	5 / 1			
	reaction time	0.172														12.45	13.37	14.58
	interval		7.15	4.07	4.16	4.22	4.31	4.43	4.63	4.81	4.86	4.91	5.61			8.43	7.85	7.20
	velocity																	
	H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	18.5	169.5				
Clayton, Rushell (JAM) (1992)	time		6.34	10.36	14.47	18.72	23.10	27.70	32.46	37.42	42.53	47.76		53.84	6 / 2			
	reaction time	0.141														12.38	13.74	15.30
	interval		7.10	4.02	4.11	4.25	4.38	4.60	4.76	4.96	5.11	5.23	6.08			8.48	7.64	6.86
	velocity																	
	H1 lead leg	L	22	15	14	14	15	15	15	16	16	16	20	178				
Woodruff, Gianna (PAN) (1993)	time		6.36	10.44	14.72	19.15	23.66	28.29	33.11	38.17	43.30	48.43		54.46	4 / 3			
	reaction time	0.198														12.79	13.96	15.32
	interval		7.08	4.08	4.28	4.43	4.51	4.63	4.82	5.06	5.13	5.13	6.03			8.21	7.52	6.85
	velocity																	
	H1 lead leg	L	22	15	15	15	15	15	15	16	16	17	19	180				
Russell, Janieve (JAM) (1993)	time		6.39	10.53	14.73	19.08	23.55	28.27	33.05	38.08	43.27	48.56		54.91	3 / 4			
	reaction time	0.135														12.69	13.97	15.51
	interval		7.04	4.14	4.20	4.35	4.47	4.72	4.78	5.03	5.19	5.29	6.35			8.27	7.52	6.77
	velocity																	
	H1 lead leg	L	23	15	15	15	15	16	16	16	17	17	20	185				
Hall, Anna (USA) (2001)	time		6.28	10.39	14.61	18.91	23.42	28.12	33.02	38.01	43.32	49.09		55.28	8 / 5			
	reaction time	0.212														12.63	14.11	16.07
	interval		7.17	4.11	4.22	4.30	4.51	4.70	4.90	4.99	5.31	5.77	6.19			8.31	7.44	6.53
	velocity																	
	H1 lead leg	L	21	14	14	14	14	15	15	15	17		139					
Tkachuk, Viktoriya (UKR) (1994)	time		6.29	10.55	14.75	19.07	23.57	28.28	33.22	38.40	43.70	49.10		55.36	7 / 6			
	reaction time	0.171														12.78	14.15	15.88
	interval		7.15	4.26	4.20	4.32	4.50	4.71	4.94	5.18	5.30	5.40	6.26			8.22	7.42	6.61
	velocity																	
	H1 lead leg	L	24	15	15	15	15	15	16	16	17		148					
Ryzhykova, Anna (UKR) (1989)	time		6.52	10.68	14.96	19.34	23.87	28.65	33.54	38.57	43.80	49.25		55.53	1 / 7			
	reaction time	0.202														12.82	14.20	15.71
	interval		6.90	4.16	4.28	4.38	4.53	4.78	4.89	5.03	5.23	5.45	6.28			8.19	7.39	6.68
	velocity																	
	H1 lead leg	R	22	14	14	14	14	15	15	15	15	16		154				
Kloster, Line (NOR) (1990)	time		6.27	10.42	14.75	19.10	23.57	28.22	33.14	38.50	43.91	49.63		56.44	2 / 8			
	reaction time	0.150														12.83	14.04	16.49
	interval		7.18	4.15	4.33	4.35	4.47	4.65	4.92	5.36	5.41	5.72	6.81			8.18	7.48	6.37
	velocity																	
	H1 lead leg	R	22	15	15	15	15	15	16	16	17	17		163				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 15 Jun 2023 20:09) - diamond league race analysis

<https://www.omegatiming.com/File/000203070102090101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=j1ZzTEHvPs>

