

2024 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

2024 Season Hurdles Report

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2024 Season Hurdles Report

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

2024 Top 10 Times - Men's 110m Hurdles

Athlete (Year)		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)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	28-Jun	time	2.43	3.48	4.43	5.37	6.34	7.32	8.31	9.32	10.36	11.42	12.86	6 / 1			
reaction time	interval	7 steps	0.98	0.98	0.97	0.97	0.98	0.99	1.01	1.04	1.06	1.44			2.93	2.94	3.11
wind	2.0 m/s	velocity	5.62	9.33	9.33	9.42	9.42	9.33	9.23	9.05	8.79	8.62	9.74	8.55	9.36	9.33	8.82
Holloway, Grant (USA) (1997)																	
Heat 1 - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	24-Jun	time	2.46	3.48	4.41	5.41	6.38	7.35	8.35	9.38	10.40	11.46	12.92	4 / 1			
reaction time	interval	7 steps	1.05	0.95	0.98	0.97	0.97	0.97	1.00	1.03	1.02	1.06	1.46		2.98	2.94	3.11
wind	0.8 m/s	velocity	5.65	8.70	9.62	9.33	9.42	9.42	9.14	8.87	8.96	8.62	9.60	8.51	9.20	9.33	8.82
Crittenden, Freddie (USA) (1994)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	28-Jun	time	2.54	3.56	4.54	5.54	6.54	7.52	8.52	9.51	10.52	11.56	12.93	7 / 2			
reaction time	interval		1.02	0.98	1.00	1.00	0.98	1.00	0.99	1.01	1.04	1.37	PB		3.00	2.98	3.04
wind	2.0 m/s	velocity	5.40	8.96	9.33	9.14	9.14	9.33	9.14	9.23	9.05	8.79	10.23	8.51	9.14	9.20	9.02
Holloway, Grant (USA) (1997)																	
Semi-Final 1 - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	27-Jun	time	2.44	3.42	4.41	5.37	6.35	7.34	8.34	9.34	10.41	11.48	12.96	7 / 1			
reaction time	interval	7 steps	0.98	0.99	0.96	0.98	0.99	1.00	1.00	1.07	1.07	1.48			2.93	2.97	3.14
wind	0.3 m/s	velocity	5.62	9.33	9.23	9.52	9.33	9.23	9.14	9.14	8.54	8.54	9.47	8.49	9.36	9.23	8.73
Roberts, Daniel (USA) (1998)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	28-Jun	time	2.44	3.48	4.48	5.47	6.48	7.50	8.51	9.53	10.55	11.58	12.96	4 / 3			
reaction time	interval	7 steps	1.02	1.00	0.99	1.01	1.02	1.01	1.02	1.02	1.03	1.38	PB		3.01	3.04	3.07
wind	2.0 m/s	velocity	5.58	8.96	9.14	9.23	9.05	8.96	9.05	8.96	8.96	8.87	10.16	8.49	9.11	9.02	8.93
Holloway, Grant (USA) (1997)																	
Semi-Final 1 - 2024 Olympic Games (Paris, FRA)													Omega Timing (2024) - Olympic games race analysis				
date	7-Aug	time	2.31	3.32	4.29	5.27	6.24	7.22	8.22	9.24	10.29	11.37	12.98	6 / 1			
reaction time	0.149	interval	7 steps	1.01	0.97	0.98	0.97	0.98	1.00	1.02	1.05	1.08	1.61		2.96	2.95	3.15
wind	0.1 m/s	velocity	5.94	9.05	9.42	9.33	9.42	9.33	9.14	8.96	8.70	8.46	8.71	8.47	9.26	9.29	8.70
Holloway, Grant (USA) (1997)																	
FINAL - 2024 Olympic Games (Paris, FRA)													Omega Timing (2024) - Olympic games race analysis				
date	8-Aug	time	2.33	3.34	4.32	5.29	6.25	7.24	8.23	9.25	10.30	11.39	12.99	6 / 1			
reaction time	0.104	interval	7 steps	1.01	0.98	0.97	0.96	0.99	0.99	1.02	1.05	1.09	1.60		2.96	2.94	3.16
wind	-0.1 m/s	velocity	5.89	9.05	9.33	9.42	9.52	9.23	9.23	8.96	8.70	8.39	8.76	8.47	9.26	9.33	8.68
Holloway, Grant (USA) (1997)																	
FINAL - 2024 Weltklasse (Zürich, SUI)													Omega Timing (2024) - diamond league race analysis				
date	5-Sep	time	2.36	3.37	4.35	5.31	6.30	7.29	8.30	9.31	10.35	11.41	12.99	6 / 1			
reaction time	0.144	interval	7 steps	1.01	0.98	0.96	0.99	0.99	1.01	1.01	1.04	1.06	1.58		2.95	2.99	3.11
wind	-0.3 m/s	velocity	5.81	9.05	9.33	9.52	9.23	9.23	9.05	9.05	8.79	8.62	8.87	8.47	9.29	9.17	8.82
Holloway, Grant (USA) (1997)																	
FINAL - 2024 Herculis Meeting International d'Athlétisme (Monaco, MON)													Omega Timing (2024) - diamond league race analysis				
date	12-Jul	time	2.37	3.39	4.35	5.33	6.31	7.30	8.30	9.33	10.37	11.45	13.01	6 / 1			
reaction time	0.132	interval	7 steps	1.02	0.96	0.98	0.98	0.99	1.00	1.03	1.04	1.08	1.56		2.96	2.97	3.15
wind	-0.7 m/s	velocity	5.79	8.96	9.52	9.33	9.33	9.23	9.14	8.87	8.79	8.46	8.99	8.46	9.26	9.23	8.70
Holloway, Grant (USA) (1997)																	
Heat 5 - 2024 Olympic Games (Paris, FRA)													Omega Timing (2024) - Olympic games race analysis				
date	4-Aug	time	2.31	3.34	4.32	5.29	6.26	7.24	8.23	9.25	10.31	11.39	13.01	6 / 1			
reaction time	0.136	interval	7 steps	1.03	0.98	0.97	0.97	0.98	0.99	1.02	1.06	1.08	1.62		2.98	2.94	3.16
wind	0.7 m/s	velocity	5.94	8.87	9.33	9.42	9.42	9.33	9.23	8.96	8.62	8.46	8.65	8.46	9.20	9.33	8.68
Holloway, Grant (USA) (1997)																	
FINAL - 2024 Prefontaine Classic (Eugene, OR)													Omega Timing (2024) - diamond league race analysis				
date	25-May	time	2.35	3.35	4.33	5.30	6.28	7.28	8.28	9.32	10.36	11.44	13.03	5 / 1			
reaction time	0.132	interval	7 steps	1.00	0.98	0.97	0.98	1.00	1.00	1.04	1.04	1.08	1.59		2.95	2.98	3.16
wind	-0.1 m/s	velocity	5.84	9.14	9.33	9.42	9.33	9.14	9.14	8.79	8.79	8.46	8.82	8.44	9.29	9.20	8.68
Tinch, Cordell (USA) (2000)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	28-Jun	time	2.50	3.54	4.52	5.50	6.50	7.50	8.50	9.52	10.56	11.65	13.03	3 / 4			
reaction time	interval	7 steps	1.04	0.98	0.98	1.00	1.00	1.00	1.00	1.02	1.04	1.09	1.38		3.00	3.00	3.15
wind	2.0 m/s	velocity	5.49	8.79	9.33	9.33	9.14	9.14	9.14	8.96	8.79	8.39	10.16	8.44	9.14	9.14	8.70
Holloway, Grant (USA) (1997)																	
FINAL - 2024 Kamila Skolimowska Memorial (Silesia, POL)													Omega Timing (2024) - diamond league race analysis				
date	25-Aug	time	2.35	3.34	4.34	5.31	6.30	7.30	8.30	9.33	10.37	11.44	13.04	6 / 1			
reaction time	0.157	interval	7 steps	0.99	1.00	0.97	0.99	1.00	1.00	1.03	1.04	1.07	1.60		2.96	2.99	3.14
wind	1.1 m/s	velocity	5.84	9.23	9.14	9.42	9.23	9.14	9.14	8.87	8.79	8.54	8.76	8.44	9.26	9.17	8.73
Simonelli, Lorenzo Ndele (ITA)																	
FINAL - 2024 European Athletics Championships (Roma, ITA) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	6-Jun	time	2.53	3.55	4.56	5.56	6.56	7.56	8.56	9.57	10.62	11.64	13.05	5 / 1			
reaction time	0.145	interval	7 steps	1.02	1.01	1.00	1.00	1.00	1.00	1.01	1.05	1.02	1.41	NR PB	3.03	3.00	3.08
wind	0.6 m/s	velocity	5.42	8.96	9.05	9.14	9.14	9.14	9.14	9.05	8.70	8.96	9.94	8.43	9.05	9.14	8.90
Crittenden, Freddie (USA) (1994)																	
Semi-Final 2 - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)													Henson (2024) - Athlete First: 2024 year end hurdle report				
date	28-Jun	time	2.53	3.56	4.56	5.57	6.56	7.55	8.56	9.56	10.58	11.62	13.05	7 / 1			
reaction time	interval		1.03	1.00	1.01	0.99	0.99	0.99	1.01	1.00	1.02	1.04	1.43		3.04	2.99	3.06
wind	-0.2 m/s	velocity	5.42	8.87	9.14	9.05	9.23	9.23	9.05	9.14	8.96	8.79	9.80	8.43	9.02	9.17	8.96

2024 Memorial van damme (Brussels, BEL)

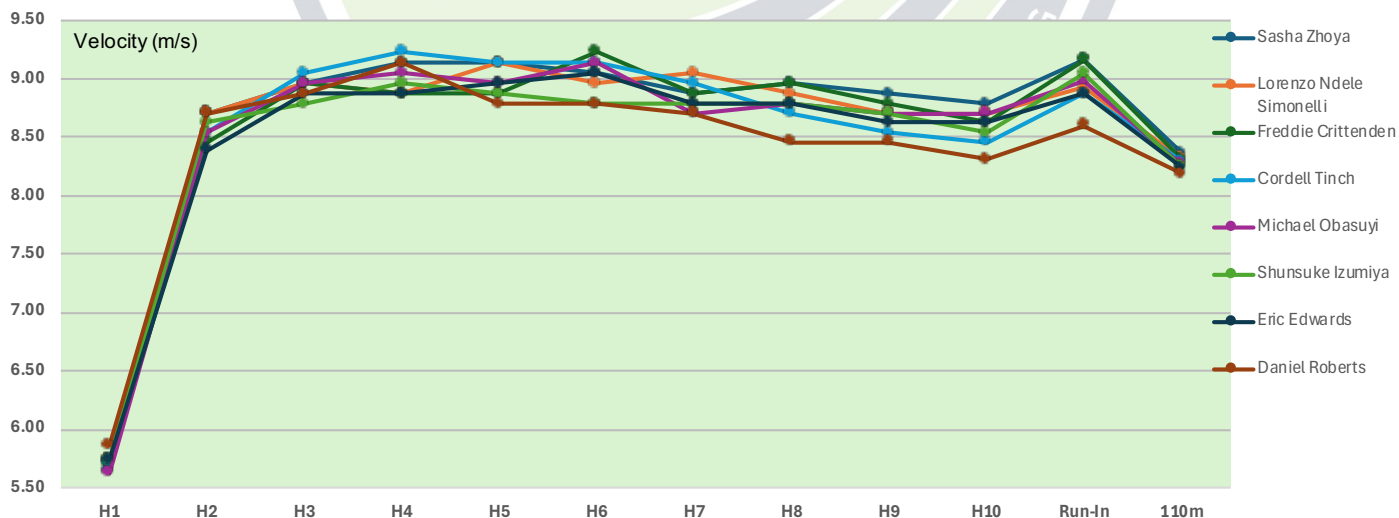
110m Hurdles

Date: 2024.09.13

Wind: 0.4 m/s

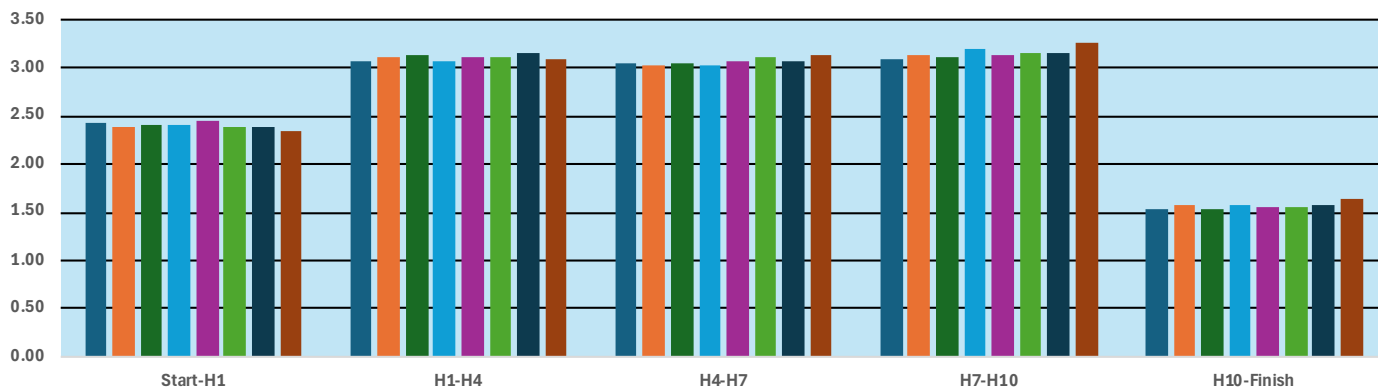
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time	2.43	3.48	4.50	5.50	6.50	7.51	8.54	9.56	10.59	11.63		13.16	6 / 1			
	reaction time	0.150															
	interval	7 steps	1.05	1.02	1.00	1.00	1.01	1.03	1.02	1.03	1.04	1.53			3.07	3.04	3.09
	velocity	5.65	8.70	8.96	9.14	9.14	9.05	8.87	8.96	8.87	8.79	9.16	8.36		8.93	9.02	8.87
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.39	3.44	4.46	5.49	6.49	7.51	8.52	9.55	10.60	11.65		13.22	4 / 2			
	reaction time	0.136															
	interval	7 steps	1.05	1.02	1.03	1.00	1.02	1.01	1.03	1.05	1.05	1.57			3.10	3.03	3.13
	velocity	5.74	8.70	8.96	8.87	9.14	8.96	9.05	8.87	8.70	8.70	8.93	8.32		8.85	9.05	8.76
Crittenden, Freddie (USA) (1994)	time	2.41	3.49	4.51	5.54	6.57	7.56	8.59	9.61	10.65	11.71		13.24	3 / 3			
	reaction time	0.141															
	interval		1.08	1.02	1.03	1.03	0.99	1.03	1.02	1.04	1.06	1.53			3.13	3.05	3.12
	velocity	5.69	8.46	8.96	8.87	8.87	9.23	8.87	8.96	8.79	8.62	9.16	8.31		8.76	8.99	8.79
Tinch, Cordell (USA) (2000)	time	2.40	3.47	4.48	5.47	6.47	7.47	8.49	9.54	10.61	11.69		13.27	7 / 4			
	reaction time	0.147															
	interval	7 steps	1.07	1.01	0.99	1.00	1.00	1.02	1.05	1.07	1.08	1.58			3.07	3.02	3.20
	velocity	5.72	8.54	9.05	9.23	9.14	9.14	8.96	8.70	8.54	8.46	8.87	8.29		8.93	9.08	8.57
Obasuyi, Michael (BEL) (1999)	time	2.44	3.51	4.53	5.54	6.56	7.56	8.61	9.65	10.70	11.75		13.31	8 / 5			
	reaction time	0.160															
	interval	7 steps	1.07	1.02	1.01	1.02	1.00	1.05	1.04	1.05	1.05	1.56			3.10	3.07	3.14
	velocity	5.62	8.54	8.96	9.05	8.96	9.14	8.70	8.79	8.70	8.70	8.99	8.26		8.85	8.93	8.73
Izumiya, Shunsuke (JPN) (2000)	time	2.39	3.45	4.49	5.51	6.54	7.58	8.62	9.66	10.71	11.78		13.33	2 / 6			
	reaction time	0.145															
	interval	7 steps	1.06	1.04	1.02	1.03	1.04	1.04	1.04	1.05	1.07	1.55			3.12	3.11	3.16
	velocity	5.74	8.62	8.79	8.96	8.87	8.79	8.79	8.79	8.70	8.54	9.05	8.25		8.79	8.82	8.68
Edwards, Eric (USA) (2000)	time	2.39	3.48	4.51	5.54	6.56	7.57	8.61	9.65	10.71	11.77		13.35	1 / 7			
	reaction time	0.128															
	interval		1.09	1.03	1.03	1.02	1.01	1.04	1.04	1.06	1.06	1.58			3.15	3.07	3.16
	velocity	5.74	8.39	8.87	8.87	8.96	9.05	8.79	8.79	8.62	8.62	8.87	8.24		8.70	8.93	8.68
Roberts, Daniel (USA) (1998)	time	2.34	3.39	4.42	5.42	6.46	7.50	8.55	9.63	10.71	11.81		13.44	5 / 8			
	reaction time	0.145															
	interval	7 steps	1.05	1.03	1.00	1.04	1.04	1.05	1.08	1.08	1.10	1.63			3.08	3.13	3.26
	velocity	5.86	8.70	8.87	9.14	8.79	8.79	8.70	8.46	8.46	8.31	8.60	8.18		8.90	8.76	8.41



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 13 Sep 2024 20:32) - diamond league race analysis
<https://www.omegatiming.com/File/000204120102090101FFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=qEclBktcl-8>

2024 Weltklasse (Zürich, SUI)

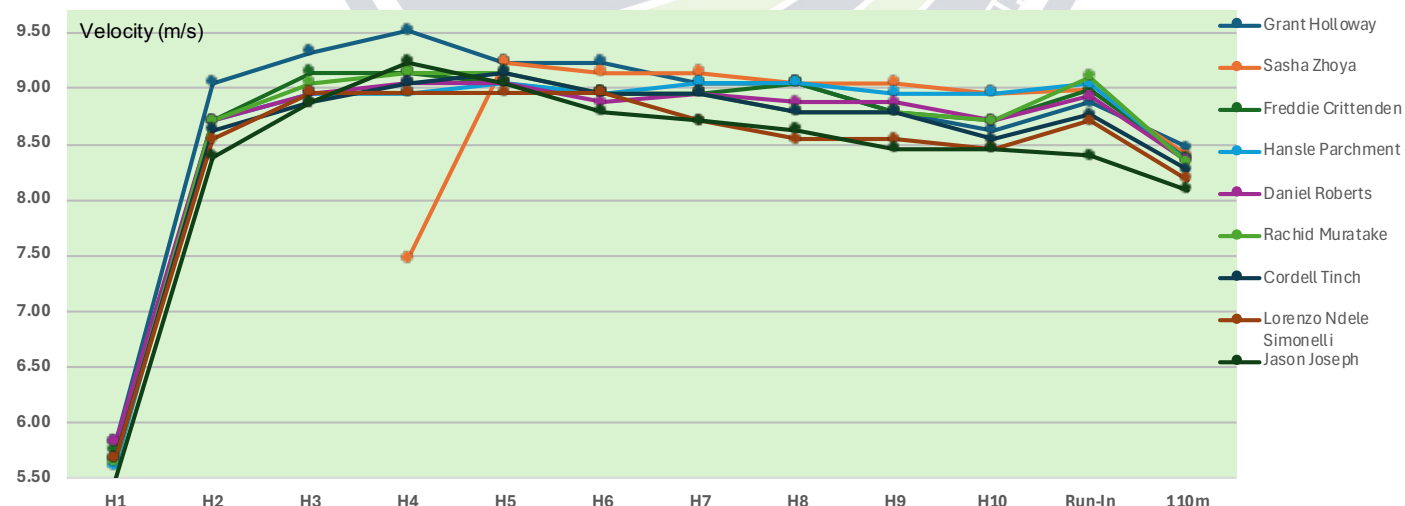
110m Hurdles

Date: 2024.09.05

Wind: -0.3 m/s

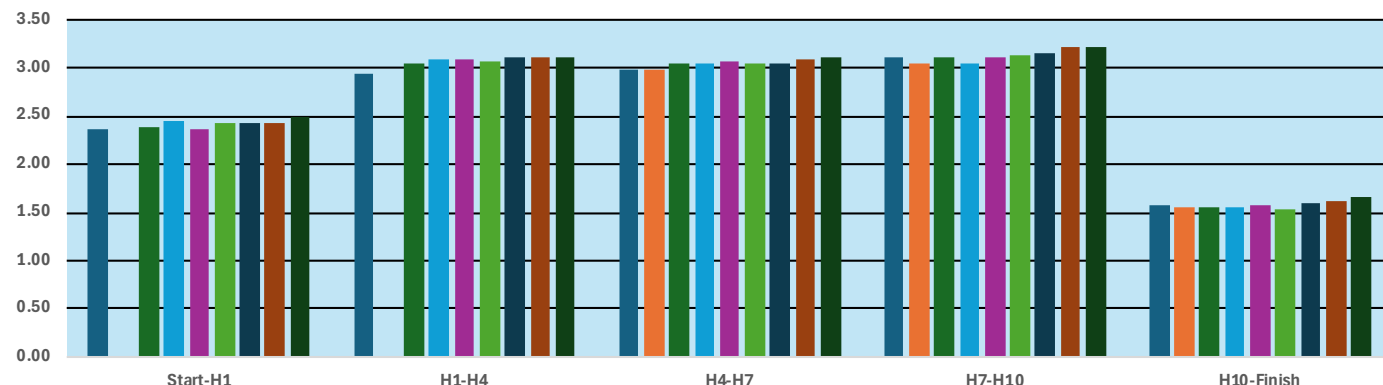
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.36	3.37	4.35	5.31	6.30	7.29	8.30	9.31	10.35	11.41	12.99	13.10	6 / 1	2.95	2.99	3.11
	reaction time	0.144													9.29	9.17	8.82
	interval velocity	7 steps	1.01	0.98	0.96	0.99	0.99	1.01	1.01	1.04	1.06	1.58					
Zhoya, Sasha (FRA) (2002)	time				5.51	6.50	7.50	8.50	9.51	10.52	11.54	13.10	13.10	2 / 2	5.51	2.99	3.04
	reaction time	0.148													4.98	9.17	9.02
	interval velocity	7 steps			7.47	9.23	9.14	9.14	9.05	9.05	8.96	8.99	8.40				
Crittenden, Freddie (USA) (1994)	time	2.39	3.44	4.44	5.44	6.45	7.47	8.49	9.50	10.54	11.59	13.15	13.15	7 / 3	3.05	3.05	3.10
	reaction time	0.127													8.99	8.99	8.85
	interval velocity		1.05	1.00	1.00	1.01	1.02	1.02	1.01	1.04	1.05	1.56					
Parchment, Hansle (JAM) (1990)	time	2.45	3.50	4.52	5.54	6.55	7.57	8.58	9.59	10.61	11.63	13.18	13.18	8 / 4	3.09	3.04	3.05
	reaction time	0.131													8.87	9.02	8.99
	interval velocity	7 steps	1.05	1.02	1.02	1.01	1.02	1.01	1.01	1.02	1.02	1.55					
Roberts, Daniel (USA) (1998)	time	2.36	3.41	4.43	5.44	6.45	7.48	8.50	9.53	10.56	11.61	13.18	13.18	5 / 5	3.08	3.06	3.11
	reaction time	0.154													8.90	8.96	8.82
	interval velocity	7 steps	1.05	1.02	1.01	1.01	1.03	1.02	1.03	1.03	1.05	1.57					
Muratake, Rachid (JPN) (2002)	time	2.43	3.48	4.49	5.49	6.49	7.51	8.53	9.57	10.61	11.66	13.20	13.20	3 / 6	3.06	3.04	3.13
	reaction time	0.161													8.96	9.02	8.76
	interval velocity	7 steps	1.05	1.01	1.00	1.00	1.02	1.02	1.04	1.04	1.05	1.54					
Tinch, Cordell (USA) (2000)	time	2.42	3.48	4.51	5.52	6.52	7.54	8.56	9.60	10.64	11.71	13.31	13.31	1 / 7	3.10	3.04	3.15
	reaction time	0.170													8.85	9.02	8.70
	interval velocity	7 steps	1.06	1.03	1.01	1.00	1.02	1.02	1.04	1.04	1.07	1.60					
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.42	3.49	4.51	5.53	6.55	7.57	8.62	9.69	10.76	11.84	13.45	13.45	4 / 8	3.11	3.09	3.22
	reaction time	0.158													8.82	8.87	8.52
	interval velocity	7 steps	1.07	1.02	1.02	1.02	1.02	1.05	1.07	1.07	1.08	1.61					
Joseph, Jason (SUI) (1998)	time	2.50	3.59	4.62	5.61	6.62	7.66	8.71	9.77	10.85	11.93	13.60	13.60	9 / 9	3.11	3.10	3.22
	reaction time	0.170													8.82	8.85	8.52
	interval velocity	7 steps	1.09	1.03	0.99	1.01	1.04	1.05	1.06	1.08	1.08	1.67					
	velocity	5.81	9.05	9.33	9.52	9.23	9.23	9.05	9.05	8.79	8.62	8.87	8.47				
	velocity	5.60	8.70	8.96	8.96	9.05	8.96	9.05	9.05	8.96	8.96	9.05	8.35				
	velocity	5.67	8.62	8.87	9.05	9.14	8.96	8.96	8.79	8.79	8.54	8.76	8.26				
	velocity	5.67	8.54	8.96	8.96	8.96	8.96	8.70	8.54	8.54	8.46	8.71	8.18				
	velocity	5.49	8.39	8.87	9.23	9.05	8.79	8.70	8.62	8.46	8.46	8.40	8.09				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 5 Sep 2024 20:45) - diamond league race analysis
<https://www.omegatiming.com/File/000204110103080101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=ljwSlrOK1g>

2024 Golden Gala • Pietro Mennea (Roma, ITA)

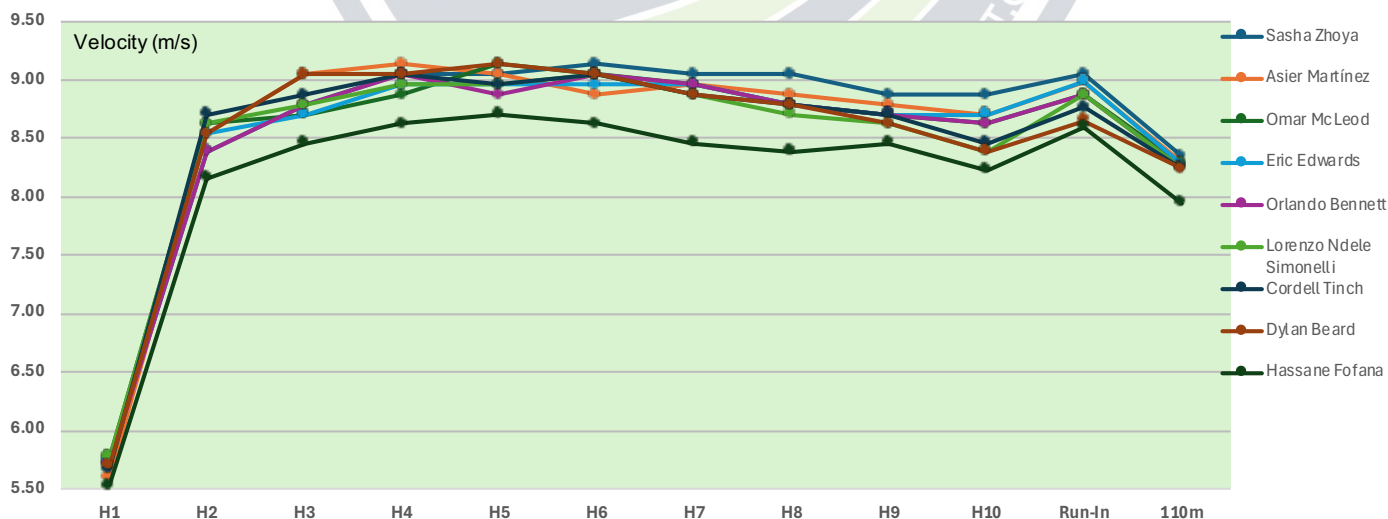
110m Hurdles

Date: 2024.08.30

Wind: 0.4 m/s

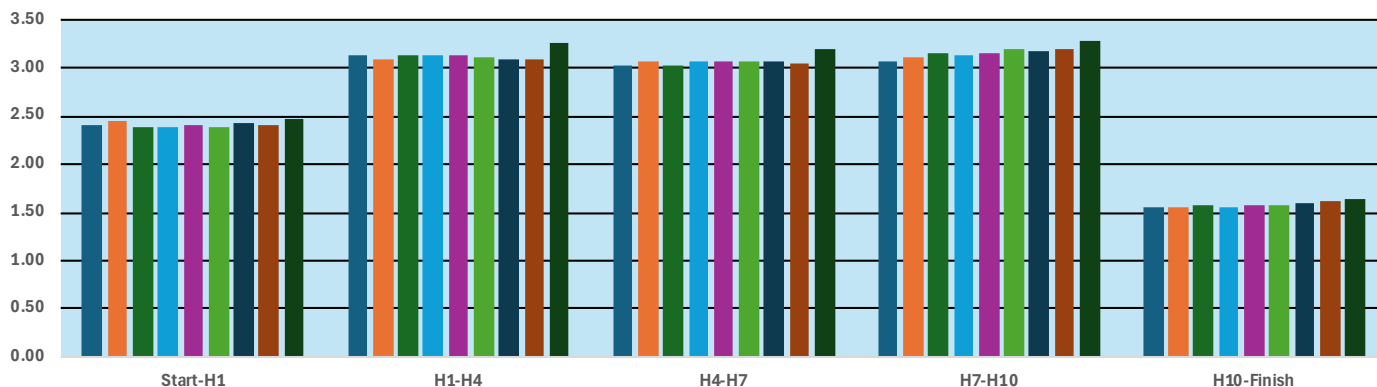
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time	2.40	3.49	4.53	5.54	6.55	7.55	8.56	9.57	10.60	11.63		13.18	6 / 1			
	reaction time	0.151													3.14	3.02	3.07
	interval		7 steps	1.09	1.04	1.01	1.01	1.00	1.01	1.01	1.03	1.03	1.55		8.73	9.08	8.93
	velocity	5.72	8.39	8.79	9.05	9.05	9.14	9.05	9.05	8.87	8.87	9.05	8.35				
Martinez, Asier (ESP) (2000)	time	2.45	3.52	4.53	5.53	6.54	7.57	8.59	9.62	10.66	11.71		13.27	2 / 2			
	reaction time	0.157													3.08	3.06	3.12
	interval		7 steps	1.07	1.01	1.00	1.01	1.03	1.02	1.03	1.04	1.05	1.56		8.90	8.96	8.79
	velocity	5.60	8.54	9.05	9.14	9.05	8.87	8.96	8.87	8.79	8.70	8.99	8.29				
McLeod, Omar (JAM) (1994)	time	2.38	3.44	4.49	5.52	6.52	7.53	8.55	9.59	10.64	11.70		13.28	9 / 3			
	reaction time	0.151													3.14	3.03	3.15
	interval			1.06	1.05	1.03	1.00	1.01	1.02	1.04	1.05	1.06	1.58		8.73	9.05	8.70
	velocity	5.76	8.62	8.70	8.87	9.14	9.05	8.96	8.79	8.70	8.62	8.87	8.28				
Edwards, Eric (USA) (2000)	time	2.39	3.46	4.51	5.53	6.55	7.57	8.59	9.63	10.68	11.73		13.29	8 / 4			
	reaction time	0.130													3.14	3.06	3.14
	interval			1.07	1.05	1.02	1.02	1.02	1.04	1.05	1.05	1.56		8.73	8.96	8.73	
	velocity	5.74	8.54	8.70	8.96	8.96	8.96	8.96	8.79	8.70	8.70	8.99	8.28				
Bennett, Orlando (JAM) (1999)	time	2.40	3.49	4.53	5.54	6.57	7.58	8.60	9.64	10.69	11.75		13.33	5 / 5			
	reaction time	0.166													3.14	3.06	3.15
	interval			1.09	1.04	1.01	1.03	1.01	1.02	1.04	1.05	1.06	1.58		8.73	8.96	8.70
	velocity	5.72	8.39	8.79	9.05	8.87	9.05	8.96	8.79	8.70	8.62	8.87	8.25				
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.38	3.44	4.48	5.50	6.52	7.53	8.56	9.61	10.67	11.76		13.34	4 / 6			
	reaction time	0.164													3.12	3.06	3.20
	interval			7 steps	1.06	1.04	1.02	1.01	1.03	1.05	1.06	1.09	1.58		8.79	8.96	8.57
	velocity	5.76	8.62	8.79	8.96	8.96	9.05	8.87	8.70	8.62	8.39	8.87	8.25				
Tinch, Cordell (USA) (2000)	time	2.42	3.47	4.50	5.51	6.53	7.54	8.57	9.61	10.66	11.74		13.34	3 / 7			
	reaction time	0.171													3.09	3.06	3.17
	interval			7 steps	1.05	1.03	1.01	1.02	1.01	1.03	1.04	1.05	1.60		8.87	8.96	8.65
	velocity	5.67	8.70	8.87	9.05	8.96	9.05	8.87	8.79	8.70	8.46	8.76	8.25				
Beard, Dylan (USA) (1998)	time	2.41	3.48	4.49	5.50	6.50	7.51	8.54	9.58	10.64	11.73		13.35	7 / 8			
	reaction time	0.170													3.09	3.04	3.19
	interval			1.07	1.01	1.01	1.00	1.01	1.03	1.04	1.06	1.09	1.62		8.87	9.02	8.60
	velocity	5.69	8.54	9.05	9.05	9.14	9.05	8.87	8.79	8.62	8.39	8.65	8.24				
Fofana, Hassane (ITA) (1992)	time	2.48	3.60	4.68	5.74	6.79	7.85	8.93	10.02	11.10	12.21		13.84	1 / 9			
	reaction time	0.154													3.26	3.19	3.28
	interval			1.12	1.08	1.06	1.05	1.06	1.08	1.09	1.08	1.11	1.63		8.41	8.60	8.36
	velocity	5.53	8.16	8.46	8.62	8.70	8.62	8.46	8.39	8.46	8.23	8.60	7.95				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 30 Aug 2024 21:59) - diamond league race analysis

<https://www.omegatiming.com/File/000204100102080101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=iZF8UAosDHE>

2024 Kamila Skolimowska Memorial (Silesia, POL)

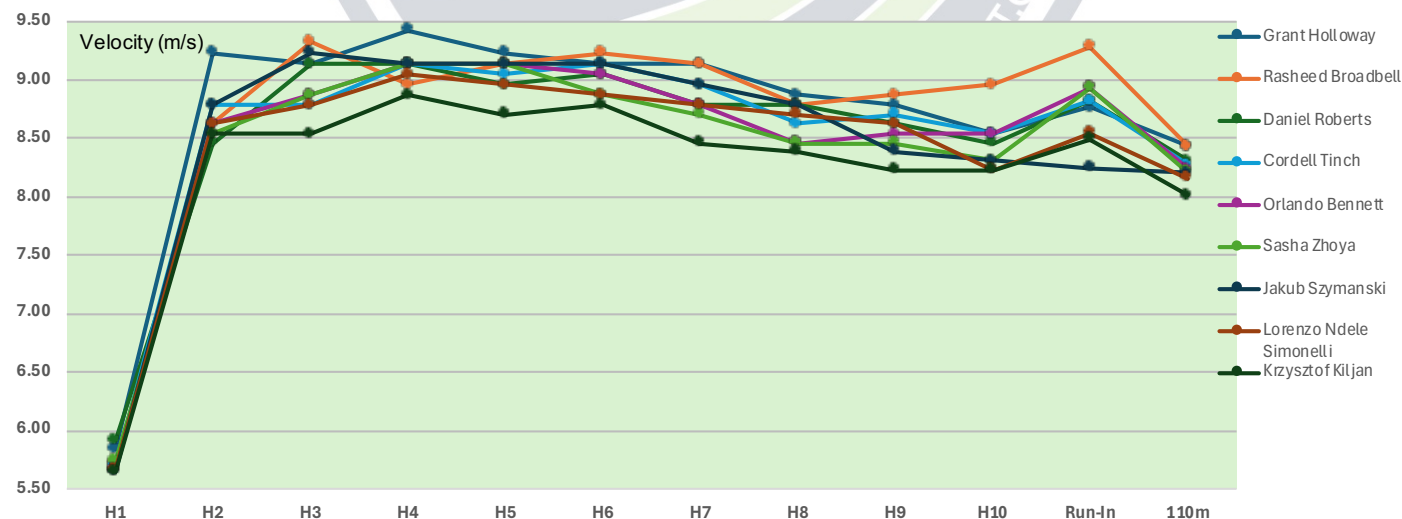
110m Hurdles

Date: 2024.08.25

Wind: 1.1 m/s

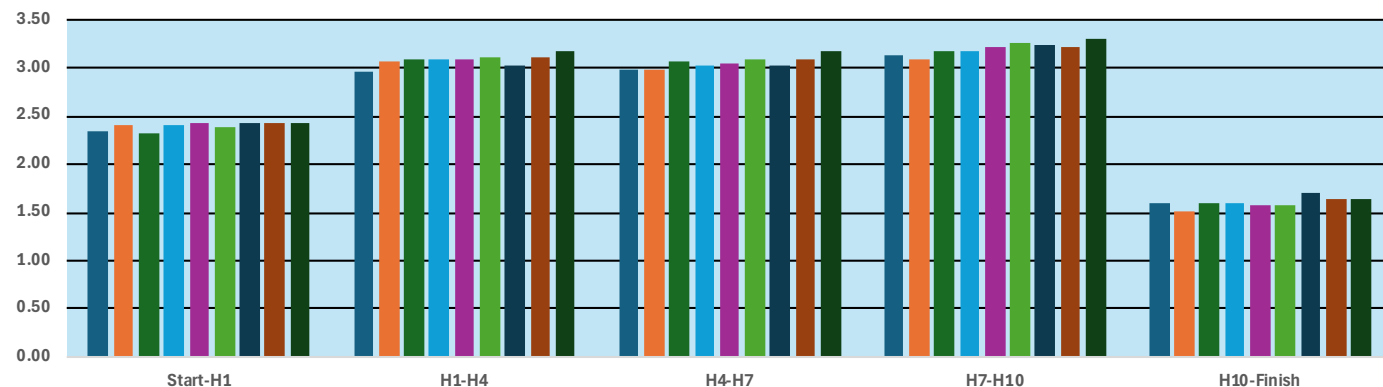
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.35	3.34	4.34	5.31	6.30	7.30	8.30	9.33	10.37	11.44		13.04	6 / 1			
	reaction time	0.157													2.96	2.99	3.14
	interval	7 steps	0.99	1.00	0.97	0.99	1.00	1.00	1.03	1.04	1.07	1.60			9.26	9.17	8.73
	velocity	5.84	9.23	9.14	9.42	9.23	9.14	9.14	8.87	8.79	8.54	8.76	8.44				
Broadbell, Rasheed (JAM) (2000)	time	2.40	3.46	4.44	5.46	6.46	7.45	8.45	9.49	10.52	11.54		13.05	5 / 2			
	reaction time	0.152													3.06	2.99	3.09
	interval	7 steps	1.06	0.98	1.02	1.00	0.99	1.00	1.04	1.03	1.02	1.51			8.96	9.17	8.87
	velocity	5.72	8.62	9.33	8.96	9.14	9.23	9.14	8.79	8.87	8.96	9.28	8.43				
Roberts, Daniel (USA) (1998)	time	2.32	3.40	4.40	5.40	6.42	7.43	8.47	9.51	10.57	11.65		13.24	8 / 3			
	reaction time	0.154													3.08	3.07	3.18
	interval	7 steps	1.08	1.00	1.00	1.02	1.01	1.04	1.04	1.06	1.08	1.59			8.90	8.93	8.62
	velocity	5.91	8.46	9.14	9.14	8.96	9.05	8.79	8.79	8.62	8.46	8.82	8.31				
Tinch, Cordell (USA) (2000)	time	2.41	3.45	4.49	5.49	6.50	7.50	8.52	9.58	10.63	11.70		13.29	4 / 4			
	reaction time	0.173													3.08	3.03	3.18
	interval	7 steps	1.04	1.04	1.00	1.01	1.00	1.02	1.06	1.05	1.07	1.59			8.90	9.05	8.62
	velocity	5.69	8.79	8.79	9.14	9.05	9.14	8.96	8.62	8.70	8.54	8.82	8.28				
Bennett, Orlando (JAM) (1999)	time	2.42	3.48	4.51	5.51	6.51	7.52	8.56	9.64	10.71	11.78		13.35	3 / 5			
	reaction time	0.154													3.09	3.05	3.22
	interval	7 steps	1.06	1.03	1.00	1.00	1.01	1.04	1.08	1.07	1.07	1.57			8.87	8.99	8.52
	velocity	5.67	8.62	8.87	9.14	9.14	9.05	8.79	8.46	8.54	8.54	8.93	8.24				
Zhoya, Sasha (FRA) (2002)	time	2.39	3.46	4.49	5.49	6.49	7.52	8.57	9.65	10.73	11.83		13.40	1 / 6			
	reaction time	0.138													3.10	3.08	3.26
	interval	7 steps	1.07	1.03	1.00	1.00	1.03	1.05	1.08	1.08	1.10	1.57			8.85	8.90	8.41
	velocity	5.74	8.54	8.87	9.14	9.14	8.87	8.70	8.46	8.46	8.31	8.93	8.21				
Szymanski, Jakub (POL) (2002)	time	2.43	3.47	4.46	5.46	6.46	7.46	8.48	9.52	10.61	11.71		13.41	2 / 7			
	reaction time	0.182													3.03	3.02	3.23
	interval	7 steps	1.04	0.99	1.00	1.00	1.00	1.02	1.04	1.09	1.10	1.70			9.05	9.08	8.49
	velocity	5.65	8.79	9.23	9.14	9.14	9.14	8.96	8.79	8.39	8.31	8.25	8.20				
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.42	3.48	4.52	5.53	6.55	7.58	8.62	9.67	10.73	11.84		13.48	7 / 8			
	reaction time	0.178													3.11	3.09	3.22
	interval	7 steps	1.06	1.04	1.01	1.02	1.03	1.04	1.05	1.06	1.11	1.64			8.82	8.87	8.52
	velocity	5.67	8.62	8.79	9.05	8.96	8.87	8.79	8.70	8.62	8.23	8.55	8.16				
Kiljan, Krzysztof (POL) (1999)	time	2.43	3.50	4.57	5.60	6.65	7.69	8.77	9.86	10.97	12.08		13.73	9 / 9			
	reaction time	0.162													3.17	3.17	3.31
	interval	7 steps	1.07	1.07	1.03	1.05	1.04	1.08	1.09	1.11	1.11	1.65			8.65	8.65	8.28
	velocity	5.65	8.54	8.54	8.87	8.70	8.79	8.46	8.39	8.23	8.23	8.50	8.01				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 25 Aug 2024 14:55) - diamond league race analysis

<https://www.omegatiming.com/File/0002040F0101080101FFFFFFFFFFFF6D.pdf>

Video: No Video

2024 Athletissima (Lausanne, SUI)

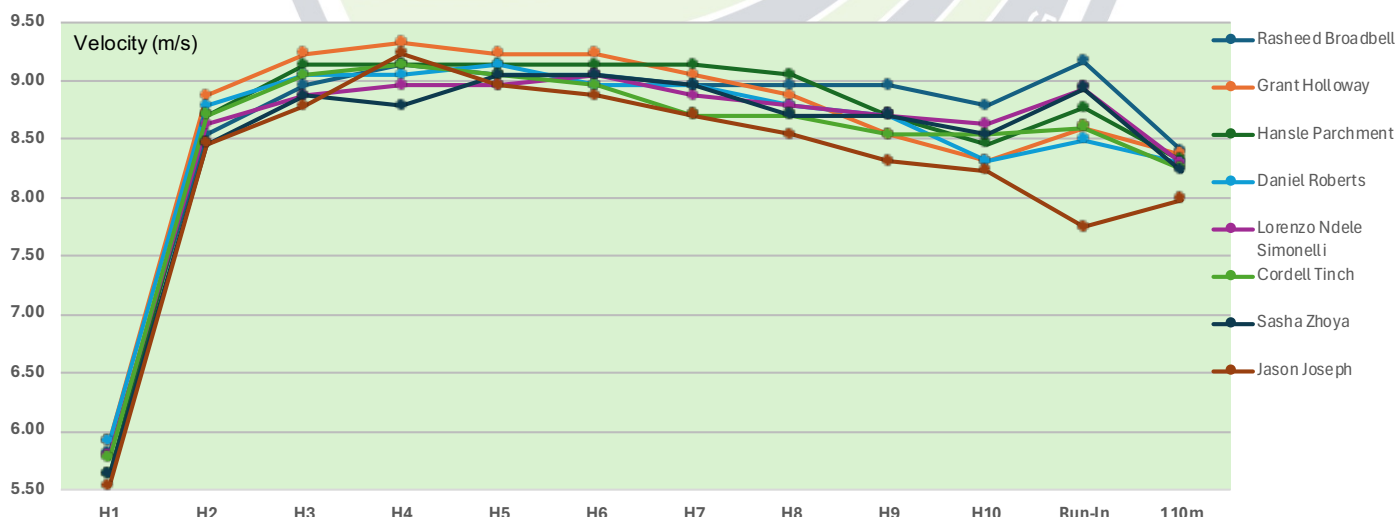
110m Hurdles

Date: 2024.08.22

Wind: -0.1 m/s

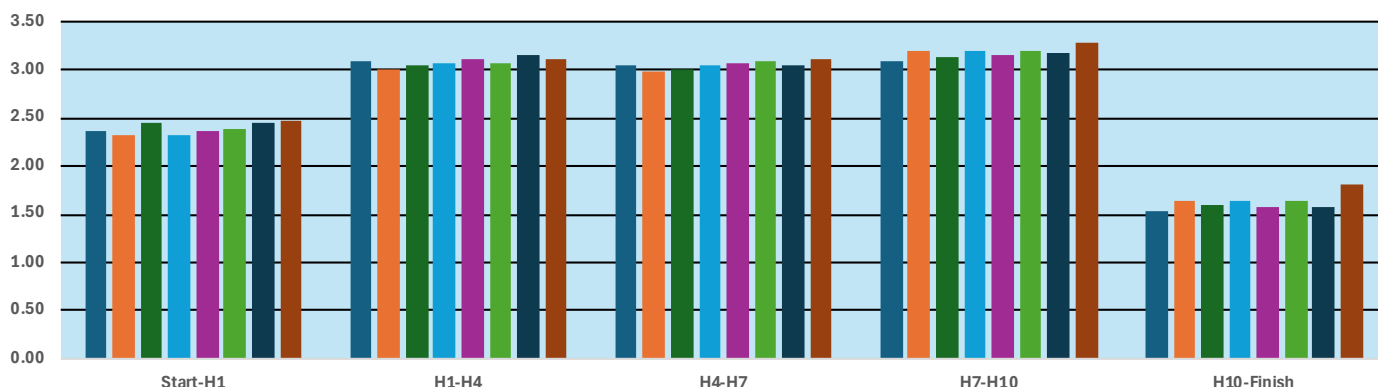
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Broadbell, Rasheed (JAM) (2000)	time	2.36	3.43	4.45	5.45	6.46	7.47	8.49	9.51	10.53	11.57		13.10	3/1			
	reaction time	0.138													3.09	3.04	3.08
	interval	7 steps	1.07	1.02	1.00	1.01	1.01	1.02	1.02	1.02	1.04	1.53			8.87	9.02	8.90
	velocity	5.81	8.54	8.96	9.14	9.05	9.05	8.96	8.96	8.96	8.79	9.16	8.40				
Holloway, Grant (USA) (1997)	time	2.32	3.35	4.34	5.32	6.31	7.30	8.31	9.34	10.41	11.51		13.14	6/2			
	reaction time	0.146													3.00	2.99	3.20
	interval	7 steps	1.03	0.99	0.98	0.99	0.99	1.01	1.03	1.07	1.10	1.63			9.14	9.17	8.57
	velocity	5.91	8.87	9.23	9.33	9.23	9.23	9.05	8.87	8.54	8.31	8.60	8.37				
Parchment, Hansle (JAM) (1990)	time	2.44	3.49	4.49	5.49	6.49	7.49	8.49	9.50	10.55	11.63		13.23	7/3			
	reaction time	0.154													3.05	3.00	3.14
	interval	7 steps	1.05	1.00	1.00	1.00	1.00	1.00	1.01	1.05	1.08	1.60			8.99	9.14	8.73
	velocity	5.62	8.70	9.14	9.14	9.14	9.14	9.14	9.05	8.70	8.46	8.76	8.31				
Roberts, Daniel (USA) (1997)	time	2.32	3.36	4.37	5.38	6.38	7.40	8.42	9.46	10.51	11.61		13.26	5/4			
	reaction time	0.164													3.06	3.04	3.19
	interval	7 steps	1.04	1.01	1.01	1.00	1.02	1.02	1.04	1.05	1.10	1.65			8.96	9.02	8.60
	velocity	5.91	8.79	9.05	9.05	9.14	8.96	8.96	8.79	8.70	8.31	8.50	8.30				
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.37	3.43	4.46	5.48	6.50	7.51	8.54	9.58	10.63	11.69		13.26	4/5			
	reaction time	0.136													3.11	3.06	3.15
	interval	7 steps	1.06	1.03	1.02	1.02	1.01	1.03	1.04	1.05	1.06	1.57			8.82	8.96	8.70
	velocity	5.79	8.62	8.87	8.96	8.96	9.05	8.87	8.79	8.70	8.62	8.93	8.30				
Tinch, Cordell (USA) (2000)	time	2.38	3.43	4.44	5.44	6.45	7.47	8.52	9.57	10.64	11.71		13.34	1/6			
	reaction time	0.153													3.06	3.08	3.19
	interval	7 steps	1.05	1.01	1.00	1.01	1.02	1.05	1.05	1.07	1.07	1.63			8.96	8.90	8.60
	velocity	5.76	8.70	9.05	9.14	9.05	8.96	8.70	8.70	8.54	8.54	8.60	8.25				
Zhoya, Sasha (FRA) (2002)	time	2.44	3.52	4.55	5.59	6.60	7.61	8.63	9.68	10.73	11.80		13.37	8/7			
	reaction time	0.142													3.15	3.04	3.17
	interval	7 steps	1.08	1.03	1.04	1.01	1.01	1.02	1.05	1.05	1.07	1.57			8.70	9.02	8.65
	velocity	5.62	8.46	8.87	8.79	9.05	9.05	8.96	8.70	8.70	8.54	8.93	8.23				
Joseph, Jason (SUI) (1998)	time	2.48	3.56	4.60	5.59	6.61	7.64	8.69	9.76	10.86	11.97		13.78	2/8			
	reaction time	0.148													3.11	3.10	3.28
	interval	7 steps	1.08	1.04	0.99	1.02	1.03	1.05	1.07	1.10	1.11	1.81			8.82	8.85	8.36
	velocity	5.53	8.46	8.79	9.23	8.96	8.87	8.70	8.54	8.31	8.23	7.75	7.98				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 22 Aug 2024 21:14) - diamond league race analysis

<https://www.omegatiming.com/File/0002040E01010B0101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=Y1txJdUJZwQ>

2024 Olympic Games (Paris, FRA)

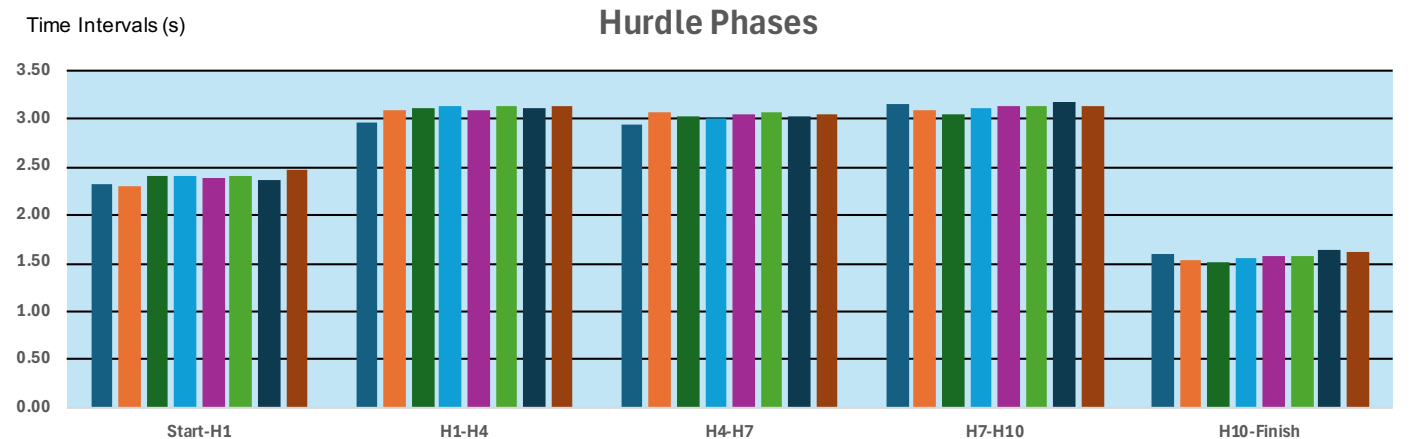
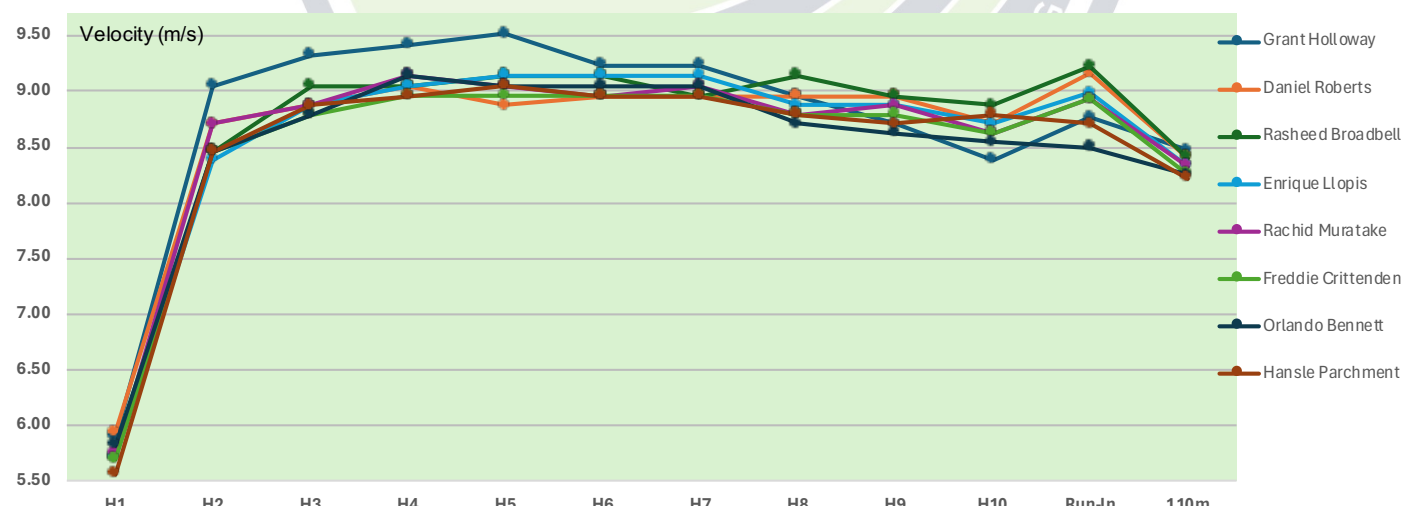
110m Hurdles

Date: 2024.08.08

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
Holloway, Grant (USA) (1997)	time	2.33	3.34	4.32	5.29	6.25	7.24	8.23	9.25	10.30	11.39	12.99	13.09	6 / 1			
	reaction time	0.104													2.96	2.94	3.16
	interval	7 steps	1.01	0.98	0.97	0.96	0.99	0.99	1.02	1.05	1.09	1.60			9.26	9.33	8.68
	velocity	5.89	9.05	9.33	9.42	9.52	9.23	9.23	8.96	8.70	8.39	8.76	8.47				
Roberts, Daniel (USA) (1997)	time	2.31	3.36	4.39	5.40	6.43	7.45	8.47	9.49	10.51	11.56	13.09	13.09	4 / 2			
	reaction time	0.139													3.09	3.07	3.09
	interval	7 steps	1.05	1.03	1.01	1.03	1.02	1.02	1.02	1.02	1.05	1.53			8.87	8.93	8.87
	velocity	5.94	8.70	8.87	9.05	8.87	8.96	8.96	8.96	8.96	8.70	9.16	8.40				
Broadbell, Rasheed (JAM) (2000)	time	2.40	3.48	4.49	5.50	6.50	7.50	8.52	9.52	10.54	11.57	13.09	13.09	5 / 3			
	reaction time	0.144													3.10	3.02	3.05
	interval	7 steps	1.08	1.01	1.01	1.00	1.00	1.02	1.00	1.02	1.03	1.52			8.85	9.08	8.99
	velocity	5.72	8.46	9.05	9.05	9.14	9.14	8.96	9.14	8.96	8.87	9.22	8.40				
Llopis, Enrique (ESP) (2000)	time	2.40	3.49	4.52	5.53	6.53	7.53	8.53	9.56	10.59	11.64	13.20	13.20	3 / 3			
	reaction time	0.144													3.13	3.00	3.11
	interval	7 steps	1.09	1.03	1.01	1.00	1.00	1.00	1.03	1.03	1.05	1.56			8.76	9.14	8.82
	velocity	5.72	8.39	8.87	9.05	9.14	9.14	8.96	9.14	8.87	8.70	8.99	8.33				
Muratake, Rachid (JPN) (2002)	time	2.39	3.44	4.47	5.47	6.48	7.50	8.51	9.55	10.58	11.64	13.21	13.21	9 / 5			
	reaction time	0.161													3.08	3.04	3.13
	interval	7 steps	1.05	1.03	1.00	1.01	1.02	1.01	1.04	1.03	1.06	1.57			8.90	9.02	8.76
	velocity	5.74	8.70	8.87	9.14	9.05	8.96	9.05	8.79	8.87	8.62	8.93	8.33				
Crittenden, Freddie (USA) (1994)	time	2.41	3.49	4.53	5.55	6.57	7.59	8.61	9.65	10.69	11.75	13.32	13.32	8 / 6			
	reaction time	0.161													3.14	3.06	3.14
	interval	7 steps	1.08	1.04	1.02	1.02	1.02	1.02	1.04	1.04	1.06	1.57			8.73	8.96	8.73
	velocity	5.69	8.46	8.79	8.96	8.96	8.96	8.96	8.79	8.79	8.62	8.93	8.26				
Bennett, Orlando (JAM) (1999)	time	2.36	3.44	4.48	5.48	6.49	7.50	8.51	9.56	10.62	11.69	13.34	13.34	7 / 7			
	reaction time	0.142													3.12	3.03	3.18
	interval	7 steps	1.08	1.04	1.00	1.01	1.01	1.01	1.05	1.06	1.07	1.65			8.79	9.05	8.62
	velocity	5.81	8.46	8.79	9.14	9.05	9.05	9.05	8.70	8.62	8.54	8.50	8.25				
Parchment, Hansle (JAM) (1990)	time	2.47	3.55	4.58	5.60	6.61	7.63	8.65	9.69	10.74	11.78	13.39	13.39	2 / 8			
	reaction time	0.144													3.13	3.05	3.13
	interval	7 steps	1.08	1.03	1.02	1.01	1.02	1.02	1.04	1.05	1.04	1.61			8.76	8.99	8.76
	velocity	5.55	8.46	8.87	8.96	9.05	8.96	8.96	8.79	8.70	8.79	8.71	8.22				



Source: Paris 2024 Olympic Games - Results Book (2024), p. 193
https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH-----_.pdf

Video: <https://www.youtube.com/watch?v=Uh23H-acHXg>

2024 Olympic Games (Paris, FRA)

110m Hurdles

Date: 2024.08.07

Wind: 0.6 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	
Bennett, Orlando (JAM) (1999)	time	2.33	3.38	4.40	5.39	6.38	7.38	8.39	9.42	10.45	11.50		13.09	7 / 1				
	reaction time	0.155																
	interval		1.05	1.02	0.99	0.99	1.00	1.01	1.03	1.03	1.05	1.59	PB		3.06	3.00	3.11	
	velocity		5.89	8.70	8.96	9.23	9.23	9.14	9.05	8.87	8.87	8.70	8.82	8.40		8.96	9.14	8.82
Roberts, Daniel (USA) (1997)	time	2.29	3.34	4.36	5.37	6.37	7.38	8.40	9.43	10.46	11.52		13.10	8 / 2				
	reaction time	0.143																
	interval		7 steps	1.05	1.02	1.01	1.00	1.01	1.02	1.03	1.03	1.06	1.58		3.08	3.03	3.12	
	velocity		5.99	8.70	8.96	9.05	9.14	9.05	8.96	8.87	8.87	8.62	8.87	8.40		8.90	9.05	8.79

Date: 2024.08.07

Wind: -0.1 m/s

Semi-Final 2

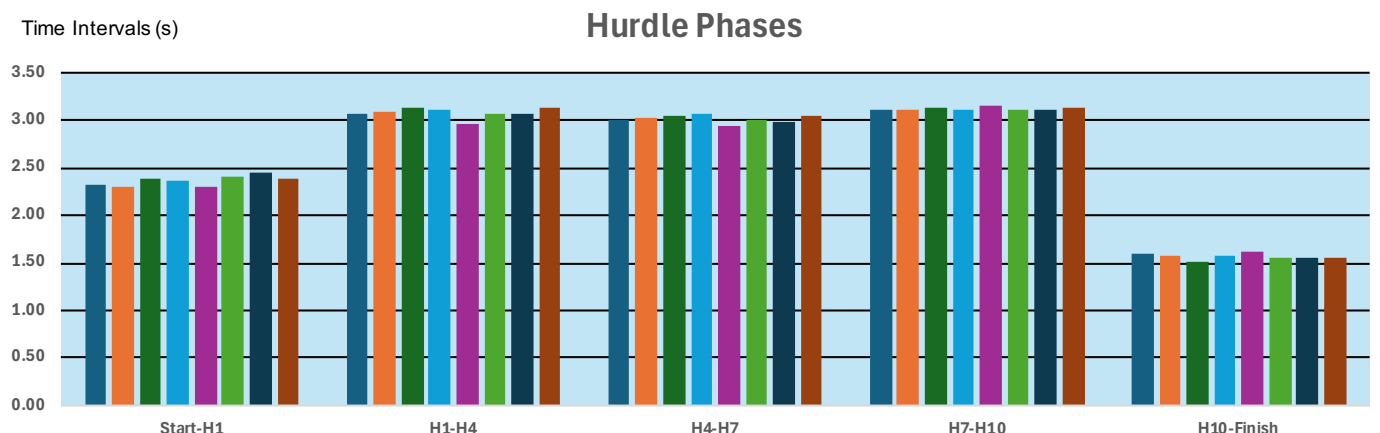
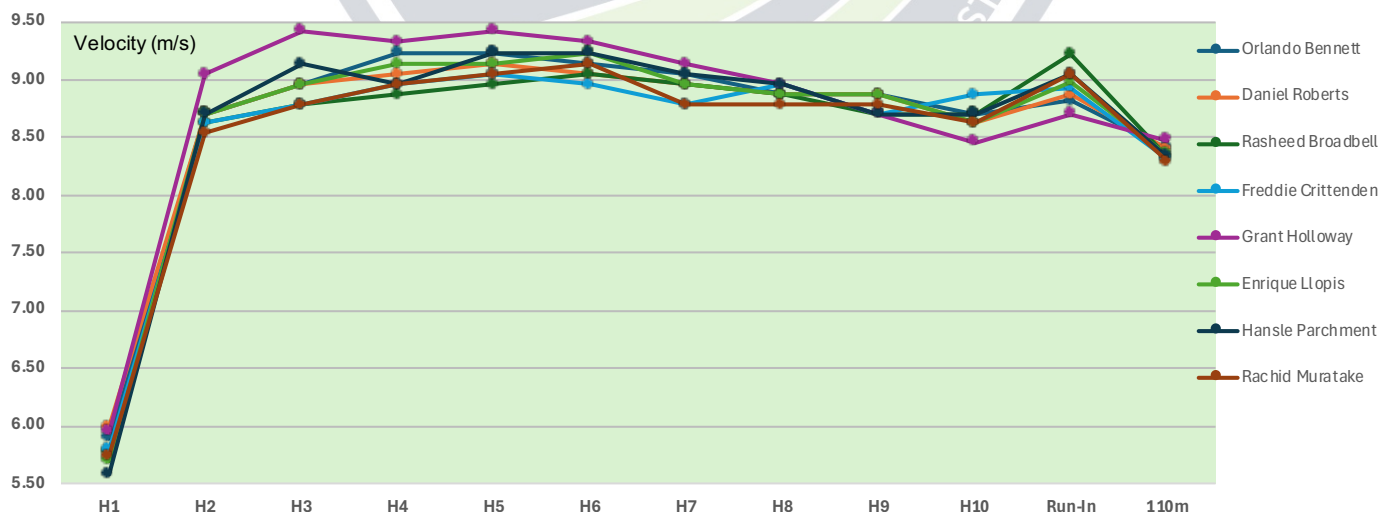
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10	
Broadbell, Rasheed (JAM) (2000)	time	2.38	3.44	4.48	5.51	6.53	7.54	8.56	9.59	10.64	11.69		13.21	6 / 1				
	reaction time	0.151																
	interval		7 steps	1.06	1.04	1.03	1.02	1.01	1.02	1.03	1.05	1.05	1.52		3.13	3.05	3.13	
	velocity		5.76	8.62	8.79	8.87	8.96	9.05	8.96	8.87	8.70	8.70	9.22	8.33		8.76	8.99	8.76
Crittenden, Freddie (USA) (1994)	time	2.37	3.43	4.47	5.49	6.50	7.52	8.56	9.58	10.63	11.66		13.23	2 / 2				
	reaction time	0.139																
	interval		1.06	1.04	1.02	1.01	1.02	1.04	1.02	1.05	1.03	1.57			3.12	3.07	3.10	
	velocity		5.79	8.62	8.79	8.96	9.05	8.96	8.79	8.96	8.70	8.93	8.31		8.79	8.93	8.85	

Date: 2024.08.07

Wind: 0.1 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	
Holloway, Grant (USA) (1997)	time	2.31	3.32	4.29	5.27	6.24	7.22	8.22	9.24	10.29	11.37		12.98	6 / 1				
	reaction time	0.149																
	interval		7 steps	1.01	0.97	0.98	0.97	0.98	1.00	1.02	1.05	1.08	1.61		2.96	2.95	3.15	
	velocity		5.94	9.05	9.42	9.33	9.42	9.33	9.14	8.96	8.70	8.46	8.71	8.47		9.26	9.29	8.70
Llopis, Enrique (ESP) (2000)	time	2.41	3.46	4.48	5.48	6.48	7.47	8.49	9.52	10.55	11.61		13.17	5 / 2				
	reaction time	0.138																
	interval		7 steps	1.05	1.02	1.00	1.00	0.99	1.02	1.03	1.03	1.06	1.56		3.07	3.01	3.12	
	velocity		5.69	8.70	8.96	9.14	9.14	9.23	8.96	8.87	8.62	8.99	8.35		8.93	9.11	8.79	
Parchment, Hansle (JAM) (1990)	time	2.46	3.51	4.51	5.53	6.52	7.51	8.52	9.54	10.59	11.64		13.19	3 / 3				
	reaction time	0.148																
	interval		7 steps	1.05	1.00	1.02	0.99	0.99	1.01	1.02	1.05	1.05	1.55		3.07	2.99	3.12	
	velocity		5.58	8.70	9.14	8.96	9.23	9.23	9.05	8.96	8.70	8.70	9.05	8.34		8.93	9.17	8.79
Muratake, Rachid (JPN) (2002)	time	2.39	3.46	4.50	5.52	6.53	7.53	8.57	9.61	10.65	11.71		13.26	4 / 4				
	reaction time	0.160																
	interval		7 steps	1.07	1.04	1.02	1.01	1.00	1.04	1.04	1.06	1.55			3.13	3.05	3.14	
	velocity		5.74	8.54	8.79	8.96	9.05	9.14	8.79	8.79	8.79	8.62	9.05	8.30		8.76	8.99	8.73



Source: Paris 2024 Olympic Games - Results Book (2024), p. 197-199

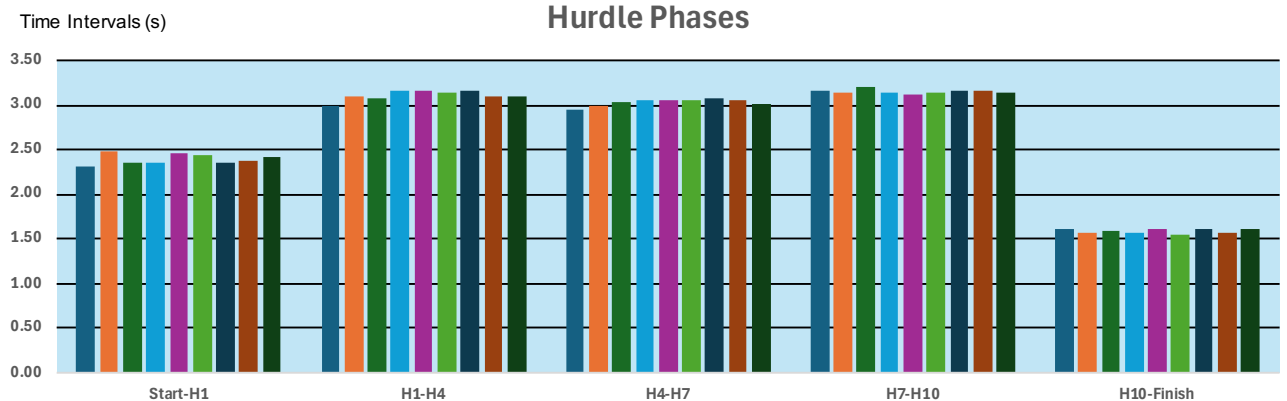
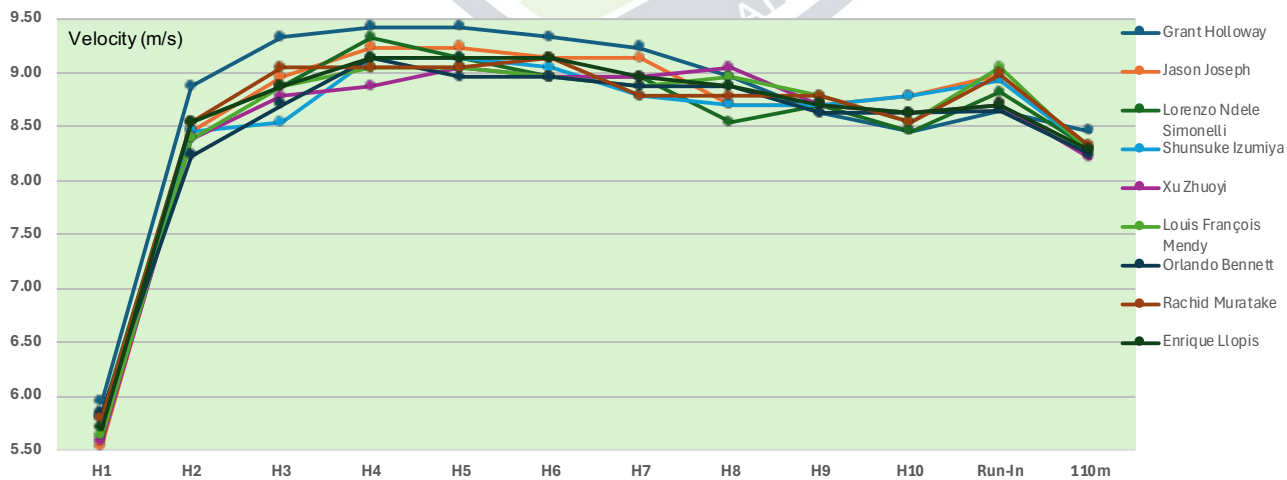
https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH-----pdf

Video: <https://olympics.com/en/paris-2024/videos/track-and-field-day-13-afternoon-athletics-olympic-games-paris-2024>

Biomechanical Analysis

2024 Olympic Games (Paris, FRA)

110m Hurdles													Heat 5				
Date: 2024.08.04 Wind: 0.7 m/s																	
		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	2.31	3.34	4.32	5.29	6.26	7.24	8.23	9.25	10.31	11.39		13.01	6 / 1			
	reaction time	0.136													2.98	2.94	3.16
	interval velocity	7 steps	1.03	0.98	0.97	0.97	0.98	0.99	1.02	1.06	1.08	1.62			9.20	9.33	8.68
Date: 2024.08.04 Wind: 0.3 m/s													Heat 4				
Date: 2024.08.04 Wind: 0.3 m/s																	
Joseph, Jason (SUI) (1998)	time	2.48	3.56	4.58	5.57	6.56	7.56	8.56	9.61	10.66	11.70		13.26	6 / 1			
	reaction time	0.170													3.09	2.99	3.14
	interval velocity	7 steps	1.08	1.02	0.99	0.99	1.00	1.00	1.05	1.04	1.04	1.56			8.87	9.17	8.73
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.36	3.43	4.46	5.44	6.44	7.46	8.48	9.55	10.60	11.68		13.27	7 / 2			
	reaction time	0.151													3.08	3.04	3.20
	interval velocity	7 steps	1.07	1.03	0.98	1.00	1.02	1.02	1.07	1.05	1.08	1.59			8.90	9.02	8.57
Izumiya, Shunsuke (JPN) (2000)	time	2.36	3.44	4.51	5.51	6.51	7.52	8.56	9.61	10.66	11.70		13.27	9 / 3			
	reaction time	0.150													3.15	3.05	3.14
	interval velocity	7 steps	1.08	1.07	1.00	1.00	1.01	1.04	1.05	1.05	1.04	1.57			8.70	8.99	8.73
Date: 2024.08.04 Wind: 1.1 m/s													Heat 3				
Date: 2024.08.04 Wind: 1.1 m/s																	
Xu Zhuoyi (CHN) (2003)	time	2.46	3.55	4.59	5.62	6.63	7.65	8.67	9.68	10.73	11.79		13.40	7 / 1			
	reaction time	0.159													3.16	3.05	3.12
	interval velocity	7 steps	1.09	1.04	1.03	1.01	1.02	1.02	1.01	1.05	1.06	1.61			8.68	8.99	8.79
Date: 2024.08.04 Wind: 1.2 m/s													Heat 2				
Date: 2024.08.04 Wind: 1.2 m/s																	
Mendy, Louis François (SEN) (1999)	time	2.44	3.53	4.56	5.57	6.58	7.60	8.63	9.65	10.69	11.76		13.31	9 / 1			
	reaction time	0.170													3.13	3.06	3.13
	interval velocity	7 steps	1.09	1.03	1.01	1.01	1.02	1.03	1.02	1.04	1.07	1.55			8.76	8.96	8.76
Bennett, Orlando (JAM) (1999)	time	2.35	3.46	4.51	5.51	6.53	7.55	8.58	9.61	10.67	11.73		13.35	7 / 2			
	reaction time	0.160													3.16	3.07	3.15
	interval velocity	7 steps	1.11	1.05	1.00	1.02	1.02	1.03	1.03	1.06	1.06	1.62			8.68	8.93	8.70
Date: 2024.08.04 Wind: 0.1 m/s													Heat 1				
Date: 2024.08.04 Wind: 0.1 m/s																	
Muratake, Rachid (JPN) (2002)	time	2.37	3.44	4.45	5.46	6.47	7.47	8.51	9.55	10.59	11.66		13.22	8 / 1			
	reaction time	0.139													3.09	3.05	3.15
	interval velocity	7 steps	1.07	1.01	1.01	1.01	1.00	1.04	1.04	1.04	1.07	1.56			8.87	8.99	8.70
Llopis, Enrique (ESP) (2000)	time	2.41	3.48	4.51	5.51	6.51	7.51	8.53	9.56	10.61	11.67		13.28	9 / 2			
	reaction time	0.143													3.10	3.02	3.14
	interval velocity	7 steps	1.07	1.03	1.00	1.00	1.00	1.02	1.03	1.05	1.06	1.61			8.85	9.08	8.73



Source: Paris 2024 Olympic Games - Results Book (2024), p. 209-213

https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH-----pdf

Video: <https://olympics.com/en/paris-2024/videos/track-and-field/day-10-morning-athletics-olympic-games-paris-2024>

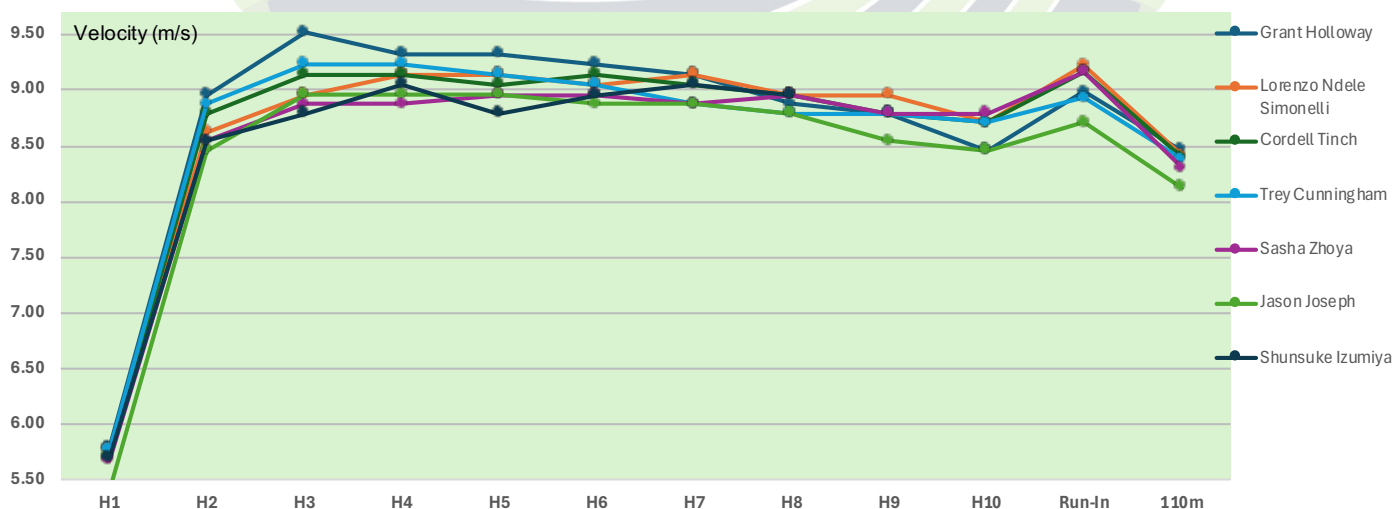
2024 Herculis Meeting International d'Athlétisme (Monaco, MON)

110m Hurdles

Date: 2024.07.12 Wind: -0.7 m/s

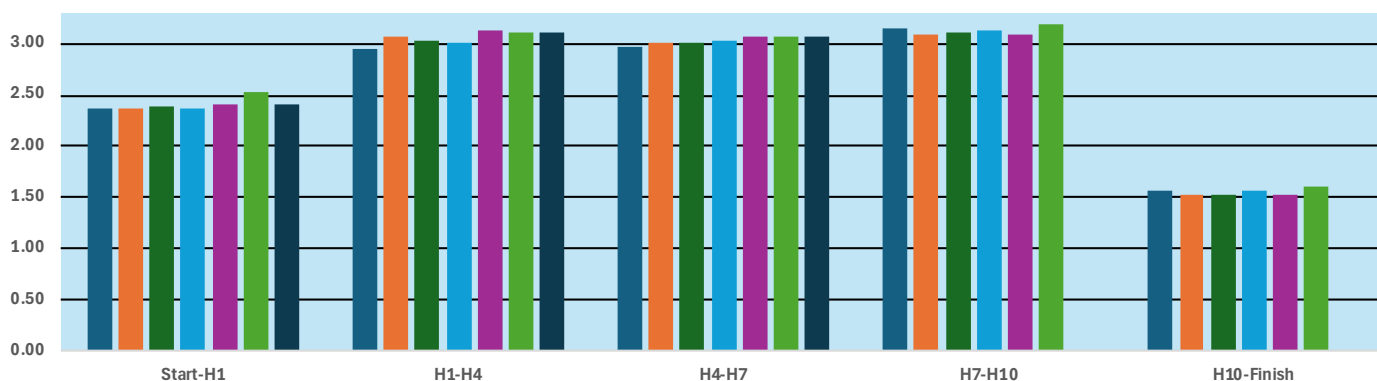
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.37	3.39	4.35	5.33	6.31	7.30	8.30	9.33	10.37	11.45		13.01	6 / 1			
	reaction time	0.132													2.96	2.97	3.15
	interval	7 steps	1.02	0.96	0.98	0.98	0.99	1.00	1.03	1.04	1.08	1.56			9.26	9.23	8.70
	velocity	5.79	8.96	9.52	9.33	9.33	9.23	9.14	8.87	8.79	8.46	8.99	8.46				
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.38	3.44	4.46	5.46	6.46	7.47	8.47	9.49	10.51	11.56		13.08	3 / 2			
	reaction time	0.140													3.08	3.01	3.09
	interval	7 steps	1.06	1.02	1.00	1.00	1.01	1.00	1.02	1.02	1.05	1.52			8.90	9.11	8.87
	velocity	5.76	8.62	8.96	9.14	9.14	9.05	9.14	8.96	8.96	8.70	9.22	8.41				
Tinch, Cordell (USA) (2000)	time	2.40	3.44	4.44	5.44	6.45	7.45	8.46	9.48	10.52	11.57		13.10	7 / 3			
	reaction time	0.161													3.04	3.02	3.11
	interval	7 steps	1.04	1.00	1.00	1.01	1.00	1.01	1.02	1.04	1.05	1.53			9.02	9.08	8.82
	velocity	5.72	8.79	9.14	9.14	9.05	9.14	9.05	8.96	8.79	8.70	9.16	8.40				
Cunningham, Trey (USA) (1998)	time	2.38	3.41	4.40	5.39	6.39	7.40	8.43	9.47	10.51	11.56		13.13	4 / 4			
	reaction time	0.134													3.01	3.04	3.13
	interval	7 steps	1.03	0.99	0.99	1.00	1.01	1.03	1.04	1.04	1.05	1.57			9.11	9.02	8.76
	velocity	5.76	8.87	9.23	9.23	9.14	9.05	8.87	8.79	8.79	8.70	8.93	8.38				
Zhoya, Sasha (FRA) (2002)	time	2.42	3.49	4.52	5.55	6.57	7.59	8.62	9.64	10.68	11.72		13.25	5 / 5			
	reaction time	0.137													3.13	3.07	3.10
	interval	7 steps	1.07	1.03	1.03	1.02	1.02	1.03	1.02	1.04	1.04	1.53			8.76	8.93	8.85
	velocity	5.67	8.54	8.87	8.87	8.96	8.96	8.87	8.96	8.79	8.79	9.16	8.30				
Joseph, Jason (SUI) (1998)	time	2.54	3.62	4.64	5.66	6.68	7.71	8.74	9.78	10.85	11.93		13.54	1 / 6			
	reaction time	0.154													3.12	3.08	3.19
	interval	7 steps	1.08	1.02	1.02	1.02	1.03	1.03	1.04	1.07	1.08	1.61			8.79	8.90	8.60
	velocity	5.40	8.46	8.96	8.96	8.96	8.87	8.87	8.79	8.54	8.46	8.71	8.12				
Izumiya, Shunsuke (JPN) (2000)	time	2.41	3.48	4.52	5.53	6.57	7.59	8.60	9.62				dnf	8 / --			
	reaction time	0.156													3.12	3.07	
	interval	7 steps	1.07	1.04	1.01	1.04	1.02	1.01	1.02						8.79	8.93	
	velocity	5.69	8.54	8.79	9.05	8.79	8.96	9.05	8.96								



