NEW YORK

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

PLANE COORDINATE PROJECTION TABLES

NEW YORK
(LAMBERT and TRANSVERSE MERCATOR)

SPECIAL PUBLICATION NO. 323

Inquiries should be directed to the Director, National Ocean Survey,
National Oceanic and Atmospheric Administration, Rockville, Maryland 20852.

U. S. Department of Commerce
Sinclair Weeks, *Secretary*

Coast and Geodetic Survey
Robert F. A. Studds, *Director*

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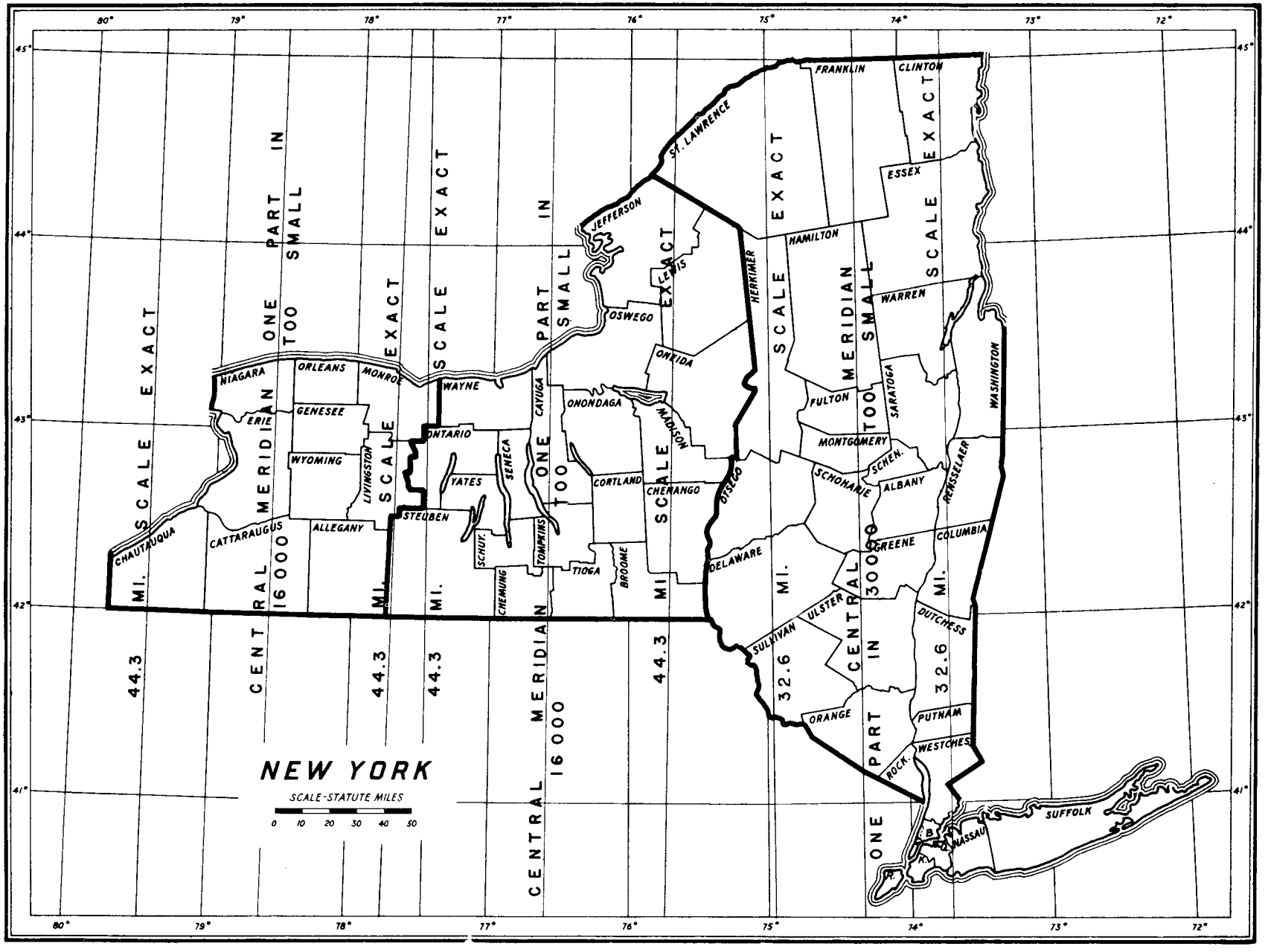
NEW YORK
SCALE-STATUTE MILES
0 10 20 30 40 50
CENTRAL MERIDIAN 16000 MI. ONE PART IN 44.3 TOO SMALL SCALE EXACT
CENTRAL MERIDIAN 16000 MI. ONE PART IN 44.3 TOO SMALL SCALE EXACT
CENTRAL MERIDIAN 16000 MI. ONE PART IN 44.3 TOO SMALL SCALE EXACT
CENTRAL MERIDIAN 30000 MI. ONE PART IN 32.6 TOO SMALL SCALE EXACT
CENTRAL MERIDIAN 30000 MI. ONE PART IN 32.6 TOO SMALL SCALE EXACT
80° 79° 78° 77° 76° 75° 74° 73° 72°
45° 44° 43° 42° 41°
NIAGARA
ORLEANS
MONROE
WAYNE
ERIE
GENESEE
WYOMING
LIVINGSTON
ONTARIO
YATES
SENECA
CAYUGA
ONONDAGA
MADISON
CORTLAND
CHENANGO
OSWEGO
ONEIDA
OSWEGO
JEFFERSON
LEWIS
HERKIMER
ST. LAWRENCE
FRANKLIN
CLINTON
ESSEX
HAMILTON
WARREN
WASHINGTON
FULTON
SARATOGA
MONTGOMERY
SCHEN.
SCHOHARIE
ALBANY
RENSSELAER
COLUMBIA
GREENE
DELAWARE
ULSTER
DUTCHESS
SULLIVAN
ORANGE
PUTNAM
WESTCHES
ROCK.
SUFFOLK
NASSAU
CHAUTAUQUA
CATTARAUGUS
ALLEGANY
STEUBEN
SCHUY.
TOMPKINS
TIOGA
BROOME
CHEMUNG