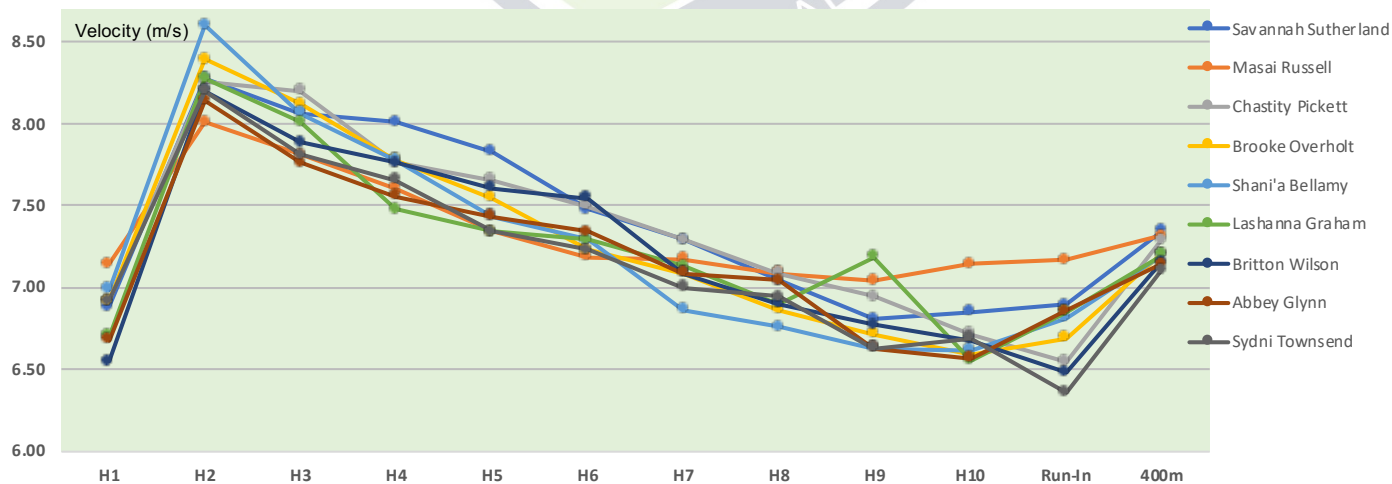
2023 NCAA Championships (Austin, TX) (TV Analysis)

