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Scan to download matrix, methodology and disclaimer

Imperial version (speed in mph ; distance in feet)

DRAG FACTOR UNCERTAINTY QUICK-REFERENCE MATRIX- SPEED VARIATION ACROSS DRAG FACTOR INTERVALS AND DISTANCE

To use this Matrix: locate the measured distance on the vertical axis and the applicable drag-factor interval on the horizontal axis. Select the cell where the two intersect. The resulting value represents the quantified effect of allowing the drag factor to vary across that interval at the selected distance. If the exact distance is not listed, use the closest available distance. This matrix does not determine what drag factor should be selected. The appropriate drag-factor range must be established independently from the available evidence and reconstruction methodology. This matrix then provides a means of quantifying the effect of that range on the resulting speed calculation.

Mean Speed: The middle-calculated speed when all simulated results are arranged from lowest to highest. Fifty percent of the results are below the median and 50% are

Speed Range: The difference between the maximum and minimum calculated speeds. It represents the total spread of possible simulated speed estimates.

Standard Deviation (SD): A measure of how widely the simulated speed results are dispersed around the mean speed. A larger standard deviation indicates greater variability in the calculated speed. To get the maximum, add the SD to the mean speed. To get the minimum speed, subtract the SD from the mean speed.

Relative Uncertainty (RU): A normalized measured of the uncertainty in the calculated speed relative to the mean speed. In this study, it provides a standardized way to describe the magnitude of speed variability associated with the uncertainty in drag factor. The relative uncertainty remained constant across all distances for each drag factor interval.

$$RU(\%) = \frac{\square}{\square\square\square\square\square\square\square\square} \square \square\square\square \qquad S = \sqrt{\square\square\square\square} \qquad SD = \frac{\square\square\square\square}{\square\square\square} \square$$