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 12 Jul 2024 21:05) - diamond league race analysis
<https://www.omegaitiming.com/File/0002040C0102060101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=5cpA23m0WGg>

2024 Meeting de Paris (Paris, FRA)

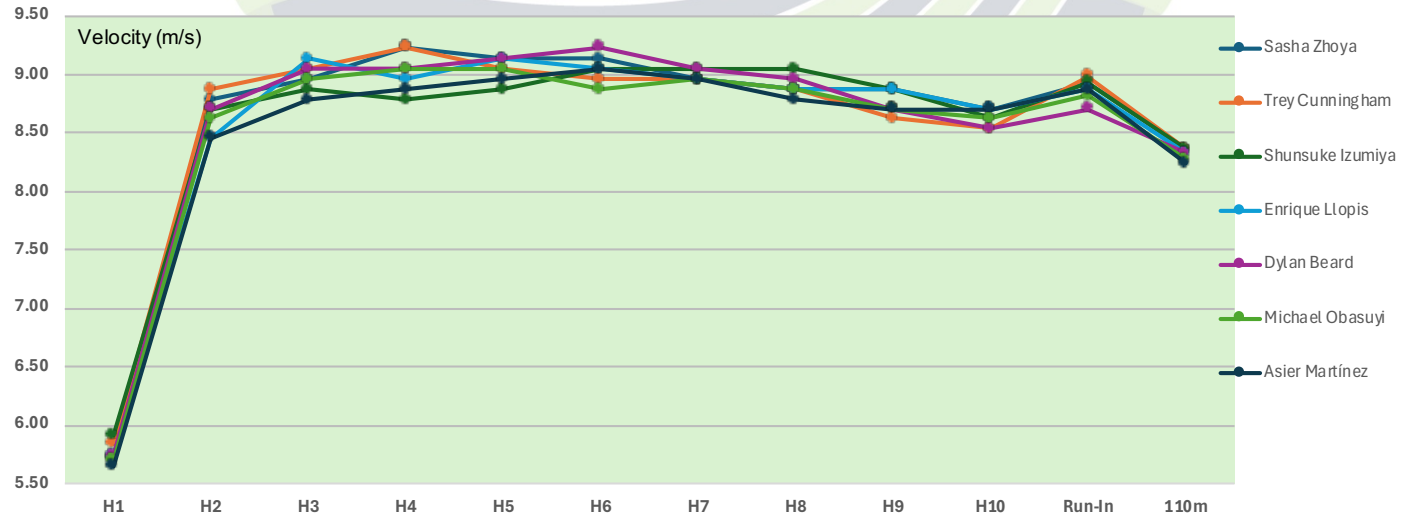
110m Hurdles

Date: 2024.07.07

Wind: -0.6 m/s

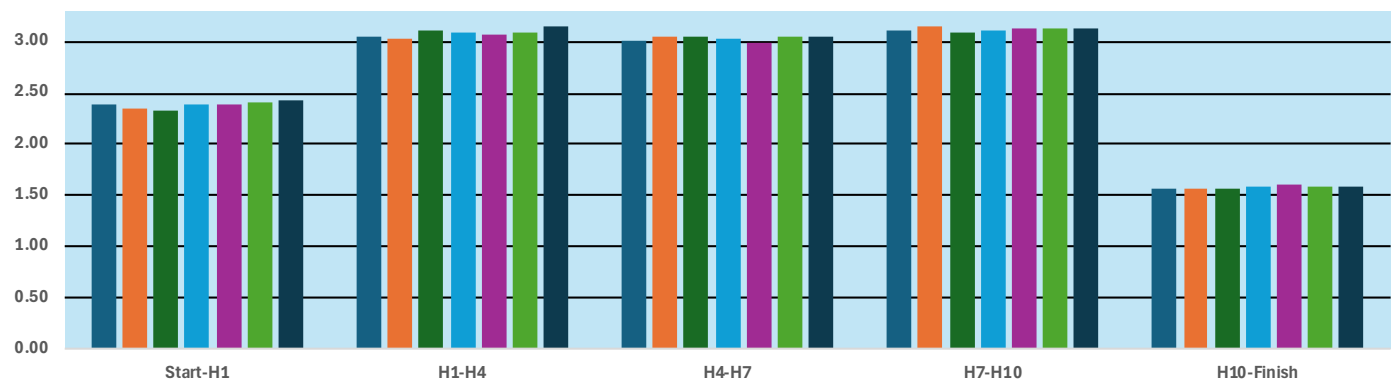
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Zhoya, Sasha (FRA) (2002)	time	2.40	3.44	4.46	5.45	6.45	7.45	8.47	9.50	10.53	11.58	13.15	13.15	8 / 1			
	reaction time	0.142													3.05	3.02	3.11
	interval	7 steps	1.04	1.02	0.99	1.00	1.00	1.02	1.03	1.03	1.05	1.57	=PB		8.99	9.08	8.82
	velocity	5.72	8.79	8.96	9.23	9.14	9.14	8.96	8.87	8.87	8.70	8.93	8.37				
Cunningham, Trey (USA) (1998)	time	2.35	3.38	4.39	5.38	6.39	7.41	8.43	9.46	10.52	11.59	13.15	13.15	5 / 2			
	reaction time	0.148													3.03	3.05	3.16
	interval	7 steps	1.03	1.01	0.99	1.01	1.02	1.02	1.03	1.06	1.07	1.56			9.05	8.99	8.68
	velocity	5.84	8.87	9.05	9.23	9.05	8.96	8.96	8.87	8.62	8.54	8.99	8.37				
Izumiya, Shunsuke (JPN) (2000)	time	2.32	3.37	4.40	5.44	6.47	7.48	8.49	9.50	10.53	11.59	13.16	13.16	6 / 3			
	reaction time	0.145													3.12	3.05	3.10
	interval	7 steps	1.05	1.03	1.04	1.03	1.01	1.01	1.01	1.03	1.06	1.57			8.79	8.99	8.85
	velocity	5.91	8.70	8.87	8.79	8.87	9.05	9.05	9.05	8.87	8.62	8.93	8.36				
Llopis, Enrique (ESP) (2000)	time	2.39	3.47	4.47	5.49	6.49	7.50	8.52	9.55	10.58	11.63	13.21	13.21	1 / 4			
	reaction time	0.146													3.10	3.03	3.11
	interval	7 steps	1.08	1.00	1.02	1.00	1.01	1.02	1.03	1.03	1.05	1.58			8.85	9.05	8.82
	velocity	5.74	8.46	9.14	8.96	9.14	9.05	8.96	8.87	8.87	8.70	8.87	8.33				
Beard, Dylan (USA) (1998)	time	2.39	3.44	4.45	5.46	6.46	7.45	8.46	9.48	10.53	11.60	13.21	13.21	3 / 5			
	reaction time	0.156													3.07	3.00	3.14
	interval	7 steps	1.05	1.01	1.01	1.00	0.99	1.01	1.02	1.05	1.07	1.61			8.93	9.14	8.73
	velocity	5.74	8.70	9.05	9.05	9.14	9.23	9.05	8.96	8.70	8.54	8.71	8.33				
Obasuyi, Michael (BEL) (1999)	time	2.41	3.47	4.49	5.50	6.51	7.54	8.56	9.59	10.64	11.70	13.29	13.29	7 / 6			
	reaction time	0.151													3.09	3.06	3.14
	interval	7 steps	1.06	1.02	1.01	1.01	1.03	1.02	1.03	1.05	1.06	1.59			8.87	8.96	8.73
	velocity	5.69	8.62	8.96	9.05	9.05	8.87	8.96	8.87	8.70	8.62	8.82	8.28				
Martínez, Asier (ESP) (2000)	time	2.43	3.51	4.55	5.58	6.60	7.61	8.63	9.67	10.72	11.77	13.35	13.35	2 / 7			
	reaction time	0.139													3.15	3.05	3.14
	interval	7 steps	1.08	1.04	1.03	1.02	1.01	1.02	1.04	1.05	1.05	1.58			8.70	8.99	8.73
	velocity	5.65	8.46	8.79	8.87	8.96	9.05	8.96	8.79	8.70	8.70	8.87	8.24				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 07 Jul 2024 16:50) - diamond league race analysis

<https://www.omegaitiming.com/File/0002040B0101090201FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=ACVFqC1mvus>

2024 Meeting de Paris (Paris, FRA)

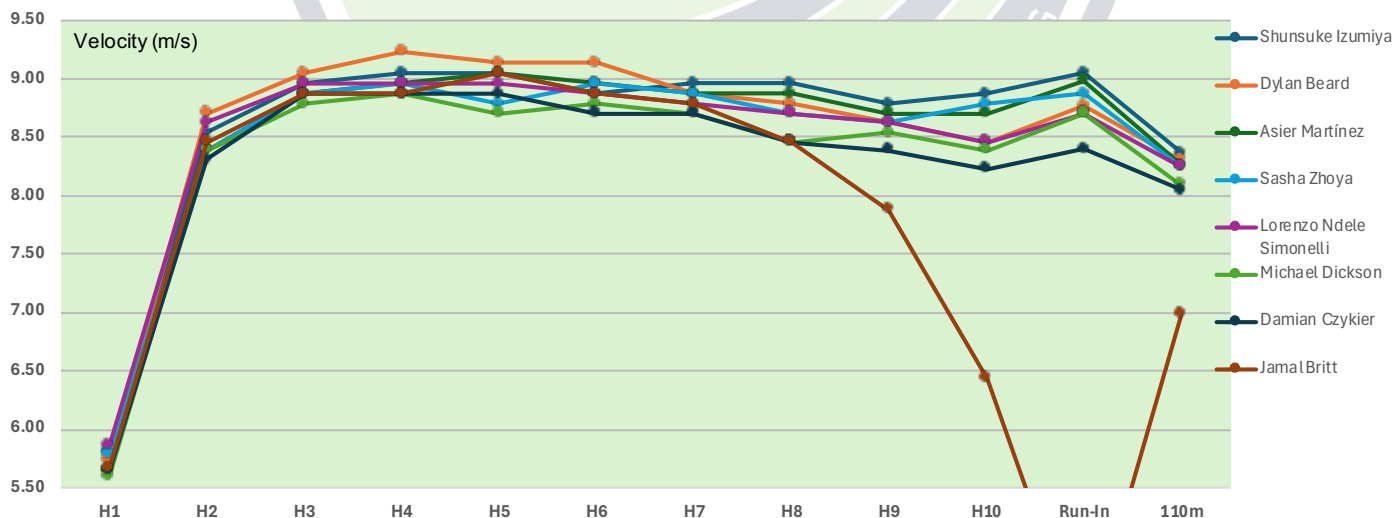
110m Hurdles

Date: 2024.07.07

Wind: 0.4 m/s

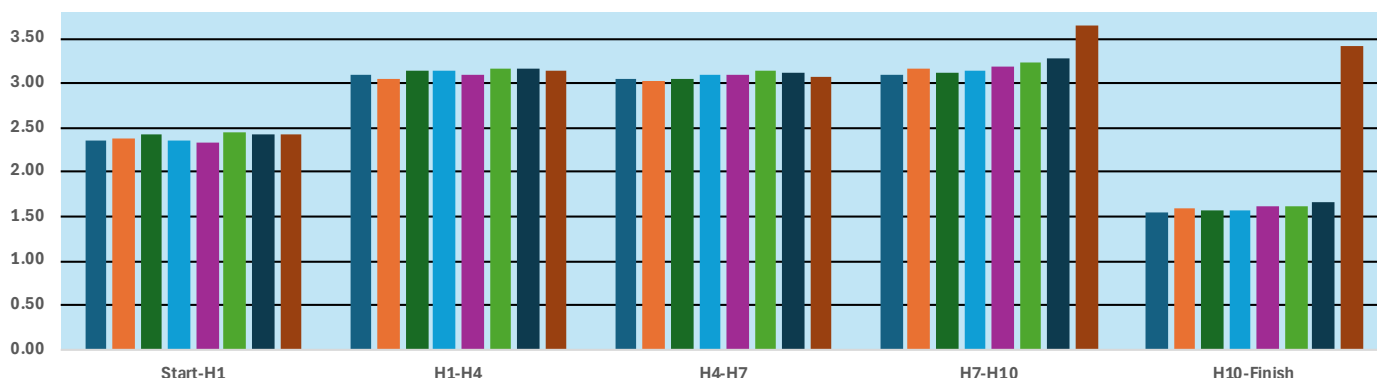
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Izumiya, Shunsuke (JPN) (2000)	time	2.36	3.43	4.45	5.46	6.47	7.50	8.52	9.54	10.58	11.61		13.16	7 / 1			
	reaction time	0.137															
	interval	7 steps	1.07	1.02	1.01	1.01	1.03	1.02	1.02	1.04	1.03	1.55			3.10	3.06	3.09
	velocity	5.81	8.54	8.96	9.05	9.05	8.87	8.96	8.96	8.79	8.87	9.05	8.36		8.85	8.96	8.87
Beard, Dylan (USA) (1998)	time	2.39	3.44	4.45	5.44	6.44	7.44	8.47	9.51	10.57	11.65		13.25	3 / 2			
	reaction time	0.164															
	interval	7 steps	1.05	1.01	0.99	1.00	1.00	1.03	1.04	1.06	1.08	1.60			3.05	3.03	3.18
	velocity	5.74	8.70	9.05	9.23	9.14	9.14	8.87	8.79	8.62	8.46	8.76	8.30		8.99	9.05	8.62
Martinez, Asier (ESP) (2000)	time	2.43	3.52	4.55	5.57	6.58	7.60	8.63	9.66	10.71	11.76		13.32	8 / 3			
	reaction time	0.140															
	interval	7 steps	1.09	1.03	1.02	1.01	1.02	1.03	1.03	1.05	1.05	1.56			3.14	3.06	3.13
	velocity	5.65	8.39	8.87	8.96	9.05	8.96	8.87	8.87	8.70	8.70	8.99	8.26		8.73	8.96	8.76
Zhoya, Sasha (FRA) (2002)	time	2.37	3.46	4.49	5.51	6.55	7.57	8.60	9.65	10.71	11.75		13.33	6 / 4			
	reaction time	0.135															
	interval	7 steps	1.09	1.03	1.02	1.04	1.02	1.03	1.05	1.06	1.04	1.58			3.14	3.09	3.15
	velocity	5.79	8.39	8.87	8.96	8.79	8.96	8.87	8.70	8.62	8.79	8.87	8.25		8.73	8.87	8.70
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.34	3.40	4.42	5.44	6.46	7.49	8.53	9.58	10.64	11.72		13.33	4 / 5			
	reaction time	0.140															
	interval	7 steps	1.06	1.02	1.02	1.02	1.03	1.04	1.05	1.06	1.08	1.61			3.10	3.09	3.19
	velocity	5.86	8.62	8.96	8.96	8.96	8.87	8.79	8.70	8.62	8.46	8.71	8.25		8.85	8.87	8.60
Dickson, Michael (USA) (1997)	time	2.45	3.54	4.58	5.61	6.66	7.70	8.75	9.83	10.90	11.99		13.60	2 / 6			
	reaction time	0.192															
	interval	7 steps	1.09	1.04	1.03	1.05	1.04	1.05	1.08	1.07	1.09	1.61			3.16	3.14	3.24
	velocity	5.60	8.39	8.79	8.87	8.70	8.79	8.70	8.46	8.54	8.39	8.71	8.09		8.68	8.73	8.46
Czykier, Damian (POL) (1992)	time	2.43	3.53	4.56	5.59	6.62	7.67	8.72	9.80	10.89	12.00		13.67	1 / 7			
	reaction time	0.152															
	interval	7 steps	1.10	1.03	1.03	1.03	1.05	1.05	1.08	1.09	1.11	1.67			3.16	3.13	3.28
	velocity	5.65	8.31	8.87	8.87	8.87	8.70	8.70	8.46	8.39	8.23	8.40	8.05		8.68	8.76	8.36
Britt, Jamal (USA) (1998)	time	2.42	3.50	4.53	5.56	6.57	7.60	8.64	9.72	10.88	12.30		15.73	5 / 8			
	reaction time	0.153															
	interval	7 steps	1.08	1.03	1.03	1.01	1.03	1.04	1.08	1.16	1.42	3.43			3.14	3.08	3.66
	velocity	5.67	8.46	8.87	8.87	9.05	8.87	8.79	8.46	7.88	6.44	4.09	6.99		8.73	8.90	7.49



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 07 Jul 2024 15:35) - diamond league race analysis
<https://www.omegatiming.com/File/0002040B0101090102FFFFFFFFFFFF6D.pdf>

Video: No Video

2024 Meeting de Paris (Paris, FRA)

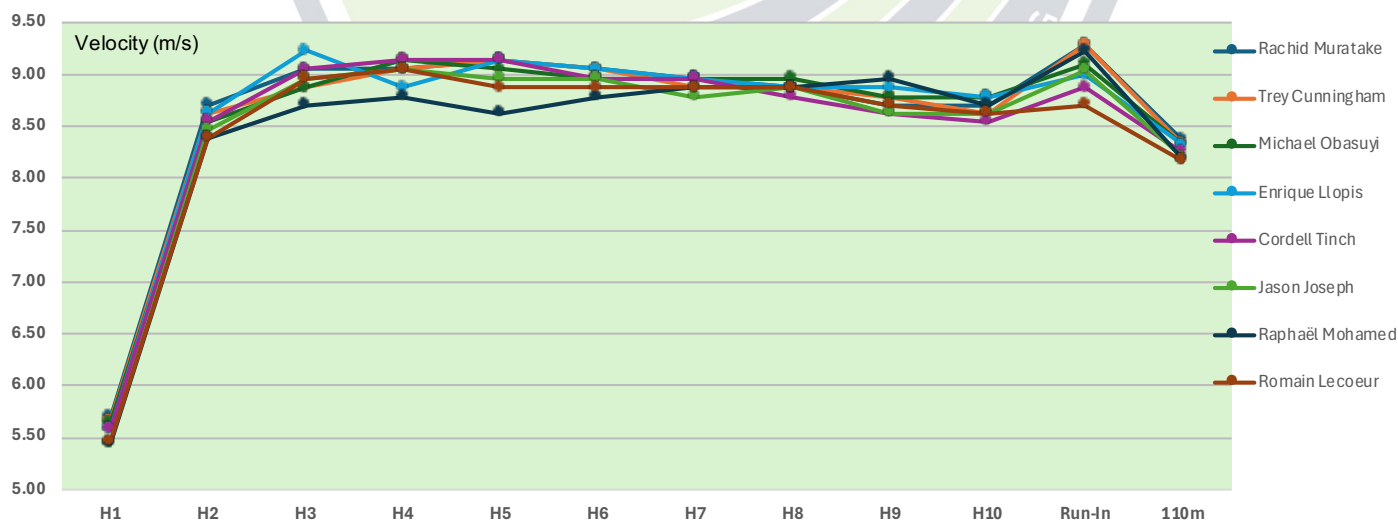
110m Hurdles

Date: 2024.07.07

Wind: 0.1 m/s

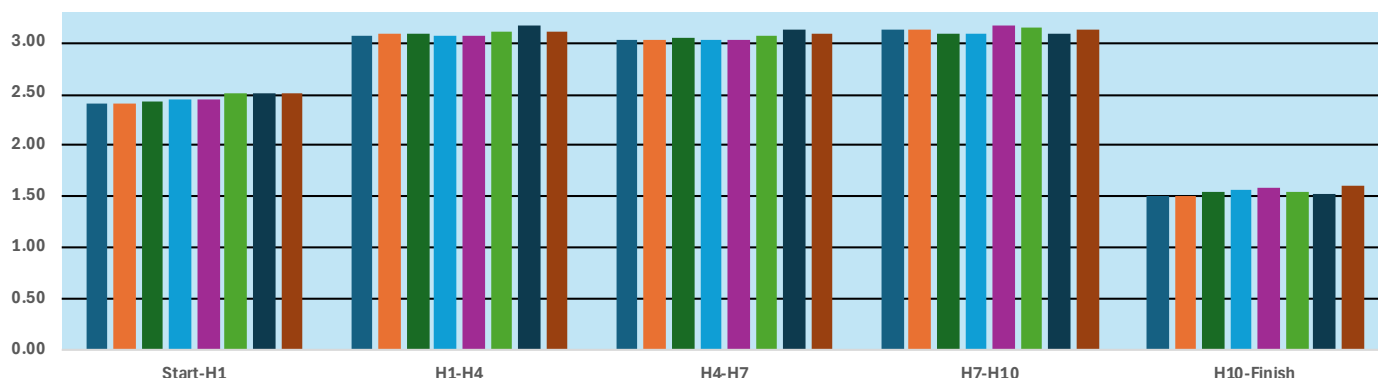
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Muratake, Rachid (JPN) (2002)	time	2.41	3.46	4.47	5.48	6.48	7.49	8.51	9.54	10.59	11.64		13.15	6 / 1			
	reaction time	0.149															
	interval	7 steps	1.05	1.01	1.01	1.00	1.01	1.02	1.03	1.05	1.05	1.51			3.07	3.03	3.13
	velocity	5.69	8.70	9.05	9.05	9.14	9.05	8.96	8.87	8.70	8.70	9.28	8.37		8.93	9.05	8.76
Cunningham, Trey (USA) (1998)	time	2.42	3.48	4.51	5.52	6.52	7.53	8.56	9.59	10.63	11.69		13.20	4 / 2			
	reaction time	0.165															
	interval	7 steps	1.06	1.03	1.01	1.00	1.01	1.03	1.03	1.04	1.06	1.51			3.10	3.04	3.13
	velocity	5.67	8.62	8.87	9.05	9.14	9.05	8.87	8.87	8.79	8.62	9.28	8.33		8.85	9.02	8.76
Obasuyi, Michael (BEL) (1999)	time	2.43	3.50	4.53	5.53	6.54	7.56	8.58	9.60	10.64	11.68		13.22	7 / 3			
	reaction time	0.129															
	interval	7 steps	1.07	1.03	1.00	1.01	1.02	1.02	1.02	1.04	1.04	1.54			3.10	3.05	3.10
	velocity	5.65	8.54	8.87	9.14	9.05	8.96	8.96	8.96	8.79	8.79	9.10	8.32		8.85	8.99	8.85
Llopis, Enrique (ESP) (2000)	time	2.46	3.52	4.51	5.54	6.54	7.55	8.57	9.60	10.63	11.67		13.23	3 / 4			
	reaction time	0.144															
	interval	7 steps	1.06	0.99	1.03	1.00	1.01	1.02	1.03	1.03	1.04	1.56			3.08	3.03	3.10
	velocity	5.58	8.62	9.23	8.87	9.14	9.05	8.96	8.87	8.87	8.79	8.99	8.31		8.90	9.05	8.85
Tinch, Cordell (USA) (2000)	time	2.46	3.53	4.54	5.54	6.54	7.56	8.58	9.62	10.68	11.75		13.33	5 / 5			
	reaction time	0.174															
	interval	7 steps	1.07	1.01	1.00	1.00	1.02	1.02	1.04	1.06	1.07	1.58			3.08	3.04	3.17
	velocity	5.58	8.54	9.05	9.14	9.14	8.96	8.96	8.79	8.62	8.54	8.87	8.25		8.90	9.02	8.65
Joseph, Jason (SUI) (1998)	time	2.52	3.60	4.62	5.63	6.65	7.67	8.71	9.74	10.80	11.86		13.41	2 / 6			
	reaction time	0.158															
	interval	7 steps	1.08	1.02	1.01	1.02	1.02	1.04	1.03	1.06	1.06	1.55			3.11	3.08	3.15
	velocity	5.44	8.46	8.96	9.05	8.96	8.96	8.79	8.87	8.62	8.62	9.05	8.20		8.82	8.90	8.70
Mohamed, Raphaël (FRA) (1998)	time	2.52	3.61	4.66	5.70	6.76	7.80	8.83	9.86	10.88	11.93		13.45	8 / 7			
	reaction time	0.155															
	interval	7 steps	1.09	1.05	1.04	1.06	1.04	1.03	1.03	1.03	1.02	1.52			3.18	3.13	3.10
	velocity	5.44	8.39	8.70	8.79	8.62	8.79	8.87	8.87	8.96	8.70	9.22	8.18		8.62	8.76	8.85
Lecoer, Romain (FRA) (1997)	time	2.51	3.60	4.62	5.63	6.66	7.69	8.72	9.75	10.80	11.86		13.47	1 / 8			
	reaction time	0.177															
	interval	7 steps	1.09	1.02	1.01	1.03	1.03	1.03	1.03	1.05	1.06	1.61			3.12	3.09	3.14
	velocity	5.47	8.39	8.96	9.05	8.87	8.87	8.87	8.87	8.70	8.62	8.71	8.17		8.79	8.87	8.73



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 07 Jul 2024 15:34) - diamond league race analysis
<https://www.omegatiming.com/File/0002040B0101090101FFFFFFFFFFFF6D.pdf>

Video: No Video

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

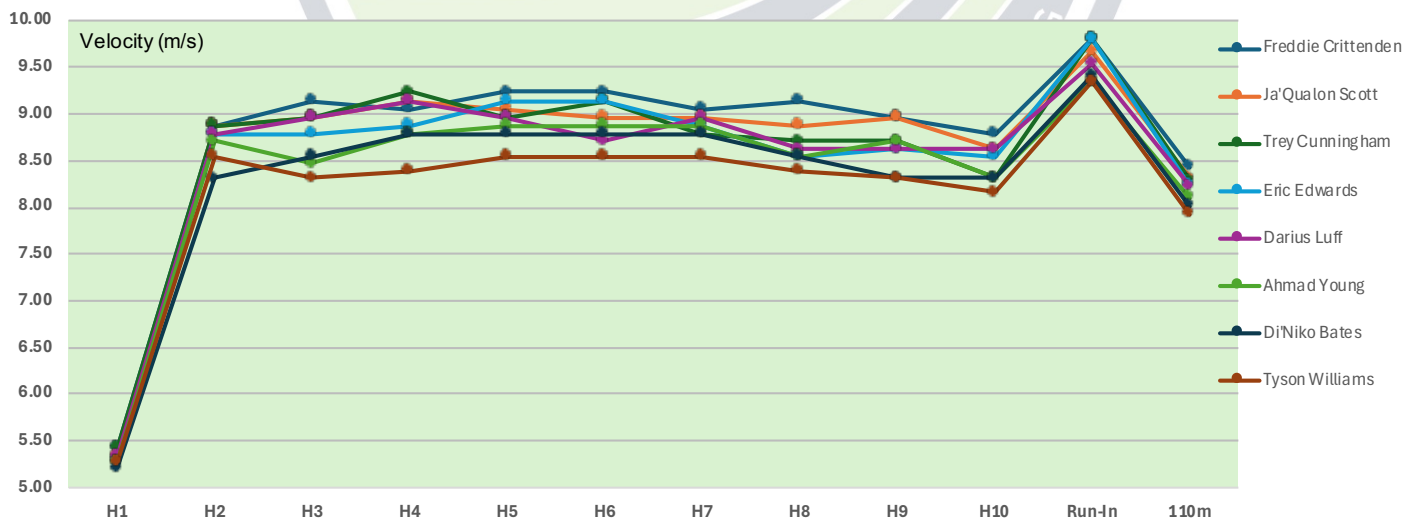
110m Hurdles

Date: 2024.06.27

Wind: -0.2 m/s

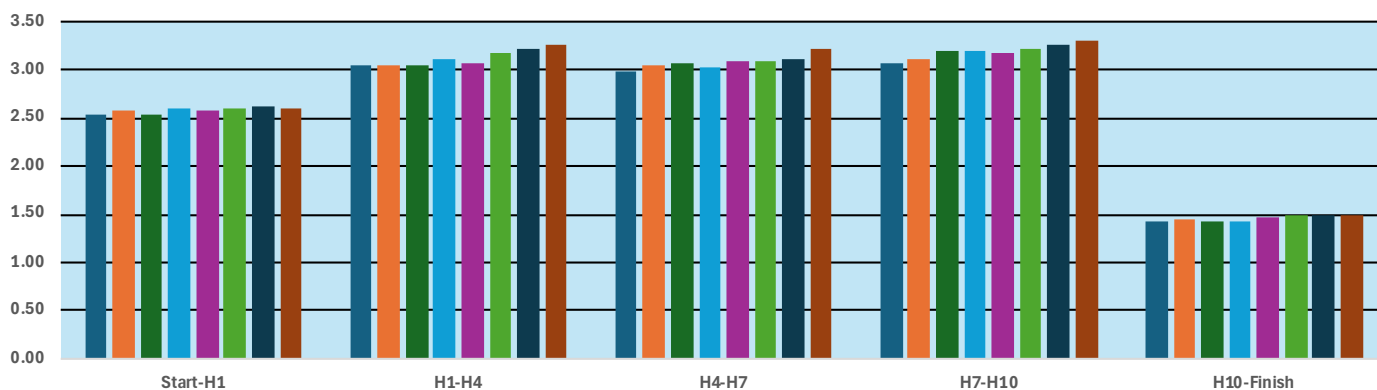
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Crittenden, Freddie (USA) (1994)	time	2.53	3.56	4.56	5.57	6.56	7.55	8.56	9.56	10.58	11.62	13.05	13.05	7 / 1			
	reaction time														3.04	2.99	3.06
	interval		1.03	1.00	1.01	0.99	0.99	1.01	1.00	1.02	1.04	1.43			9.02	9.17	8.96
	velocity	5.42	8.87	9.14	9.05	9.23	9.23	9.05	9.14	8.96	8.79	9.80	8.43				
Scott, Ja'Qualon (USA) (2001)	time	2.57	3.60	4.62	5.62	6.63	7.65	8.67	9.70	10.72	11.78	13.23	13.23	6 / 2			
	reaction time														3.05	3.05	3.11
	interval		1.03	1.02	1.00	1.01	1.02	1.02	1.03	1.02	1.06	1.45			8.99	8.99	8.82
	velocity	5.34	8.87	8.96	9.14	9.05	8.96	8.96	8.87	8.96	8.62	9.67	8.31				
Cunningham, Trey (USA) (1998)	time	2.53	3.56	4.58	5.57	6.59	7.59	8.63	9.68	10.73	11.83	13.26	13.26	4 / 3			
	reaction time														3.04	3.06	3.20
	interval		1.03	1.02	0.99	1.02	1.00	1.04	1.05	1.05	1.10	1.43			9.02	8.96	8.57
	velocity	5.42	8.87	8.96	9.23	8.96	9.14	8.79	8.70	8.70	8.31	9.80	8.30				
Edwards, Eric (USA) (2000)	time	2.59	3.63	4.67	5.70	6.70	7.70	8.73	9.80	10.86	11.93	13.36	13.36	8 / 4			
	reaction time														3.11	3.03	3.20
	interval		1.04	1.04	1.03	1.00	1.00	1.03	1.07	1.06	1.07	1.43			8.82	9.05	8.57
	velocity	5.30	8.79	8.79	8.87	9.14	8.87	9.14	8.87	8.54	8.62	8.54	8.23				
Luff, Darius (USA) (2001)	time	2.57	3.61	4.63	5.63	6.65	7.70	8.72	9.78	10.84	11.90	13.37	13.37	5 / 5			
	reaction time														3.06	3.09	3.18
	interval		1.04	1.02	1.00	1.02	1.05	1.02	1.06	1.06	1.06	1.47			8.96	8.87	8.62
	velocity	5.34	8.79	8.96	9.14	8.96	8.70	8.96	8.62	8.62	8.62	9.54	8.23				
Young, Ahmad (USA) (2000)	time	2.60	3.65	4.73	5.77	6.80	7.83	8.86	9.93	10.98	12.08	13.58	13.58	9 / 6			
	reaction time														3.17	3.09	3.22
	interval		1.05	1.08	1.04	1.03	1.03	1.03	1.07	1.05	1.10	1.50			8.65	8.87	8.52
	velocity	5.28	8.70	8.46	8.79	8.87	8.87	8.87	8.54	8.70	8.31	9.35	8.10				
Bates, Di'Niko (USA) (2003)	time	2.63	3.73	4.80	5.84	6.88	7.92	8.96	10.03	11.13	12.23	13.72	13.72	2 / 7			
	reaction time														3.21	3.12	3.27
	interval		1.10	1.07	1.04	1.04	1.04	1.04	1.07	1.10	1.10	1.49			8.54	8.79	8.39
	velocity	5.22	8.31	8.54	8.79	8.79	8.79	8.79	8.54	8.31	8.31	9.41	8.02				
Williams, Tyson (USA) (2002)	time	2.60	3.67	4.77	5.86	6.93	8.00	9.07	10.16	11.26	12.38	13.88	13.88	1 / 8			
	reaction time														3.26	3.21	3.31
	interval		1.07	1.10	1.09	1.07	1.07	1.07	1.09	1.10	1.12	1.50			8.41	8.54	8.28
	velocity	5.28	8.54	8.31	8.39	8.54	8.54	8.54	8.39	8.31	8.16	9.35	7.93				



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=EE_MZM6ziM

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

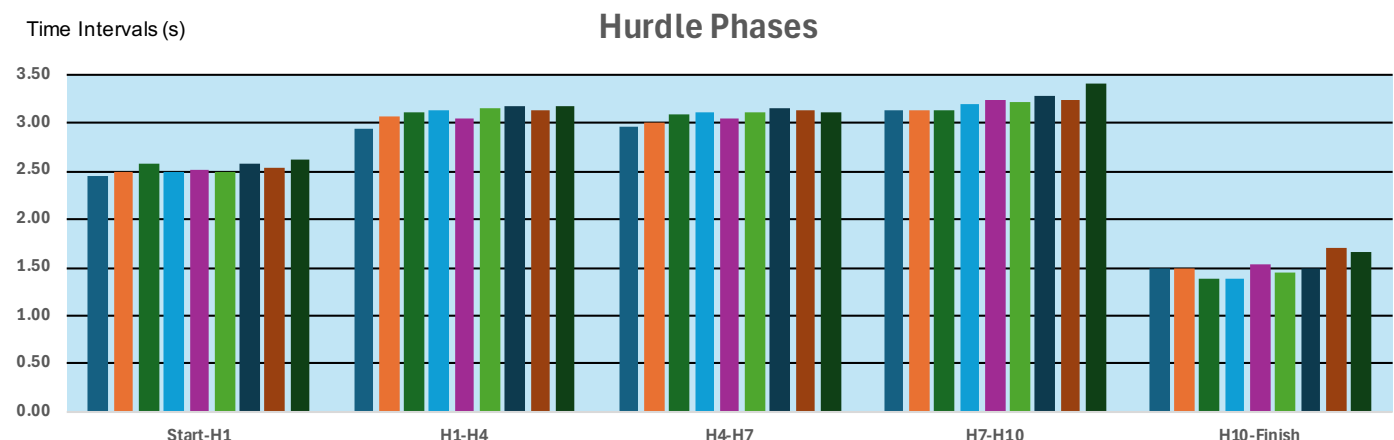
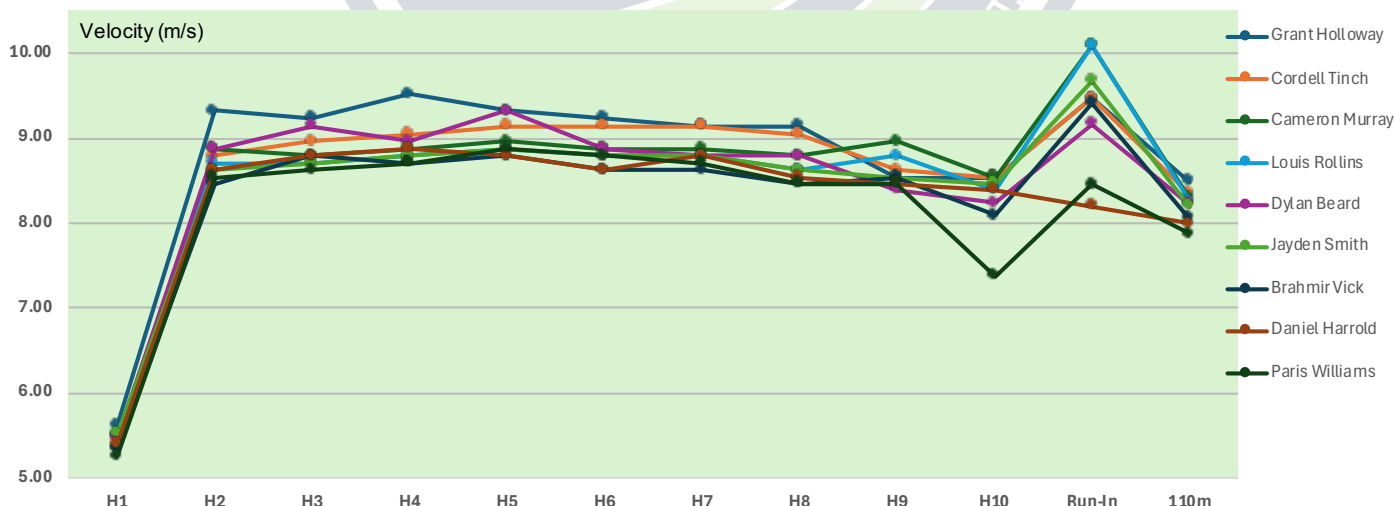
110m Hurdles

Date: 2024.06.27

Wind: 0.3 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
Holloway, Grant (USA) (1997)	time	2.44	3.42	4.41	5.37	6.35	7.34	8.34	9.34	10.41	11.48	12.96		7 / 1			
	reaction time														2.93	2.97	3.14
	interval	7 steps	0.98	0.99	0.96	0.98	0.99	1.00	1.00	1.07	1.07	1.48			9.36	9.23	8.73
	velocity	5.62	9.33	9.23	9.52	9.33	9.23	9.14	9.14	8.54	8.54	9.47	8.49				
Tinch, Cordell (USA) (2000)	time	2.50	3.54	4.56	5.57	6.57	7.57	8.57	9.58	10.64	11.71	13.19		6 / 2			
	reaction time														3.07	3.00	3.14
	interval	7 steps	1.04	1.02	1.01	1.00	1.00	1.00	1.01	1.06	1.07	1.48			8.93	9.14	8.73
	velocity	5.49	8.79	8.96	9.05	9.14	9.14	9.14	9.05	8.62	8.54	9.47	8.34				
Murray, Cameron (USA) (1999)	time	2.57	3.60	4.64	5.67	6.69	7.72	8.75	9.79	10.81	11.88	13.27		8 / 3			
	reaction time														3.10	3.08	3.13
	interval	7 steps	1.03	1.04	1.03	1.02	1.03	1.03	1.04	1.02	1.07	1.39			8.85	8.90	8.76
	velocity	5.34	8.87	8.79	8.87	8.96	8.87	8.87	8.79	8.96	8.54	10.09	8.29				
Rollins, Louis (USA) (1996)	time	2.50	3.55	4.60	5.64	6.67	7.71	8.75	9.81	10.85	11.94	13.33		3 / 4			
	reaction time														3.14	3.11	3.19
	interval		1.05	1.05	1.04	1.03	1.04	1.04	1.06	1.04	1.09	1.39			8.73	8.82	8.60
	velocity	5.49	8.70	8.70	8.79	8.87	8.79	8.79	8.62	8.79	8.39	10.09	8.25				
Beard, Dylan (USA) (1998)	time	2.51	3.54	4.54	5.56	6.54	7.57	8.61	9.65	10.74	11.85	13.38		5 / 5			
	reaction time														3.05	3.05	3.24
	interval		1.03	1.00	1.02	0.98	1.03	1.04	1.04	1.09	1.11	1.53			8.99	8.99	8.46
	velocity	5.47	8.87	9.14	8.96	9.33	8.87	8.79	8.79	8.39	8.23	9.16	8.22				
Smith, Jayden (USA) (2003)	time	2.49	3.55	4.60	5.64	6.67	7.71	8.75	9.81	10.88	11.96	13.41		4 / 6			
	reaction time														3.15	3.11	3.21
	interval	7 steps	1.06	1.05	1.04	1.03	1.04	1.04	1.06	1.07	1.08	1.45			8.70	8.82	8.54
	velocity	5.51	8.62	8.70	8.79	8.87	8.79	8.79	8.62	8.54	8.46	9.67	8.20				
Vick, Brahmir (USA) (2002)	time	2.57	3.65	4.69	5.74	6.78	7.84	8.90	9.98	11.05	12.18	13.67		1 / 7			
	reaction time														3.17	3.16	3.28
	interval		1.08	1.04	1.05	1.04	1.06	1.06	1.08	1.07	1.13	1.49			8.65	8.68	8.36
	velocity	5.34	8.46	8.79	8.70	8.79	8.62	8.62	8.46	8.54	8.09	9.41	8.05				
Harrold, Daniel (USA) (2000)	time	2.54	3.60	4.64	5.67	6.71	7.77	8.81	9.88	10.96	12.05	13.76		9 / 8			
	reaction time														3.13	3.14	3.24
	interval	7 steps	1.06	1.04	1.03	1.04	1.06	1.04	1.07	1.08	1.09	1.71			8.76	8.73	8.46
	velocity	5.40	8.62	8.79	8.87	8.79	8.62	8.79	8.54	8.46	8.39	8.20	7.99				
Williams, Paris (USA) (1998)	time	2.61	3.68	4.74	5.79	6.82	7.86	8.91	9.99	11.07	12.31	13.97		2 / 9			
	reaction time														3.18	3.12	3.40
	interval	7 steps	1.07	1.06	1.05	1.03	1.04	1.05	1.08	1.08	1.24	1.66			8.62	8.79	8.06
	velocity	5.26	8.54	8.62	8.70	8.87	8.79	8.70	8.46	8.46	7.37	8.45	7.87				



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=GAMKRCjRSf4>

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

110m Hurdles

Date: 2024.06.24 Wind: 1.2 m/s

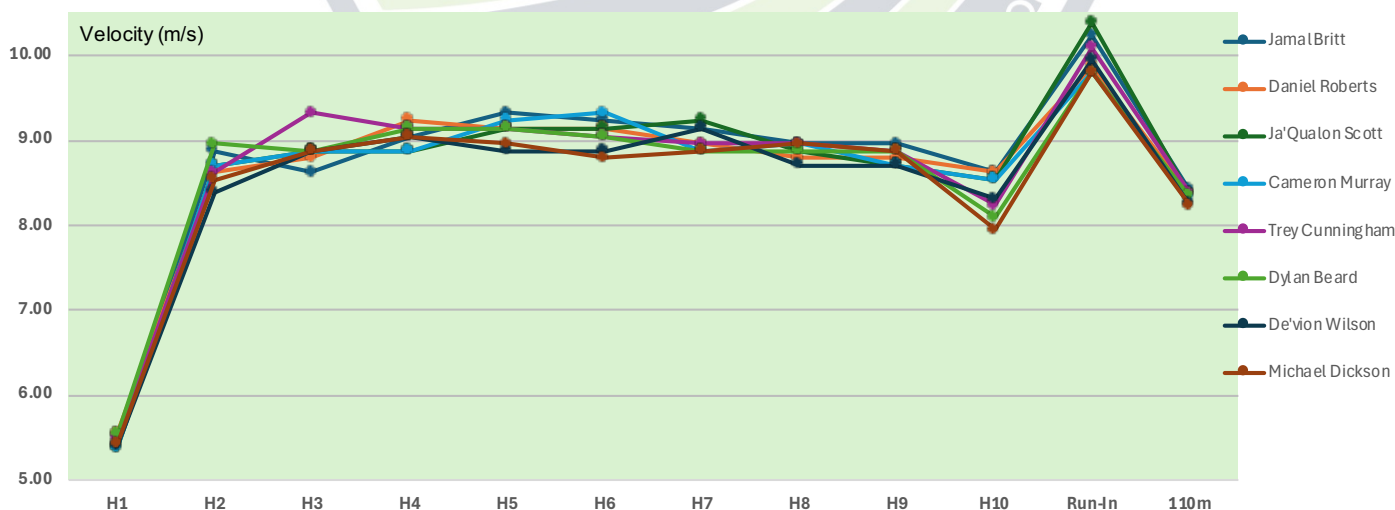
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Britt, Jamal (USA) (1998)	time	2.53	3.56	4.62	5.63	6.61	7.60	8.60	9.62	10.64	11.70	13.07	13.07	4 / 1			
	reaction time														3.10	2.97	3.10
	interval	7 steps	1.03	1.06	1.01	0.98	0.99	1.00	1.02	1.02	1.06	1.37	PB		8.85	9.23	8.85
velocity		5.42	8.87	8.62	9.05	9.33	9.23	9.14	8.96	8.96	8.62	10.23	8.42				
Roberts, Daniel (USA) (1998)	time	2.47	3.53	4.57	5.56	6.56	7.56	8.58	9.62	10.66	11.72	13.14	13.14	5 / 2			
	reaction time														3.09	3.02	3.14
	interval	7 steps	1.06	1.04	0.99	1.00	1.00	1.02	1.04	1.04	1.06	1.42			8.87	9.08	8.73
velocity		5.55	8.62	8.79	9.23	9.14	9.14	8.96	8.79	8.79	8.62	9.87	8.37				
Scott, Ja'Qualon (USA) (2001)	time	2.55	3.60	4.63	5.66	6.66	7.66	8.65	9.68	10.73	11.80	13.15	13.15	2 / 3			
	reaction time														3.11	2.99	3.15
	interval	7 steps	1.05	1.03	1.03	1.00	1.00	0.99	1.03	1.05	1.07	1.35	PB		8.82	9.17	8.70
velocity		5.38	8.70	8.87	8.87	9.14	9.14	9.23	8.87	8.70	8.54	10.39	8.37				
Murray, Cameron (USA) (1999)	time	2.55	3.60	4.63	5.66	6.65	7.63	8.66	9.68	10.73	11.80	13.23	13.23	7 / 4			
	reaction time														3.11	3.00	3.14
	interval		1.05	1.03	1.03	0.99	0.98	1.03	1.02	1.05	1.07	1.43			8.82	9.14	8.73
velocity		5.38	8.70	8.87	8.87	9.23	9.33	8.87	8.96	8.70	8.54	9.80	8.31				

Date: 2024.06.24 Wind: 1.8 m/s

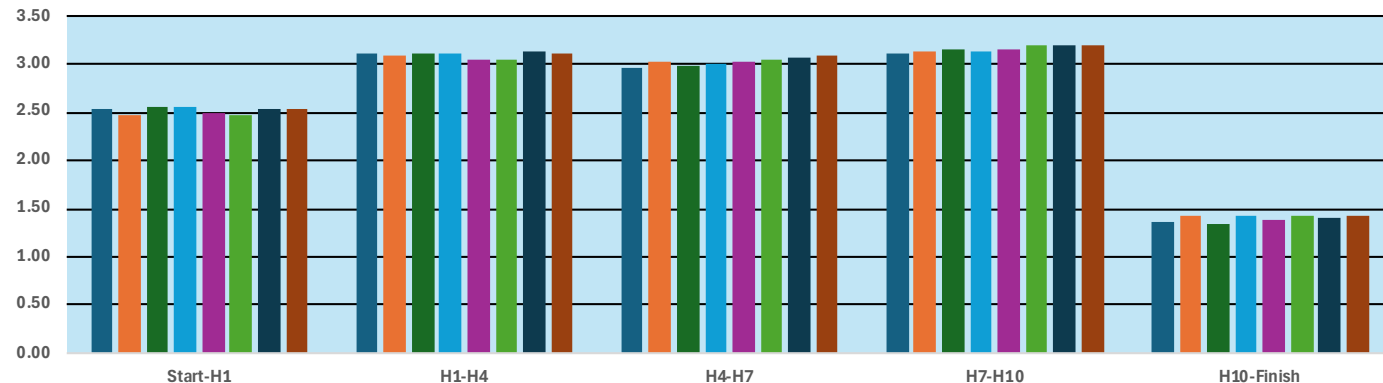
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Cunningham, Trey (USA) (1998)	time	2.50	3.56	4.54	5.54	6.54	7.55	8.57	9.59	10.62	11.73	13.12	13.12	3 / 1			
	reaction time														3.04	3.03	3.16
	interval	7 steps	1.06	0.98	1.00	1.00	1.01	1.02	1.02	1.03	1.11	1.39			9.02	9.05	8.68
velocity		5.49	8.62	9.33	9.14	9.14	9.05	8.96	8.96	8.87	8.23	10.09	8.38				
Beard, Dylan (USA) (1998)	time	2.48	3.50	4.53	5.53	6.53	7.54	8.57	9.60	10.63	11.76	13.19	13.19	4 / 2			
	reaction time														3.05	3.04	3.19
	interval		1.02	1.03	1.00	1.00	1.01	1.03	1.03	1.03	1.13	1.43			8.99	9.02	8.60
velocity		5.53	8.96	8.87	9.14	9.14	9.05	8.87	8.87	8.87	8.09	9.80	8.34				
Wilson, De'vion (USA) (2000)	time	2.54	3.63	4.66	5.67	6.70	7.73	8.73	9.78	10.83	11.93	13.34	13.34	6 / 3			
	reaction time														3.13	3.06	3.20
	interval	7 steps	1.09	1.03	1.01	1.03	1.03	1.00	1.05	1.05	1.10	1.41			8.76	8.96	8.57
velocity		5.40	8.39	8.87	9.05	8.87	8.87	9.14	8.70	8.70	8.31	9.94	8.25				
Dickson, Michael (USA) (1997)	time	2.53	3.60	4.63	5.64	6.66	7.70	8.73	9.75	10.78	11.93	13.36	13.36	2 / 4			
	reaction time														3.11	3.09	3.20
	interval	7 steps	1.07	1.03	1.01	1.02	1.04	1.03	1.02	1.03	1.15	1.43			8.82	8.87	8.57
velocity		5.42	8.54	8.87	9.05	8.96	8.79	8.87	8.96	8.87	7.95	9.80	8.23				



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=CHiQlrTa0j4&pp=ygUlMjAyNCBVLjYyBPhHltcGlljFRyaWFscyB0cmEjYjBhbmQzZmlhGQ%3D>

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

110m Hurdles

Date: 2024.06.24 Wind: -0.3 m/s

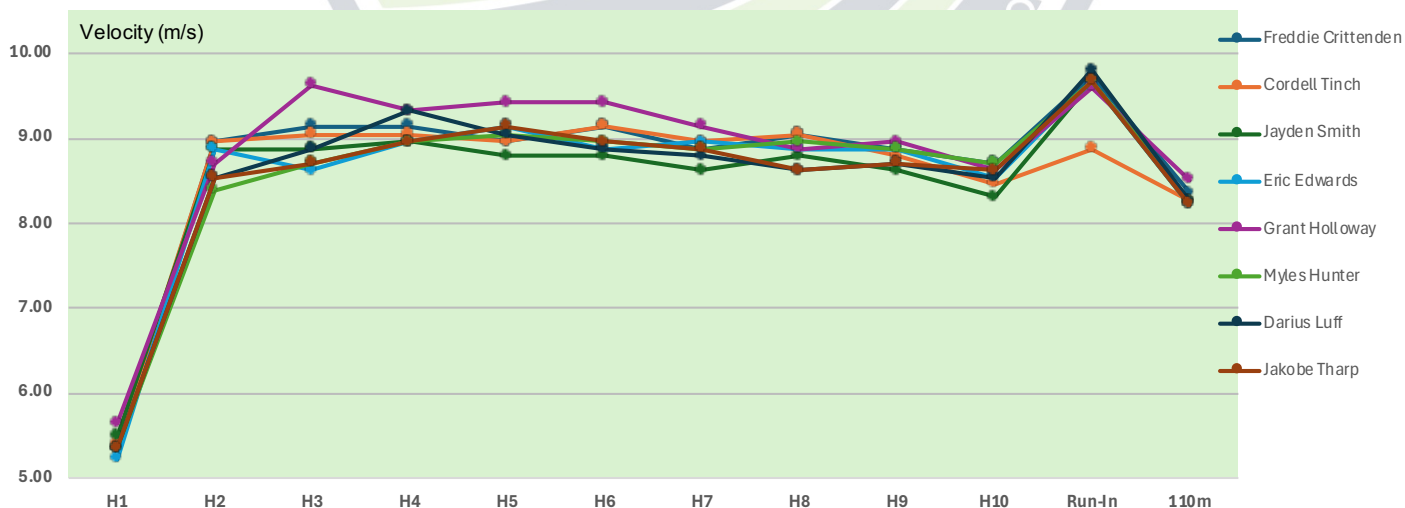
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Crittenden, Freddie (USA) (1994)	time	2.56	3.58	4.58	5.58	6.60	7.60	8.63	9.64	10.67	11.72		13.16	2 / 1			
	reaction time		1.02	1.00	1.00	1.02	1.00	1.03	1.01	1.03	1.05	1.44			3.02	3.05	3.09
	velocity	5.36	8.96	9.14	9.14	8.96	9.14	8.87	9.05	8.87	8.70	9.74	8.36		9.08	8.99	8.87
Tinch, Cordell (USA) (2000)	time	2.54	3.56	4.57	5.58	6.60	7.60	8.62	9.63	10.67	11.75		13.33	6 / 2			
	reaction time		1.02	1.01	1.01	1.02	1.00	1.02	1.01	1.04	1.08	1.58			3.04	3.04	3.13
	velocity	5.40	8.96	9.05	9.05	8.96	9.14	8.96	9.05	8.79	8.46	8.87	8.25		9.02	9.02	8.76
Smith, Jayden (USA) (2003)	time	2.50	3.53	4.56	5.58	6.62	7.66	8.72	9.76	10.82	11.92		13.37	1 / 3			
	reaction time		1.03	1.03	1.02	1.04	1.04	1.06	1.04	1.06	1.10	1.45	PB		3.08	3.14	3.20
	velocity	5.49	8.87	8.87	8.96	8.79	8.79	8.62	8.79	8.62	8.31	9.67	8.23		8.90	8.73	8.57
Edwards, Eric (USA) (2000)	time	2.63	3.66	4.72	5.74	6.74	7.77	8.79	9.82	10.85	11.92		13.37	8 / 4			
	reaction time		1.03	1.06	1.02	1.00	1.03	1.02	1.03	1.03	1.07	1.45			3.11	3.05	3.13
	velocity	5.22	8.87	8.62	8.96	9.14	8.87	8.96	8.87	8.87	8.54	9.67	8.23		8.82	8.99	8.76

Date: 2024.06.24 Wind: 0.8 m/s

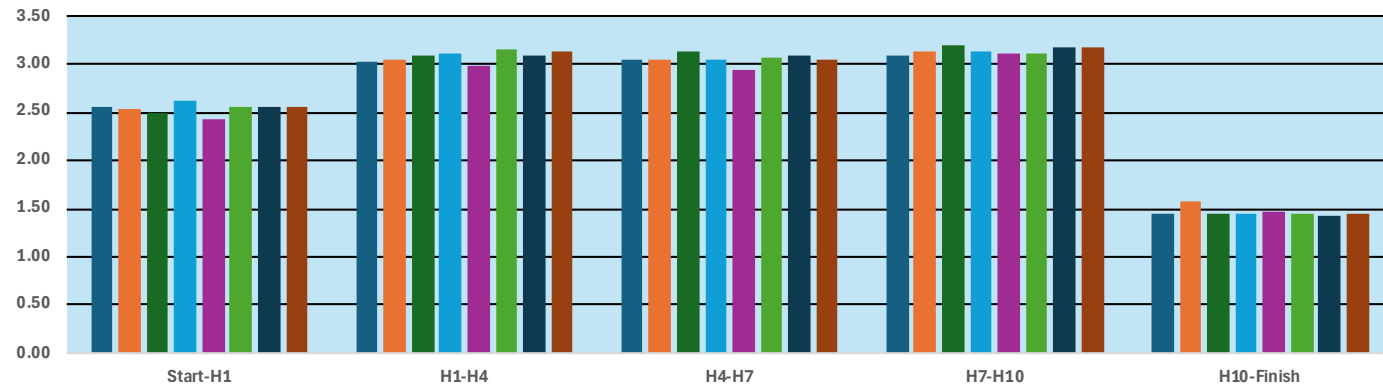
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.43	3.48	4.43	5.41	6.38	7.35	8.35	9.38	10.40	11.46		12.92	4 / 1			
	reaction time		1.05	0.95	0.98	0.97	0.97	1.00	1.03	1.02	1.06	1.46			2.98	2.94	3.11
	velocity	5.65	8.70	9.62	9.33	9.42	9.42	9.14	8.87	8.96	8.62	9.60	8.51		9.20	9.33	8.82
Hunter, Myles (USA) (1995)	time	2.56	3.65	4.70	5.72	6.73	7.75	8.78	9.80	10.83	11.88		13.33	6 / 2			
	reaction time		1.09	1.05	1.02	1.01	1.02	1.03	1.02	1.03	1.05	1.45	PB		3.16	3.06	3.10
	velocity	5.36	8.39	8.70	8.96	9.05	8.96	8.87	8.96	8.87	8.70	9.67	8.25		8.68	8.96	8.85
Luff, Darius (USA) (2001)	time	2.56	3.63	4.66	5.64	6.65	7.68	8.72	9.78	10.83	11.90		13.33	1 / 3			
	reaction time		1.07	1.03	0.98	1.01	1.03	1.04	1.06	1.05	1.07	1.43			3.08	3.08	3.18
	velocity	5.36	8.54	8.87	9.33	9.05	8.87	8.79	8.62	8.70	8.54	9.80	8.25		8.90	8.90	8.62
Tharp, Jakobe (USA) (2005)	time	2.56	3.63	4.68	5.70	6.70	7.72	8.75	9.81	10.86	11.92		13.37	3 / 4			
	reaction time		1.07	1.05	1.02	1.00	1.02	1.03	1.06	1.05	1.06	1.45			3.14	3.05	3.17
	velocity	5.36	8.54	8.70	8.96	9.14	8.96	8.87	8.62	8.70	8.62	9.67	8.23		8.73	8.99	8.65



Time Intervals (s)

Hurdle Phases

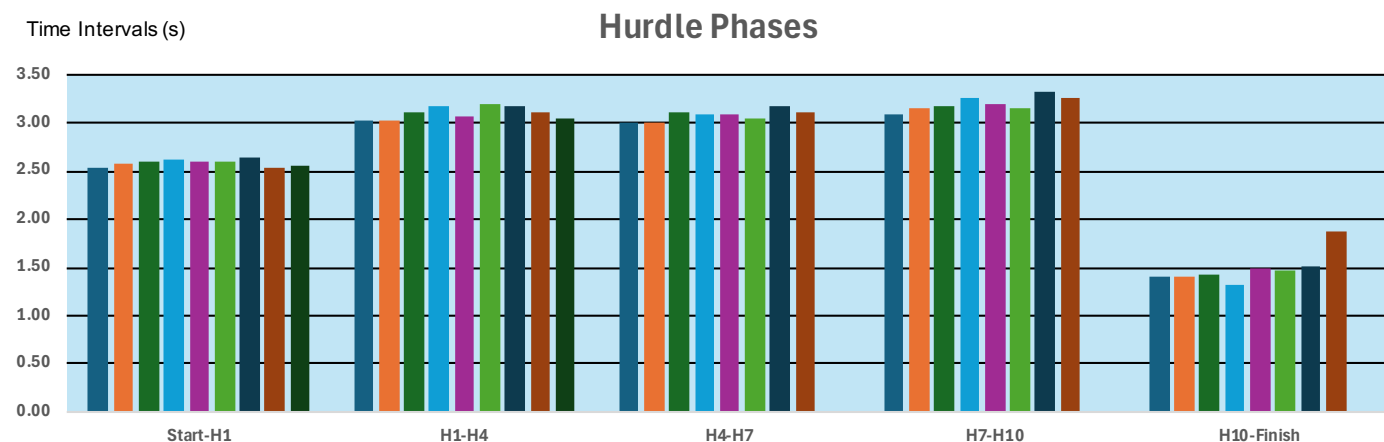
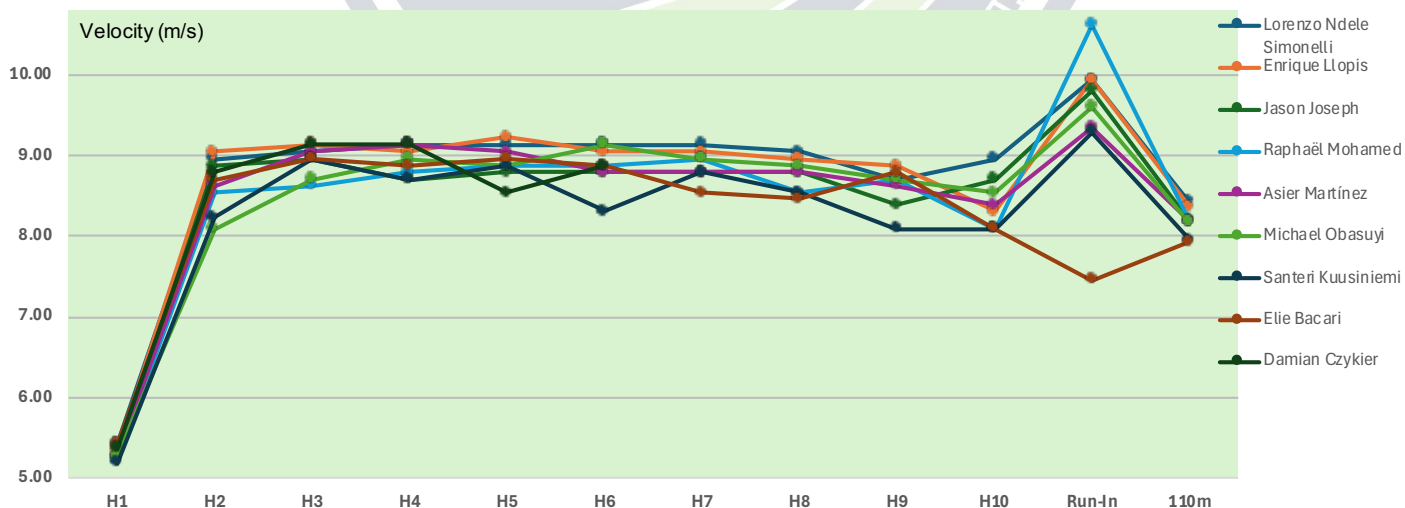


Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1280 x 720 @ 30fps
 Timing From: First Movement

Source: <https://www.youtube.com/watch?v=CHtQlrTa0j4&pp=ygtUmMjAyNCBVLjYyBPhHltcGltJRyaWFscyB0cmEjYyBhbmQgZmlibG0%3D>

2024 European Athletics Championships (Roma, ITA) (TV Analysis)

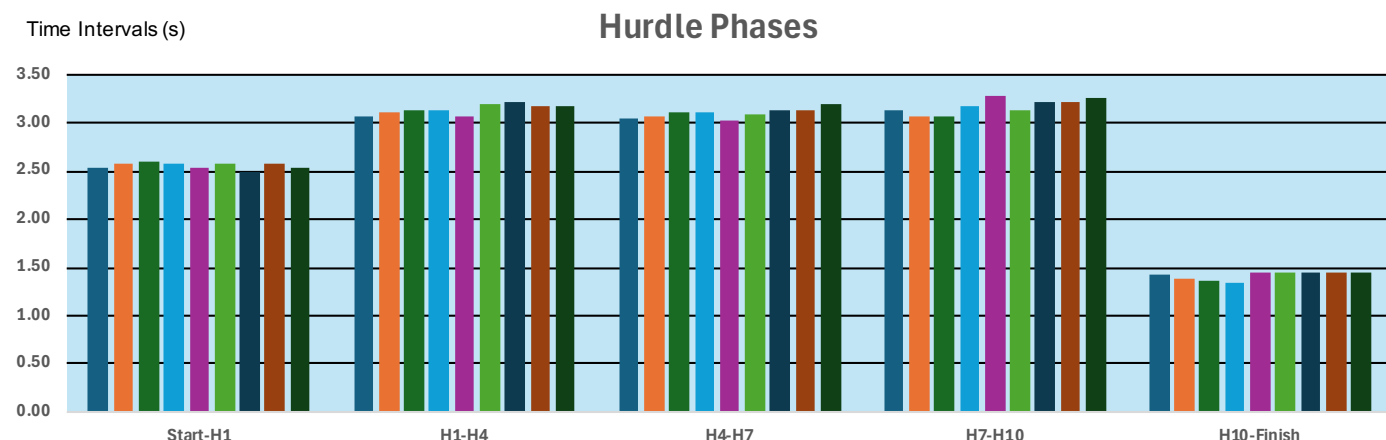
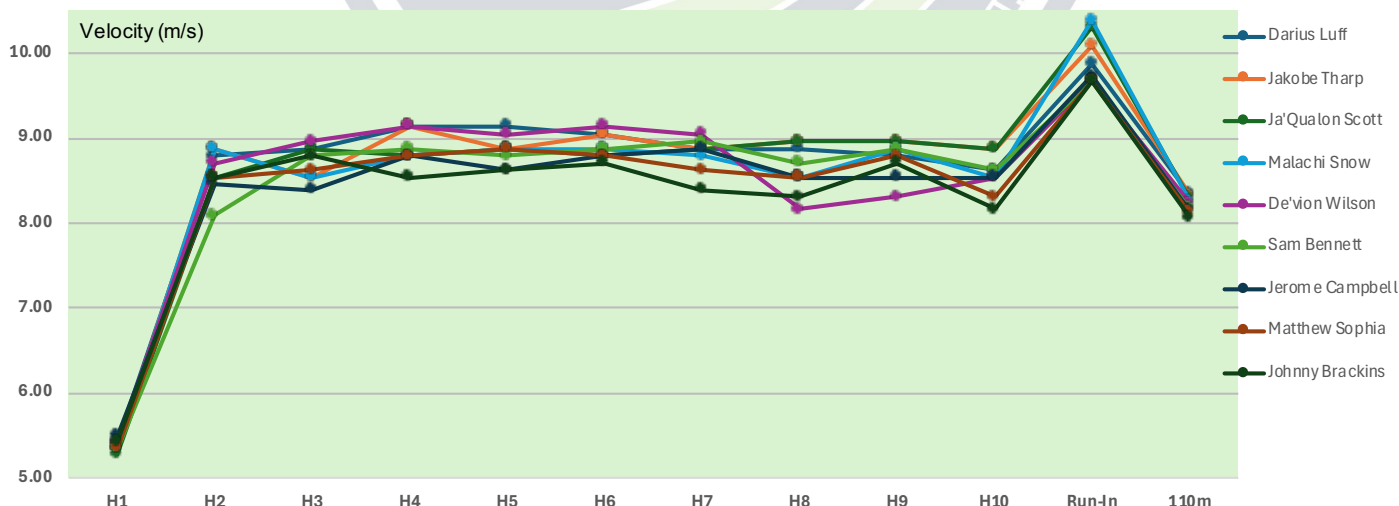
110m Hurdles		Date: 2024.06.08	Wind: 0.6 m/s										FINAL					
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Simonelli, Lorenzo Ndele (ITA) (2002)	time	2.53	3.55	4.56	5.56	6.56	7.56	8.56	9.57	10.62	11.64		13.05	5 / 1				
	reaction time	0.145														3.03	3.00	3.08
	interval	7 steps	1.02	1.01	1.00	1.00	1.00	1.00	1.01	1.05	1.02	1.41	NR PB			9.05	9.14	8.90
	velocity	5.42	8.96	9.05	9.14	9.14	9.14	9.14	9.05	8.70	8.96	9.94	8.43					
Llopis, Enrique (ESP) (2000)	time	2.57	3.58	4.58	5.59	6.58	7.59	8.60	9.62	10.65	11.75		13.16	7 / 2				
	reaction time	0.144														3.02	3.01	3.15
	interval	7 steps	1.01	1.00	1.01	0.99	1.01	1.01	1.02	1.03	1.10	1.41	PB			9.08	9.11	8.70
	velocity	5.34	9.05	9.14	9.05	9.23	9.05	9.05	9.05	8.96	8.87	8.31	9.94	8.36				
Joseph, Jason (SUI) (1998)	time	2.60	3.63	4.65	5.70	6.74	7.78	8.82	9.86	10.95	12.00		13.43	6 / 3				
	reaction time	0.155														3.10	3.12	3.18
	interval	7 steps	1.03	1.02	1.05	1.04	1.04	1.04	1.04	1.09	1.05	1.43				8.85	8.79	8.62
	velocity	5.28	8.87	8.96	8.70	8.79	8.79	8.79	8.79	8.39	8.70	9.80	8.19					
Mohamed, Raphaël (FRA) (1998)	time	2.63	3.70	4.76	5.80	6.83	7.86	8.88	9.95	11.00	12.13		13.45	3 / =4				
	reaction time	0.171														3.17	3.08	3.25
	interval	7 steps	1.07	1.06	1.04	1.03	1.03	1.02	1.07	1.05	1.13	1.32				8.65	8.90	8.44
	velocity	5.22	8.54	8.62	8.79	8.87	8.87	8.87	8.96	8.54	8.70	8.09	10.62	8.18				
Martinez, Asier (ESP) (2000)	time	2.60	3.66	4.67	5.67	6.68	7.72	8.76	9.80	10.86	11.95		13.45	4 / =4				
	reaction time	0.165														3.07	3.09	3.19
	interval	7 steps	1.06	1.01	1.00	1.01	1.04	1.04	1.04	1.06	1.09	1.50				8.93	8.87	8.60
	velocity	5.28	8.62	9.05	9.14	9.05	8.79	8.79	8.79	8.62	8.39	9.35	8.18					
Obasuyi, Michael (BEL) (1999)	time	2.60	3.73	4.78	5.80	6.83	7.83	8.85	9.88	10.93	12.00		13.46	8 / 6				
	reaction time	0.170														3.20	3.05	3.15
	interval	7 steps	1.13	1.05	1.02	1.03	1.00	1.02	1.03	1.05	1.07	1.46				8.57	8.99	8.70
	velocity	5.28	8.09	8.70	8.96	8.87	9.14	8.96	8.87	8.70	8.54	9.60	8.17					
Kuusiniemi, Santeri (FIN) (1998)	time	2.65	3.76	4.78	5.83	6.86	7.96	9.00	10.07	11.20	12.33		13.84	1 / 7				
	reaction time	0.157														3.18	3.17	3.33
	interval	7 steps	1.11	1.02	1.05	1.03	1.10	1.04	1.07	1.13	1.13	1.51				8.62	8.65	8.23
	velocity	5.18	8.23	8.96	8.70	8.87	8.31	8.79	8.54	8.09	8.09	9.28	7.95					
Bacari, Elie (BEL) (2003)	time	2.53	3.58	4.60	5.63	6.65	7.68	8.75	9.83	10.87	12.00		13.88	2 / =8				
	reaction time	0.115														3.10	3.12	3.25
	interval	7 steps	1.05	1.02	1.03	1.02	1.03	1.07	1.08	1.04	1.13	1.88	DQ			8.85	8.79	8.44
	velocity	5.42	8.70	8.96	8.87	8.96	8.87	8.54	8.46	8.79	8.09	7.46	7.93					
Czykier, Damian (POL) (1992)	time	2.56	3.60	4.60	5.60	6.67	7.70						dnf	9 / --				
	reaction time	0.151														3.04		
	interval	7 steps	1.04	1.00	1.00	1.07	1.03									9.02		
	velocity	5.36	8.79	9.14	9.14	8.54	8.87											



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=E_zkyngenfU

2024 NCAA Championships (Eugene, OR) (TV Analysis)

110m Hurdles		Date: 2024.06.07	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	
Luff, Darius (USA) (2001)	time	2.53	3.57	4.60	5.60	6.60	7.61	8.64	9.67	10.71	11.77	13.19	13.19	6 / 1				
	reaction time		interval	1.04	1.03	1.00	1.00	1.01	1.03	1.03	1.04	1.06	1.42	PB		3.07	3.04	3.13
	velocity	5.42	8.79	8.87	9.14	9.14	9.05	8.87	8.87	8.79	8.62	9.87	8.34		8.93	9.02	8.76	
Tharp, Jakobe (USA) (2005)	time	2.57	3.60	4.67	5.67	6.70	7.71	8.74	9.76	10.78	11.81	13.20	13.20	5 / 2				
	reaction time		interval	1.03	1.07	1.00	1.03	1.01	1.03	1.02	1.02	1.39				3.10	3.07	3.07
	velocity	5.34	8.87	8.54	9.14	8.87	9.05	8.87	8.96	8.96	8.87	10.09	8.33		8.85	8.93	8.93	
Scott, Ja'Qualon (USA) (2001)	time	2.60	3.67	4.70	5.74	6.77	7.81	8.84	9.86	10.88	11.91	13.27	13.27	3 / 3				
	reaction time		interval	7 steps 1.07	1.03	1.04	1.03	1.04	1.03	1.02	1.02	1.03	1.36	PB		3.14	3.10	3.07
	velocity	5.28	8.54	8.87	8.79	8.87	8.79	8.87	8.96	8.96	8.87	10.31	8.29		8.73	8.85	8.93	
Snow, Malachi (USA) ()	time	2.57	3.60	4.67	5.71	6.74	7.77	8.81	9.88	10.91	11.98	13.33	13.33	8 / 4				
	reaction time		interval	7 steps 1.03	1.07	1.04	1.03	1.03	1.04	1.07	1.03	1.07	1.35	PB		3.14	3.10	3.17
	velocity	5.34	8.87	8.54	8.79	8.87	8.87	8.79	8.87	8.54	8.87	10.39	8.25		8.73	8.85	8.65	
Wilson, De'vion (USA) (2000)	time	2.53	3.58	4.60	5.60	6.61	7.61	8.62	9.74	10.84	11.91	13.36	13.36	4 / 5				
	reaction time		interval	7 steps 1.05	1.02	1.00	1.01	1.00	1.01	1.12	1.10	1.07	1.45			3.07	3.02	3.29
	velocity	5.42	8.70	8.96	9.14	9.05	9.14	9.05	8.16	8.31	8.54	9.67	8.23		8.93	9.08	8.33	
Bennett, Sam (GBR) (2001)	time	2.57	3.70	4.74	5.77	6.81	7.84	8.86	9.91	10.94	12.00	13.45	13.45	1 / 6				
	reaction time		interval	7 steps 1.13	1.04	1.03	1.04	1.03	1.02	1.05	1.03	1.06	1.45	PB		3.20	3.09	3.14
	velocity	5.34	8.09	8.79	8.87	8.79	8.87	8.96	8.70	8.87	8.62	9.67	8.18		8.57	8.87	8.73	
Campbell, Jerome (JAM) (2002)	time	2.50	3.58	4.67	5.71	6.77	7.81	8.84	9.91	10.98	12.05	13.49	13.49	9 / 7				
	reaction time		interval	1.08	1.09	1.04	1.06	1.04	1.03	1.07	1.07	1.44				3.21	3.13	3.21
	velocity	5.49	8.46	8.39	8.79	8.62	8.79	8.87	8.54	8.54	8.54	9.74	8.15		8.54	8.76	8.54	
Sophia, Matthew (NED) (2003)	time	2.57	3.64	4.70	5.74	6.77	7.81	8.87	9.94	10.98	12.08	13.53	13.53	2 / 8				
	reaction time		interval	1.07	1.06	1.04	1.03	1.04	1.06	1.07	1.04	1.10	1.45			3.17	3.13	3.21
	velocity	5.34	8.54	8.62	8.79	8.87	8.79	8.62	8.54	8.79	8.31	9.67	8.13		8.65	8.76	8.54	
Brackins, Johnny (USA) (2003)	time	2.53	3.60	4.64	5.71	6.77	7.82	8.91	10.01	11.06	12.18	13.63	13.63	7 / 9				
	reaction time		interval	7 steps 1.07	1.04	1.07	1.06	1.05	1.09	1.10	1.05	1.12	1.45			3.18	3.20	3.27
	velocity	5.42	8.54	8.79	8.54	8.62	8.70	8.39	8.31	8.70	8.16	9.67	8.07		8.62	8.57	8.39	



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=AVbhjJzRW9w&pp=ygUlJd29ybGQgaW5kb29yIGF0aGxldGljcyAyMDl0IGh1cmRsZXM%3D>

2024 Prefontaine Classic (Eugene, OR)

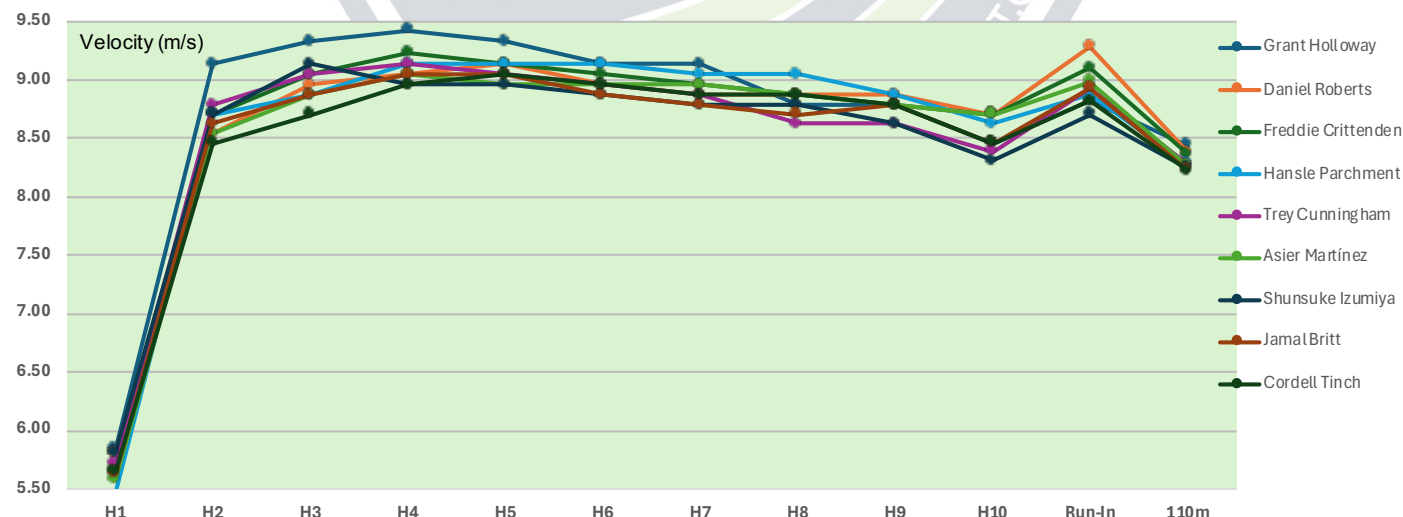
110m Hurdles

Date: 2024.05.25

Wind: -0.1 m/s

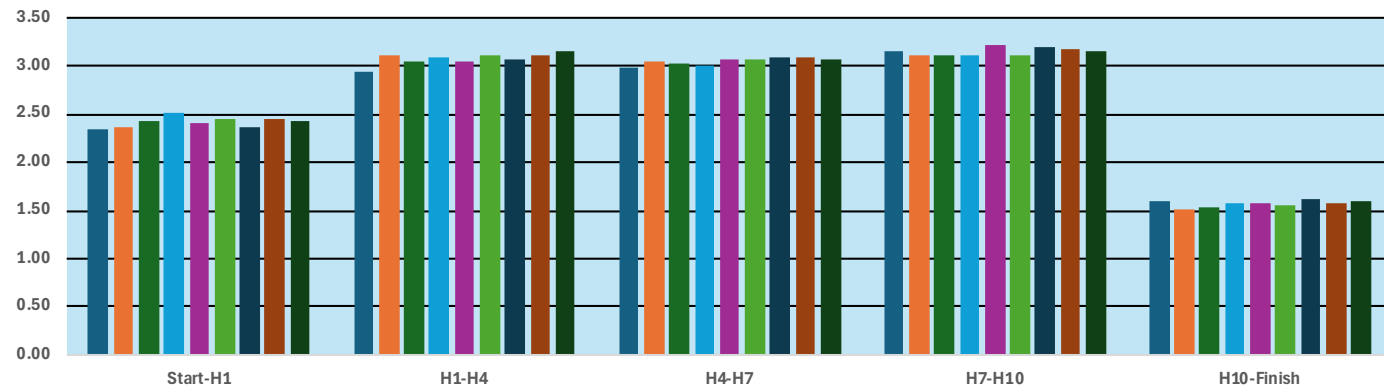
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.35	3.35	4.33	5.30	6.28	7.28	8.28	9.32	10.36	11.44		13.03	5/1			
	reaction time	0.132													2.95	2.98	3.16
	interval	7 steps	1.00	0.98	0.97	0.98	1.00	1.00	1.04	1.04	1.08	1.59			9.29	9.20	8.68
	velocity	5.84	9.14	9.33	9.42	9.33	9.14	9.14	8.79	8.79	8.46	8.82	8.44				
Roberts, Daniel (USA) (1998)	time	2.36	3.43	4.45	5.46	6.46	7.48	8.51	9.54	10.57	11.62		13.13	4/2			
	reaction time	0.148													3.10	3.05	3.11
	interval	7 steps	1.07	1.02	1.01	1.00	1.02	1.03	1.03	1.03	1.05	1.51			8.85	8.99	8.82
	velocity	5.81	8.54	8.96	9.05	9.14	8.96	8.87	8.87	8.87	8.70	9.28	8.38				
Crittenden, Freddie (USA) (1994)	time	2.42	3.47	4.48	5.47	6.47	7.48	8.50	9.53	10.57	11.62		13.16	8/3			
	reaction time	0.140													3.05	3.03	3.12
	interval		1.05	1.01	0.99	1.00	1.01	1.02	1.03	1.04	1.05	1.54			8.99	9.05	8.79
	velocity	5.67	8.70	9.05	9.23	9.14	9.05	8.96	8.87	8.79	8.70	9.10	8.36				
Parchment, Hansle (JAM) (1990)	time	2.51	3.56	4.59	5.59	6.59	7.59	8.60	9.61	10.64	11.70		13.28	6/4			
	reaction time	0.151													3.08	3.01	3.10
	interval	7 steps	1.05	1.03	1.00	1.00	1.00	1.01	1.01	1.03	1.06	1.58			8.90	9.11	8.85
	velocity	5.47	8.70	8.87	9.14	9.14	9.14	9.05	9.05	8.87	8.62	8.87	8.28				
Cunningham, Trey (USA) (1998)	time	2.40	3.44	4.45	5.45	6.46	7.48	8.51	9.57	10.63	11.72		13.29	2/5			
	reaction time	0.134													3.05	3.06	3.21
	interval	7 steps	1.04	1.01	1.00	1.01	1.02	1.03	1.06	1.06	1.09	1.57			8.99	8.96	8.54
	velocity	5.72	8.79	9.05	9.14	9.05	8.96	8.87	8.62	8.62	8.39	8.93	8.28				
Martínez, Asier (ESP) (2000)	time	2.46	3.53	4.56	5.57	6.59	7.61	8.63	9.66	10.70	11.75		13.31	1/6			
	reaction time	0.136													3.11	3.06	3.12
	interval	7 steps	1.07	1.03	1.01	1.02	1.02	1.02	1.03	1.04	1.05	1.56			8.82	8.96	8.79
	velocity	5.58	8.54	8.87	9.05	8.96	8.96	8.87	8.79	8.70	8.70	8.99	8.26				
Izumiya, Shunsuke (JPN) (2000)	time	2.36	3.41	4.41	5.43	6.45	7.48	8.52	9.56	10.62	11.72		13.33	7/7			
	reaction time	0.131													3.07	3.09	3.20
	interval	7 steps	1.05	1.00	1.02	1.02	1.03	1.04	1.04	1.06	1.10	1.61			8.93	8.87	8.57
	velocity	5.81	8.70	9.14	8.96	8.96	8.87	8.79	8.79	8.62	8.31	8.71	8.25				
Britt, Jamal (USA) (1998)	time	2.44	3.50	4.53	5.54	6.55	7.58	8.62	9.67	10.71	11.79		13.36	9/8			
	reaction time	0.149													3.10	3.08	3.17
	interval	7 steps	1.06	1.03	1.01	1.01	1.03	1.04	1.05	1.04	1.08	1.57			8.85	8.90	8.65
	velocity	5.62	8.62	8.87	9.05	9.05	8.87	8.79	8.70	8.79	8.46	8.93	8.23				
Tinch, Cordell (USA) (2000)	time	2.43	3.51	4.56	5.58	6.59	7.61	8.64	9.67	10.71	11.79		13.38	3/9			
	reaction time	0.164													3.15	3.06	3.15
	interval	7 steps	1.08	1.05	1.02	1.01	1.02	1.03	1.03	1.04	1.08	1.59			8.70	8.96	8.70
	velocity	5.65	8.46	8.70	8.96	9.05	8.96	8.87	8.87	8.79	8.46	8.82	8.22				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 25 May 2024 14:06) - diamond league race analysis
<https://www.omegatiming.com/File/000204080103060101FFFFFFFFFFFF6D.pdf>