Women's 400m Hurdles

Date 2023.06.10

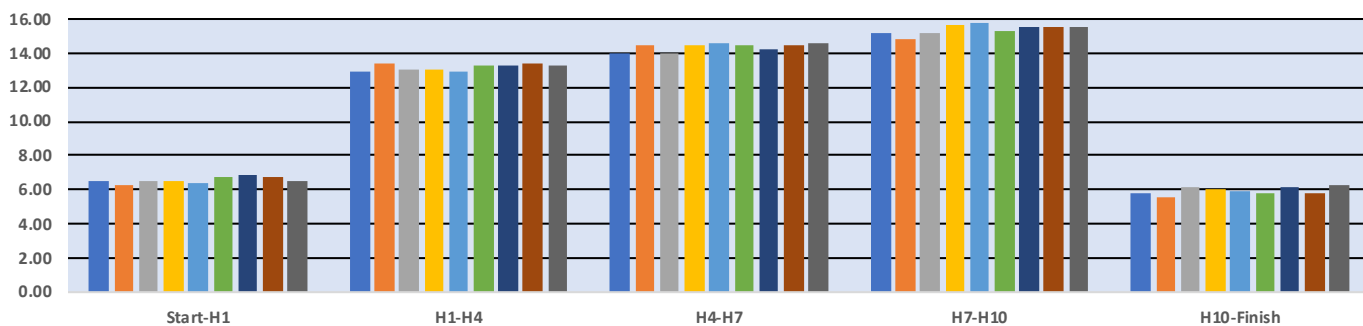
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Sutherland, Savannah (CAN) (2003)	time		6.54	10.77	15.11	19.48	23.95	28.63	33.43	38.40	43.54	48.65		54.45	7 / 1			
	reaction time																	
	interval			4.23	4.34	4.37	4.47	4.68	4.80	4.97	5.14	5.11	5.80	PB		12.94	13.95	15.22
	velocity		6.88	8.27	8.06	8.01	7.83	7.48	7.29	7.04	6.81	6.85	6.90	7.35		8.11	7.53	6.90
Russell, Masai (USA) (2000)	H1 lead leg	R	23	15	15	15	15	15	16	16	16	16	20	182				
	time		6.30	10.67	15.15	19.75	24.52	29.39	34.27	39.21	44.18	49.08		54.66	5 / 2			
	reaction time																	
	interval			4.37	4.48	4.60	4.77	4.87	4.88	4.94	4.97	4.90	5.58	PB		13.45	14.52	14.81
Pickett, Chastity (USA) (2001)	velocity		7.14	8.01	7.81	7.61	7.34	7.19	7.17	7.09	7.04	7.14	7.17	7.32		7.81	7.23	7.09
	H1 lead leg	R	24	16	16	16	16	16	16	17	17	17	21	192				
	time		6.50	10.74	15.01	19.52	24.09	28.76	33.56	38.50	43.54	48.75		54.86	8 / 3			
	reaction time																	
Overholt, Brooke (CAN) (2000)	interval			4.24	4.27	4.51	4.57	4.67	4.80	4.94	5.04	5.21	6.11	PB		13.02	14.04	15.19
	velocity		6.92	8.25	8.20	7.76	7.66	7.49	7.29	7.09	6.94	6.72	6.55	7.29		8.06	7.48	6.91
	H1 lead leg	L	22	14	14	14	14	15	15	15	15	15	18.2	171.2				
	strides																	
Bellamy, Shani'a (USA) (2002)	time		6.50	10.67	14.98	19.48	24.12	28.96	33.90	39.00	44.21	49.52		55.50	4 / 4			
	reaction time																	
	interval			4.17	4.31	4.50	4.64	4.84	4.94	5.10	5.21	5.31	5.98	PB		12.98	14.42	15.62
	velocity		6.92	8.39	8.12	7.78	7.54	7.23	7.09	6.86	6.72	6.59	6.69	7.21		8.09	7.28	6.72
Graham, Lashanna (JAM) (2000)	H1 lead leg	L	24	15	15	15	15	16	16	17	17	17	20	187				
	time		6.44	10.51	14.85	19.35	24.06	28.86	33.96	39.14	44.42	49.71		55.58	1 / 5			
	reaction time																	
	interval			4.07	4.34	4.50	4.71	4.80	5.10	5.18	5.28	5.29	5.87	PB		12.91	14.61	15.75
Wilson, Britton (USA) (2000)	velocity		6.99	8.60	8.06	7.78	7.43	7.29	6.86	6.76	6.63	6.62	6.81	7.20		8.13	7.19	6.67
	H1 lead leg	R	22	14	15	15	15	15	16	16	16	16	18.5	178.5				
	time		6.71	10.94	15.31	19.99	24.76	29.56	34.47	39.54	44.41	49.75		55.59	9 / 6			
	reaction time																	
Glynn, Abbey (USA) (2001)	interval			4.23	4.37	4.68	4.77	4.80	4.91	5.07	4.87	5.34	5.84	PB		13.28	14.48	15.28
	velocity		6.71	8.27	8.01	7.48	7.34	7.29	7.13	6.90	7.19	6.55	6.85	7.20		7.91	7.25	6.87
	H1 lead leg	L	22.14	15	15	15	15	15	15	16	15	16		159.14				
	strides																	
Townsend, Sydney (USA) (2000)	time		6.87	11.14	15.58	20.09	24.69	29.33	34.27	39.34	44.51	49.75		55.92	6 / 7			
	reaction time																	
	interval			4.27	4.44	4.51	4.60	4.64	4.94	5.07	5.17	5.24	6.17					
	velocity		6.55	8.20	7.88	7.76	7.61	7.54	7.09	6.90	6.77	6.68	6.48	7.15		13.22	14.18	15.48
Glynn, Abbey (USA) (2001)	H1 lead leg	R	23	15	15	15	15	15	16	16	16	16		162		7.94	7.40	6.78
	time		6.74	11.04	15.55	20.18	24.89	29.66	34.60	39.57	44.85	50.18		56.01	3 / 8			
	reaction time																	
	interval			4.30	4.51	4.63	4.71	4.77	4.94	4.97	5.28	5.33	5.83					
Townsend, Sydney (USA) (2000)	velocity		6.68	8.14	7.76	7.56	7.43	7.34	7.09	7.04	6.63	6.57	6.86	7.14		7.81	7.28	6.74
	H1 lead leg	L	22	15	15	15	15	15	15	15	17	17		161				
	time		6.50	10.77	15.25	19.82	24.59	29.43	34.43	39.47	44.75	49.98		56.27	2 / 9			
	reaction time																	
Glynn, Abbey (USA) (2001)	interval			4.27	4.48	4.57	4.77	4.84	5.00	5.04	5.28	5.23	6.29					
	velocity		6.92	8.20	7.81	7.66	7.34	7.23	7.00	6.94	6.63	6.69	6.36	7.11		13.32	14.61	15.55
	H1 lead leg	L	23	16	16	16	16	17	18	17	18	18		175		7.88	7.19	6.75
	strides																	