DRAG FACTOR RANGE- INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	10 FT			20 FT			30 FT			40 FT			50 FT		
		MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)
0.01 - 0.05	20.7%	2.93	2.14	0.61	4.14	3.03	0.86	5.07	3.71	1.05	5.85	4.28	1.21	6.55	4.79	1.36
0.05 - 0.10	9.7%	4.73	1.60	0.46	6.68	2.27	0.65	8.19	2.78	0.79	9.45	3.21	0.92	10.57	3.59	1.02
0.10 - 0.15	5.8%	6.12	1.23	0.36	8.65	1.74	0.50	10.60	2.13	0.62	12.24	2.46	0.71	13.68	2.75	0.79
0.15 - 0.20	4.1%	7.24	1.04	0.30	10.24	1.47	0.42	12.54	1.80	0.52	14.48	2.08	0.60	16.19	2.32	0.67
0.20 - 0.25	3.2%	8.21	0.91	0.26	11.62	1.29	0.37	14.23	1.58	0.46	16.43	1.83	0.53	18.37	2.04	0.59
0.25 - 0.30	2.6%	9.08	0.83	0.24	12.85	1.17	0.34	15.73	1.43	0.41	18.17	1.65	0.47	20.31	1.85	0.53
0.30 - 0.35	2.2%	9.87	0.76	0.22	13.96	1.07	0.31	17.10	1.32	0.38	19.74	1.52	0.44	22.08	1.70	0.49
0.35 - 0.40	1.9%	10.60	0.71	0.20	14.99	1.00	0.29	18.36	1.23	0.35	21.21	1.41	0.41	23.71	1.58	0.46
0.40 - 0.45	1.7%	11.29	0.66	0.19	15.96	0.94	0.27	19.55	1.15	0.33	22.58	1.33	0.38	25.24	1.49	0.43
0.45 - 0.50	1.5%	11.94	0.63	0.18	16.88	0.89	0.26	20.67	1.09	0.32	23.87	1.26	0.36	26.69	1.41	0.41
0.50 - 0.55	1.4%	12.55	0.60	0.17	17.75	0.85	0.24	21.74	1.04	0.30	25.10	1.20	0.34	28.06	1.34	0.38
0.55 - 0.60	1.3%	13.13	0.57	0.17	18.57	0.81	0.23	22.75	0.99	0.29	26.27	1.14	0.33	29.37	1.28	0.37
0.60 - 0.65	1.2%	13.69	0.55	0.16	19.36	0.77	0.22	23.71	0.95	0.27	27.38	1.10	0.32	30.62	1.22	0.35
0.65 - 0.70	1.1%	14.23	0.53	0.15	20.12	0.75	0.22	24.65	0.91	0.26	28.46	1.05	0.30	31.82	1.18	0.34
0.70 - 0.75	1.0%	14.75	0.51	0.15	20.86	0.72	0.21	25.54	0.88	0.26	29.50	1.02	0.30	32.98	1.14	0.33
0.75 - 0.80	0.9%	15.25	0.49	0.14	21.56	0.70	0.20	26.41	0.85	0.25	30.50	0.98	0.29	34.10	1.10	0.32
0.80 - 0.85	0.9%	15.73	0.48	0.14	22.25	0.67	0.20	27.25	0.83	0.24	31.47	0.95	0.28	35.18	1.07	0.31
0.85 - 0.90	0.8%	16.20	0.46	0.13	22.91	0.65	0.19	28.06	0.80	0.23	32.40	0.93	0.27	36.23	1.04	0.30
0.90 - 0.95	0.8%	16.66	0.45	0.13	23.56	0.64	0.18	28.85	0.78	0.23	33.31	0.90	0.26	37.25	1.01	0.29
0.95 - 1.0	0.7%	17.10	0.44	0.13	24.19	0.62	0.18	29.62	0.76	0.22	34.21	0.88	0.25	38.25	0.98	0.28
1.0 - 1.05	0.7%	17.54	0.43	0.12	24.80	0.60	0.18	30.37	0.74	0.21	35.07	0.86	0.25	39.21	0.96	0.28
1.05 - 1.10	0.7%	17.96	0.42	0.12	25.39	0.59	0.17	31.10	0.72	0.21	35.91	0.84	0.24	40.15	0.93	0.27
1.10 - 1.15	0.6%	18.37	0.41	0.12	25.98	0.58	0.17	31.82	0.71	0.20	36.74	0.82	0.24	41.08	0.91	0.26
1.15 - 1.20	0.6%	18.78	0.40	0.12	26.55	0.56	0.16	32.52	0.69	0.20	37.55	0.80	0.23	41.98	0.89	0.26
DRAG FACTOR RANGE- INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	60 FT			70 FT			80 FT			90 FT			100 FT		
		MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)
0.01 - 0.05	20.7%	7.17	5.24	1.48	7.74	5.66	1.60	8.28	6.05	1.71	8.78	6.42	1.82	9.26	6.77	1.92
0.05 - 0.10	9.7%	11.58	3.93	1.12	12.50	4.24	1.21	13.37	4.54	1.29	14.18	4.81	1.37	14.94	5.07	1.45
0.10 - 0.15	5.8%	14.99	3.01	0.87	16.19	3.26	0.94	17.30	3.48	1.00	18.35	3.69	1.07	19.35	3.89	1.12
0.15 - 0.20	4.1%	17.73	2.54	0.73	19.16	2.75	0.79	20.48	2.94	0.84	21.72	3.11	0.90	22.90	3.28	0.94
0.20 - 0.25	3.2%	20.12	2.24	0.65	21.73	2.42	0.70	23.23	2.59	0.75	24.64	2.74	0.79	25.98	2.89	0.83
0.25 - 0.30	2.6%	22.25	2.02	0.58	24.03	2.19	0.63	25.69	2.34	0.67	27.25	2.48	0.71	28.72	2.61	0.75
0.30 - 0.35	2.2%	24.18	1.86	0.54	26.12	2.01	0.58	27.92	2.15	0.62	29.62	2.28	0.66	31.22	2.40	0.69
0.35 - 0.40	1.9%	25.97	1.73	0.50	28.05	1.87	0.54	29.99	2.00	0.58	31.81	2.12	0.61	33.53	2.24	0.65
0.40 - 0.45	1.7%	27.65	1.63	0.47	29.87	1.76	0.51	31.93	1.88	0.54	33.86	1.99	0.58	35.70	2.10	0.61
0.45 - 0.50	1.5%	29.24	1.54	0.45	31.58	1.66	0.48	33.76	1.78	0.51	35.81	1.89	0.55	37.75	1.99	0.58
0.50 - 0.55	1.4%	30.74	1.46	0.42	33.20	1.58	0.45	35.49	1.69	0.49	37.65	1.79	0.52	39.68	1.89	0.54
0.55 - 0.60	1.3%	32.17	1.40	0.40	34.75	1.51	0.44	37.15	1.62	0.47	39.40	1.71	0.50	41.53	1.81	0.52
0.60 - 0.65	1.2%	33.54	1.34	0.39	36.22	1.45	0.42	38.73	1.55	0.45	41.07	1.64	0.47	43.30	1.73	0.50
0.65 - 0.70	1.1%	34.86	1.29	0.37	37.65	1.39	0.40	40.25	1.49	0.43	42.69	1.58	0.46	45.00	1.67	0.48
0.70 - 0.75	1.0%	36.12	1.25	0.36	39.02	1.35	0.39	41.71	1.44	0.42	44.24	1.53	0.44	46.64	1.61	0.47
0.75 - 0.80	0.9%	37.35	1.20	0.35	40.34	1.30	0.38	43.13	1.39	0.40	45.74	1.48	0.43	48.22	1.56	0.45
0.80 - 0.85	0.9%	38.54	1.17	0.34	41.63	1.26	0.37	44.50	1.35	0.39	47.20	1.43	0.41	49.75	1.51	0.44
0.85 - 0.90	0.8%	39.69	1.13	0.33	42.87	1.22	0.35	45.83	1.31	0.38	48.60	1.39	0.40	51.23	1.46	0.42
0.90 - 0.95	0.8%	40.80	1.10	0.32	44.07	1.19	0.34	47.11	1.27	0.37	49.97	1.35	0.39	52.67	1.42	0.41
0.95 - 1.0	0.7%	41.90	1.07	0.31	45.25	1.16	0.33	48.38	1.24	0.36	51.31	1.32	0.38	54.09	1.39	0.40
1.0 - 1.05	0.7%	42.96	1.05	0.30	46.40	1.13	0.33	49.60	1.21	0.35	52.61	1.28	0.37	55.46	1.35	0.39
1.05 - 1.10	0.7%	43.98	1.02	0.30	47.51	1.10	0.32	50.79	1.18	0.34	53.87	1.25	0.36	56.78	1.32	0.38
1.10 - 1.15	0.6%	45.00	1.00	0.29	48.61	1.08	0.31	51.96	1.15	0.33	55.11	1.22	0.35	58.10	1.29	0.37
1.15 - 1.20	0.6%	45.99	0.98	0.28	49.67	1.06	0.31	53.10	1.13	0.33	56.33	1.20	0.35	59.37	1.26	0.37

DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	110 FT			120 FT			130 FT			140 FT			150 FT		
		MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)
0.01 - 0.05	20.7%	9.71	7.10	2.01	10.14	7.41	2.10	10.55	7.72	2.19	10.95	8.01	2.27	11.34	8.29	2.35
0.05 - 0.10	9.7%	15.67	5.32	1.52	16.37	5.56	1.59	17.04	5.78	1.65	17.68	6.00	1.71	18.30	6.21	1.77
0.10 - 0.15	5.8%	20.29	4.08	1.18	21.19	4.26	1.23	22.06	4.44	1.28	22.89	4.61	1.33	23.70	4.77	1.38
0.15 - 0.20	4.1%	24.01	3.44	0.99	25.08	3.59	1.03	26.10	3.74	1.08	27.09	3.88	1.12	28.04	4.02	1.16
0.20 - 0.25	3.2%	27.24	3.03	0.88	28.45	3.17	0.91	29.62	3.30	0.95	30.73	3.42	0.99	31.81	3.54	1.02
0.25 - 0.30	2.6%	30.13	2.74	0.79	31.47	2.86	0.82	32.75	2.98	0.86	33.99	3.09	0.89	35.18	3.20	0.92
0.30 - 0.35	2.2%	32.74	2.52	0.73	34.20	2.63	0.76	35.60	2.74	0.79	36.94	2.84	0.82	38.24	2.94	0.85
0.35 - 0.40	1.9%	35.16	2.35	0.68	36.73	2.45	0.71	38.23	2.55	0.74	39.67	2.65	0.77	41.06	2.74	0.79
0.40 - 0.45	1.7%	37.44	2.20	0.64	39.10	2.30	0.66	40.70	2.40	0.69	42.24	2.49	0.72	43.72	2.57	0.74
0.45 - 0.50	1.5%	39.59	2.08	0.60	41.35	2.18	0.63	43.04	2.27	0.66	44.66	2.35	0.68	46.23	2.43	0.70
0.50 - 0.55	1.4%	41.62	1.98	0.57	43.47	2.07	0.60	45.25	2.15	0.62	46.96	2.24	0.64	48.60	2.31	0.67
0.55 - 0.60	1.3%	43.56	1.89	0.55	45.49	1.98	0.57	47.35	2.06	0.59	49.14	2.14	0.62	50.86	2.21	0.64
0.60 - 0.65	1.2%	45.41	1.82	0.52	47.43	1.90	0.55	49.37	1.98	0.57	51.23	2.05	0.59	53.03	2.12	0.61
0.65 - 0.70	1.1%	47.19	1.75	0.51	49.29	1.83	0.53	51.31	1.90	0.55	53.24	1.97	0.57	55.11	2.04	0.59
0.70 - 0.75	1.0%	48.91	1.69	0.49	51.09	1.76	0.51	53.17	1.83	0.53	55.18	1.90	0.55	57.12	1.97	0.57
0.75 - 0.80	0.9%	50.57	1.63	0.47	52.82	1.70	0.49	54.98	1.77	0.51	57.05	1.84	0.53	59.06	1.91	0.55
0.80 - 0.85	0.9%	52.18	1.58	0.46	54.50	1.65	0.48	56.73	1.72	0.50	58.87	1.78	0.52	60.94	1.85	0.53
0.85 - 0.90	0.8%	53.73	1.54	0.44	56.12	1.60	0.46	58.42	1.67	0.48	60.62	1.73	0.50	62.75	1.79	0.52
0.90 - 0.95	0.8%	55.25	1.49	0.43	57.70	1.56	0.45	60.06	1.62	0.47	62.33	1.68	0.49	64.51	1.74	0.50
0.95 - 1.0	0.7%	56.73	1.45	0.42	59.25	1.52	0.44	61.67	1.58	0.46	64.00	1.64	0.47	66.24	1.70	0.49
1.0 - 1.05	0.7%	58.16	1.42	0.41	60.75	1.48	0.43	63.23	1.54	0.45	65.62	1.60	0.46	67.92	1.66	0.48
1.05 - 1.10	0.7%	59.56	1.39	0.40	62.20	1.45	0.42	64.74	1.51	0.44	67.19	1.56	0.45	69.55	1.62	0.47
1.10 - 1.15	0.6%	60.93	1.35	0.39	63.64	1.41	0.41	66.24	1.47	0.42	68.74	1.53	0.44	71.15	1.58	0.46
1.15 - 1.20	0.6%	62.27	1.32	0.38	65.04	1.38	0.40	67.69	1.44	0.42	70.25	1.49	0.43	72.72	1.55	0.45

DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	160 FT			170 FT			180 FT			190 FT			200 FT		
		MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)
0.01 - 0.05	20.7%	11.71	8.56	2.42	12.07	8.83	2.50	12.42	9.08	2.57	12.76	9.33	2.64	13.09	9.57	2.71
0.05 - 0.10	9.7%	18.90	6.42	1.83	19.48	6.61	1.89	20.05	6.81	1.94	20.60	6.99	2.00	21.13	7.17	2.05
0.10 - 0.15	5.8%	24.47	4.92	1.42	25.23	5.07	1.46	25.96	5.22	1.51	26.67	5.37	1.55	27.36	5.50	1.59
0.15 - 0.20	4.1%	28.96	4.15	1.19	29.85	4.28	1.23	30.72	4.40	1.27	31.56	4.52	1.30	32.38	4.64	1.34
0.20 - 0.25	3.2%	32.86	3.66	1.06	33.87	3.77	1.09	34.85	3.88	1.12	35.80	3.99	1.15	36.73	4.09	1.18
0.25 - 0.30	2.6%	36.33	3.31	0.95	37.45	3.41	0.98	38.54	3.51	1.01	39.59	3.60	1.03	40.62	3.70	1.06
0.30 - 0.35	2.2%	39.49	3.04	0.88	40.70	3.13	0.90	41.88	3.22	0.93	43.03	3.31	0.95	44.15	3.40	0.98
0.35 - 0.40	1.9%	42.41	2.83	0.82	43.72	2.92	0.84	44.98	3.00	0.87	46.22	3.08	0.89	47.42	3.16	0.92
0.40 - 0.45	1.7%	45.15	2.66	0.77	46.54	2.74	0.79	47.89	2.82	0.81	49.20	2.90	0.84	50.48	2.97	0.86
0.45 - 0.50	1.5%	47.74	2.51	0.73	49.21	2.59	0.75	50.64	2.67	0.77	52.03	2.74	0.79	53.38	2.81	0.81
0.50 - 0.55	1.4%	50.20	2.39	0.69	51.74	2.46	0.71	53.24	2.54	0.73	54.70	2.61	0.75	56.12	2.67	0.77
0.55 - 0.60	1.3%	52.53	2.28	0.66	54.15	2.36	0.68	55.72	2.42	0.70	57.25	2.49	0.72	58.73	2.55	0.74
0.60 - 0.65	1.2%	54.77	2.19	0.63	56.45	2.26	0.65	58.09	2.32	0.67	59.68	2.39	0.69	61.23	2.45	0.71
0.65 - 0.70	1.1%	56.92	2.11	0.61	58.67	2.17	0.63	60.37	2.24	0.65	62.03	2.30	0.66	63.34	2.36	0.68
0.70 - 0.75	1.0%	58.99	2.03	0.59	60.81	2.10	0.61	62.57	2.16	0.63	64.28	2.22	0.64	65.95	2.27	0.66
0.75 - 0.80	0.9%	60.99	1.97	0.57	62.87	2.03	0.59	64.69	2.09	0.60	66.47	2.14	0.62	68.19	2.20	0.64
0.80 - 0.85	0.9%	62.93	1.91	0.55	64.87	1.97	0.57	66.75	2.02	0.59	68.58	2.08	0.60	70.36	2.13	0.62
0.85 - 0.90	0.8%	64.81	1.85	0.54	66.80	1.91	0.55	68.74	1.96	0.57	70.62	2.02	0.58	72.46	2.07	0.60
0.90 - 0.95	0.8%	66.63	1.80	0.52	68.68	1.86	0.54	70.67	1.91	0.55	72.61	1.96	0.57	74.49	2.01	0.58
0.95 - 1.0	0.7%	68.42	1.75	0.50	70.52	1.81	0.52	72.57	1.86	0.54	74.55	1.91	0.55	76.49	1.96	0.56
1.0 - 1.05	0.7%	70.15	1.71	0.50	72.31	1.76	0.51	74.40	1.81	0.53	76.44	1.86	0.54	78.43	1.91	0.55
1.05 - 1.10	0.7%	71.83	1.67	0.48	74.04	1.72	0.50	76.18	1.77	0.51	78.27	1.82	0.53	80.30	1.87	0.54
1.10 - 1.15	0.6%	73.49	1.63	0.47	75.75	1.68	0.49	77.94	1.73	0.50	80.08	1.78	0.51	82.16	1.83	0.53
1.15 - 1.20	0.6%	75.10	1.60	0.46	77.41	1.65	0.48	79.66	1.69	0.49	81.84	1.74	0.50	83.96	1.79	0.52

DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	210 FT			220 FT			230 FT			240 FT			250 FT		
		MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)	MEAN SPEED (MPH)	SPEED RANGE (MPH)	SD (MPH)
0.01 - 0.05	20.7%	13.41	9.81	2.78	13.73	10.04	2.84	14.04	10.27	2.91	14.34	10.49	2.97	14.64	10.70	3.03
0.05 - 0.10	9.7%	21.66	7.35	2.10	22.17	7.52	2.15	22.66	7.69	2.20	23.15	7.86	2.24	23.63	8.02	2.29
0.10 - 0.15	5.8%	28.04	5.64	1.63	28.70	5.77	1.67	29.34	5.90	1.70	29.97	6.03	1.74	30.59	6.15	1.78
0.15 - 0.20	4.1%	33.18	4.76	1.37	33.96	4.87	1.40	34.72	4.98	1.43	35.47	5.08	1.46	36.20	5.19	1.49
0.20 - 0.25	3.2%	37.64	4.19	1.21	38.53	4.29	1.24	39.39	4.38	1.27	40.24	4.48	1.29	41.07	4.57	1.32
0.25 - 0.30	2.6%	41.63	3.79	1.09	42.60	3.88	1.11	43.56	3.96	1.14	44.50	4.05	1.16	45.42	4.13	1.19
0.30 - 0.35	2.2%	45.24	3.48	1.00	46.31	3.57	1.03	47.35	3.65	1.05	48.36	3.72	1.07	49.36	3.80	1.10
0.35 - 0.40	1.9%	48.59	3.24	0.94	49.73	3.32	0.96	50.85	3.39	0.98	51.94	3.47	1.00	53.01	3.54	1.02
0.40 - 0.45	1.7%	51.73	3.04	0.88	52.95	3.12	0.90	54.14	3.19	0.92	55.30	3.25	0.94	56.44	3.32	0.96
0.45 - 0.50	1.5%	54.70	2.88	0.83	55.99	2.95	0.85	57.24	3.01	0.87	58.47	3.08	0.89	59.68	3.14	0.91
0.50 - 0.55	1.4%	57.51	2.74	0.79	58.86	2.80	0.81	60.18	2.87	0.82	61.48	2.93	0.84	62.75	2.99	0.86
0.55 - 0.60	1.3%	60.18	2.62	0.76	61.60	2.68	0.77	62.98	2.74	0.79	64.34	2.80	0.81	65.66	2.86	0.83
0.60 - 0.65	1.2%	62.74	2.51	0.72	64.22	2.57	0.74	65.66	2.63	0.76	67.08	2.68	0.77	68.46	2.74	0.79
0.65 - 0.70	1.1%	65.21	2.42	0.70	66.74	2.47	0.71	68.24	2.53	0.73	69.71	2.58	0.75	71.15	2.64	0.76
0.70 - 0.75	1.0%	67.58	2.33	0.68	69.17	2.39	0.69	70.73	2.44	0.71	72.25	2.49	0.72	73.74	2.54	0.74
0.75 - 0.80	0.9%	69.88	2.25	0.65	71.52	2.31	0.67	73.13	2.36	0.68	74.70	2.41	0.70	76.24	2.46	0.71
0.80 - 0.85	0.9%	72.10	2.18	0.63	73.80	2.24	0.65	75.46	2.29	0.66	77.08	2.33	0.68	78.67	2.38	0.69
0.85 - 0.90	0.8%	74.25	2.12	0.61	75.99	2.17	0.63	77.70	2.22	0.64	79.37	2.27	0.66	81.01	2.31	0.67
0.90 - 0.95	0.8%	76.33	2.06	0.60	78.13	2.11	0.61	79.88	2.16	0.62	81.60	2.21	0.64	83.29	2.25	0.65
0.95 - 1.0	0.7%	78.38	2.01	0.58	80.22	2.06	0.59	82.03	2.10	0.61	83.79	2.15	0.62	85.52	2.19	0.63
1.0 - 1.05	0.7%	80.36	1.96	0.57	82.25	2.01	0.58	84.10	2.05	0.59	85.91	2.09	0.61	87.68	2.14	0.62
1.05 - 1.10	0.7%	82.29	1.91	0.56	84.22	1.96	0.57	86.12	2.00	0.58	87.97	2.05	0.59	89.78	2.09	0.61
1.10 - 1.15	0.6%	84.19	1.87	0.54	86.17	1.91	0.55	88.11	1.96	0.57	90.00	2.00	0.58	91.86	2.04	0.59
1.15 - 1.20	0.6%	86.04	1.83	0.53	88.06	1.87	0.54	90.04	1.92	0.55	91.98	1.96	0.57	93.88	2.00	0.58

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Scan to download matrix, methodology and disclaimer

Metric version (Speed in km/h; distance in meters)

DRAG FACTOR UNCERTAINTY QUICK-REFERENCE MATRIX- SPEED VARIATION ACROSS DRAG FACTOR INTERVALS AND DISTANCE

To use this Matrix: locate the measured distance on the vertical axis and the applicable drag-factor interval on the horizontal axis. Select the cell where the two intersect. The resulting value represents the quantified effect of allowing the drag factor to vary across that interval at the selected distance. If the exact distance is not listed, use the closest available distance. This matrix does not determine what drag factor should be selected. The appropriate drag-factor range must be established independently from the available evidence and reconstruction methodology. This matrix then provides a means of quantifying the effect of that range on the resulting speed calculation.