Foreword

The plane coordinate system used in this State is based on two conformal projections. The mainland uses a transverse Mercator projection, with three zones, using a reduced scale for the central meridian of each zone. A Lambert conic projection with two standard parallels is used for Long Island. The tables in this publication are to be used for the conversion of geographic positions to plane coordinates or plane coordinates to geographic positions. The various constants of the projections are listed herein.

The methods of computation have been designed for machine calculation. For computation on the transverse Mercator projection all the required functions are given in this table. However, for computation on the Lambert projection, tables of natural trigonometric functions will be required. A table of these functions has been published by the Coast and Geodetic Survey in Special Publication No. 246. This contains sines, cosines, and tangents to ten decimal places with an interval of ten seconds for 0° to 6°. It is sold for a nominal sum by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.

The formulas and sample computations which follow show the general methods for computing either type of coordinates on either type of projection.

THE LAMBERT PROJECTION

Plane Coordinates from Geographic Positions

$$x = R \sin \theta + C$$

$$y = R_b - R \cos \theta$$

Grid azimuth = geodetic azimuth - θ + second term

where

R is the radius for the latitude of the station,

R_b is a constant for a zone,

θ is the mapping angle for the longitude of the station,

and

C is the value of x assigned to the Central Meridian for a zone.

The second term for the reduction of geodetic to grid azimuths may be neglected for most work. However, for lines five miles or more in length, if the same degree of accuracy is desired as is obtained by geographic computations, this term should be evaluated and used.

$$\text{Second term} = \frac{x_2 - x_1}{2\rho_0^2 \sin 1''} \left(y_1 - y_o + \frac{y_2 - y_1}{3} \right)$$

Geographic Positions from Plane Coordinates

The formulas show the method of computing R and θ from which the latitude and longitude may be obtained.

$$x' = x - C$$

$$\tan \theta = x' \div (R_b - y)$$

$$R = (R_b - y) \div \cos \theta$$

$$\Delta\lambda = \theta \div \ell$$

$$\lambda = \text{Central Meridian} - \Delta\lambda$$

where

R, R_b, θ and C are the same as previously defined

and

ℓ is a constant for a zone.