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

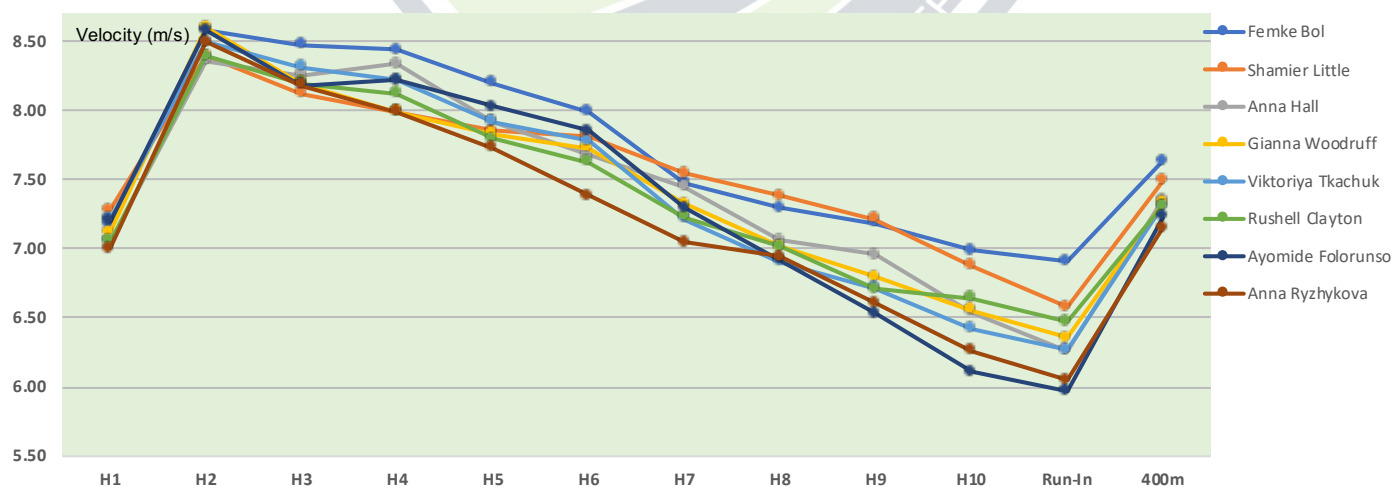
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Women's 400m Hurdles