Mean Speed: The middle-calculated speed when all simulated results are arranged from lowest to highest. Fifty percent of the results are below the median and 50% are

Speed Range: The difference between the maximum and minimum calculated speeds. It represents the total spread of possible simulated speed estimates.

Standard Deviation (SD): A measure of how widely the simulated speed results are dispersed around the mean speed. A larger standard deviation indicates greater variability in the calculated speed. To get the maximum, add the SD to the mean speed. To get the minimum speed, subtract the SD from the mean speed.

Relative Uncertainty (RU): A normalized measured of the uncertainty in the calculated speed relative to the mean speed. In this study, it provides a standardized way to describe the magnitude of speed variability associated with the uncertainty in drag factor. The relative uncertainty remained constant across all distances for each drag factor interval.

$$RU\,(\%) = \frac{SD}{MEAN\ SPEED}\ X\ 100$$

$$S = \sqrt{\quad}$$

$$SD = \frac{\quad}{\quad}$$

DRAG FACTOR RANGE- INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	3.05 M			6.10 M			9.14 M			12.19 M			15.24 M		
		MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)
0.01 - 0.05	20.7%	4.72	3.44	0.98	6.66	4.88	1.38	8.16	5.97	1.69	9.41	6.89	1.95	10.54	7.71	2.19
0.05 - 0.10	9.7%	7.61	2.57	0.74	10.75	3.65	1.05	13.18	4.47	1.27	15.21	5.17	1.48	17.01	5.78	1.64
0.10 - 0.15	5.8%	9.85	1.98	0.58	13.92	2.80	0.80	17.06	3.43	1.00	19.70	3.96	1.14	22.02	4.43	1.27
0.15 - 0.20	4.1%	11.65	1.67	0.48	16.48	2.37	0.68	20.18	2.90	0.84	23.30	3.35	0.97	26.06	3.73	1.08
0.20 - 0.25	3.2%	13.21	1.46	0.42	18.70	2.08	0.60	22.90	2.54	0.74	26.44	2.95	0.85	29.56	3.28	0.95
0.25 - 0.30	2.6%	14.61	1.34	0.39	20.68	1.88	0.55	25.31	2.30	0.66	29.24	2.66	0.76	32.69	2.98	0.85
0.30 - 0.35	2.2%	15.88	1.22	0.35	22.47	1.72	0.50	27.52	2.12	0.61	31.77	2.45	0.71	35.53	2.74	0.79
0.35 - 0.40	1.9%	17.06	1.14	0.32	24.12	1.61	0.47	29.55	1.98	0.56	34.13	2.27	0.66	38.16	2.54	0.74
0.40 - 0.45	1.7%	18.17	1.06	0.31	25.69	1.51	0.43	31.46	1.85	0.53	36.34	2.14	0.61	40.62	2.40	0.69
0.45 - 0.50	1.5%	19.22	1.01	0.29	27.17	1.43	0.42	33.27	1.75	0.51	38.42	2.03	0.58	42.95	2.27	0.66
0.50 - 0.55	1.4%	20.20	0.97	0.27	28.57	1.37	0.39	34.99	1.67	0.48	40.39	1.93	0.55	45.16	2.16	0.61
0.55 - 0.60	1.3%	21.13	0.92	0.27	29.89	1.30	0.37	36.61	1.59	0.47	42.28	1.83	0.53	47.27	2.06	0.60
0.60 - 0.65	1.2%	22.03	0.89	0.26	31.16	1.24	0.35	38.16	1.53	0.43	44.06	1.77	0.51	49.28	1.96	0.56
0.65 - 0.70	1.1%	22.90	0.85	0.24	32.38	1.21	0.35	39.67	1.46	0.42	45.80	1.69	0.48	51.21	1.90	0.55
0.70 - 0.75	1.0%	23.74	0.82	0.24	33.57	1.16	0.34	41.10	1.42	0.42	47.48	1.64	0.48	53.08	1.83	0.53
0.75 - 0.80	0.9%	24.54	0.79	0.23	34.70	1.13	0.32	42.50	1.37	0.40	49.08	1.58	0.47	54.88	1.77	0.51
0.80 - 0.85	0.9%	25.31	0.77	0.23	35.81	1.08	0.32	43.85	1.34	0.39	50.65	1.53	0.45	56.62	1.72	0.50
0.85 - 0.90	0.8%	26.07	0.74	0.21	36.87	1.05	0.31	45.16	1.29	0.37	52.14	1.50	0.43	58.31	1.67	0.48