THE TRANSVERSE MERCATOR PROJECTION

Plane coordinates from geographic positions

$$x = x' + 500{,}000$$

$$x' = H.\ \Delta\lambda'' \pm a\ b$$

$$y = y_o + V\left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$$

Grid azimuth = geodetic azimuth - $\Delta\alpha$ - second term

$$\Delta\alpha'' = \Delta\lambda''\ \sin\phi + g$$

where

y_o, H, V, and a are based on the latitude of the geographic position,

and

b, c, and g are based on $\Delta\lambda''$.

$$\Delta\lambda'' = \text{Central Meridian} - \lambda$$

and

$\Delta\alpha''$ is the convergence of the meridian at the station with respect to the Central Meridian.

The second term for the reduction of geodetic to grid azimuths may be neglected for most work. However, for lines five miles or more in length if the same degree of accuracy is desired as is obtained by geographic computations, this term should be evaluated and used.

$$\text{Second term} = \frac{(y_2 - y_1)\ (2x_1' + x_2')}{(6\rho_0^2\ \sin 1'')_g}$$

Geographic positions from plane coordinates

$$P\,(x'/10{,}000)^2 + d = V\,(\Delta\lambda''/100)^2 + c$$

$$y_o = y - P\,(x'/10{,}000)^2 - d$$

Obtain the latitude from the table of y_o.

Use latitude to obtain H from the table.

$$x' = x - 500{,}000$$

$$\text{approximate } \Delta\lambda'' = x' \div H.$$

Determine a from latitude and b from approximate $\Delta\lambda$

then

$$\Delta\lambda'' = (x' \mp a\ b) \div H$$

$$\Delta\alpha'' = Mx' - e.$$

M is based on the y and e on the x and y of the plane coordinates.

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
Form 725 d

PLANE COORDINATES ON LAMBERT PROJECTION

(Condensed form for calculating-machine computation)

$X = R \sin\theta + C$ $\quad Y = R_b - R\cos\theta$ $\quad$ State - Zone N.Y. - Long Island

$C =$ 2,000,000.00 $\quad R_b =$ 24,462,545.30 $\quad$ Grid Az. = Geod. Az. $- \theta$

Station	Latitude / Longitude	R / θ	sin θ / cos θ	X / Y
1 Holt, 1951	40 47 50.624	24,254,197.58	+0.01092 01975	2,264,860.63
	73 02 36.247	+0° 37′ 32.″49718	0.99994 03729	209,793.93
	Grid azimuth to azimuth mark			2° 34′ 41″
2 Bogart, 1885 r. 1933	40 36 07.281	24,325,376.66	-0.00132 59072	1,967,746.81
	74 06 58.125	-0° 04′ 33.″48807	0.99999 91210	137,190.02
	Grid azimuth to azimuth mark			96° 57′ 38″
3				
	Grid azimuth to azimuth mark			° ′ ″
4				

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 742 b

GEODETIC POSITIONS FROM LAMBERT COORDINATES

(CALCULATING MACHINE COMPUTATION)

STATE - ZONE N.Y. - Long Island $\quad \ell =$ 0.654 08209

Station Holt, 1951

C	− 2,000,000.00	R_b	24,462,545.30
X	2,264,860.63	Y	− 209,793.93
$X' = X - C$	+ 264,860.63	$R_b - Y$	24,252,751.37
$\tan\theta = X' \div (R_b - Y)$	+0.01092 08488	θ	+2,252.″49722
θ	+0° 37′ 32.″49722	$\Delta\lambda = \theta \div \ell$	+3,443.″753
cos θ	0.99994 03729	Δλ	+0° 57′ 23.″753
$R = (R_b - Y) \div \cos\theta$	24,254,197.58	Central Meridian	74° 00′ 00.″000
φ	40° 47′ 50.″624	$\lambda = C.M. - \Delta\lambda$	73° 02′ 36.″247