Date 2023.06.02

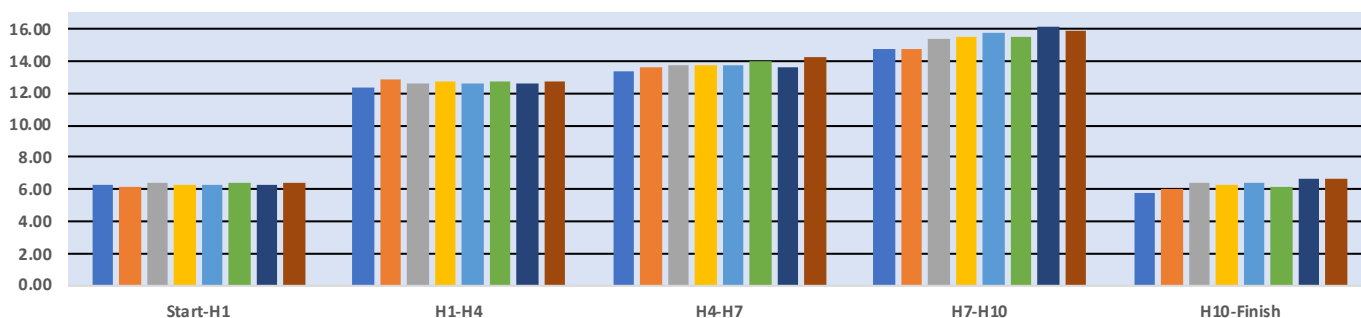
FINAL

Women 5'40cm Hurdles			Date	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-in	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
Bol, Femke (NED) (2000)			time	6.27	10.35	14.48	18.63	22.90	27.28	31.96	36.76	41.63	46.64		52.43		6 / 1			
reaction time			interval	4.08	4.13	4.15	4.27	4.38	4.68	4.80	4.87	5.01	5.79					12.36	13.33	14.68
H1 lead leg			velocity	7.18	8.58	8.47	8.43	8.20	7.99	7.48	7.29	7.19	6.99	6.91	7.63			8.50	7.88	7.15
			strides	22	14	14	14	14	14	14	15	15	15	19	170					
Little, Shamier (USA) (1995)			time	6.18	10.35	14.66	19.04	23.50	27.98	32.62	37.36	42.21	47.30		53.38		4 / 2			
reaction time			interval	4.17	4.31	4.31	4.38	4.46	4.48	4.64	4.74	4.85	5.09	6.08				12.86	13.58	14.68
H1 lead leg			velocity	7.28	8.39	8.12	7.99	7.85	7.81	7.54	7.38	7.22	6.88	6.58	7.49			8.16	7.73	7.15
			strides	23	15	15	15	15	15	15	15	15	16	19.2	178.2					
Hall, Anna (USA) (2001)			time	6.38	10.57	14.81	19.01	23.43	27.99	32.69	37.65	42.68	48.03		54.42		8 / 3			
reaction time			interval	4.19	4.24	4.24	4.20	4.42	4.56	4.70	4.96	5.03	5.35	PB				12.63	13.68	15.34
H1 lead leg			velocity	7.05	8.35	8.25	8.33	7.92	7.68	7.45	7.06	6.96	6.54	6.26	7.35			8.31	7.68	6.84
			strides	21	14	14	14	14	15	15	15	15	17	19.5	173.5					
Woodruff, Gianna (PAN) (1993)			time	6.32	10.39	14.66	19.04	23.51	28.04	32.82	37.81	42.96	48.30		54.59		3 / 4			
reaction time			interval	4.07	4.27	4.27	4.38	4.47	4.53	4.78	4.99	5.15	5.34	6.29				12.72	13.78	15.48
H1 lead leg			velocity	7.12	8.60	8.20	7.99	7.83	7.73	7.32	7.01	6.80	6.55	6.36	7.33			8.25	7.62	6.78
			strides	22	15	15	15	15	15	15	16	16	17	19.5	180.5					
Tkachuk, Viktoriya (UKR) (1994)			time	6.24	10.36	14.57	18.83	23.25	27.75	32.60	37.67	42.88	48.33		54.71		7 / 5			
reaction time			interval	4.12	4.21	4.26	4.42	4.50	4.85	5.07	5.21	5.45	6.38					12.59	13.77	15.73
H1 lead leg			velocity	7.21	8.50	8.31	8.22	7.92	7.78	7.22	6.90	6.72	6.42	6.27	7.31			8.34	7.63	6.68
			strides	22	15	15	15	15	15	16	161	17	17	20.2	328.2					
Clayton, Rushell (JAM) (1992)			time	6.38	10.55	14.82	19.13	23.62	28.21	33.05	38.04	43.26	48.53		54.71		5 / 6			
reaction time			interval	4.17	4.27	4.31	4.49	4.59	4.84	4.99	5.22	5.27	6.18					12.75	13.92	15.48
H1 lead leg			velocity	7.05	8.39	8.20	8.12	7.80	7.63	7.23	7.01	6.70	6.64	6.47	7.31			8.24	7.54	6.78
			strides	23	15	14	14	15	15	15	16	16	16	19	178					
Folorunso, Ayomide (ITA) (1996)			time	6.25	10.33	14.61	18.87	23.23	27.69	32.49	37.55	42.91	48.64		55.34		2 / 7			
reaction time			interval	4.08	4.28	4.26	4.36	4.46	4.80	5.06	5.36	5.73	6.70					12.62	13.62	16.15
H1 lead leg			velocity	7.20	8.58	8.18	8.22	8.03	7.85	7.29	6.92	6.53	6.11	5.97	7.23			8.32	7.71	6.50
			strides	23	15	15	15	15	15	16	16	16	17	21.2	184.2					
Ryzhykova, Anna (UKR) (1989)			time	6.43	10.55	14.83	19.21	23.74	28.48	33.45	38.49	43.79	49.38		55.99		1 / 8			
reaction time			interval	4.12	4.28	4.38	4.53	4.74	4.97	5.04	5.30	5.59	6.61					12.78	14.24	15.93
H1 lead leg			velocity	7.00	8.50	8.18	7.99	7.73	7.38	7.04	6.94	6.60	6.26	6.05	7.14			8.22	7.37	6.59
			strides	22	14	14	14	14	14	14	14	16	16	20	130					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 2 Jun 2023 20:10) - diamond league race analysis