0.90 - 0.95	0.8%	26.81	0.72	0.21	37.92	1.03	0.29	46.43	1.26	0.37	53.61	1.45	0.42	59.95	1.63	0.47
0.95 - 1.0	0.7%	27.52	0.71	0.21	38.93	1.00	0.29	47.67	1.22	0.35	55.06	1.42	0.40	61.56	1.58	0.45
1.0 - 1.05	0.7%	28.23	0.69	0.19	39.91	0.97	0.29	48.88	1.19	0.34	56.44	1.38	0.40	63.10	1.54	0.45
1.05 - 1.10	0.7%	28.90	0.68	0.19	40.86	0.95	0.27	50.05	1.16	0.34	57.79	1.35	0.39	64.62	1.50	0.43
1.10 - 1.15	0.6%	29.56	0.66	0.19	41.81	0.93	0.27	51.21	1.14	0.32	59.13	1.32	0.39	66.11	1.46	0.42
1.15 - 1.20	0.6%	30.22	0.64	0.19	42.73	0.90	0.26	52.34	1.11	0.32	60.43	1.29	0.37	67.56	1.43	0.42
DRAG FACTOR RANGE- INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	18.29 M			21.34 M			24.38 M			27.43 M			30.48 M		
		MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)
0.01 - 0.05	20.7%	11.54	8.43	2.38	12.46	9.11	2.57	13.33	9.74	2.75	14.1	10.3	2.9	14.90	10.90	3.09
0.05 - 0.10	9.7%	18.64	6.32	1.80	20.12	6.82	1.95	21.52	7.31	2.08	22.8	7.7	2.2	24.04	8.16	2.33
0.10 - 0.15	5.8%	24.12	4.84	1.40	26.06	5.25	1.51	27.84	5.60	1.61	29.5	5.9	1.7	31.14	6.26	1.80
0.15 - 0.20	4.1%	28.53	4.09	1.17	30.84	4.43	1.27	32.96	4.73	1.35	35.0	5.0	1.4	36.85	5.28	1.51
0.20 - 0.25	3.2%	32.38	3.60	1.05	34.97	3.89	1.13	37.39	4.17	1.21	39.7	4.4	1.3	41.81	4.65	1.34
0.25 - 0.30	2.6%	35.81	3.25	0.93	38.67	3.52	1.01	41.34	3.77	1.08	43.9	4.0	1.1	46.22	4.20	1.21
0.30 - 0.35	2.2%	38.91	2.99	0.87	42.04	3.23	0.93	44.93	3.46	1.00	47.7	3.7	1.1	50.24	3.86	1.11
0.35 - 0.40	1.9%	41.79	2.78	0.80	45.14	3.01	0.87	48.26	3.22	0.93	51.2	3.4	1.0	53.96	3.60	1.05
0.40 - 0.45	1.7%	44.50	2.62	0.76	48.07	2.83	0.82	51.39	3.03	0.87	54.5	3.2	0.9	57.45	3.38	0.98
0.45 - 0.50	1.5%	47.06	2.48	0.72	50.82	2.67	0.77	54.33	2.86	0.82	57.6	3.0	0.9	60.75	3.20	0.93
0.50 - 0.55	1.4%	49.47	2.35	0.68	53.43	2.54	0.72	57.12	2.72	0.79	60.6	2.9	0.8	63.86	3.04	0.87
0.55 - 0.60	1.3%	51.77	2.25	0.64	55.92	2.43	0.71	59.79	2.61	0.76	63.4	2.8	0.8	66.84	2.91	0.84
0.60 - 0.65	1.2%	53.98	2.16	0.63	58.29	2.33	0.68	62.33	2.49	0.72	66.1	2.6	0.8	69.68	2.78	0.80
0.65 - 0.70	1.1%	56.10	2.08	0.60	60.59	2.24	0.64	64.78	2.40	0.69	68.7	2.5	0.7	72.42	2.69	0.77
0.70 - 0.75	1.0%	58.13	2.01	0.58	62.80	2.17	0.63	67.13	2.32	0.68	71.2	2.5	0.7	75.06	2.59	0.76
0.75 - 0.80	0.9%	60.11	1.93	0.56	64.92	2.09	0.61	69.41	2.24	0.64	73.6	2.4	0.7	77.60	2.51	0.72
0.80 - 0.85	0.9%	62.02	1.88	0.55	67.00	2.03	0.60	71.62	2.17	0.63	76.0	2.3	0.7	80.06	2.43	0.71
0.85 - 0.90	0.8%	63.87	1.82	0.53	68.99	1.96	0.56	73.76	2.11	0.61	78.2	2.2	0.6	82.45	2.35	0.68
0.90 - 0.95	0.8%	65.66	1.77	0.51	70.92	1.92	0.55	75.82	2.04	0.60	80.4	2.2	0.6	84.76	2.29	0.66
0.95 - 1.0	0.7%	67.43	1.72	0.50	72.82	1.87	0.53	77.86	2.00	0.58	82.6	2.1	0.6	87.05	2.24	0.64
1.0 - 1.05	0.7%	69.14	1.69	0.48	74.67	1.82	0.53	79.82	1.95	0.56	84.7	2.1	0.6	89.25	2.17	0.63
1.05 - 1.10	0.7%	70.78	1.64	0.48	76.46	1.77	0.51	81.74	1.90	0.55	86.7	2.0	0.6	91.38	2.12	0.61
1.10 - 1.15	0.6%	72.42	1.61	0.47	78.23	1.74	0.50	83.62	1.85	0.53	88.7	2.0	0.6	93.50	2.08	0.60
1.15 - 1.20	0.6%	74.01	1.58	0.45	79.94	1.71	0.50	85.46	1.82	0.53	90.7	1.9	0.6	95.55	2.03	0.60

DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	33.53 M			36.58 M			39.62 M			42.67 M			45.72 M		
		MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)
0.01 - 0.05	20.7%	15.63	11.43	3.23	16.32	11.93	3.38	16.98	12.42	3.52	17.62	12.89	3.65	18.25	13.34	3.78
0.05 - 0.10	9.7%	25.22	8.56	2.45	26.34	8.95	2.56	27.42	9.30	2.66	28.45	9.66	2.75	29.45	9.99	2.85
0.10 - 0.15	5.8%	32.65	6.57	1.90	34.10	6.86	1.98	35.50	7.15	2.06	36.84	7.42	2.14	38.14	7.68	2.22
0.15 - 0.20	4.1%	38.64	5.54	1.59	40.36	5.78	1.66	42.00	6.02	1.74	43.60	6.24	1.80	45.13	6.47	1.87
0.20 - 0.25	3.2%	43.84	4.88	1.42	45.79	5.10	1.46	47.67	5.31	1.53	49.46	5.50	1.59	51.19	5.70	1.64
0.25 - 0.30	2.6%	48.49	4.41	1.27	50.65	4.60	1.32	52.71	4.80	1.38	54.70	4.97	1.43	56.62	5.15	1.48
0.30 - 0.35	2.2%	52.69	4.06	1.17	55.04	4.23	1.22	57.29	4.41	1.27	59.45	4.57	1.32	61.54	4.73	1.37
0.35 - 0.40	1.9%	56.58	3.78	1.09	59.11	3.94	1.14	61.53	4.10	1.19	63.84	4.26	1.24	66.08	4.41	1.27
0.40 - 0.45	1.7%	60.25	3.54	1.03	62.93	3.70	1.06	65.50	3.86	1.11	67.98	4.01	1.16	70.36	4.14	1.19
0.45 - 0.50	1.5%	63.71	3.35	0.97	66.55	3.51	1.01	69.27	3.65	1.06	71.87	3.78	1.09	74.40	3.91	1.13
0.50 - 0.55	1.4%	66.98	3.19	0.92	69.96	3.33	0.97	72.82	3.46	1.00	75.57	3.60	1.03	78.21	3.72	1.08
0.55 - 0.60	1.3%	70.10	3.04	0.89	73.21	3.19	0.92	76.20	3.32	0.95	79.08	3.44	1.00	81.85	3.56	1.03
0.60 - 0.65	1.2%	73.08	2.93	0.84	76.33	3.06	0.89	79.45	3.19	0.92	82.45	3.30	0.95	85.34	3.41	0.98
0.65 - 0.70	1.1%	75.94	2.82	0.82	79.32	2.95	0.85	82.58	3.06	0.89	85.68	3.17	0.92	88.69	3.28	0.95
0.70 - 0.75	1.0%	78.71	2.72	0.79	82.22	2.83	0.82	85.57	2.95	0.85	88.80	3.06	0.89	91.93	3.17	0.92
0.75 - 0.80	0.9%	81.38	2.62	0.76	85.01	2.74	0.79	88.48	2.85	0.82	91.81	2.96	0.85	95.05	3.07	0.89
0.80 - 0.85	0.9%	83.98	2.54	0.74	87.71	2.66	0.77	91.30	2.77	0.80	94.74	2.86	0.84	98.07	2.98	0.85
0.85 - 0.90	0.8%	86.47	2.48	0.71	90.32	2.57	0.74	94.02	2.69	0.77	97.56	2.78	0.80	100.99	2.88	0.84
0.90 - 0.95	0.8%	88.92	2.40	0.69	92.86	2.51	0.72	96.66	2.61	0.76	100.31	2.70	0.79	103.82	2.80	0.80
0.95 - 1.0	0.7%	91.30	2.33	0.68	95.35	2.45	0.71	99.25	2.54	0.74	103.00	2.64	0.76	106.60	2.74	0.79
1.0 - 1.05	0.7%	93.60	2.29	0.66	97.77	2.38	0.69	101.76	2.48	0.72	105.61	2.57	0.74	109.31	2.67	0.77
1.05 - 1.10	0.7%	95.85	2.24	0.64	100.10	2.33	0.68	104.19	2.43	0.71	108.13	2.51	0.72	111.93	2.61	0.76
1.10 - 1.15	0.6%	98.06	2.17	0.63	102.42	2.27	0.66	106.60	2.37	0.68	110.63	2.46	0.71	114.50	2.54	0.74
1.15 - 1.20	0.6%	100.21	2.12	0.61	104.67	2.22	0.64	108.94	2.32	0.68	113.06	2.40	0.69	117.03	2.49	0.72
DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	48.77 M			51.82 M			54.86 M			57.91 M			60.96 M		
		MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)
0.01 - 0.05	20.7%	18.85	13.78	3.89	19.42	14.21	4.02	19.99	14.61	4.14	20.54	15.02	4.25	21.07	15.40	4.36
0.05 - 0.10	9.7%	30.42	10.33	2.95	31.35	10.64	3.04	32.27	10.96	3.12	33.15	11.25	3.22	34.01	11.54	3.30
0.10 - 0.15	5.8%	39.38	7.92	2.29	40.60	8.16	2.35	41.78	8.40	2.43	42.92	8.64	2.49	44.03	8.85	2.56
0.15 - 0.20	4.1%	46.61	6.68	1.92	48.04	6.89	1.98	49.44	7.08	2.04	50.79	7.27	2.09	52.11	7.47	2.16
0.20 - 0.25	3.2%	52.88	5.89	1.71	54.51	6.07	1.75	56.09	6.24	1.80	57.61	6.42	1.85	59.11	6.58	1.90
0.25 - 0.30	2.6%	58.47	5.33	1.53	60.27	5.49	1.58	62.02	5.65	1.63	63.71	5.79	1.66	65.37	5.95	1.71
0.30 - 0.35	2.2%	63.55	4.89	1.42	65.50	5.04	1.45	67.40	5.18	1.50	69.25	5.33	1.53	71.05	5.47	1.58
0.35 - 0.40	1.9%	68.25	4.55	1.32	70.36	4.70	1.35	72.39	4.83	1.40	74.38	4.96	1.43	76.32	5.09	1.48
0.40 - 0.45	1.7%	72.66	4.28	1.24	74.90	4.41	1.27	77.07	4.54	1.30	79.18	4.67	1.35	81.24	4.78	1.38
0.45 - 0.50	1.5%	76.83	4.04	1.17	79.20	4.17	1.21	81.50	4.30	1.24	83.73	4.41	1.27	85.91	4.52	1.30
0.50 - 0.55	1.4%	80.79	3.85	1.11	83.27	3.96	1.14	85.68	4.09	1.17	88.03	4.20	1.21	90.32	4.30	1.24
0.55 - 0.60	1.3%	84.54	3.67	1.06	87.15	3.80	1.09	89.67	3.89	1.13	92.13	4.01	1.16	94.52	4.10	1.19