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

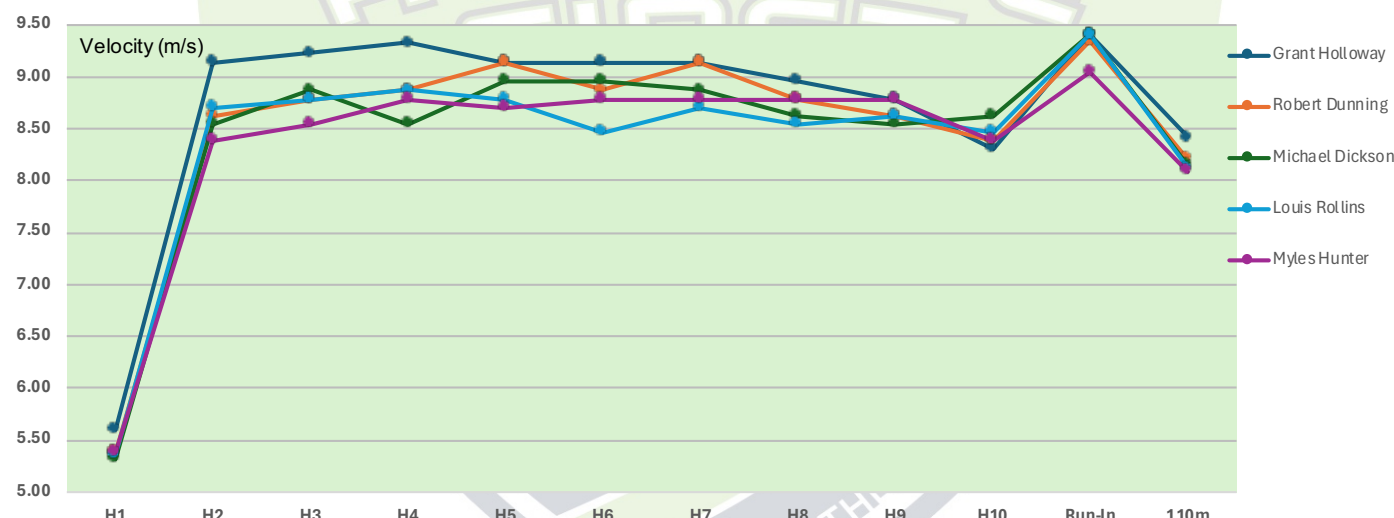
2024 Atlanta City Games (Atlanta, GA) (Street Race) (TV Analysis)

110m Hurdles

Date: 2024.05.18 Wind: -0.7 m/s

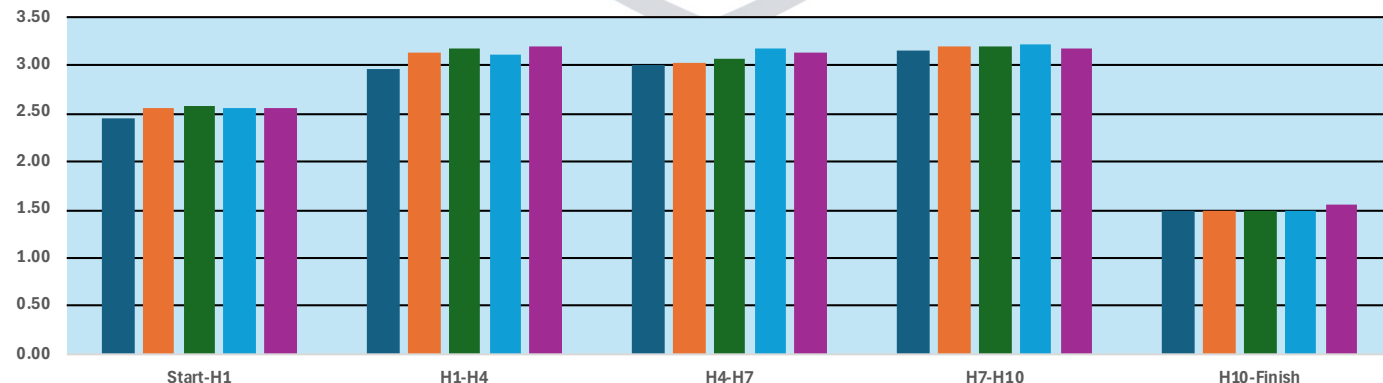
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Holloway, Grant (USA) (1997)	time	2.45	3.45	4.44	5.42	6.42	7.42	8.42	9.44	10.48	11.58		13.07	3 / 1			
	reaction time														2.97	3.00	3.16
	interval	7 steps	1.00	0.99	0.98	1.00	1.00	1.00	1.02	1.04	1.10	1.49			9.23	9.14	8.68
	velocity	5.60	9.14	9.23	9.33	9.14	9.14	9.14	8.96	8.79	8.31	9.41	8.42				
Dunning, Robert (USA) (1997)	time	2.55	3.61	4.65	5.68	6.68	7.71	8.71	9.75	10.81	11.90		13.40	1 / 2			
	reaction time														3.13	3.03	3.19
	interval	7 steps	1.06	1.04	1.03	1.00	1.03	1.00	1.04	1.06	1.09	1.50			8.76	9.05	8.60
	velocity	5.38	8.62	8.79	8.87	9.14	8.87	9.14	8.79	8.62	8.39	9.35	8.21				
Dickson, Michael (USA) (1997)	time	2.58	3.65	4.68	5.75	6.77	7.79	8.82	9.88	10.95	12.01		13.50	4 / 3			
	reaction time														3.17	3.07	3.19
	interval	7 steps	1.07	1.03	1.07	1.02	1.02	1.03	1.06	1.07	1.06	1.49			8.65	8.93	8.60
	velocity	5.32	8.54	8.87	8.54	8.96	8.96	8.87	8.62	8.54	8.62	9.41	8.15				
Rollins, Louis (USA) (1996)	time	2.56	3.61	4.65	5.68	6.72	7.80	8.85	9.92	10.98	12.06		13.55	2 / 4			
	reaction time														3.12	3.17	3.21
	interval		1.05	1.04	1.03	1.04	1.08	1.05	1.07	1.06	1.08	1.49			8.79	8.65	8.54
	velocity	5.36	8.70	8.79	8.87	8.79	8.46	8.70	8.54	8.62	8.46	9.41	8.12				
Hunter, Myles (USA) (1995)	time	2.55	3.64	4.71	5.75	6.80	7.84	8.88	9.92	10.96	12.05		13.60	5 / 5			
	reaction time														3.20	3.13	3.17
	interval		1.09	1.07	1.04	1.05	1.04	1.04	1.04	1.04	1.09	1.55			8.57	8.76	8.65
	velocity	5.38	8.39	8.54	8.79	8.70	8.79	8.79	8.79	8.79	8.39	9.05	8.09				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 60fps
 Timing From: First Movement

Source: <https://www.youtube.com/watch?v=vdvvpAAu9g8&pp=ygUkMjAyNCBhdGxhbnRhlGNpdHkgZ2EiZXMgMTFwbsBodXJkbGVz>

2024 Yangtze River Delta Athletics Diamond Gala (Suzhou, CHN) (TV Analysis)

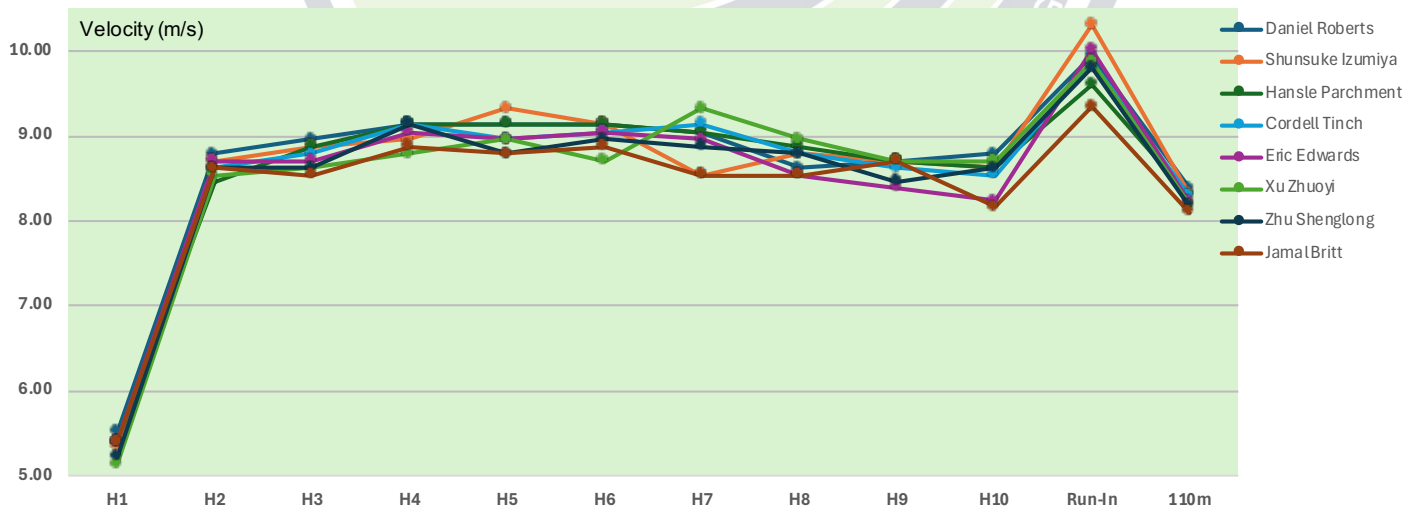
110m Hurdles

Date: 2024.04.27

Wind: 0.8 m/s

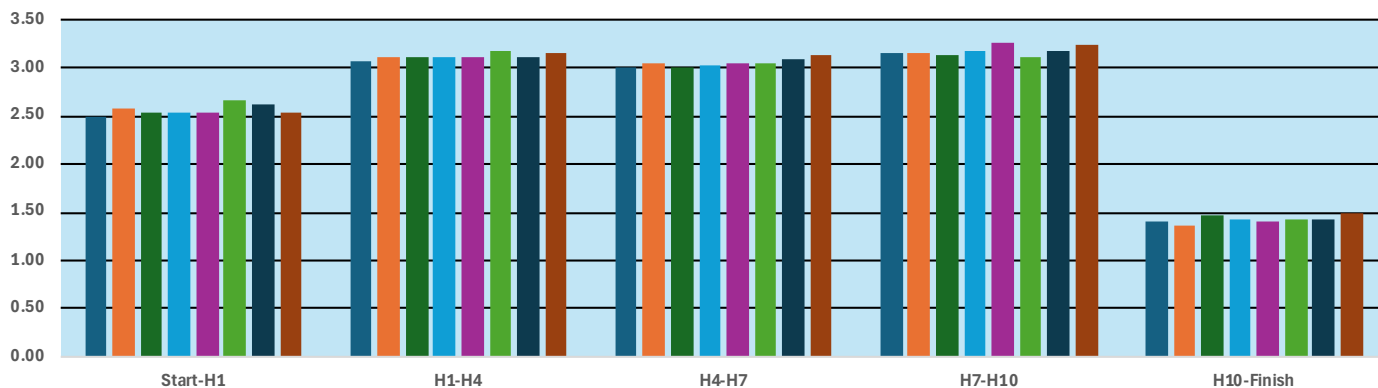
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	110m	Lane/Place	H1-H4	H4-H7	H7-H10
Roberts, Daniel (USA) (1998)	time	2.49	3.53	4.55	5.55	6.55	7.55	8.56	9.62	10.67	11.71		13.12	4 / 1			
	reaction time	0.147															
	interval	7 steps	1.04	1.02	1.00	1.00	1.00	1.01	1.06	1.05	1.04	1.41			3.06	3.01	3.15
	velocity	5.51	8.79	8.96	9.14	9.14	9.14	9.05	8.62	8.70	8.79	9.94	8.38		8.96	9.11	8.70
Izumiya, Shunsuke (JPN) (2000)	time	2.57	3.62	4.65	5.67	6.65	7.65	8.72	9.76	10.81	11.87		13.23	3 / 2			
	reaction time	0.146															
	interval	7 steps	1.05	1.03	1.02	0.98	1.00	1.07	1.04	1.05	1.06	1.36			3.10	3.05	3.15
	velocity	5.34	8.70	8.87	8.96	9.33	9.14	8.54	8.79	8.70	8.62	10.31	8.31		8.85	8.99	8.70
Parchment, Hansle (JAM) (1990)	time	2.54	3.62	4.65	5.65	6.65	7.65	8.66	9.69	10.74	11.80		13.26	5 / 3			
	reaction time	0.143															
	interval	7 steps	1.08	1.03	1.00	1.00	1.00	1.01	1.03	1.05	1.06	1.46			3.11	3.01	3.14
	velocity	5.40	8.46	8.87	9.14	9.14	9.14	9.05	8.87	8.70	8.62	9.60	8.30		8.82	9.11	8.73
Tinch, Cordell (USA) (2000)	time	2.54	3.60	4.64	5.64	6.66	7.67	8.67	9.71	10.77	11.84		13.26	6 / 4			
	reaction time	0.151															
	interval	7 steps	1.06	1.04	1.00	1.02	1.01	1.00	1.04	1.06	1.07	1.42			3.10	3.03	3.17
	velocity	5.40	8.62	8.79	9.14	8.96	9.05	9.14	8.79	8.62	8.54	9.87	8.30		8.85	9.05	8.65
Edwards, Eric (USA) (2000)	time	2.54	3.59	4.64	5.65	6.67	7.68	8.70	9.77	10.86	11.97		13.37	7 / 5			
	reaction time	0.139															
	interval	7 steps	1.05	1.05	1.01	1.02	1.01	1.02	1.07	1.09	1.11	1.40			3.11	3.05	3.27
	velocity	5.40	8.70	8.70	9.05	8.96	9.05	8.96	8.54	8.39	8.23	10.01	8.23		8.82	8.99	8.39
Xu Zhuoyi (CHN) (2003)	time	2.67	3.74	4.80	5.84	6.86	7.91	8.89	9.91	10.96	12.01		13.43	2 / 6			
	reaction time	0.155															
	interval	7 steps	1.07	1.06	1.04	1.02	1.05	0.98	1.02	1.05	1.05	1.42			3.17	3.05	3.12
	velocity	5.14	8.54	8.62	8.79	8.96	8.70	9.33	8.96	8.70	8.70	9.87	8.19		8.65	8.99	8.79
Zhu Shenglong (CHN) (2000)	time	2.63	3.69	4.75	5.75	6.79	7.81	8.84	9.88	10.96	12.02		13.45	8 / 7			
	reaction time	0.150															
	interval	7 steps	1.06	1.06	1.00	1.04	1.02	1.03	1.04	1.08	1.06	1.43			3.12	3.09	3.18
	velocity	5.22	8.62	8.62	9.14	8.79	8.96	8.87	8.79	8.46	8.62	9.80	8.18		8.79	8.87	8.62
Britt, Jamal (USA) (1998)	time	2.54	3.60	4.67	5.70	6.74	7.77	8.84	9.91	10.96	12.08		13.58	1 / 8			
	reaction time	0.128															
	interval	7 steps	1.06	1.07	1.03	1.04	1.03	1.07	1.07	1.05	1.12	1.50			3.16	3.14	3.24
	velocity	5.40	8.62	8.54	8.87	8.79	8.87	8.54	8.54	8.70	8.16	9.35	8.10		8.68	8.73	8.46



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=zCIQ03WG3VY>

2024 Xiamen Diamond League (Xiamen, CHN)

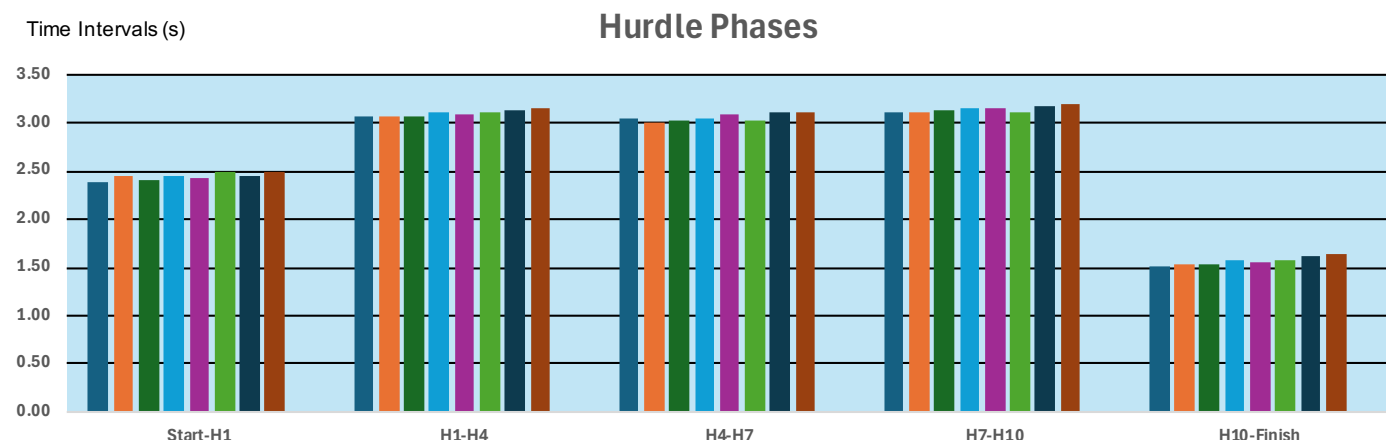
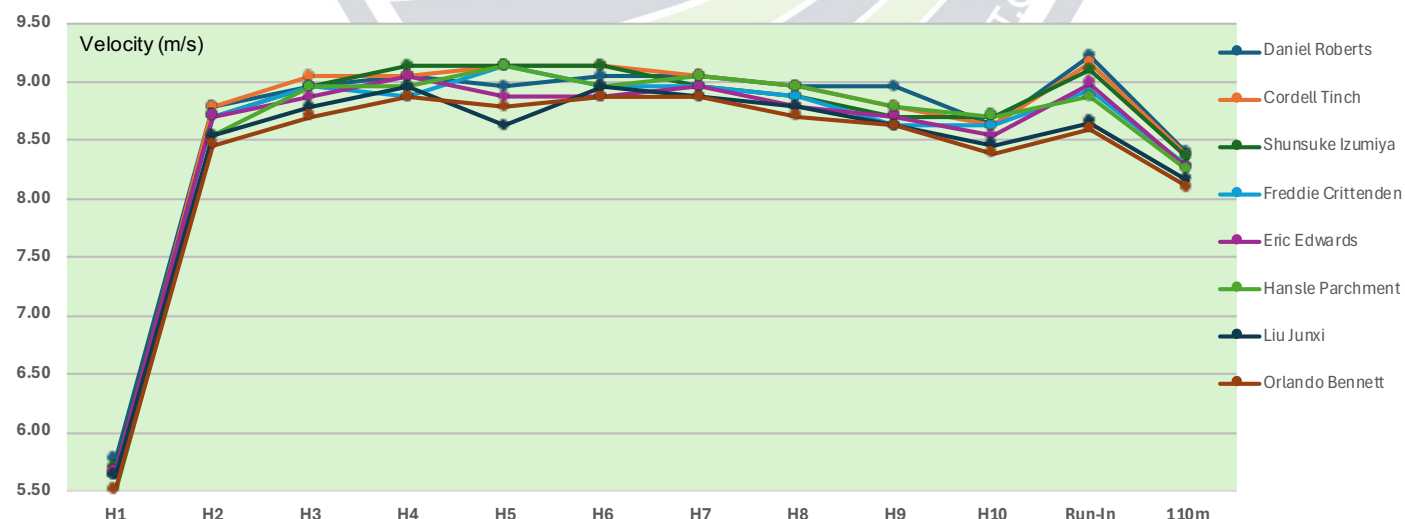
110m Hurdles

Date: 2024.04.20

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
Roberts, Daniel (USA) (1998)	time	2.38	3.42	4.44	5.45	6.47	7.48	8.49	9.51	10.53	11.59		13.11	6 / 1			
	reaction time	0.156													3.07	3.04	3.10
	interval	7 steps	1.04	1.02	1.01	1.02	1.01	1.01	1.02	1.02	1.06	1.52			8.93	9.02	8.85
Tinch, Cordell (USA) (2000)	time	2.44	3.48	4.49	5.50	6.50	7.50	8.51	9.53	10.57	11.63		13.16	3 / 2			
	reaction time	0.176													3.06	3.01	3.12
	interval	7 steps	1.04	1.01	1.01	1.00	1.00	1.01	1.02	1.04	1.06	1.53			8.96	9.11	8.79
Izumiya, Shunsuke (JPN) (2000)	time	2.41	3.46	4.48	5.48	6.48	7.48	8.50	9.53	10.58	11.63		13.17	4 / 3			
	reaction time	0.172													3.07	3.02	3.13
	interval	7 steps	1.05	1.02	1.00	1.00	1.00	1.02	1.03	1.05	1.05	1.54			8.93	9.08	8.76
Crittenden, Freddie (USA) (1994)	time	2.44	3.49	4.51	5.54	6.54	7.56	8.58	9.61	10.67	11.73		13.30	7 / 4			
	reaction time	0.166													3.10	3.04	3.15
	interval	7 steps	1.05	1.02	1.03	1.00	1.02	1.02	1.03	1.06	1.06	1.57			8.85	9.02	8.70
Edwards, Eric (USA) (2000)	time	2.42	3.47	4.50	5.51	6.54	7.57	8.59	9.63	10.68	11.75		13.31	9 / 5			
	reaction time	0.143													3.09	3.08	3.16
	interval	7 steps	1.05	1.03	1.01	1.03	1.03	1.02	1.04	1.05	1.07	1.56			8.87	8.90	8.68
Parchment, Hansle (JAM) (1990)	time	2.50	3.57	4.59	5.61	6.61	7.63	8.64	9.66	10.70	11.75		13.33	5 / 6			
	reaction time	0.157													3.11	3.03	3.11
	interval	7 steps	1.07	1.02	1.02	1.00	1.02	1.01	1.02	1.04	1.05	1.58			8.82	9.05	8.82
Liu Junxi (CHN) (2003)	time	2.44	3.51	4.55	5.57	6.63	7.65	8.68	9.72	10.78	11.86		13.48	10 / 7			
	reaction time	0.159													3.13	3.11	3.18
	interval	7 steps	1.07	1.04	1.02	1.06	1.02	1.03	1.04	1.06	1.08	1.62			8.76	8.82	8.62
Bennett, Orlando (JAM) (1999)	time	2.49	3.57	4.62	5.65	6.69	7.72	8.75	9.80	10.86	11.95		13.58	2 / 8			
	reaction time	0.182													3.16	3.10	3.20
	interval	7 steps	1.08	1.05	1.03	1.04	1.03	1.03	1.05	1.06	1.09	1.63			8.68	8.85	8.57
Britt, Jamal (USA) (1998)	time	0.144											13.88	8 / 9			
	interval	7 steps															



Source: Omega Timing (Sat 20 Apr 2024 20:29) - diamond league race analysis
<https://www.omegatiming.com/File/000204040102090101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=u6sgslkWITU>

Women's 100m Hurdles

2024 Top 10 Times - Women's 100m Hurdles

	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)																	
FINAL - 2024 Golden Gala • Pietro Mennea (Roma, ITA)																	
date 30-Aug time	2.40	3.42	4.37	5.31	6.27	7.21	8.16	9.12	10.08	11.06							
reaction time	0.153	interval	1.02	0.95	0.94	0.96	0.94	0.95	0.96	0.98	1.18				2.91	2.85	2.90
wind -0.4 m/s velocity	5.42	8.33	8.95	9.04	8.85	9.04	8.95	8.85	8.85	8.67	8.52			8.76	8.95	8.79	
Russell, Masai (USA) (2000)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date 30-Jun time	2.54	3.55	4.55	5.51	6.46	7.39	8.35	9.29	10.23	11.19							
reaction time	interval	1.01	1.00	0.96	0.95	0.93	0.96	0.94	0.94	0.96	1.06				2.97	2.84	2.84
wind 0.7 m/s velocity	5.12	8.42	8.50	8.85	8.95	9.14	8.85	9.04	9.04	8.85	9.48			8.59	8.98	8.98	
Nugent, Ackera (JAM) (2002)																	
FINAL - 2024 Jamaican National Senior Championships (Kingston, JAM) (TV Analysis)																	
date 28-Jun time	2.53	3.53	4.50	5.47	6.41	7.35	8.30	9.27	10.24	11.22							
reaction time	0.145	interval	1.00	0.97	0.97	0.94	0.94	0.95	0.97	0.97	1.06				2.94	2.83	2.92
wind 0.1 m/s velocity	5.14	8.50	8.76	8.76	9.04	9.04	8.95	8.76	8.76	8.67	9.48			8.67	9.01	8.73	
Nugent, Ackera (JAM) (2002)																	
FINAL - 2024 Kamila Skolimowska Memorial (Silesia, POL)																	
date 25-Aug time	2.40	3.42	4.38	5.32	6.25	7.17	8.13	9.11	10.10	11.08							
reaction time	0.147	interval	1.02	0.96	0.94	0.93	0.92	0.96	0.98	0.99	1.21				2.92	2.81	2.95
wind -0.5 m/s velocity	5.42	8.33	8.85	9.04	9.14	9.24	8.85	8.67	8.59	8.67	8.31			8.73	9.07	8.64	
Nugent, Ackera (JAM) (2002)																	
Heat B - 2024 Kamila Skolimowska Memorial (Silesia, POL)																	
date 25-Aug time	2.39	3.40	4.35	5.30	6.24	7.21	8.16	9.12	10.09	11.08							
reaction time	0.140	interval	1.01	0.95	0.95	0.94	0.97	0.95	0.96	0.97	1.22				2.91	2.86	2.92
wind 0.6 m/s velocity	5.44	8.42	8.95	8.95	9.04	8.76	8.95	8.85	8.76	8.59	8.24			8.76	8.92	8.73	
Samba-Mayela, Cyréna (FRA) (2000)																	
FINAL - 2024 European Athletics Championships (Roma, ITA) (TV Analysis)																	
date 6-Jun time	2.54	3.54	4.52	5.46	6.42	7.34	8.30	9.26	10.23	11.22							
reaction time	0.150	interval	1.00	0.98	0.94	0.96	0.92	0.96	0.96	0.97	1.09				2.92	2.84	2.92
wind 0.8 m/s velocity	5.12	8.50	8.67	9.04	8.85	9.24	8.85	8.85	8.76	8.59	9.22			8.73	8.98	8.73	
Johnson, Alaysha (USA) (1996)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date 30-Jun time	2.56	3.57	4.53	5.48	6.42	7.38	8.34	9.28	10.25	11.21							
reaction time	interval	1.01	0.96	0.95	0.94	0.96	0.96	0.94	0.97	0.96	1.10				2.92	2.86	2.87
wind 0.7 m/s velocity	5.08	8.42	8.85	8.95	9.04	8.85	8.85	9.04	8.76	8.85	9.14			8.73	8.92	8.89	
Stark, Grace (USA) (2001)																	
FINAL - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date 30-Jun time	2.52	3.54	4.53	5.46	6.42	7.37	8.33	9.27	10.25	11.25							
reaction time	interval	1.02	0.99	0.93	0.96	0.95	0.96	0.94	0.98	1.00	1.06				2.94	2.87	2.92
wind 0.7 m/s velocity	5.16	8.33	8.59	9.14	8.85	8.95	8.85	9.04	8.67	8.50	9.48			8.67	8.89	8.73	
Russell, Masai (USA) (2000)																	
FINAL - 2024 Golden Gala • Pietro Mennea (Roma, ITA)																	
date 30-Aug time	2.41	3.45	4.44	5.41	6.36	7.31	8.26	9.21	10.17	11.13							
reaction time	0.152	interval	1.04	0.99	0.97	0.95	0.95	0.95	0.96	0.96	1.18				3.00	2.85	2.87
wind -0.4 m/s velocity	5.39	8.17	8.59	8.76	8.95	8.95	8.95	8.95	8.85	8.85	8.52			8.50	8.95	8.89	
Russell, Masai (USA) (2000)																	
FINAL - 2024 Olympic Games (Paris, FRA)																	
date 10-Aug time	2.40	3.44	4.45	5.42	6.38	7.32	8.27	9.22	10.18	11.14							
reaction time	0.137	interval	1.04	1.01	0.97	0.96	0.94	0.95	0.96	0.96	1.19				3.02	2.85	2.87
wind -0.3 m/s velocity	5.42	8.17	8.42	8.76	8.85	9.04	8.95	8.95	8.85	8.85	8.45			8.44	8.95	8.89	
Johnson, Alaysha (USA) (1996)																	
Semi-Final 2 - 2024 Olympic Games (Paris, FRA)																	
date 10-Aug time	2.41	3.45	4.44	5.40	6.36	7.31	8.25	9.21	10.17	11.14							
reaction time	0.133	interval	1.04	0.99	0.96	0.96	0.95	0.94	0.96	0.96	1.20				2.99	2.85	2.89
wind 0.4 m/s velocity	5.39	8.17	8.59	8.85	8.85	8.95	9.04	8.85	8.85	8.76	8.38			8.53	8.95	8.82	
Samba-Mayela, Cyréna (FRA) (2000)																	
FINAL - 2024 Olympic Games (Paris, FRA)																	
date 10-Aug time	2.42	3.44	4.43	5.39	6.34	7.29	8.22	9.18	10.15	11.12							
reaction time	0.143	interval	1.02	0.99	0.96	0.95	0.95	0.93	0.96	0.97	1.22				2.97	2.83	2.90
wind -0.3 m/s velocity	5.37	8.33	8.59	8.85	8.95	8.95	9.14	8.85	8.76	8.76	8.24			8.59	9.01	8.79	
Russell, Masai (USA) (2000)																	
Heat 2 - 2024 USA Olympic Trials (Eugene, OR) (TV Analysis)																	
date 28-Jun time	2.57	3.56	4.55	5.53	6.48	7.44	8.39	9.34	10.31	11.28							
reaction time	interval	0.99	0.99	0.98	0.95	0.96	0.95	0.95	0.97	0.97	1.07				2.96	2.86	2.89
wind 0.2 m/s velocity	5.06	8.59	8.59	8.67	8.95	8.85	8.95	8.95	8.76	8.76	9.39			8.61	8.92	8.82	
Camacho-Quinn, Jasmine (PUR) (1996)																	
Semi-Final 3 - 2024 Olympic Games (Paris, FRA)																	
date 10-Aug time	2.44	3.46	4.43	5.39	6.32	7.27	8.23	9.19	10.17	11.15							
reaction time	0.161	interval	1.02	0.97	0.96	0.93	0.95	0.96	0.96	0.98	1.20				2.95	2.84	2.92
wind -0.7 m/s velocity	5.33	8.33	8.76	8.85	9.14	8.95	8.85	8.85	8.67	8.67	8.38			8.64	8.98	8.73	

2024 Memorial van damme (Brussels, BEL)

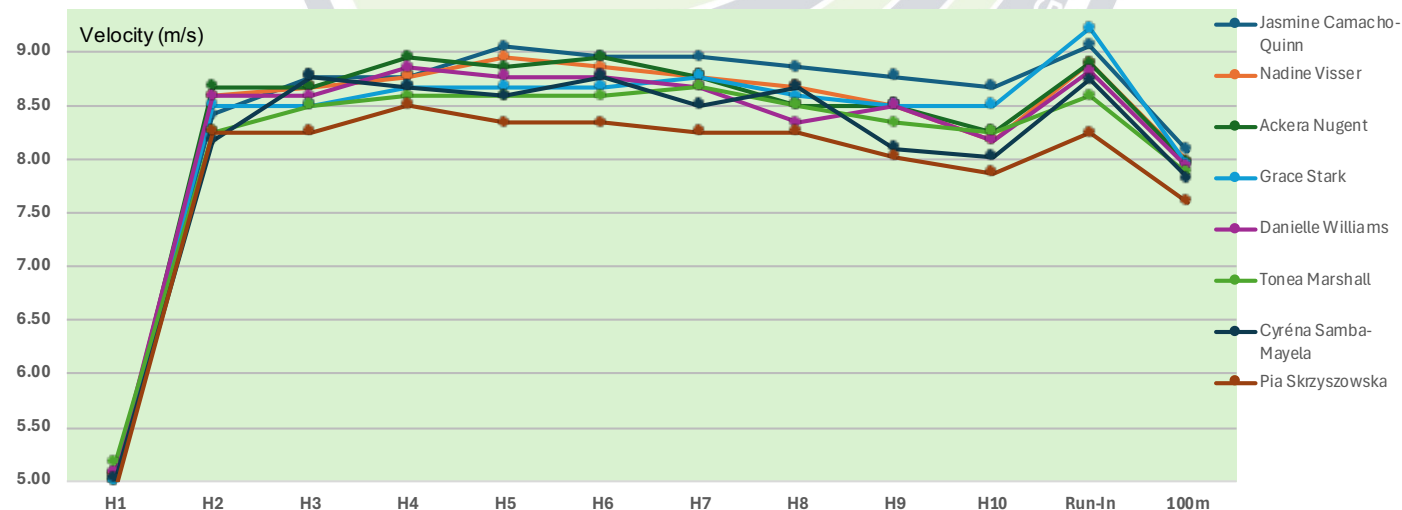
100m Hurdles

Date: 2024.09.14

Wind: 0.4 m/s

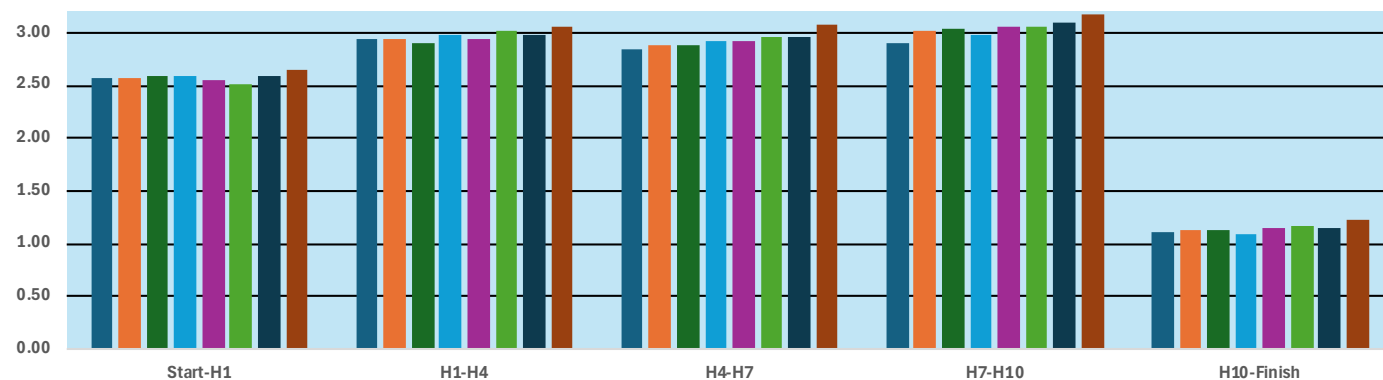
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.57	3.58	4.55	5.52	6.46	7.41	8.36	9.32	10.29	11.27		12.38	4 / 1			
	reaction time	0.152													2.95	2.84	2.91
	interval		1.01	0.97	0.97	0.94	0.95	0.95	0.96	0.97	0.98	1.11			8.64	8.98	8.76
	velocity	5.06	8.42	8.76	8.76	9.04	8.95	8.95	8.85	8.76	8.67	9.05	8.08				
Visser, Nadine (NED) (1995)	time	2.57	3.56	4.54	5.51	6.46	7.42	8.39	9.37	10.37	11.41		12.54	2 / 2			
	reaction time	0.150													2.94	2.88	3.02
	interval		0.99	0.98	0.97	0.95	0.96	0.97	0.98	1.00	1.04	1.13			8.67	8.85	8.44
	velocity	5.06	8.59	8.67	8.76	8.95	8.85	8.76	8.67	8.50	8.17	8.89	7.97				
Nugent, Ackera (JAM) (2002)	time	2.60	3.58	4.56	5.51	6.47	7.42	8.39	9.39	10.39	11.42		12.55	5 / 3			
	reaction time	0.130													2.91	2.88	3.03
	interval		0.98	0.98	0.95	0.96	0.95	0.97	1.00	1.00	1.03	1.13			8.76	8.85	8.42
	velocity	5.00	8.67	8.67	8.95	8.85	8.95	8.76	8.50	8.50	8.25	8.89	7.97				
Stark, Grace (USA) (2001)	time	2.60	3.60	4.60	5.58	6.56	7.54	8.51	9.50	10.50	11.50		12.59	3 / 4			
	reaction time	0.153													2.98	2.93	2.99
	interval		1.00	1.00	0.98	0.98	0.98	0.97	0.99	1.00	1.00	1.09			8.56	8.70	8.53
	velocity	5.00	8.50	8.50	8.67	8.67	8.67	8.76	8.59	8.50	8.50	9.22	7.94				
Williams, Danielle (JAM) (1992)	time	2.56	3.55	4.54	5.50	6.47	7.44	8.42	9.44	10.44	11.48		12.62	7 / 5			
	reaction time	0.129													2.94	2.92	3.06
	interval		0.99	0.99	0.96	0.97	0.97	0.98	1.02	1.00	1.04	1.14			8.67	8.73	8.33
	velocity	5.08	8.59	8.59	8.85	8.76	8.76	8.67	8.33	8.50	8.17	8.82	7.92				
Marshall, Tonea (USA) (1998)	time	2.51	3.54	4.54	5.53	6.52	7.51	8.49	9.49	10.51	11.54		12.71	1 / 6			
	reaction time	0.128													3.02	2.96	3.05
	interval		1.03	1.00	0.99	0.99	0.99	0.98	1.00	1.02	1.03	1.17			8.44	8.61	8.36
	velocity	5.18	8.25	8.50	8.59	8.59	8.59	8.67	8.50	8.33	8.25	8.59	7.87				
Samba-Mayela, Cyréna (FRA) (2000)	time	2.59	3.63	4.60	5.58	6.57	7.54	8.54	9.52	10.57	11.63		12.78	6 / 7			
	reaction time	0.132													2.99	2.96	3.09
	interval		1.04	0.97	0.98	0.99	0.97	1.00	0.98	1.05	1.06	1.15			8.53	8.61	8.25
	velocity	5.02	8.17	8.76	8.67	8.59	8.76	8.50	8.67	8.10	8.02	8.74	7.82				
Skrzyszowska, Pia (POL) (2001)	time	2.64	3.67	4.70	5.70	6.72	7.74	8.77	9.80	10.86	11.94		13.16	8 / 8			
	reaction time	0.165													3.06	3.07	3.17
	interval		1.03	1.03	1.00	1.02	1.02	1.03	1.03	1.06	1.08	1.22			8.33	8.31	8.04
	velocity	4.92	8.25	8.25	8.50	8.33	8.33	8.25	8.25	8.02	7.87	8.24	7.60				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

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

2024 Weltklasse (Zürich, SUI)

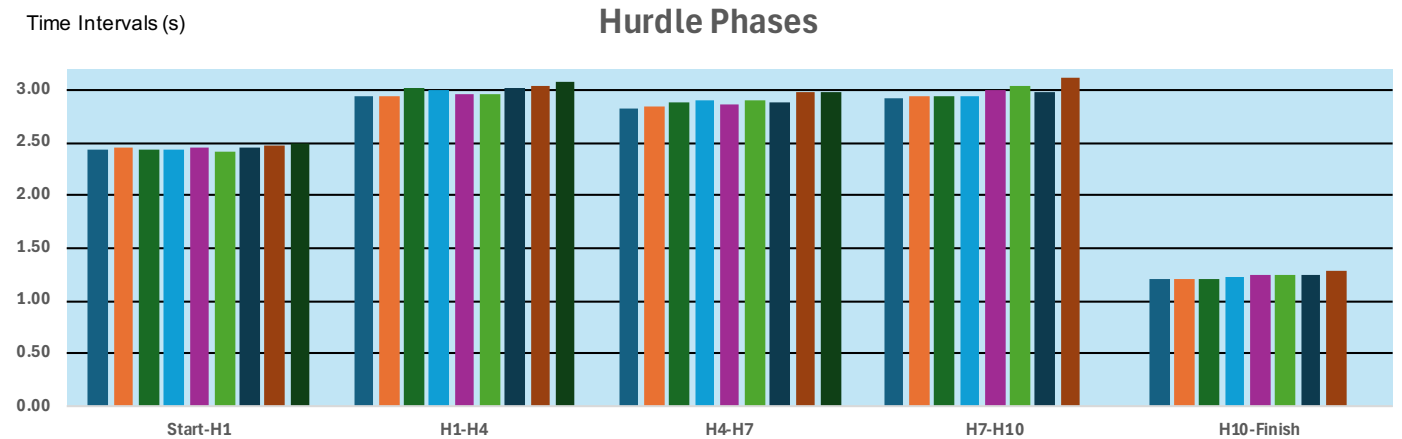
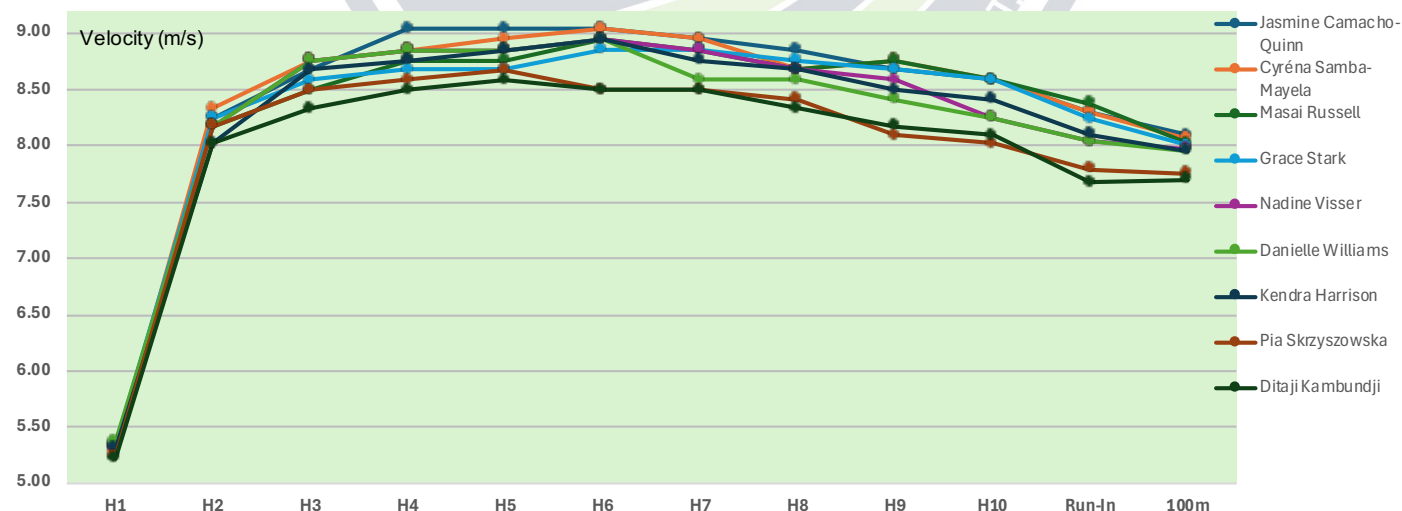
100m Hurdles

Date: 2024.09.05

Wind: 0.8 m/s

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.44	3.47	4.45	5.39	6.33	7.27	8.22	9.18	10.16	11.15		12.36	4 / 1			
	reaction time	0.145													2.95	2.83	2.93
	interval		1.03	0.98	0.94	0.94	0.94	0.95	0.96	0.98	0.99	1.21			8.64	9.01	8.70
	velocity	5.33	8.25	8.67	9.04	9.04	9.04	8.95	8.85	8.67	8.59	8.31	8.09				
Samba-Mayela, Cyréna (FRA) (2000)	time	2.46	3.48	4.45	5.41	6.36	7.30	8.25	9.23	10.20	11.19		12.40	6 / 2			
	reaction time	0.121													2.95	2.84	2.94
	interval		1.02	0.97	0.96	0.95	0.94	0.95	0.98	0.97	0.99	1.21			8.64	8.98	8.67
	velocity	5.28	8.33	8.76	8.85	8.95	9.04	8.95	8.67	8.76	8.59	8.31	8.06				
Russell, Masai (USA) (2000)	time	2.44	3.48	4.48	5.45	6.42	7.37	8.33	9.31	10.28	11.27		12.47	5 / 3			
	reaction time	0.149													3.01	2.88	2.94
	interval		1.04	1.00	0.97	0.97	0.95	0.96	0.98	0.97	0.99	1.20			8.47	8.85	8.67
	velocity	5.33	8.17	8.50	8.76	8.76	8.95	8.85	8.67	8.76	8.59	8.37	8.02				
Stark, Grace (USA) (2001)	time	2.43	3.46	4.45	5.43	6.41	7.37	8.33	9.30	10.28	11.27		12.49	7 / 4			
	reaction time	0.144													3.00	2.90	2.94
	interval		1.03	0.99	0.98	0.98	0.96	0.96	0.97	0.98	0.99	1.22			8.50	8.79	8.67
	velocity	5.35	8.25	8.59	8.67	8.67	8.85	8.85	8.76	8.67	8.59	8.24	8.01				
Visser, Nadine (NED) (1995)	time	2.45	3.49	4.46	5.42	6.38	7.33	8.29	9.27	10.26	11.29		12.54	3 / 5			
	reaction time	0.140													2.97	2.87	3.00
	interval		1.04	0.97	0.96	0.96	0.95	0.96	0.98	0.99	1.03	1.25			8.59	8.89	8.50
	velocity	5.31	8.17	8.76	8.85	8.85	8.95	8.85	8.67	8.59	8.25	8.04	7.97				
Williams, Danielle (JAM) (1992)	time	2.42	3.46	4.43	5.39	6.35	7.30	8.29	9.28	10.29	11.32		12.57	2 / 6			
	reaction time	0.108													2.97	2.90	3.03
	interval		1.04	0.97	0.96	0.96	0.95	0.99	0.99	1.01	1.03	1.25			8.59	8.79	8.42
	velocity	5.37	8.17	8.76	8.85	8.85	8.95	8.59	8.59	8.42	8.25	8.04	7.96				
Harrison, Kendra (USA) (1992)	time	2.45	3.51	4.49	5.46	6.42	7.37	8.34	9.32	10.32	11.33		12.57	1 / 7			
	reaction time	0.147													3.01	2.88	2.99
	interval		1.06	0.98	0.97	0.96	0.95	0.97	0.98	1.00	1.01	1.24			8.47	8.85	8.53
	velocity	5.31	8.02	8.67	8.76	8.85	8.95	8.76	8.67	8.50	8.42	8.10	7.96				
Skrzysowska, Pia (POL) (2001)	time	2.48	3.52	4.52	5.51	6.49	7.49	8.49	9.50	10.55	11.61		12.90	9 / 8			
	reaction time	0.134													3.03	2.98	3.12
	interval		1.04	1.00	0.99	0.98	1.00	1.00	1.01	1.05	1.06	1.29			8.42	8.56	8.17
	velocity	5.24	8.17	8.50	8.59	8.67	8.50	8.50	8.42	8.10	8.02	7.79	7.75				
Kambundji, Ditaji (SUI) (2002)	time	2.49	3.55	4.57	5.57	6.56	7.56	8.56	9.58	10.62	11.67		12.98	8 / 9	no official time given		
	reaction time	0.097													3.08	2.99	3.11
	interval		1.06	1.02	1.00	0.99	1.00	1.00	1.02	1.04	1.05	1.31	DQ		8.28	8.53	8.20
	velocity	5.22	8.02	8.33	8.50	8.59	8.50	8.50	8.33	8.17	8.10	7.67	7.70				



Source: Omega Timing (Thu 5 Sep 2024 21:57) - diamond league race analysis
<https://www.omegatiming.com/File/0002041101010A0101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=2etLovyhd14>

2024 Golden Gala • Pietro Mennea (Roma, ITA)

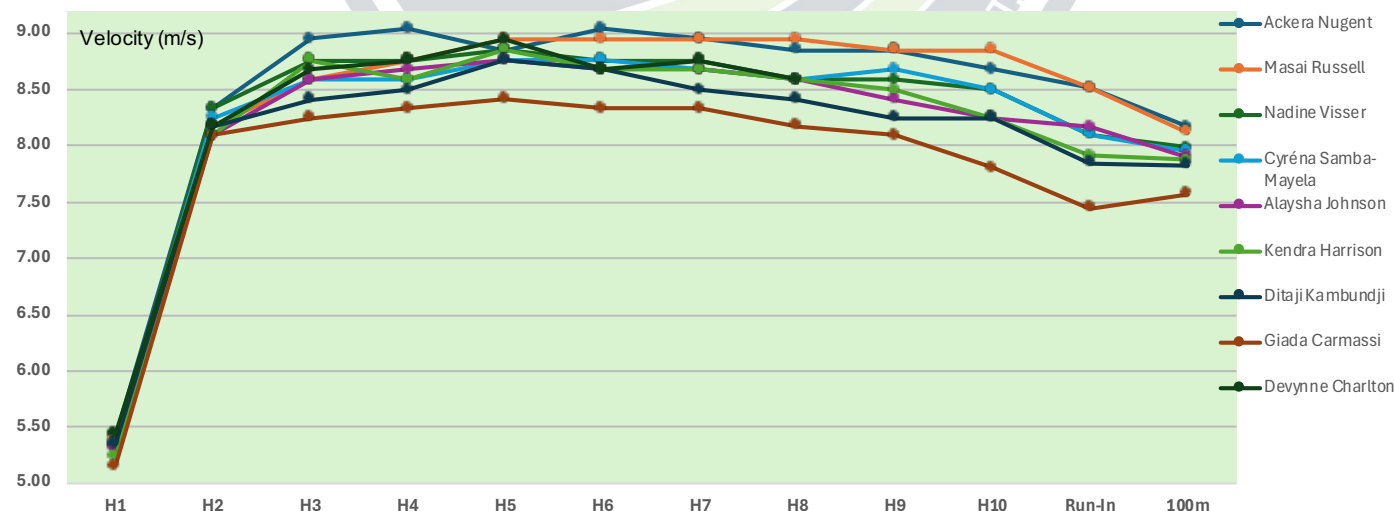
100m Hurdles

Date: 2024.08.30

Wind: -0.4 m/s

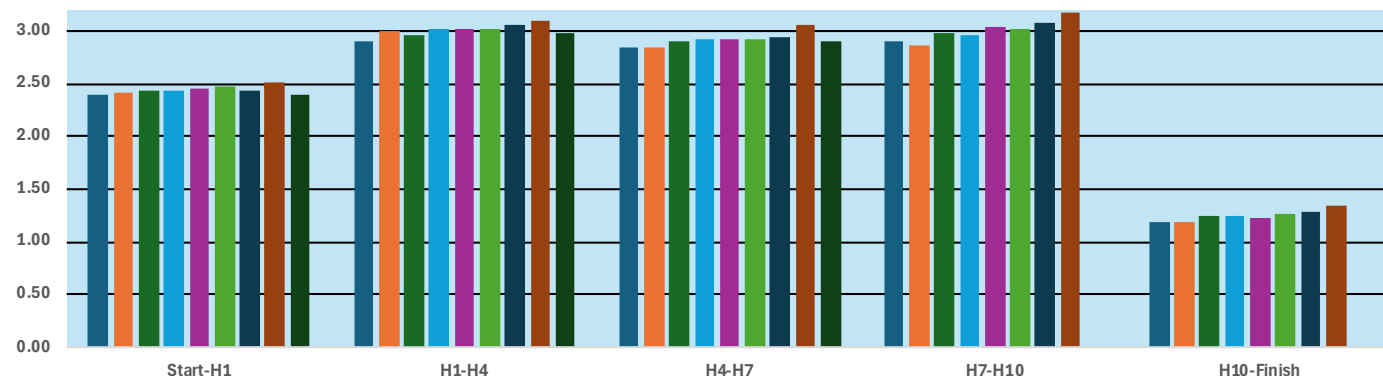
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nugent, Ackera (JAM) (2002)	time	2.40	3.42	4.37	5.31	6.27	7.21	8.16	9.12	10.08	11.06	12.24	12.24	7 / 1			
	reaction time	0.153											NR PB		2.91	2.85	2.90
	interval velocity	5.42	8.33	8.95	9.04	8.85	9.04	8.95	8.85	8.85	8.85	8.67	8.52	8.17	8.76	8.95	8.79
Russell, Masai (USA) (2000)	time	2.41	3.45	4.44	5.41	6.36	7.31	8.26	9.21	10.17	11.13	12.31	12.31	4 / 2			
	reaction time	0.152										1.18	1.18		3.00	2.85	2.87
	interval velocity	5.39	8.17	8.59	8.76	8.95	8.95	8.95	8.95	8.85	8.85	8.52	8.12		8.50	8.95	8.89
Visser, Nadine (NED) (1995)	time	2.44	3.46	4.43	5.40	6.36	7.33	8.30	9.29	10.28	11.28	12.52	12.52	3 / 3			
	reaction time	0.145										1.24	1.24		2.96	2.90	2.98
	interval velocity	5.33	8.33	8.76	8.76	8.85	8.76	8.76	8.59	8.59	8.50	8.10	7.99		8.61	8.79	8.56
Samba-Mayela, Cyréna (FRA) (2000)	time	2.43	3.46	4.45	5.44	6.41	7.38	8.36	9.35	10.33	11.33	12.57	12.57	5 / 4			
	reaction time	0.141										1.24	1.24		3.01	2.92	2.97
	interval velocity	5.35	8.25	8.59	8.59	8.76	8.76	8.67	8.59	8.67	8.50	8.10	7.96		8.47	8.73	8.59
Johnson, Alaysha (USA) (1996)	time	2.45	3.50	4.49	5.47	6.44	7.42	8.40	9.39	10.40	11.43	12.66	12.66	2 / 5			
	reaction time	0.147										1.23	1.23		3.02	2.93	3.03
	interval velocity	5.31	8.10	8.59	8.67	8.76	8.67	8.67	8.59	8.42	8.25	8.17	7.90		8.44	8.70	8.42
Harrison, Kendra (USA) (1992)	time	2.48	3.53	4.50	5.49	6.45	7.43	8.41	9.40	10.40	11.43	12.70	12.70	9 / 6			
	reaction time	0.161										1.27	1.27		3.01	2.92	3.02
	interval velocity	5.24	8.10	8.76	8.59	8.85	8.67	8.67	8.59	8.50	8.25	7.91	7.87		8.47	8.73	8.44
Kambundji, Ditaji (SUI) (2002)	time	2.43	3.47	4.48	5.48	6.45	7.43	8.43	9.44	10.47	11.50	12.78	12.78	8 / 7			
	reaction time	0.119										1.28	1.28		3.05	2.95	3.07
	interval velocity	5.35	8.17	8.42	8.50	8.76	8.67	8.50	8.42	8.25	8.25	7.85	7.82		8.36	8.64	8.31
Carmassi, Giada (ITA) (1994)	time	2.52	3.57	4.60	5.62	6.63	7.65	8.67	9.71	10.76	11.85	13.20	13.20	1 / 8			
	reaction time	0.136										1.35	1.35		3.10	3.05	3.18
	interval velocity	5.16	8.10	8.25	8.33	8.42	8.33	8.33	8.17	8.10	7.80	7.44	7.58		8.23	8.36	8.02
Charlton, Devynne (BAH) (1995)	time	2.39	3.43	4.41	5.38	6.33	7.31	8.28	9.27					dnf			
	reaction time	0.151													2.99	2.90	
	interval velocity	5.44	8.17	8.67	8.76	8.95	8.67	8.76	8.59						8.53	8.79	



Time Intervals (s)

Hurdle Phases

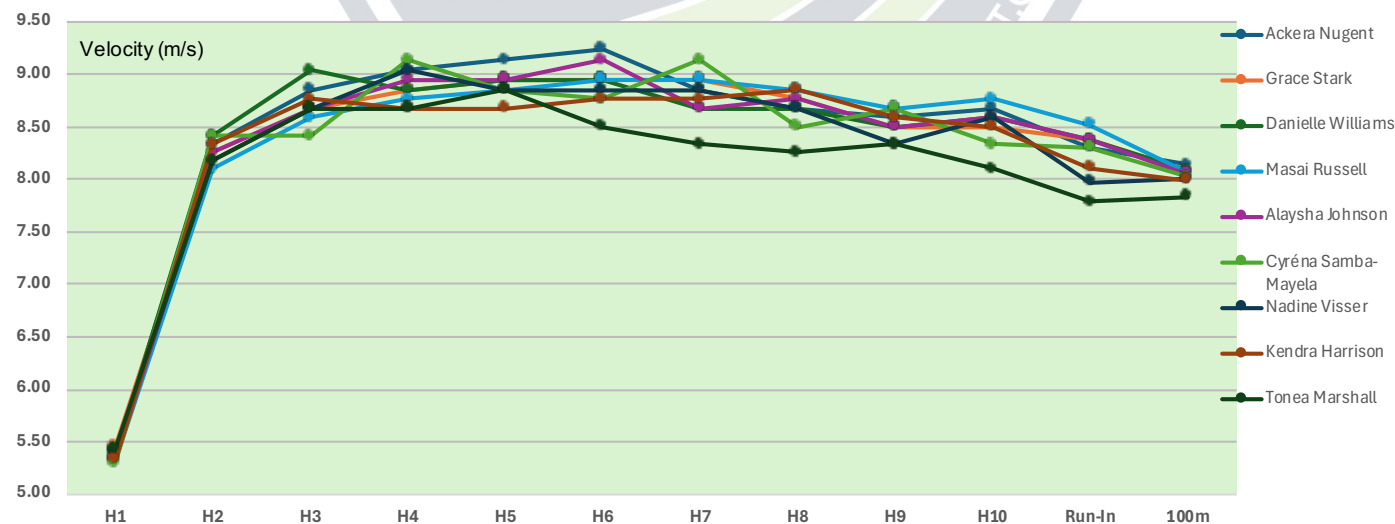


Source: Omega Timing (Fri 30 Aug 2024 21:20) - diamond league race analysis
<https://www.omegatiming.com/File/000204100103030101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=4C8buXxBdxA>

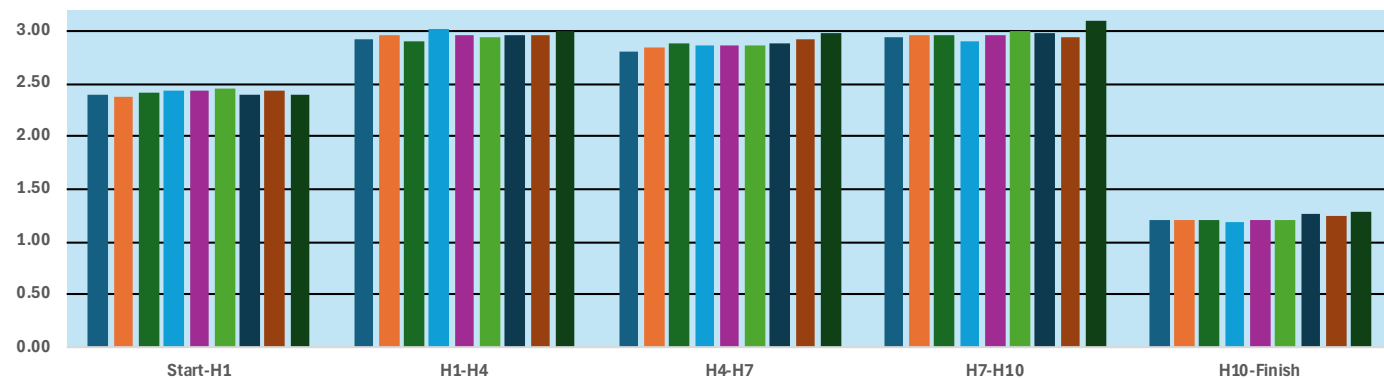
2024 Kamila Skolimowska Memorial (Silesia, POL)

100m Hurdles		Date: 2024.08.25	Wind: -0.5 m/s										FINAL					
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nugent, Ackera (JAM) (2002)	time	2.40	3.42	4.38	5.32	6.25	7.17	8.13	9.11	10.10	11.08		12.29	5/1				
	reaction time	0.147														2.92	2.81	2.95
	interval		1.02	0.96	0.94	0.93	0.92	0.96	0.98	0.99	0.98	1.21				8.73	9.07	8.64
	velocity	5.42	8.33	8.85	9.04	9.14	9.24	8.85	8.67	8.59	8.67	8.31	8.14					
Stark, Grace (USA) (2001)	time	2.38	3.41	4.39	5.35	6.30	7.25	8.20	9.17	10.17	11.17		12.37	7/2				
	reaction time	0.142														2.97	2.85	2.97
	interval		1.03	0.98	0.96	0.95	0.95	0.95	0.97	1.00	1.00	1.20				8.59	8.95	8.59
	velocity	5.46	8.25	8.67	8.85	8.95	8.95	8.95	8.76	8.50	8.50	8.38	8.08					
Williams, Danielle (JAM) (1992)	time	2.42	3.43	4.37	5.33	6.28	7.23	8.21	9.19	10.19	11.18		12.38	4/3				
	reaction time	0.129														2.91	2.88	2.97
	interval		1.01	0.94	0.96	0.95	0.95	0.98	0.98	1.00	0.99	1.20				8.76	8.85	8.59
	velocity	5.37	8.42	9.04	8.85	8.95	8.95	8.67	8.67	8.50	8.59	8.37	8.08					
Russell, Masai (USA) (2000)	time	2.44	3.49	4.48	5.45	6.41	7.36	8.31	9.27	10.25	11.22		12.40	1/4				
	reaction time	0.151														3.01	2.86	2.91
	interval		1.05	0.99	0.97	0.96	0.95	0.96	0.98	0.98	0.97	1.18				8.47	8.92	8.76
	velocity	5.33	8.10	8.59	8.76	8.85	8.95	8.95	8.85	8.67	8.76	8.52	8.06					
Johnson, Alaysha (USA) (1996)	time	2.44	3.47	4.45	5.40	6.35	7.28	8.26	9.23	10.23	11.22		12.42	6/5				
	reaction time	0.155														2.96	2.86	2.96
	interval		1.03	0.98	0.95	0.95	0.93	0.98	0.97	1.00	0.99	1.20				8.61	8.92	8.61
	velocity	5.33	8.25	8.67	8.95	8.95	9.14	8.67	8.76	8.50	8.59	8.38	8.05					
Samba-Mayela, Cyréna (FRA) (2000)	time	2.45	3.46	4.47	5.40	6.36	7.33	8.26	9.26	10.24	11.26		12.47	8/6				
	reaction time	0.162														2.95	2.86	3.00
	interval		1.01	1.01	0.93	0.96	0.97	0.93	1.00	0.98	1.02	1.21				8.64	8.92	8.50
	velocity	5.31	8.42	8.42	9.14	8.85	8.76	9.14	8.50	8.67	8.33	8.31	8.02					
Visser, Nadine (NED) (1995)	time	2.40	3.44	4.42	5.36	6.32	7.28	8.24	9.22	10.24	11.23		12.49	2/7				
	reaction time	0.144														2.96	2.88	2.99
	interval		1.04	0.98	0.94	0.96	0.96	0.96	0.98	1.02	0.99	1.26				8.61	8.85	8.53
	velocity	5.42	8.17	8.67	9.04	8.85	8.85	8.85	8.67	8.33	8.59	7.98	8.01					
Harrison, Kendra (USA) (1992)	time	2.44	3.46	4.43	5.41	6.39	7.36	8.33	9.29	10.28	11.28		12.52	3/8				
	reaction time	0.153														2.97	2.92	2.95
	interval		1.02	0.97	0.98	0.98	0.97	0.97	0.96	0.99	1.00	1.24				8.59	8.73	8.64
	velocity	5.33	8.33	8.76	8.67	8.67	8.76	8.76	8.85	8.59	8.50	8.10	7.99					
Marshall, Tonea (USA) (1998)	time	2.39	3.43	4.41	5.39	6.35	7.35	8.37	9.40	10.42	11.47		12.76	9/9				
	reaction time	0.149														3.00	2.98	3.10
	interval		1.04	0.98	0.98	0.96	1.00	1.02	1.03	1.02	1.05	1.29				8.50	8.56	8.23
	velocity	5.44	8.17	8.67	8.67	8.85	8.50	8.33	8.25	8.33	8.10	7.79	7.84					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 25 Aug 2024 16:40) - diamond league race analysis
<https://www.omegatiming.com/File/0002040F0102030201FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=7bzFUwS3BSA>

2024 Kamila Skolimowska Memorial (Silesia, POL)

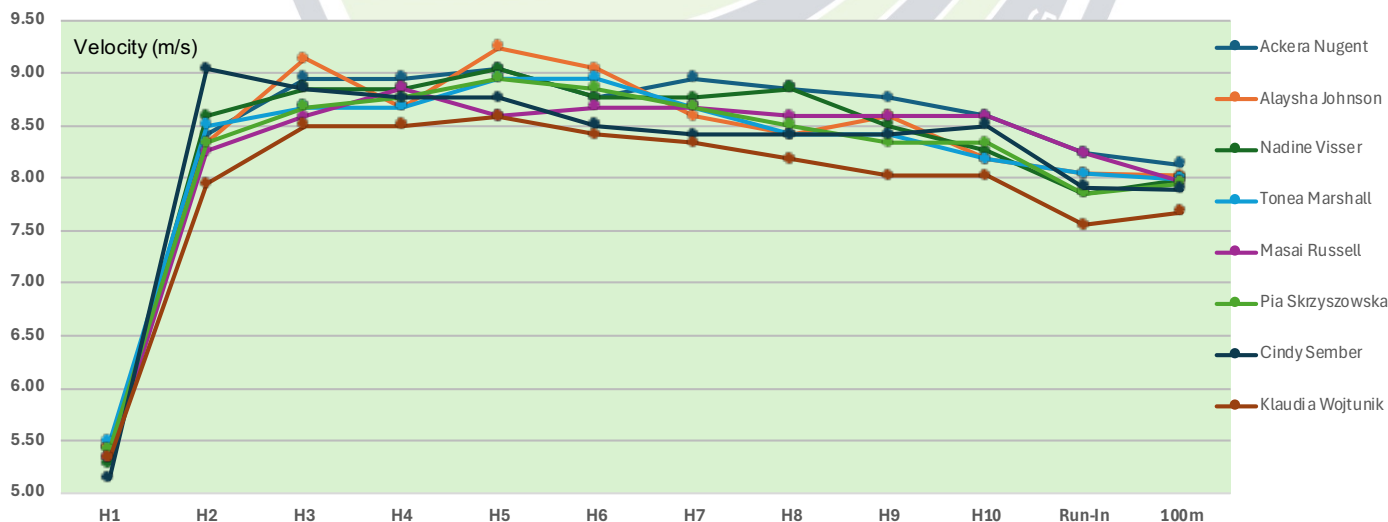
100m Hurdles

Date: 2024.08.25

Wind: 0.6 m/s

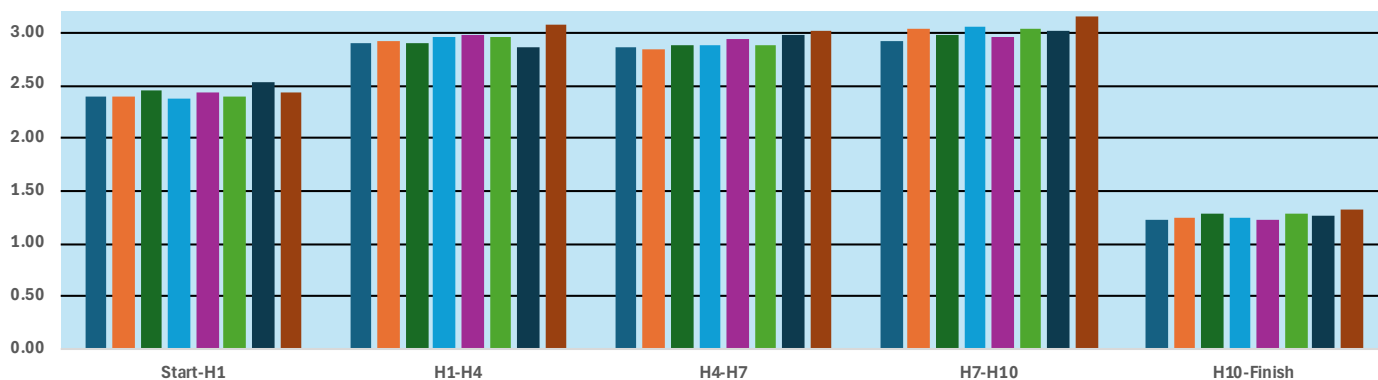
Heat B

		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	2.39	3.40	4.35	5.30	6.24	7.21	8.16	9.12	10.09	11.08		12.30	3 / 1			
	reaction time	0.140													2.91	2.86	2.92
	interval		1.01	0.95	0.95	0.94	0.97	0.95	0.96	0.97	0.99	1.22			8.76	8.92	8.73
	velocity	5.44	8.42	8.95	8.95	9.04	8.76	8.95	8.85	8.76	8.59	8.24	8.13				
Johnson, Alaysha (USA) (1996)	time	2.39	3.41	4.34	5.32	6.24	7.18	8.17	9.18	10.17	11.21		12.46	7 / 2			
	reaction time	0.145													2.93	2.85	3.04
	interval		1.02	0.93	0.98	0.92	0.94	0.99	1.01	0.99	1.04	1.25			8.70	8.95	8.39
	velocity	5.44	8.33	9.14	8.67	9.24	9.04	8.59	8.42	8.59	8.17	8.04	8.03				
Visser, Nadine (NED) (1995)	time	2.46	3.45	4.41	5.37	6.31	7.28	8.25	9.21	10.21	11.24		12.52	4 / 3			
	reaction time	0.153													2.91	2.88	2.99
	interval		0.99	0.96	0.96	0.94	0.97	0.97	0.96	1.00	1.03	1.28			8.76	8.85	8.53
	velocity	5.28	8.59	8.85	8.85	9.04	8.76	8.76	8.85	8.50	8.25	7.85	7.99				
Marshall, Tanea (USA) (1998)	time	2.37	3.37	4.35	5.33	6.28	7.23	8.21	9.22	10.23	11.27		12.52	8 / 4			
	reaction time	0.126													2.96	2.88	3.06
	interval		1.00	0.98	0.98	0.95	0.95	0.98	1.01	1.01	1.04	1.25			8.61	8.85	8.33
	velocity	5.49	8.50	8.67	8.67	8.95	8.95	8.67	8.42	8.42	8.17	8.04	7.99				
Russell, Masai (USA) (2000)	time	2.44	3.47	4.46	5.42	6.41	7.39	8.37	9.36	10.35	11.34		12.56	5 / 5			
	reaction time	0.156													2.98	2.95	2.97
	interval		1.03	0.99	0.96	0.99	0.98	0.98	0.99	0.99	0.99	1.22			8.56	8.64	8.59
	velocity	5.33	8.25	8.59	8.85	8.59	8.67	8.67	8.59	8.59	8.59	8.24	7.96				
Skrzyszowska, Pia (POL) (2001)	time	2.40	3.42	4.40	5.37	6.32	7.28	8.26	9.26	10.28	11.30		12.58	6 / 6			
	reaction time	0.119													2.97	2.89	3.04
	interval		1.02	0.98	0.97	0.95	0.96	0.98	1.00	1.02	1.02	1.28			8.59	8.82	8.39
	velocity	5.42	8.33	8.67	8.76	8.95	8.85	8.67	8.50	8.33	8.33	7.85	7.95				
Sember, Cindy (GBR) (1994)	time	2.53	3.47	4.43	5.40	6.37	7.37	8.38	9.39	10.40	11.40		12.67	2 / 7			
	reaction time	0.150													2.87	2.98	3.02
	interval		0.94	0.96	0.97	0.97	1.00	1.01	1.01	1.01	1.01	1.27			8.89	8.56	8.44
	velocity	5.14	9.04	8.85	8.76	8.76	8.50	8.42	8.42	8.42	8.50	7.91	7.89				
Wojtunik, Klaudia (POL) (1999)	time	2.44	3.51	4.51	5.51	6.50	7.51	8.53	9.57	10.63	11.69		13.02	9 / 8			
	reaction time	0.131													3.07	3.02	3.16
	interval		1.07	1.00	1.00	0.99	1.01	1.02	1.04	1.06	1.06	1.33			8.31	8.44	8.07
	velocity	5.33	7.94	8.50	8.50	8.59	8.42	8.33	8.17	8.02	8.02	7.56	7.68				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 25 Aug 2024 15:19) - diamond league race analysis
<https://www.omegatiming.com/File/0002040F0102030102FFFFFFFFFFFF6D.pdf>

Video: No Video

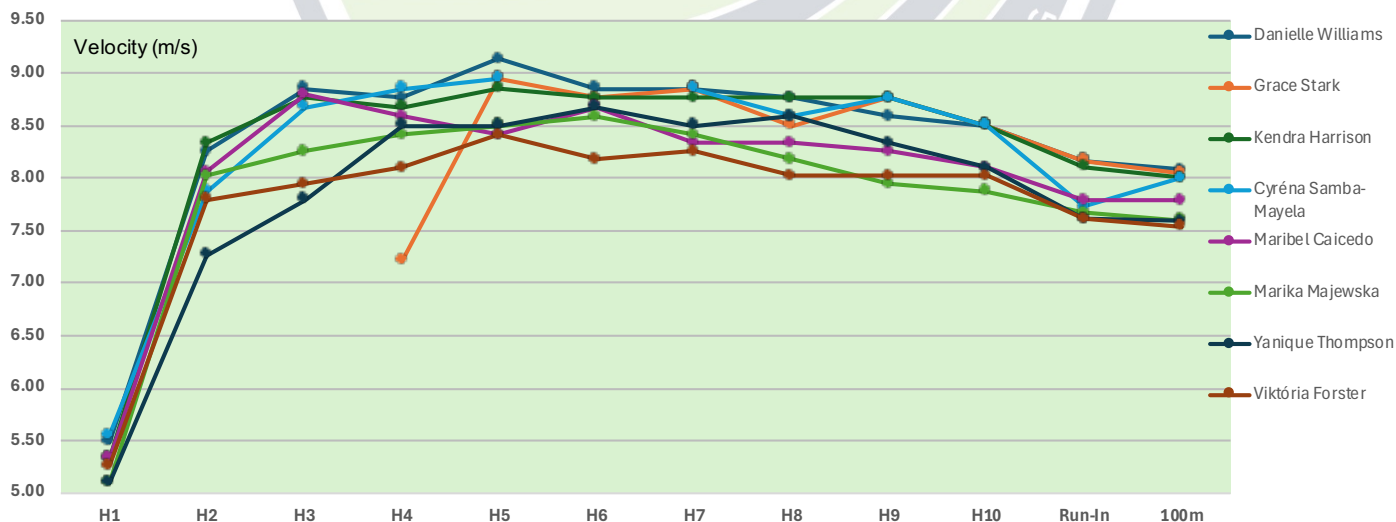
2024 Kamila Skolimowska Memorial (Silesia, POL)

100m Hurdles

Date: 2024.08.25 Wind: -0.3 m/s

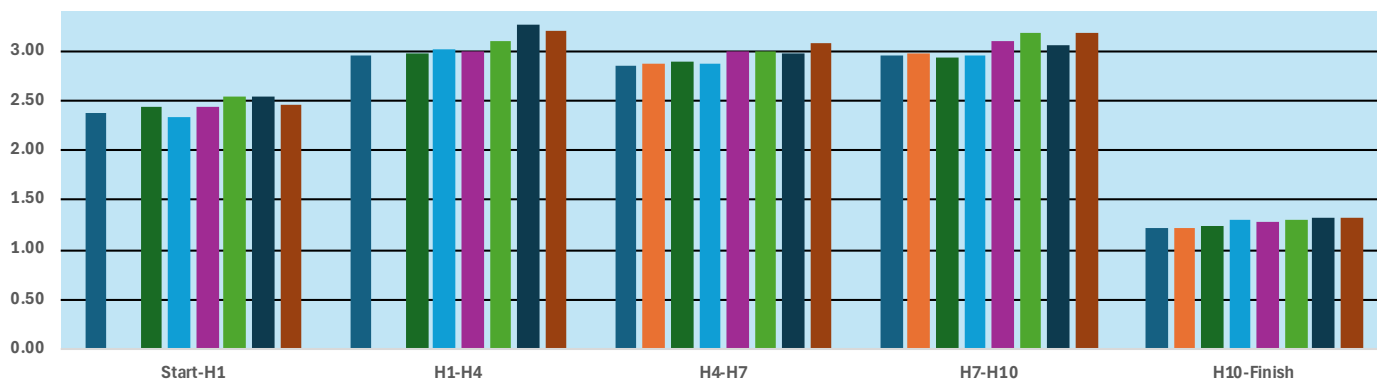
Heat A

		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	4.36	5.33	6.26	7.22	8.18	9.15	10.14	11.14		12.37	4 / 1			
	reaction time	0.116													2.96	2.85	2.96
	interval		1.03	0.96	0.97	0.93	0.96	0.96	0.97	0.99	1.00	1.23			8.61	8.95	8.61
	velocity	5.49	8.25	8.85	8.76	9.14	8.85	8.85	8.76	8.59	8.50	8.17	8.08				
Stark, Grace (USA) (2001)	time				5.34	6.29	7.26	8.22	9.22	10.19	11.19		12.42	6 / 2			
	reaction time	0.137													2.88	2.97	
	interval				0.95	0.97	0.96	1.00	0.97	1.00	1.23				8.85	8.59	
	velocity				7.21	8.95	8.76	8.85	8.50	8.76	8.50	8.17	8.05				
Harrison, Kendra (USA) (1992)	time	2.44	3.46	4.43	5.41	6.37	7.34	8.31	9.28	10.25	11.25		12.49	7 / 3			
	reaction time	0.186													2.97	2.90	2.94
	interval		1.02	0.97	0.98	0.96	0.97	0.97	0.97	0.97	1.00	1.24			8.59	8.79	8.67
	velocity	5.33	8.33	8.76	8.67	8.85	8.76	8.76	8.76	8.76	8.50	8.10	8.01				
Samba-Mayela, Cyréna (FRA) (2000)	time	2.34	3.42	4.40	5.36	6.31		8.23	9.22	10.19	11.19		12.49	5 / 3			
	reaction time	0.138													3.02	2.87	2.96
	interval		1.08	0.98	0.96	0.95		1.92	0.99	0.97	1.00	1.30			8.44	8.89	8.61
	velocity	5.56	7.87	8.67	8.85	8.95		8.85	8.59	8.76	8.50	7.73	8.01				
Caicedo, Maribel (ECU) (1998)	time	2.44	3.49	4.46	5.45	6.46	7.44	8.46	9.48	10.51	11.56		12.85	8 / 5			
	reaction time	0.158													3.01	3.01	3.10
	interval		1.05	0.97	0.99	1.01	0.98	1.02	1.02	1.03	1.05	1.29			8.47	8.47	8.23
	velocity	5.33	8.06	8.80	8.59	8.42	8.67	8.33	8.33	8.25	8.10	7.79	7.78				
Majewska, Marika (POL) (2002)	time	2.55	3.61	4.64	5.65	6.65	7.64	8.65	9.69	10.76	11.84		13.15	9 / 6			
	reaction time	0.155													3.10	3.00	3.19
	interval		1.06	1.03	1.01	1.00	0.99	1.01	1.04	1.07	1.08	1.31			8.23	8.50	7.99
	velocity	5.10	8.02	8.25	8.42	8.50	8.59	8.42	8.17	7.94	7.87	7.67	7.60				
Thompson, Yanique (JAM) (1996)	time	2.55	3.72	4.81	5.81	6.81	7.79	8.79	9.78	10.80	11.85		13.17	3 / 7			
	reaction time	0.147													3.26	2.98	3.06
	interval		1.17	1.09	1.00	1.00	0.98	1.00	0.99	1.02	1.05	1.32			7.82	8.56	8.33
	velocity	5.10	7.26	7.80	8.50	8.50	8.67	8.50	8.59	8.33	8.10	7.61	7.59				
Forster, Viktória (SVK) (2002)	time	2.47	3.56	4.63	5.68	6.69	7.73	8.76	9.82	10.88	11.94		13.26	2 / 8			
	reaction time	0.150													3.21	3.08	3.18
	interval		1.09	1.07	1.05	1.01	1.04	1.03	1.06	1.06	1.06	1.32			7.94	8.28	8.02
	velocity	5.26	7.80	7.94	8.10	8.42	8.17	8.25	8.02	8.02	8.02	7.61	7.54				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 25 Aug 2024 15:19) - diamond league race analysis
<https://www.omegatiming.com/File/0002040F0102030101FFFFFFFFFFFF6D.pdf>