<https://www.omegatiming.com/File/000203050101050101FFFFFFFFFFFFF4D.pdf>

Video: <https://www.youtube.com/watch?v=Cw6tko0tXnE>

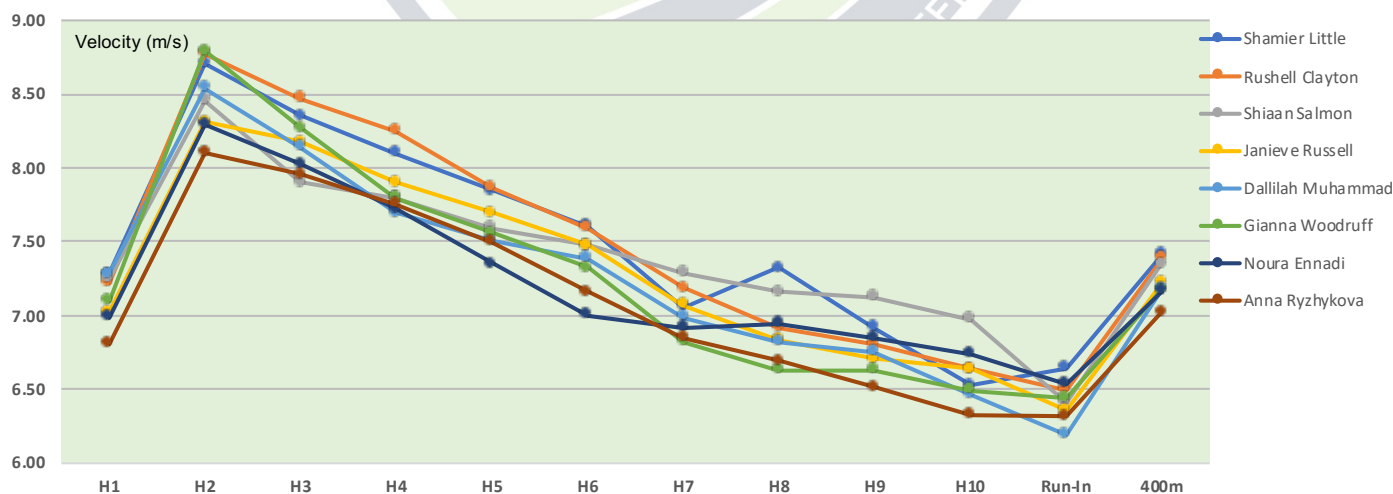
2023 Meeting International Mohammed VI d'Athlétisme (Rabat, MAR)