0.60 - 0.65	1.2%	88.14	3.52	1.01	90.85	3.64	1.05	93.49	3.73	1.08	96.05	3.85	1.11	98.54	3.94	1.14
0.65 - 0.70	1.1%	91.60	3.40	0.98	94.42	3.49	1.01	97.16	3.60	1.05	99.82	3.70	1.06	102.42	3.80	1.09
0.70 - 0.75	1.0%	94.94	3.27	0.95	97.86	3.38	0.98	100.70	3.48	1.01	103.45	3.57	1.03	106.14	3.65	1.06
0.75 - 0.80	0.9%	98.15	3.17	0.92	101.18	3.27	0.95	104.11	3.36	0.97	106.97	3.44	1.00	109.74	3.54	1.03
0.80 - 0.85	0.9%	101.28	3.07	0.89	104.40	3.17	0.92	107.42	3.25	0.95	110.37	3.35	0.97	113.23	3.43	1.00
0.85 - 0.90	0.8%	104.30	2.98	0.87	107.50	3.07	0.89	110.63	3.15	0.92	113.65	3.25	0.93	116.61	3.33	0.97
0.90 - 0.95	0.8%	107.23	2.90	0.84	110.53	2.99	0.87	113.73	3.07	0.89	116.85	3.15	0.92	119.88	3.23	0.93
0.95 - 1.0	0.7%	110.11	2.82	0.80	113.49	2.91	0.84	116.79	2.99	0.87	119.98	3.07	0.89	123.10	3.15	0.90
1.0 - 1.05	0.7%	112.90	2.75	0.80	116.37	2.83	0.82	119.74	2.91	0.85	123.02	2.99	0.87	126.22	3.07	0.89
1.05 - 1.10	0.7%	115.60	2.69	0.77	119.16	2.77	0.80	122.60	2.85	0.82	125.96	2.93	0.85	129.23	3.01	0.87
1.10 - 1.15	0.6%	118.27	2.62	0.76	121.91	2.70	0.79	125.43	2.78	0.80	128.88	2.86	0.82	132.22	2.95	0.85
1.15 - 1.20	0.6%	120.86	2.57	0.74	124.58	2.66	0.77	128.20	2.72	0.79	131.71	2.80	0.80	135.12	2.88	0.84
DRAG FACTOR RANGE-INCREMENTS OF 0.05	RELATIVE UNCERTAINTY	64.01 M			67.06 M			70.10 M			73.15 M			76.20 M		
		MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)	MEAN SPEED (KM/H)	SPEED RANGE (KM/H)	SD (KM/H)
0.01 - 0.05	20.7%	21.58	15.79	4.47	22.10	16.16	4.57	22.60	16.53	4.68	23.08	16.88	4.78	23.56	17.22	4.88
0.05 - 0.10	9.7%	34.86	11.83	3.38	35.68	12.10	3.46	36.47	12.38	3.54	37.26	12.65	3.60	38.03	12.91	3.69
0.10 - 0.15	5.8%	45.13	9.08	2.62	46.19	9.29	2.69	47.22	9.50	2.74	48.23	9.70	2.80	49.23	9.90	2.86
0.15 - 0.20	4.1%	53.40	7.66	2.20	54.65	7.84	2.25	55.88	8.01	2.30	57.08	8.18	2.35	58.26	8.35	2.40
0.20 - 0.25	3.2%	60.58	6.74	1.95	62.01	6.90	2.00	63.39	7.05	2.04	64.76	7.21	2.08	66.10	7.35	2.12
0.25 - 0.30	2.6%	67.00	6.10	1.75	68.56	6.24	1.79	70.10	6.37	1.83	71.62	6.52	1.87	73.10	6.65	1.92
0.30 - 0.35	2.2%	72.81	5.60	1.61	74.53	5.75	1.66	76.20	5.87	1.69	77.83	5.99	1.72	79.44	6.12	1.77
0.35 - 0.40	1.9%	78.20	5.21	1.51	80.03	5.34	1.54	81.84	5.46	1.58	83.59	5.58	1.61	85.31	5.70	1.64
0.40 - 0.45	1.7%	83.25	4.89	1.42	85.21	5.02	1.45	87.13	5.13	1.48	89.00	5.23	1.51	90.83	5.34	1.54
0.45 - 0.50	1.5%	88.03	4.63	1.34	90.11	4.75	1.37	92.12	4.84	1.40	94.10	4.96	1.43	96.05	5.05	1.46
0.50 - 0.55	1.4%	92.55	4.41	1.27	94.73	4.51	1.30	96.85	4.62	1.32	98.94	4.72	1.35	100.99	4.81	1.38
0.55 - 0.60	1.3%	96.85	4.22	1.22	99.14	4.31	1.24	101.36	4.41	1.27	103.55	4.51	1.30	105.67	4.60	1.34
0.60 - 0.65	1.2%	100.97	4.04	1.16	103.35	4.14	1.19	105.67	4.23	1.22	107.95	4.31	1.24	110.18	4.41	1.27
0.65 - 0.70	1.1%	104.95	3.89	1.13	107.41	3.98	1.14	109.82	4.07	1.17	112.19	4.15	1.21	114.50	4.25	1.22
0.70 - 0.75	1.0%	108.76	3.75	1.09	111.32	3.85	1.11	113.83	3.93	1.14	116.28	4.01	1.16	118.67	4.09	1.19
0.75 - 0.80	0.9%	112.46	3.62	1.05	115.10	3.72	1.08	117.69	3.80	1.09	120.22	3.88	1.13	122.70	3.96	1.14
0.80 - 0.85	0.9%	116.03	3.51	1.01	118.77	3.60	1.05	121.44	3.69	1.06	124.05	3.75	1.09	126.61	3.83	1.11
0.85 - 0.90	0.8%	119.49	3.41	0.98	122.29	3.49	1.01	125.05	3.57	1.03	127.73	3.65	1.06	130.37	3.72	1.08
0.90 - 0.95	0.8%	122.84	3.32	0.97	125.74	3.40	0.98	128.55	3.48	1.00	131.32	3.56	1.03	134.04	3.62	1.05
0.95 - 1.0	0.7%	126.14	3.23	0.93	129.10	3.32	0.95	132.01	3.38	0.98	134.85	3.46	1.00	137.63	3.52	1.01
1.0 - 1.05	0.7%	129.33	3.15	0.92	132.37	3.23	0.93	135.35	3.30	0.95	138.26	3.36	0.98	141.11	3.44	1.00
1.05 - 1.10	0.7%	132.43	3.07	0.90	135.54	3.15	0.92	138.60	3.22	0.93	141.57	3.30	0.95	144.49	3.36	0.98
1.10 - 1.15	0.6%	135.49	3.01	0.87	138.68	3.07	0.89	141.80	3.15	0.92	144.84	3.22	0.93	147.83	3.28	0.95
1.15 - 1.20	0.6%	138.47	2.95	0.85	141.72	3.01	0.87	144.91	3.09	0.89	148.03	3.15	0.92	151.09	3.22	0.93