Video: No Video

2024 Athletissima (Lausanne, SUI)

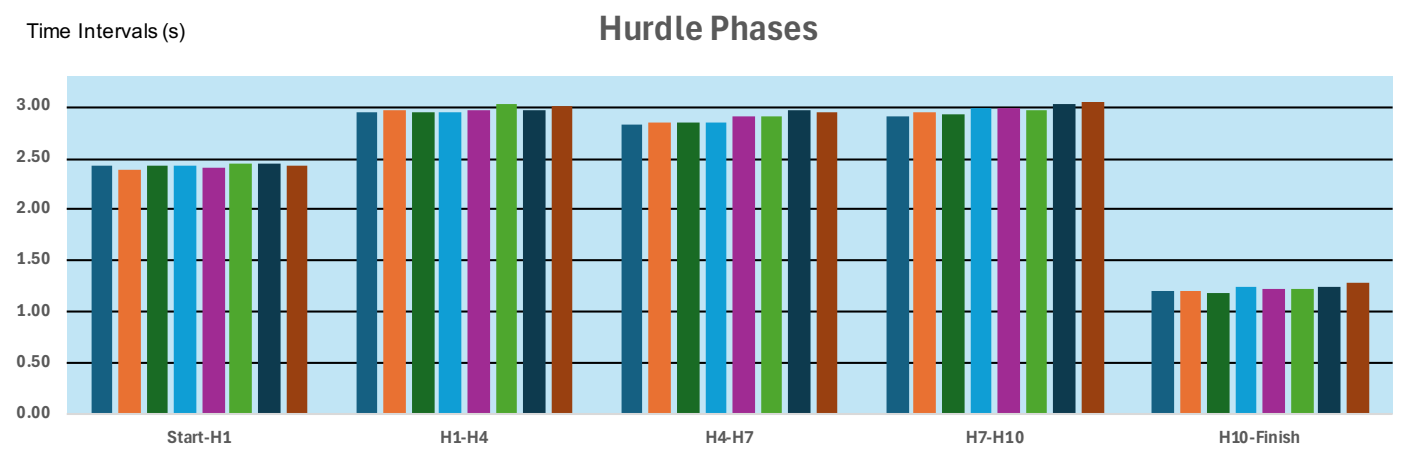
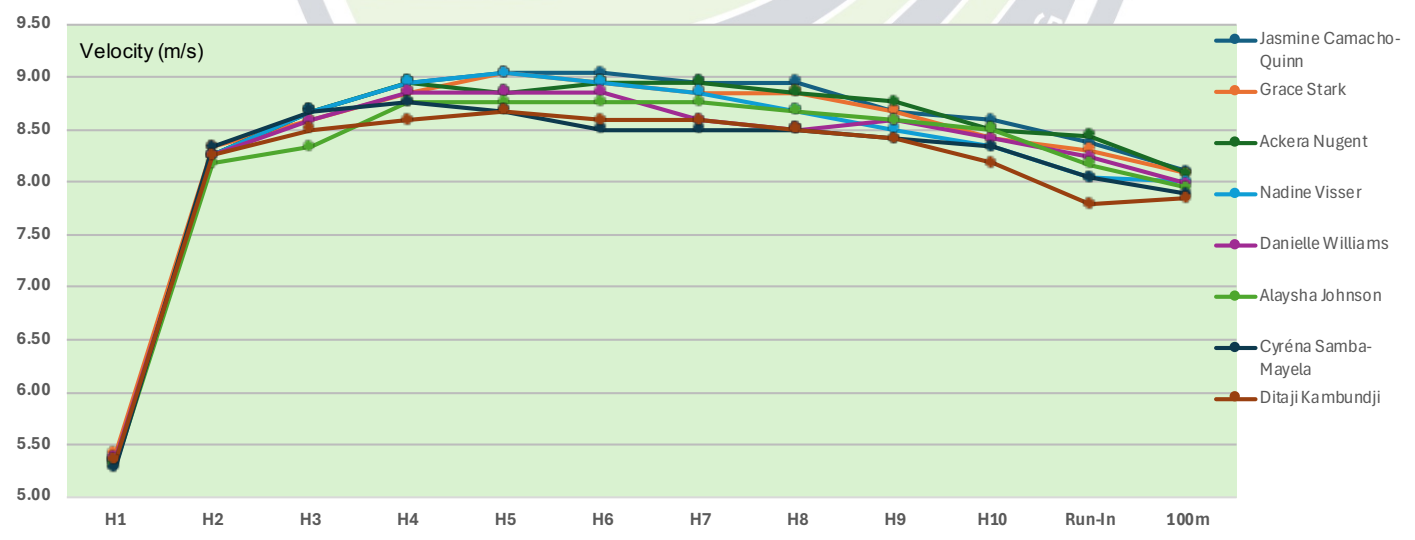
100m Hurdles

Date: 2024.08.22

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
Camacho-Quinn, Jasmine (PUR) (199)	time	2.44	3.47	4.45	5.40	6.34	7.28	8.23	9.18	10.16	11.15		12.35	5 / 1			
	reaction time	0.131													2.96	2.83	2.92
	interval		1.03	0.98	0.95	0.94	0.94	0.95	0.95	0.98	0.99	1.20			8.61	9.01	8.73
	velocity	5.33	8.25	8.67	8.95	9.04	9.04	8.95	8.95	8.67	8.59	8.38	8.10				
Stark, Grace (USA) (2001)	time	2.40	3.42	4.41	5.37	6.31	7.26	8.22	9.18	10.16	11.17		12.38	7 / 2			
	reaction time	0.145													2.97	2.85	2.95
	interval		1.02	0.99	0.96	0.94	0.95	0.96	0.96	0.98	1.01	1.21			8.59	8.95	8.64
	velocity	5.42	8.33	8.59	8.85	9.04	8.95	8.85	8.85	8.67	8.42	8.31	8.08				
Nugent, Ackera (JAM) (2002)	time	2.44	3.47	4.45	5.40	6.36	7.31	8.26	9.22	10.19	11.19		12.38	8 / 3			
	reaction time	0.159													2.96	2.86	2.93
	interval		1.03	0.98	0.95	0.96	0.95	0.95	0.96	0.97	1.00	1.19			8.61	8.92	8.70
	velocity	5.33	8.25	8.67	8.95	8.85	8.95	8.95	8.85	8.76	8.50	8.45	8.08				
Visser, Nadine (NED) (1995)	time	2.43	3.46	4.44	5.39	6.33	7.28	8.24	9.22	10.22	11.24		12.49	6 / 4			
	reaction time	0.142													2.96	2.85	3.00
	interval		1.03	0.98	0.95	0.94	0.95	0.96	0.98	1.00	1.02	1.25			8.61	8.95	8.50
	velocity	5.35	8.25	8.67	8.95	9.04	8.95	8.85	8.67	8.50	8.33	8.04	8.01				
Williams, Danielle (JAM) (1992)	time	2.42	3.45	4.44	5.40	6.36	7.32	8.31	9.31	10.30	11.31		12.53	1 / 5			
	reaction time	0.138													2.98	2.91	3.00
	interval		1.03	0.99	0.96	0.96	0.96	0.99	1.00	0.99	1.01	1.22			8.56	8.76	8.50
	velocity	5.37	8.25	8.59	8.85	8.85	8.85	8.59	8.50	8.59	8.42	8.24	7.98				
Johnson, Alaysha (USA) (1996)	time	2.45	3.49	4.51	5.48	6.45	7.42	8.39	9.37	10.36	11.36		12.59	3 / 6			
	reaction time	0.164													3.03	2.91	2.97
	interval		1.04	1.02	0.97	0.97	0.97	0.97	0.98	0.99	1.00	1.23			8.42	8.76	8.59
	velocity	5.31	8.17	8.33	8.76	8.76	8.76	8.76	8.67	8.59	8.50	7.94					
Samba-Mayela, Cyréna (FRA) (2000)	time	2.46	3.48	4.46	5.43	6.41	7.41	8.41	9.41	10.42	11.44		12.69	4 / 7			
	reaction time	0.144													2.97	2.98	3.03
	interval		1.02	0.98	0.97	0.98	1.00	1.00	1.00	1.01	1.02	1.25			8.59	8.56	8.42
	velocity	5.28	8.33	8.67	8.76	8.67	8.50	8.50	8.50	8.42	8.33	8.04	7.88				
Kambundji, Ditaji (SUI) (2002)	time	2.43	3.46	4.46	5.45	6.43	7.42	8.41	9.41	10.42	11.46		12.75	2 / 8			
	reaction time	0.146													3.02	2.96	3.05
	interval		1.03	1.00	0.99	0.98	0.99	0.99	1.00	1.01	1.04	1.29			8.44	8.61	8.36
	velocity	5.35	8.25	8.50	8.59	8.67	8.59	8.59	8.50	8.42	8.17	7.79	7.84				



Source: Omega Timing (Thu 22 Aug 2024 20:27) - diamond league race analysis
<https://www.omegatiming.com/File/0002040E0102090101FFFFFFFFFFFF6D.pdf>

Video: https://www.youtube.com/watch?v=R4bPqGnG_Pw

2024 Olympic Games (Paris, FRA)

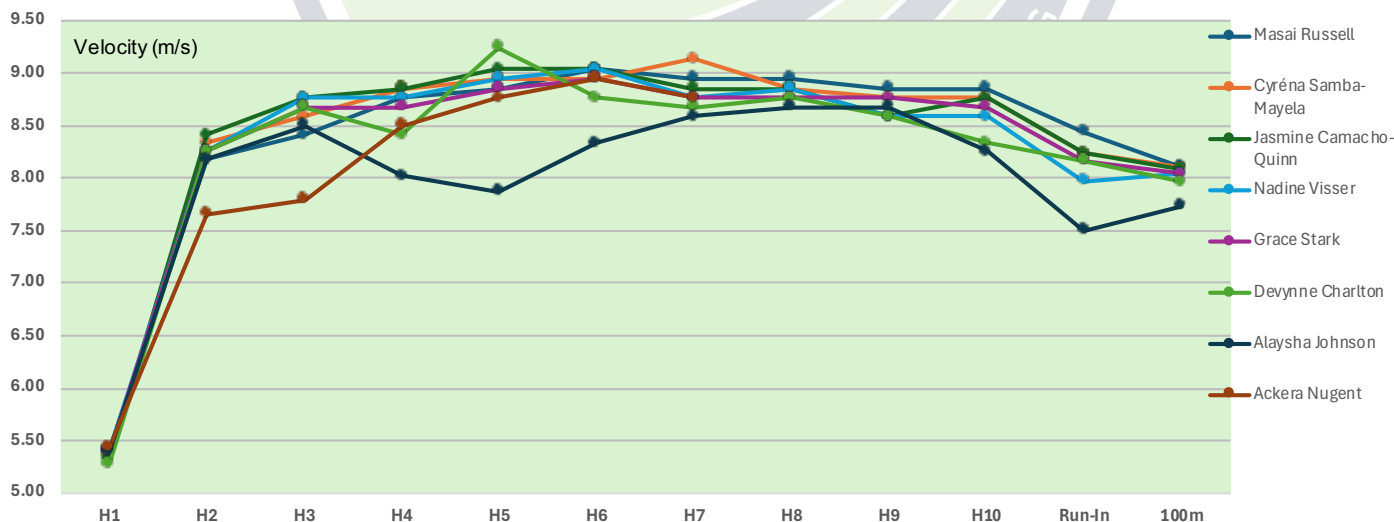
100m Hurdles

Date: 2024.08.10

Wind: -0.3 m/s

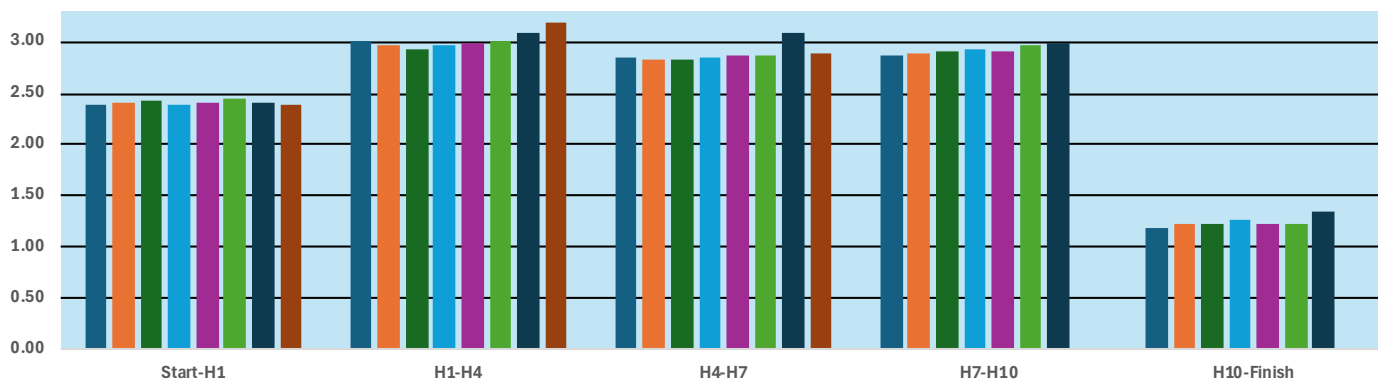
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Russell, Masai (USA) (2000)	time	2.40	3.44	4.45	5.42	6.38	7.32	8.27	9.22	10.18	11.14		12.33	5 / 1			
	reaction time	0.137													3.02	2.85	2.87
	interval velocity		1.04	1.01	0.97	0.96	0.94	0.95	0.95	0.96	0.96	1.19			8.44	8.95	8.89
Samba-Mayela, Cyréna (FRA) (2000)	time	2.42	3.44	4.43	5.39	6.34	7.29	8.22	9.18	10.15	11.12		12.34	2 / 2			
	reaction time	0.143													2.97	2.83	2.90
	interval velocity		1.02	0.99	0.96	0.95	0.95	0.93	0.96	0.97	0.97	1.22			8.59	9.01	8.79
Camacho-Quinn, Jasmine (PUR) (199)	time	2.44	3.45	4.42	5.38	6.32	7.26	8.22	9.18	10.17	11.14		12.36	7 / 3			
	reaction time	0.173													2.94	2.84	2.92
	interval velocity		1.01	0.97	0.96	0.94	0.94	0.96	0.96	0.99	0.97	1.22			8.67	8.98	8.73
Visser, Nadine (NED) (1995)	time	2.40	3.43	4.40	5.37	6.32	7.26	8.23	9.19	10.18	11.17		12.43	3 / 4			
	reaction time	0.134													2.97	2.86	2.94
	interval velocity		1.03	0.97	0.97	0.95	0.94	0.97	0.96	0.99	0.99	1.26			8.59	8.92	8.67
Stark, Grace (USA) (2001)	time	2.41	3.44	4.42	5.40	6.36	7.31	8.28	9.25	10.22	11.20		12.43	4 / 5			
	reaction time	0.161													2.99	2.88	2.92
	interval velocity		1.03	0.98	0.98	0.96	0.95	0.97	0.97	0.97	0.98	1.23			8.53	8.85	8.73
Charlton, Devynne (BAH) (1995)	time	2.46	3.49	4.47	5.48	6.40	7.37	8.35	9.32	10.31	11.33		12.56	8 / 6			
	reaction time	0.203													3.02	2.87	2.98
	interval velocity		1.03	0.98	1.01	0.92	0.97	0.98	0.97	0.99	1.02	1.23			8.44	8.89	8.56
Johnson, Alaysha (USA) (1996)	time	2.41	3.45	4.45	5.51	6.59	7.61	8.60	9.58	10.56	11.59		12.93	6 / 7			
	reaction time	0.151													3.10	3.09	2.99
	interval velocity		1.04	1.00	1.06	1.08	1.02	0.99	0.98	0.98	1.03	1.34			8.23	8.25	8.53
Nugent, Ackera (JAM) (2002)	time	2.39	3.50	4.59	5.59	6.56	7.51	8.48					dnf	9 / --			
	reaction time	0.138													3.20	2.89	-8.48
	interval velocity		1.11	1.09	1.00	0.97	0.95	0.97							7.97	8.82	-3.01



Time Intervals (s)

Hurdle Phases



Source: Paris 2024 Olympic Games - Results Book (2024), p. 541

https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH-----pdf

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

2024 Olympic Games (Paris, FRA)

100m Hurdles

Date: 2024.08.09 Wind: -0.7 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	2.44	3.46	4.43	5.39	6.32	7.27	8.23	9.19	10.17	11.15		12.35	5 / 1			
	reaction time	0.161													2.95	2.84	2.92
	interval velocity		1.02	0.97	0.96	0.93	0.95	0.96	0.96	0.98	0.98	1.20			8.64	8.98	8.73
	velocity	5.33	8.33	8.76	8.85	9.14	8.95	8.85	8.85	8.67	8.67	8.38	8.10				
Russell, Masai (USA) (2000)	time	2.41	3.47	4.46	5.43	6.39	7.34	8.30	9.26	10.23	11.21		12.42	7 / 2			
	reaction time	0.155													3.02	2.87	2.91
	interval velocity		1.06	0.99	0.97	0.96	0.95	0.96	0.96	0.97	0.97	1.21			8.44	8.89	8.76
	velocity	5.39	8.02	8.59	8.76	8.85	8.95	8.85	8.85	8.76	8.67	8.31	8.05				
Nugent, Ackera (JAM) (2002)	time	2.41	3.46	4.45	5.41	6.37	7.34	8.31	9.28	10.25	11.23		12.44	4 / 3			
	reaction time	0.142													3.00	2.90	2.92
	interval velocity		1.05	0.99	0.96	0.96	0.97	0.97	0.97	0.97	0.98	1.21			8.50	8.79	8.73
	velocity	5.39	8.10	8.59	8.85	8.85	8.76	8.76	8.76	8.76	8.67	8.31	8.04				
Samba-Mayela, Cyréna (FRA) (2000)	time	2.42	3.44	4.44	5.41	6.38	7.33	8.29	9.26	10.24	11.23		12.52	6 / 4			
	reaction time	0.147													2.99	2.88	2.94
	interval velocity		1.02	1.00	0.97	0.97	0.95	0.96	0.97	0.98	0.99	1.29			8.53	8.85	8.67
	velocity	5.37	8.33	8.50	8.76	8.76	8.95	8.85	8.76	8.67	8.59	7.79	7.99				

Date: 2024.08.09 Wind: 0.4 m/s

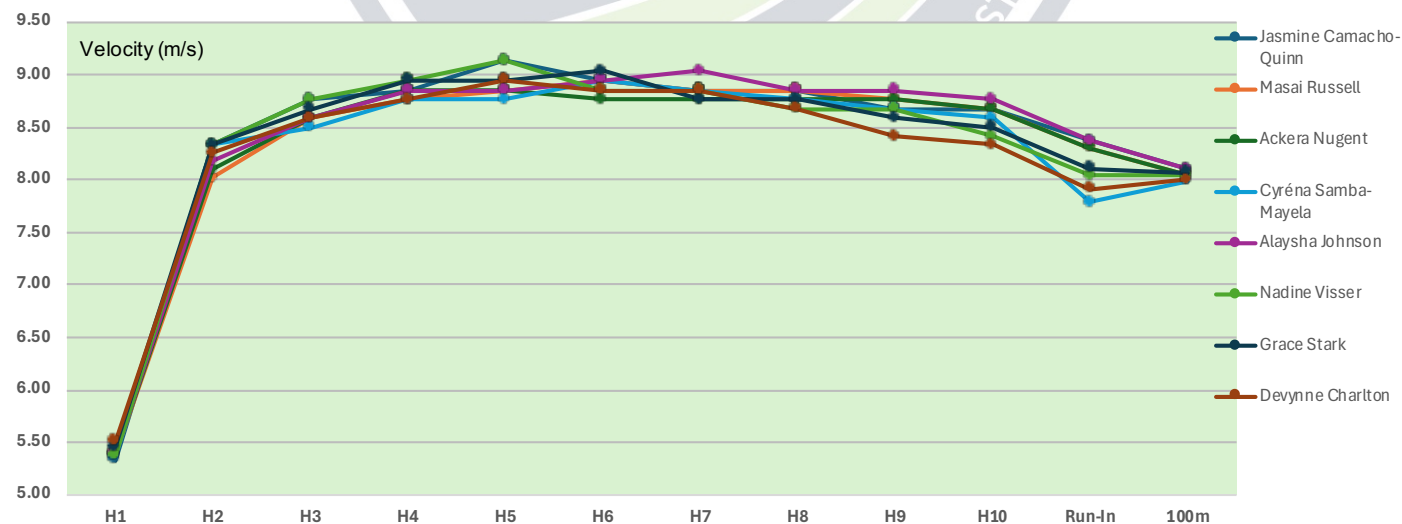
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Johnson, Alaysha (USA) (1996)	time	2.41	3.45	4.44	5.40	6.36	7.31	8.25	9.21	10.17	11.14		12.34	5 / 1			
	reaction time	0.133													2.99	2.85	2.89
	interval velocity		1.04	0.99	0.96	0.96	0.95	0.95	0.94	0.96	0.96	0.97	1.20		8.53	8.95	8.82
	velocity	5.39	8.17	8.59	8.85	8.85	8.95	9.04	8.85	8.85	8.76	8.38	8.10				
Visser, Nadine (NED) (1995)	time	2.42	3.44	4.41	5.36	6.29	7.25	8.21	9.19	10.17	11.18		12.43	7 / 2			
	reaction time	0.143													2.94	2.85	2.97
	interval velocity		1.02	0.97	0.95	0.93	0.96	0.96	0.98	0.98	1.01	1.25			8.67	8.95	8.59
	velocity	5.37	8.33	8.76	8.95	9.14	8.85	8.85	8.67	8.67	8.42	8.04	8.05				

Date: 2024.08.09 Wind: 0.5 m/s

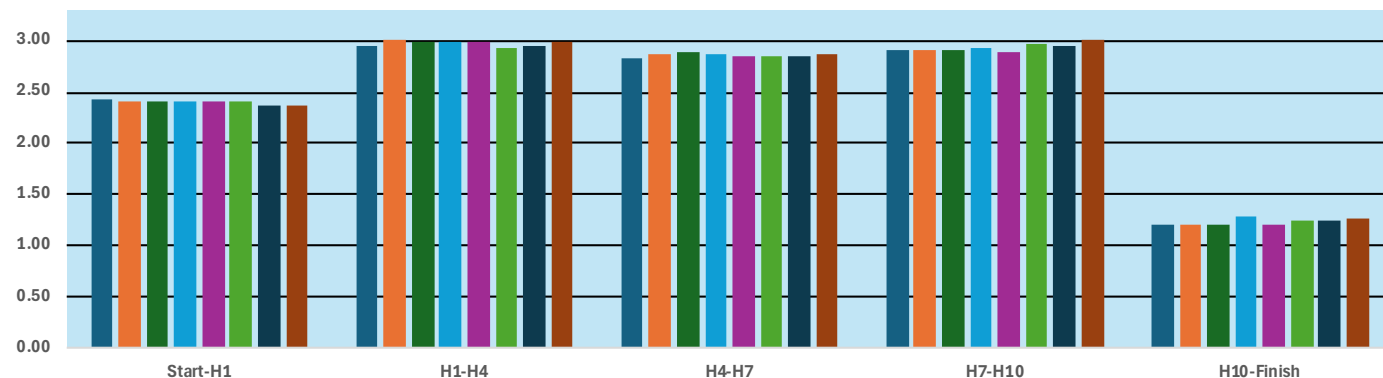
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Stark, Grace (USA) (2001)	time	2.38	3.40	4.38	5.33	6.28	7.22	8.19	9.16	10.15	11.15		12.39	4 / 1			
	reaction time	0.148													2.95	2.86	2.96
	interval velocity		1.02	0.98	0.95	0.95	0.94	0.97	0.97	0.99	1.00	1.24			8.64	8.92	8.61
	velocity	5.46	8.33	8.67	8.95	8.95	9.04	8.76	8.76	8.59	8.50	8.10	8.07				
Charlton, Devynne (BAH) (1995)	time	2.36	3.39	4.38	5.35	6.30	7.26	8.22	9.20	10.21	11.23		12.50	7 / 2			
	reaction time	0.138													2.99	2.87	3.01
	interval velocity		1.03	0.99	0.97	0.95	0.96	0.96	0.98	1.01	1.02	1.27			8.53	8.89	8.47
	velocity	5.51	8.25	8.59	8.76	8.95	8.85	8.85	8.67	8.42	8.33	7.91	8.00				



Time Intervals (s)

Hurdle Phases



Source: Paris 2024 Olympic Games - Results Book (2024), p. 546-48

https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH-----pdf

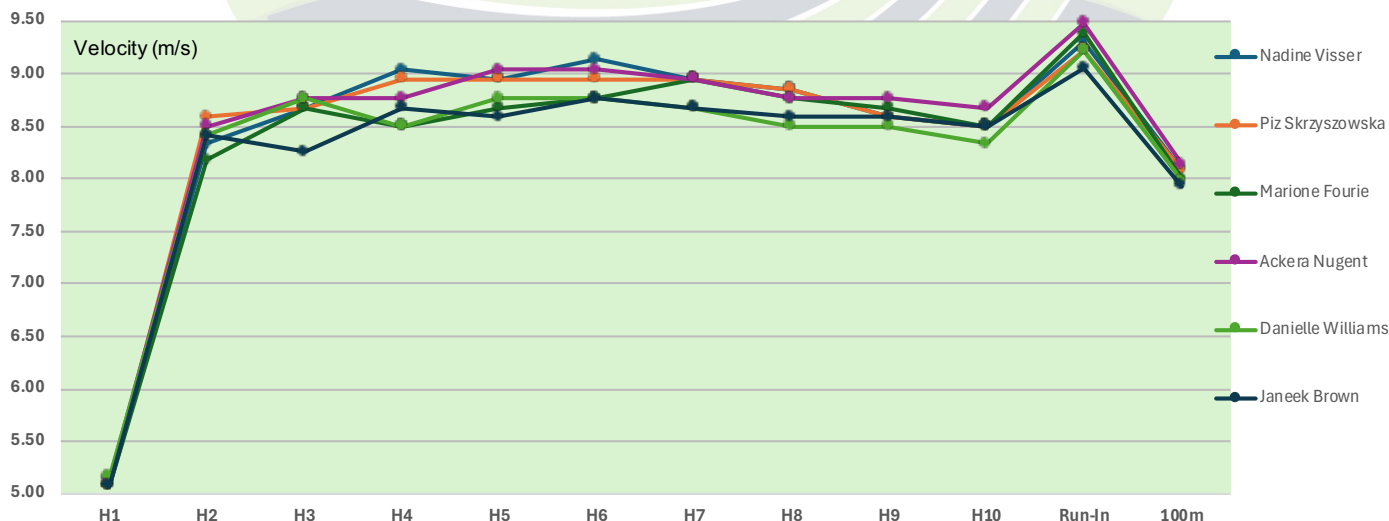
Video: <https://olympics.com/en/paris-2024/videos/track-and-field-day-14-morning-athletics-olympic-games-paris-2024>

2024 Resisprint International (La Chaux-de-Fonds, SUI) (TV Analysis)

		Date: 2024.07.14 Wind: 1.6 m/s										A Final					
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Visser, Nadine (NED) (1995)	time	2.56	3.58	4.56	5.50	6.45	7.38	8.33	9.29	10.28	11.28		12.36	4 / 1			
	reaction time											1.08	NR PB		2.94	2.83	2.95
	interval		1.02	0.98	0.94	0.95	0.93	0.95	0.96	0.99	1.00	1.00	1.08		8.67	9.01	8.64
	velocity	5.08	8.33	8.67	9.04	8.95	9.14	8.95	8.85	8.59	8.50	9.31	8.09				
Skrzysowska, Pia (POL) (2001)	time	2.56	3.55	4.53	5.48	6.43	7.38	8.33	9.29	10.28	11.28		12.37	5 / 2			
	reaction time											1.09	PB		2.92	2.85	2.95
	interval		0.99	0.98	0.95	0.95	0.95	0.95	0.96	0.99	1.00	1.00	1.09		8.73	8.95	8.64
	velocity	5.08	8.59	8.67	8.95	8.95	8.95	8.95	8.85	8.59	8.50	9.22	8.08				
Fourie, Marione (RSA) (2002)	time	2.56	3.60	4.58	5.58	6.56	7.53	8.48	9.45	10.43	11.43		12.50	3 / 3			
	reaction time											1.07			3.02	2.90	2.95
	interval		1.04	0.98	1.00	0.98	0.97	0.95	0.97	0.98	1.00	1.00	1.07		8.44	8.79	8.64
	velocity	5.08	8.17	8.67	8.50	8.67	8.76	8.95	8.76	8.67	8.50	9.39	8.00				

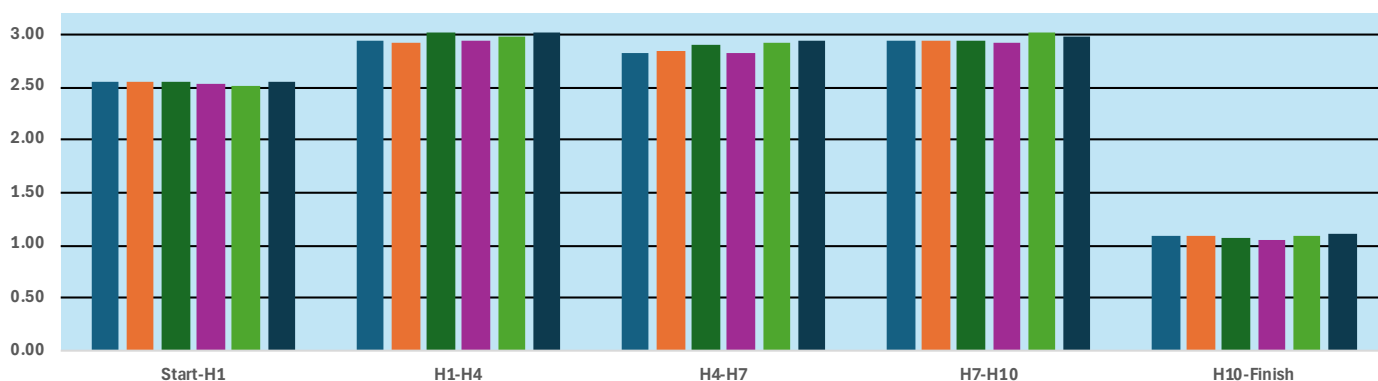
2024 Jamaican National Senior Championships (Kingston, JAM) (TV Analysis)

		Date: 2024.06.28 Wind: 0.1 m/s										FINAL					
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Nugent, Ackera (JAM) (2002)	time	2.53	3.53	4.50	5.47	6.41	7.35	8.30	9.27	10.24	11.22		12.28	3 / 1			
	reaction time	0.145										1.06	NR PB		2.94	2.83	2.92
	interval		1.00	0.97	0.97	0.94	0.94	0.95	0.97	0.97	0.98	1.00	1.06		8.67	9.01	8.73
	velocity	5.14	8.50	8.76	8.76	9.04	9.04	8.95	8.76	8.76	8.67	9.48	8.14				
Williams, Danielle (JAM) (1992)	time	2.52	3.53	4.50	5.50	6.47	7.44	8.42	9.42	10.42	11.44		12.53	4 / 2			
	reaction time	0.168										1.09			2.98	2.92	3.02
	interval		1.01	0.97	1.00	0.97	0.97	0.98	1.00	1.00	1.02	1.09	1.09		8.56	8.73	8.44
	velocity	5.16	8.42	8.76	8.50	8.76	8.76	8.67	8.50	8.50	8.33	9.22	7.98				
Brown, Janeek (JAM) (1998)	time	2.56	3.57	4.60	5.58	6.57	7.54	8.52	9.51	10.50	11.50		12.61	2 / 3			
	reaction time	0.167										1.11			3.02	2.94	2.98
	interval		1.01	1.03	0.98	0.99	0.97	0.98	0.99	0.99	1.00	1.11	1.11		8.44	8.67	8.56
	velocity	5.08	8.42	8.25	8.67	8.59	8.76	8.67	8.59	8.59	8.50	9.05	7.93				



Time Intervals (s)

Hurdle Phases



Resisprint International

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=uf8nMlKb4Rk>

Jamaican National Senior Championships

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=aUJ-AUyAfdM>

2024 FBK Games (Hengelo, NED) (TV Analysis)

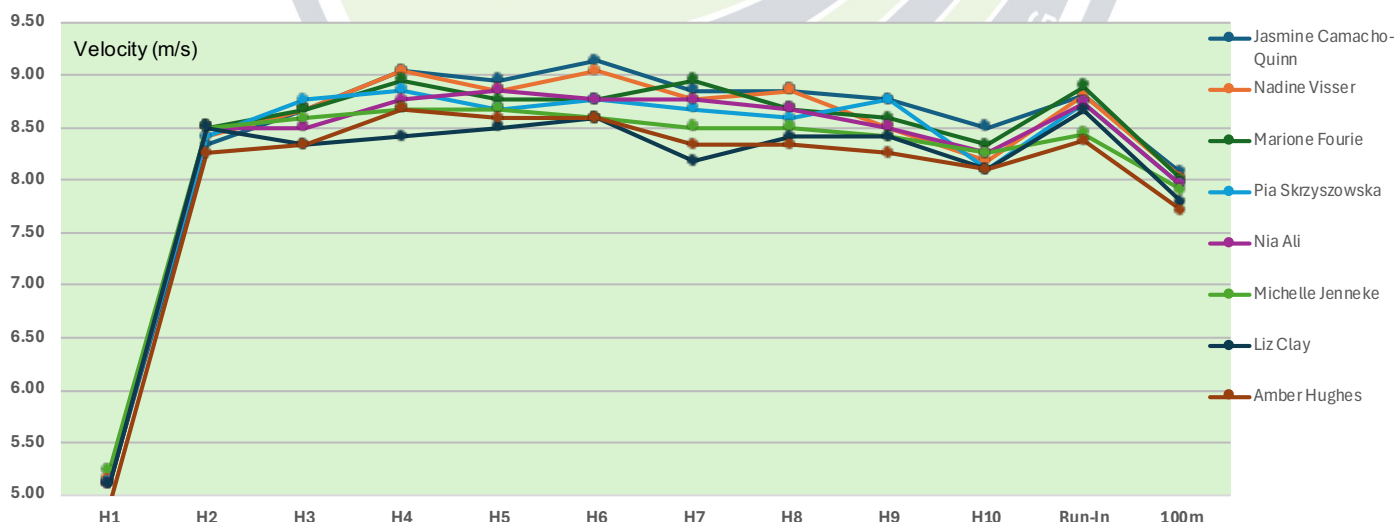
100m Hurdles

Date: 2024.07.07

Wind: 1.6 m/s

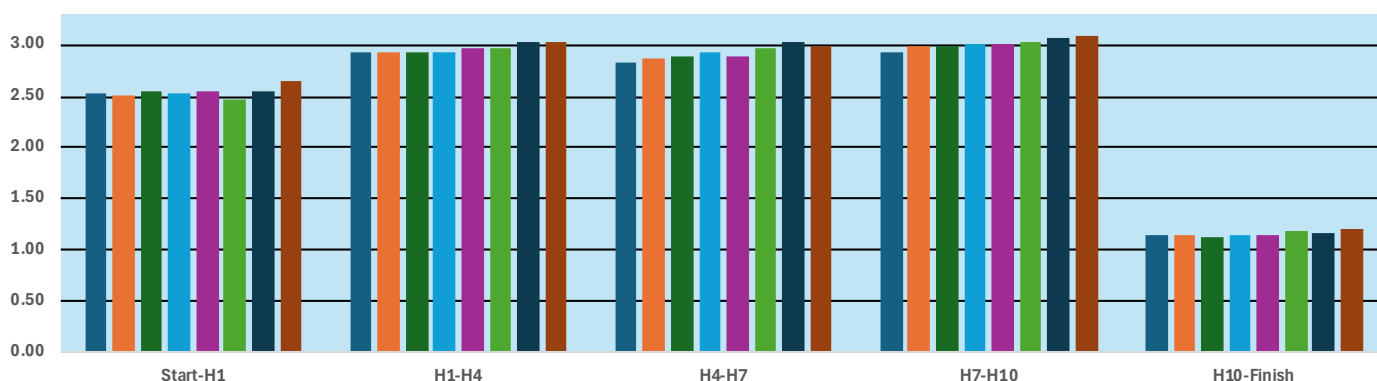
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Camacho-Quinn, Jasmine (PUR) (199)	time	2.54	3.56	4.54	5.48	6.43	7.36	8.32	9.28	10.25	11.25		12.39	4 / 1			
	reaction time	0.163													2.94	2.84	2.93
	interval		1.02	0.98	0.94	0.95	0.93	0.96	0.96	0.97	1.00	1.14			8.67	8.98	8.70
	velocity	5.12	8.33	8.67	9.04	8.95	9.14	8.85	8.85	8.76	8.50	8.82	8.07				
Visser, Nadine (NED) (1995)	time	2.52	3.53	4.51	5.45	6.41	7.35	8.32	9.28	10.28	11.32		12.46	5 / 2			
	reaction time	0.133													2.93	2.87	3.00
	interval		1.01	0.98	0.94	0.96	0.94	0.97	0.96	1.00	1.04	1.14	NR PB		8.70	8.89	8.50
	velocity	5.16	8.42	8.67	9.04	8.85	9.04	8.76	8.85	8.50	8.17	8.82	8.03				
Fourie, Marione (RSA) (2002)	time	2.55	3.55	4.53	5.48	6.45	7.42	8.37	9.35	10.34	11.36		12.49	7 / 3			
	reaction time	0.163													2.93	2.89	2.99
	interval		1.00	0.98	0.95	0.97	0.97	0.95	0.98	0.99	1.02	1.13	NR PB		8.70	8.82	8.53
	velocity	5.10	8.50	8.67	8.95	8.76	8.76	8.95	8.67	8.59	8.33	8.89	8.01				
Skrzysowska, Pia (POL) (2001)	time	2.54	3.55	4.52	5.48	6.46	7.43	8.41	9.40	10.37	11.42		12.57	6 / 4			
	reaction time	0.000													2.94	2.93	3.01
	interval		1.01	0.97	0.96	0.98	0.97	0.98	0.99	0.97	1.05	1.15			8.67	8.70	8.47
	velocity	5.12	8.42	8.76	8.85	8.67	8.76	8.67	8.59	8.76	8.10	8.74	7.96				
Ali, Nia (USA) (1988)	time	2.55	3.55	4.55	5.52	6.48	7.45	8.42	9.40	10.40	11.43		12.58	3 / 5			
	reaction time	0.149													2.97	2.90	3.01
	interval		1.00	1.00	0.97	0.96	0.97	0.97	0.98	1.00	1.03	1.15			8.59	8.79	8.47
	velocity	5.10	8.50	8.50	8.76	8.85	8.76	8.76	8.67	8.50	8.25	8.74	7.95				
Jenneke, Michelle (AUS) (1993)	time	2.48	3.48	4.47	5.45	6.43	7.42	8.42	9.42	10.43	11.46		12.65	9 / 6			
	reaction time	0.129													2.97	2.97	3.04
	interval		1.00	0.99	0.98	0.98	0.99	1.00	1.00	1.01	1.03	1.19	PB		8.59	8.59	8.39
	velocity	5.24	8.50	8.59	8.67	8.67	8.59	8.50	8.50	8.42	8.25	8.45	7.91				
Clay, Liz (AUS) (1995)	time	2.55	3.55	4.57	5.58	6.58	7.57	8.61	9.62	10.63	11.68		12.84	8 / 7			
	reaction time	0.130													3.03	3.03	3.07
	interval		1.00	1.02	1.01	1.00	0.99	1.04	1.01	1.01	1.05	1.16			8.42	8.42	8.31
	velocity	5.10	8.50	8.33	8.42	8.50	8.59	8.17	8.42	8.42	8.10	8.66	7.79				
Hughes, Amber (USA) (1994)	time	2.65	3.68	4.70	5.68	6.67	7.66	8.68	9.70	10.73	11.78		12.98	1 / 8			
	reaction time	0.169													3.03	3.00	3.10
	interval		1.03	1.02	0.98	0.99	0.99	1.02	1.02	1.03	1.05	1.20			8.42	8.50	8.23
	velocity	4.91	8.25	8.33	8.67	8.59	8.59	8.33	8.33	8.25	8.10	8.37	7.70				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=TeZSsV7_S20

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

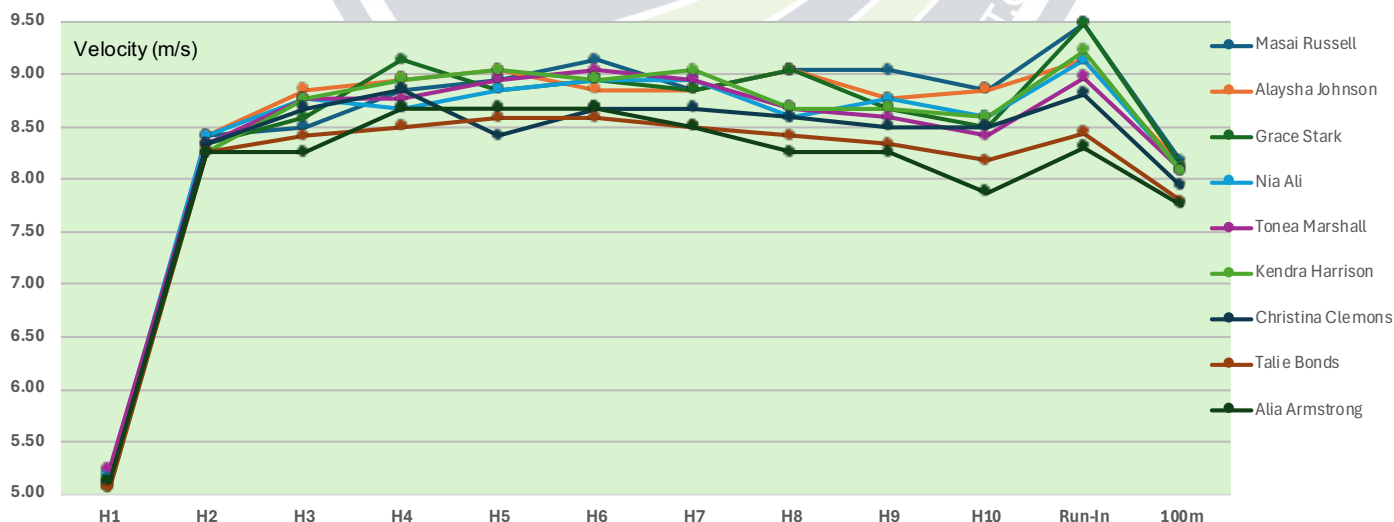
100m Hurdles

Date: 2024.06.30

Wind: 0.7 m/s

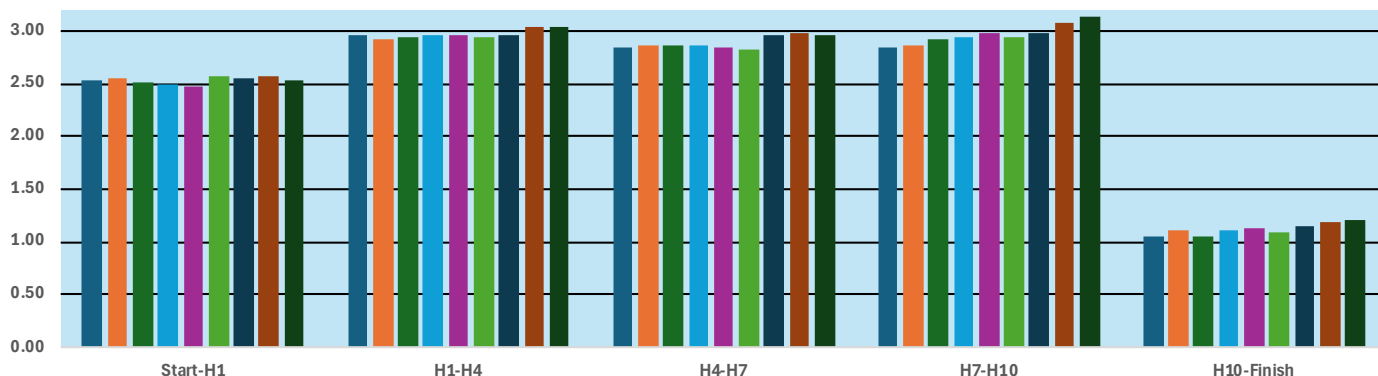
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Russell, Masai (USA) (2000)	time	2.54	3.55	4.55	5.51	6.46	7.39	8.35	9.29	10.23	11.19		12.25	4 / 1			
	reaction time												PB		2.97	2.84	2.84
	interval		1.01	1.00	0.96	0.95	0.93	0.96	0.94	0.94	0.96	1.06			8.59	8.98	8.98
	velocity	5.12	8.42	8.50	8.85	8.95	9.14	8.85	9.04	9.04	8.85	9.48	8.16				
Johnson, Alaysha (USA) (1996)	time	2.56	3.57	4.53	5.48	6.42	7.38	8.34	9.28	10.25	11.21		12.31	5 / 2			
	reaction time												PB		2.92	2.86	2.87
	interval		1.01	0.96	0.95	0.94	0.96	0.96	0.94	0.97	0.96	1.10			8.73	8.92	8.89
	velocity	5.08	8.42	8.85	8.95	9.04	8.85	8.85	9.04	8.76	8.85	9.14	8.12				
Stark, Grace (USA) (2001)	time	2.52	3.54	4.53	5.46	6.42	7.37	8.33	9.27	10.25	11.25		12.31	8 / 3			
	reaction time												PB		2.94	2.87	2.92
	interval		1.02	0.99	0.93	0.96	0.95	0.96	0.94	0.98	1.00	1.06			8.67	8.89	8.73
	velocity	5.16	8.33	8.59	9.14	8.85	8.95	8.85	9.04	8.67	8.50	9.48	8.12				
Ali, Nia (USA) (1988)	time	2.50	3.51	4.48	5.46	6.42	7.37	8.32	9.31	10.28	11.27		12.37	2 / 4			
	reaction time														2.96	2.86	2.95
	interval		1.01	0.97	0.98	0.96	0.95	0.95	0.99	0.97	0.99	1.10			8.61	8.92	8.64
	velocity	5.20	8.42	8.76	8.67	8.85	8.95	8.95	8.95	8.59	8.76	8.59	8.08				
Marshall, Tonia (USA) (1998)	time	2.48	3.50	4.47	5.44	6.39	7.33	8.28	9.26	10.25	11.26		12.38	6 / 5			
	reaction time														2.96	2.84	2.98
	interval		1.02	0.97	0.97	0.95	0.94	0.95	0.98	0.99	1.01	1.12			8.61	8.98	8.56
	velocity	5.24	8.33	8.76	8.76	8.95	9.04	8.95	8.67	8.59	8.42	8.97	8.08				
Harrison, Kendra (USA) (1992)	time	2.57	3.60	4.57	5.52	6.46	7.41	8.35	9.33	10.31	11.30		12.39	3 / 6			
	reaction time														2.95	2.83	2.95
	interval		1.03	0.97	0.95	0.94	0.95	0.94	0.98	0.98	0.99	1.09			8.64	9.01	8.64
	velocity	5.06	8.25	8.76	8.95	9.04	8.95	9.04	8.67	8.67	8.67	8.59	8.07				
Clemons, Christina (USA) (1990)	time	2.55	3.57	4.55	5.51	6.52	7.50	8.48	9.47	10.47	11.47		12.61	7 / 7			
	reaction time														2.96	2.97	2.99
	interval		1.02	0.98	0.96	1.01	0.98	0.98	0.99	1.00	1.00	1.14			8.61	8.59	8.53
	velocity	5.10	8.33	8.67	8.85	8.42	8.67	8.67	8.59	8.50	8.50	8.82	7.93				
Bonds, Talie (USA) (1998)	time	2.57	3.60	4.61	5.61	6.60	7.59	8.59	9.60	10.62	11.66		12.85	1 / 8			
	reaction time														3.04	2.98	3.07
	interval		1.03	1.01	1.00	0.99	0.99	1.00	1.01	1.02	1.04	1.19			8.39	8.56	8.31
	velocity	5.06	8.25	8.42	8.50	8.59	8.59	8.50	8.42	8.33	8.17	8.45	7.78				
Armstrong, Alia (USA) (2000)	time	2.54	3.57	4.60	5.58	6.56	7.54	8.54	9.57	10.60	11.68		12.89	9 / 9			
	reaction time														3.04	2.96	3.14
	interval		1.03	1.03	0.98	0.98	0.98	1.00	1.03	1.03	1.08	1.21			8.39	8.61	8.12
	velocity	5.12	8.25	8.25	8.67	8.67	8.67	8.50	8.25	8.25	7.87	8.31	7.76				



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=qv1FN-27qos>

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

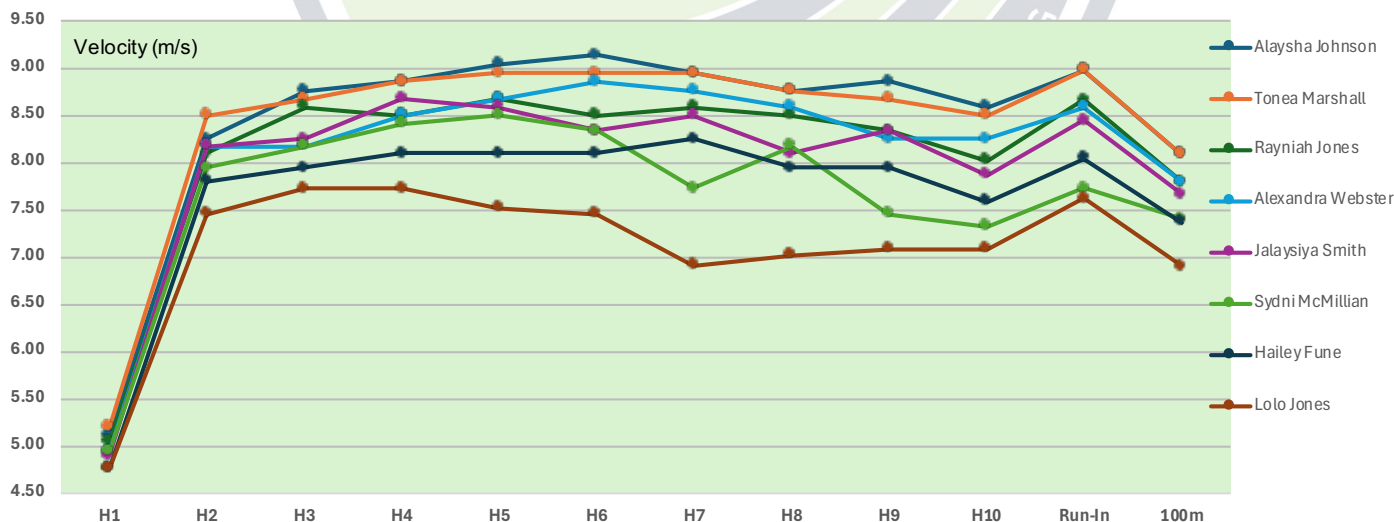
100m Hurdles

Date: 2024.06.29

Wind: 1.0 m/s

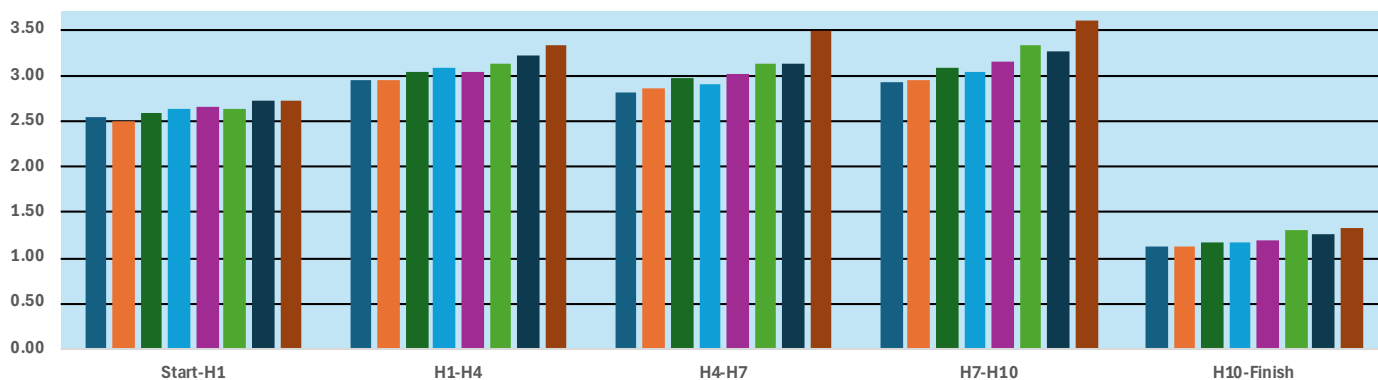
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Johnson, Alaysha (USA) (1996)	time	2.54	3.57	4.54	5.50	6.44	7.37	8.32	9.29	10.25	11.24		12.36	4 / 1			
	reaction time														2.96	2.82	2.92
	interval		1.03	0.97	0.96	0.94	0.93	0.95	0.97	0.96	0.99	1.12			8.61	9.04	8.73
	velocity	5.12	8.25	8.76	8.85	9.04	9.14	8.95	8.76	8.85	8.59	8.97	8.09				
Marshall, Tonia (USA) (1998)	time	2.50	3.50	4.48	5.44	6.39	7.34	8.29	9.26	10.24	11.24		12.36	5 / 2			
	reaction time														2.94	2.85	2.95
	interval		1.00	0.98	0.96	0.95	0.95	0.95	0.97	0.98	1.00	1.12			8.67	8.95	8.64
	velocity	5.20	8.50	8.67	8.85	8.95	8.95	8.95	8.76	8.67	8.50	8.97	8.09				
Jones, Rayniah (USA) (2001)	time	2.58	3.63	4.62	5.62	6.60	7.60	8.59	9.59	10.61	11.67		12.83	6 / 3			
	reaction time														3.04	2.97	3.08
	interval		1.05	0.99	1.00	0.98	1.00	0.99	1.00	1.02	1.06	1.16			8.39	8.59	8.28
	velocity	5.04	8.10	8.59	8.50	8.67	8.50	8.59	8.50	8.33	8.02	8.66	7.79				
Webster, Alexandra (USA) (2002)	time	2.63	3.67	4.71	5.71	6.69	7.65	8.62	9.61	10.64	11.67		12.84	7 / 4			
	reaction time														3.08	2.91	3.05
	interval		1.04	1.04	1.00	0.98	0.96	0.97	0.99	1.03	1.03	1.17			8.28	8.76	8.36
	velocity	4.94	8.17	8.17	8.50	8.67	8.85	8.76	8.59	8.25	8.25	8.59	7.79				
Smith, Jalaysiya (USA) (2003)	time	2.65	3.69	4.72	5.70	6.69	7.71	8.71	9.76	10.78	11.86		13.05	3 / 5			
	reaction time														3.05	3.01	3.15
	interval		1.04	1.03	0.98	0.99	1.02	1.00	1.05	1.02	1.08	1.19			8.36	8.47	8.10
	velocity	4.91	8.17	8.25	8.67	8.59	8.33	8.50	8.10	8.33	7.87	8.45	7.66				
McMillian, Sydni (USA) (2002)	time	2.63	3.70	4.74	5.75	6.75	7.77	8.87	9.91	11.05	12.21		13.51	9 / 6			
	reaction time														3.12	3.12	3.34
	interval		1.07	1.04	1.01	1.00	1.02	1.10	1.04	1.14	1.16	1.30			8.17	8.17	7.63
	velocity	4.94	7.94	8.17	8.42	8.50	8.33	7.73	8.17	7.46	7.33	7.73	7.40				
Fune, Hailey (USA) (1982)	time	2.73	3.82	4.89	5.94	6.99	8.04	9.07	10.14	11.21	12.33		13.58	2 / 7			
	reaction time														3.21	3.13	3.26
	interval		1.09	1.07	1.05	1.05	1.05	1.03	1.07	1.07	1.12	1.25			7.94	8.15	7.82
	velocity	4.76	7.80	7.94	8.10	8.10	8.10	8.25	7.94	7.94	7.59	8.04	7.36				
Jones, Lolo (USA) (1982)	time	2.73	3.87	4.97	6.07	7.20	8.34	9.57	10.78	11.98	13.18		14.50	1 / 8			
	reaction time														3.34	3.50	3.61
	interval		1.14	1.10	1.10	1.13	1.14	1.23	1.21	1.20	1.20	1.32			7.63	7.29	7.06
	velocity	4.76	7.46	7.73	7.73	7.52	7.46	6.91	7.02	7.08	7.08	7.61	6.90				



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=3FftWm3MuI>

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

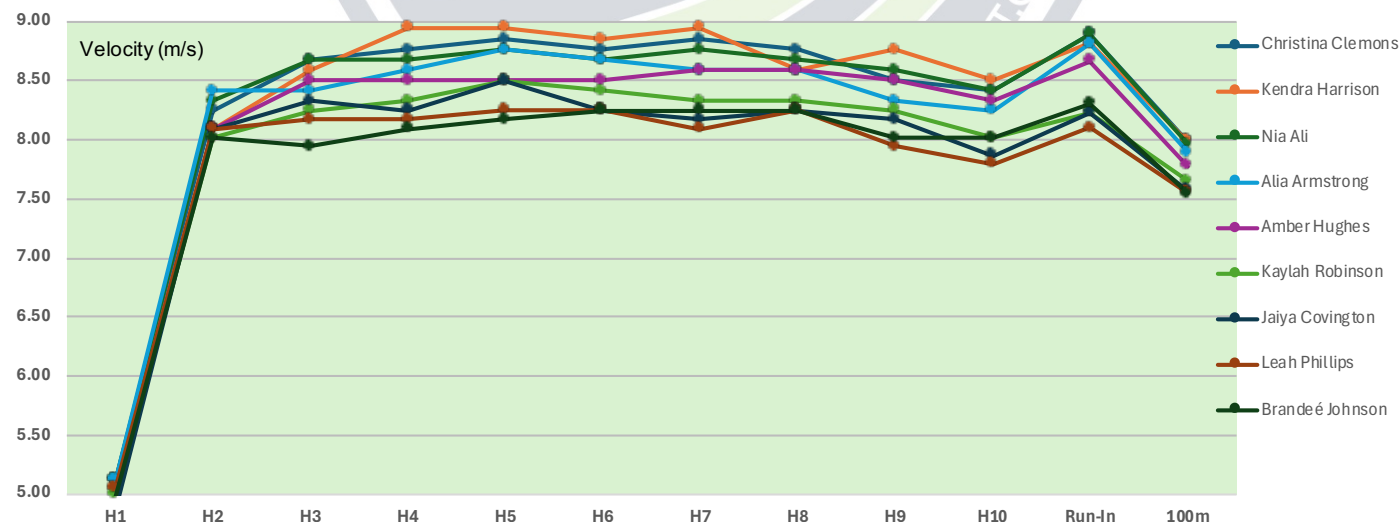
100m Hurdles

Date: 2024.06.29

Wind: 0.8 m/s

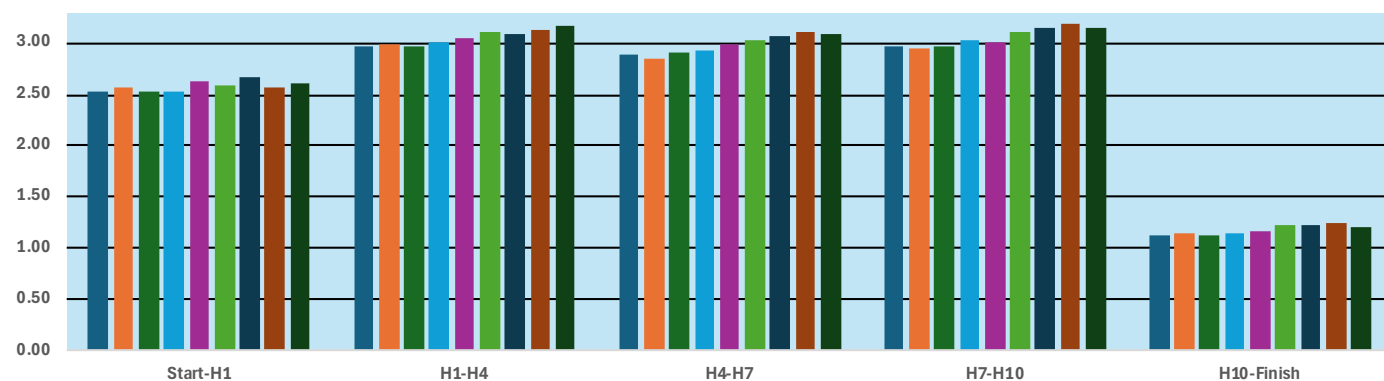
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Clemons, Christina (USA) (1990)	time	2.54	3.57	4.55	5.52	6.48	7.45	8.41	9.38	10.38	11.39		12.52	6 / 1			
	reaction time														2.98	2.89	2.98
	interval		1.03	0.98	0.97	0.96	0.97	0.96	0.97	1.00	1.01	1.13			8.56	8.82	8.56
	velocity	5.12	8.25	8.67	8.76	8.85	8.76	8.85	8.76	8.50	8.42	8.89	7.99				
Harrison, Kendra (USA) (1992)	time	2.57	3.62	4.61	5.56	6.51	7.47	8.42	9.41	10.38	11.38		12.52	7 / 2			
	reaction time														2.99	2.86	2.96
	interval		1.05	0.99	0.95	0.95	0.96	0.95	0.99	0.97	1.00	1.14			8.53	8.92	8.61
	velocity	5.06	8.10	8.59	8.95	8.95	8.85	8.95	8.59	8.76	8.50	8.82	7.99				
Ali, Nia (USA) (1988)	time	2.54	3.56	4.54	5.52	6.49	7.47	8.44	9.42	10.41	11.42		12.55	1 / 3			
	reaction time														2.98	2.92	2.98
	interval		1.02	0.98	0.98	0.97	0.98	0.97	0.98	0.99	1.01	1.13			8.56	8.73	8.56
	velocity	5.12	8.33	8.67	8.67	8.76	8.67	8.76	8.67	8.59	8.42	8.89	7.97				
Armstrong, Alia (USA) (2000)	time	2.54	3.55	4.56	5.55	6.52	7.50	8.49	9.48	10.50	11.53		12.67	4 / 4			
	reaction time														3.01	2.94	3.04
	interval		1.01	1.01	0.99	0.97	0.98	0.99	0.99	1.02	1.03	1.14			8.47	8.67	8.39
	velocity	5.12	8.42	8.42	8.59	8.76	8.67	8.59	8.59	8.33	8.25	8.82	7.89				
Hughes, Amber (USA) (1994)	time	2.64	3.69	4.69	5.69	6.69	7.69	8.68	9.67	10.67	11.69		12.85	5 / 5			
	reaction time														3.05	2.99	3.01
	interval		1.05	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.02	1.16			8.36	8.53	8.47
	velocity	4.92	8.10	8.50	8.50	8.50	8.50	8.59	8.59	8.50	8.33	8.66	7.78				
Robinson, Kaylah (USA) (1999)	time	2.60	3.66	4.69	5.71	6.71	7.72	8.74	9.76	10.79	11.85		13.07	3 / 6			
	reaction time														3.11	3.03	3.11
	interval		1.06	1.03	1.02	1.00	1.01	1.02	1.02	1.03	1.06	1.22			8.20	8.42	8.20
	velocity	5.00	8.02	8.25	8.33	8.50	8.42	8.33	8.33	8.25	8.02	8.24	7.65				
Covington, Jaiya (USA) (2003)	time	2.67	3.72	4.74	5.77	6.77	7.80	8.84	9.87	10.91	11.99		13.21	9 / 7			
	reaction time														3.10	3.07	3.15
	interval		1.05	1.02	1.03	1.00	1.03	1.04	1.03	1.04	1.08	1.22			8.23	8.31	8.10
	velocity	4.87	8.10	8.33	8.25	8.50	8.25	8.17	8.25	8.17	7.87	8.24	7.57				
Phillips, Leah (USA) (2002)	time	2.57	3.62	4.66	5.70	6.73	7.76	8.81	9.84	10.91	12.00		13.24	8 / 8			
	reaction time														3.13	3.11	3.19
	interval		1.05	1.04	1.04	1.03	1.03	1.05	1.03	1.07	1.09	1.24			8.15	8.20	7.99
	velocity	5.06	8.10	8.17	8.17	8.25	8.25	8.10	8.25	7.94	7.80	8.10	7.55				
Johnson, Brandeé (USA) (1998)	time	2.61	3.67	4.74	5.79	6.83	7.86	8.89	9.92	10.98	12.04		13.25	2 / 9			
	reaction time														3.18	3.10	3.15
	interval		1.06	1.07	1.05	1.04	1.03	1.03	1.03	1.06	1.06	1.21			8.02	8.23	8.10
	velocity	4.98	8.02	7.94	8.10	8.17	8.25	8.25	8.25	8.02	8.02	8.31	7.55				



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=TyAnmsGrxQo>

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2024.06.28 Wind: 0.2 m/s

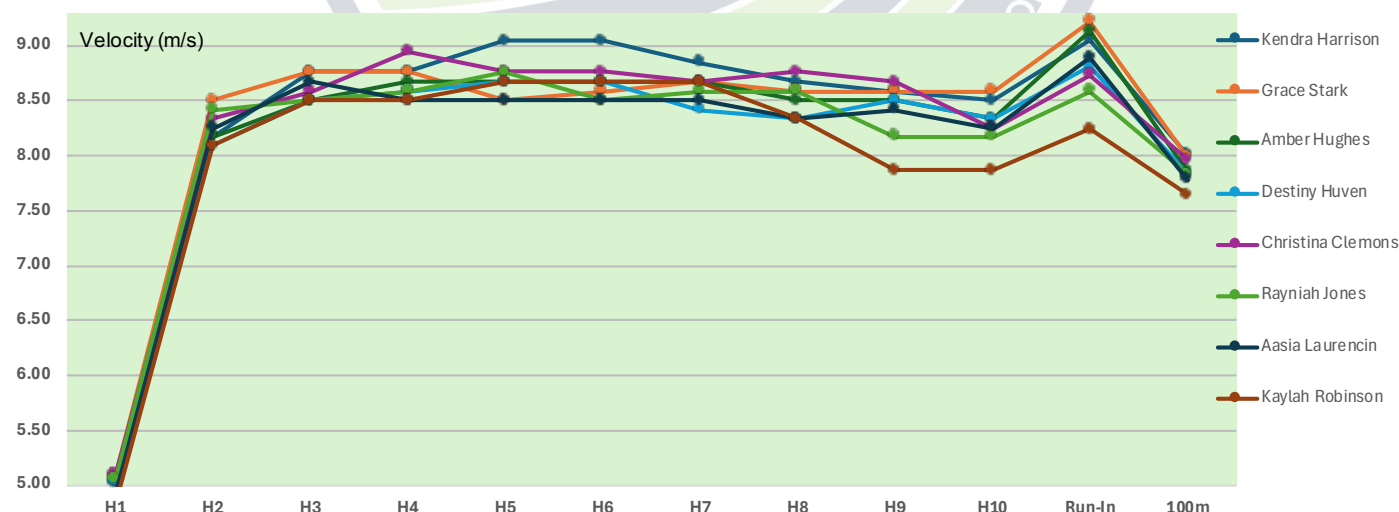
Heat 4

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Harrison, Kendra (USA) (1992)	time	2.59	3.63	4.60	5.57	6.51	7.45	8.41	9.39	10.38	11.38		12.49	3 / 1			
	reaction time														2.98	2.84	2.97
	interval velocity	5.02	8.17	8.76	8.76	9.04	9.04	8.85	8.67	8.59	8.50	9.05	8.01		8.56	8.98	8.59
Stark, Grace (USA) (2001)	time	2.55	3.55	4.52	5.49	6.49	7.48	8.46	9.45	10.44	11.43		12.52	8 / 2			
	reaction time														2.94	2.97	2.97
	interval velocity	5.10	8.50	8.76	8.76	8.50	8.59	8.67	8.59	8.59	8.59	9.22	7.99		8.67	8.59	8.59
Hughes, Amber (USA) (1994)	time	2.65	3.69	4.69	5.67	6.65	7.63	8.61	9.61	10.61	11.63		12.73	4 / 3			
	reaction time														3.02	2.94	3.02
	interval velocity	4.91	8.17	8.50	8.67	8.67	8.67	8.67	8.50	8.50	8.33	9.14	7.86		8.44	8.67	8.44
Huven, Destiny (USA) (2001)	time	2.58	3.63	4.63	5.62	6.60	7.58	8.59	9.61	10.61	11.63		12.77	7 / 4			
	reaction time														3.04	2.97	3.04
	interval velocity	5.04	8.10	8.50	8.59	8.67	8.67	8.42	8.33	8.50	8.33	8.82	7.83		8.39	8.59	8.39

Date: 2024.06.28 Wind: 0.1 m/s

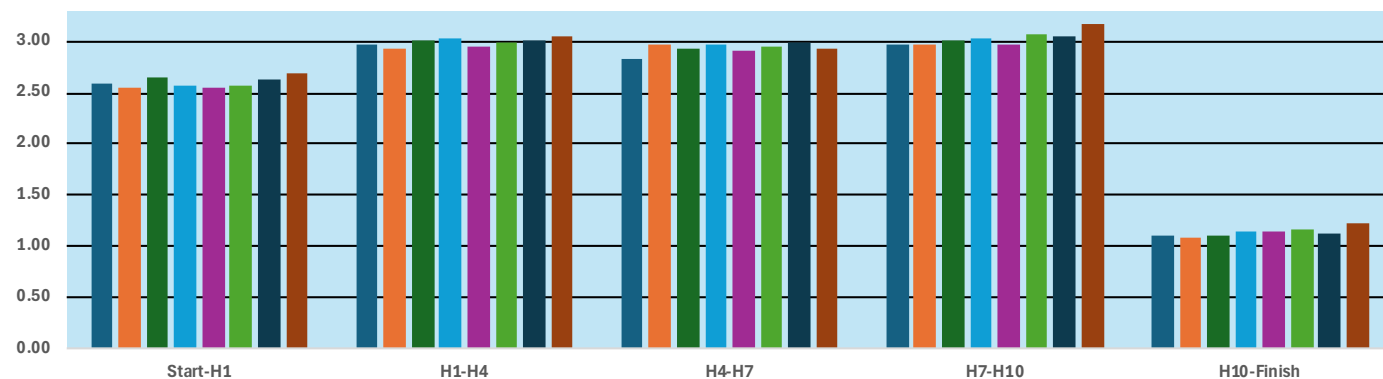
Heat 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Clemons, Christina (USA) (1990)	time	2.55	3.57	4.56	5.51	6.48	7.45	8.43	9.40	10.38	11.41		12.56	4 / 1			
	reaction time														2.96	2.92	2.98
	interval velocity	5.10	8.33	8.59	8.95	8.76	8.76	8.67	8.76	8.67	8.67	8.25	8.74	7.96	8.61	8.73	8.56
Jones, Rayniah (USA) (2001)	time	2.57	3.58	4.58	5.57	6.54	7.54	8.53	9.52	10.56	11.60		12.77	7 / 2			
	reaction time														3.00	2.96	3.07
	interval velocity	5.06	8.42	8.50	8.59	8.76	8.50	8.59	8.59	8.17	8.17	8.59	7.83		8.50	8.61	8.31
Laurencin, Aasia (USA) (2002)	time	2.64	3.67	4.65	5.65	6.65	7.65	8.65	9.67	10.68	11.71		12.84	2 / 3			
	reaction time														3.01	3.00	3.06
	interval velocity	4.92	8.25	8.67	8.50	8.50	8.50	8.50	8.33	8.42	8.25	8.89	7.79		8.47	8.50	8.33
Robinson, Kaylah (USA) (1999)	time	2.69	3.74	4.74	5.74	6.72	7.70	8.68	9.70	10.78	11.86		13.08	6 / 4			
	reaction time														3.05	2.94	3.18
	interval velocity	4.83	8.10	8.50	8.50	8.67	8.67	8.67	8.33	7.87	7.87	8.24	7.65		8.36	8.67	8.02



Time Intervals (s)

Hurdle Phases



Heat 4

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ut8nMtkh4Rk>

Heat 3

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

2024 USA Olympic Trials (Eugene, OR) (TV Analysis)

100m Hurdles

Date: 2024.06.28 Wind: 0.2 m/s

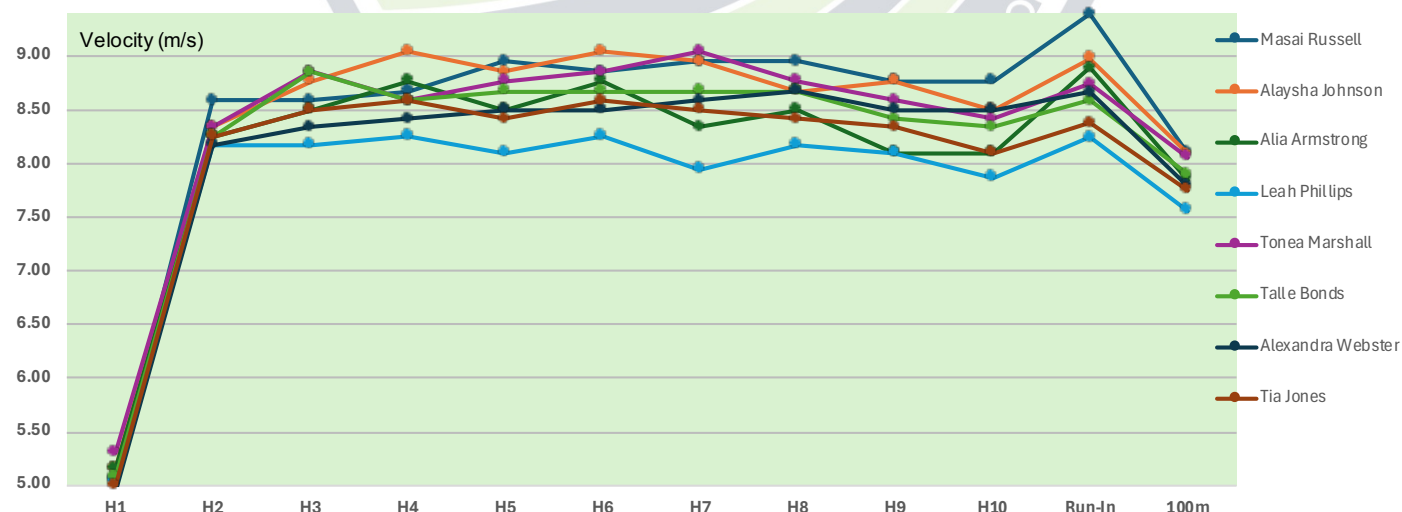
Heat 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Russell, Masai (USA) (2000)	time	2.57	3.56	4.55	5.53	6.48	7.44	8.39	9.34	10.31	11.28		12.35	5 / 1			
	reaction time		interval	0.99	0.99	0.98	0.95	0.96	0.95	0.95	0.97	0.97	1.07	PB	2.96	2.86	2.89
	velocity	5.06	8.59	8.59	8.67	8.95	8.85	8.95	8.95	8.76	8.76	9.39	8.10		8.61	8.92	8.82
Johnson, Alaysha (USA) (1996)	time	2.52	3.54	4.51	5.45	6.41	7.35	8.30	9.28	10.25	11.25		12.37	4 / 2			
	reaction time		interval	1.02	0.97	0.94	0.96	0.94	0.95	0.98	0.97	1.00	1.12		2.93	2.85	2.95
	velocity	5.16	8.33	8.76	9.04	8.85	9.04	8.95	8.67	8.76	8.50	8.97	8.08		8.70	8.95	8.64
Armstrong, Alia (USA) (2000)	time	2.52	3.55	4.55	5.52	6.52	7.49	8.51	9.51	10.56	11.61		12.74	2 / 3			
	reaction time		interval	1.03	1.00	0.97	1.00	0.97	1.02	1.00	1.05	1.05	1.13		3.00	2.99	3.10
	velocity	5.16	8.25	8.50	8.76	8.50	8.76	8.33	8.50	8.10	8.10	8.89	7.85		8.50	8.53	8.23
Phillips, Leah (USA) (2002)	time	2.58	3.62	4.66	5.69	6.74	7.77	8.84	9.88	10.93	12.01		13.23	3 / 4			
	reaction time		interval	1.04	1.04	1.03	1.05	1.03	1.07	1.04	1.05	1.08	1.22		3.11	3.15	3.17
	velocity	5.04	8.17	8.17	8.25	8.10	8.25	7.94	8.17	8.10	8.10	8.24	7.56		8.20	8.10	8.04

Date: 2024.06.28 Wind: 1.7 m/s

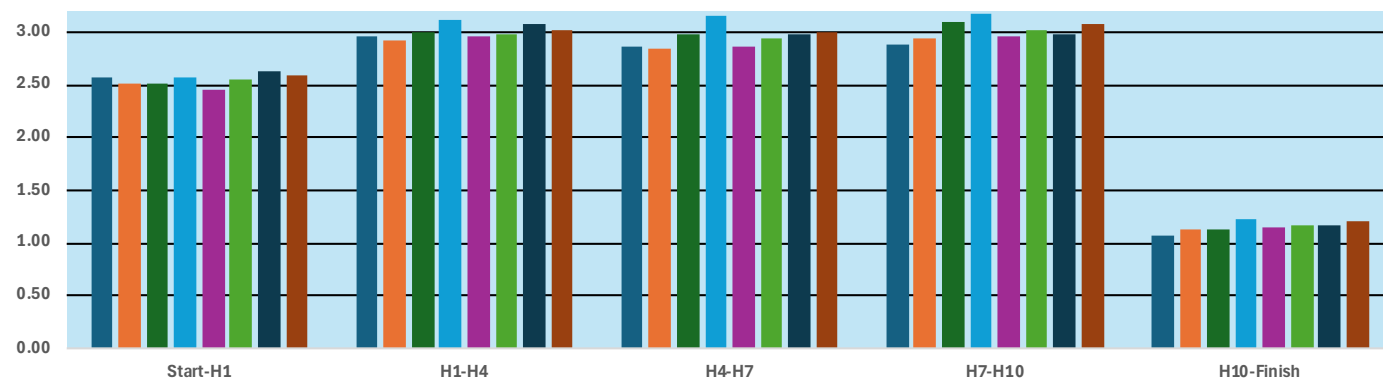
Heat 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Marshall, Tonia (USA) (1998)	time	2.45	3.47	4.43	5.42	6.39	7.35	8.29	9.26	10.25	11.26		12.41	5 / 1			
	reaction time		interval	1.02	0.96	0.99	0.97	0.96	0.94	0.97	0.99	1.01	1.15	PB	2.97	2.87	2.97
	velocity	5.31	8.33	8.85	8.59	8.76	8.85	9.04	8.76	8.59	8.42	8.74	8.06		8.59	8.89	8.59
Bonds, Tallie (USA) (1998)	time	2.56	3.59	4.55	5.54	6.52	7.50	8.48	9.46	10.47	11.49		12.66	6 / 2			
	reaction time		interval	1.03	0.96	0.99	0.98	0.98	0.98	1.01	1.02	1.17		2.98	2.94	3.01	
	velocity	5.08	8.25	8.85	8.59	8.67	8.67	8.67	8.67	8.42	8.33	8.59	7.90		8.56	8.67	8.47
Webster, Alexandra (USA) (2002)	time	2.63	3.67	4.69	5.70	6.70	7.70	8.69	9.67	10.67	11.67		12.83	3 / 3			
	reaction time		interval	1.04	1.02	1.01	1.00	1.00	0.99	0.98	1.00	1.00	1.16		3.07	2.99	2.98
	velocity	4.94	8.17	8.33	8.42	8.50	8.50	8.59	8.67	8.50	8.50	8.66	7.79		8.31	8.53	8.56
Jones, Tia (USA) (2000)	time	2.60	3.63	4.63	5.62	6.63	7.62	8.62	9.63	10.65	11.70		12.90	2 / 4			
	reaction time		interval	1.03	1.00	0.99	1.01	0.99	1.00	1.01	1.02	1.05	1.20		3.02	3.00	3.08
	velocity	5.00	8.25	8.50	8.59	8.42	8.59	8.50	8.42	8.33	8.10	8.37	7.75		8.44	8.50	8.28



Time Intervals (s)

Hurdle Phases



Heat 2

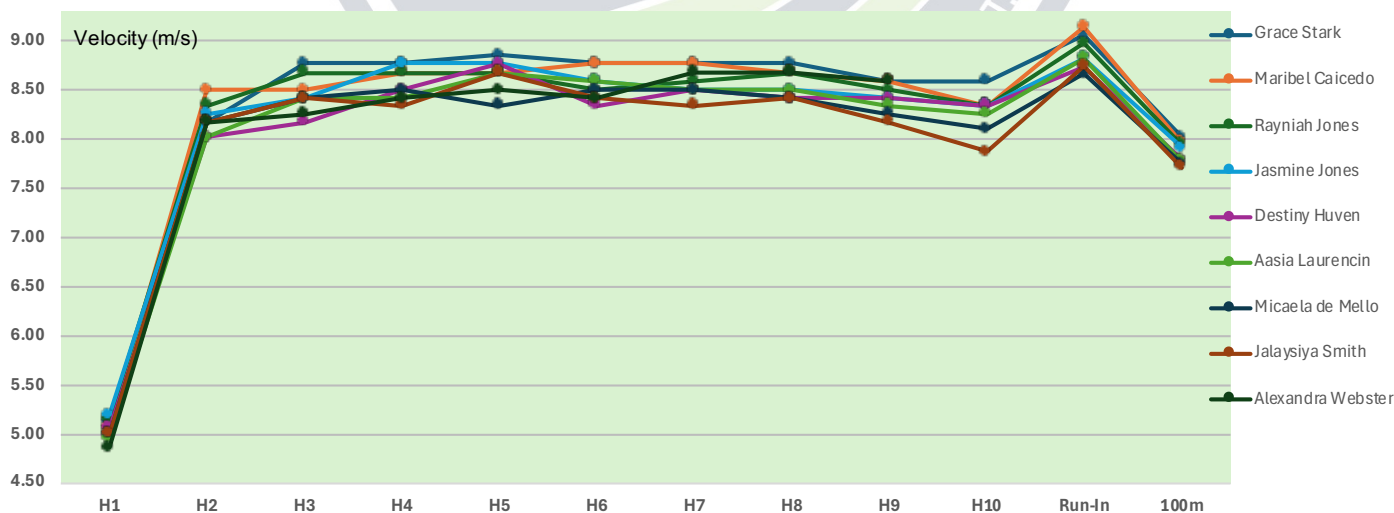
Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=BHOIUYO18I8>

Heat 1

Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=vx8xFe0u3Ec>

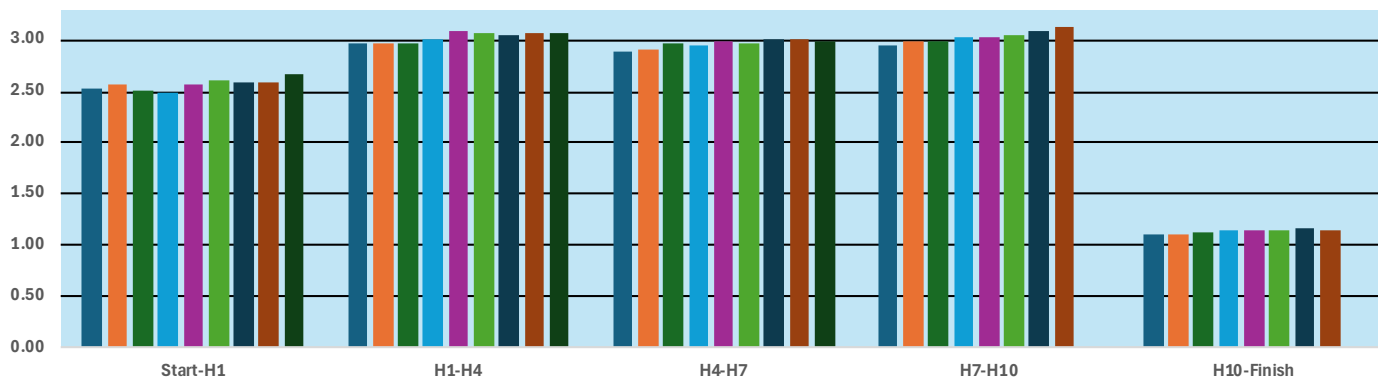
2024 NCAA Championships (Eugene, OR) (TV Analysis)