Women's 400m Hurdles

Date 2023.05.28

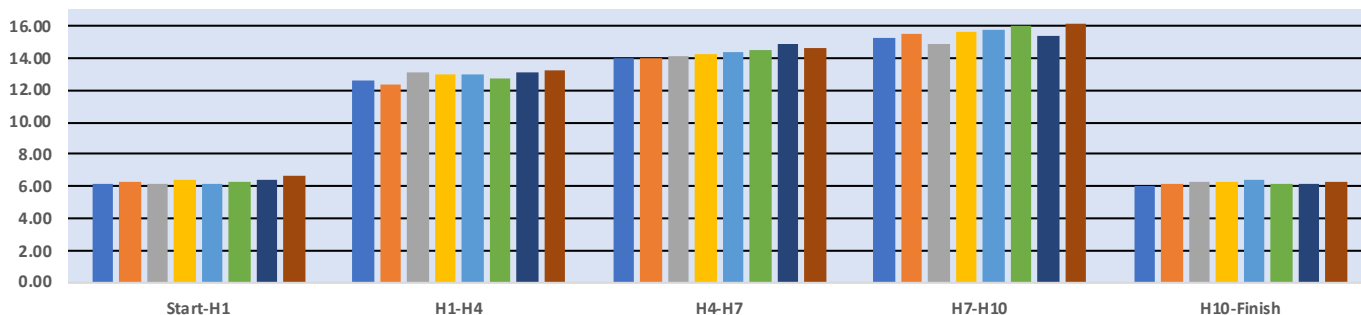
FINAL

			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Little, Shamier (USA) (1995)	time		6.18	10.20	14.39	18.71	23.17	27.77	32.73	37.51	42.57	47.93		53.95	4 / 1			
	reaction time	0.183														12.53	14.02	15.20
	interval velocity		7.28	8.71	8.35	8.10	7.85	7.61	7.06	7.32	6.92	6.53	6.64	7.41		8.38	7.49	6.91
	H1 lead leg	R	23	15	15	15	15	15	15	15	15	16	19.5	178.5				
Clayton, Rushell (JAM) (1992)	time		6.23	10.22	14.35	18.59	23.04	27.65	32.52	37.58	42.72	47.99		54.15	5 / 2			
	reaction time	0.142														12.36	13.93	15.47
	interval velocity		7.22	8.77	8.47	8.25	7.87	7.59	7.19	6.92	6.81	6.64	6.49	7.39		8.50	7.54	6.79
	H1 lead leg	L	23	15	15	15	15	15	16	16	16	16	19.2	181.2				
Salmon, Shiaan (JAM) (1999)	time		6.21	10.35	14.78	19.27	23.88	28.56	33.36	38.25	43.16	48.18		54.42	3 / 3			
	reaction time	0.178														13.06	14.09	14.82
	interval velocity		7.25	8.45	7.90	7.80	7.59	7.48	7.29	7.16	7.13	6.97	6.41	7.35		8.04	7.45	7.09
	H1 lead leg	R	21	15	15	14	15	15	16	16	16	16	19.7	178.7				
Russell, Janieve (JAM) (1993)	time		6.41	10.62	14.90	19.33	23.88	28.56	33.51	38.63	43.85	49.12		55.41	7 / 4			
	reaction time	0.160														12.92	14.18	15.61
	interval velocity		7.02	8.31	8.18	7.90	7.69	7.48	7.07	6.84	6.70	6.64	6.36	7.22		8.13	7.40	6.73
	H1 lead leg	L	23	15	15	15	15	16	16			17	20	152				
Muhammad, Dalilah (USA) (1990)	time		6.18	10.28	14.58	19.13	23.79	28.53	33.54	38.67	43.85	49.26		55.72	6 / 5			
	reaction time	0.17														12.95	14.41	15.72
	interval velocity		7.28	8.54	8.14	7.69	7.51	7.38	6.99	6.82	6.76	6.47	6.19	7.18		8.11	7.29	6.68
	H1 lead leg	R	22	14	14	15	15	15	15			16	20	146				
Woodruff, Gianna (PAN) (1993)	time		6.34	10.32	14.55	19.04	23.67	28.45	33.58	38.86	44.14	49.53		55.74	2 / 6			
	reaction time	0.201														12.70	14.54	15.95
	interval velocity		7.10	8.79	8.27	7.80	7.56	7.32	6.82	6.63	6.63	6.49	6.44	7.18		8.27	7.22	6.58
	H1 lead leg	R	22	14		15	15	15	16			16	19	132				
Ennadi, Noura (MAR) (1999)	time		6.44	10.66	15.02	19.55	24.31	29.31	34.37	39.41	44.52	49.71		55.83	1 / 7			
	reaction time	0.183														13.11	14.82	15.34
	interval velocity		6.99	8.29	8.03	7.73	7.35	7.00	6.92	6.94	6.85	6.74	6.54	7.16		8.01	7.09	6.84
	H1 lead leg	R	23	15		15	15	17			17	17	20	139				
Ryzhykova, Anna (UKR) (1989)	time		6.61	10.93	15.33	19.84	24.51	29.40	34.51	39.74	45.11	50.64		56.97	8 / 8			
	reaction time	0.268														13.23	14.67	16.13
	interval velocity		6.81	8.10	7.95	7.76	7.49	7.16	6.85	6.69	6.52	6.33	6.32	7.02		7.94	7.16	6.51
	H1 lead leg	R	22	14	14	14	14	15	15		16	16	19	159				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 28 May 2023 19:08) - diamond league race analysis

<https://www.omegatiming.com/File/000203040101050101FFFFFFFFFFFF4D.pdf>Video: <https://www.youtube.com/watch?v=WczG-g8j6bQ>