100m Hurdles		Date: 2024.06.08	Wind: -0.5 m/s										FINAL				
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Stark, Grace (USA) (2001)	time	2.53	3.57	4.54	5.51	6.47	7.44	8.41	9.38	10.37	11.36	12.47	12.47	8 / 1			
	reaction time														2.98	2.90	2.95
	interval		1.04	0.97	0.97	0.96	0.97	0.97	0.97	0.99	0.99	1.11	PB		8.56	8.79	8.64
	velocity	5.14	8.17	8.76	8.76	8.85	8.76	8.76	8.76	8.59	8.59	9.05	8.02				
Caicedo, Maribel (ECU) (1998)	time	2.57	3.57	4.57	5.55	6.53	7.50	8.47	9.45	10.44	11.46	12.56	12.56	6 / 2			
	reaction time														2.98	2.92	2.99
	interval		1.00	1.00	0.98	0.98	0.97	0.97	0.98	0.99	1.02	1.10			8.56	8.73	8.53
	velocity	5.06	8.50	8.50	8.67	8.67	8.76	8.76	8.67	8.59	8.33	9.14	7.96				
Jones, Rayniah (USA) (2001)	time	2.52	3.54	4.52	5.50	6.48	7.48	8.47	9.45	10.45	11.47	12.59	12.59	4 / 3			
	reaction time														2.98	2.97	3.00
	interval		1.02	0.98	0.98	0.98	1.00	0.99	0.98	1.00	1.02	1.12	PB		8.56	8.59	8.50
	velocity	5.16	8.33	8.67	8.67	8.67	8.50	8.59	8.67	8.50	8.33	8.97	7.94				
Jones, Jasmine (USA) (2001)	time	2.50	3.53	4.54	5.51	6.48	7.47	8.47	9.47	10.48	11.50	12.64	12.64	3 / 4			
	reaction time														3.01	2.96	3.03
	interval		1.03	1.01	0.97	0.97	0.99	1.00	1.00	1.01	1.02	1.14	PB		8.47	8.61	8.42
	velocity	5.20	8.25	8.42	8.76	8.76	8.59	8.50	8.50	8.42	8.33	8.82	7.91				
Huven, Destiny (USA) (2001)	time	2.57	3.63	4.67	5.67	6.64	7.66	8.66	9.67	10.68	11.70	12.85	12.85	2 / 5			
	reaction time														3.10	2.99	3.04
	interval		1.06	1.04	1.00	0.97	1.02	1.00	1.01	1.01	1.02	1.15			8.23	8.53	8.39
	velocity	5.06	8.02	8.17	8.50	8.76	8.33	8.50	8.42	8.42	8.33	8.74	7.78				
Laurencin, Aasia (USA) (2002)	time	2.62	3.68	4.69	5.70	6.68	7.67	8.67	9.67	10.69	11.72	12.86	12.86	5 / 6			
	reaction time														3.08	2.97	3.05
	interval		1.06	1.01	1.01	0.98	0.99	1.00	1.00	1.02	1.03	1.14			8.28	8.59	8.36
	velocity	4.96	8.02	8.42	8.42	8.67	8.59	8.50	8.50	8.33	8.25	8.82	7.78				
de Mello, Micaela (BRA) (2000)	time	2.60	3.64	4.65	5.65	6.67	7.67	8.67	9.68	10.71	11.76	12.92	12.92	9 / 7			
	reaction time														3.05	3.02	3.09
	interval		1.04	1.01	1.00	1.02	1.00	1.00	1.01	1.03	1.05	1.16			8.36	8.44	8.25
	velocity	5.00	8.17	8.42	8.50	8.33	8.50	8.50	8.42	8.25	8.10	8.66	7.74				
Smith, Jalaysiya (USA) (2003)	time	2.60	3.64	4.65	5.67	6.65	7.66	8.68	9.69	10.73	11.81	12.96	12.96	7 / 8			
	reaction time														3.07	3.01	3.13
	interval		1.04	1.01	1.02	0.98	1.01	1.02	1.01	1.04	1.08	1.15			8.31	8.47	8.15
	velocity	5.00	8.17	8.42	8.33	8.67	8.42	8.33	8.42	8.17	7.87	8.74	7.72				
Webster, Alexandra (USA) (2002)	time	2.67	3.71	4.74	5.75	6.75	7.76	8.74	9.72	10.71		dnf	dnf	1 / 9			
	reaction time														3.08	2.99	
	interval		1.04	1.03	1.01	1.00	1.01	0.98	0.98	0.99					8.28	8.53	
	velocity	4.87	8.17	8.25	8.42	8.50	8.42	8.67	8.67	8.59							



Time Intervals (s)

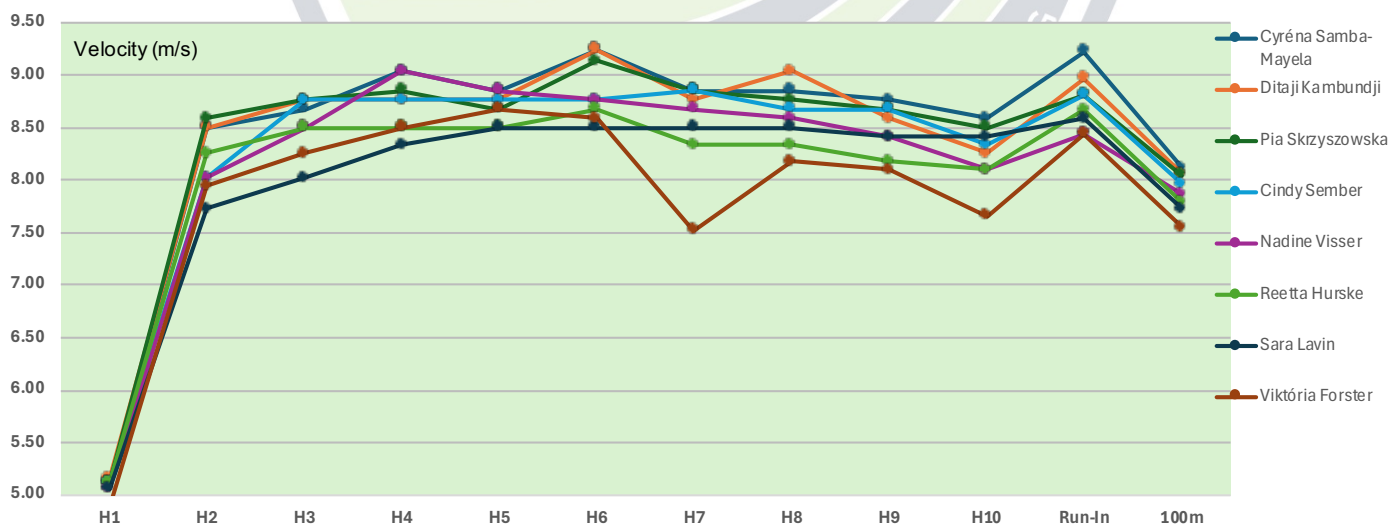
Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=ukW2iTpuTIU>

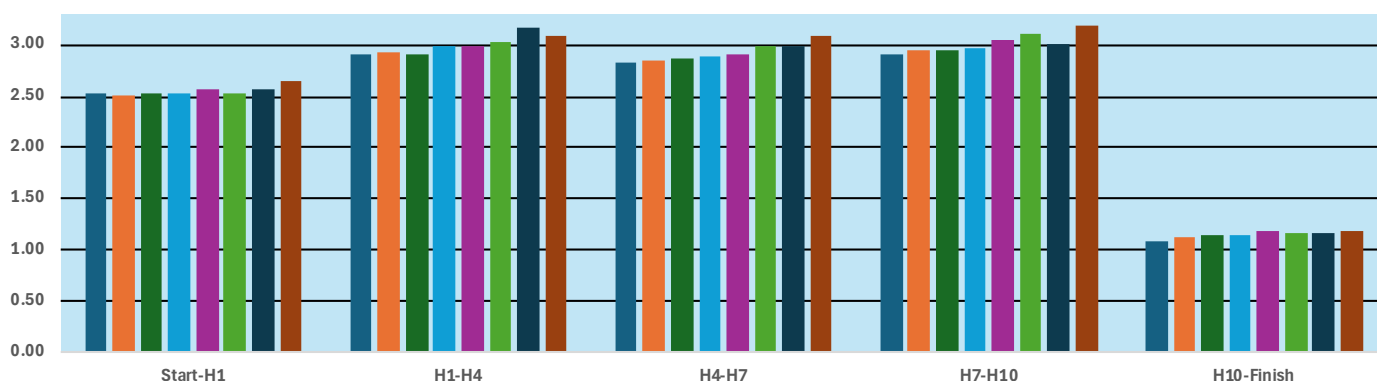
2024 European Athletics Championships (Roma, ITA) (TV Analysis)

100m Hurdles		Date: 2024.06.08	Wind: 0.8 m/s											FINAL			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Samba-Mayela, Cyréna (FRA) (2000)	time	2.54	3.54	4.52	5.46	6.42	7.34	8.30	9.26	10.23	11.22		12.31	5 / 1			
	reaction time	0.150											NR PB		2.92	2.84	2.92
	interval		1.00	0.98	0.94	0.96	0.92	0.96	0.96	0.97	0.99	1.09	8.12		8.73	8.98	8.73
	velocity	5.12	8.50	8.67	9.04	8.85	9.24	8.85	8.85	8.76	8.59	9.22					
Kambundji, Ditaji (SUI) (2002)	time	2.52	3.52	4.49	5.46	6.43	7.35	8.32	9.26	10.25	11.28		12.40	8 / 2			
	reaction time	0.159											NR PB		2.94	2.86	2.96
	interval		1.00	0.97	0.97	0.97	0.92	0.97	0.94	0.99	1.03	1.12	8.06		8.67	8.92	8.61
	velocity	5.16	8.50	8.76	8.76	8.76	9.24	8.76	9.04	8.59	8.25	8.97					
Skrzyszowska, Pia (POL) (2001)	time	2.54	3.53	4.50	5.46	6.44	7.37	8.33	9.30	10.28	11.28		12.42	6 / 3			
	reaction time	0.151											PB		2.92	2.87	2.95
	interval		0.99	0.97	0.96	0.98	0.93	0.96	0.97	0.98	1.00	1.14	8.05		8.73	8.89	8.64
	velocity	5.12	8.59	8.76	8.85	8.67	9.14	8.85	8.76	8.67	8.50	8.82					
Sember, Cindy (GBR) (1994)	time	2.54	3.60	4.57	5.54	6.51	7.48	8.44	9.42	10.40	11.42		12.56	7 / 4			
	reaction time	0.175													3.00	2.90	2.98
	interval		1.06	0.97	0.97	0.97	0.97	0.96	0.98	0.98	1.02	1.14			8.50	8.79	8.56
	velocity	5.12	8.02	8.76	8.76	8.76	8.76	8.85	8.67	8.67	8.33	8.82					
Visser, Nadine (NED) (1995)	time	2.57	3.63	4.63	5.57	6.53	7.50	8.48	9.47	10.48	11.53		12.72	3 / 5			
	reaction time	0.150													3.00	2.91	3.05
	interval		1.06	1.00	0.94	0.96	0.97	0.98	0.99	1.01	1.05	1.19			8.50	8.76	8.36
	velocity	5.06	8.02	8.50	9.04	8.85	8.76	8.67	8.59	8.42	8.10	8.45					
Hurske, Reetta (FIN) (1995)	time	2.54	3.57	4.57	5.57	6.57	7.55	8.57	9.59	10.63	11.68		12.84	9 / 6			
	reaction time	0.145													3.03	3.00	3.11
	interval		1.03	1.00	1.00	1.00	0.98	1.02	1.02	1.04	1.05	1.16			8.42	8.50	8.20
	velocity	5.12	8.25	8.50	8.50	8.50	8.67	8.33	8.33	8.17	8.10	8.66					
Lavin, Sarah (IRL) (1994)	time	2.57	3.67	4.73	5.75	6.75	7.75	8.75	9.75	10.76	11.77		12.94	4 / 7			
	reaction time	0.141													3.18	3.00	3.02
	interval		1.10	1.06	1.02	1.00	1.00	1.00	1.00	1.01	1.01	1.17			8.02	8.50	8.44
	velocity	5.06	7.73	8.02	8.33	8.50	8.50	8.50	8.50	8.42	8.42	8.59					
Forster, Viktória (SVK) (2002)	time	2.66	3.73	4.76	5.76	6.74	7.73	8.86	9.90	10.95	12.06		13.25	2 / 8			
	reaction time	0.173													3.10	3.10	3.20
	interval		1.07	1.03	1.00	0.98	0.99	1.13	1.04	1.05	1.11	1.19			8.23	8.23	7.97
	velocity	4.89	7.94	8.25	8.50	8.67	8.59	7.52	8.17	8.10	7.66	8.45					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 24fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=5pQv2cUKIYY>

2024 Prefontaine Classic (Eugene, OR)

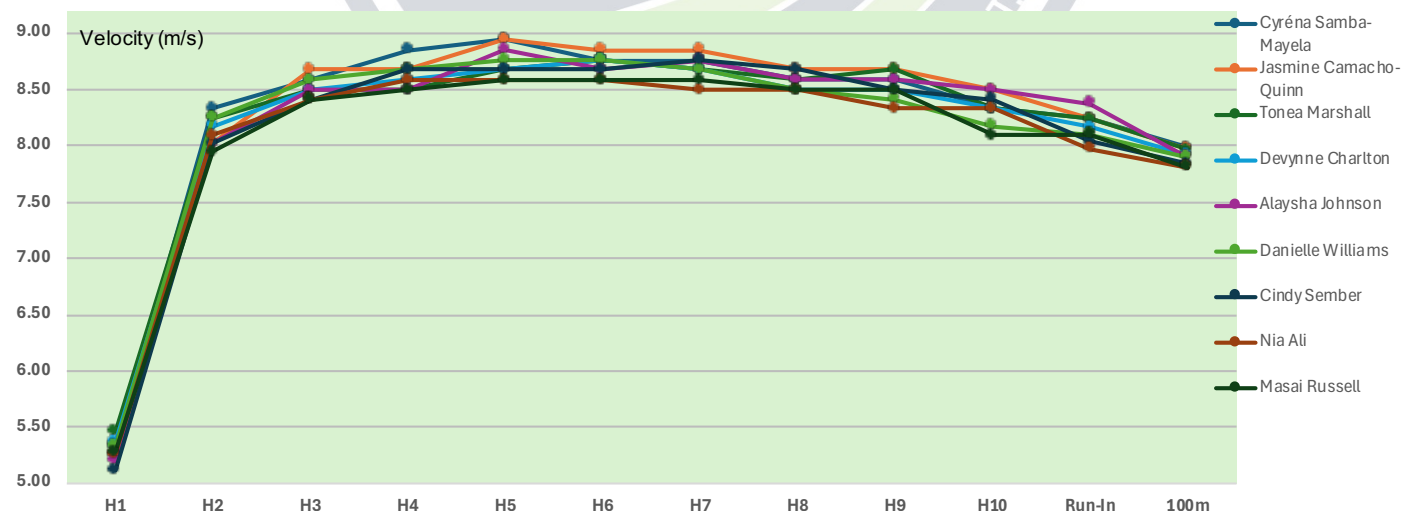
100m Hurdles

Date: 2024.05.25

Wind: -0.9 m/s

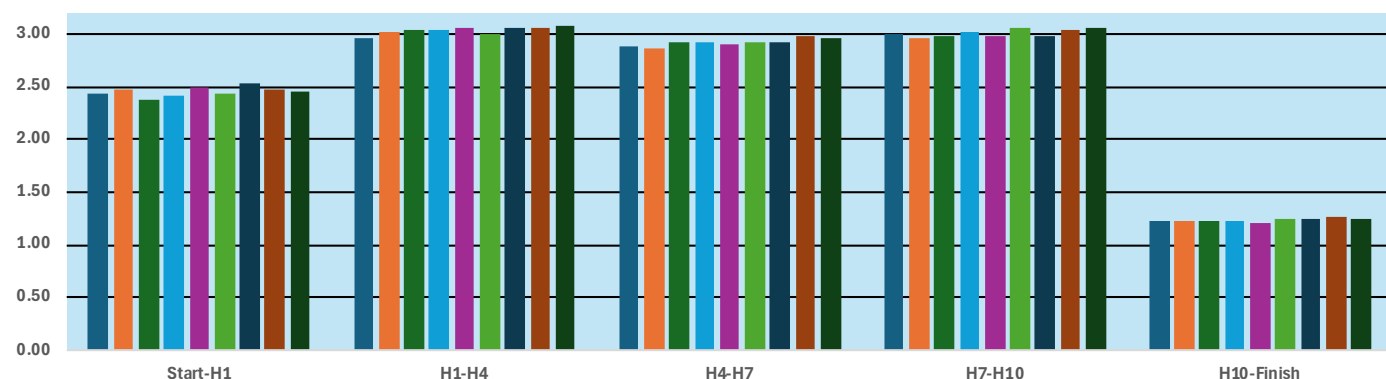
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10
Samba-Mayela, Cyréna (FRA) (2000)	time	2.44	3.46	4.45	5.41	6.36	7.33	8.30	9.29	10.28	11.30		12.52	8 / 1			
	reaction time	0.132											=NR =PB		2.97	2.89	3.00
	interval		1.02	0.99	0.96	0.95	0.97	0.97	0.99	0.99	1.02	1.22			8.59	8.82	8.50
	velocity	5.33	8.33	8.59	8.85	8.95	8.76	8.76	8.59	8.59	8.33	8.24	7.99				
Camacho-Quinn, Jasmine (PUR) (199)	time	2.47	3.53	4.51	5.49	6.44	7.40	8.36	9.34	10.32	11.32		12.54	6 / 2			
	reaction time	0.148													3.02	2.87	2.96
	interval		1.06	0.98	0.98	0.95	0.96	0.96	0.98	0.98	1.00	1.22			8.44	8.89	8.61
	velocity	5.26	8.02	8.67	8.67	8.95	8.85	8.85	8.67	8.67	8.50	8.24	7.97				
Marshall, Tonea (USA) (1998)	time	2.38	3.41	4.41	5.41	6.39	7.36	8.34	9.33	10.31	11.33		12.55	4 / 3			
	reaction time	0.128													3.03	2.93	2.99
	interval		1.03	1.00	1.00	0.98	0.97	0.98	0.99	0.98	1.02	1.22			8.42	8.70	8.53
	velocity	5.46	8.25	8.50	8.50	8.67	8.76	8.67	8.59	8.67	8.33	8.24	7.97				
Charlton, Devynne (BAH) (1995)	time	2.42	3.46	4.46	5.45	6.43	7.40	8.38	9.38	10.38	11.40		12.63	3 / 4			
	reaction time	0.138													3.03	2.93	3.02
	interval		1.04	1.00	0.99	0.98	0.97	0.98	1.00	1.00	1.02	1.23			8.42	8.70	8.44
	velocity	5.37	8.17	8.50	8.59	8.67	8.76	8.67	8.50	8.50	8.33	8.17	7.92				
Johnson, Alaysha (USA) (1996)	time	2.50	3.56	4.56	5.56	6.52	7.50	8.47	9.46	10.45	11.45		12.65	2 / 5			
	reaction time	0.162													3.06	2.91	2.98
	interval		1.06	1.00	1.00	0.96	0.98	0.97	0.99	0.99	1.00	1.20			8.33	8.76	8.56
	velocity	5.20	8.02	8.50	8.50	8.85	8.67	8.76	8.59	8.59	8.50	8.37	7.91				
Williams, Danielle (JAM) (1992)	time	2.44	3.47	4.46	5.44	6.41	7.38	8.36	9.36	10.37	11.41		12.65	5 / 6			
	reaction time	0.127													3.00	2.92	3.05
	interval		1.03	0.99	0.98	0.97	0.97	0.98	1.00	1.01	1.04	1.24			8.50	8.73	8.36
	velocity	5.33	8.25	8.59	8.67	8.76	8.76	8.67	8.50	8.42	8.17	7.91					
Sember, Cindy (GBR) (1994)	time	2.54	3.60	4.61	5.59	6.57	7.55	8.52	9.50	10.50	11.51		12.76	9 / 7			
	reaction time	0.175													3.05	2.93	2.99
	interval		1.06	1.01	0.98	0.98	0.98	0.97	0.98	1.00	1.01	1.25			8.36	8.70	8.53
	velocity	5.12	8.02	8.42	8.67	8.67	8.67	8.76	8.67	8.50	8.42	8.04	7.84				
Ali, Nia (USA) (1988)	time	2.47	3.52	4.53	5.52	6.51	7.50	8.50	9.50	10.52	11.54		12.80	7 / 8			
	reaction time	0.187													3.05	2.98	3.04
	interval		1.05	1.01	0.99	0.99	0.99	1.00	1.00	1.02	1.02	1.26			8.36	8.56	8.39
	velocity	5.26	8.10	8.42	8.59	8.59	8.59	8.50	8.50	8.33	8.33	7.98	7.81				
Russell, Masai (USA) (2000)	time	2.46	3.53	4.54	5.54	6.53	7.52	8.51	9.51	10.51	11.56		12.80	1 / 9			
	reaction time	0.141													3.08	2.97	3.05
	interval		1.07	1.01	1.00	0.99	0.99	0.99	1.00	1.00	1.05	1.24			8.28	8.59	8.36
	velocity	5.28	7.94	8.42	8.50	8.59	8.59	8.59	8.50	8.50	8.10	8.10	7.81				



Time Intervals (s)

Hurdle Phases

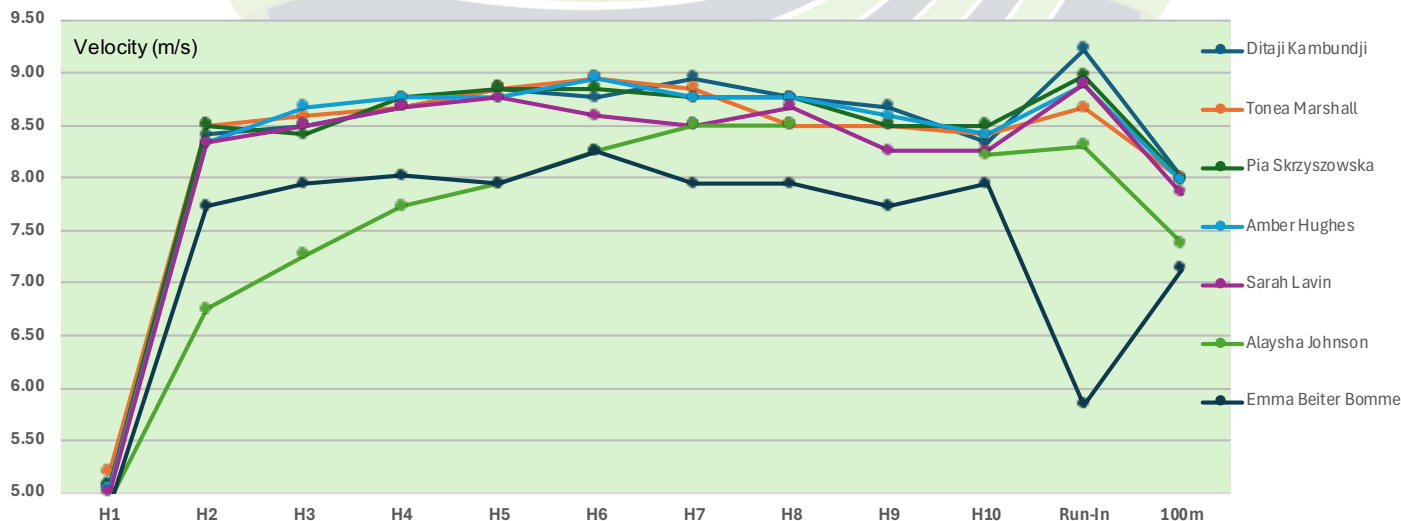


Source: Omega Timing (Sat 25 May 2024 13:52) - diamond league race analysis
<https://www.omegatiming.com/File/000204080102090101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=QBZC81WWr7k>

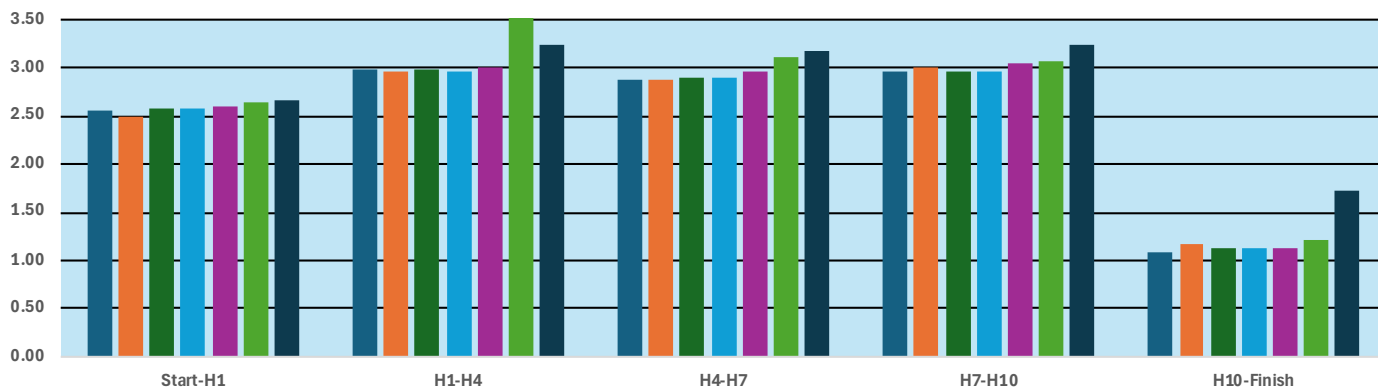
2024 Seashore Doha Meeting (Doha, QAT) (TV Analysis)

100m Hurdles		Date: 2024.05.10	Wind: 1.7 m/s												FINAL			
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	100m	Lane/Place	H1-H4	H4-H7	H7-H10	
Kambundji, Ditaji (SUI) (2002)	time	2.56	3.57	4.57	5.55	6.51	7.48	8.43	9.40	10.38	11.40		12.49	7 / 1				
	reaction time	0.127													2.99	2.88	2.97	
	interval		1.01	1.00	0.98	0.96	0.97	0.95	0.97	0.98	1.02	1.09			8.53	8.85	8.59	
	velocity	5.08	8.42	8.50	8.67	8.85	8.76	8.95	8.76	8.67	8.33	9.22	8.01					
Marshall, Tonia (USA) (1998)	time	2.50	3.50	4.49	5.47	6.43	7.38	8.34	9.34	10.34	11.35		12.51	6 / 2				
	reaction time	0.119													2.97	2.87	3.01	
	interval		1.00	0.99	0.98	0.96	0.95	0.96	1.00	1.00	1.01	1.16			8.59	8.89	8.47	
	velocity	5.20	8.50	8.59	8.67	8.85	8.95	8.85	8.50	8.50	8.42	8.66	7.99					
Skrzyszowska, Pia (POL) (2001)	time	2.57	3.57	4.58	5.55	6.51	7.47	8.44	9.41	10.41	11.41		12.53	3 / 3				
	reaction time	0.124													2.98	2.89	2.97	
	interval		1.00	1.01	0.97	0.96	0.96	0.97	0.97	1.00	1.00	1.12			8.56	8.82	8.59	
	velocity	5.06	8.50	8.42	8.76	8.85	8.85	8.76	8.76	8.50	8.50	8.97	7.98					
Hughes, Amber (USA) (1994)	time	2.58	3.60	4.58	5.55	6.52	7.47	8.44	9.41	10.40	11.41		12.54	5 / 4				
	reaction time	0.150													2.97	2.89	2.97	
	interval		1.02	0.98	0.97	0.97	0.95	0.97	0.97	0.99	1.01	1.13			8.59	8.82	8.59	
	velocity	5.04	8.33	8.67	8.76	8.76	8.95	8.76	8.76	8.59	8.42	8.89	7.97					
Lavin, Sarah (IRL) (1994)	time	2.60	3.62	4.62	5.60	6.57	7.56	8.56	9.54	10.57	11.60		12.73	2 / 5				
	reaction time	0.127													3.00	2.96	3.04	
	interval		1.02	1.00	0.98	0.97	0.99	1.00	0.98	1.03	1.03	1.13			8.50	8.61	8.39	
	velocity	5.00	8.33	8.50	8.67	8.76	8.59	8.50	8.67	8.25	8.25	8.89	7.86					
Johnson, Alaysha (USA) (1996)	time	2.64	3.90	5.07	6.17	7.24	8.27	9.27	10.27		12.34		13.55	4 / 6	no official time given			
	reaction time	0.137													3.53	3.10	3.07	
	interval		1.26	1.17	1.10	1.07	1.03	1.00	1.00		2.07	1.21			7.22	8.23	8.31	
	velocity	4.92	6.75	7.26	7.73	7.94	8.25	8.50	8.50		8.21	8.31	7.38					
Bomme, Emma Beiter (DEN) (1998)	time	2.67	3.77	4.84	5.90	6.97	8.00	9.07	10.14	11.24	12.31		14.03	1 / 7 6				
	reaction time	0.149													3.23	3.17	3.24	
	interval		1.10	1.07	1.06	1.07	1.03	1.07	1.07	1.10	1.07	1.72			7.89	8.04	7.87	
	velocity	4.87	7.73	7.94	8.02	7.94	8.25	7.94	7.94	7.73	7.94	5.84	7.13					



Time Intervals (s)

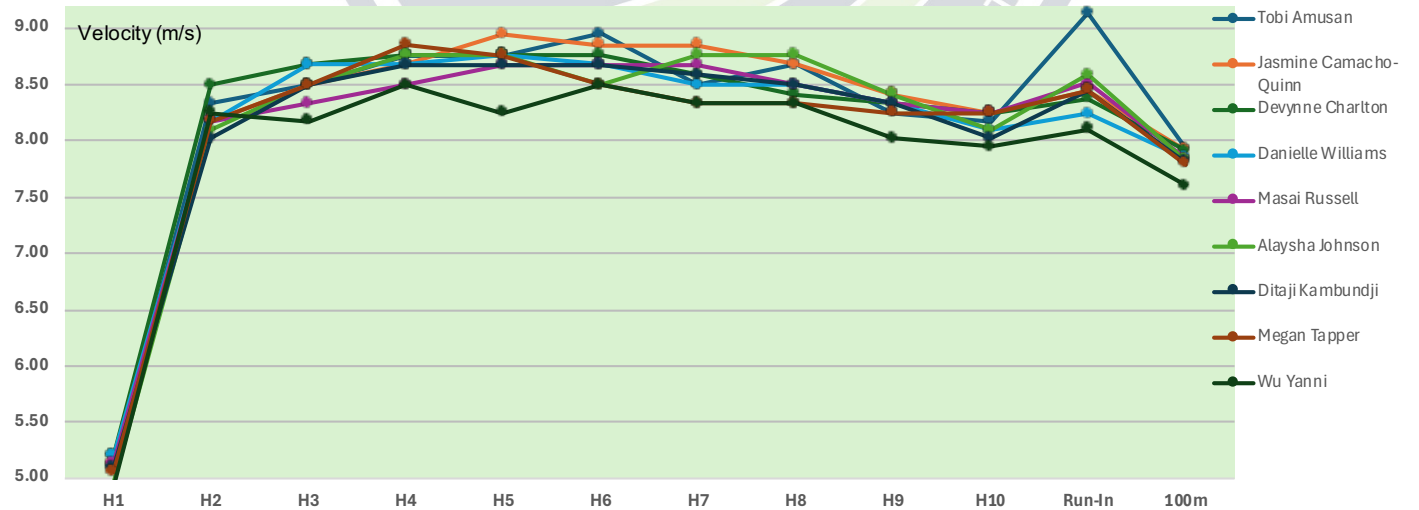
Hurdle Phases



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=w8UoerhAc>

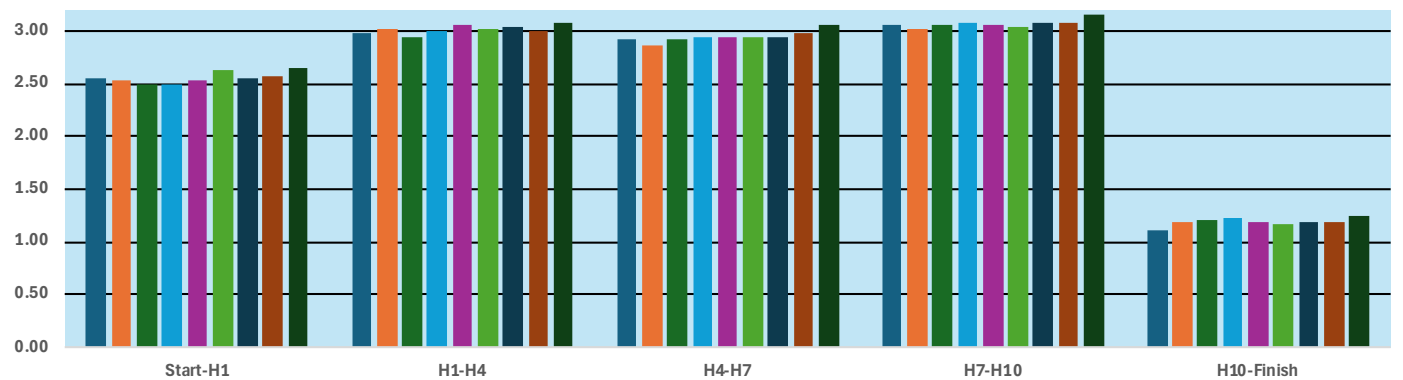
2024 Yangtze River Delta Athletics Diamond Gala (Suzhou, CHN) (TV Analysis)

100m Hurdles		Date: 2024.04.27	Wind: 0.3 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	2.55	3.57	4.57	5.54	6.51	7.46	8.46	9.44	10.47	11.51			12.61	6 / 4	no official time given		
	reaction time	0.123														2.99	2.92	3.05
	interval		1.02	1.00	0.97	0.97	0.95	1.00	0.98	1.03	1.04	1.10	1.10			8.53	8.73	8.36
	velocity		5.10	8.33	8.50	8.76	8.76	8.95	8.50	8.67	8.25	8.17	9.14	7.93				
Camacho-Quinn, Jasmine (PUR) (199)	time	2.53	3.57	4.57	5.55	6.50	7.46	8.42	9.40	10.41	11.44			12.63	5 / 2 1	3.02	2.87	3.02
	reaction time	0.163														8.44	8.89	8.44
	interval		1.04	1.00	0.98	0.95	0.96	0.96	0.98	1.01	1.03	1.19	1.19					
	velocity		5.14	8.17	8.50	8.67	8.95	8.85	8.85	8.67	8.42	8.25	8.45	7.92				
Charlton, Devynne (BAH) (1995)	time	2.50	3.50	4.48	5.45	6.42	7.39	8.38	9.39	10.41	11.44			12.64	4 / 3 2	2.95	2.93	3.06
	reaction time	0.136														8.64	8.70	8.33
	interval		1.00	0.98	0.97	0.97	0.97	0.99	1.01	1.02	1.03	1.20	1.20					
	velocity		5.20	8.50	8.67	8.76	8.76	8.76	8.59	8.42	8.33	8.25	8.37	7.91				
Williams, Danielle (JAM) (1992)	time	2.50	3.54	4.52	5.50	6.47	7.45	8.45	9.45	10.47	11.52			12.74	3 / 4 3	3.00	2.95	3.07
	reaction time	0.123														8.50	8.64	8.31
	interval		1.04	0.98	0.98	0.97	0.98	1.00	1.00	1.02	1.05	1.22	1.22					
	velocity		5.20	8.17	8.67	8.67	8.67	8.67	8.50	8.50	8.33	8.10	8.24	7.85				
Russell, Masai (USA) (2000)	time	2.53	3.57	4.59	5.59	6.57	7.55	8.53	9.53	10.55	11.58			12.76	7 / 5 4	3.06	2.94	3.05
	reaction time	0.134														8.33	8.67	8.36
	interval		1.04	1.02	1.00	0.98	0.98	0.98	1.00	1.02	1.03	1.18	1.18					
	velocity		5.14	8.17	8.33	8.50	8.67	8.67	8.67	8.50	8.33	8.25	8.52	7.84				
Johnson, Alaysha (USA) (1996)	time	2.62	3.67	4.67	5.64	6.61	7.61	8.58	9.55	10.56	11.61			12.78	1 / 6 5	3.02	2.94	3.03
	reaction time	0.138														8.44	8.67	8.42
	interval		1.05	1.00	0.97	0.97	1.00	0.97	0.97	1.01	1.05	1.17	1.17					
	velocity		4.96	8.10	8.50	8.76	8.76	8.50	8.76	8.76	8.42	8.10	8.59	7.82				
Kambundji, Ditaji (SUI) (2002)	time	2.55	3.61	4.61	5.59	6.57	7.55	8.54	9.54	10.56	11.62			12.81	2 / 7 6	3.04	2.95	3.08
	reaction time	0.137														8.39	8.64	8.28
	interval		1.06	1.00	0.98	0.98	0.98	0.99	1.00	1.02	1.06	1.19	1.19					
	velocity		5.10	8.02	8.50	8.67	8.67	8.67	8.59	8.50	8.33	8.02	8.45	7.81				
Tapper, Megan (JAM) (1994)	time	2.57	3.61	4.61	5.57	6.54	7.54	8.56	9.58	10.61	11.64			12.83	8 / 8 7	3.00	2.99	3.08
	reaction time	0.123														8.50	8.53	8.28
	interval		1.04	1.00	0.96	0.97	1.00	1.02	1.02	1.03	1.03	1.19	1.19					
	velocity		5.06	8.17	8.50	8.85	8.76	8.50	8.33	8.33	8.25	8.25	8.45	7.79				
Wu Yanni (CHN) (1997)	time	2.64	3.67	4.71	5.71	6.74	7.74	8.76	9.78	10.84	11.91			13.15	9 / 9 8	3.07	3.05	3.15
	reaction time	0.166														8.31	8.36	8.10
	interval		1.03	1.04	1.00	1.03	1.00	1.02	1.02	1.06	1.07	1.24	1.24					
	velocity		4.92	8.25	8.17	8.50	8.25	8.50	8.33	8.33	8.02	7.94	8.10	7.60				



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=ZTDpZQV2ioU>

2024 Xiamen Diamond League (Xiamen, CHN)

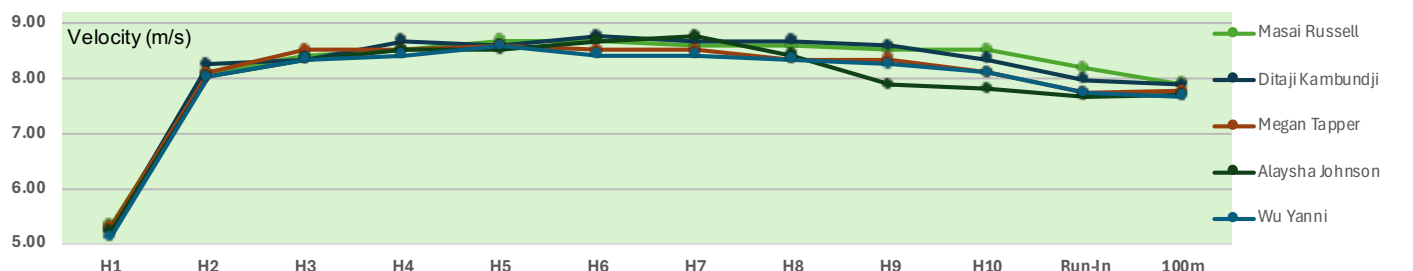
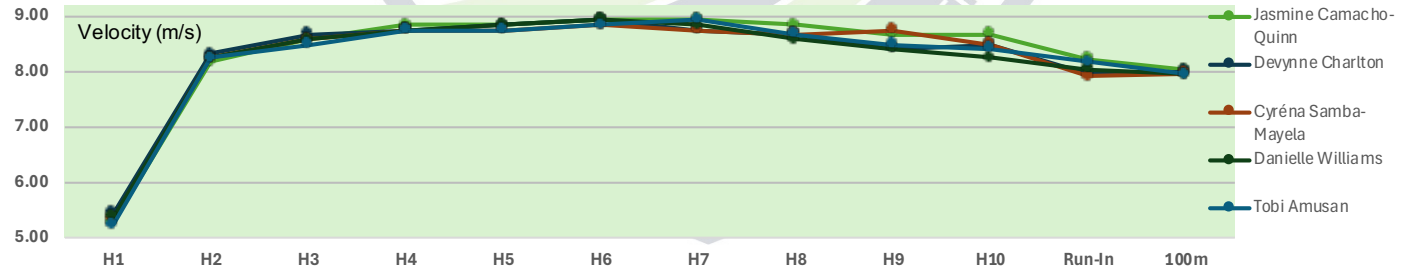
100m Hurdles

Date: 2024.04.20

Wind: -0.2 m/s

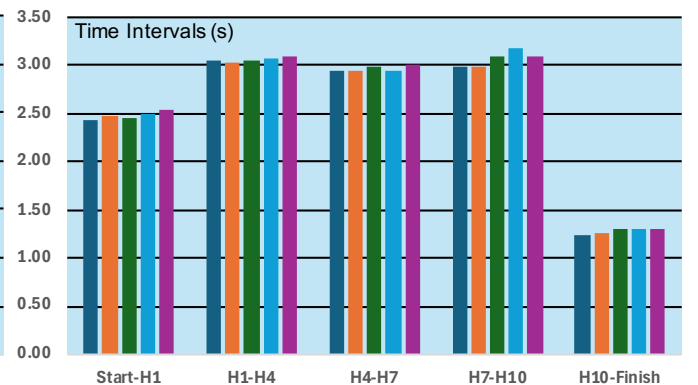
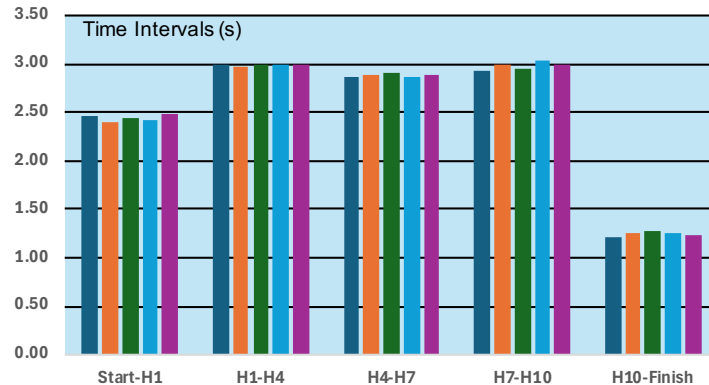
FINAL

		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	2.46	3.50	4.49	5.45	6.41	7.36	8.31	9.27	10.25	11.23		12.45	5/1			
	reaction time	0.163													2.99	2.86	2.92
	interval velocity		1.04	0.99	0.96	0.96	0.95	0.95	0.96	0.98	0.98	1.22			8.53	8.92	8.73
Charlton, Devynne (BAH) (1995)	time	2.39	3.41	4.39	5.36	6.32	7.27	8.24	9.22	10.23	11.23		12.49	6/2			
	reaction time	0.144													2.97	2.88	2.99
	interval velocity		1.02	0.98	0.97	0.96	0.95	0.97	0.98	1.01	1.00	1.26			8.59	8.85	8.53
Samba-Mayela, Cyréna (FRA) (2000)	time	2.44	3.47	4.46	5.43	6.40	7.36	8.33	9.31	10.28	11.28		12.55	10/3			
	reaction time	0.141													2.99	2.90	2.95
	interval velocity		1.03	0.99	0.97	0.97	0.96	0.97	0.98	0.97	1.00	1.27	NR PB		8.53	8.79	8.64
Williams, Danielle (JAM) (1992)	time	2.42	3.45	4.44	5.41	6.37	7.32	8.28	9.27	10.28	11.31		12.56	3/4			
	reaction time	0.142													2.99	2.87	3.03
	interval velocity		1.03	0.99	0.97	0.96	0.95	0.96	0.99	1.01	1.03	1.25			8.53	8.89	8.42
Amusan, Tobi (NGR) (1997)	time	2.48	3.51	4.51	5.48	6.45	7.41	8.36	9.34	10.34	11.35		12.58	4/5			
	reaction time	0.148													3.00	2.88	2.99
	interval velocity		1.03	1.00	0.97	0.97	0.96	0.95	0.98	1.00	1.01	1.23			8.50	8.85	8.53
Russell, Masai (USA) (2000)	time	2.44	3.49	4.50	5.50	6.48	7.46	8.45	9.44	10.44	11.44		12.67	9/6			
	reaction time	0.155													3.06	2.95	2.99
	interval velocity		1.05	1.01	1.00	0.98	0.98	0.99	0.99	1.00	1.00	1.23			8.33	8.64	8.53
Kambundji, Ditaji (SUI) (2002)	time	2.48	3.51	4.53	5.51	6.50	7.47	8.45	9.43	10.42	11.44		12.70	2/7			
	reaction time	0.152													3.03	2.94	2.99
	interval velocity		1.03	1.02	0.98	0.99	0.97	0.98	0.98	0.99	1.02	1.26			8.42	8.67	8.53
Tapper, Megan (JAM) (1994)	time	2.45	3.50	4.50	5.50	6.49	7.49	8.49	9.51	10.53	11.58		12.88	7/8			
	reaction time	0.144													3.05	2.99	3.09
	interval velocity		1.05	1.00	1.00	0.99	1.00	1.00	1.02	1.02	1.05	1.30			8.36	8.53	8.25
Johnson, Alaysha (USA) (1996)	time	2.49	3.55	4.57	5.57	6.57	7.55	8.52	9.53	10.61	11.70		13.01	8/9			
	reaction time	0.177													3.08	2.95	3.18
	interval velocity		1.06	1.02	1.00	1.00	0.98	0.97	1.01	1.08	1.09	1.31			8.28	8.64	8.02
Wu Yanni (CHN) (1997)	time	2.54	3.60	4.62	5.63	6.62	7.63	8.64	9.66	10.69	11.74		13.04	1/10			
	reaction time	0.161													3.09	3.01	3.10
	interval velocity		1.06	1.02	1.01	0.99	1.01	1.01	1.02	1.03	1.05	1.30			8.25	8.47	8.23



Hurdle Phases 1st-5th

Hurdle Phases 6th-10th



Source: Omega Timing (Sat 20 Apr 2024 19:19) - diamond league race analysis
<https://www.omegatiming.com/File/000204040101070101FFFFFFF6D.pdf>

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

Men's 400m Hurdles

2024 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 - 2024 USA Olympic Trials (Eugene, OR)		USATF and Karmarush (2024) - USA Olympic trials results and race analysis															
date	30-Jun	time	5.62	9.21	12.96	16.94	20.81	24.59	28.43	32.49	36.81	41.28	46.46	7 / 1			
reaction time		interval		3.59	3.75	3.98	3.87	3.78	3.84	4.06	4.32	4.47	5.18		11.32	11.49	12.85
		velocity	8.01	9.75	9.33	8.79	9.04	9.26	9.11	8.62	8.10	7.83	7.72	8.61	9.28	9.14	8.17
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	13	16.5	153.5			
Benjamin, Rai (USA) (1997)																	
FINAL - 2024 Olympic Games (Paris, FRA)		Paris 2024 Olymipc Games - Results Book (2024)															
date	9-Aug	time	5.62	9.21	12.82	16.50	20.32	24.15	28.02	32.02	36.39	40.96	46.46	8 / 1			
reaction time	0.171	interval		3.59	3.61	3.68	3.82	3.83	3.87	4.00	4.37	4.57	5.50		10.88	11.52	12.94
		velocity	8.01	9.75	9.70	9.51	9.16	9.14	9.04	8.75	8.01	7.66	7.27	8.61	9.65	9.11	8.11
H1 lead leg	R	strides	20	13	13	13	13	13	13	13	13	14	17	155			
dos Santos, Alison (BRA) (2000)																	
FINAL - 2024 Bislett Games (Oslo, NOR)		Omega Timing (2024) - diamond league race analysis															
date	30-May	time	5.77	9.37	12.98	16.58	20.38	24.39	28.42	32.63	36.90	41.37	46.63	5 / 1			
reaction time	0.182	interval		3.60	3.61	3.60	3.80	4.01	4.03	4.21	4.27	4.47	5.26		10.81	11.84	12.95
		velocity	7.80	9.72	9.70	9.72	9.21	8.73	8.68	8.31	8.20	7.83	7.60	8.58	9.71	8.87	8.11
H1 lead leg	L	strides	20	13	12	12	12	12	13	13	13	13	16.5	149.5			
Benjamin, Rai (USA) (1997)																	
FINAL - USATF LA Grand Prix (Los Angeles, CA) (TV Analysis)		Henson (2024) - Athlete First: 2024 year end hurdle report															
date	18-May	time	5.84	9.51	13.18	16.95	20.75		28.56	32.60	36.87	41.41	46.64	5 / 1			
reaction time	0.207	interval		3.67	3.67	3.77	3.80		7.81	4.04	4.27	4.54	5.23		11.11	11.61	12.85
		velocity	7.71	9.54	9.54	9.28	9.21		8.96	8.66	8.20	7.71	7.65	8.58	9.45	9.04	8.17
H1 lead leg	R	strides	20	13	13	13	13		13	13	13	13	17	128			
Benjamin, Rai (USA) (1997)																	
FINAL - 2024 Herculis Meeting International d'Atlétisme (Monaco, MON)		Henson (2024) - Athlete First: 2024 year end hurdle report															
date	12-Jul	time	5.68	9.25	12.88	16.55	20.33	24.40	28.55	32.71	37.00	41.45	46.67	5 / 1			
reaction time	0.188	interval		3.57	3.63	3.67	3.78	4.07	4.15	4.16	4.29	4.45	5.22		10.87	12.00	12.90
		velocity	7.92	9.80	9.64	9.54	9.26	8.60	8.43	8.41	8.16	7.87	7.66	8.57	9.66	8.75	8.14
H1 lead leg	R	strides	20	13	13	12	13	14	13	13	13	13	17	154			
Warholm, Karsten (NOR) (1996)																	
FINAL - 2024 Bislett Games (Oslo, NOR)		Omega Timing (2024) - diamond league race analysis															
date	30-May	time	5.70	9.21	12.81	16.45	20.22	24.19	28.19	32.40	36.83	41.37	46.70	7 / 2			
reaction time	0.157	interval		3.51	3.60	3.64	3.77	3.97	4.00	4.21	4.43	4.54	5.33		10.75	11.74	13.18
		velocity	7.89	9.97	9.72	9.62	9.28	8.82	8.75	8.31	7.90	7.71	7.50	8.57	9.77	8.94	7.97
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	14	14	18	157			
Warholm, Karsten (NOR) (1996)																	
FINAL - 2024 Herculis Meeting International d'Atlétisme (Monaco, MON)		Henson (2024) - Athlete First: 2024 year end hurdle report															
date	12-Jul	time	5.66	9.20	12.79	16.48	20.31	24.25	28.30	32.50	36.88	41.41	46.73	7 / 2			
reaction time	0.164	interval		3.54	3.59	3.69	3.83	3.94	4.05	4.20	4.38	4.53	5.32		10.82	11.82	13.11
		velocity	7.95	9.89	9.75	9.49	9.14	8.88	8.64	8.33	7.99	7.73	7.52	8.56	9.70	8.88	8.01
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	157			
dos Santos, Alison (BRA) (2000)																	
FINAL - 2024 Seashore Doha Meeting (Doha, QAT)		Omega Timing (2024) - diamond league race analysis															
date	10-May	time	5.67	9.24	12.89	16.61	20.53	24.58	28.66	32.88	37.18	41.61	46.86	5 / 1			
reaction time	0.148	interval		3.57	3.65	3.72	3.92	4.05	4.08	4.22	4.30	4.43	5.25		10.94	12.05	12.95
		velocity	7.94	9.80	9.59	9.41	8.93	8.64	8.58	8.29	8.14	7.90	7.62	8.54	9.60	8.71	8.11
H1 lead leg	L	strides	20	13	12	12	13	13	13	13	13	13	16.2	151.2			
Warholm, Karsten (NOR) (1996)																	
FINAL - 2024 Kamila Skolimowska Memorial (Silesia, POL)		Omega Timing (2024) - diamond league race analysis															
date	25-Aug	time	5.64	9.26	12.93	16.66	20.49	24.44	28.54	32.71	37.00	41.58	46.95	8 / 1			
reaction time	0.154	interval		3.62	3.67	3.73	3.83	3.95	4.10	4.17	4.29	4.58	5.37		11.02	11.88	13.04
		velocity	7.98	9.67	9.54	9.38	9.14	8.86	8.54	8.39	8.16	7.64	7.45	8.52	9.53	8.84	8.05
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	17.7	156.7			
Warholm, Karsten (NOR) (1996)																	
FINAL - 2024 European Athletics Championships (Roma, ITA)		European Athletics (2024) - 2024 european athletics championships - results book															
date	11-Jun	time	5.62	9.12	12.81	16.51	20.35	24.24	28.21	32.36	36.93	41.56	46.98	8 / 1			
reaction time	0.184	interval		3.50	3.69	3.70	3.84	3.89	3.97	4.15	4.57	4.63	5.42	CR	10.89	11.70	13.35
		velocity	8.01	10.00	9.49	9.46	9.11	9.00	8.82	8.43	7.66	7.56	7.38	8.51	9.64	8.97	7.87
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	14	14	18	157			
dos Santos, Alison (BRA) (2000)																	
FINAL - 2024 Bauhaus Galan (Stockholm, SWE) (TV Analysis)		Omega Timing (2024) - diamond league race analysis															
date	2-Jun	time	5.80	9.50	13.06	16.70	20.53	24.47	28.60	32.87	37.27	41.80	47.01	5 / 1			
reaction time	0.164	interval		3.70	3.56	3.64	3.83	3.94	4.13	4.27	4.40	4.53	5.21		10.90	11.90	13.20
		velocity	7.76	9.46	9.83	9.62	9.14	8.88	8.47	8.20	7.95	7.73	7.68	8.51	9.63	8.82	7.95
H1 lead leg	L	strides	20	13	12	12	12	12	13	13	13	13	16.2	149.2			
Warholm, Karsten (NOR) (1996)																	
FINAL - 2024 Olympic Games (Paris, FRA)		Paris 2024 Olymipc Games - Results Book (2024)															
date	9-Aug	time	5.51	9.09	12.73	16.41	20.18	24.03	27.99	32.15	36.58	41.44	47.06	7 / 2			
reaction time	0.152	interval		3.58	3.64	3.68	3.77	3.85	3.96	4.16	4.43	4.86	5.62		10.90	11.58	13.45
		velocity	8.17	9.78	9.62	9.51	9.28	9.09	8.84	8.41	7.90	7.20	7.12	8.50	9.63	9.07	7.81
H1 lead leg	L	strides	20	13	13	13	13	13	13	13	13	15	18	157			

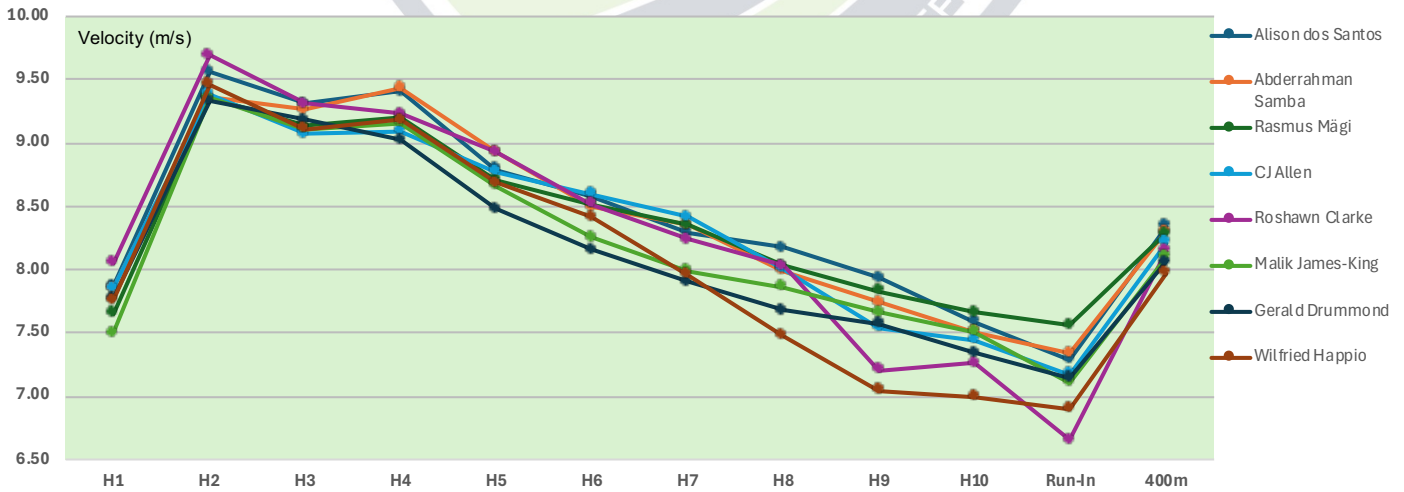
2024 Memorial van damme (Brussels, BEL)

Men's 400m Hurdles

Date 2024.09.14

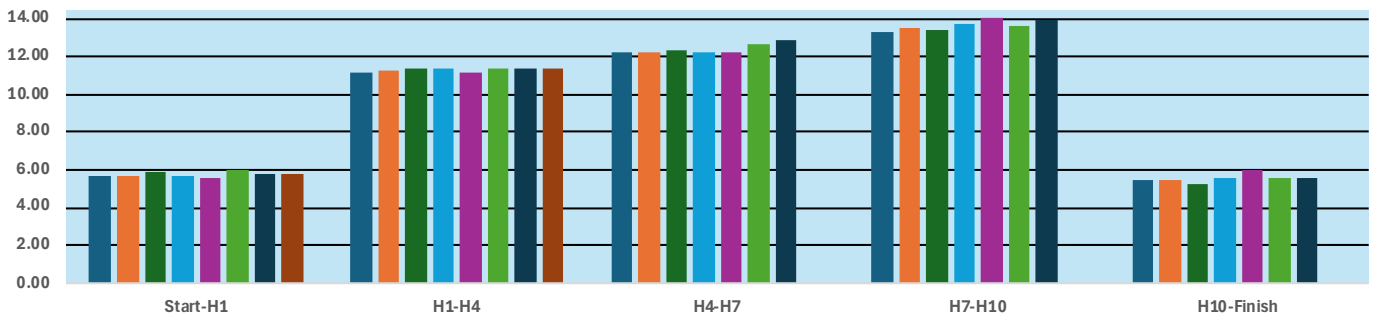
FINAL

		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	5.72	9.38	13.14	16.86	20.84	24.92	29.14	33.42	37.83	42.44	47.93		6 / 1			
	reaction time	0.151															
	interval		3.66	3.76	3.72	3.98	4.08	4.22	4.28	4.41	4.61	5.49			11.14	12.28	13.30
	velocity	7.87	9.56	9.31	9.41	8.79	8.58	8.29	8.18	7.94	7.59	7.29	8.35		9.43	8.55	7.89
H1 lead leg	L																
Samba, Abderrahman (QAT) (1995)	time	5.73	9.47	13.25	16.96	20.88	25.00	29.19	33.57	38.09	42.75	48.20		4 / 2			
	reaction time	0.170															
	interval		3.74	3.78	3.71	3.92	4.12	4.19	4.38	4.52	4.66	5.45			11.23	12.23	13.56
	velocity	7.85	9.36	9.26	9.43	8.93	8.50	8.35	7.99	7.74	7.51	7.34	8.30		9.35	8.59	7.74
H1 lead leg	R																
Mägi, Rasmus (EST) (1992)	time	5.88	9.62	13.45	17.25	21.27	25.38	29.57	33.93	38.40	42.97	48.26		8 / 3			
	reaction time	0.160															
	interval		3.74	3.83	3.80	4.02	4.11	4.19	4.36	4.47	4.57	5.29			11.37	12.32	13.40
	velocity	7.65	9.36	9.14	9.21	8.71	8.52	8.35	8.03	7.83	7.66	7.56	8.29		9.23	8.52	7.84
H1 lead leg	R																
Allen, CJ (USA) (1995)	time	5.73	9.46	13.32	17.17	21.16	25.23	29.39	33.76	38.40	43.10	48.68		3 / 4			
	reaction time	0.144															
	interval		3.73	3.86	3.85	3.99	4.07	4.16	4.37	4.64	4.70	5.58			11.44	12.22	13.71
	velocity	7.85	9.38	9.07	9.09	8.77	8.60	8.41	8.01	7.54	7.45	7.17	8.22		9.18	8.59	7.66
H1 lead leg	L																
Clarke, Roshawn (JAM) (2004)	time	5.59	9.20	12.96	16.75	20.67	24.78	29.03	33.39	38.25	43.07	49.08		5 / 5			
	reaction time	0.176															
	interval		3.61	3.76	3.79	3.92	4.11	4.25	4.36	4.86	4.82	6.01			11.16	12.28	14.04
	velocity	8.05	9.70	9.31	9.23	8.93	8.52	8.24	8.03	7.20	7.26	6.66	8.15		9.41	8.55	7.48
H1 lead leg	R																
James-King, Malik (JAM) (1999)	time	6.00	9.74	13.58	17.40	21.44	25.68	30.06	34.51	39.08	43.74	49.37		7 / 6			
	reaction time	0.153															
	interval		3.74	3.84	3.82	4.04	4.24	4.38	4.45	4.57	4.66	5.63			11.40	12.66	13.68
	velocity	7.50	9.36	9.11	9.16	8.66	8.25	7.99	7.87	7.66	7.51	7.10	8.10		9.21	8.29	7.68
H1 lead leg	R																
Drummond, Gerald (CRC) (1994)	time	5.79	9.54	13.35	17.23	21.36	25.65	30.08	34.64	39.26	44.03	49.63		1 / 7			
	reaction time	0.221															
	interval		3.75	3.81	3.88	4.13	4.29	4.43	4.56	4.62	4.77	5.60			11.44	12.85	13.95
	velocity	7.77	9.33	9.19	9.02	8.47	8.16	7.90	7.68	7.58	7.34	7.14	8.06		9.18	8.17	7.53
H1 lead leg	R																
Happio, Wilfried (FRA) (1998)	time	5.80	9.50	13.34	17.15	21.18	25.34	29.74	34.42	39.39	44.39	50.19		2 / 8			
	reaction time	0.151															
	interval		3.70	3.84	3.81	4.03	4.16	4.40	4.68	4.97	5.00	5.80			11.35	12.59	14.65
	velocity	7.76	9.46	9.11	9.19	8.68	8.41	7.95	7.48	7.04	7.00	6.90	7.97		9.25	8.34	7.17
H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 14 Sep 2024 20:07) - diamond league race analysis
<https://www.omegatiming.com/File/000204120102150101FFFFFFFFFFFF6D.pdf>

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

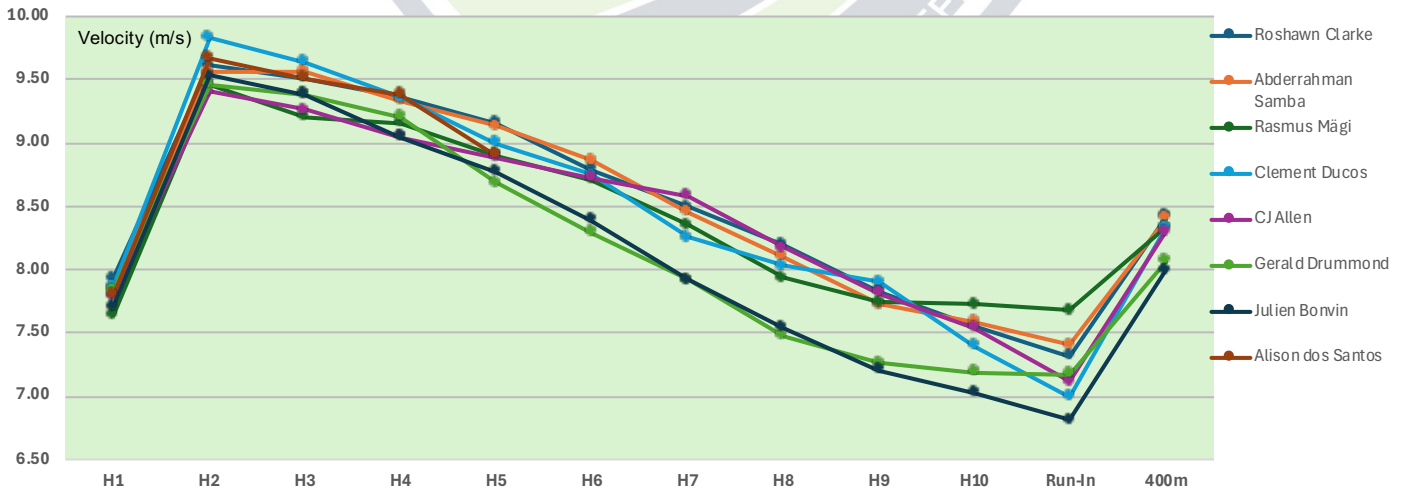
2024 Weltklasse (Zürich, SUI)

Men's 400m Hurdles

Date 2024.09.05

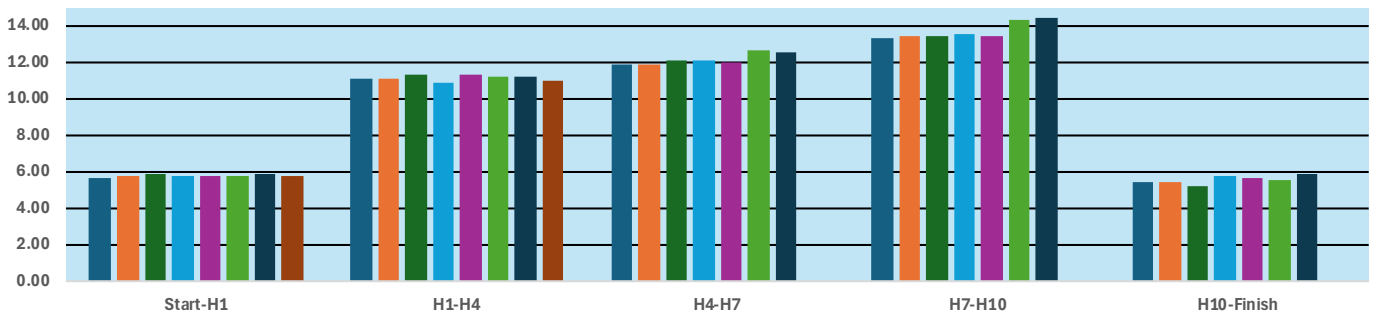
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Clarke, Roshawn (JAM) (2004)	time	5.67	9.31	12.99	16.73	20.55	24.53	28.65	32.92	37.39	42.02		47.49	3 / 1			
	reaction time	0.177															
	interval		3.64	3.68	3.74	3.82	3.98	4.12	4.27	4.47	4.63	5.47			11.06	11.92	13.37
	velocity	7.94	9.62	9.51	9.36	9.16	8.79	8.50	8.20	7.83	7.56	7.31	8.42		9.49	8.81	7.85
H1 lead leg	R		21	13		14	14	14	14	15	15	19	139				
Samba, Abderrahman (QAT) (1995)	time	5.73	9.39	13.05	16.80	20.63	24.58	28.72	33.04	37.57	42.18		47.58	4 / 2			
	reaction time	0.177															
	interval		3.66	3.66	3.75	3.83	3.95	4.14	4.32	4.53	4.61	5.40			11.07	11.92	13.46
	velocity	7.85	9.56	9.56	9.33	9.14	8.86	8.45	8.10	7.73	7.59	7.41	8.41		9.49	8.81	7.80
H1 lead leg	R		21	13		13	13	13	13	14	14	17.2	131.2				
Mägi, Rasmus (EST) (1992)	time	5.89	9.59	13.39	17.21	21.14	25.16	29.35	33.76	38.28	42.81		48.02	8 / 3			
	reaction time	0.175															
	interval		3.70	3.80	3.82	3.93	4.02	4.19	4.41	4.52	4.53	5.21			11.32	12.14	13.46
	velocity	7.64	9.46	9.21	9.16	8.91	8.71	8.35	7.94	7.74	7.73	7.68	8.33		9.28	8.65	7.80
H1 lead leg	R		20	13		13	13	13	14	14	17	117					
Ducos, Clement (FRA) (2001)	time	5.72	9.28	12.91	16.65	20.54	24.54	28.78	33.14	37.57	42.30		48.02	5 / 4			
	reaction time	0.162															
	interval		3.56	3.63	3.74	3.89	4.00	4.24	4.36	4.43	4.73	5.72			10.93	12.13	13.52
	velocity	7.87	9.83	9.64	9.36	9.00	8.75	8.25	8.03	7.90	7.40	6.99	8.33		9.61	8.66	7.77
H1 lead leg	L		20	13	13	13	13	14	14	15	15	18	161				
Allen, CJ (USA) (1995)	time	5.78	9.50	13.28	17.15	21.09	25.10	29.18	33.46	37.94	42.58		48.20	2 / 5			
	reaction time	0.131															
	interval		3.72	3.78	3.87	3.94	4.01	4.08	4.28	4.48	4.64	5.62			11.37	12.03	13.40
	velocity	7.79	9.41	9.26	9.04	8.88	8.73	8.58	8.18	7.81	7.54	7.12	8.30		9.23	8.73	7.84
H1 lead leg	L		20	13		13	13	13	14	15	17.7	118.7					
Drummond, Gerald (CRC) (1994)	time	5.74	9.44	13.17	16.97	21.00	25.22	29.64	34.32	39.14	44.01		49.59	7 / 6			
	reaction time	0.168															
	interval		3.70	3.73	3.80	4.03	4.22	4.42	4.68	4.82	4.87	5.58			11.23	12.67	14.37
	velocity	7.84	9.46	9.38	9.21	8.68	8.29	7.92	7.48	7.26	7.19	7.17	8.07		9.35	8.29	7.31
H1 lead leg	R		20	13		14	14	14	15	15		105					
Bonvin, Julien (SUI) (1999)	time	5.84	9.51	13.24	17.11	21.10	25.27	29.69	34.33	39.19	44.17		50.04	1 / 7			
	reaction time	0.176															
	interval		3.67	3.73	3.87	3.99	4.17	4.42	4.64	4.86	4.98	5.87			11.27	12.58	14.48
	velocity	7.71	9.54	9.38	9.04	8.77	8.39	7.92	7.54	7.20	7.03	6.81	7.99		9.32	8.35	7.25
H1 lead leg	L		21	13		13	13	14	14	15	15	118					
dos Santos, Alison (BRA) (2000)	time	5.77	9.39	13.07	16.80	20.73							dnf	6 / --			
	reaction time	0.153															
	interval		3.62	3.68	3.73	3.93											
	velocity	7.80	9.67	9.51	9.38	8.91											
H1 lead leg	L		20	13	12	12	12										
												69					



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 5 Sep 2024 20:08) - diamond league race analysis
<https://www.omegatiming.com/File/000204110103060101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=PZBMO8vZu0I>

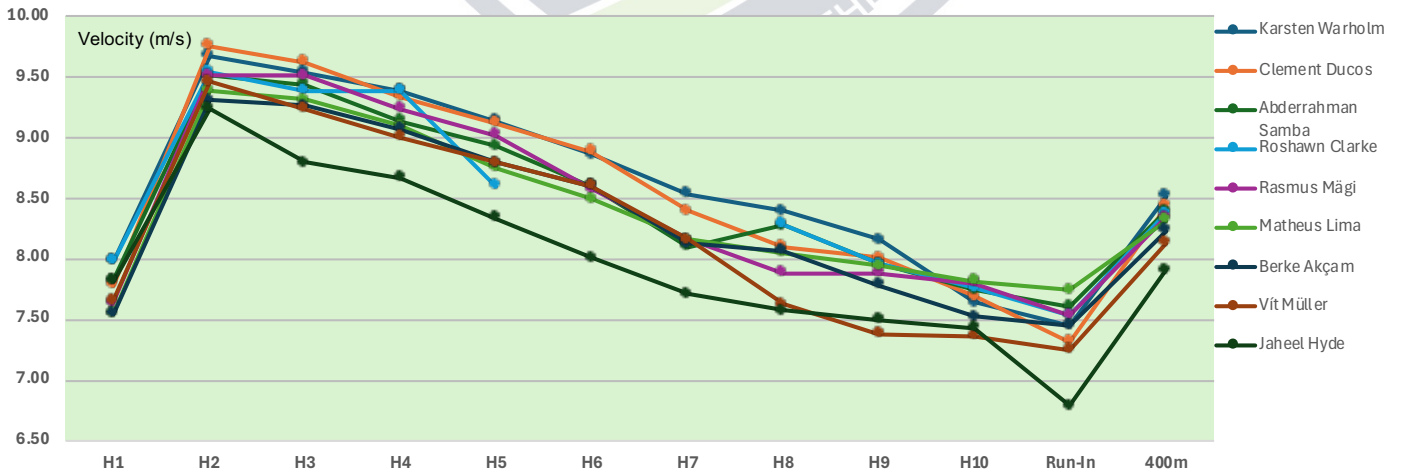
2024 Kamila Skolimowska Memorial (Silesia, POL)

Men's 400m Hurdles

Date 2024.08.25

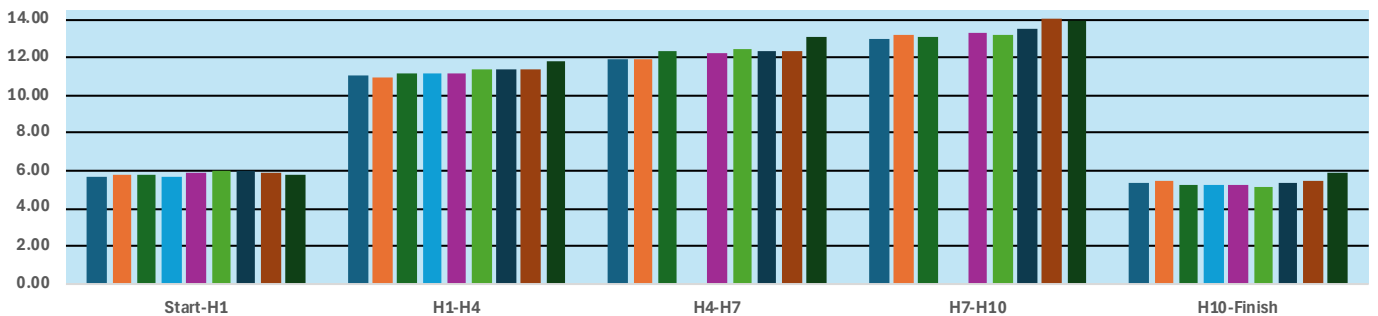
FINAL

		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	5.64	9.26	12.93	16.66	20.49	24.44	28.54	32.71	37.00	41.58		46.95	8 / 1			
	reaction time	0.154															
	interval velocity	7.98	9.67	9.54	9.38	9.14	8.86	8.54	8.39	8.16	7.64	7.45	8.52		11.02	11.88	13.04
	H1 lead leg L strides	20	13	13	13	13	13	13	13	13	13	15	17.7	156.7	9.53	8.84	8.05
Ducos, Clement (FRA) (2001)	time	5.78	9.37	13.01	16.76	20.60	24.54	28.71	33.03	37.40	41.95		47.42	5 / 2			
	reaction time	0.179															
	interval velocity	7.79	9.75	9.62	9.33	9.11	8.88	8.39	8.10	8.01	7.69	7.31	8.44		10.98	11.95	13.24
	H1 lead leg L strides	20	13	13	13	13	13	14	14	15	15	18	161		9.56	8.79	7.93
Samba, Abderrahman (QAT) (1995)	time	5.75	9.43	13.14	16.97	20.89	24.96	29.28	33.51	37.91	42.43		47.69	7 / 3			
	reaction time	0.203															
	interval velocity	7.83	9.51	9.43	9.14	8.93	8.60	8.10	8.27	7.95	7.74	7.60	8.39		11.22	12.31	13.15
	H1 lead leg R strides	21	13	13	13	13	13	13	13	13	14	17	156		9.36	8.53	7.98
Clarke, Roshawn (JAM) (2004)	time	5.64	9.31	13.04	16.77	20.84			33.52	37.92	42.43		47.74	6 / 4			
	reaction time	0.188							12.68	4.40	4.51	5.31					
	interval velocity	7.98	9.54	9.38	9.38	8.60			8.28	7.95	7.76	7.53	8.38		11.13		
	H1 lead leg R strides	21	13	13	13	13	14	14	14	14	15	18	162		9.43		
Mägi, Rasmus (EST) (1992)	time	5.89	9.57	13.25	17.04	20.92	25.00	29.29	33.73	38.17	42.66		47.97	9 / 5			
	reaction time	0.178							3.88	4.44	4.49	5.31					
	interval velocity	7.64	9.51	9.51	9.23	9.02	8.58	8.16	7.88	7.88	7.80	7.53	8.34		11.15	12.25	13.37
	H1 lead leg R strides	20	13	13	13	13	13	13	13	14	17	129		9.42	8.57	7.85	
Lima, Matheus (BRA) (2003)	time	5.96	9.69	13.45	17.30	21.30	25.42	29.71	34.06	38.47	42.95		48.12	4 / 6			
	reaction time	0.175							4.35	4.41	4.48	5.17					
	interval velocity	7.55	9.38	9.31	9.09	8.75	8.50	8.16	8.05	7.94	7.81	7.74	8.31		11.34	12.41	13.24
	H1 lead leg L strides	20	13	13	13	13	13	13	13	14	14	16.2	155.2		9.26	8.46	7.93
Akçam, Berke (TUR) (2002)	time	5.96	9.72	13.50	17.36	21.34	25.41	29.72	34.06	38.56	43.21		48.58	3 / 7			
	reaction time	0.162							4.34	4.50	4.65	5.37					
	interval velocity	7.55	9.31	9.26	9.07	8.79	8.60	8.12	8.06	7.78	7.53	7.45	8.23		11.40	12.36	13.49
	H1 lead leg L strides	21	13	13	13	13	13	14	14	15	15	18.5	162.5		9.21	8.50	7.78
Müller, Vit (CZE) (1996)	time	5.88	9.58	13.37	17.26	21.24	25.31	29.60	34.19	38.93	43.68		49.20	1 / 8			
	reaction time	0.163							4.59	4.74	4.75	5.52					
	interval velocity	7.65	9.46	9.23	9.00	8.79	8.60	8.16	7.63	7.38	7.37	7.25	8.13		11.38	12.34	14.08
	H1 lead leg L strides	20	13	13	13	13	13	13	14	15	15	17.5	131.5		9.23	8.51	7.46
Hyde, Jaheel (JAM) (1997)	time	5.76	9.55	13.53	17.57	21.77	26.14	30.68	35.30	39.97	44.68		50.57	2 / 9			
	reaction time	0.151							4.62	4.67	4.71	5.89					
	interval velocity	7.81	9.23	8.79	8.66	8.33	8.01	7.71	7.58	7.49	7.43	6.79	7.91		11.81	13.11	14.00
	H1 lead leg L strides	22	14	14	14	14	14	14	14	14		134		8.89	8.01	7.50	



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 25 Aug 2024 15:55) - diamond league race analysis

<https://www.omegatiming.com/File/0002040F01010B0101FFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=3sP3r5lXlOs&t=33s&pp=ygUac2lsZXNpYSAyMDI0IG1hdidIGh1cmRsZXNM%3D>

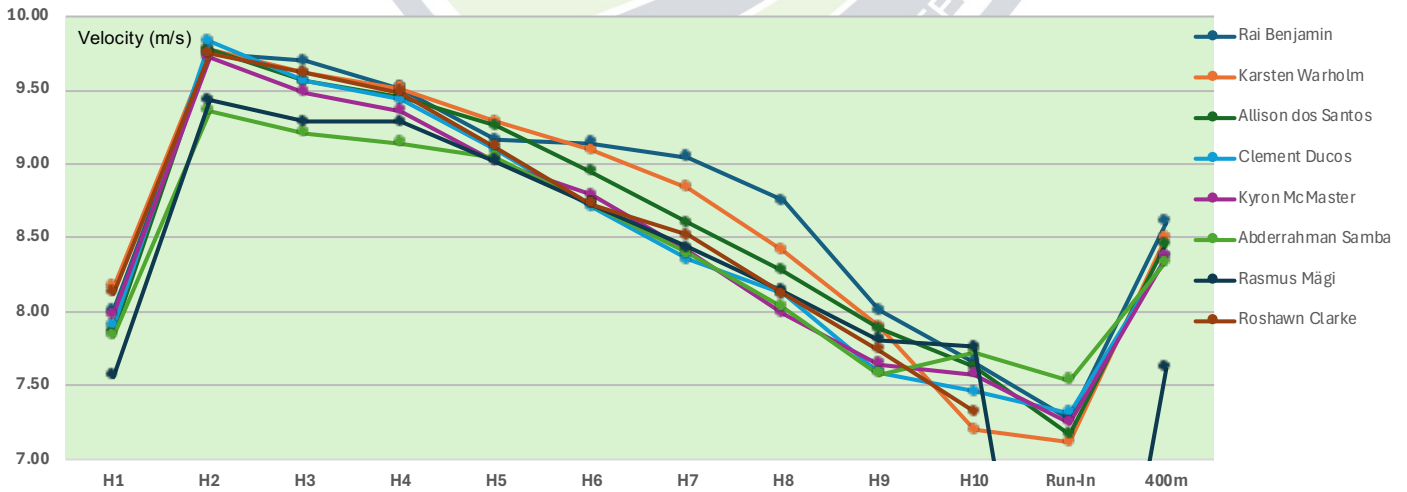
2024 Olympic Games (Paris, FRA)

Men's 400m Hurdles

Date 2024.08.09

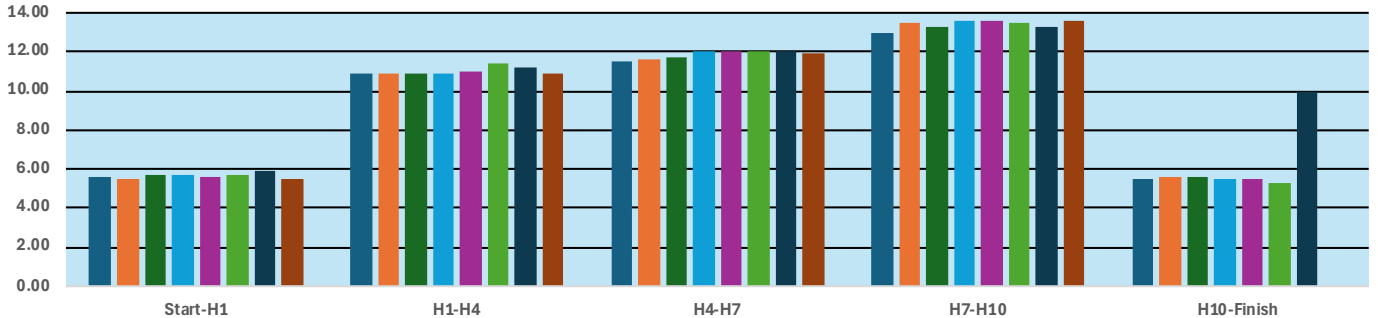
FINAL

		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	5.62	9.21	12.82	16.50	20.32	24.15	28.02	32.02	36.39	40.96	46.46		8 / 1			
	reaction time	0.171	interval	3.59	3.61	3.68	3.82	3.83	3.87	4.00	4.37	5.50			10.88	11.52	12.94
	velocity	8.01	9.75	9.70	9.51	9.28	9.09	9.14	9.04	8.75	8.01	7.66	8.61		9.65	9.11	8.11
	H1 lead leg	R	strides	20	13	13	13	13	13	13	13	14	17	155			
Warholm, Karsten (NOR) (1996)	time	5.51	9.09	12.73	16.41	20.18	24.03	27.99	32.15	36.58	41.44		47.06	7 / 2			
	reaction time	0.152	interval	3.58	3.64	3.68	3.77	3.85	3.96	4.16	4.43	4.86	5.62		10.90	11.58	13.45
	velocity	8.17	9.78	9.62	9.51	9.28	9.09	8.84	8.41	7.90	7.20	7.12	8.50		9.63	9.07	7.81
	H1 lead leg	L	strides	20	13	13	13	13	13	13	15	18	157				
dos Santos, Alison (BRA) (2000)	time	5.72	9.30	12.96	16.66	20.44	24.35	28.42	32.65	37.09	41.68		47.26	3 / 3			
	reaction time	0.167	interval	3.58	3.66	3.70	3.78	3.91	4.07	4.23	4.44	4.59	5.58		10.94	11.76	13.26
	velocity	7.87	9.78	9.56	9.46	9.26	8.95	8.60	8.27	7.88	7.63	7.17	8.46		9.60	8.93	7.92
	H1 lead leg	L	strides	20	13	12	12	13	13	13	13	16.5	137.5				
Ducos, Clement (FRA) (2001)	time	5.69	9.25	12.91	16.62	20.47	24.49	28.68	32.99	37.60	42.29		47.76	5 / 4			
	reaction time	0.162	interval	3.56	3.66	3.71	3.85	4.02	4.19	4.31	4.61	4.69	5.47		10.93	12.06	13.61
	velocity	7.91	9.83	9.56	9.43	9.09	8.71	8.35	8.12	7.59	7.46	7.31	8.38		9.61	8.71	7.71
	H1 lead leg	L	strides	20	13	13	14	14	15	15	15	18	150				
McMaster, Kyrion (IVB) (1997)	time	5.64	9.24	12.93	16.67	20.55	24.53	28.69	33.07	37.65	42.27		47.79	6 / 5			
	reaction time	0.143	interval	3.60	3.69	3.74	3.88	3.98	4.16	4.38	4.58	4.62	5.52		11.03	12.02	13.58
	velocity	7.98	9.72	9.49	9.36	9.02	8.79	8.41	7.99	7.64	7.58	7.25	8.37		9.52	8.74	7.73
	H1 lead leg	L	strides	21	13	13	13	14	14	14	14	17	159				
Samba, Abderrahman (QAT) (1995)	time	5.74	9.48	13.28	17.11	20.98	24.99	29.16	33.52	38.14	42.67		47.98	2 / 6			
	reaction time	0.169	interval	3.74	3.80	3.83	3.87	4.01	4.17	4.36	4.62	4.53	5.31		11.37	12.05	13.51
	velocity	7.84	9.36	9.21	9.14	9.04	8.73	8.39	8.03	7.58	7.73	7.53	8.34		9.23	8.71	7.77
	H1 lead leg	R	strides	21	13	13	13	13	13	14	14	17	144				
Mägi, Rasmus (EST) (1992)	time	5.95	9.66	13.43	17.20	21.08	25.09	29.24	33.54	38.02	42.53		52.53	4 / 7			
	reaction time	0.175	interval	3.71	3.77	3.77	3.88	4.01	4.15	4.30	4.48	4.51	10.00		11.25	12.04	13.29
	velocity	7.56	9.43	9.28	9.28	9.02	8.73	8.43	8.14	7.81	7.76	7.66	4.00	7.61	9.33	8.72	7.90
	H1 lead leg	R	strides	20	13	13	13	13	13	14	14	14	126				
Clarke, Roshawn (JAM) (2004)	time	5.54	9.13	12.77	16.46	20.30	24.31	28.42	32.73	37.25	42.03		dnf	9 / --			
	reaction time	0.195	interval	3.59	3.64	3.69	3.84	4.01	4.11	4.31	4.52	4.78			10.92	11.96	13.61
	velocity	8.12	9.75	9.62	9.49	9.11	8.73	8.52	8.12	7.74	7.32	7.32			9.62	8.78	7.71
	H1 lead leg	R	strides	21	14	13	13	14	14	15	15	15	147				



Time Intervals (s)

Hurdle Phases



Source: Paris 2024 Olympic Games - Results Book (2024). p. 216
https://olympics.com/OG2024/pdf/OG2024_ATH/OG2024_ATH_B99_ATH-----pdf
Video: https://www.youtube.com/watch?v=ZEs1FBHF_d8

Biomechanical Analysis

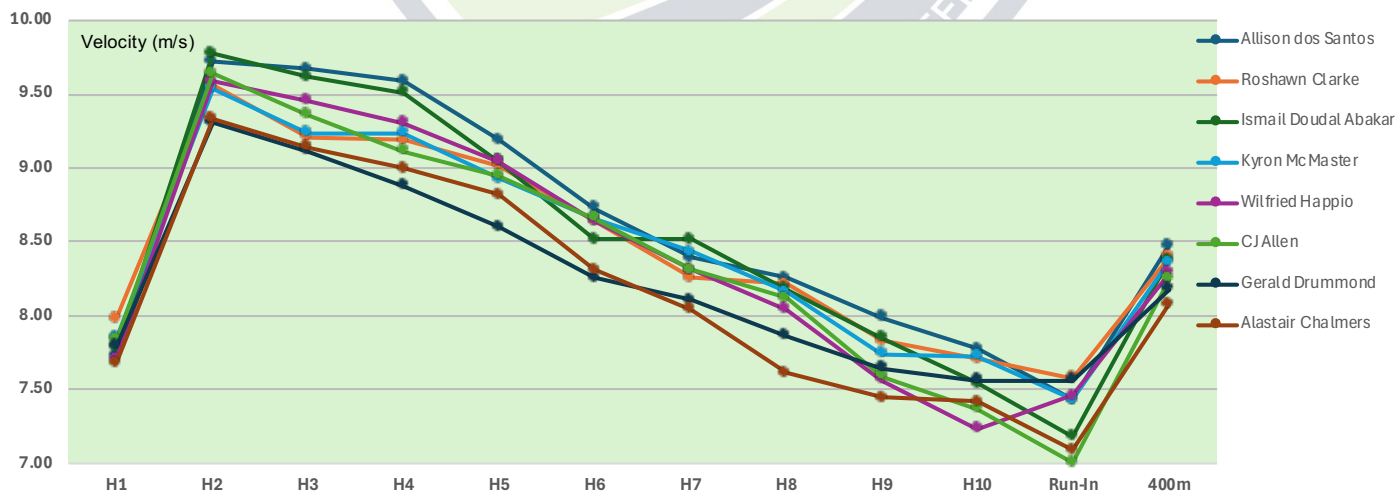
2024 London Athletics Meet (London, GBR)

Men's 400m Hurdles

Date 2024.07.20

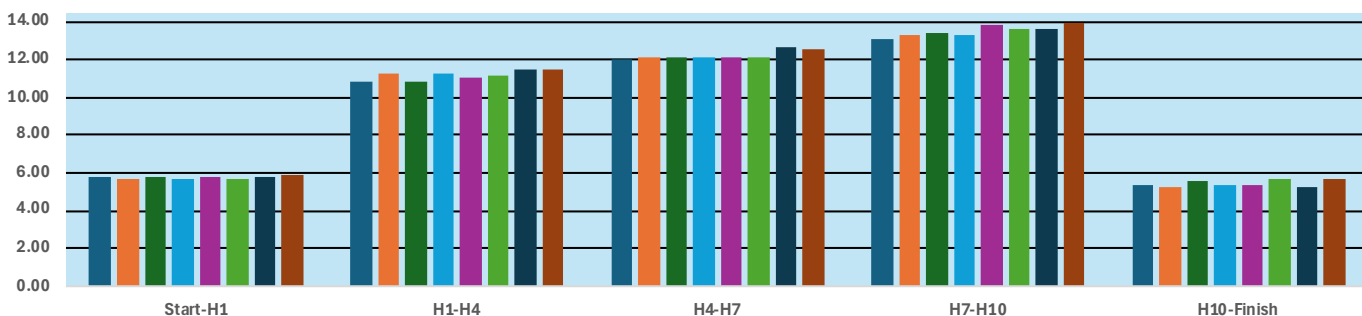
FINAL

		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	5.82	9.42	13.04	16.69	20.50	24.51	28.68	32.92	37.30	41.80		47.18	6 / 1			
	reaction time	0.178	interval	3.60	3.62	3.65	3.81	4.01	4.17	4.24	4.38	4.50	5.38		10.87	11.99	13.12
	H1 lead leg	L	velocity	7.73	9.72	9.67	9.59	9.19	8.73	8.39	8.25	7.99	7.78	8.48		9.66	8.76
			strides	20	13	12	12	12		13	13	13	16.2	124.2			
Clarke, Roshawn (JAM) (2004)	time	5.64	9.30	13.10	16.91	20.79	24.84	29.08	33.34	37.81	42.35		47.63	3 / 2			
	reaction time	0.187	interval	3.66	3.80	3.81	3.88	4.05	4.24	4.26	4.47	4.54	5.28		11.27	12.17	13.27
	H1 lead leg	R	velocity	7.98	9.56	9.21	9.19	9.02	8.64	8.25	8.22	7.83	7.71	7.58		9.32	8.63
			strides	21	13	13	13	13	14	14	14	15	15	18	163		
Abakar, Ismail Doudai (QAT) (2004)	time	5.78	9.36	13.00	16.68	20.55	24.66	28.77	33.05	37.51	42.15		47.72	8 / 3			
	reaction time	0.198	interval	3.58	3.64	3.68	3.87	4.11	4.11	4.28	4.46	4.64	5.57	PB	10.90	12.09	13.38
	H1 lead leg	L	velocity	7.79	9.78	9.62	9.51	9.04	8.52	8.52	8.18	7.85	7.54	7.18		9.63	8.68
			strides	20	13	13	13	13		13	13	14	14	17.2	129.2		
McMaster, Kyron (IVB) (1997)	time	5.73	9.40	13.19	16.98	20.90	24.94	29.09	33.38	37.90	42.43		47.81	5 / 4			
	reaction time	0.150	interval	3.67	3.79	3.79	3.92	4.04	4.15	4.29	4.52	4.53	5.38		11.25	12.11	13.34
	H1 lead leg	L	velocity	7.85	9.54	9.23	9.23	8.93	8.66	8.43	8.16	7.74	7.73	7.43		9.33	8.67
			strides	21	13	13	13	13	13	13	14	14	17	157			
Happio, Wilfried (FRA) (1998)	time	5.84	9.49	13.19	16.95	20.82	24.87	29.08	33.43	38.06	42.90		48.26	4 / 5			
	reaction time	0.153	interval	3.65	3.70	3.76	3.87	4.05	4.21	4.35	4.63	4.84	5.36		11.11	12.13	13.82
	H1 lead leg	L	velocity	7.71	9.59	9.46	9.31	9.04	8.64	8.31	8.05	7.56	7.23	7.46		9.45	8.66
			strides	20	13	13	13	13	13	13	14	14	17.2	156.2			
Allen, CJ (USA) (1995)	time	5.74	9.37	13.11	16.95	20.86	24.90	29.11	33.42	38.03	42.78		48.49	7 / 6			
	reaction time	0.146	interval	3.63	3.74	3.84	3.91	4.04	4.21	4.31	4.61	4.75	5.71		11.21	12.16	13.67
	H1 lead leg	L	velocity	7.84	9.64	9.36	9.11	8.95	8.66	8.31	8.12	7.59	7.37	7.01		9.37	8.63
			strides	20	13	13	13	13		14		18	104				
Drummond, Gerald (CRC) (1994)	time	5.77	9.53	13.37	17.31	21.38	25.62	29.94	34.39	38.97	43.60		48.89	1 / 7			
	reaction time	0.205	interval	3.76	3.84	3.94	4.07	4.24	4.32	4.45	4.58	4.63	5.29		11.54	12.63	13.66
	H1 lead leg	L	velocity	7.80	9.31	9.11	8.88	8.60	8.25	8.10	7.87	7.64	7.56	7.56		9.10	8.31
			strides	21	14	14	14	14		15	15	15	18	140			
Chalmers, Alastair (GBR) (2000)	time	5.86	9.61	13.44	17.33	21.30	25.51	29.86	34.46	39.16	43.88		49.52	2 / 8			
	reaction time	0.153	interval	3.75	3.83	3.89	3.97	4.21	4.35	4.60	4.70	4.72	5.64		11.47	12.53	14.02
	H1 lead leg	L	velocity	7.68	9.33	9.14	9.00	8.82	8.31	8.05	7.61	7.45	7.42	7.09		9.15	8.38
			strides	20	13	13	13	13		15	15	18	105				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 20 Jul 2024 14:46) - diamond league race analysis
<https://www.omegatiming.com/File/0002040D01020B0101FFFFFFFFFFFF6D.pdf>

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

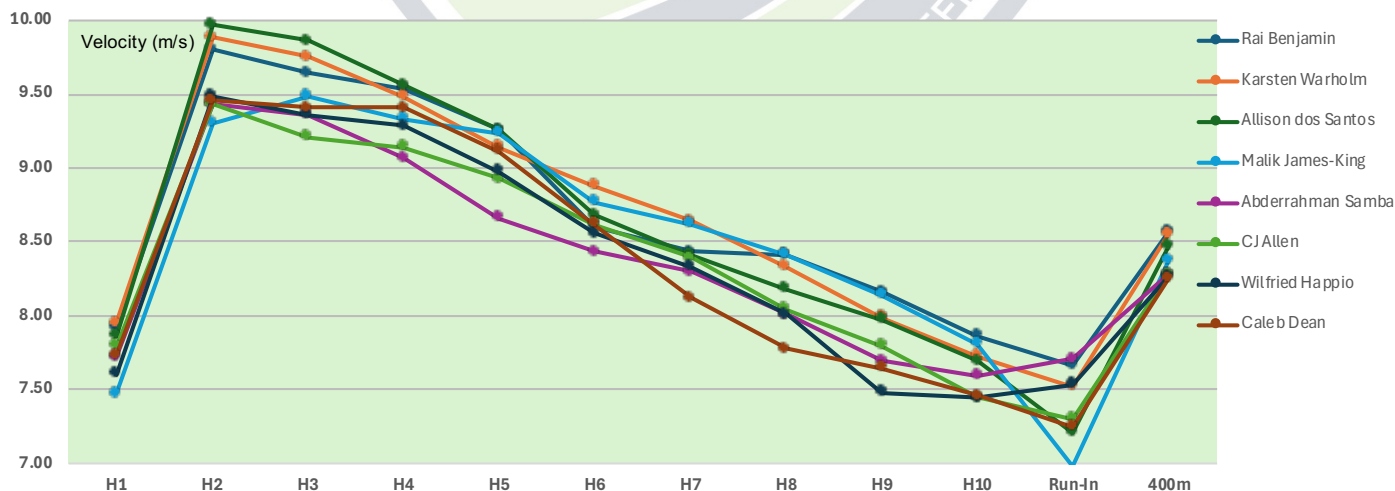
2024 Herculis Meeting International d'Athlétisme (Monaco, MON)

Men's 400m Hurdles

Date 2024.07.12

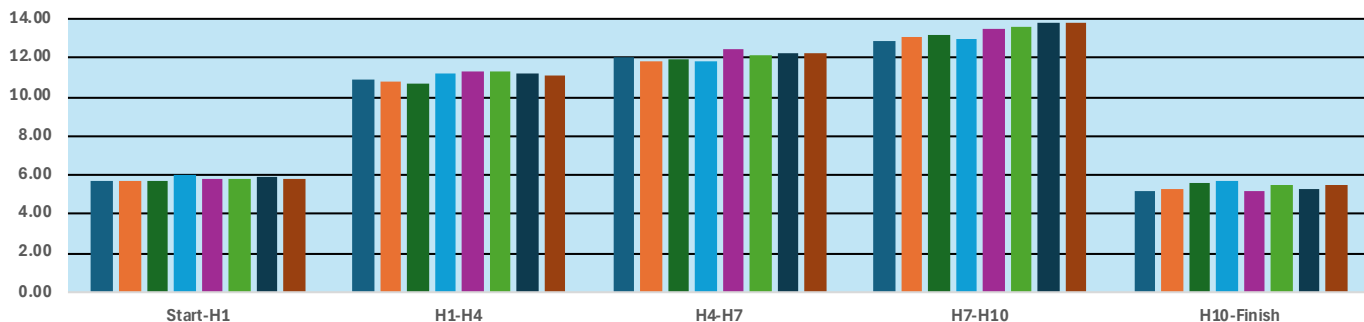
FINAL

		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	5.68	9.25	12.88	16.55	20.33	24.40	28.55	32.71	37.00	41.45		46.67	5 / 1			
	reaction time	0.188															
	interval		3.57	3.63	3.67	3.78	4.07	4.15	4.16	4.29	4.45	5.22			10.87	12.00	12.90
	velocity	7.92	9.80	9.64	9.54	9.26	8.60	8.43	8.41	8.16	7.87	7.66	8.57		9.66	8.75	8.14
H1 lead leg	R		20	13	13	12	13	14	13	13	13	17	154				
Warholm, Karsten (NOR) (1996)	time	5.66	9.20	12.79	16.48	20.31	24.25	28.30	32.50	36.88	41.41		46.73	7 / 2			
	reaction time	0.164															
	interval		3.54	3.59	3.69	3.83	3.94	4.05	4.20	4.38	4.53	5.32			10.82	11.82	13.11
	velocity	7.95	9.89	9.75	9.49	9.14	8.88	8.64	8.33	7.99	7.73	7.52	8.56		9.70	8.88	8.01
H1 lead leg	L		20	13	13	13	13	13	13	13	15	18	157				
dos Santos, Alison (BRA) (2000)	time	5.72	9.23	12.78	16.44	20.22	24.25	28.41	32.69	37.08	41.63		47.18	6 / 3			
	reaction time	0.161															
	interval		3.51	3.55	3.66	3.78	4.03	4.16	4.28	4.39	4.55	5.55			10.72	11.97	13.22
	velocity	7.87	9.97	9.86	9.56	9.26	8.68	8.41	8.18	7.97	7.69	7.21	8.48		9.79	8.77	7.94
H1 lead leg	L		20	13	12	12	13	13	13	13	13	17	151				
James-King, Malik (JAM) (1999)	time	6.02	9.78	13.47	17.22	21.01	25.00	29.06	33.22	37.52	42.00		47.73	3 / 4			
	reaction time	0.150															
	interval		3.76	3.69	3.75	3.79	3.99	4.06	4.16	4.30	4.48	5.73			11.20	11.84	12.94
	velocity	7.48	9.31	9.49	9.33	9.23	8.77	8.62	8.41	8.14	7.81	6.98	8.38		9.38	8.87	8.11
H1 lead leg	L		23	14	14	14	14	14	15	15	15	19.5	157.5				
Samba, Abderrahman (QAT) (1995)	time	5.83	9.54	13.28	17.14	21.18	25.33	29.55	33.92	38.47	43.08		48.27	8 / 5			
	reaction time	0.179															
	interval		3.71	3.74	3.86	4.04	4.15	4.22	4.37	4.55	4.61	5.19			11.31	12.41	13.53
	velocity	7.72	9.43	9.36	9.07	8.66	8.43	8.29	8.01	7.69	7.59	7.71	8.29		9.28	8.46	7.76
H1 lead leg	R		21	13	13	13	13	13	13	13	14	17	156				
Allen, CJ (USA) (1995)	time	5.77	9.48	13.28	17.11	21.03	25.09	29.26	33.61	38.10	42.80		48.28	2 / 6			
	reaction time	0.160															
	interval		3.71	3.80	3.83	3.92	4.06	4.17	4.35	4.49	4.70	5.48			11.34	12.15	13.54
	velocity	7.80	9.43	9.21	9.14	8.93	8.62	8.39	8.05	7.80	7.45	7.30	8.29		9.26	8.64	7.75
H1 lead leg	L		20	13	13	13	13	13	14	15	15	17.7	146.7				
Happio, Wilfried (FRA) (1998)	time	5.92	9.61	13.35	17.12	21.02	25.11	29.31	33.68	38.36	43.06		48.37	1 / 7			
	reaction time	0.161															
	interval		3.69	3.74	3.77	3.90	4.09	4.20	4.37	4.68	4.70	5.31			11.20	12.19	13.75
	velocity	7.60	9.49	9.36	9.28	8.97	8.56	8.33	8.01	7.48	7.45	7.53	8.27		9.38	8.61	7.64
H1 lead leg	L		20	13	13	13	13	13	13	14	14	17.2	143.2				
Dean, Caleb (USA) (2001)	time	5.82	9.52	13.24	16.96	20.80	24.86	29.17	33.67	38.25	42.94		48.46	4 / 8			
	reaction time	0.174															
	interval		3.70	3.72	3.72	3.84	4.06	4.31	4.50	4.58	4.69	5.52			11.14	12.21	13.77
	velocity	7.73	9.46	9.41	9.41	9.11	8.62	8.12	7.78	7.64	7.46	7.25	8.25		9.43	8.60	7.63
H1 lead leg	R		21	13	13	13	13	14	14	15	15	17.7	161.7				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 12 Jul 2024 20.09) - diamond league race analysis

<https://www.omegatiming.com/File/0002040C0102020101FFFFFFFF6D.pdf>

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

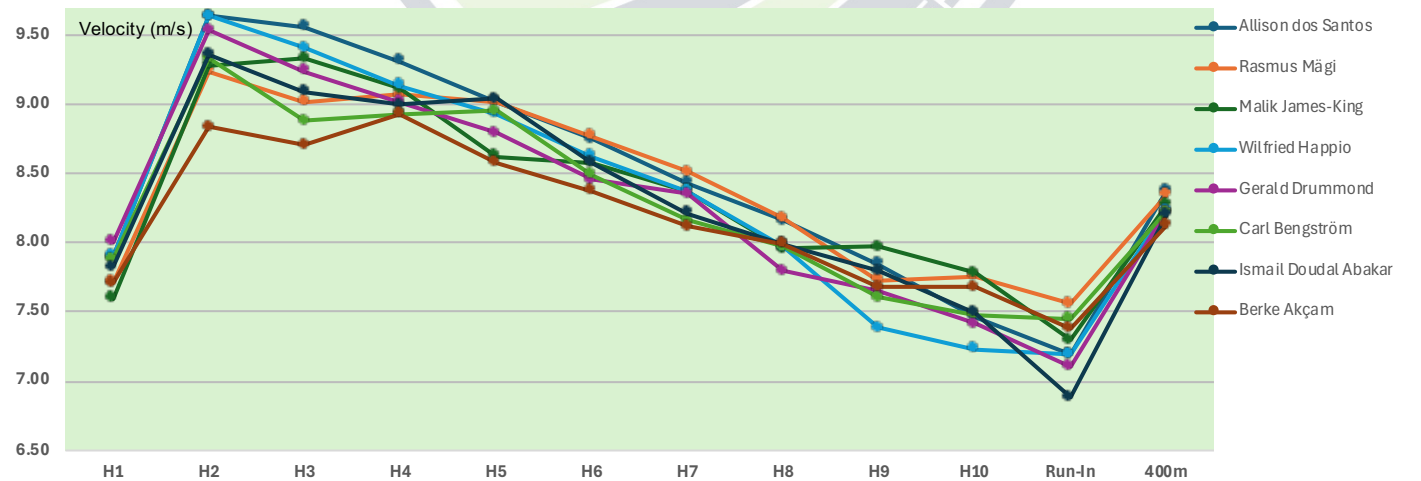
2024 Meeting de Paris (Paris, FRA)

Men's 400m Hurdles

Date 2024.07.07

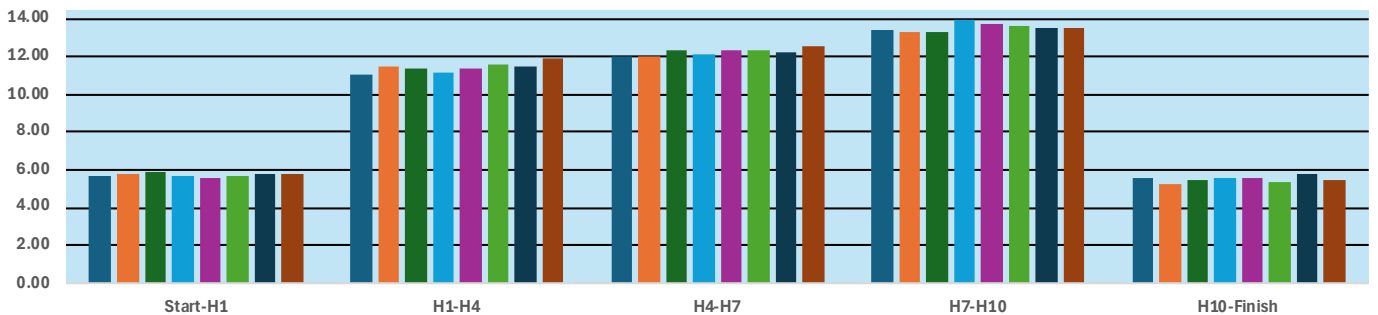
FINAL

		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	5.70	9.33	12.99	16.75	20.63	24.63	28.78	33.07	37.53	42.22		47.78	6 / 1			
	reaction time	0.168													11.05	12.03	13.44
	interval velocity	7.89	9.64	9.56	9.31	9.02	8.75	8.43	8.16	7.85	7.46	7.19	8.37		9.50	8.73	7.81
	H1 lead leg	L	20	13	12	12	12	12	13	13	13	13	16.7	149.7			
Mägi, Rasmus (EST) (1992)	time	5.83	9.62	13.50	17.36	21.24	25.23	29.34	33.62	38.15	42.66		47.95	3 / 2			
	reaction time	0.168													11.53	11.98	13.32
	interval velocity	7.72	9.23	9.02	9.07	9.02	8.77	8.52	8.18	7.73	7.76	7.56	8.34		9.11	8.76	7.88
	H1 lead leg	R	20	13	13	13	13		13	14	14	17	130				
James-King, Malik (JAM) (1999)	time	5.92	9.69	13.44	17.28	21.34	25.42	29.60	34.00	38.39	42.89		48.37	7 / 3			
	reaction time	0.172													11.36	12.32	13.29
	interval velocity	7.60	9.28	9.33	9.11	8.62	8.58	8.37	7.95	7.97	7.78	7.30	8.27		9.24	8.52	7.90
	H1 lead leg	R	22	14	14	14	14	14	15	15	15	15	18	170			
Happio, Wilfried (FRA) (1998)	time	5.69	9.32	13.04	16.87	20.79	24.85	29.03	33.42	38.16	43.00		48.56	5 / 4			
	reaction time	0.151													11.18	12.16	13.97
	interval velocity	7.91	9.64	9.41	9.14	8.93	8.62	8.37	7.97	7.38	7.23	7.19	8.24		9.39	8.63	7.52
	H1 lead leg	L	20	13	13	13	13	13	13	14	15	18	158				
Drummond, Gerald (CRC) (1994)	time	5.62	9.29	13.08	16.96	20.94	25.08	29.27	33.76	38.33	43.05		48.68	2 / 5			
	reaction time	0.217													11.34	12.31	13.78
	interval velocity	8.01	9.54	9.23	9.02	8.79	8.45	8.35	7.80	7.66	7.42	7.10	8.22		9.26	8.53	7.62
	H1 lead leg	L	21	14	14	14	14		15	15	15	18	140				
Bengtström, Carl (SWE) (2000)	time	5.71	9.46	13.40	17.32	21.23	25.35	29.64	34.03	38.63	43.31		48.68	4 / 6			
	reaction time	0.179													11.61	12.32	13.67
	interval velocity	7.88	9.33	8.88	8.93	8.95	8.50	8.16	7.97	7.61	7.48	7.45	8.22		9.04	8.52	7.68
	H1 lead leg	L	22	14	14	14	14		15	15	15	19	142				
Abakar, Ismail Doudai (QAT) (2004)	time	5.75	9.49	13.34	17.23	21.10	25.18	29.44	33.82	38.31	42.98		48.79	1 / 7			
	reaction time	0.192													11.48	12.21	13.54
	interval velocity	7.83	9.36	9.09	9.00	9.04	8.58	8.22	7.99	7.80	7.49	6.88	8.20		9.15	8.60	7.75
	H1 lead leg	L	20	13	13	13	13		13	13	15	17.2	130.2				
Akçam, Berke (TUR) (2002)	time	5.84	9.80	13.82	17.74	21.82	26.00	30.31	34.69	39.25	43.81		49.23	8 / 8			
	reaction time	0.144													11.90	12.57	13.50
	interval velocity	7.71	8.84	8.71	8.93	8.58	8.37	8.12	7.99	7.68	7.38	8.13			8.82	8.35	7.78
	H1 lead leg	L	21	13	13	13	13	14	14	15	15	15	146				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 7 Jul 2024 16:09) - diamond league race analysis

<https://www.omegatiming.com/File/0002040B01010B0101FFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=YVBd4iDkv28>

Biomechanical Analysis

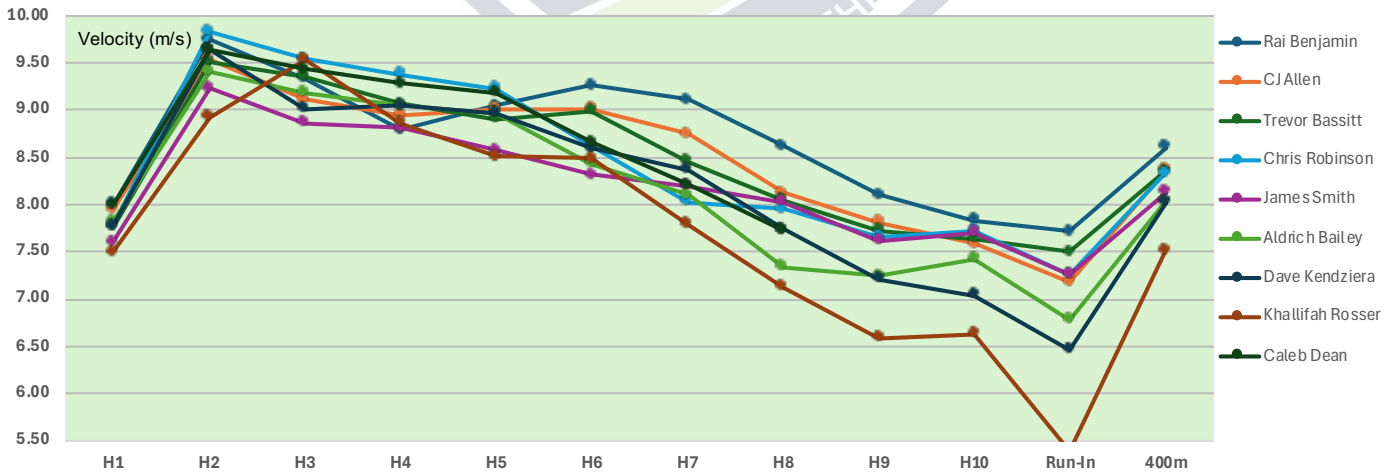
2024 USA Olympic Trials (Eugene, OR)

Men's 400m Hurdles

Date 2024.06.30

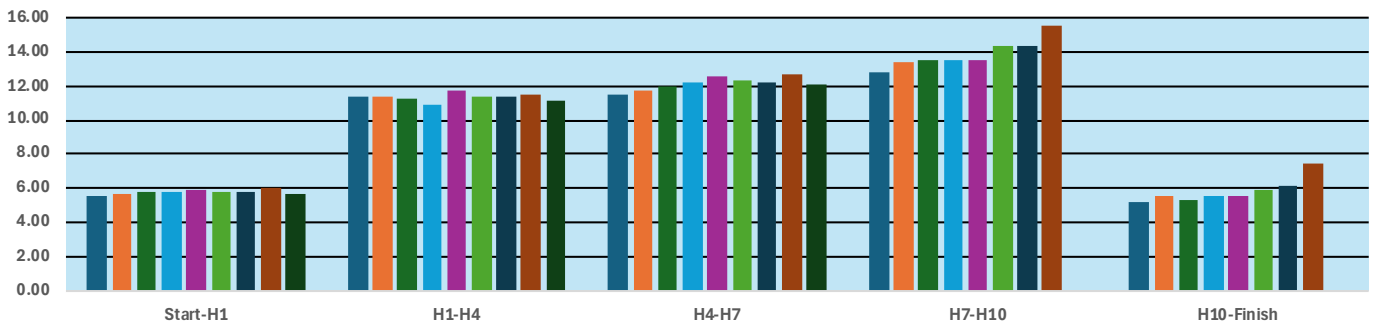
FINAL

		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	5.62	9.21	12.96	16.94	20.81	24.59	28.43	32.49	36.81	41.28		46.46	7 / 1			
	reaction time		3.59	3.75	3.98	3.87	3.78	3.84	4.06	4.32	4.47	5.18			11.32	11.49	12.85
	velocity	8.01	9.75	9.33	8.79	9.04	9.26	9.11	8.62	8.10	7.83	7.72	8.61		9.28	9.14	8.17
	H1 lead leg R strides	20	13	13	13	13	13	13	13	13	13	13	16.5	153.5			
Allen, CJ (USA) (1995)	time	5.66	9.33	13.17	17.08	20.96	24.84	28.84	33.15	37.63	42.24		47.81	8 / 2			
	reaction time		3.67	3.84	3.91	3.88	3.88	4.00	4.31	4.48	4.61	5.57			11.42	11.76	13.40
	velocity	7.95	9.54	9.11	8.95	9.02	9.02	8.75	8.12	7.81	7.59	7.18	8.37		9.19	8.93	7.84
	H1 lead leg L strides	20	13	13	13	13	13	14	14	14	14	18	159				
Bassitt, Trevor (USA) (1998)	time	5.79	9.47	13.21	17.07	21.00	24.89	29.03	33.38	37.91	42.49		47.82	6 / 3			
	reaction time		3.68	3.74	3.86	3.93	3.89	4.14	4.35	4.53	4.58	5.33			11.28	11.96	13.46
	velocity	7.77	9.51	9.36	9.07	8.91	9.00	8.45	8.05	7.73	7.64	7.50	8.36		9.31	8.78	7.80
	H1 lead leg R strides	20	13	13	13	13	13	13	13	14	14	17	156				
Robinson, Chris (USA) (2001)	time	5.78	9.34	13.01	16.74	20.53	24.59	28.95	33.35	37.92	42.45		47.96	4 / 4			
	reaction time		3.56	3.67	3.73	3.79	4.06	4.36	4.40	4.57	4.53	5.51			10.96	12.21	13.50
	velocity	7.79	9.83	9.54	9.38	9.23	8.62	8.03	7.95	7.66	7.73	7.26	8.34		9.58	8.60	7.78
	H1 lead leg R strides	20	13	13	13	13	14	14	15	15	15	18.5	143.5				
Smith, James (USA) (2000)	time	5.91	9.70	13.65	17.62	21.70	25.91	30.18	34.54	39.13	43.67		49.18	1 / 5			
	reaction time		3.79	3.95	3.97	4.08	4.21	4.27	4.36	4.59	4.54	5.51			11.71	12.56	13.49
	velocity	7.61	9.23	8.86	8.82	8.58	8.31	8.20	8.03	7.63	7.71	7.26	8.13		8.97	8.36	7.78
	H1 lead leg L strides	21	13	13	13	13	14	14	15	15	15	18	164				
Bailey, Aldrich (USA) (1994)	time	5.75	9.47	13.28	17.15	21.05	25.20	29.52	34.29	39.12	43.83		49.73	3 / 6			
	reaction time		3.72	3.81	3.87	3.90	4.15	4.27	4.36	4.77	4.83	4.71	5.90		11.40	12.37	14.31
	velocity	7.83	9.41	9.19	9.04	8.97	8.43	8.10	7.34	7.25	7.43	6.78	8.04		9.21	8.49	7.34
	H1 lead leg L strides	21	13	13	13	13	13	14	14	14	14	17.5	159.5				
Kenziera, Dave (USA) (1994)	time	5.78	9.41	13.29	17.16	21.06	25.13	29.31	33.83	38.68	43.65		49.84	2 / 7			
	reaction time		3.63	3.88	3.87	3.90	4.07	4.18	4.52	4.85	4.97	6.19			11.38	12.15	14.34
	velocity	7.79	9.64	9.02	9.04	8.97	8.60	8.37	7.74	7.22	7.04	6.46	8.03		9.23	8.64	7.32
	H1 lead leg R strides	20	13	13	13	13	13	13	14	15	16	18	161				
Rosser, Khalifah (USA) (1995)	time	6.00	9.92	13.59	17.54	21.65	25.77	30.26	35.17	40.48	45.76		53.18	9 / 8			
	reaction time		3.92	3.67	3.95	4.11	4.12	4.49	4.91	5.31	5.28	7.42			11.54	12.72	15.50
	velocity	7.50	8.93	9.54	8.86	8.52	8.50	7.80	7.13	6.59	6.63	5.39	7.52		9.10	8.25	6.77
	H1 lead leg R strides	20	13	13	13	13	13	13	15	15	15	115					
Dean, Caleb (USA) (2001)	time	5.63	9.26	12.97	16.74	20.55	24.59	28.85	33.38				dnf	5 / --			
	reaction time		3.63	3.71	3.77	3.81	4.04	4.26	4.53						11.11	12.11	
	velocity	7.99	9.64	9.43	9.28	9.19	8.66	8.22	7.73						9.45	8.67	
	H1 lead leg R strides	20	13	13	13	13	13	14	14				113				



Time Intervals (s)

Hurdle Phases



Source: USATF and Karmarush (Sun 30 Jun 2024) - USA Olympic trials results and race analysis

<https://results.usatf.org/2024trials/>

Video: https://www.youtube.com/watch?v=TdnFfD_dMTE

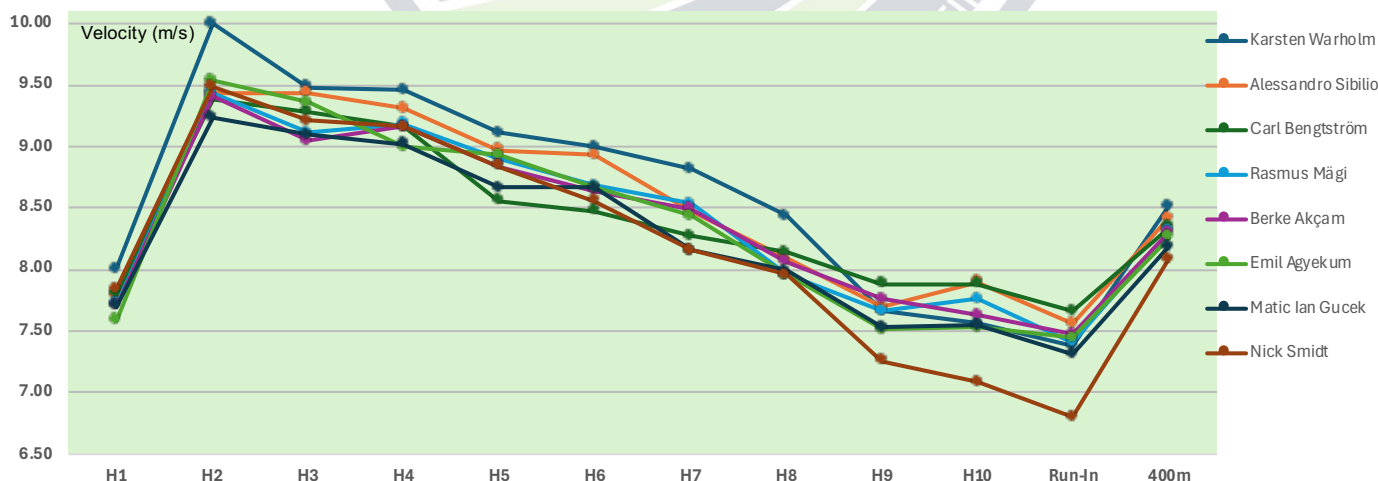
2024 European Athletics Championships (Roma, ITA)

Men's 400m Hurdles

Date 2024.06.11

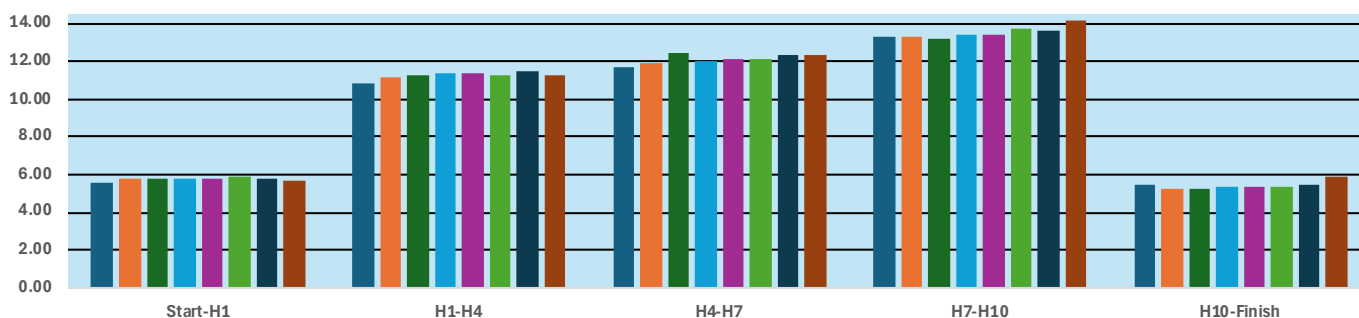
FINAL

		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	5.62	9.12	12.81	16.51	20.35	24.24	28.21	32.36	36.93	41.56		46.98	8 / 1			
	reaction time	0.184															
	interval		3.50	3.69	3.70	3.84	3.89	3.97	4.15	4.57	4.63	5.42	CR		10.89	11.70	13.35
	velocity	8.01	10.00	9.49	9.46	9.11	9.00	8.82	8.43	7.66	7.56	7.38	8.51		9.64	8.97	7.87
H1 lead leg	L																
Sibilio, Alessandro (ITA) (1999)	time	5.78	9.49	13.20	16.96	20.86	24.78	28.91	33.23	37.78	42.21		47.50	7 / 2			
	reaction time	0.174															
	interval		3.71	3.71	3.76	3.90	3.92	4.13	4.32	4.55	4.43	5.29	NR		11.18	11.95	13.30
	velocity	7.79	9.43	9.43	9.31	8.97	8.93	8.47	8.10	7.69	7.90	7.56	8.42		9.39	8.79	7.89
H1 lead leg	R																
Bengtström, Carl (SWE) (2000)	time	5.77	9.50	13.27	17.09	21.18	25.31	29.54	33.84	38.28	42.72		47.94	9 / 3			
	reaction time	0.167															
	interval		3.73	3.77	3.82	4.09	4.13	4.23	4.30	4.44	4.44	5.22	NR		11.32	12.45	13.18
	velocity	7.80	9.38	9.28	9.16	8.56	8.47	8.27	8.14	7.88	7.88	7.66	8.34		9.28	8.43	7.97
H1 lead leg	L																
Mägi, Rasmus (EST) (1992)	time	5.83	9.54	13.38	17.19	21.12	25.15	29.25	33.65	38.22	42.73		48.13	5 / 4			
	reaction time	0.138															
	interval		3.71	3.84	3.81	3.93	4.03	4.10	4.40	4.57	4.51	5.40			11.36	12.06	13.48
	velocity	7.72	9.43	9.11	9.19	8.91	8.68	8.54	7.95	7.66	7.76	7.41	8.31		9.24	8.71	7.79
H1 lead leg	R																
Akçam, Berke (TUR) (2002)	time	5.84	9.56	13.43	17.25	21.21	25.26	29.38	33.72	38.23	42.82		48.17	6 / 5			
	reaction time	0.172															
	interval		3.72	3.87	3.82	3.96	4.05	4.12	4.34	4.51	4.59	5.35			11.41	12.13	13.44
	velocity	7.71	9.41	9.04	9.16	8.84	8.64	8.50	8.06	7.76	7.63	7.48	8.30		9.20	8.66	7.81
H1 lead leg	L																
Agyekum, Emil (GER) (1999)	time	5.93	9.60	13.34	17.23	21.15	25.19	29.34	33.74	38.40	43.05		48.42	3 / 6			
	reaction time	0.179															
	interval		3.67	3.74	3.89	3.92	4.04	4.15	4.40	4.66	4.65	5.37			11.30	12.11	13.71
	velocity	7.59	9.54	9.36	9.00	8.93	8.66	8.43	7.95	7.51	7.53	7.45	8.26		9.29	8.67	7.66
H1 lead leg	L																
Gucek, Matic Ian (SLO) (2003)	time	5.84	9.63	13.48	17.36	21.40	25.44	29.73	34.11	38.76	43.40		48.87	2 / 7			
	reaction time	0.158															
	interval		3.79	3.85	3.88	4.04	4.04	4.29	4.38	4.65	4.64	5.47			11.52	12.37	13.67
	velocity	7.71	9.23	9.09	9.02	8.66	8.66	8.16	7.99	7.53	7.54	7.31	8.18		9.11	8.49	7.68
H1 lead leg	R																
Smidt, Nick (NED) (1997)	time	5.74	9.43	13.23	17.05	21.01	25.10	29.39	33.79	38.61	43.55		49.43	4 / 8			
	reaction time	0.182															
	interval		3.69	3.80	3.82	3.96	4.09	4.29	4.40	4.82	4.94	5.88			11.31	12.34	14.16
	velocity	7.84	9.49	9.21	9.16	8.84	8.56	8.16	7.95	7.26	7.09	6.80	8.09		9.28	8.51	7.42
H1 lead leg	L																



Time Intervals (s)

Hurdle Phases



Source: European Athletics (2024). 2024 European athletics championships - results book. p. 116

<https://european-athletics.directus.app/assets/fe31f746-d9d1-4555-8899-d095f5843ff0/Results%20Book%20-%20European%20Athletics%20Championships%202024.pdf>

Video: <https://www.youtube.com/watch?v=2nEwXiZ9RJA>

Biomechanical Analysis

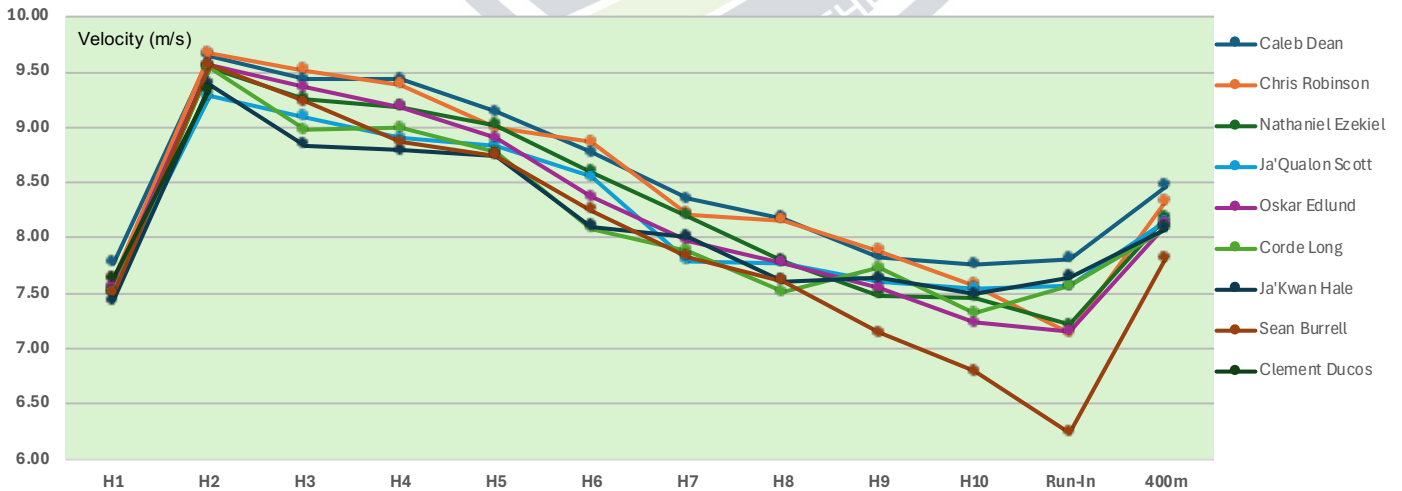
2024 NCAA Championships (Eugene, OR) (TV Analysis)

Men's 400m Hurdles

Date 2024.06.07

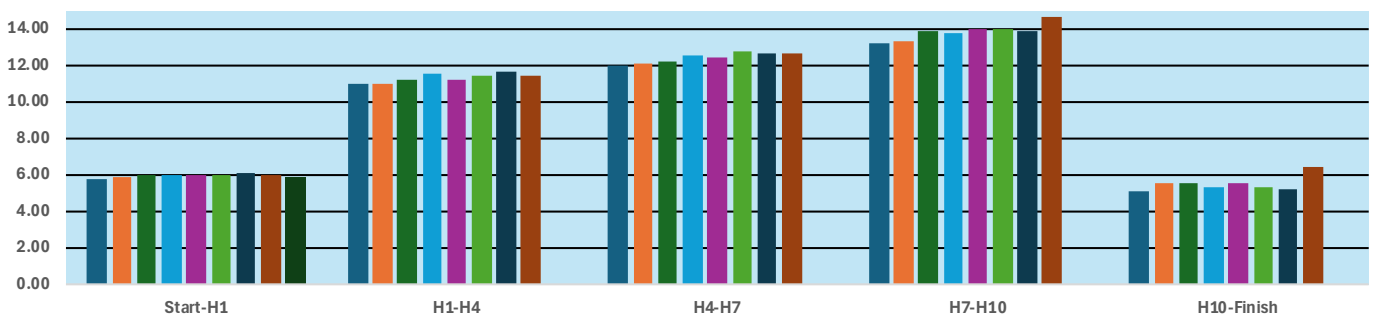
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Dean, Caleb (USA) (2001)	time	5.79	9.42	13.13	16.84	20.67	24.66	28.85	33.13	37.60	42.11	47.23	47.23	6 / 1			
	reaction time		interval	3.63	3.71	3.71	3.83	3.99	4.19	4.28	4.47	5.12	PB		11.05	12.01	13.26
	velocity	7.77	9.64	9.43	9.43	9.14	8.77	8.35	8.18	7.83	7.76	7.81	8.47		9.50	8.74	7.92
	H1 lead leg	R	strides	20	13	13	13	13	14	14	14	14	18	159			
Robinson, Chris (USA) (2001)	time	5.90	9.52	13.20	16.93	20.82	24.77	29.03	33.32	37.76	42.38	47.98	47.98	8 / 2			
	reaction time		interval	3.62	3.68	3.73	3.89	3.95	4.26	4.29	4.44	4.62	5.60		11.03	12.10	13.35
	velocity	7.63	9.67	9.51	9.38	9.00	8.86	8.22	8.16	7.88	7.58	7.14	8.34		9.52	8.68	7.87
	H1 lead leg	R	strides	13	13	13	13	13	14	14	15	15	18.5	141.5			
Ezekiel, Nathaniel (NGR) (2003)	time	6.00	9.67	13.45	17.26	21.14	25.21	29.48	33.97	38.65	43.34	48.88	48.88	5 / 3			
	reaction time		interval	3.67	3.78	3.81	3.88	4.07	4.27	4.49	4.68	4.69	5.54		11.26	12.22	13.86
	velocity	7.50	9.54	9.26	9.19	9.02	8.60	8.20	7.80	7.48	7.46	7.22	8.18		9.33	8.59	7.58
	H1 lead leg	R	strides	21	13	13	13	13	13	14	14	14	17	158			
Scott, Ja'Qualon (USA) (2001)	time	5.96	9.73	13.58	17.51	21.47	25.56	30.05	34.55	39.15	43.79	49.08	49.08	1 / 4			
	reaction time		interval	3.77	3.85	3.93	3.96	4.09	4.49	4.50	4.60	4.64	5.29	PB	11.55	12.54	13.74
	velocity	7.55	9.28	9.09	8.91	8.84	8.56	7.80	7.78	7.61	7.54	7.56	8.15		9.09	8.37	7.64
	H1 lead leg	R	strides	21	13	13	13	13	14	14	14	18	160				
Edlund, Oskar (SWE) (2002)	time	5.95	9.61	13.35	17.16	21.09	25.27	29.66	34.16	38.80	43.64	49.23	49.23	9 / 5			
	reaction time		interval	3.66	3.74	3.81	3.93	4.18	4.39	4.50	4.64	4.84	5.59		11.21	12.50	13.98
	velocity	7.56	9.56	9.36	9.19	8.91	8.37	7.97	7.78	7.54	7.23	7.16	8.13		9.37	8.40	7.51
	H1 lead leg	L	strides	13	13	13	13	14	14	15	15	18.5	143.5				
Long, Corde (USA) (2002)	time	5.99	9.66	13.56	17.45	21.44	25.77	30.21	34.87	39.40	44.18	49.47	49.47	3 / 6			
	reaction time		interval	3.67	3.90	3.89	3.99	4.33	4.44	4.66	4.53	4.78	5.29		11.46	12.76	13.97
	velocity	7.51	9.54	9.37	9.00	8.77	8.08	7.88	7.51	7.73	7.32	7.56	8.09		9.16	8.23	7.52
	H1 lead leg	L	strides	21	13	13	13	14	14	14	14	17	160				
Hale, Ja'Kwan (USA) (2000)	time	6.05	9.78	13.74	17.72	21.72	26.04	30.41	35.01	39.59	44.26	49.49	49.49	2 / 7			
	reaction time		interval	3.73	3.96	3.98	4.00	4.32	4.37	4.60	4.58	4.67	5.23		11.67	12.69	13.85
	velocity	7.44	9.38	8.84	8.79	8.75	8.10	8.01	7.61	7.64	7.49	7.65	8.08		9.00	8.27	7.58
	H1 lead leg	R	strides	20	13	14	14	13	14	14	15	15	18	165			
Burrell, Sean (USA) (2002)	time	6.00	9.66	13.45	17.40	21.40	25.64	30.11	34.71	39.61	44.76	51.17	51.17	4 / 8			
	reaction time		interval	3.66	3.79	3.95	4.00	4.24	4.47	4.60	4.90	5.15	6.41		11.40	12.71	14.65
	velocity	7.50	9.56	9.23	8.86	8.75	8.25	7.83	7.61	7.14	6.80	6.24	7.82		9.21	8.26	7.17
	H1 lead leg	R	strides	22	13	14	14	14	15	15	15	16	153				
Ducos, Clement (FRA) (2001)	time	5.89	9.64										dnf	7 / --			
	reaction time		interval	3.75													
	velocity	7.64	9.33														
	H1 lead leg	L	strides	20	13								33				



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=Qn03eA3Kas&pp=ygUjdj9ybGQoaW5kb29vGF0aGxldGlscyAvMDI0IGh1cmRsZXNM%3D>

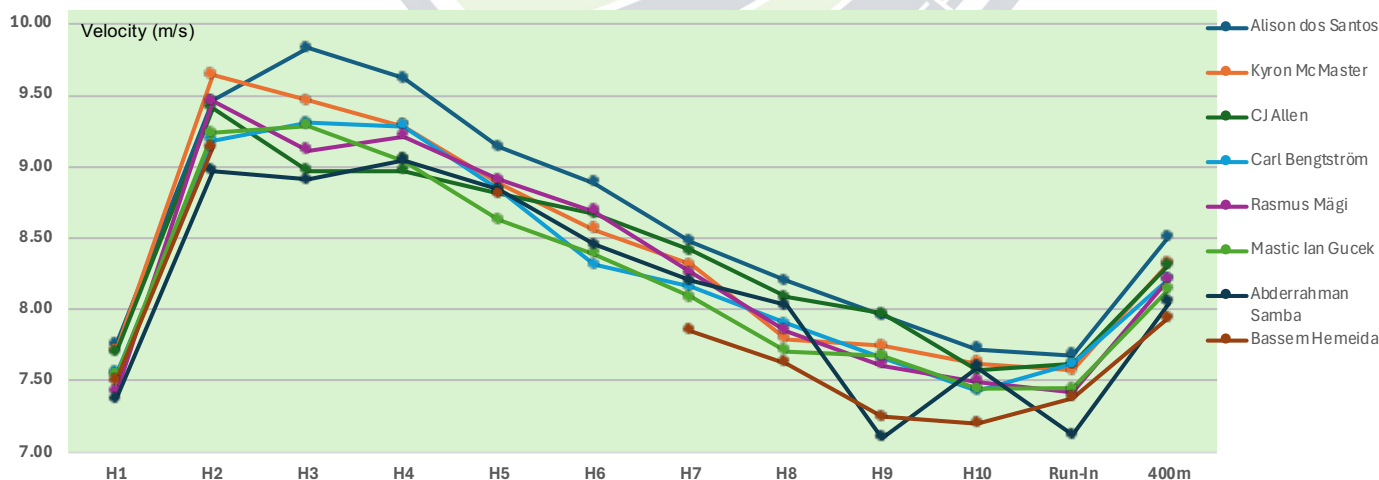
2024 Bauhaus Galan (Stockholm, SWE) (TV Analysis)

Men's 400m Hurdles

Date 2024.06.02

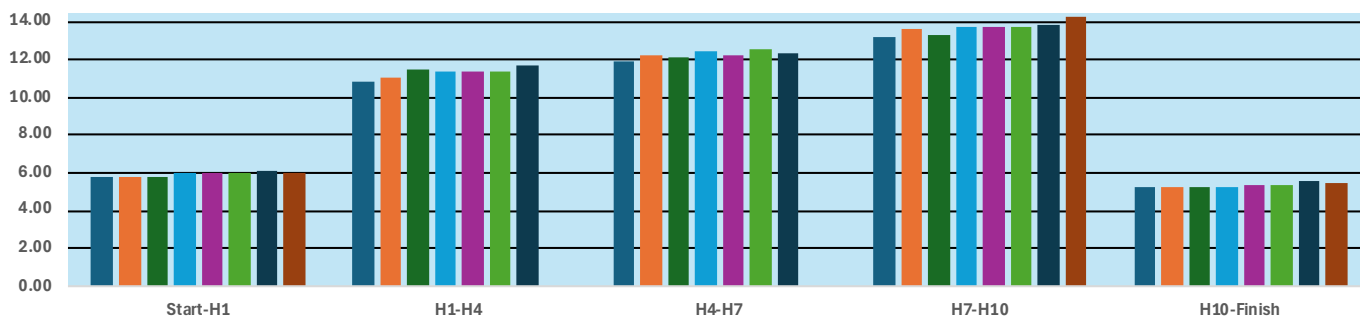
FINAL

		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	5.80	9.50	13.06	16.70	20.53	24.47	28.60	32.87	37.27	41.80		47.01	5 / 1			
	reaction time	0.164															
	interval		3.70	3.56	3.64	3.83	3.94	4.13	4.27	4.40	4.53	5.21			10.90	11.90	13.20
	velocity	7.76	9.46	9.83	9.62	9.14	8.88	8.47	8.20	7.95	7.73	7.68	8.51		9.63	8.82	7.95
H1 lead leg	L												149.2				
McMaster, Kyron (IVB) (1997)	time	5.83	9.46	13.16	16.93	20.87	24.96	29.17	33.66	38.18	42.77		48.05	7 / 2			
	reaction time	0.157															
	interval		3.63	3.70	3.77	3.94	4.09	4.21	4.49	4.52	4.59	5.28			11.10	12.24	13.60
	velocity	7.72	9.64	9.46	9.28	8.88	8.56	8.31	7.80	7.74	7.63	7.58	8.32		9.46	8.58	7.72
H1 lead leg	L											158.2					
Allen, CJ (USA) (1995)	time	5.84	9.56	13.46	17.36	21.33	25.37	29.53	33.86	38.25	42.87		48.12	4 / 3			
	reaction time	0.135															
	interval		3.72	3.90	3.90	3.97	4.04	4.16	4.33	4.39	4.62	5.25			11.52	12.17	13.34
	velocity	7.71	9.41	8.97	8.97	8.82	8.66	8.41	8.08	7.97	7.58	7.62	8.31		9.11	8.63	7.87
H1 lead leg	L											151.5					
Bengtström, Carl (SWE) (2000)	time	5.96	9.77	13.53	17.30	21.26	25.47	29.76	34.19	38.76	43.47		48.72	6 / 4			
	reaction time	0.182															
	interval		3.81	3.76	3.77	3.96	4.21	4.29	4.43	4.57	4.71	5.25			11.34	12.46	13.71
	velocity	7.55	9.19	9.31	9.28	8.84	8.31	8.16	7.90	7.66	7.43	7.62	8.21		9.26	8.43	7.66
H1 lead leg	L											174					
Mägi, Rasmus (EST) (1992)	time	6.06	9.76	13.60	17.40	21.33	25.36	29.60	34.06	38.66	43.33		48.72	3 / 5			
	reaction time	0.147															
	interval		3.70	3.84	3.80	3.93	4.03	4.24	4.46	4.60	4.67	5.39			11.34	12.20	13.73
	velocity	7.43	9.46	9.11	9.21	8.91	8.68	8.25	7.85	7.61	7.49	7.42	8.21		9.26	8.61	7.65
H1 lead leg	R											158.7					
Gucek, Matic Ian (SLO) (2003)	time	5.97	9.76	13.53	17.40	21.46	25.63	29.96	34.50	39.06	43.76		49.13	8 / 6			
	reaction time	0.151															
	interval		3.79	3.77	3.87	4.06	4.17	4.33	4.54	4.56	4.70	5.37			11.43	12.56	13.80
	velocity	7.54	9.23	9.28	9.04	8.62	8.39	8.08	7.71	7.68	7.45	7.45	8.14		9.19	8.36	7.61
H1 lead leg	R											169.5					
Samba, Abderrahmane (QAT) (1995)	time	6.10	10.00	13.93	17.80	21.76	25.90	30.17	34.53	39.46	44.07		49.69	2 / 7			
	reaction time	0.187															
	interval		3.90	3.93	3.87	3.96	4.14	4.27	4.36	4.93	4.61	5.62			11.70	12.37	13.90
	velocity	7.38	8.97	8.91	9.04	8.84	8.45	8.20	8.03	7.10	7.59	7.12	8.05		8.97	8.49	7.55
H1 lead leg	L											161					
Hemeida, Bassem (QAT) (2000)	time	6.00	9.83			21.76		30.68	35.27	40.10	44.96		50.38	1 / 8			
	reaction time	0.154															
	interval		3.83			11.93		8.92	4.59	4.83	4.86	5.42					14.28
	velocity	7.50	9.14			8.80		7.85	7.63	7.25	7.20	7.38	7.94				7.35
H1 lead leg	R											96					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=g_bM2GefB-A&pp=vgUhc3RvY2lob2xtIGRvYW1vbMqGbGVhZ3VlIDlwMiQqbmJi

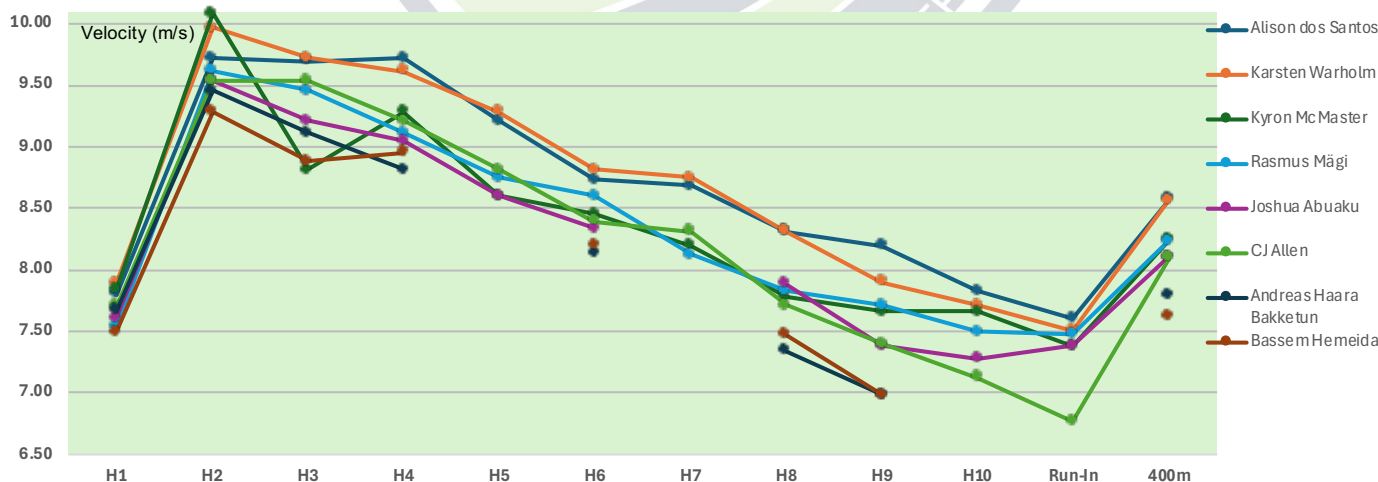
2024 Bislett Games (Oslo, NOR) (TV Analysis)

Men's 400m Hurdles

Date 2024.05.30

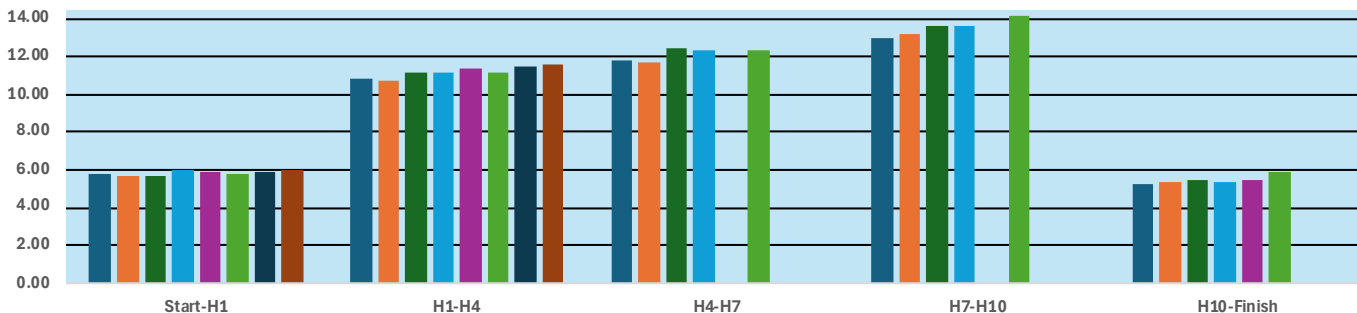
FINAL

		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	5.77	9.37	12.98	16.58	20.38	24.39	28.42	32.63	36.90	41.37		46.63	5 / 1			
	reaction time	0.182															
	interval		3.60	3.61	3.60	3.80	4.01	4.03	4.21	4.27	4.47	5.26			10.81	11.84	12.95
	velocity	7.80	9.72	9.70	9.72	9.21	8.73	8.68	8.31	8.20	7.83	7.60	8.58		9.71	8.87	8.11
H1 lead leg	L		20	13	12	12	12	13	13	13	13	16.5	149.5				
Warholm, Karsten (NOR) (1996)	time	5.70	9.21	12.81	16.45	20.22	24.19	28.19	32.40	36.83	41.37		46.70	7 / 2			
	reaction time	0.157															
	interval		3.51	3.60	3.64	3.77	3.97	4.00	4.21	4.43	4.54	5.33			10.75	11.74	13.18
	velocity	7.89	9.97	9.72	9.62	9.28	8.82	8.75	8.31	7.90	7.71	7.50	8.57		9.77	8.94	7.97
H1 lead leg	L		20	13	13	13	13	13	13	14	14	18	157				
McMaster, Kyron (IVB) (1997)	time	5.74	9.21	13.18	16.95	21.02	25.16	29.43	33.93	38.50	43.07		48.49	6 / 3			
	reaction time	0.145															
	interval		3.47	3.97	3.77	4.07	4.14	4.27	4.50	4.57	4.57	5.42			11.21	12.48	13.64
	velocity	7.84	10.09	8.82	9.28	8.60	8.45	8.20	7.78	7.66	7.66	7.38	8.25		9.37	8.41	7.70
H1 lead leg	L		21	13	13	13	13	13	14	14	14	141					
Mägi, Rasmus (EST) (1992)	time	5.97	9.61	13.31	17.15	21.15	25.22	29.53	34.00	38.54	43.21		48.56	8 / 4			
	reaction time	0.213															
	interval		3.64	3.70	3.84	4.00	4.07	4.31	4.47	4.54	4.67	5.35			11.18	12.38	13.68
	velocity	7.54	9.62	9.46	9.11	8.75	8.60	8.12	7.83	7.71	7.49	7.48	8.24		9.39	8.48	7.68
H1 lead leg	R		21	13	13	13	13	13	14	14	14	141					
Abuaku, Joshua (GER) (1996)	time	5.91	9.58	13.38	17.25	21.32	25.52		34.40	39.14	43.95		49.37	3 / 5			
	reaction time	0.173															
	interval		3.67	3.80	3.87	4.07	4.20		8.88	4.74	4.81	5.42			11.34		
	velocity	7.61	9.54	9.21	9.04	8.60	8.33		7.88	7.38	7.28	7.38	8.10		9.26		
H1 lead leg	L		20	13	13	13	13		15	15		115					
Allen, CJ (USA) (1995)	time	5.84	9.51	13.18	16.98	20.95	25.12	29.33	33.87	38.60	43.51		49.42	4 / 6			
	reaction time	0.154															
	interval		3.67	3.67	3.80	3.97	4.17	4.21	4.54	4.73	4.91	5.91			11.14	12.35	14.18
	velocity	7.71	9.54	9.54	9.21	8.82	8.39	8.31	7.71	7.40	7.13	6.77	8.09		9.43	8.50	7.40
H1 lead leg	L		21	13	13	13	14	14	15	15	15	146					
Bakketun, Andreas Haara (NOR) (2000)	time	5.87	9.57	13.41	17.38		25.99		35.53	40.54			51.32	1 / 7			
	reaction time	0.174															
	interval		3.70	3.84	3.97		8.61		9.54	5.01					11.51		
	velocity	7.67	9.46	9.11	8.82		8.13		7.34	6.99			7.79		9.12		
H1 lead leg	R		21	14	14	14			15			78					
Hemeida, Bassem (QAT) (2000)	time	6.00	9.77	13.71	17.62		26.16		35.53	40.54			52.41	2 / 8			
	reaction time	0.171															
	interval		3.77	3.94	3.91		8.54		9.37	5.01					11.62		
	velocity	7.50	9.28	8.88	8.95		8.20		7.47	6.99			7.63		9.04		
H1 lead leg	R		21	13	13	14			15			76					



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=AQUHZwF_T94

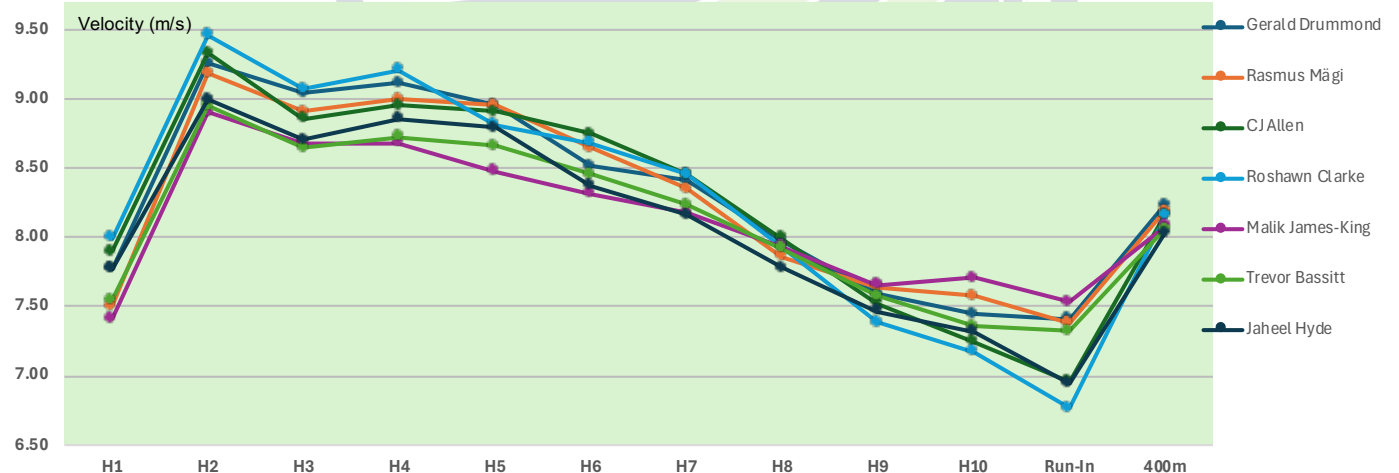
2024 Prefontaine Classic (Eugene, OR)

Men's 400m Hurdles

Date 2024.05.25

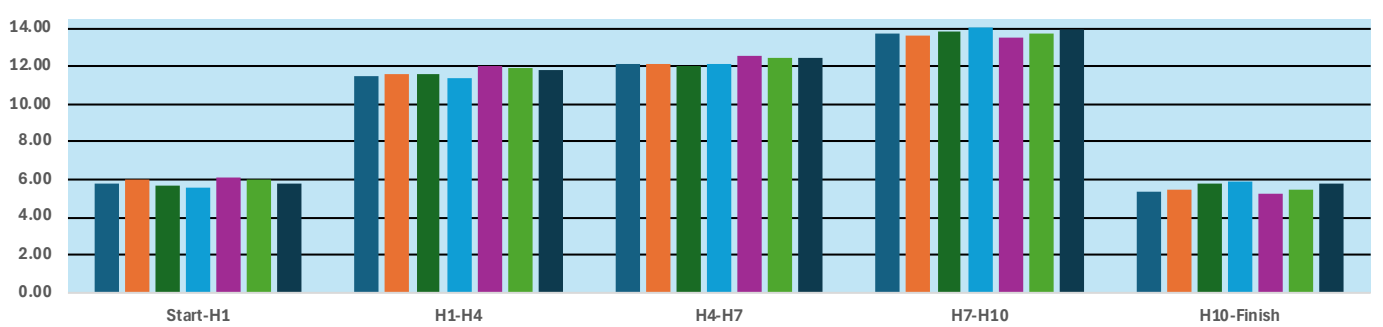
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Drummond, Gerald (CRC) (1994)	time	5.79	9.57	13.44	17.28	21.19	25.30	29.46	33.85	38.46	43.16		48.56	8 / 1			
	reaction time	0.211															
	interval		3.78	3.87	3.84	3.91	4.11	4.16	4.39	4.61	4.70	5.40			11.49	12.18	13.70
	velocity		7.77	9.26	9.04	9.11	8.95	8.52	8.41	7.97	7.59	7.45	7.41	8.24		9.14	8.62
H1 lead leg	strides			14	14	14	14	14	15	15	15		115				
Mägi, Rasmus (EST) (1992)	time	6.00	9.81	13.74	17.63	21.54	25.59	29.78	34.23	38.81	43.43		48.85	7 / 2			
	reaction time	0.209															
	interval		3.81	3.93	3.89	3.91	4.05	4.19	4.45	4.58	4.62	5.42			11.63	12.15	13.65
	velocity		7.50	9.19	8.91	9.00	8.95	8.64	8.35	7.87	7.64	7.58	7.38	8.19		9.03	8.64
H1 lead leg	strides			13	13	13	13	13	14	14	14		107				
Allen, CJ (USA) (1995)	time	5.70	9.45	13.40	17.31	21.24	25.24	29.38	33.76	38.41	43.24		48.99	6 / 3			
	reaction time	0.114															
	interval		3.75	3.95	3.91	3.93	4.00	4.14	4.38	4.65	4.83	5.75			11.61	12.07	13.86
	velocity		7.89	9.33	8.86	8.95	8.91	8.75	8.45	7.99	7.53	7.25	6.96	8.16		9.04	8.70
H1 lead leg	strides			13	13	13	13	13	14	15	15		109				
Clarke, Roshawn (JAM) (2004)	time	5.63	9.33	13.19	16.99	20.96	24.99	29.13	33.54	38.28	43.16		49.07	5 / 4			
	reaction time	0.186															
	interval		3.70	3.86	3.80	3.97	4.03	4.14	4.41	4.74	4.88	5.91			11.36	12.14	14.03
	velocity		7.99	9.46	9.07	9.21	8.82	8.68	8.45	7.94	7.38	7.17	6.77	8.15		9.24	8.65
H1 lead leg	strides			14	14	14	14	14	15	16	15		116				
James-King, Malik (JAM) (1999)	time	6.07	10.00	14.03	18.06	22.19	26.40	30.68	35.09	39.66	44.20		49.51	3 / 5			
	reaction time	0.144															
	interval		3.93	4.03	4.03	4.13	4.21	4.28	4.41	4.57	4.54	5.31			11.99	12.62	13.52
	velocity		7.41	8.91	8.68	8.68	8.47	8.31	8.18	7.94	7.66	7.71	7.53	8.08		8.76	8.32
H1 lead leg	L	strides		23	15	15	14	15	15	15	15	15	142				
Bassitt, Trevor (USA) (1998)	time	5.96	9.87	13.92	17.93	21.97	26.11	30.36	34.78	39.40	44.16		49.62	4 / 6			
	reaction time	0.187															
	interval		3.91	4.05	4.01	4.04	4.14	4.25	4.41	4.62	4.76	5.46			11.97	12.43	13.80
	velocity		7.55	8.95	8.64	8.73	8.66	8.45	8.24	7.92	7.58	7.35	7.33	8.06		8.77	8.45
H1 lead leg	R	strides		21	13	13	13	13	13	13	14	14	140				
Hyde, Jaheel (JAM) (1997)	time	5.79	9.68	13.70	17.65	21.63	25.81	30.10	34.60	39.29	44.07		49.83	9 / 7			
	reaction time	0.188															
	interval		3.89	4.02	3.95	3.98	4.18	4.29	4.50	4.69	4.78	5.76			11.86	12.45	13.97
	velocity		7.77	9.00	8.71	8.86	8.79	8.37	8.16	7.78	7.46	7.32	6.94	8.03		8.85	8.43
H1 lead leg	strides			14	14	14	14	14	14	15	15		114				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 25 May 2024 13:16) - diamond league race analysis
<https://www.omegatiming.com/File/000204080103040101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=Kult6B4fyJU>

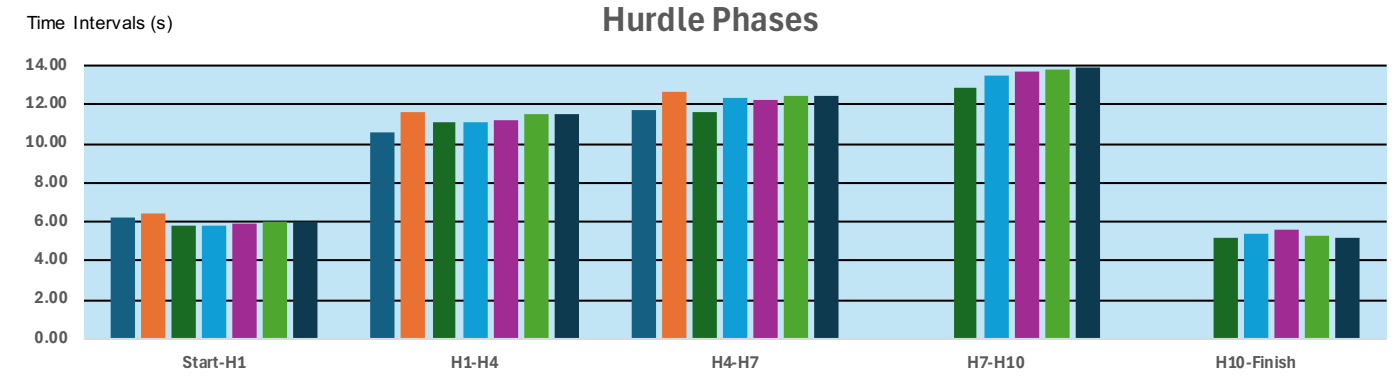
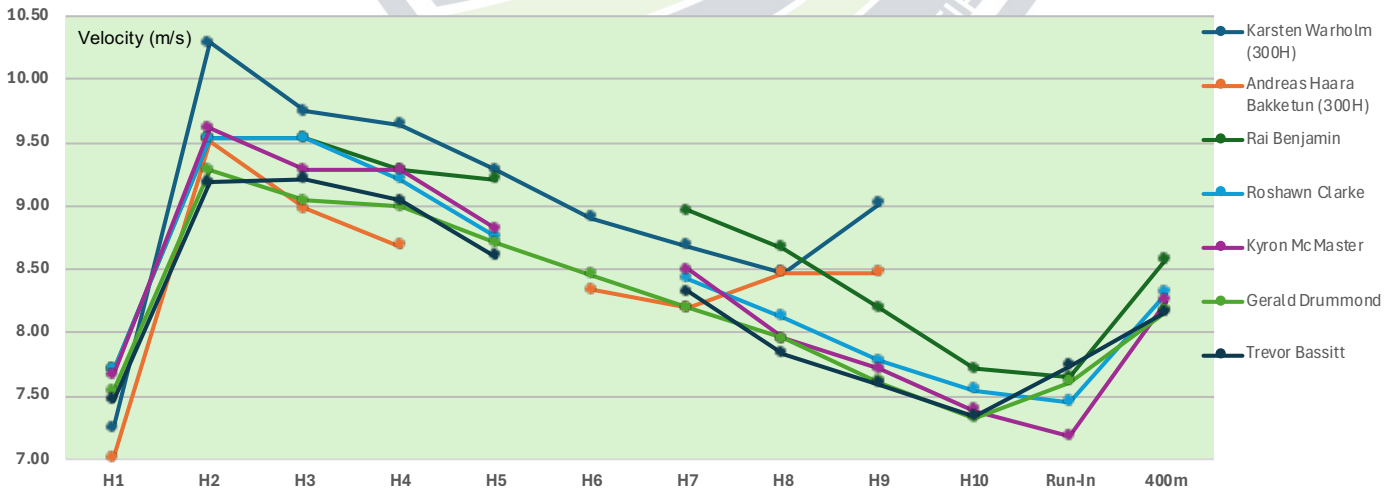
Biomechanical Analysis

2024 Trond Mohn Games (Bergen, NOR) (300m Hurdles) (TV Analysis)

Men's 400m Hurdles											FINAL			
Date 2024.05.22											Lane / Place	H1-H4	H4-H7	H7-H10
Warholm, Karsten (NOR) (1996)	time	H1	H2	H3	H4	H5	H6	H7	Run-In	300m	7 / 1			
	reaction time	6.21	9.61	13.20	16.83	20.60	24.53	28.56		33.28		10.62	11.73	
	interval velocity	7.25	3.40	3.59	3.63	3.77	3.93	4.03	4.72	9.01		9.89	8.95	
	H1 lead leg L	22	13	13	13	13	13	13	17	117				
Bakketun, Andreas Haara (NOR) (200)	time	H1	H2	H3	H4	H5	H6	H7	Run-In	300m	6 / 2			
	reaction time	6.42	10.10	14.00	18.03		26.43	30.70		35.42		11.61	12.67	
	interval velocity	7.01	3.68	3.90	4.03		8.40	4.27	4.72	PB		9.04	8.29	
	H1 lead leg R	24	13	14	14		8.33	8.20	8.47	8.47				

2024 USATF LA Grand Prix (Los Angeles, CA) (TV Analysis)

Men's 400m Hurdles														FINAL				
Date 2024.05.18														Lane / Place	H1-H4	H4-H7	H7-H10	
Benjamin, Rai (USA) (1997)	time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	5 / 1				
	reaction time	0.207	5.84	9.51	13.18	16.95	20.75	28.56	32.60	36.87	41.41		46.64		11.11	11.61	12.85	
	interval velocity	7.71	3.67	3.67	3.77	3.80		7.81	4.04	4.27	4.54	5.23	8.58		9.45	9.04	8.17	
	H1 lead leg R	20	13	13	13	13		8.96	8.66	8.20	7.71	7.65	8.58					
Clarke, Roshawn (JAM) (2004)	time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	6 / 2				
	reaction time	0.245	5.84	9.51	13.18	16.98	20.98	29.29	33.60	38.10	42.74		48.11		11.14	12.31	13.45	
	interval velocity	7.71	3.67	3.67	3.80	4.00		8.31	4.31	4.50	4.64	5.37	8.31		9.43	8.53	7.81	
	H1 lead leg R	21	13	13	13	14		8.42	8.12	7.78	7.54	7.45	8.31					
McMaster, Kyron (IVB) (1997)	time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	7 / 3				
	reaction time	0.220	5.87	9.51	13.28	17.05	21.02	29.26	33.66	38.20	42.94		48.51		11.18	12.21	13.68	
	interval velocity	7.67	3.64	3.77	3.77	3.97		8.24	4.40	4.54	4.74	5.57	8.25		9.39	8.60	7.68	
	H1 lead leg L	21	13	13	13	13		8.50	7.95	7.71	7.38	7.18	8.25					
Drummond, Gerald (CRC) (1994)	time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	1 / 4				
	reaction time	0.245	5.97	9.74	13.61	17.50	21.52	25.66	29.93	34.33	38.93	43.71		48.97		11.53	12.43	13.78
	interval velocity	7.54	3.77	3.87	3.89	4.02	4.14	4.27	4.40	4.60	4.78	5.26	8.17		9.11	8.45	7.62	
	H1 lead leg L	21	14	14	14	14	14	14	15	15	15	18	168					
Bassitt, Trevor (USA) (1998)	time	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	8 / 5				
	reaction time	0.218	6.03	9.84	13.64	17.51	21.58	29.99	34.46	39.07	43.84		49.01		11.48	12.48	13.85	
	interval velocity	7.46	3.81	3.80	3.87	4.07		8.41	4.47	4.61	4.77	5.17	8.16		9.15	8.41	7.58	
	H1 lead leg R	21	13	13	13	13		8.32	7.83	7.59	7.34	7.74	8.16					



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

USATF LA Grand Prix
 Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: Gun Flash
 Source: <https://www.youtube.com/watch?v=z8lrmw9lQPg>

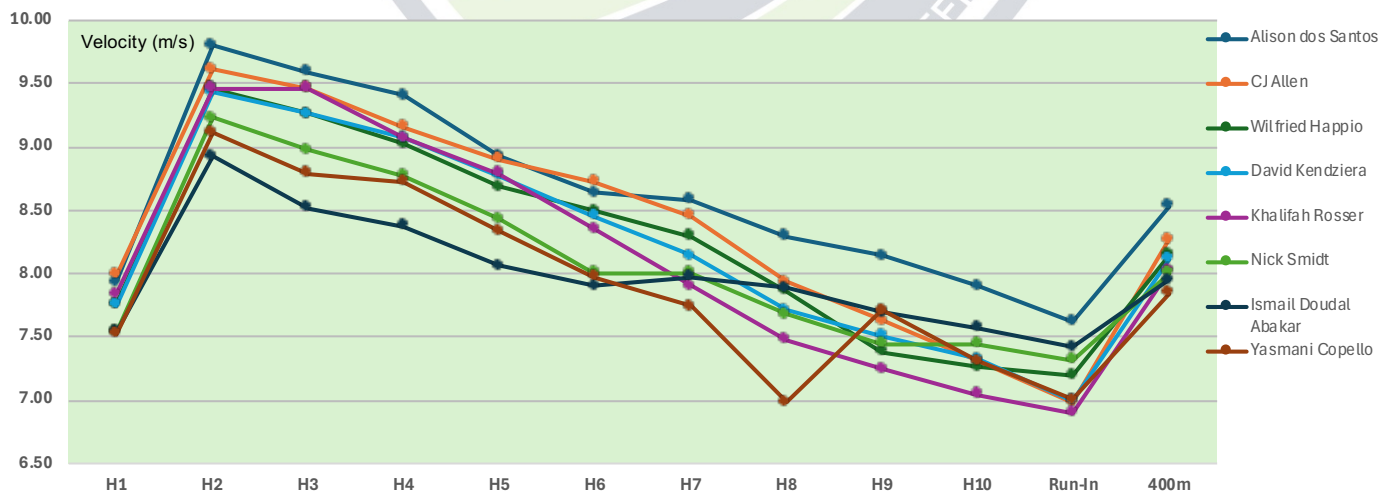
2024 Seahorse Doha Meeting (Doha, QAT)

Men's 400m Hurdles

Date 2024.05.10

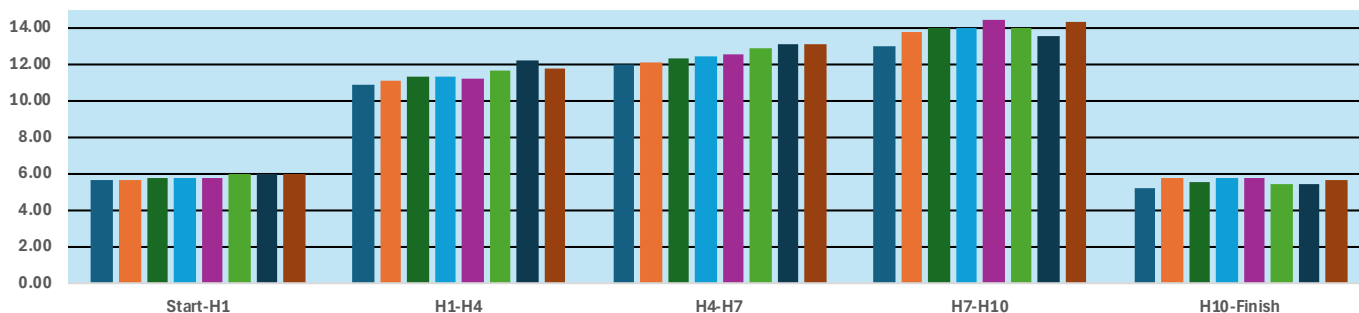
FINAL

		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	5.67	9.24	12.89	16.61	20.53	24.58	28.66	32.88	37.18	41.61		46.86	5 / 1			
	reaction time	0.148															
	interval		3.57	3.65	3.72	3.92	4.05	4.08	4.22	4.30	4.43	5.25			10.94	12.05	12.95
	velocity	7.94	9.80	9.59	9.41	8.93	8.64	8.58	8.29	8.14	7.90	7.62	8.54		9.60	8.71	8.11
H1 lead leg	L																
Allen, CJ (USA) (1995)	time	5.63	9.27	12.97	16.79	20.72	24.73	28.87	33.28	37.87	42.66		48.39	6 / 2			
	reaction time	0.139															
	interval		3.64	3.70	3.82	3.93	4.01	4.14	4.41	4.59	4.79	5.73			11.16	12.08	13.79
	velocity	7.99	9.62	9.46	9.16	8.91	8.73	8.45	7.94	7.63	7.31	6.98	8.27		9.41	8.69	7.61
H1 lead leg	L																
Happio, Wilfried (FRA) (1998)	time	5.80	9.50	13.28	17.16	21.19	25.31	29.53	33.98	38.72	43.54		49.10	4 / 3			
	reaction time	0.151															
	interval		3.70	3.78	3.88	4.03	4.12	4.22	4.45	4.74	4.82	5.56			11.36	12.37	14.01
	velocity	7.76	9.46	9.26	9.02	8.68	8.50	8.29	7.87	7.38	7.26	7.19	8.15		9.24	8.49	7.49
H1 lead leg	L																
Kenziera, David (USA) (1994)	time	5.81	9.52	13.30	17.16	21.15	25.29	29.59	34.13	38.79	43.57		49.29	8 / 4			
	reaction time	0.165															
	interval		3.71	3.78	3.86	3.99	4.14	4.30	4.54	4.66	4.78	5.72			11.35	12.43	13.98
	velocity	7.75	9.43	9.26	9.07	8.77	8.45	8.14	7.71	7.51	7.32	6.99	8.12		9.25	8.45	7.51
H1 lead leg	R																
Rosser, Khalifah (USA) (1995)	time	5.74	9.44	13.14	17.00	20.98	25.17	29.60	34.28	39.11	44.08		49.88	7 / 5			
	reaction time	0.153															
	interval		3.70	3.70	3.86	3.98	4.19	4.43	4.68	4.83	4.97	5.80			11.26	12.60	14.48
	velocity	7.84	9.46	9.46	9.07	8.79	8.35	7.90	7.48	7.25	7.04	6.90	8.02		9.33	8.33	7.25
H1 lead leg	R																
Smidt, Nick (NED) (1997)	time	5.97	9.76	13.66	17.65	21.80	26.17	30.54	35.10	39.80	44.50		49.97	1 / 6			
	reaction time	0.194															
	interval		3.79	3.90	3.99	4.15	4.37	4.37	4.56	4.70	4.70	5.47			11.68	12.89	13.96
	velocity	7.54	9.23	8.97	8.77	8.43	8.01	8.01	7.68	7.45	7.45	7.31	8.00		8.99	8.15	7.52
H1 lead leg	L																
Abakar, Ismail Doudai (QAT) (2004)	time	5.97	9.89	14.00	18.18	22.52	26.95	31.34	35.78	40.33	44.95		50.34	3 / 7			
	reaction time	0.167															
	interval		3.92	4.11	4.18	4.34	4.43	4.39	4.44	4.55	4.62	5.39			12.21	13.16	13.61
	velocity	7.54	8.93	8.52	8.37	8.06	7.90	7.97	7.88	7.69	7.58	7.42	7.95		8.60	7.98	7.71
H1 lead leg	L																
Copello, Yasmani (TUR) (1987)	time	5.98	9.82	13.80	17.81	22.01	26.40	30.92	35.93	40.47	45.26		50.97	2 / 8			
	reaction time	0.222															
	interval		3.84	3.98	4.01	4.20	4.39	4.52	5.01	4.54	4.79	5.71			11.83	13.11	14.34
	velocity	7.53	9.11	8.79	8.73	8.33	7.97	7.74	6.99	7.71	7.31	7.01	7.85		8.88	8.01	7.32
H1 lead leg	R																



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 10 May 2024 20:42) - diamond league race analysis
<https://www.omegatiming.com/File/0002040601010D0101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=ngkVbyr6G0g>

Women's 400m Hurdles

2024 Top 10 Times - Women's 400m Hurdles

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
McLaughlin-Levrone, Sydney (USA)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2024 Olympic Games (Paris, FRA)															Paris 2024 Olympc Games - Results Book (2024)			
date	8-Aug	time	5.91	9.79	13.81	17.86	22.02	26.29	30.72	35.24	39.89	44.71		50.37	5 / 1			
reaction time	0.139	interval		3.88	4.02	4.05	4.16	4.27	4.43	4.52	4.65	4.82	5.66	WR		11.95	12.86	13.99
		velocity	7.61	9.02	8.71	8.64	8.41	8.20	7.90	7.74	7.53	7.26	7.07	7.94		8.79	8.16	7.51
H1 lead leg	R	strides	22	14	14	14	14	14	14	15	15	15	19	170				
McLaughlin-Levrone, Sydney (USA)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2024 USA Olympic Trials (Eugene, OR)															USATF and Karmarush (2024) - USA Olympic trials results and race analysis			
date	30-Jun	time	6.08	9.99	14.05	18.19	22.45	26.89	31.44	36.12	40.79	45.44		50.65	5 / 1			
reaction time		interval		3.91	4.06	4.14	4.26	4.44	4.55	4.68	4.67	4.65	5.21	WR		12.11	13.25	14.00
		velocity	7.40	8.95	8.62	8.45	8.22	7.88	7.69	7.48	7.49	7.53	7.68	7.90		8.67	7.92	7.50
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	15	18	171				
Boi, Femke (NED) (2000)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
A FINAL - 2024 Resisprint International (La Chaux-de-Fonds, SUI) (TV Analysis)															Henson (2024) - Athlete First: 2024 year end hurdle report			
date	14-Jul	time	6.16	10.09	14.16	18.20	22.40	26.68	31.10	35.77	40.50	45.33		50.95	4 / 1			
reaction time		interval		3.93	4.07	4.04	4.20	4.28	4.42	4.67	4.73	4.83	5.62	AR		12.04	12.90	14.23
		velocity	7.31	8.91	8.60	8.66	8.33	8.18	7.92	7.49	7.40	7.25	7.12	7.85		8.72	8.14	7.38
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170				
Boi, 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 - 2024 London Athletics Meet (London, GBR)															Omega Timing (2024) - diamond league race analysis			
date	20-Jun	time	6.22	10.14	14.10	18.13	22.32	26.71	31.21	35.88	40.70	45.55		51.30	6 / 1			
reaction time	0.175	interval		3.92	3.96	4.03	4.19	4.39	4.50	4.67	4.82	4.85	5.75			11.91	13.08	14.34
		velocity	7.23	8.93	8.84	8.68	8.35	7.97	7.78	7.49	7.26	7.22	6.96	7.80		8.82	8.03	7.32
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170				
Cockrell, Anna (USA) (1997)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2024 Olympic Games (Paris, FRA)															Paris 2024 Olympc Games - Results Book (2024)			
date	8-Aug	time	6.10	9.98	13.94	18.09	22.40	26.72	31.28	35.96	40.84	45.84		51.87	7 / 2			
reaction time	0.158	interval		3.88	3.96	4.15	4.31	4.32	4.56	4.68	4.88	5.00	6.03	PB		11.99	13.19	14.56
		velocity	7.38	9.02	8.84	8.43	8.12	8.10	7.68	7.48	7.17	7.00	6.63	7.71		8.76	7.96	7.21
H1 lead leg	R	strides	22	13	14	14	14	14	14	15	15	15	19	169				
McLaughlin-Levrone, Sydney (USA)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
Semi-Final 2 - 2024 Olympic Games (Paris, FRA)															Paris 2024 Olympc Games - Results Book (2024)			
date	6-Aug	time	6.03	10.05	14.28	18.62	22.97	27.38	31.90	36.62	41.54	46.49		52.13	7 / 1			
reaction time	0.154	interval		4.02	4.23	4.34	4.35	4.41	4.52	4.72	4.92	4.95	5.64			12.59	13.28	14.59
		velocity	7.46	8.71	8.27	8.06	8.05	7.94	7.74	7.42	7.11	7.07	7.09	7.67		8.34	7.91	7.20
H1 lead leg	R	strides	22	14	15	15	14	14	14	15	16	15	18	172				
Boi, 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 - 2024 Kamila Skolimowska Memorial (Silesia, POL)															Omega Timing (2024) - diamond league race analysis			
date	25-Aug	time	6.28	10.30	14.38	18.63	23.00	27.47	32.14	36.93	41.81	46.67		52.13	6 / 1			
reaction time	0.158	interval		4.02	4.08	4.25	4.37	4.47	4.67	4.79	4.88	4.86	5.46			12.35	13.51	14.53
		velocity	7.17	8.71	8.58	8.24	8.01	7.83	7.49	7.31	7.17	7.20	7.33	7.67		8.50	7.77	7.23
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.2	169.2				
Boi, 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 - 2024 Olympic Games (Paris, FRA)															Paris 2024 Olympc Games - Results Book (2024)			
date	8-Aug	time	6.13	10.00	13.93	17.99	22.16	26.48	31.00	35.74	40.70	45.90		52.15	6 / 3			
reaction time	0.165	interval		3.87	3.93	4.06	4.17	4.32	4.52	4.74	4.96	5.20	6.25			11.86	13.01	14.90
		velocity	7.34	9.04	8.91	8.62	8.39	8.10	7.74	7.38	7.06	6.73	6.40	7.67		8.85	8.07	7.05
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	16	19	171				
Boi, 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 - 2024 Athletissima (Lausanne, SUI)															Omega Timing (2024) - diamond league race analysis			
date	22-Aug	time	6.25	10.30	14.42	18.61	22.92	27.40	31.98	36.72	41.55	46.53		52.25	5 / 1			
reaction time	0.182	interval		4.05	4.12	4.19	4.31	4.48	4.58	4.74	4.83	4.98	5.72			12.36	13.37	14.55
		velocity	7.20	8.64	8.50	8.35	8.12	7.81	7.64	7.38	7.25	7.03	6.99	7.66		8.50	7.85	7.22
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	18.7	169.7				
Jones, Jasmine (USA) (2001)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
FINAL - 2024 Olympic Games (Paris, FRA)															Paris 2024 Olympc Games - Results Book (2024)			
date	8-Aug	time	6.02	9.99	14.03	18.17	22.45	26.86	31.51	36.21	41.16	46.31		52.29	9 / 4			
reaction time	0.157	interval		3.97	4.04	4.14	4.28	4.41	4.65	4.70	4.95	5.15	5.98	PB		12.15	13.34	14.80
		velocity	7.48	8.82	8.66	8.45	8.18	7.94	7.53	7.45	7.07	6.80	6.69	7.65		8.64	7.87	7.09
H1 lead leg	R	strides	22	14	14	14	14	14	15	15	16	18.7	156.7					
McLaughlin-Levrone, Sydney (USA)		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane/Place	H1-H4	H4-H7	H7-H10	
Semi-Final 1 - 2024 USA Olympic Trials (Eugene, OR)															USATF and Karmarush (2024) - USA Olympic trials results and race analysis			
date	29-Jun	time	6.16	10.13	14.20	18.40	22.70	27.10	31.75	36.52	41.53	46.55		52.48	6 / 1			
reaction time		interval		3.97	4.07	4.20	4.30	4.40	4.65	4.77	5.01	5.02	5.93			12.24	13.35	14.80
		velocity	7.31	8.82	8.60	8.33	8.14	7.95	7.53	7.34	6.99	6.97	6.75	7.62		8.58	7.87	7.09
H1 lead leg	R	strides	22	14	14	14	14	15	15	15	15	16	18	172				
Boi, 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 - 2024 European Championships (Roma, ITA)															European Athletics (2024) - 2024 european athletics championships - results book			
date	11-Jun	time	6.40	10.38	14.48	18.66	22.98	27.43	32.08	36.92	41.91	46.91		52.49	6 / 1			
reaction time	0.180	interval		3.98	4.10	4.18	4.32	4.45	4.65	4.84	4.99	5.00	5.58	CR		12.26	13.42	14.83
		velocity	7.03	8.79	8.54	8.37	8.10	7.87	7.53	7.23	7.01	7.00	7.17	7.62		8.56	7.82	7.08
H1 lead leg	L	strides	22	14	14	14	14	14	14	15	15	15	19	170				

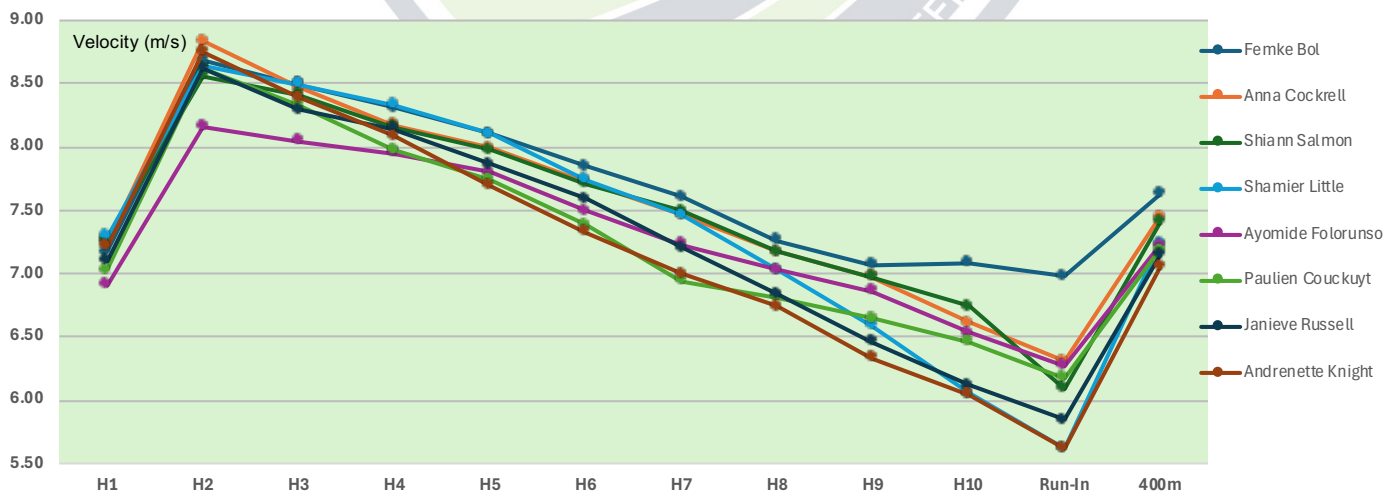
2024 Memorial van damme (Brussels, BEL)

Women's 400m Hurdles

Date 2024.09.14

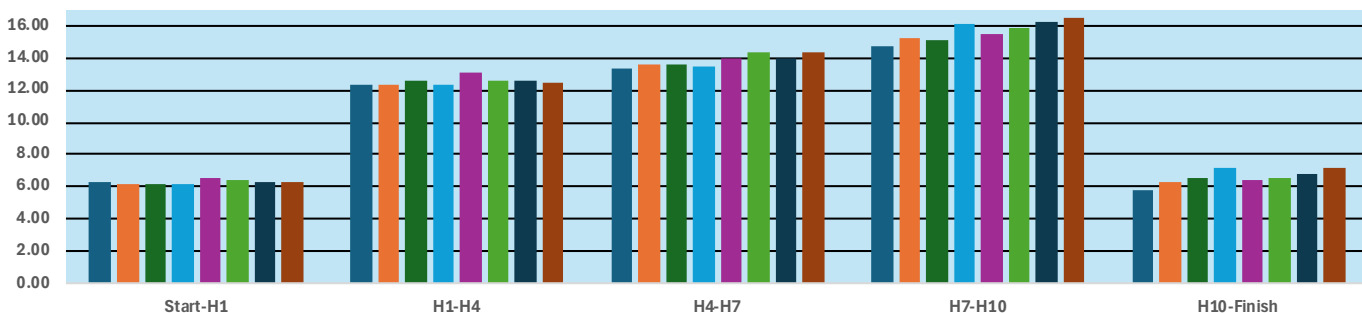
FINAL

		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	10.30	14.42	18.63	22.95	27.41	32.01	36.83	41.78	46.72	52.45	53.71	5 / 1			
	reaction time	0.213															
	interval		4.03	4.12	4.21	4.32	4.46	4.60	4.82	4.95	4.94	5.73			12.36	13.38	14.71
	velocity	7.18	8.68	8.50	8.31	8.10	7.85	7.61	7.26	7.07	7.09	6.98	7.63		8.50	7.85	7.14
H1 lead leg	L																
Cockrell, Anna (USA) (1997)	time	6.21	10.17	14.30	18.58	22.96	27.49	32.18	37.06	42.08	47.37	53.71	53.71	4 / 2			
	reaction time	0.168															
	interval		3.96	4.13	4.28	4.38	4.53	4.69	4.88	5.02	5.29	6.34			12.37	13.60	15.19
	velocity	7.25	8.84	8.47	8.18	7.99	7.73	7.46	7.17	6.97	6.62	6.31	7.45		8.49	7.72	6.91
H1 lead leg	L																
Salmon, Shiann (JAM) (1999)	time	6.19	10.28	14.44	18.73	23.12	27.66	32.33	37.21	42.23	47.42	53.99	53.99	7 / 3			
	reaction time	0.197															
	interval		4.09	4.16	4.29	4.39	4.54	4.67	4.88	5.02	5.19	6.57			12.54	13.60	15.09
	velocity	7.27	8.56	8.41	8.16	7.97	7.71	7.49	7.17	6.97	6.74	6.09	7.41		8.37	7.72	6.96
H1 lead leg	L																
Little, Shamier (USA) (1995)	time	6.17	10.22	14.34	18.54	22.86	27.38	32.07	37.05	42.36	48.14	55.26	55.26	6 / 4			
	reaction time	0.199															
	interval		4.05	4.12	4.20	4.32	4.52	4.69	4.98	5.31	5.78	7.12			12.37	13.53	16.07
	velocity	7.29	8.64	8.50	8.33	8.10	7.74	7.46	7.03	6.59	6.06	5.62	7.24		8.49	7.76	6.53
H1 lead leg	R																
Folorunso, Ayomide (ITA) (1996)	time	6.51	10.80	15.15	19.55	24.04	28.71	33.55	38.53	43.63	48.99	55.37	55.37	8 / 5			
	reaction time	0.204															
	interval		4.29	4.35	4.40	4.49	4.67	4.84	4.98	5.10	5.36	6.38			13.04	14.00	15.44
	velocity	6.91	8.16	8.05	7.95	7.80	7.49	7.23	7.03	6.86	6.53	6.27	7.22		8.05	7.50	6.80
H1 lead leg	R																
Couckuyt, Paulien (BEL) (1997)	time	6.40	10.46	14.66	19.05	23.57	28.31	33.35	38.49	43.76	49.18	55.66	55.66	1 / 6			
	reaction time	0.172															
	interval		4.06	4.20	4.39	4.42	4.54	4.74	5.04	5.14	5.42	6.48			12.65	14.30	15.83
	velocity	7.03	8.62	8.33	7.97	7.74	7.38	6.94	6.81	6.64	6.46	6.17	7.19		8.30	7.34	6.63
H1 lead leg	L																
Russell, Janieve (JAM) (1993)	time	6.34	10.40	14.62	18.92	23.37	27.98	32.84	37.96	43.38	49.10	55.94	55.94	3 / 7			
	reaction time	0.174															
	interval		4.06	4.22	4.30	4.45	4.61	4.86	5.12	5.42	5.72	6.84			12.58	13.92	16.26
	velocity	7.10	8.62	8.29	8.14	7.87	7.59	7.20	6.84	6.46	6.12	5.85	7.15		8.35	7.54	6.46
H1 lead leg	R																
Knight, Andrenette (JAM) (1996)	time	6.24	10.24	14.41	18.74	23.29	28.07	33.07	38.26	43.79	49.58	56.70	56.70	2 / 8			
	reaction time	0.165															
	interval		4.00	4.17	4.33	4.55	4.78	5.00	5.19	5.53	5.79	7.12			12.50	14.33	16.51
	velocity	7.21	8.75	8.39	8.08	7.69	7.32	7.00	6.74	6.33	6.04	5.62	7.05		8.40	7.33	6.36
H1 lead leg	R																



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 14 Sep 2024 21:55) - diamond league race analysis
<https://www.omegatiming.com/File/0002041201011A0101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=Cl8-iUBYIYo>

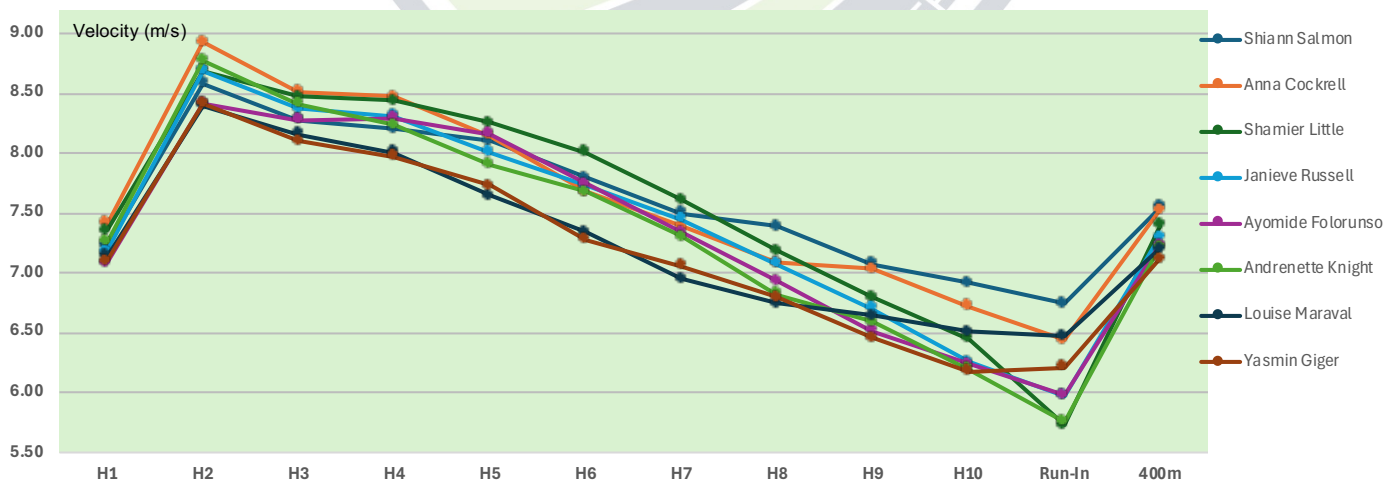
2024 Weltklasse (Züch, SUI)

Women's 400m Hurdles

Date 2024.09.05

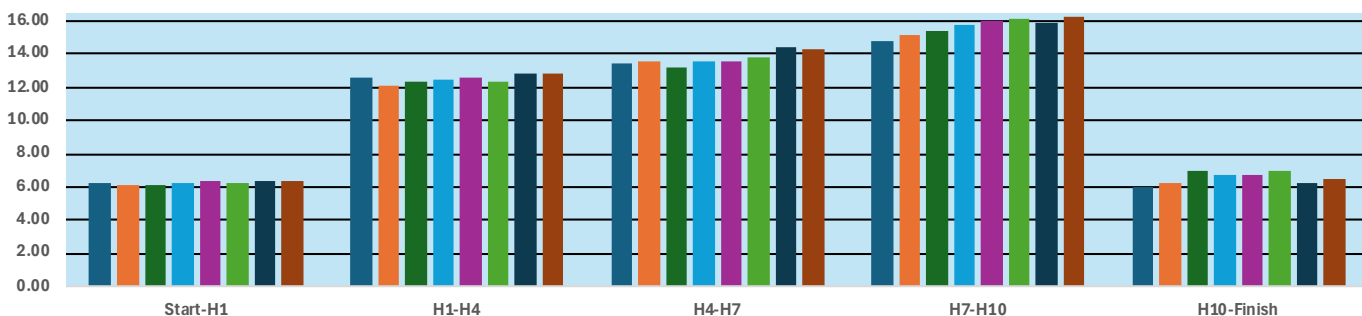
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Salmon, Shiann (JAM) (1999)	time	6.23	10.31	14.54	18.81	23.13	27.62	32.29	37.03	41.98	47.04	52.97	52.97	6 / 1			
	reaction time	0.176															
	interval		4.08	4.23	4.27	4.32	4.49	4.67	4.74	4.95	5.06	5.93	PB		12.58	13.48	14.75
	velocity	7.22	8.58	8.27	8.20	8.10	7.80	7.49	7.38	7.07	6.92	6.75	7.55		8.35	7.79	7.12
H1 lead leg	R		21	14	14	14	14	15	15	16	16	19.5	172.5				
Cockrell, Anna (USA) (1997)	time	6.07	9.99	14.10	18.23	22.53	27.09	31.83	36.77	41.75	46.96		53.17	4 / 2			
	reaction time	0.152															
	interval		3.92	4.11	4.13	4.30	4.56	4.74	4.94	4.98	5.21	6.21			12.16	13.60	15.13
	velocity	7.41	8.93	8.52	8.47	8.14	7.68	7.38	7.09	7.03	6.72	6.44	7.52		8.63	7.72	6.94
H1 lead leg	L		21	13	13	13	14	14	15	15	15	20	167				
Little, Shamier (USA) (1995)	time	6.12	10.15	14.28	18.43	22.67	27.04	31.64	36.51	41.66	47.09		54.07	5 / 3			
	reaction time	0.174															
	interval		4.03	4.13	4.15	4.24	4.37	4.60	4.87	5.15	5.43	6.98			12.31	13.21	15.45
	velocity	7.35	8.68	8.47	8.43	8.25	8.01	7.61	7.19	6.80	6.45	5.73	7.40		8.53	7.95	6.80
H1 lead leg	R		23	15	15	15	15	15	16	16	17	20.2	182.2				
Russell, Janieve (JAM) (1993)	time	6.26	10.29	14.47	18.68	23.05	27.58	32.28	37.23	42.45	48.05		54.75	7 / 4			
	reaction time	0.185															
	interval		4.03	4.18	4.21	4.37	4.53	4.70	4.95	5.22	5.60	6.70			12.42	13.60	15.77
	velocity	7.19	8.68	8.37	8.31	8.01	7.73	7.45	7.07	6.70	6.25	5.97	7.31		8.45	7.72	6.66
H1 lead leg	R		23	15	15	15	15	16	16	17	17	20	184				
Folorunso, Ayomide (ITA) (1996)	time	6.35	10.51	14.74	18.96	23.25	27.77	32.54	37.59	42.96	48.57		55.26	2 / 5			
	reaction time	0.205															
	interval		4.16	4.23	4.22	4.29	4.52	4.77	5.05	5.37	5.61	6.69			12.61	13.58	16.03
	velocity	7.09	8.41	8.27	8.29	8.16	7.74	7.34	6.93	6.52	6.24	5.98	7.24		8.33	7.73	6.55
H1 lead leg	R		23	15	15	15	16	16	16	18	21	124					
Knight, Andrenette (JAM) (1996)	time	6.20	10.19	14.35	18.60	23.03	27.59	32.38	37.51	42.82	48.47		55.42	3 / 6			
	reaction time	0.176															
	interval		3.99	4.16	4.25	4.43	4.56	4.79	5.13	5.31	5.65	6.95			12.40	13.78	16.09
	velocity	7.26	8.77	8.41	8.24	7.90	7.68	7.31	6.82	6.59	6.19	5.76	7.22		8.47	7.62	6.53
H1 lead leg	R		22	15	15	15	15	15	16	16	17	20	151				
Maraval, Louise (FRA) (2001)	time	6.30	10.47	14.76	19.13	23.71	28.48	33.52	38.71	43.98	49.36		55.54	8 / 7			
	reaction time	0.145															
	interval		4.17	4.29	4.37	4.58	4.77	5.04	5.19	5.27	5.38	6.18			12.83	14.39	15.84
	velocity	7.14	8.39	8.16	8.01	7.64	7.34	6.94	6.74	6.64	6.51	6.47	7.20		8.18	7.30	6.63
H1 lead leg	R		23	15	15	15	15	16	16	17	20	152					
Giger, Yasmin (SUI) (1999)	time	6.34	10.50	14.82	19.21	23.74	28.55	33.51	38.66	44.08	49.75		56.19	1 / 8			
	reaction time	0.155															
	interval		4.16	4.32	4.39	4.53	4.81	4.96	5.15	5.42	5.67	6.44			12.87	14.30	16.24
	velocity	7.10	8.41	8.10	7.97	7.73	7.28	7.06	6.80	6.46	6.17	6.21	7.12		8.16	7.34	6.47
H1 lead leg	R		23	15	15	15	16	16	16	17	18	20	140				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 5 Sep 2024 21:14) - diamond league race analysis
<https://www.omegatiming.com/File/000204110101090101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=9SEifrmc7JA>

Biomechanical Analysis

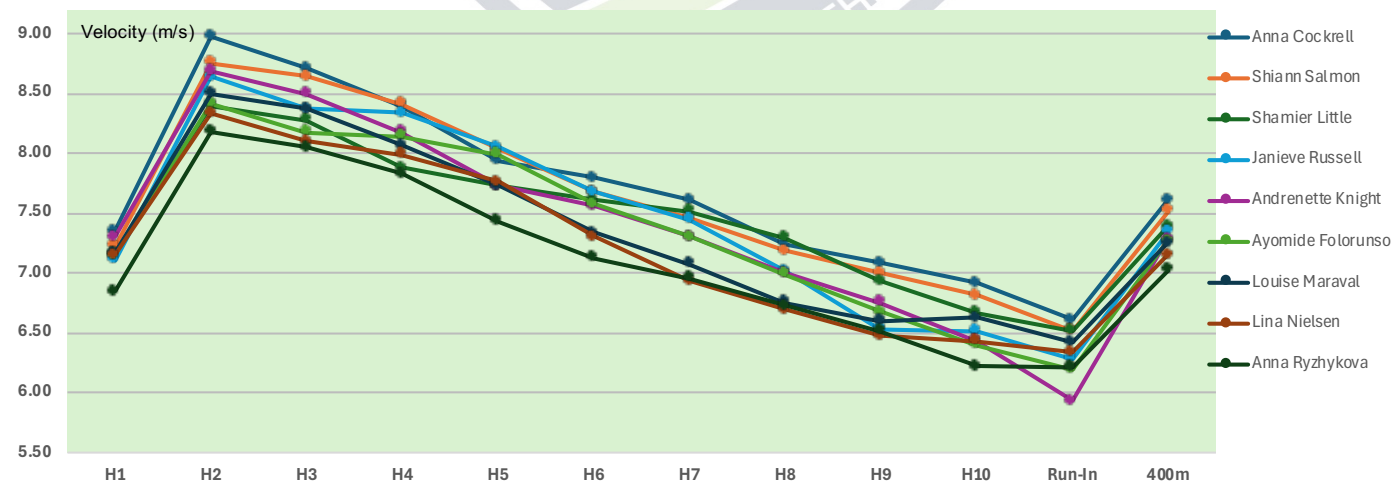
2024 Golden Gala • Pietro Mennea (Roma, ITA)

Women's 400m Hurdles

Date 2024.08.30

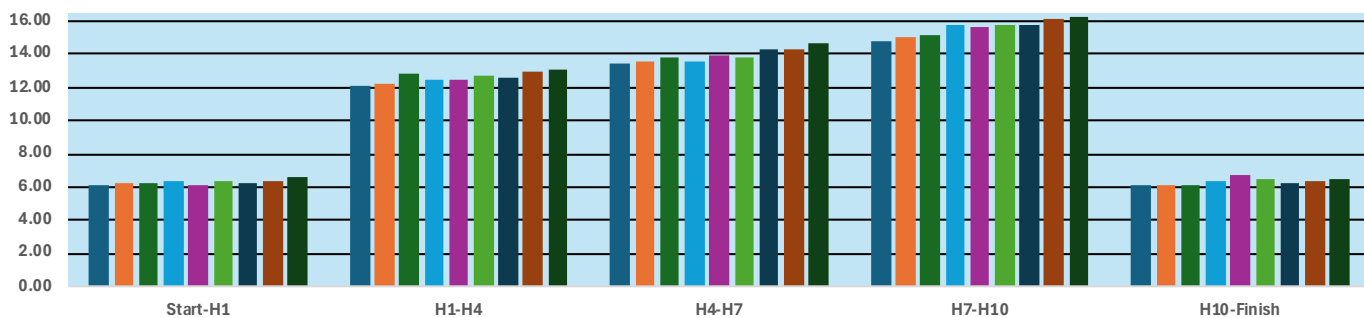
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10	
Cockrell, Anna (USA) (1997)	time	6.12	10.02	14.04	18.21	22.62	27.11	31.71	36.54	41.48	46.54		52.59	4 / 1				
	reaction time	0.161	interval	3.90	4.02	4.17	4.41	4.49	4.60	4.83	4.94	6.05			12.09	13.50	14.83	
	H1 lead leg	L	velocity	7.35	8.97	8.71	8.39	7.94	7.80	7.61	7.09	6.92	6.61	7.61		8.68	7.78	7.08
		strides	22	13		14	14	14	15	15	15	19	141					
Salmon, Shiann (JAM) (1999)	time	6.23	10.23	14.28	18.44	22.80	27.36	32.05	36.92	41.92	47.06		53.20	5 / 2				
	reaction time	0.200	interval	4.00	4.05	4.16	4.36	4.56	4.69	4.87	5.00	6.14			12.21	13.61	15.01	
	H1 lead leg	L	velocity	7.22	8.75	8.64	8.41	8.03	7.68	7.46	7.19	7.00	6.81	7.52		8.60	7.71	7.00
		strides	22	14		14	15	15	16	16	16	19.5	147.5					
Little, Shamier (USA) (1995)	time	6.28	10.45	14.68	19.12	23.65	28.25	32.91	37.71	42.76	48.01		54.15	8 / 3				
	reaction time	0.234	interval	4.17	4.23	4.44	4.53	4.60	4.66	4.80	5.05	6.14			12.84	13.79	15.10	
	H1 lead leg	R	velocity	7.17	8.39	8.27	7.88	7.73	7.61	7.51	7.29	6.93	6.67	7.39		8.18	7.61	6.95
		strides	23	15	14	14	15	15	15	16	16	19	162					
Russell, Janieve (JAM) (1993)	time	6.33	10.38	14.56	18.76	23.11	27.67	32.37	37.36	42.72	48.09		54.46	3 / 4				
	reaction time	0.182	interval	4.05	4.18	4.20	4.35	4.56	4.70	4.99	5.36	6.37			12.43	13.61	15.72	
	H1 lead leg	R	velocity	7.11	8.64	8.37	8.33	8.05	7.68	7.45	7.01	6.53	6.52	7.34		8.45	7.71	6.68
		strides	23	15		15	15	16	17	16	17	19.7	153.7					
Knight, Andrenette (JAM) (1996)	time	6.16	10.19	14.31	18.59	23.12	27.75	32.54	37.54	42.72	48.16		54.90	7 / 5				
	reaction time	0.176	interval	4.03	4.12	4.28	4.38	4.62	4.79	5.00	5.18	5.44	6.74		12.43	13.95	15.62	
	H1 lead leg	R	velocity	7.31	8.68	8.50	8.18	7.73	7.56	7.31	7.00	6.76	6.43	5.93	7.29		8.45	7.53
		strides	22	15	15	15	15	15	16	17	17	147						
Folorunso, Ayomide (ITA) (1996)	time	6.29	10.45	14.73	19.03	23.41	28.03	32.82	37.83	43.07	48.54		55.00	2 / 6				
	reaction time	0.168	interval	4.16	4.28	4.30	4.38	4.62	4.79	5.01	5.24	5.47	6.46		12.74	13.79	15.72	
	H1 lead leg	R	velocity	7.15	8.41	8.18	8.14	7.99	7.58	7.31	6.99	6.68	6.40	6.19	7.27		8.24	7.61
		strides	23	15		15	16	16	16	16	17	134						
Maraval, Louise (FRA) (2001)	time	6.28	10.40	14.58	18.92	23.45	28.22	33.17	38.35	43.65	48.93		55.16	6 / 7				
	reaction time	0.150	interval	4.12	4.18	4.34	4.53	4.77	4.95	5.18	5.30	5.28	6.23		12.64	14.25	15.76	
	H1 lead leg	R	velocity	7.17	8.50	8.37	8.06	7.73	7.34	7.07	6.76	6.60	6.63	6.42	7.25		8.31	7.37
		strides	23	15		15	16	16	17	17	119							
Nielsen, Lina (GBR) (1996)	time	6.29	10.49	14.81	19.19	23.70	28.49	33.54	38.77	44.18	49.62		55.93	1 / 8				
	reaction time	0.140	interval	4.20	4.32	4.38	4.51	4.79	5.05	5.23	5.41	5.44	6.31		12.90	14.35	16.08	
	H1 lead leg	L	velocity	7.15	8.33	8.10	7.99	7.76	7.31	6.93	6.69	6.43	6.34	7.15		8.14	7.32	6.53
		strides	22	15		15	16	16	16	16	17	117						
Ryzykova, Anna (UKR) (1989)	time	6.57	10.85	15.20	19.67	24.38	29.29	34.32	39.52	44.89	50.52		56.96	9 / 9				
	reaction time	0.221	interval	4.28	4.35	4.47	4.71	4.91	5.03	5.20	5.37	6.44			13.10	14.65	16.20	
	H1 lead leg	R	velocity	6.85	8.18	8.05	7.83	7.43	7.13	6.96	6.73	6.52	6.22	6.21	7.02		8.02	7.17
		strides	21	14	14	14	15	15	15	15	123							



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Fri 30 Aug 2024 22:34) - diamond league race analysis

<https://www.omegatiming.com/File/000204100103070101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=PJAKc9ns9pw>

Biomechanical Analysis

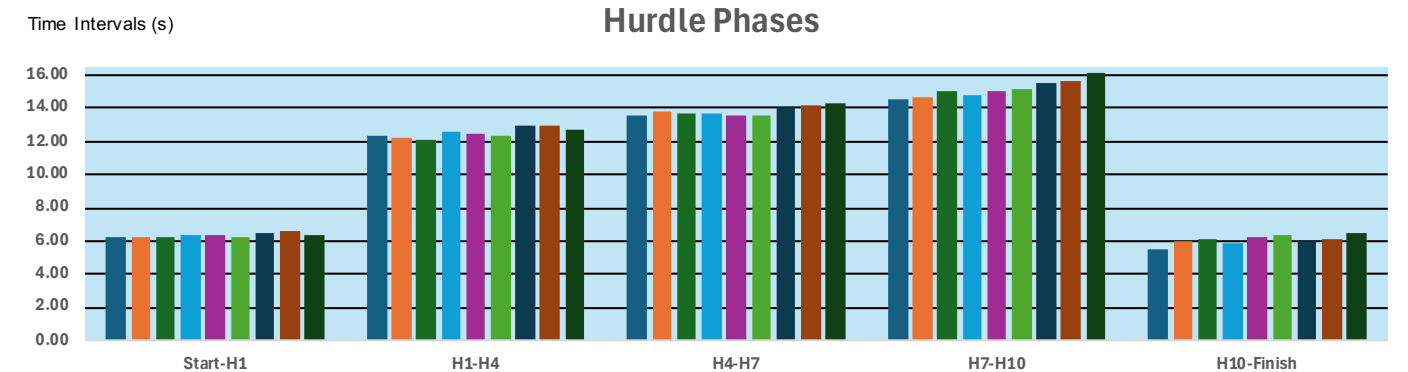
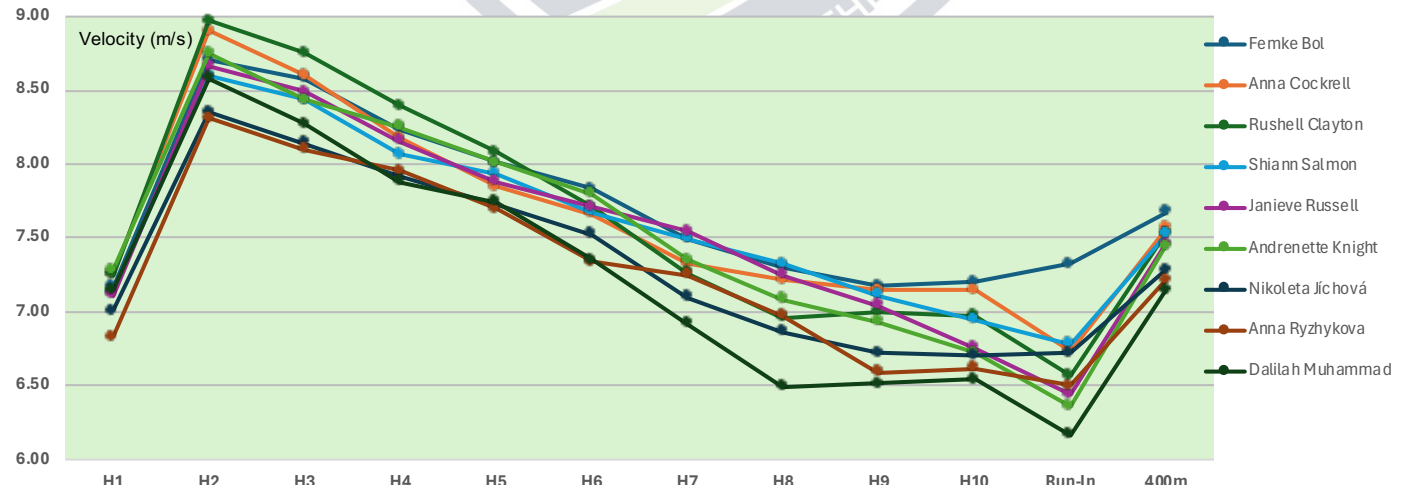
2024 Kamila Skolimowska Memorial (Silesia, POL)

Women's 400m Hurdles

Date 2024.08.25

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	6.28	10.30	14.38	18.63	23.00	27.47	32.14	36.93	41.81	46.67		52.13	6 / 1			
	reaction time	0.158													12.35	13.51	14.53
	H1 lead leg	L	interval velocity strides	7.17 8.71 22	4.02 8.58 14	4.08 8.24 14	4.25 8.01 14	4.37 7.83 14	4.47 7.49 14	4.67 7.31 15	4.79 7.17 15	4.88 7.20 15	4.86 7.33 18.2	5.46 7.67 169.2		8.50	7.77
Cockrell, Anna (USA) (1997)	time	6.20	10.13	14.20	18.48	22.94	27.51	32.29	37.14	42.04	46.94		52.88	5 / 2			
	reaction time	0.167													12.28	13.81	14.65
	H1 lead leg	L	interval velocity strides	7.26 8.91 22	4.07 8.60 13	4.15 8.18 13	4.24 7.85 14	4.37 7.66 14	4.49 7.32 14	4.64 7.22 15	4.83 7.14 15	4.90 7.14 15	5.94 7.56 19	6.73 7.56 168		8.55	7.60
Clayton, Rushell (JAM) (1992)	time	6.21	10.11	14.11	18.28	22.61	27.15	31.97	37.00	42.00	47.02		53.11	7 / 3			
	reaction time	0.131													12.07	13.69	15.05
	H1 lead leg	L	interval velocity strides	7.25 8.97 22	4.00 8.75 14	4.17 8.39 14	4.33 8.08 14	4.54 7.71 15	4.82 7.26 15	5.03 6.96 16	5.00 7.00 16	5.02 6.97 16	6.09 6.57 19	7.53 7.53 175		8.70	7.67
Salmon, Shiann (JAM) (1999)	time	6.31	10.38	14.53	18.87	23.28	27.84	32.51	37.29	42.21	47.25		53.15	8 / 4			
	reaction time	0.229													12.56	13.64	14.74
	H1 lead leg	L	interval velocity strides	7.13 8.60 22	4.07 8.43 14	4.15 8.06 14	4.41 7.94 14	4.56 7.68 15	4.67 7.49 15	4.78 7.32 16	4.92 7.11 16	5.04 6.94 16	5.90 6.78 19	7.53 7.53 175		8.36	7.70
Russell, Janieve (JAM) (1993)	time	6.33	10.37	14.49	18.78	23.22	27.76	32.40	37.23	42.20	47.38		53.59	4 / 5			
	reaction time	0.160													12.45	13.62	14.98
	H1 lead leg	R	interval velocity strides	7.11 8.66 23	4.04 8.50 15	4.12 8.16 15	4.29 7.88 15	4.44 7.71 16	4.54 7.54 16	4.64 7.25 16	4.83 7.04 17	4.97 6.76 17	5.18 6.44 19.7	6.21 7.46 184.7		8.43	7.71
Knight, Andrenette (JAM) (1996)	time	6.18	10.18	14.33	18.57	22.94	27.43	32.19	37.13	42.18	47.39		53.68	3 / 6			
	reaction time	0.166													12.39	13.62	15.20
	H1 lead leg	R	interval velocity strides	7.28 8.75 22	4.00 8.43 15	4.15 8.25 15	4.24 8.01 15	4.37 7.80 15	4.49 7.35 16	4.76 7.09 16	4.94 6.93 16	5.05 6.72 16	5.21 6.36 20	6.29 7.45 181		8.47	7.71
Jíchová, Nikoleta (CZE) (2000)	time	6.42	10.61	14.91	19.33	23.86	28.51	33.44	38.54	43.75	48.97		54.92	1 / 7			
	reaction time	0.169													12.91	14.11	15.53
	H1 lead leg	R	interval velocity strides	7.01 8.35 22	4.19 8.14 15	4.30 7.92 15	4.42 7.73 15	4.53 7.53 15	4.65 7.10 16	4.93 6.86 16	5.10 6.72 16	5.21 6.70 16	5.95 6.72 98	7.28 7.28 98		8.13	7.44
Ryzhykova, Anna (UKR) (1989)	time	6.59	10.80	15.12	19.52	24.07	28.84	33.67	38.69	44.00	49.29		55.44	2 / 8			
	reaction time	0.188													12.93	14.15	15.62
	H1 lead leg	R	interval velocity strides	6.83 8.31 21	4.21 8.10 14	4.32 7.95 14	4.40 7.69 14	4.55 7.34 14	4.77 7.25 14	4.83 6.97 16	5.02 6.59 16	5.31 6.62 16	5.29 6.50 16	6.15 7.22 79		8.12	7.42
Muhammad, Dalilah (USA) (1990)	time	6.30	10.38	14.61	19.05	23.57	28.33	33.39	38.78	44.15	49.50		55.99	9 / 9			
	reaction time	0.163													12.75	14.34	16.11
	H1 lead leg	R	interval velocity strides	7.14 8.58 22	4.08 8.27 14	4.23 7.88 14	4.44 7.74 15	4.52 7.35 15	4.76 6.92 15	5.06 6.49 16	5.39 6.52 16	5.37 6.54 16	5.35 6.16 142	6.49 7.14 142		8.24	7.32



Source: Omega Timing (Sun 25 Aug 2024 16:08) - diamond league race analysis
<https://www.omegatiming.com/File/0002040E0102060101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=7bzFUws3BSA>

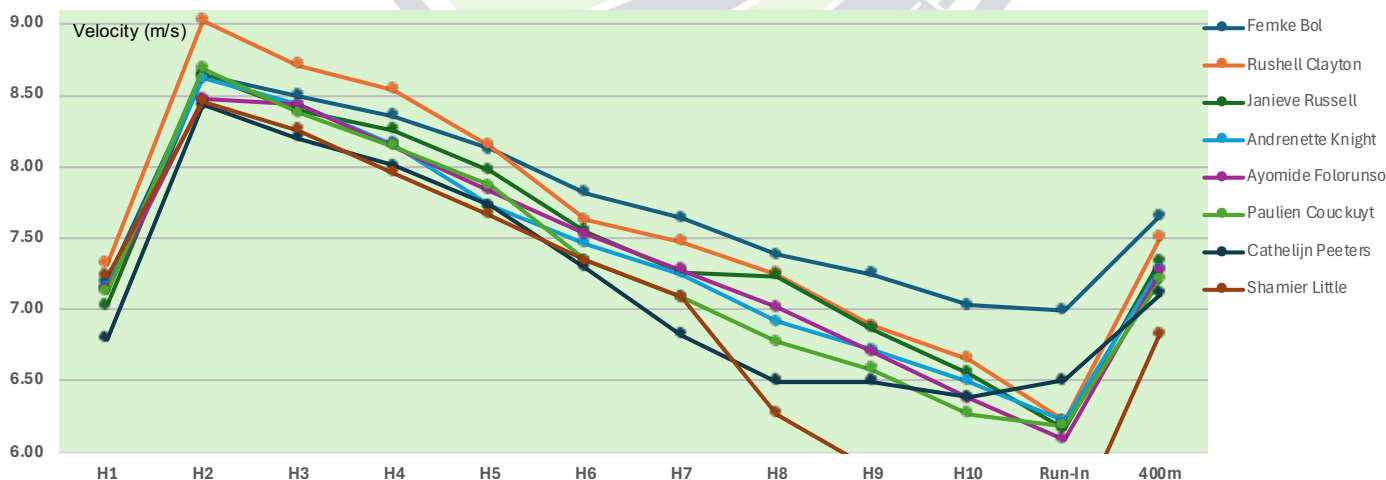
2024 Athletissima (Lausanne, SUI)

Women's 400m Hurdles

Date 2024.08.22

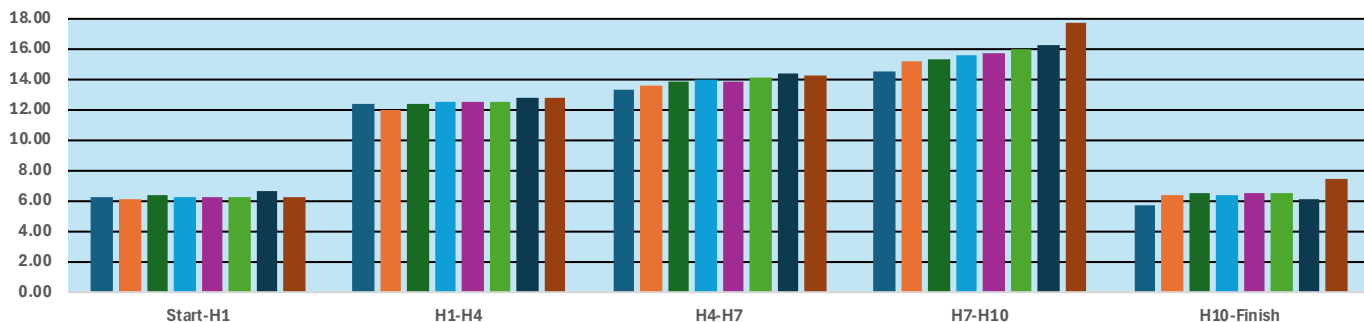
FINAL

		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	10.30	14.42	18.61	22.92	27.40	31.98	36.72	41.55	46.53	52.25	52.25	5 / 1			
	reaction time	0.182	interval	4.05	4.12	4.19	4.31	4.48	4.58	4.74	4.83	4.98	5.72		12.36	13.37	14.55
	H1 lead leg	L	velocity	7.20	8.64	8.50	8.35	8.12	7.64	7.38	7.25	7.03	6.99	7.66		8.50	7.85
			strides	22	14	14	14	14	15	15	15	18.7	169.7				
Clayton, Rushell (JAM) (1992)	time	6.15	10.03	14.05	18.15	22.45	27.04	31.72	36.55	41.63	46.89	53.32	53.32	4 / 2			
	reaction time	0.159	interval	3.88	4.02	4.10	4.30	4.59	4.68	4.83	5.08	6.43			12.00	13.57	15.17
	H1 lead leg	L	velocity	7.32	9.02	8.71	8.54	8.14	7.63	7.48	7.25	6.89	6.65	6.22		8.75	7.74
			strides	22	14	14	14	15	15	15	16	16	19	174			
Russell, Janieve (JAM) (1993)	time	6.40	10.45	14.62	18.86	23.25	27.89	32.71	37.55	42.65	47.99	54.48	54.48	3 / 3			
	reaction time	0.180	interval	4.05	4.17	4.24	4.39	4.64	4.82	4.84	5.10	6.49			12.46	13.85	15.28
	H1 lead leg	R	velocity	7.03	8.64	8.39	8.25	7.97	7.54	7.26	7.23	6.86	6.55	6.16		8.43	7.58
			strides	23	15	15	15	15	16	16	17	20	152				
Knight, Andrenette (JAM) (1996)	time	6.29	10.35	14.50	18.79	23.32	28.01	32.84	37.90	43.11	48.50	54.93	54.93	7 / 4			
	reaction time	0.182	interval	4.06	4.15	4.29	4.53	4.69	4.83	5.06	5.21	6.43			12.50	14.05	15.66
	H1 lead leg	L	velocity	7.15	8.62	8.43	8.16	7.73	7.46	7.25	6.92	6.72	6.49	6.22		8.40	7.47
			strides	22	14	14	14	15	15	16	16	16	19.5	176.5			
Folorunso, Ayomide (ITA) (1996)	time	6.30	10.43	14.58	18.88	23.35	28.00	32.81	37.80	43.02	48.51	55.08	55.08	8 / 5			
	reaction time	0.203	interval	4.13	4.15	4.30	4.47	4.65	4.81	4.99	5.22	6.57			12.58	13.93	15.70
	H1 lead leg	R	velocity	7.14	8.47	8.43	8.14	7.83	7.53	7.28	7.01	6.70	6.38	6.09		8.35	7.54
			strides	23	15	15	15	15	16	16	16	17	21	185			
Couckuyt, Paulien (BEL) (1997)	time	6.32	10.35	14.53	18.83	23.28	28.05	32.99	38.16	43.48	49.06	55.53	55.53	1 / 6			
	reaction time	0.193	interval	4.03	4.18	4.30	4.45	4.77	4.94	5.17	5.32	6.47			12.51	14.16	16.07
	H1 lead leg	L	velocity	7.12	8.68	8.37	8.14	7.87	7.34	7.09	6.77	6.58	6.27	6.18		8.39	7.42
			strides	23	15	15	15	15	16	17	17	21.5	154.5				
Peeters, Cathelijn (NED) (1996)	time	6.62	10.77	15.04	19.41	23.94	28.74	33.87	39.26	44.65	50.13	56.28	56.28	2 / 7			
	reaction time	0.244	interval	4.15	4.27	4.37	4.53	4.80	5.13	5.39	5.39	6.15			12.79	14.46	16.26
	H1 lead leg	R	velocity	6.80	8.43	8.20	8.01	7.73	7.29	6.82	6.49	6.49	6.39	6.50		8.21	7.26
			strides	23	15	15	15	15	17	17	17	17	134				
Little, Shamier (USA) (1995)	time	6.22	10.36	14.60	19.00	23.57	28.34	33.28	38.86	44.81	51.08	58.57	58.57	6 / 8			
	reaction time	0.203	interval	4.14	4.24	4.40	4.57	4.77	4.94	5.58	5.95	7.49			12.78	14.28	17.80
	H1 lead leg	R	velocity	7.23	8.45	8.25	7.95	7.66	7.34	7.09	6.27	5.88	5.58	5.34		8.22	7.35
			strides	23	15	15	15	15	17	18	18	18	136				



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Thu 22 Aug 2024 21:39) - diamond league race analysis

<https://www.omegatiming.com/File/0002040E01020D0101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=cjXbp4TjEoQ>

Biomechanical Analysis

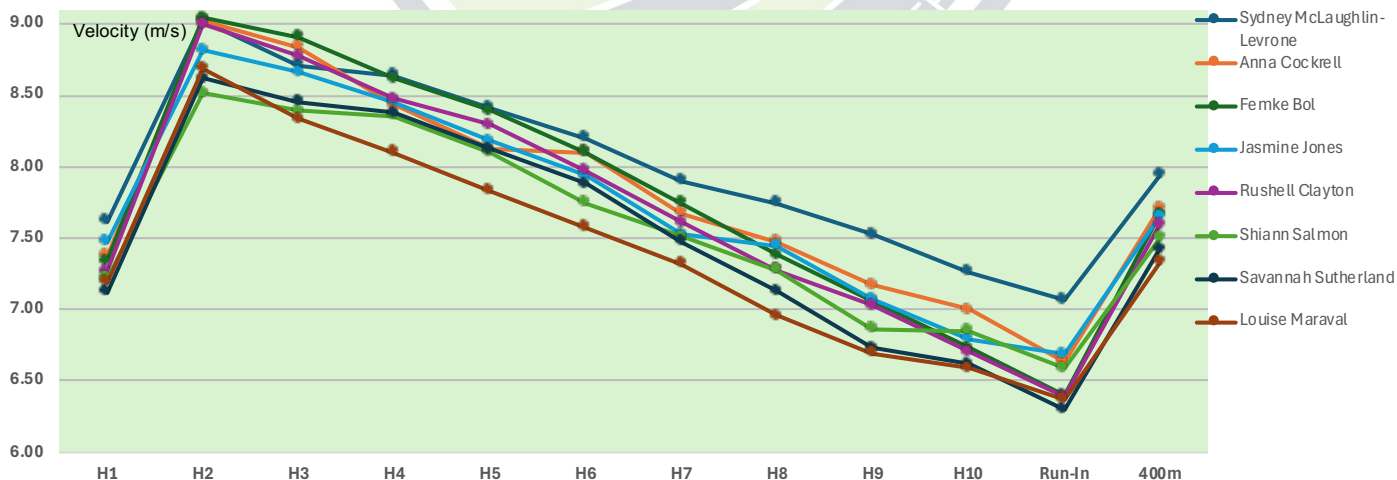
2024 Olympic Games (Paris, FRA)

Women's 400m Hurdles

Date 2024.08.08

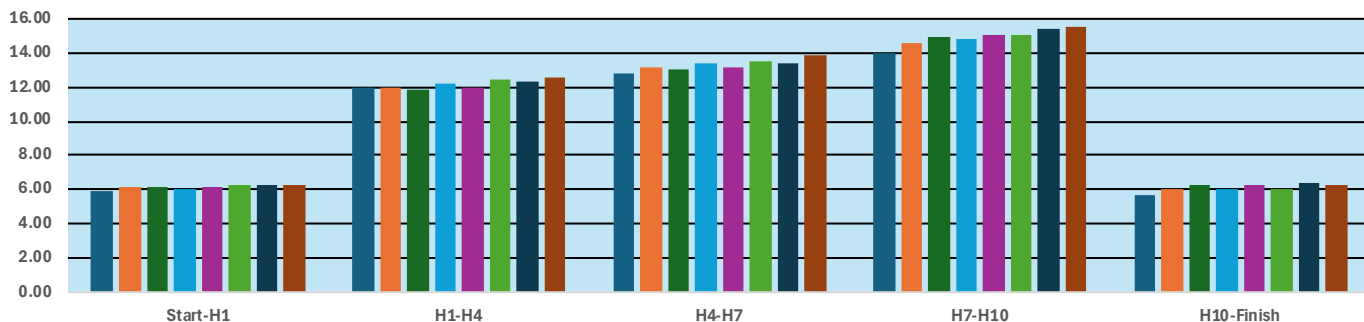
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin-Levrone, Sydney (USA)	(time)	5.91	9.79	13.81	17.86	22.02	26.29	30.72	35.24	39.89	44.71		50.37	5 / 1			
	reaction time	0.139															
	interval velocity	7.61	3.88	4.02	4.05	4.16	4.27	4.43	4.52	4.65	4.82	5.66	WR		11.95	12.86	13.99
H1 lead leg	R														8.79	8.16	7.51
Cockrell, Anna (USA) (1997)	time	6.10	9.98	13.94	18.09	22.40	26.72	31.28	35.96	40.84	45.84		51.87	7 / 2			
	reaction time	0.158															
	interval velocity	7.38	3.88	3.96	4.15	4.31	4.32	4.56	4.68	4.88	5.00	6.03	PB		11.99	13.19	14.56
H1 lead leg	R														8.76	7.96	7.21
Bol, Femke (NED) (2000)	time	6.13	10.00	13.93	17.99	22.16	26.48	31.00	35.74	40.70	45.90		52.15	6 / 3			
	reaction time	0.165															
	interval velocity	7.34	3.87	3.93	4.06	4.17	4.32	4.52	4.74	4.96	5.20	6.25			11.86	13.01	14.90
H1 lead leg	L														8.85	8.07	7.05
Jones, Jasmine (USA) (2001)	time	6.02	9.99	14.03	18.17	22.45	26.86	31.51	36.21	41.16	46.31		52.29	9 / 4			
	reaction time	0.157															
	interval velocity	7.48	3.97	4.04	4.14	4.28	4.41	4.65	4.70	4.95	5.15	5.98	PB		12.15	13.34	14.80
H1 lead leg	R														8.64	7.87	7.09
Clayton, Rushell (JAM) (1992)	time	6.19	10.08	14.07	18.20	22.42	26.81	31.41	36.22	41.20	46.42		52.68	8 / 5			
	reaction time	0.142															
	interval velocity	7.27	3.89	3.99	4.13	4.22	4.39	4.60	4.81	4.98	5.22	6.26			12.01	13.21	15.01
H1 lead leg	L														8.74	7.95	7.00
Salmon, Shiann (JAM) (1999)	time	6.23	10.34	14.51	18.70	23.02	27.54	32.20	37.01	42.11	47.22		53.29	2 / 6			
	reaction time	0.207															
	interval velocity	7.22	4.11	4.17	4.19	4.32	4.52	4.66	4.81	5.10	5.11	6.07			12.47	13.50	15.02
H1 lead leg	L														8.42	7.78	6.99
Sutherland, Savannah (CAN) (2003)	time	6.32	10.38	14.52	18.70	23.01	27.45	32.13	37.04	42.24	47.53		53.88	3 / 7			
	reaction time	0.157															
	interval velocity	7.12	4.06	4.14	4.18	4.31	4.44	4.68	4.91	5.20	5.29	6.35			12.38	13.43	15.40
H1 lead leg	R														8.48	7.82	6.82
Maraval, Louise (FRA) (2001)	time	6.26	10.29	14.49	18.81	23.28	27.90	32.68	37.71	42.94	48.25		54.53	4 / 8			
	reaction time	0.166															
	interval velocity	7.19	4.03	4.20	4.32	4.47	4.62	4.78	5.03	5.23	5.31	6.28			12.55	13.87	15.57
H1 lead leg	R														8.37	7.57	6.74



Time Intervals (s)

Hurdle Phases



Source: Paris 2024 Olympic Games - Results Book (2024). p. 565

https://olympics.com/OG2024/pdf/OG2024_ATH_B99_ATH-----pdf

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

2024 Olympic Games (Paris, FRA)

Women's 400m Hurdles

Date 2024.08.06

Semi-Final 3

		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	6.24	10.18	14.24	18.35	22.61	27.03	31.64	36.50	41.55	46.62		52.57	6 / 1			
	reaction time	0.194															
	interval velocity	7.21	8.88	8.62	8.52	8.22	7.92	7.59	7.26	6.93	6.90	6.72	7.61		12.11	13.29	14.98
H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	18	169		8.67	7.90	7.01
Cockrell, Anna (USA) (1997)	time	6.14	10.10	14.25	18.59	23.06	27.52	32.13	36.91	41.87	46.91		52.90	7 / 2			
	reaction time	0.178															
	interval velocity	7.33	8.84	8.43	8.06	7.83	7.85	7.59	7.32	7.06	6.94	6.68	7.56		12.45	13.54	14.78
H1 lead leg	R	22	13	14	14	14	14	14	14	15	15	19	168		8.43	7.75	7.10
Salmon, Shiann (JAM) (1999)	time	6.13	10.16	14.26	18.45	22.80	27.35	32.04	36.82	41.81	46.95		53.13	5 / 3			
	reaction time	0.182															
	interval velocity	7.34	8.68	8.54	8.35	8.05	7.69	7.46	7.32	7.01	6.81	6.47	7.53		12.32	13.59	14.91
H1 lead leg	L	22	14	14	14	14	15	15	16	16	16	20	176		8.52	7.73	7.04
Sutherland, Savannah (CAN) (2003)	time	6.26	10.35	14.50	18.76	23.10	27.57	32.21	37.01	42.13	47.56		53.80	4 / 4			
	reaction time	0.145															
	interval velocity	7.19	8.56	8.43	8.22	8.06	7.83	7.54	7.29	6.84	6.45	6.41	7.43		12.50	13.45	15.35
H1 lead leg	R	23	15	15	15	15	15	15	15	16	16	20	180		8.40	7.81	6.84

Date 2024.08.06

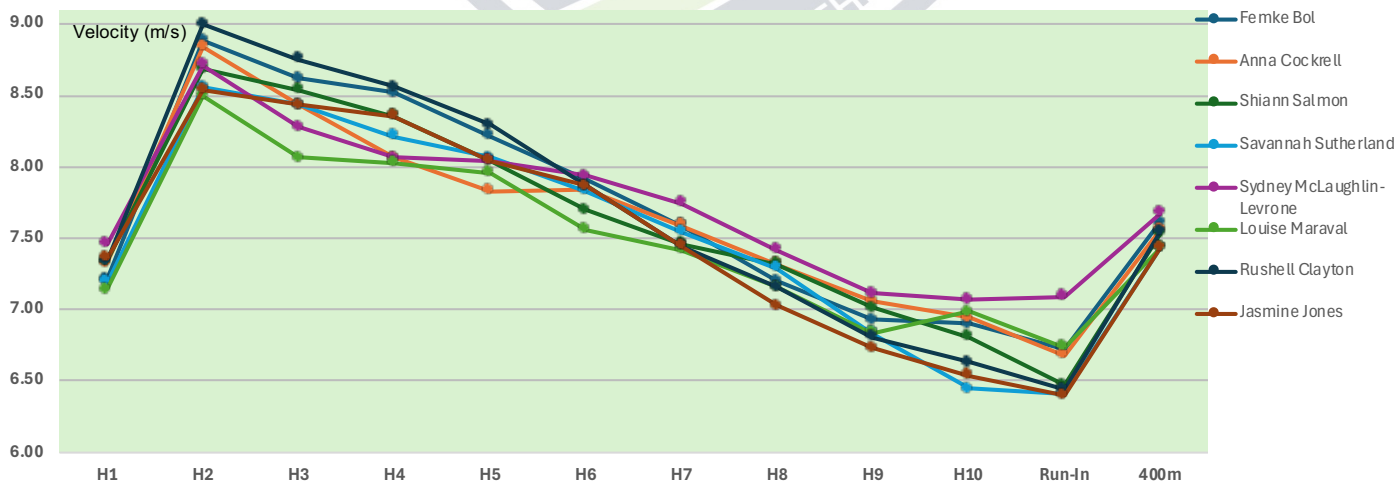
Semi-Final 2

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin-Levrone, Sydney (USA)	time	6.03	10.05	14.28	18.62	22.97	27.38	31.90	36.62	41.54	46.49		52.13	7 / 1			
	reaction time	0.154															
	interval velocity	7.46	8.71	8.27	8.06	8.05	7.94	7.74	7.42	7.11	7.07	7.09	7.67		12.59	13.28	14.59
H1 lead leg	R	22	14	15	15	14	14	14	15	16	15	18	172		8.34	7.91	7.20
Maraval, Louise (FRA) (2001)	time	6.30	10.42	14.76	19.12	23.52	28.15	32.87	37.76	42.88	47.89		53.83	4 / 2			
	reaction time	0.160															
	interval velocity	7.14	8.50	8.06	8.03	7.95	7.56	7.42	7.16	6.84	6.99	6.73	7.43		12.82	13.75	15.02
H1 lead leg	R	23	15	15	15	15	16	16	17	17	17	20	186		8.19	7.64	6.99

Date 2024.08.06

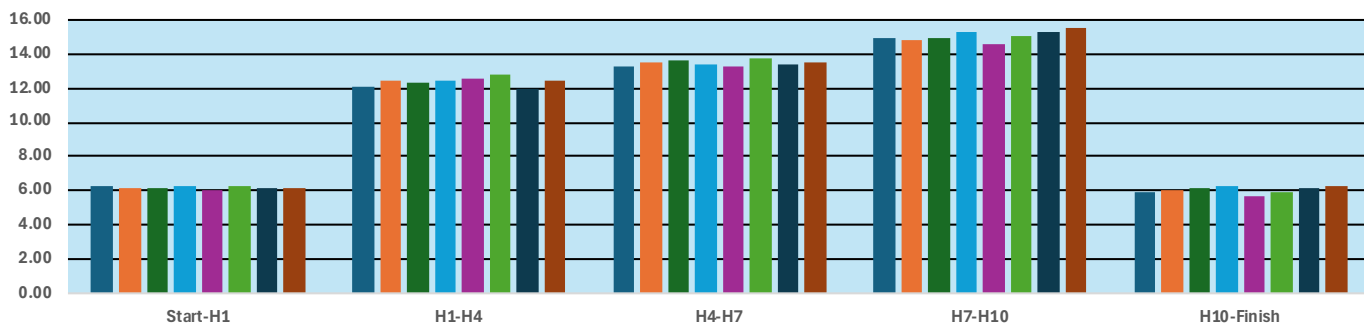
Semi-Final 1

		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	6.13	10.02	14.02	18.11	22.33	26.78	31.48	36.37	41.51	46.79		53.00	5 / 1			
	reaction time	0.152															
	interval velocity	7.34	8.89	8.75	8.56	8.29	7.87	7.45	7.16	6.81	6.63	6.44	7.55		11.98	13.37	15.31
H1 lead leg												0			8.76	7.85	6.86
Jones, Jasmine (USA) (2001)	time	6.11	10.21	14.36	18.55	22.90	27.35	32.05	37.03	42.23	47.58		53.83	7 / 2			
	reaction time	0.166															
	interval velocity	7.36	8.54	8.43	8.35	8.05	7.87	7.45	7.03	6.73	6.54	6.40	7.43		12.44	13.50	15.53
H1 lead leg												0			8.44	7.78	6.76



Time Intervals (s)

Hurdle Phases



Source: Paris 2024 Olympic Games - Results Book (2024). p. 570-572

https://olympics.com/OG2024/pdf/OG2024/ATH/OG2024_ATH_B99_ATH_...pdf

Video: <https://olympics.com/en/paris-2024/videos/track-and-field/day-11-afternoon-athletics-olympic-games-paris-2024>

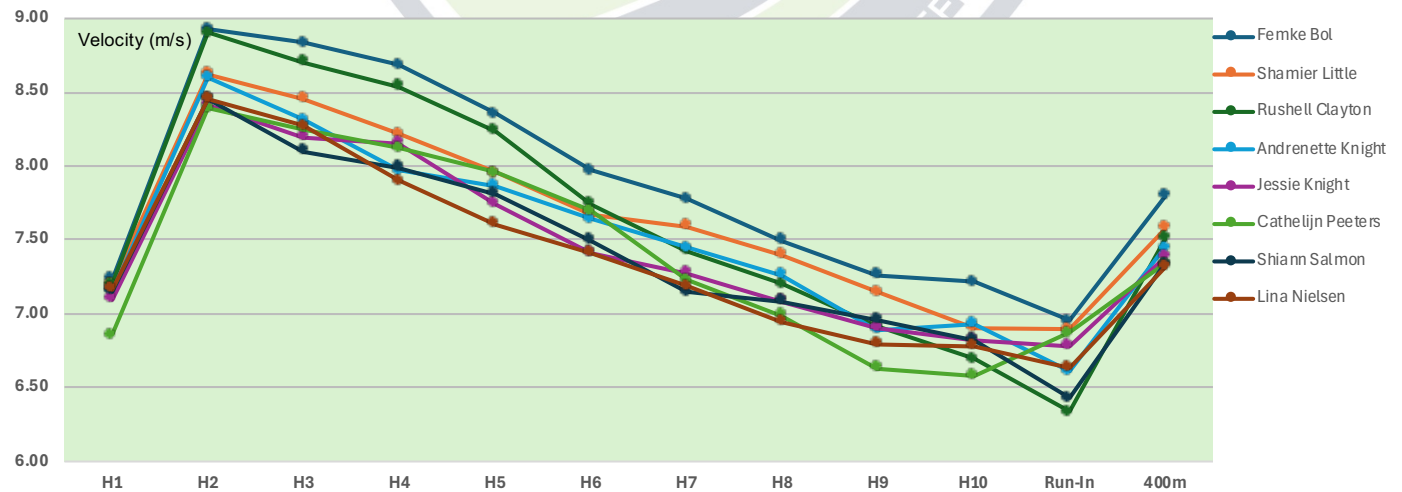
2024 London Athletics Meet (London, GBR)

Women's 400m Hurdles

Date 2024.07.20

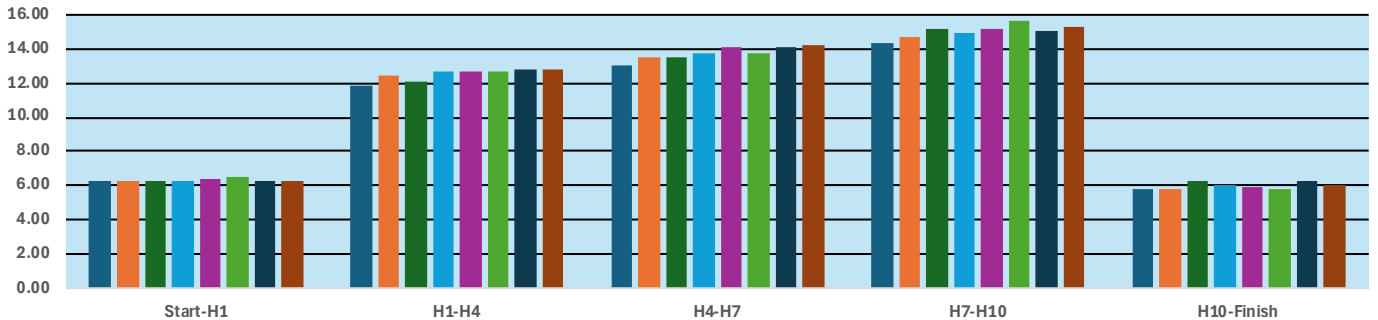
FINAL

		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	6.22	10.14	14.10	18.13	22.32	26.71	31.21	35.88	40.70	45.55		51.30	6 / 1			
	reaction time	0.175															
	interval velocity	7.23	8.92	8.96	8.03	8.19	8.39	8.50	8.67	8.82	8.85	5.75			11.91	13.08	14.34
H1 lead leg	L	strides	22	14	14	14	14	14	15	15	15	19	170		8.82	8.03	7.32
Little, Shamier (USA) (1995)	time	6.25	10.31	14.45	18.71	23.11	27.67	32.28	37.01	41.91	46.98		52.78	5 / 2			
	reaction time	0.207															
	interval velocity	7.20	8.62	8.45	8.22	7.95	7.68	7.59	7.40	7.14	6.90	5.80			12.46	13.57	14.70
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	19	147		8.43	7.74	7.14	
Clayton, Rushell (JAM) (1992)	time	6.25	10.18	14.20	18.30	22.55	27.07	31.78	36.64	41.70	46.93		53.24	4 / 3			
	reaction time	0.132															
	interval velocity	7.20	8.91	8.71	8.54	8.24	7.74	7.43	7.20	6.92	6.69	6.31			12.05	13.48	15.15
H1 lead leg	L	strides	22	14	14	14	15	15	15	15	19	142		8.71	7.79	6.93	
Knight, Andrenette (JAM) (1996)	time	6.29	10.36	14.57	18.96	23.41	27.99	32.69	37.51	42.59	47.64		53.69	8 / 4			
	reaction time	0.170															
	interval velocity	7.15	8.60	8.31	7.97	7.87	7.64	7.45	7.26	6.89	6.93	6.61			12.67	13.73	14.95
H1 lead leg	R	strides	23	15	15	15	15	15	15	15	113		8.29	7.65	7.02		
Knight, Jessie (GBR) (1994)	time	6.34	10.50	14.77	19.06	23.58	28.30	33.11	38.05	43.12	48.25		54.15	1 / 5			
	reaction time	0.159															
	interval velocity	7.10	8.41	8.20	8.16	7.74	7.42	7.28	7.09	6.90	6.82	6.78			12.72	14.05	15.14
H1 lead leg	R	strides	22	15	15	15	15	15	15	15	97		8.25	7.47	6.94		
Peeters, Cathelij (NED) (1996)	time	6.56	10.73	14.97	19.28	23.68	28.23	33.07	38.08	43.36	48.68		54.50	2 / 6			
	reaction time	0.196															
	interval velocity	6.86	8.39	8.25	8.12	7.95	7.69	7.23	6.99	6.63	6.58	6.87			12.72	13.79	15.61
H1 lead leg	L	strides	23	15	15	15	15	16	16	17	116		8.25	7.61	6.73		
Salmon, Shiann (JAM) (1999)	time	6.29	10.43	14.75	19.13	23.61	28.28	33.18	38.12	43.15	48.28		54.50	3 / 7			
	reaction time	0.169															
	interval velocity	7.15	8.45	8.10	7.99	7.81	7.49	7.14	7.09	6.96	6.82	6.43			12.84	14.05	15.10
H1 lead leg	L	strides	22	15	15	15	15	16	16	16	130		8.18	7.47	6.95		
Nielsen, Lina (GBR) (1996)	time	6.28	10.42	14.65	19.08	23.68	28.40	33.27	38.31	43.46	48.62		54.65	7 / 8			
	reaction time	0.147															
	interval velocity	7.17	8.45	8.27	7.90	7.61	7.42	7.19	6.94	6.80	6.78	6.63			12.80	14.19	15.35
H1 lead leg	L	strides	22	15	15	15	15	15	16	16	113		8.20	7.40	6.84		



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sat 20 Jul 2024 14:08) - diamond league race analysis

<https://www.omegatiming.com/File/0002040D0101090101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=dhxm3yNiVU>

Biomechanical Analysis

2024 Resisprint International (La Chaux-de-Fonds, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2024.07.14

A Final

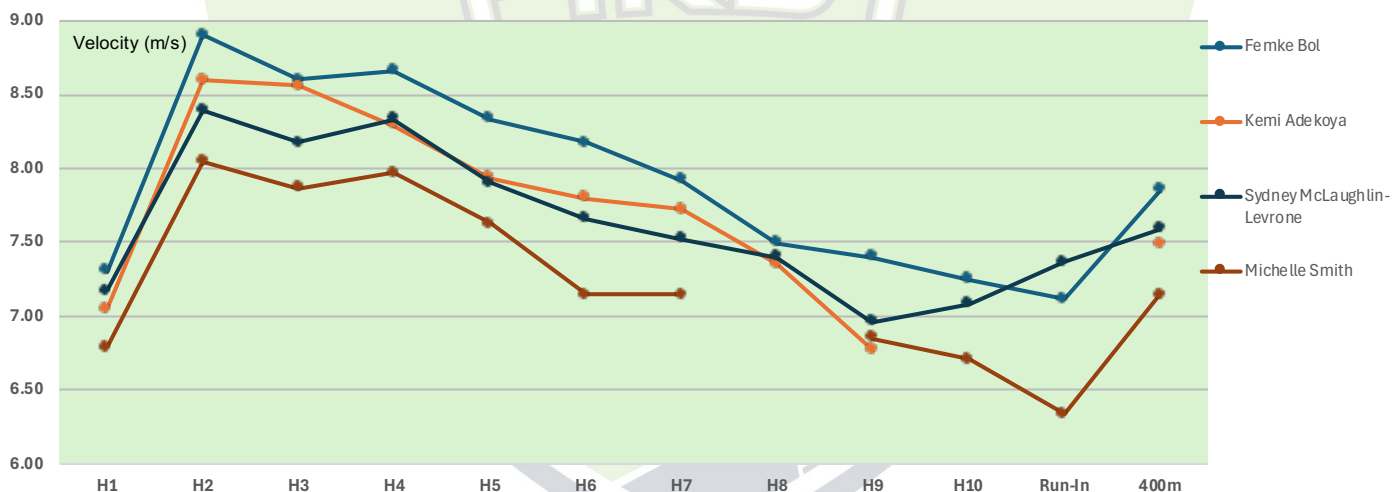
		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Bol, Femke (NED) (2000)	time	6.16	10.09	14.16	18.20	22.40	26.68	31.10	35.77	40.50	45.33		50.95	4 / 1			
	reaction time												AR		12.04	12.90	14.23
	interval		3.93	4.07	4.04	4.20	4.28	4.42	4.67	4.73	4.83	5.62					
	velocity	7.31	8.91	8.60	8.66	8.33	8.18	7.92	7.49	7.40	7.25	7.12	7.85		8.72	8.14	7.38
H1 lead leg	L	22	14	14	14	14	14	14	15	15	15	19	170				
Adekoya, Kemi (BRN) (1993)	time	6.38	10.45	14.54	18.76	23.17	27.66	32.19	36.95	42.12			53.41	5 / 2			
	reaction time														12.38	13.43	
	interval		4.07	4.09	4.22	4.41	4.49	4.53	4.76	5.17					8.48	7.82	
	velocity	7.05	8.60	8.56	8.29	7.94	7.80	7.73	7.35	6.77			7.49				
H1 lead leg	R	23	15	15	15	15	15	15	15	16		144					

2024 The Edwin Moses Legends Meet (Atlanta, GA) (TV Analysis)

Date 2024.05.31

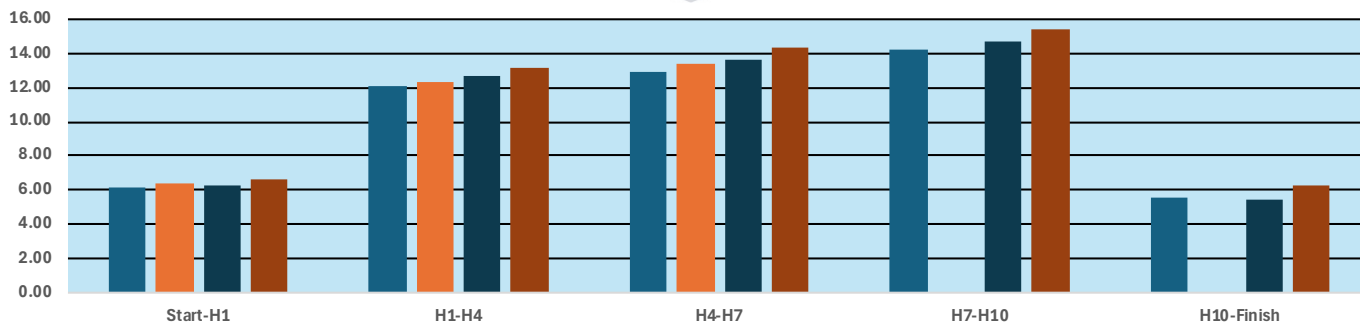
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin-Levrone, Sydney (USA)	time	6.27	10.44	14.72	18.92	23.35	27.92	32.57	37.30	42.33	47.27		52.70	6 / 1			
	reaction time												5.43		12.65	13.65	14.70
	interval		4.17	4.28	4.20	4.43	4.57	4.65	4.73	5.03	4.94				8.30	7.69	7.14
	velocity	7.18	8.39	8.18	8.33	7.90	7.66	7.53	7.40	6.96	7.09	7.37	7.59				
H1 lead leg	R	22	15	15	15	15	15	15	15	16	16	18	177				
Smith, Michelle (ISV) (2006)	time	6.63	10.98	15.43	19.82	24.41	29.31	34.21		44.43	49.65		55.96	7 / 2			
	reaction time												6.31	NR PB	13.19	14.39	15.44
	interval		4.35	4.45	4.39	4.59	4.90	4.90	10.22	5.22			6.34	7.15	7.96	7.30	6.80
	velocity	6.79	8.05	7.87	7.97	7.63	7.14	7.14		6.85	6.70	6.34	7.15				
H1 lead leg	R	23	15	15	15	15	16	16			17	132					



Hurdle Phases

Time Intervals (s)



Resisprint International

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=LJHzF5oQ4y8&pp=ygUJWMjAyNCBzYSBjaG9peCBkZSBmb25kcmw%3D%3D>

The Edwin Moses Legends Meet

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 60fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=aIphiAoI0GE&pp=ygUJmMjAyNCBzYSBjaG9peCBkZSBmb25kcmw%3D%3D>

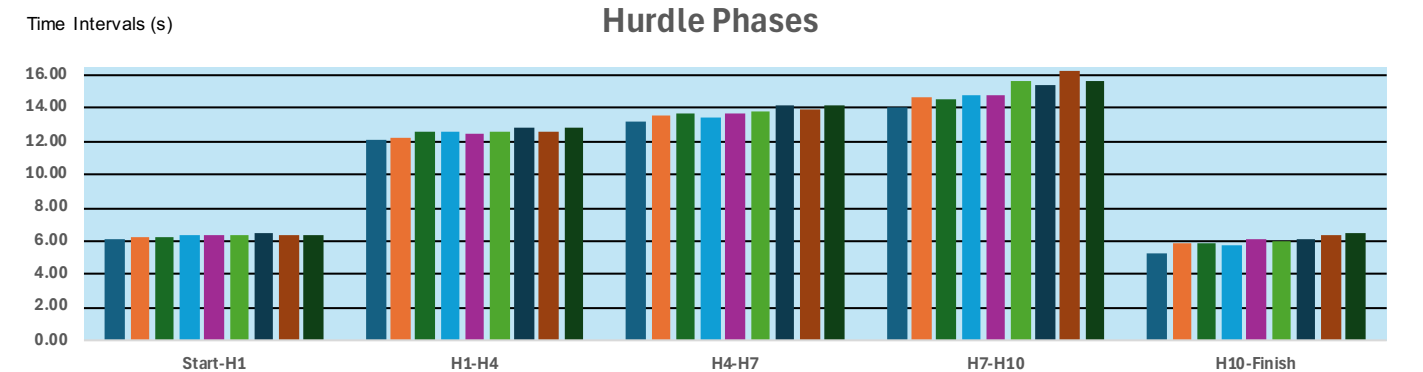
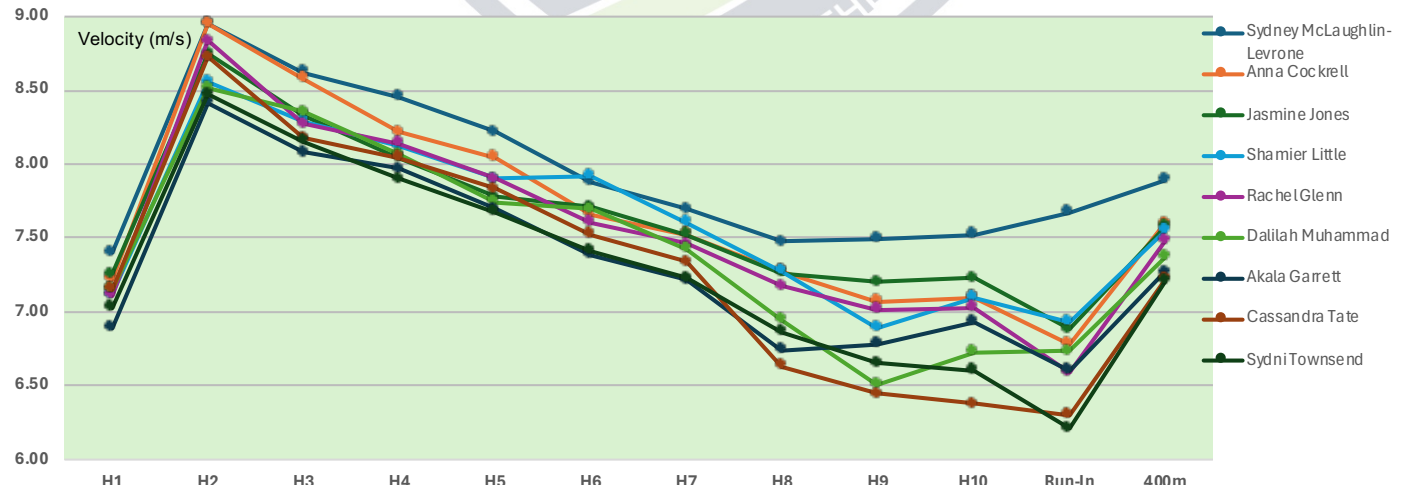
2024 USA Olympic Trials (Eugene, OR)

Women's 400m Hurdles

Date 2024.06.30

FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin-Levrone, Sydney (USA)	(time)	6.08	9.99	14.05	18.19	22.45	26.89	31.44	36.12	40.79	45.44		50.65	5 / 1			
	reaction time		interval	3.91	4.06	4.14	4.26	4.44	4.55	4.68	4.67	4.65	5.21	WR	12.11	13.25	14.00
	velocity	7.40	8.95	8.62	8.45	8.22	7.88	7.69	7.48	7.49	7.53	7.68	7.90		8.67	7.92	7.50
	H1 lead leg R	strides	22	14	14	14	14	15	15	15	15	15	18	171			
Cockrell, Anna (USA) (1997)	time	6.23	10.14	14.22	18.48	22.83	27.40	32.05	36.86	41.81	46.74		52.64	6 / 2			
	reaction time		interval	3.91	4.08	4.26	4.35	4.57	4.65	4.81	4.95	4.93	5.90	PB	12.25	13.57	14.69
	velocity	7.22	8.95	8.58	8.22	8.05	7.66	7.53	7.28	7.07	7.10	6.78	7.60		8.57	7.74	7.15
	H1 lead leg R	strides	22	14	14	14	14	15	15	15	15	15	19	172			
Jones, Jasmine (USA) (2001)	time	6.20	10.20	14.40	18.75	23.25	27.79	32.44	37.26	42.12	46.96		52.77	8 / 3			
	reaction time		interval	4.00	4.20	4.35	4.50	4.54	4.65	4.82	4.86	4.84	5.81	PB	12.55	13.69	14.52
	velocity	7.26	8.75	8.33	8.05	7.78	7.71	7.53	7.26	7.20	7.23	6.88	7.58		8.37	7.67	7.23
	H1 lead leg R	strides	14	15	14	15	15	15	15	15	15	15	18.2	151.2			
Little, Shamier (USA) (1995)	time	6.32	10.41	14.63	18.94	23.37	27.79	32.39	37.20	42.28	47.21		52.98	7 / 4			
	reaction time		interval	4.09	4.22	4.31	4.43	4.42	4.60	4.81	5.08	4.93	5.77		12.62	13.45	14.82
	velocity	7.12	8.56	8.29	8.12	7.90	7.92	7.61	7.28	6.89	7.10	6.93	7.55		8.32	7.81	7.09
	H1 lead leg R	strides	23	15	15	15	15	15	15	15	16	16	19.2	179.2			
Glenn, Rachel (USA) (2002)	time	6.33	10.29	14.52	18.82	23.25	27.85	32.54	37.42	42.41	47.39		53.46	4 / 5			
	reaction time		interval	3.96	4.23	4.30	4.43	4.60	4.69	4.88	4.99	4.98	6.07	PB	12.49	13.72	14.85
	velocity	7.11	8.84	8.27	8.14	7.90	7.61	7.46	7.17	7.01	7.03	6.59	7.48		8.41	7.65	7.07
	H1 lead leg R	strides	21	14	14	14	14	14	14	15	15	15	18.7	168.7			
Muhammad, Dalilah (USA) (1990)	time	6.29	10.40	14.59	18.93	23.45	28.00	32.71	37.75	43.13	48.33		54.27	9 / 6			
	reaction time		interval	4.11	4.19	4.34	4.52	4.55	4.71	5.04	5.38	5.20	5.94		12.64	13.78	15.62
	velocity	7.15	8.52	8.35	8.06	7.74	7.69	7.43	6.94	6.51	6.73	6.73	7.37		8.31	7.62	6.72
	H1 lead leg R	strides	15	15	15	15	15	15	15	15	16	16	19.2	156.2			
Garrett, Akala (USA) (2005)	time	6.53	10.69	15.02	19.41	23.96	28.70	33.55	38.74	43.90	48.95		55.01	1 / 7			
	reaction time		interval	4.16	4.33	4.39	4.55	4.74	4.85	5.19	5.16	5.05	6.06		12.88	14.14	15.40
	velocity	6.89	8.41	8.08	7.97	7.69	7.38	7.22	6.74	6.78	6.93	6.60	7.27		8.15	7.43	6.82
	H1 lead leg R	strides	23	15	15	15	15	15	16	16	17	17	19.5	183.5			
Tate, Cassandra (USA) (1990)	time	6.29	10.30	14.58	18.93	23.40	28.05	32.82	38.10	43.53	49.02		55.37	2 / 8			
	reaction time		interval	4.01	4.28	4.35	4.47	4.65	4.77	5.28	5.43	5.49	6.35		12.64	13.89	16.20
	velocity	7.15	8.73	8.18	8.05	7.83	7.53	7.34	6.63	6.45	6.38	6.30	7.22		8.31	7.56	6.48
	H1 lead leg R	strides	22	14	14	15	15	15	16	16	16	17	20	180			
Townsend, Sydni (USA) (2000)	time	6.40	10.53	14.82	19.25	23.81	28.53	33.37	38.47	43.73	49.03		55.47	3 / 9			
	reaction time		interval	4.13	4.29	4.43	4.56	4.72	4.84	5.10	5.26	5.30	6.44		12.85	14.12	15.66
	velocity	7.03	8.47	8.16	7.90	7.68	7.42	7.23	6.86	6.65	6.60	6.21	7.21		8.17	7.44	6.70
	H1 lead leg L	strides	23	16	16	16	16	17	17	17	17	18	22.5	195.5			



Source: USATF and Karmarush (Sun 30 Jun 2024) - USA Olympic trials results and race analysis

<https://results.usatf.org/2024trials/>

Video: <https://www.youtube.com/watch?v=5WJswSOsoYw>

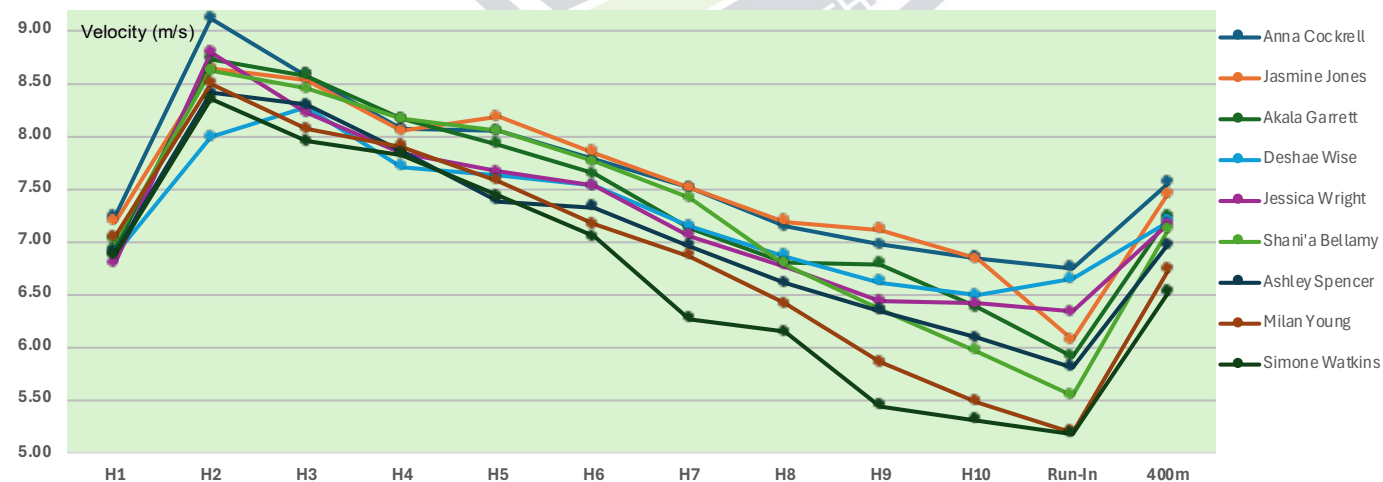
2024 USA Olympic Trials (Eugene, OR)

Women's 400m Hurdles

Date 2024.06.29

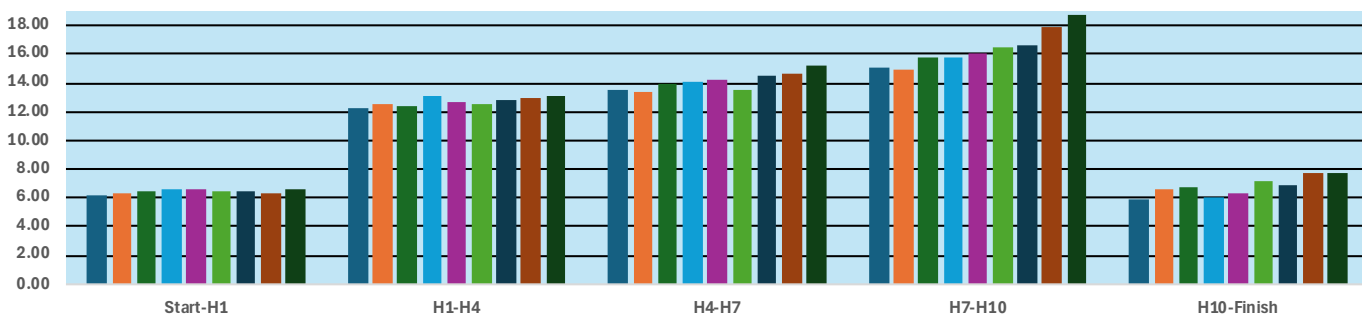
Semi-Final 3

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Cockrell, Anna (USA) (1997)	time	6.22	10.06	14.14	18.48	22.83	27.33	31.99	36.89	41.91	47.02	52.95	52.95	5 / 1			
	reaction time		3.84	4.08	4.34	4.35	4.50	4.66	4.90	5.02	5.11	5.93	PB		12.26	13.51	15.03
	velocity	7.23	9.11	8.58	8.06	8.05	7.78	7.51	7.14	6.97	6.85	6.75	7.55		8.56	7.77	6.99
H1 lead leg	R	22	14	14	14	14	14	15	15	15	15	19	171				
Jones, Jasmine (USA) (2001)	time	6.26	10.31	14.41	18.76	23.04	27.50	32.16	37.03	41.95	47.07	53.66	53.66	6 / 2			
	reaction time		4.05	4.10	4.35	4.28	4.46	4.66	4.87	4.92	5.12	6.59			12.50	13.40	14.91
	velocity	7.19	8.64	8.54	8.05	8.18	7.85	7.51	7.19	7.11	6.84	6.07	7.45		8.40	7.84	7.04
H1 lead leg	R	14	14	14	14	14	15	15	15	15	16	19	151				
Garrett, Akala (USA) (2005)	time	6.49	10.50	14.58	18.87	23.29	27.87	32.78	37.92	43.08	48.57	55.34	55.34	8 / 3			
	reaction time		4.01	4.08	4.29	4.42	4.58	4.91	5.14	5.16	5.49	6.77			12.38	13.91	15.79
	velocity	6.93	8.73	8.58	8.16	7.92	7.64	7.13	6.81	6.78	6.38	5.91	7.23		8.48	7.55	6.65
H1 lead leg	R	15	15	15	15	15	16	16	17	17	17	20	163				
Wise, Deshae (USA) (1999)	time	6.54	10.92	15.15	19.69	24.28	28.93	33.83	38.93	44.22	49.61	55.63	55.63	9 / 4			
	reaction time		4.38	4.23	4.54	4.59	4.65	4.90	5.10	5.29	5.39	6.02			13.15	14.14	15.78
	velocity	6.88	7.99	8.27	7.71	7.63	7.53	7.14	6.86	6.62	6.49	6.64	7.19		7.98	7.43	6.65
H1 lead leg	L	16	16	16	16	16	16	16	16	17	17	19.7	165.7				
Wright, Jessica (USA) (2000)	time	6.62	10.60	14.86	19.32	23.89	28.54	33.50	38.67	44.11	49.57	55.88	55.88	4 / 5			
	reaction time		3.98	4.26	4.46	4.57	4.65	4.96	5.17	5.44	5.46	6.31			12.70	14.18	16.07
	velocity	6.80	8.79	8.22	7.85	7.66	7.53	7.06	6.77	6.43	6.41	6.34	7.16		8.27	7.40	6.53
H1 lead leg	L	24	15	16	16	16	16	17	17	18	18	22	195				
Bellamy, Shani'a (USA) (2002)	time	6.41	10.47	14.61	18.90	23.25	27.76	32.48	37.64	43.15	49.02	56.24	56.24	7 / 6			
	reaction time		4.06	4.14	4.29	4.35	4.51	4.72	5.16	5.51	5.87	7.22			12.49	13.58	16.54
	velocity	7.02	8.62	8.45	8.16	8.05	7.76	7.42	6.78	6.35	5.96	5.54	7.11		8.41	7.73	6.35
H1 lead leg	L	15	15	15	15	15	15	16	16	16	17	20.2	160.2				
Spencer, Ashley (USA) (1993)	time	6.53	10.69	14.91	19.36	24.10	28.88	33.91	39.21	44.73	50.48	57.37	57.37	1 / 7			
	reaction time		4.16	4.22	4.45	4.74	4.78	5.03	5.30	5.52	5.75	6.89			12.83	14.55	16.57
	velocity	6.89	8.41	8.29	7.87	7.38	7.32	6.96	6.60	6.34	6.09	5.81	6.97		8.18	7.22	6.34
H1 lead leg	L	23	15	15	15	15	15	16	16	16	17	20	167				
Young, Milan (USA) (1999)	time	6.39	10.51	14.85	19.28	23.90	28.79	33.89	39.35	45.33	51.72	59.43	59.43	3 / 8			
	reaction time		4.12	4.34	4.43	4.62	4.89	5.10	5.46	5.98	6.39	7.71			12.89	14.61	17.83
	velocity	7.04	8.50	8.06	7.90	7.58	7.16	6.86	6.41	5.85	5.48	5.19	6.73		8.15	7.19	5.89
H1 lead leg	R	23	15	15	15	15	15	15	16	16	18	21	168				
Watkins, Simone (USA) (2001)	time	6.55	10.74	15.14	19.61	24.32	29.29	34.87	40.57	47.00	53.60	61.33	61.33	2 / 9			
	reaction time		4.19	4.40	4.47	4.71	4.97	5.58	5.70	6.43	6.60	7.73			13.06	15.26	18.73
	velocity	6.87	8.35	7.95	7.83	7.43	7.04	6.27	6.14	5.44	5.30	5.17	6.52		8.04	6.88	5.61
H1 lead leg	L	23	15	15	15	15	16	16	17	18	20	170					



Time Intervals (s)

Hurdle Phases



Source: USATF and Karmarush (Sat 29 Jun 2024) - USA Olympic trials results and race analysis

<https://results.usatf.org/2024trials/>

Video: <https://www.youtube.com/watch?v=DT61nLKTrNl>

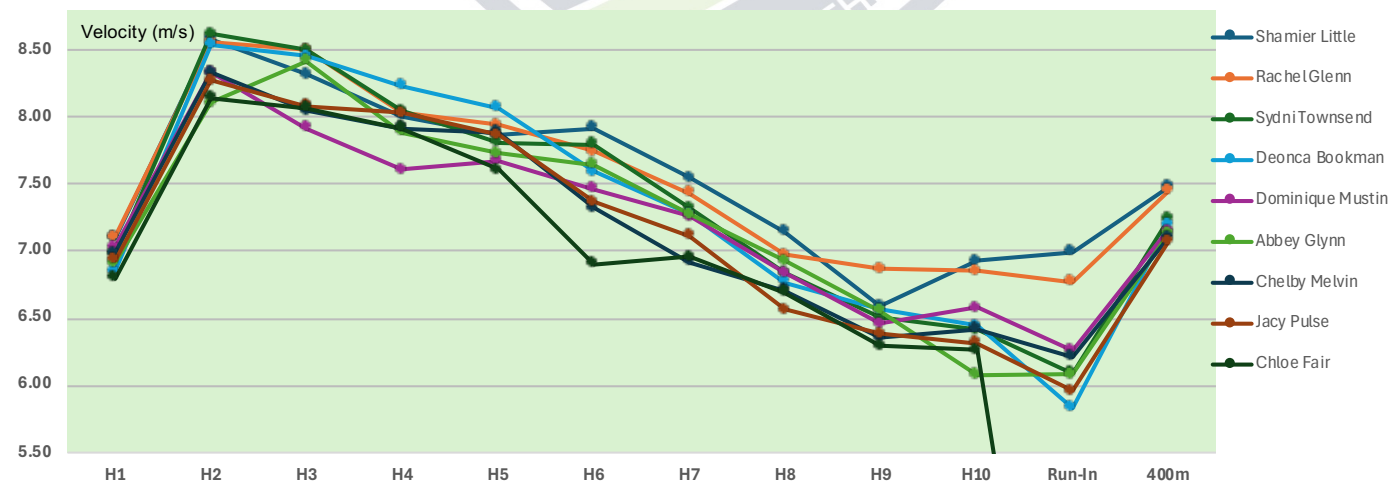
2024 USA Olympic Trials (Eugene, OR)

Women's 400m Hurdles

Date 2024.06.29

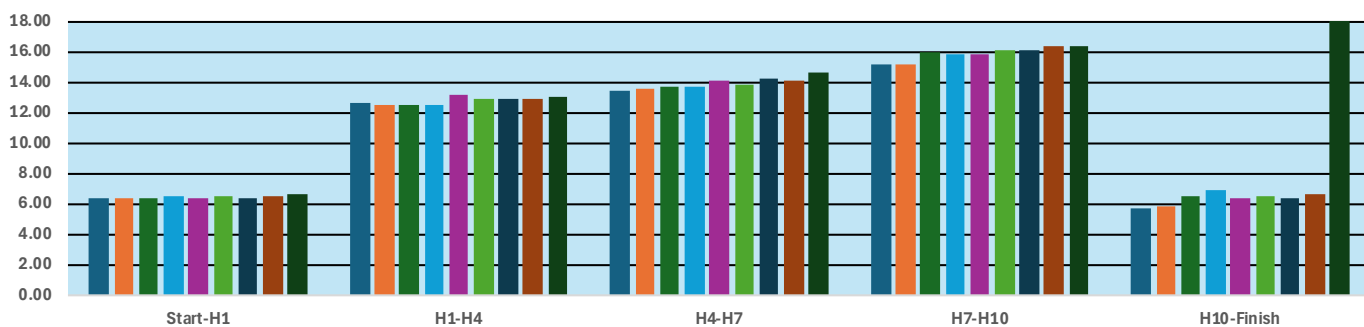
Semi-Final 2

		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	6.34	10.42	14.63	19.00	23.45	27.87	32.51	37.41	42.72	47.77		53.49	7 / 1			
	reaction time		4.08	4.21	4.37	4.45	4.42	4.64	4.90	5.31	5.05	5.72			12.66	13.51	15.26
	velocity	7.10	8.58	8.31	8.01	7.87	7.92	7.54	7.14	6.59	6.93	6.99	7.48		8.29	7.77	6.88
	H1 lead leg R strides	23	15	15	15	15	15	15	15	16	16	19	179				
Glenn, Rachel (USA) (2002)	time	6.33	10.42	14.54	18.90	23.31	27.83	32.54	37.56	42.66	47.77		53.68	5 / 2			
	reaction time		4.09	4.12	4.36	4.41	4.52	4.71	5.02	5.10	5.11	5.91	PB		12.57	13.64	15.23
	velocity	7.11	8.56	8.50	8.03	7.94	7.74	7.43	6.97	6.86	6.85	6.77	7.45		8.35	7.70	6.89
	H1 lead leg L strides	21	14	14	13	14	14	15	15	15	15	18.2	168.2				
Townsend, Sydney (USA) (2000)	time	6.45	10.51	14.63	18.98	23.46	27.95	32.73	37.85	43.23	48.69		55.26	8 / 3			
	reaction time		4.06	4.12	4.35	4.48	4.49	4.78	5.12	5.38	5.46	6.57			12.53	13.75	15.96
	velocity	6.98	8.62	8.50	8.05	7.81	7.80	7.32	6.84	6.51	6.41	6.09	7.24		8.38	7.64	6.58
	H1 lead leg L strides	23	16	16	16	16	16	17	17	18	18	22.7	195.7				
Bookman, Deonca (USA) (1995)	time	6.57	10.67	14.81	19.06	23.40	28.01	32.82	37.99	43.32	48.75		55.61	6 / 4			
	reaction time		4.10	4.14	4.25	4.34	4.61	4.81	5.17	5.33	5.43	6.86			12.49	13.76	15.93
	velocity	6.85	8.54	8.45	8.24	8.06	7.59	7.28	6.77	6.57	6.45	5.83	7.19		8.41	7.63	6.59
	H1 lead leg R strides	24	16	16	16	16	17	18	18	19	19	23.2	201.2				
Mustin, Dominique (USA) (2002)	time	6.40	10.60	15.02	19.62	24.18	28.87	33.69	38.81	44.23	49.55		55.94	4 / 5			
	reaction time		4.20	4.42	4.60	4.56	4.69	4.82	5.12	5.42	5.32	6.39			13.22	14.07	15.86
	velocity	7.03	8.33	7.92	7.61	7.68	7.46	7.26	6.84	6.46	6.58	6.26	7.15		7.94	7.46	6.62
	H1 lead leg R strides	22	15	15	15	15	15	15	16	16	16	19.2	179.2				
Glynn, Abbey (USA) (2001)	time	6.51	10.83	14.99	19.43	23.96	28.54	33.35	38.40	43.74	49.50		56.08	9 / 6			
	reaction time		4.32	4.16	4.44	4.53	4.58	4.81	5.05	5.34	5.76	6.58			12.92	13.92	16.15
	velocity	6.91	8.10	8.41	7.88	7.73	7.64	7.28	6.93	6.55	6.08	6.08	7.13		8.13	7.54	6.50
	H1 lead leg L strides		15	15	15	15	15	15	15	16	18	139					
Melvin, Chelby (USA) (2003)	time	6.44	10.64	14.99	19.41	23.85	28.63	33.69	38.91	44.42	49.87		56.31	2 / 7			
	reaction time		4.20	4.35	4.42	4.44	4.78	5.06	5.22	5.51	5.45	6.44	PB		12.97	14.28	16.18
	velocity	6.99	8.33	8.05	7.92	7.88	7.32	6.92	6.70	6.35	6.42	6.21	7.10		8.10	7.35	6.49
	H1 lead leg R strides	22	15	15	15	15	16	16	17	17	17	20.2	185.2				
Pulse, Jacy (USA) (2001)	time	6.49	10.72	15.05	19.41	23.86	28.61	33.53	38.86	44.34	49.88		56.59	3 / 8			
	reaction time		4.23	4.33	4.36	4.45	4.75	4.92	5.33	5.48	5.54	6.71			12.92	14.12	16.35
	velocity	6.93	8.27	8.08	8.03	7.87	7.37	7.11	6.57	6.39	6.32	5.96	7.07		8.13	7.44	6.42
	H1 lead leg R strides	23	15	15	15	15	17	17	17	17	17	21	189				
Fair, Chloe (USA) (2001)	time	6.62	10.92	15.26	19.68	24.28	29.35	34.38	39.61	45.17	50.76		73.14	1 / 9			
	reaction time		4.30	4.34	4.42	4.60	5.07	5.03	5.23	5.56	5.59	22.38			13.06	14.70	16.38
	velocity	6.80	8.14	8.06	7.92	7.61	6.90	6.96	6.69	6.29	6.26	1.79	5.47		8.04	7.14	6.41
	H1 lead leg L strides	25	16	16	16	17	17	17	18	18	18	178					



Time Intervals (s)

Hurdle Phases



Source: USATF and Karmarush (Sat 29 Jun 2024) - USA Olympic trials results and race analysis
<https://results.usatf.org/2024trials/>

Video: https://www.youtube.com/watch?v=llmPZ-nf_vQ

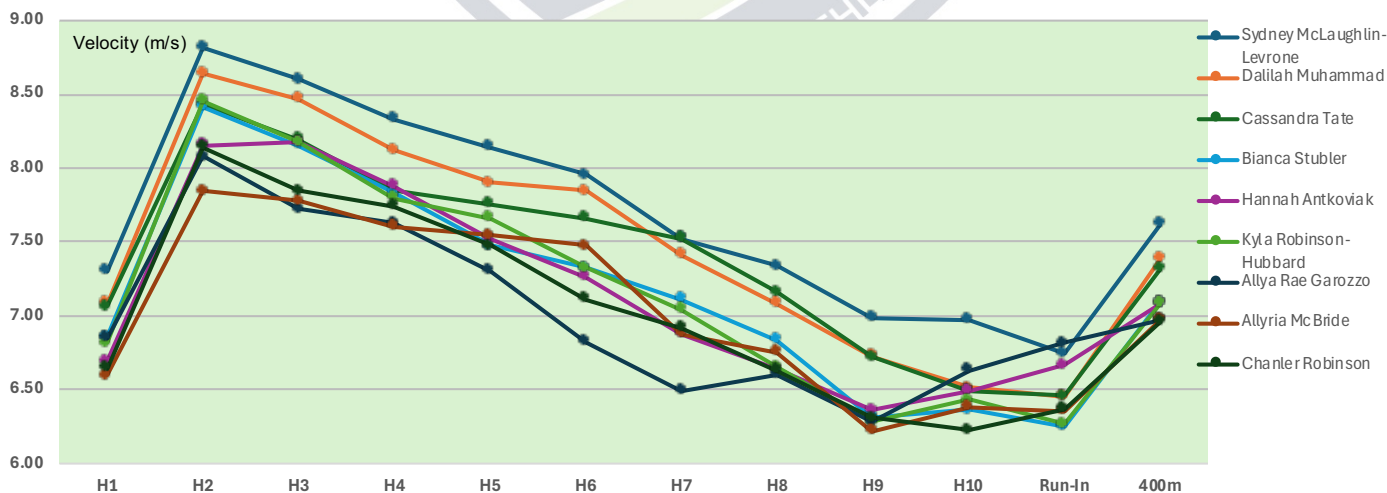
2024 USA Olympic Trials (Eugene, OR)

Women's 400m Hurdles

Date 2024.06.29

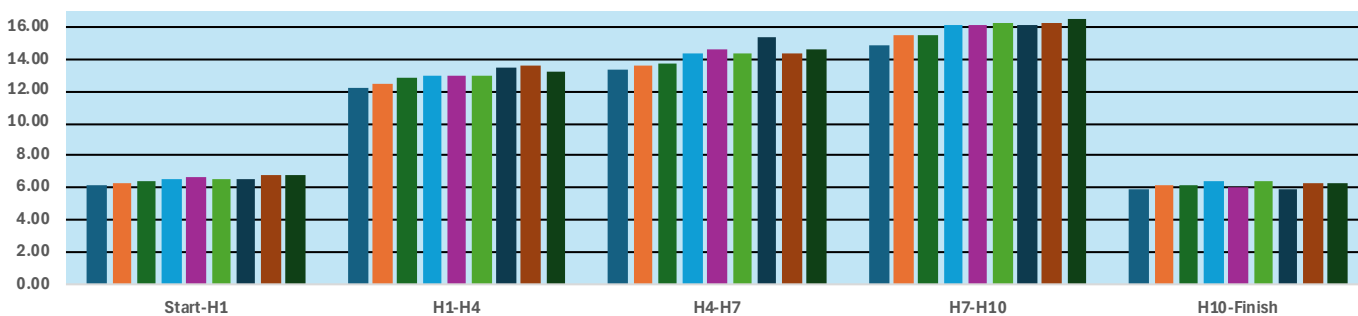
Semi-Final 1

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
McLaughlin-Levrone, Sydney (USA)	time	6.16	10.13	14.20	18.40	22.70	27.10	31.75	36.52	41.53	46.55		52.48	6 / 1			
	reaction time		interval	3.97	4.07	4.20	4.30	4.40	4.65	4.77	5.01	5.02	5.93		12.24	13.35	14.80
	velocity	7.31	8.82	8.60	8.33	8.14	7.95	7.53	7.34	6.99	6.97	6.75	7.62		8.58	7.87	7.09
	H1 lead leg R	22	14	14	14	14	15	15	15	15	15	16	18	172			
Muhammad, Dalilah (USA) (1990)	time	6.35	10.40	14.53	18.84	23.27	27.73	32.45	37.39	42.59	47.96		54.16	5 / 2			
	reaction time		interval	4.05	4.13	4.31	4.43	4.46	4.72	4.94	5.20	5.37	6.20		12.49	13.61	15.51
	velocity	7.09	8.64	8.47	8.12	7.90	7.85	7.42	7.09	6.73	6.52	6.45	7.39		8.41	7.71	6.77
	H1 lead leg R	22	15	15	15	15	15	15	15	15	16	16	20	179			
Tate, Cassandra (USA) (1990)	time	6.37	10.52	14.79	19.25	23.76	28.33	32.98	37.87	43.08	48.47		54.66	8 / 3			
	reaction time		interval	4.15	4.27	4.46	4.51	4.57	4.65	4.89	5.21	5.39	6.19		12.88	13.73	15.49
	velocity	7.06	8.43	8.20	7.85	7.76	7.66	7.53	7.16	6.72	6.49	6.46	7.32		8.15	7.65	6.78
	H1 lead leg R	15	15	15	15	15	15	15	15	16	16	16	19.2	156.2			
Stubler, Bianca (USA) (1999)	time	6.56	10.72	15.01	19.48	24.16	28.94	33.86	38.98	44.52	50.02		56.42	2 / 4			
	reaction time		interval	4.16	4.29	4.47	4.68	4.78	4.92	5.12	5.54	5.50	6.40		12.92	14.38	16.16
	velocity	6.86	8.41	8.16	7.83	7.48	7.32	7.11	6.84	6.32	6.36	6.25	7.09		8.13	7.30	6.50
	H1 lead leg R	23	15	15	15	16	16	16	16	17	17	21.5	187.5				
Antkoviak, Hannah (USA) (2003)	time	6.72	11.01	15.29	19.73	24.38	29.20	34.29	39.56	45.06	50.45		56.45	7 / 5			
	reaction time		interval	4.29	4.28	4.44	4.65	4.82	5.09	5.27	5.50	5.39	6.00		13.01	14.56	16.16
	velocity	6.70	8.16	8.18	7.88	7.53	7.26	6.88	6.64	6.36	6.49	6.67	7.09		8.07	7.21	6.50
	H1 lead leg L	24	15	15	15	15	15	17	17	17	17	17	167				
Robinson-Hubbard, Kyla (USA) (2001)	time	6.60	10.74	15.02	19.51	24.08	28.86	33.83	39.09	44.66	50.10		56.48	4 / 6			
	reaction time		interval	4.14	4.28	4.49	4.57	4.78	4.97	5.26	5.57	5.44	6.38		12.91	14.32	16.27
	velocity	6.82	8.45	8.18	7.80	7.66	7.32	7.04	6.65	6.28	6.43	6.27	7.08		8.13	7.33	6.45
	H1 lead leg L	23	16	16	16	16	16	16	16	17	17	20	190				
Garozzo, Aliya Rae (USA) (2001)	time	6.57	10.90	15.43	20.02	24.81	29.94	35.33	40.63	46.20	51.48		57.35	1 / 7			
	reaction time		interval	4.33	4.53	4.59	4.79	5.13	5.39	5.30	5.57	5.28	5.87		13.45	15.31	16.15
	velocity	6.85	8.08	7.73	7.63	7.31	6.82	6.49	6.60	6.28	6.63	6.81	6.97		7.81	6.86	6.50
	H1 lead leg R	23	15	15	15	15	16	16	16	16	16	19	182				
McBride, Allyria (USA) (2004)	time	6.82	11.28	15.78	20.38	25.02	29.70	34.79	39.97	45.60	51.08		57.37	9 / 8			
	reaction time		interval	4.46	4.50	4.60	4.64	4.68	5.09	5.18	5.63	5.48	6.29		13.56	14.41	16.29
	velocity	6.60	7.85	7.78	7.61	7.54	7.48	6.88	6.76	6.22	6.39	6.36	6.97		7.74	7.29	6.45
	H1 lead leg L	16	16	15	15	16	16	16	17	17	17	128					
Robinson, Chanler (USA) (2001)	time	6.77	11.07	15.53	20.05	24.73	29.65	34.71	39.99	45.54	51.16		57.44	3 / 9			
	reaction time		interval	4.30	4.46	4.52	4.68	4.92	5.06	5.28	5.55	5.62	6.28		13.28	14.66	16.45
	velocity	6.65	8.14	7.85	7.74	7.48	7.11	6.92	6.63	6.31	6.23	6.37	6.96		7.91	7.16	6.38
	H1 lead leg L	25	16	16	15	16	16	16	16	16	17	20	190				



Time Intervals (s)

Hurdle Phases



Source: USATF and Karmarush (Sat 29 Jun 2024) - USA Olympic trials results and race analysis

<https://results.usatf.org/2024trials/>

Video: <https://www.youtube.com/watch?v=4Qbn6Yv0HQ>

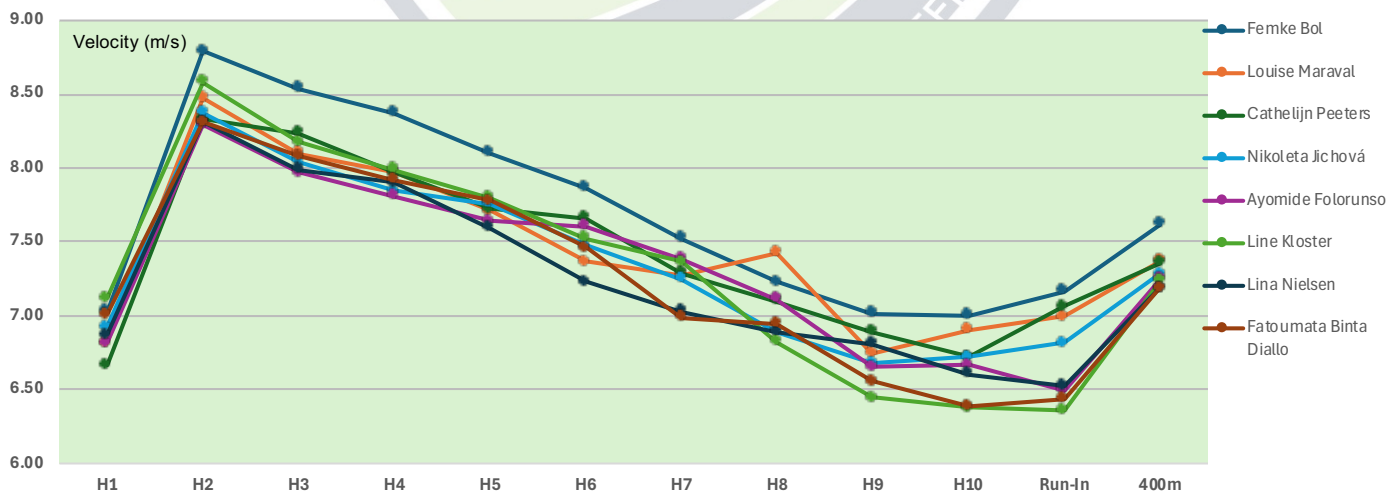
2024 European Athletics Championships (Roma, ITA)

Women's 400m Hurdles

Date 2024.06.11

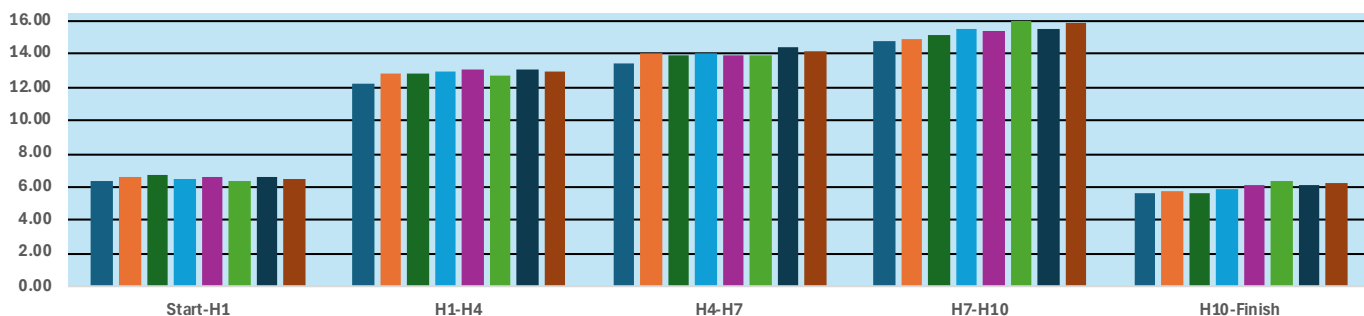
FINAL

		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	10.38	14.48	18.66	22.98	27.43	32.08	36.92	41.91	46.91		52.49	6 / 1			
	reaction time	0.180															
	interval velocity	7.03	8.98	8.10	8.18	8.32	8.45	8.65	8.84	8.99	9.00	5.58	CR		12.26	13.42	14.83
H1 lead leg	L	strides	22	14	14	14	14	14	15	15	15	19	170		8.56	7.82	7.08
Maraval, Louise (FRA) (2001)	time	6.60	10.73	15.05	19.44	23.98	28.73	33.54	38.25	43.44	48.51		54.23	7 / 2			
	reaction time	0.211															
	interval velocity	6.82	8.47	8.10	7.97	7.71	7.37	7.28	7.43	6.74	6.90	6.99	7.38		12.84	14.10	14.97
H1 lead leg	R	strides	23	15	15		16	16			17	20	122		8.18	7.45	7.01
Peeters, Cathelijm (NED) (1996)	time	6.75	10.95	15.20	19.59	24.12	28.69	33.49	38.42	43.50	48.71		54.37	9 / 3			
	reaction time	0.266															
	interval velocity	6.67	8.33	8.24	7.97	7.73	7.66	7.29	7.10	6.89	6.72	7.07	7.36		12.84	13.90	15.22
H1 lead leg	R	strides	23	15	15	15	15	16			17	20	151		8.18	7.55	6.90
Jíchová, Nikoleta (CZE) (2000)	time	6.50	10.68	15.03	19.49	24.00	28.68	33.51	38.59	43.83	49.04		54.91	4 / 4			
	reaction time	0.254															
	interval velocity	6.92	8.37	8.05	7.85	7.76	7.48	7.25	6.89	6.68	6.72	6.81	7.28		12.99	14.02	15.53
H1 lead leg	R	strides	22	15	15		15			16	20.5	103.5		8.08	7.49	6.76	
Folorunso, Ayomide (ITA) (1996)	time	6.60	10.82	15.21	19.69	24.27	28.87	33.61	38.53	43.79	49.04		55.2	2 / 5			
	reaction time	0.173															
	interval velocity	6.82	8.29	7.97	7.81	7.64	7.61	7.38	7.11	6.65	6.67	6.49	7.25		13.09	13.92	15.43
H1 lead leg	L	strides	23	15	15	15	16			17	21	122		8.02	7.54	6.80	
Kloster, Line (NOR) (1990)	time	6.32	10.40	14.68	19.06	23.55	28.20	32.95	38.08	43.51	49.00		55.29	5 / 6			
	reaction time	0.168															
	interval velocity	7.12	8.58	8.18	7.99	7.80	7.53	7.37	6.82	6.45	6.38	6.36	7.23		12.74	13.89	16.05
H1 lead leg	R	strides	22	15	15		15	15	16		17	20	135		8.24	7.56	6.54
Nielsen, Lina (GBR) (1996)	time	6.55	10.76	15.14	19.57	24.18	29.02	34.00	39.08	44.22	49.52		55.65	8 / 7			
	reaction time	0.209															
	interval velocity	6.87	8.31	7.99	7.90	7.59	7.23	7.03	6.89	6.81	6.60	6.53	7.19		13.02	14.43	15.52
H1 lead leg	L	strides	22	15	15	15	16	16	16		17	19	151		8.06	7.28	6.77
Diallo, Fatoumata Binta (POR) (2000)	time	6.42	10.63	14.96	19.38	23.88	28.57	33.58	38.62	43.96	49.44		55.65	3 / 8			
	reaction time	0.166															
	interval velocity	7.01	8.31	8.08	7.92	7.78	7.46	6.99	6.94	6.55	6.39	6.44	7.19		12.96	14.20	15.86
H1 lead leg	R	strides	24	16	16		17			18	21.5	112.5		8.10	7.39	6.62	



Time Intervals (s)

Hurdle Phases



Source: European Athletics (2024). 2024 European athletics championships - results book. p. 327

<https://european-athletics.directus.app/assets/fe31f746-d9d1-4555-8899-d095f5843ff0/Results%20Book%20-%20European%20Athletics%20Championships%202024.pdf>

Video: <https://www.youtube.com/watch?v=M5GTBi4chFQ>

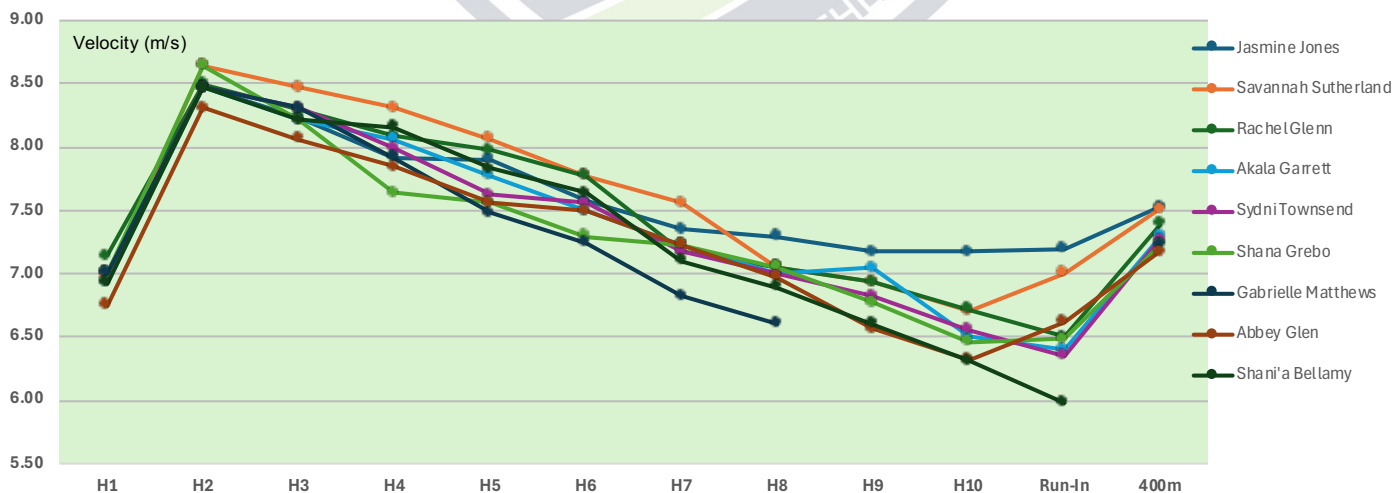
2024 NCAA Championships (Eugene, OR) (TV Analysis)

Women's 400m Hurdles

Date 2024.06.08

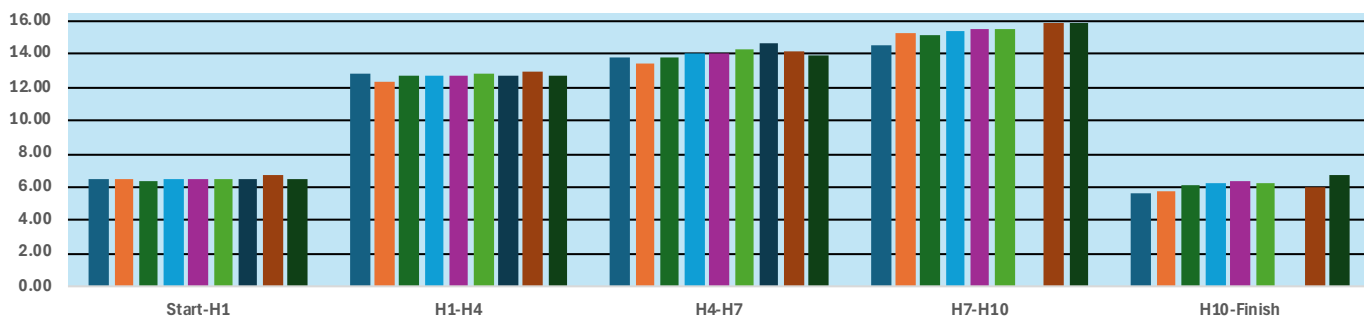
FINAL

		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Run-In	400m	Lane / Place	H1-H4	H4-H7	H7-H10
Jones, Jasmine (USA) (2001)	time	6.42	10.55	14.80	19.22	23.65	28.27	33.03	37.83	42.71	47.59		53.15	5 / 1			
	reaction time																
	interval		4.13	4.25	4.42	4.43	4.62	4.76	4.80	4.88	4.88	5.56	PB		12.80	13.81	14.56
	velocity	7.01	8.47	8.24	7.92	7.90	7.58	7.35	7.29	7.17	7.17	7.19	7.53		8.20	7.60	7.21
H1 lead leg	R																
Sutherland, Savannah (CAN) (2003)	time	6.46	10.51	14.64	18.85	23.19	27.69	32.32	37.28	42.33	47.55		53.26	7 / 2			
	reaction time																
	interval		4.05	4.13	4.21	4.34	4.50	4.63	4.96	5.05	5.22	5.71	NR PB		12.39	13.47	15.23
	velocity	6.97	8.64	8.47	8.31	8.06	7.78	7.56	7.06	6.93	6.70	7.01	7.51		8.47	7.80	6.89
H1 lead leg	R																
Glenn, Rachel (USA) (2002)	time	6.30	10.42	14.64	18.97	23.36	27.86	32.74	37.70	42.75	47.96		54.11	6 / 3			
	reaction time																
	interval		4.12	4.22	4.33	4.39	4.50	4.88	4.96	5.05	5.21	6.15			12.67	13.77	15.22
	velocity	7.14	8.50	8.29	8.08	7.97	7.78	7.17	7.06	6.93	6.72	6.50	7.39		8.29	7.63	6.90
H1 lead leg	R																
Garrett, Akala (USA) (2005)	time	6.50	10.63	14.89	19.23	23.73	28.40	33.24	38.24	43.21	48.59		54.84	8 / 4			
	reaction time																
	interval		4.13	4.26	4.34	4.50	4.67	4.84	5.00	4.97	5.38	6.25			12.73	14.01	15.35
	velocity	6.92	8.47	8.22	8.06	7.78	7.49	7.23	7.00	7.04	6.51	6.40	7.29		8.25	7.49	6.84
H1 lead leg	R																
Townsend, Sydney (USA) (2000)	time	6.42	10.55	14.76	19.14	23.73	28.36	33.24	38.24	43.37	48.71		55.01	3 / 5			
	reaction time																
	interval		4.13	4.21	4.38	4.59	4.63	4.88	5.00	5.13	5.34	6.30			12.72	14.10	15.47
	velocity	7.01	8.47	8.31	7.99	7.63	7.56	7.17	7.00	6.82	6.55	6.35	7.27		8.25	7.45	6.79
H1 lead leg	L																
Grebo, Shana (FRA) (2000)	time	6.42	10.47	14.73	19.31	23.94	28.74	33.58	38.54	43.71	49.13		55.30	4 / 6			
	reaction time																
	interval		4.05	4.26	4.58	4.63	4.80	4.84	4.96	5.17	5.42	6.17	PB		12.89	14.27	15.55
	velocity	7.01	8.64	8.22	7.64	7.56	7.29	7.23	7.06	6.77	6.46	6.48	7.23		8.15	7.36	6.75
H1 lead leg	L																
Matthews, Gabrielle (JAM) (2002)	time	6.42	10.55	14.76	19.18	23.86	28.69	33.82	39.12				55.33	9 / 7			
	reaction time																
	interval		4.13	4.21	4.42	4.68	4.83	5.13	5.30								
	velocity	7.01	8.47	8.31	7.92	7.48	7.25	6.82	6.60				7.23		12.76	14.64	
H1 lead leg	L																
Glynn, Abbey (USA) (2001)	time	6.67	10.88	15.22	19.68	24.31	28.98	33.82	38.84	44.17	49.71		55.75	2 / 8			
	reaction time																
	interval		4.21	4.34	4.46	4.63	4.67	4.84	5.02	5.33	5.54	6.04			13.01	14.14	15.89
	velocity	6.75	8.31	8.06	7.85	7.56	7.49	7.23	6.97	6.57	6.32	6.62	7.17		8.07	7.43	6.61
H1 lead leg	L																
Bellamy, Shani'a (USA) (2002)	time	6.50	10.63	14.89	19.18	23.65	28.23	33.16	38.24	43.54	49.09		55.78	1 / 9			
	reaction time																
	interval		4.13	4.26	4.29	4.47	4.58	4.93	5.08	5.30	5.55	6.69			12.68	13.98	15.93
	velocity	6.92	8.47	8.22	8.16	7.83	7.64	7.10	6.89	6.60	6.31	5.98			8.28	7.51	6.59
H1 lead leg	L																



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=cDnZJWvQVfk>

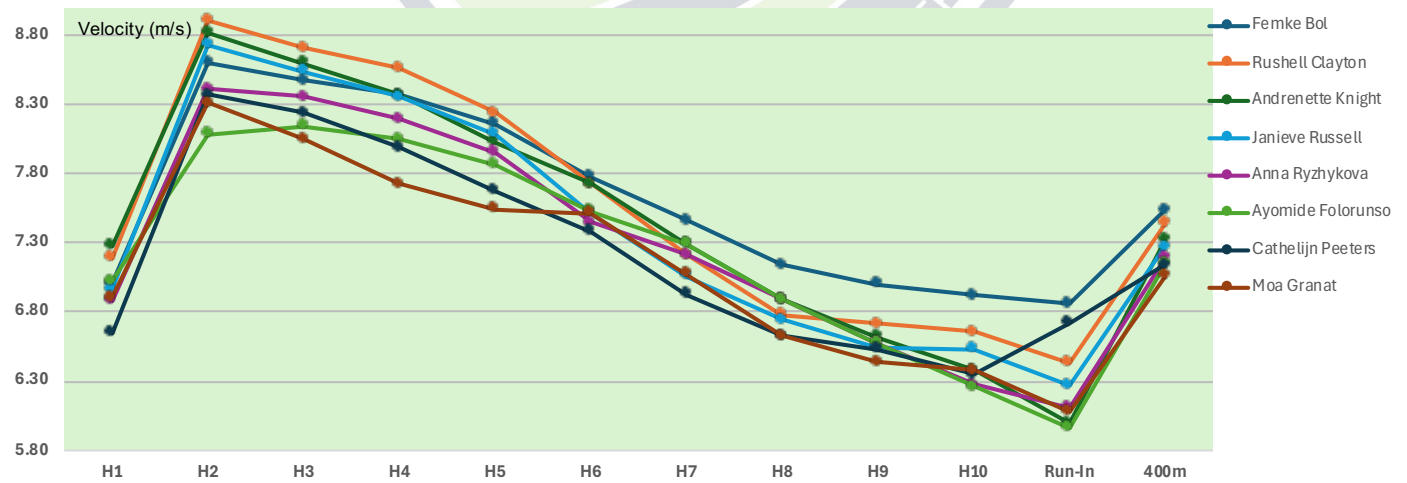
2024 Bauhaus Galan (Stockholm, SWE)

Women's 400m Hurdles

Date 2024.06.02

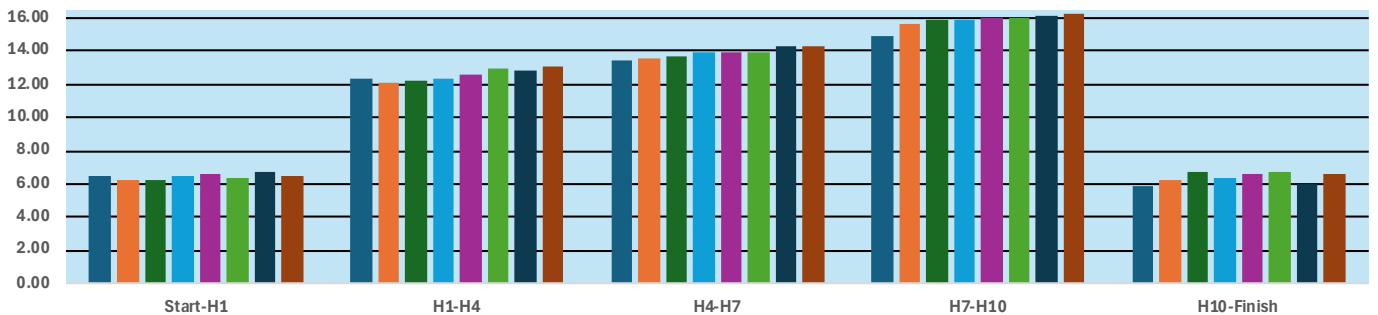
FINAL

		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	6.42	10.49	14.62	18.80	23.09	27.59	32.28	37.18	42.18	47.24	53.07	53.07	5 / 1			
	reaction time	0.191															
	interval		4.07	4.13	4.18	4.29	4.50	4.69	4.90	5.00	5.06	5.83			12.38	13.48	14.96
	velocity	7.01	8.60	8.47	8.37	8.16	7.78	7.46	7.14	7.00	6.92	6.86	7.54		8.48	7.79	7.02
H1 lead leg	L																
Clayton, Rushell (JAM) (1992)	time	6.26	10.19	14.21	18.30	22.55	27.08	31.93	37.09	42.30	47.56	53.78	53.78	6 / 2			
	reaction time	0.142															
	interval		3.93	4.02	4.09	4.25	4.53	4.85	5.16	5.21	5.26	6.22			12.04	13.63	15.63
	velocity	7.19	8.91	8.71	8.56	8.24	7.73	7.22	6.78	6.72	6.65	6.43	7.44		8.72	7.70	6.72
H1 lead leg	L																
Knight, Andrenette (JAM) (1996)	time	6.18	10.15	14.22	18.40	22.76	27.29	32.09	37.17	42.46	47.95	54.62	54.62	4 / 3			
	reaction time	0.168															
	interval		3.97	4.07	4.18	4.36	4.53	4.80	5.08	5.29	5.49	6.67			12.22	13.69	15.86
	velocity	7.28	8.82	8.60	8.37	8.03	7.73	7.29	6.89	6.62	6.38	6.00	7.32		8.59	7.67	6.62
H1 lead leg	R																
Russell, Janieve (JAM) (1993)	time	6.46	10.47	14.57	18.76	23.09	27.75	32.71	37.90	43.25	48.61	54.99	54.99	7 / 4			
	reaction time	0.159															
	interval		4.01	4.10	4.19	4.33	4.66	4.96	5.19	5.35	5.36	6.38			12.30	13.95	15.90
	velocity	6.97	8.73	8.54	8.35	8.08	7.51	7.06	6.74	6.54	6.53	6.27	7.27		8.54	7.53	6.60
H1 lead leg	R																
Ryzhykova, Anna (UKR) (1989)	time	6.54	10.70	14.89	19.16	23.56	28.26	33.11	38.19	43.51	49.09	55.64	55.64	1 / 5			
	reaction time	0.194															
	interval		4.16	4.19	4.27	4.40	4.70	4.85	5.08	5.32	5.58	6.55			12.62	13.95	15.98
	velocity	6.88	8.41	8.35	8.20	7.95	7.45	7.22	6.89	6.58	6.27	6.11	7.19		8.32	7.53	6.57
H1 lead leg	R																
Folorunso, Ayomide (ITA) (1996)	time	6.41	10.74	15.04	19.39	23.84	28.49	33.29	38.37	43.69	49.28	55.99	55.99	2 / 6			
	reaction time	0.174															
	interval		4.33	4.30	4.35	4.45	4.65	4.80	5.08	5.32	5.59	6.71			12.98	13.90	15.99
	velocity	7.02	8.08	8.14	8.05	7.87	7.53	7.29	6.89	6.58	6.26	5.96	7.14		8.09	7.55	6.57
H1 lead leg	L																
Peeters, Cathelijin (NED) (1996)	time	6.77	10.95	15.20	19.58	24.14	28.88	33.93	39.21	44.57	50.08	56.03	56.03	3 / 7			
	reaction time	0.279															
	interval		4.18	4.25	4.38	4.56	4.74	5.05	5.28	5.36	5.51	5.95			12.81	14.35	16.15
	velocity	6.65	8.37	8.24	7.99	7.68	7.38	6.93	6.63	6.53	6.35	6.72	7.14		8.20	7.32	6.50
H1 lead leg	R																
Granat, Moa (SWE) (2004)	time	6.52	10.73	15.08	19.61	24.25	28.91	33.86	39.14	44.58	50.07	56.65	56.65	8 / 8			
	reaction time	0.154															
	interval		4.21	4.35	4.53	4.64	4.66	4.95	5.28	5.44	5.49	6.58			13.09	14.25	16.21
	velocity	6.90	8.31	8.05	7.73	7.54	7.51	7.07	6.63	6.43	6.38	6.08	7.06		8.02	7.37	6.48
H1 lead leg	R																



Time Intervals (s)

Hurdle Phases



Source: Omega Timing (Sun 02 Jun 2024 19:40) - diamond league race analysis
<https://www.omegatiming.com/File/0002040A0102090101FFFFFFFFFFFF6D.pdf>

Video: <https://www.youtube.com/watch?v=dhxm3yNiVU>

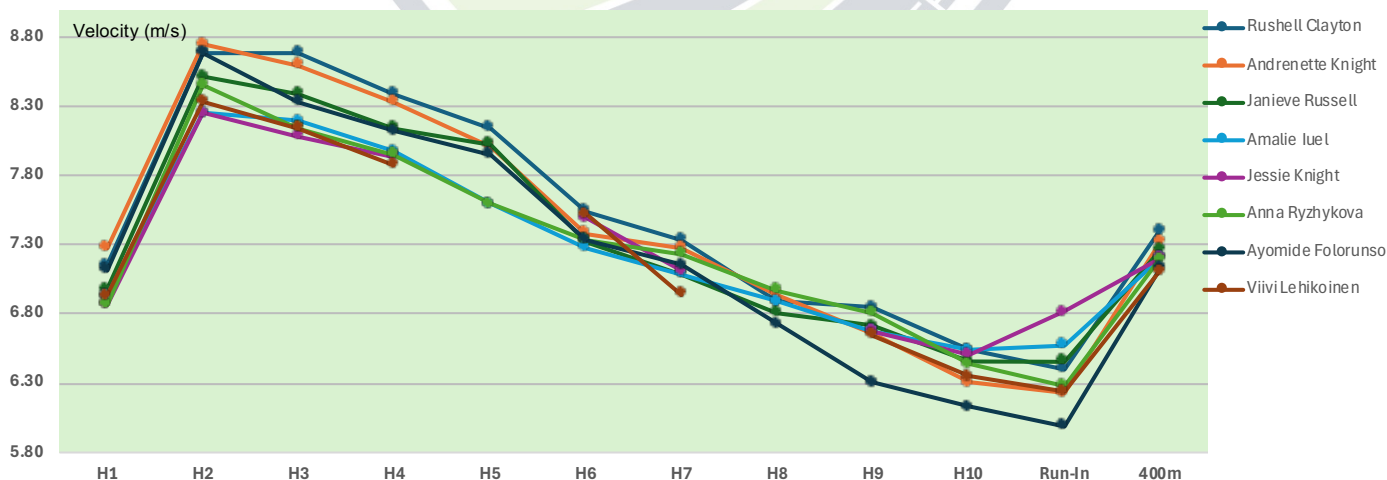
2024 Bislett Games (Oslo, NOR) (TV Analysis)

Women's 400m Hurdles

Date 2024.05.30

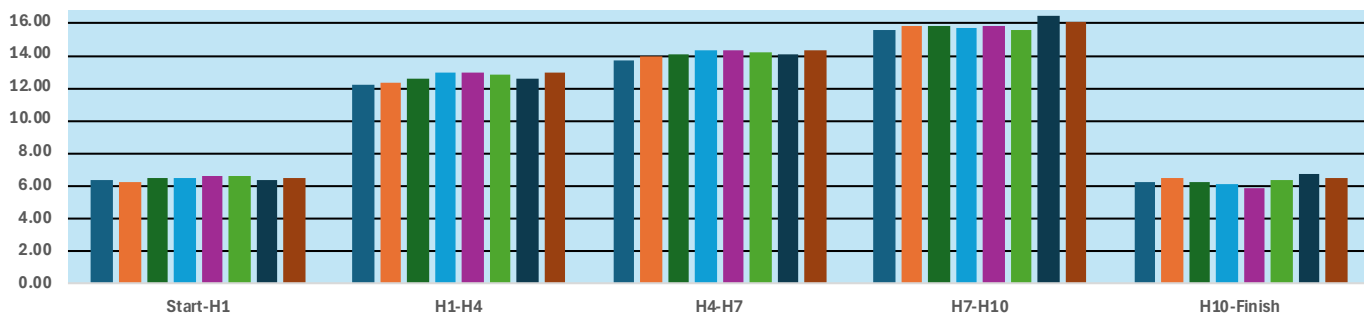
FINAL

		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	6.29	10.32	14.35	18.52	22.82	27.46	32.23	37.31	42.42	47.77		54.02	5 / 2			
	reaction time	0.147															
	interval		4.03	4.03	4.17	4.30	4.64	4.77	5.08	5.11	5.35	6.25			12.23	13.71	15.54
	velocity	7.15	8.68	8.68	8.39	8.14	7.54	6.89	6.85	6.54	6.40	7.40			8.59	7.66	6.76
H1 lead leg	L											19.2	175.2				
Knight, Andrenette (JAM) (1996)	time	6.18	10.18	14.25	18.45	22.82	27.56	32.37	37.41	42.66	48.21		54.63	4 / 2			
	reaction time	0.172															
	interval		4.00	4.07	4.20	4.37	4.74	4.81	5.04	5.25	5.55	6.42			12.27	13.92	15.84
	velocity	7.28	8.75	8.60	8.33	8.01	7.38	7.28	6.94	6.67	6.31	6.23	7.32		8.56	7.54	6.63
H1 lead leg	R											20	185				
Russell, Janieve (JAM) (1993)	time	6.45	10.56	14.73	19.03	23.39	28.17	33.11	38.25	43.46	48.88		55.07	6 / 3			
	reaction time	0.139															
	interval		4.11	4.17	4.30	4.36	4.78	4.94	5.14	5.21	5.42	6.19			12.58	14.08	15.77
	velocity	6.98	8.52	8.39	8.14	8.03	7.32	7.09	6.81	6.72	6.46	6.46	7.26		8.35	7.46	6.66
H1 lead leg	R											20	186				
luel, Amalie (NOR) (1996)	time	6.49	10.73	15.00	19.39	24.00	28.81	33.75	38.83	44.07	49.42		55.50	7 / 4			
	reaction time	0.129															
	interval		4.24	4.27	4.39	4.61	4.81	4.94	5.08	5.24	5.35	6.08			12.90	14.36	15.67
	velocity	6.93	8.25	8.20	7.97	7.59	7.28	7.09	6.89	6.68	6.54	6.58	7.21		8.14	7.31	6.70
H1 lead leg	L											19	179				
Knight, Jessie (GBR) (1994)	time	6.55	10.79	15.12	19.53		28.87	33.79		44.27	49.65		55.52	2 / 5			
	reaction time	0.154															
	interval		4.24	4.33	4.41		9.34	4.92		10.48	5.38	5.87			12.98	14.26	15.86
	velocity	6.87	8.25	8.08	7.94		7.49	7.11		6.68	6.51	6.81	7.20		8.09	7.36	6.62
H1 lead leg	R											19.2	163.2				
Ryzhykova, Anna (UKR) (1989)	time	6.55	10.69	14.99	19.39	24.00	28.77	33.61	38.63	43.77	49.21		55.58	8 / 6			
	reaction time	0.189															
	interval		4.14	4.30	4.40	4.61	4.77	4.84	5.02	5.14	5.44	6.37			12.84	14.22	15.60
	velocity	6.87	8.45	8.14	7.95	7.59	7.34	7.23	6.97	6.81	6.43	6.28	7.20		8.18	7.38	6.73
H1 lead leg	R											20	172				
Folorunso, Ayomide (ITA) (1996)	time	6.32	10.35	14.55	18.86	23.26	28.03	32.92	38.12	43.67	49.38		56.06	3 / 7			
	reaction time	0.168															
	interval		4.03	4.20	4.31	4.40	4.77	4.89	5.20	5.55	5.71	6.68			12.54	14.06	16.46
	velocity	7.12	8.68	8.33	8.12	7.95	7.34	7.16	6.73	6.31	6.13	5.99	7.14		8.37	7.47	6.38
H1 lead leg	L											21	187				
Lehikoinen, Viivi (FIN) (1999)	time	6.49	10.69	14.99	19.43		28.74	33.78		44.31	49.82		56.23	1 / 8			
	reaction time	0.234															
	interval		4.20	4.30	4.44		9.31	5.04		10.53	5.51	6.41			12.94	14.35	16.04
	velocity	6.93	8.33	8.14	7.88		7.52	6.94		6.65	6.35	6.24	7.11		8.11	7.32	6.55
H1 lead leg	R											21	158				



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 24fps

Timing From: First Movement

Source: https://www.youtube.com/watch?v=4XvY_RMxQag

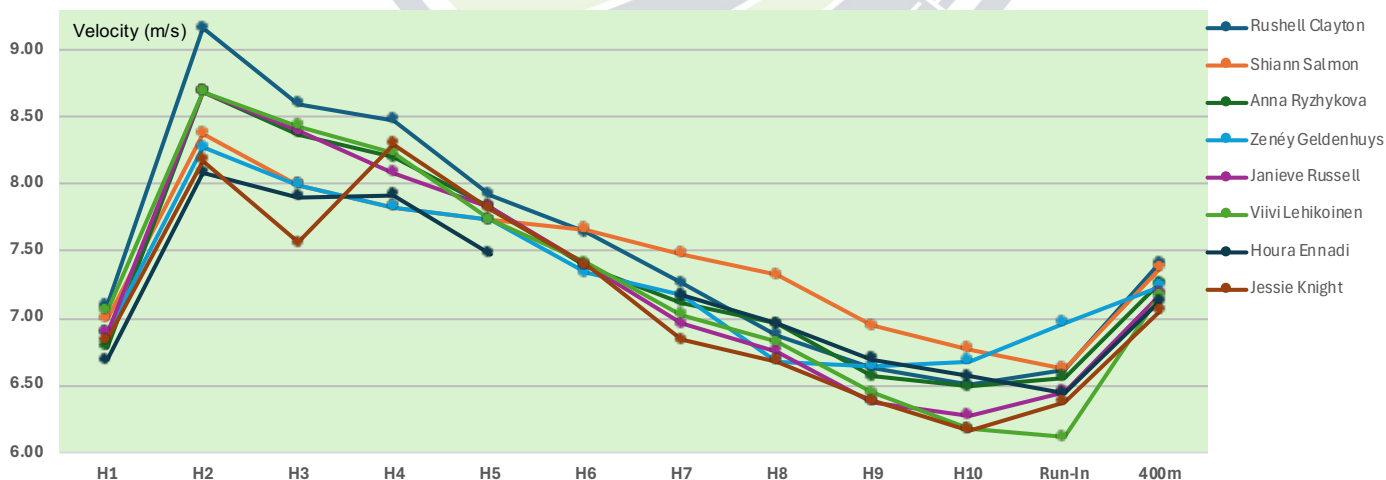
2024 Meeting International Mohammed VI d'Athlétisme (Marrakech, MAR)

Women's 400m Hurdles

Date 2024.05.19

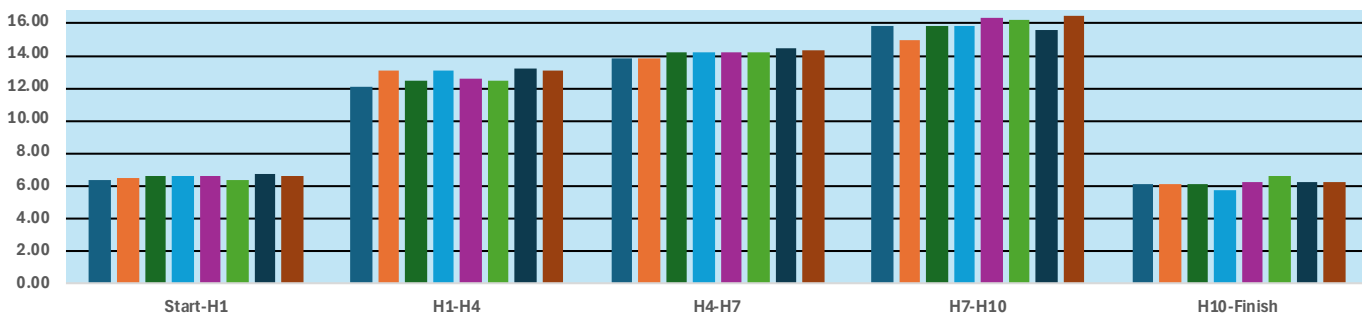
FINAL

		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	6.34	10.16	14.23	18.36	22.78	27.36	32.18	37.27	42.55	47.93		53.98	6 / 1			
	reaction time	0.158															
	interval		3.82	4.07	4.13	4.42	4.58	4.82	5.09	5.28	5.38	6.05			12.02	13.82	15.75
	velocity	7.10	9.16	8.60	8.47	7.92	7.64	7.26	6.88	6.63	6.51	6.61	7.41		8.74	7.60	6.67
H1 lead leg	L																
	strides	22	14	14	14	15	15	15	16	16	16	19.2	176.2				
Salmon, Shiann (JAM) (1999)	time	6.43	10.61	14.99	19.46	23.99	28.56	33.24	38.02	43.06	48.23		54.27	7 / 2			
	reaction time	0.163															
	interval		4.18	4.38	4.47	4.53	4.57	4.68	4.78	5.04	5.17	6.04			13.03	13.78	14.99
	velocity	7.00	8.37	7.99	7.83	7.73	7.66	7.48	7.32	6.94	6.77	6.62	7.37		8.06	7.62	7.00
H1 lead leg	R																
	strides	22	15	15	15	15	15	15	15	16	16	19.7	163.7				
Ryzhykova, Anna (UKR) (1989)	time	6.63	10.66	14.84	19.11	23.58	28.32	33.24	38.27	43.60	48.99		55.09	4 / 3			
	reaction time	0.202															
	interval		4.03	4.18	4.27	4.47	4.74	4.92	5.03	5.33	5.39	6.10			12.48	14.13	15.75
	velocity	6.79	8.68	8.37	8.20	7.83	7.38	7.11	6.96	6.57	6.49	6.56	7.26		8.41	7.43	6.67
H1 lead leg	R																
	strides	21	14	14	14	14	15	15	15	16	16	19	158				
Geldenhuis, Zenéy (RSA) (2000)	time	6.53	10.76	15.14	19.61	24.14	28.91	33.79	39.03	44.30	49.54		55.28	1 / 4			
	reaction time	0.163															
	interval		4.23	4.38	4.47	4.53	4.77	4.88	5.24	5.27	5.24	5.74			13.08	14.18	15.75
	velocity	6.89	8.27	7.99	7.83	7.73	7.34	7.17	6.68	6.64	6.68	6.97	7.24		8.03	7.40	6.67
H1 lead leg	R																
	strides	23	15	15	15	15	15	16	16	16	19	165					
Russell, Janieve (JAM) (1993)	time	6.53	10.56	14.73	19.06	23.53	28.26	33.29	38.47	43.96	49.54		55.74	5 / 5			
	reaction time	0.141															
	interval		4.03	4.17	4.33	4.47	4.73	5.03	5.18	5.49	5.58	6.20			12.53	14.23	16.25
	velocity	6.89	8.68	8.39	8.08	7.83	7.40	6.96	6.76	6.38	6.27	6.45	7.18		8.38	7.38	6.46
H1 lead leg	R																
	strides	23	15	15	15	15	16	17	17	17	20	170					
Lehikoinen, Viivi (FIN) (1999)	time	6.38	10.41	14.56	18.81	23.34	28.06	33.04	38.17	43.60	49.27		55.81	8 / 6			
	reaction time	0.192															
	interval		4.03	4.15	4.25	4.53	4.72	4.98	5.13	5.43	5.67	6.54			12.43	14.23	16.23
	velocity	7.05	8.68	8.43	8.24	7.73	7.42	7.03	6.82	6.45	6.17	6.12	7.17		8.45	7.38	6.47
H1 lead leg	R																
	strides	23	15	15	15	16	16	16	17	18	18	21	190				
Ennadi, Noura (MAR) (1999)	time	6.73	11.06	15.49	19.91	24.59		34.35	39.38	44.61	49.94		56.15	3 / 7			
	reaction time	0.177															
	interval		4.33	4.43	4.42	4.68		9.76	5.03	5.23	5.33	6.21			13.18	14.44	15.59
	velocity	6.69	8.08	7.90	7.92	7.48		7.17	6.96	6.69	6.57	6.44	7.12		7.97	7.27	6.74
H1 lead leg	R																
	strides	23	15	15	15	15	15	15	17	17	17	20.2	169.2				
Knight, Jessie (GBR) (1994)	time	6.58	10.86	15.49	19.71	24.19	28.92	34.04	39.28	44.76	50.44		56.71	2 / 8			
	reaction time	0.163															
	interval		4.28	4.63	4.22	4.48	4.73	5.12	5.24	5.48	5.68	6.27			13.13	14.33	16.40
	velocity	6.84	8.18	7.56	8.29	7.81	7.40	6.84	6.68	6.39	6.16	6.38	7.05		8.00	7.33	6.40
H1 lead leg	R																
	strides	22	14	16	15	15	15	15	16	16	16	19.5	164.5				



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=C15ozhfg5WQ>