Station Bogart, 1885, r. 1933

C	− 2,000,000.00	R_b	24,462,545.30
X	1,967,746.81	Y	− 137,190.02
$X' = X - C$	− 32,253.19	$R_b - Y$	24,325,355.28
$\tan\theta = X' \div (R_b - Y)$	-0.00132 59083	θ	-273.″48806
θ	-0° 04′ 33.″48806	$\Delta\lambda = \theta \div \ell$	-418.″125
cos θ	0.99999 91210	Δλ	-0° 06′ 58.″125
$R = (R_b - Y) \div \cos\theta$	24,325,376.66	Central Meridian	74° 00′ 00.″000
φ	40° 36′ 07.″281	$\lambda = C.M. - \Delta\lambda$	74° 06′ 58.″125

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form No. 744b

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

(Condensed form for calculating-machine computation)

State New York Zone East Central meridian 74° 20′ 00.″000

Station	Jones, 1942	Dugan, 1942			
ϕ	42° 17′ 01.″775	42° 30′ 07.″382			
λ	74 02 53.671	74 44 39.818			
$\Delta\lambda$ = Central mer. − λ	+ 0° 17′ 06.″329	− 0° 24′ 39.″818			
$\Delta\lambda''$	+ 1,026.329	− 1,479.818			
$\left(\frac{\Delta\lambda''}{100}\right)^2$	105.335	218.986			
H	75.169 203	74.909 207			
V	1.226 174	1.227 041			
a | b	− 0.530 | + 1.208	− 0.487 | + 1.648			
$x' = H \cdot \Delta\lambda \pm ab$	+ 77,147.69	− 110,851.19			
$V\left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$	129.14	268.66			
Tabular y	832,090.76	911,616.23			
x	577,147.69	389,148.81			
y	832,219.90	911,884.89			
$\Delta\alpha''$	+ 690.52	− 999.80			
$\Delta\alpha$	+ 0° 11′ 30.″5	− 0° 16′ 39.″8			
Geod. Az. to Az. Mk.	266 26 56.0	287 45 53.7			
Grid Az. to Az. Mk.	266 15 26	288 02 34			

$x = x' + 500{,}000$

y = Tab. $y + V\left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$

$\Delta\alpha'' = \Delta\lambda'' \sin\phi + g$

Grid Az. = Geod. Az. − $\Delta\alpha$

H and V = Tab. H and Tab. V.

When ab is $\begin{matrix}-\\+\end{matrix}$, $\begin{matrix}\text{decrease}\\\text{increase}\end{matrix}$ $H \cdot \Delta\lambda$ numerically.

g increases $\Delta\lambda'' \cdot \sin\phi$ numerically.

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

(CALCULATING MACHINE COMPUTATION)

STATE – ZONE New York – East

Station Jones, 1942

X	577,147.69		Y	832,219.90	
C	– 500,000.00		$P(\frac{X'}{10,000})^2 + d$	– 129.14	
X'	+ 77,147.69		Y_o	832,090.76	
P	2.16949		Approx. $\Delta\lambda = X' \div H$	+1,026"	
d	+0.02		$\Delta\lambda = (X' \mp ab) \div H$	+1,026".329	
H	75.169 203		$\Delta\lambda$	+0° 17' 06".329	
a | b	-0.530	+1.207	Central Meridian	74 20 00.000	
ϕ	42° 17' 01".775		λ = C.M. – $\Delta\lambda$	74° 02' 53".671	

Station Dugan, 1942

X	389,148.81		Y	911,884.89	
C	– 500,000.00		$P(\frac{X'}{10,000})^2 + d$	– 268.65	
X'	-110,851.19		Y_o	911,616.24	
P	2.18613		Approx. $\Delta\lambda = X' \div H$	-1,480"	
d	+0.02		$\Delta\lambda = (X' \mp ab) \div H$	-1,479".818	
H	74.909 207		$\Delta\lambda$	-0° 24' 39".818	
a | b	-0.487	+1.648	Central Meridian	74 20 00.000	
ϕ	42° 30' 07".382		λ = C.M. – $\Delta\lambda$	74° 44' 39".818	

Station

X			Y		
C	–		$P(\frac{X'}{10,000})^2 + d$	–	
X'			Y_o		
P			Approx. $\Delta\lambda = X' \div H$	"	
d			$\Delta\lambda = (X' \mp ab) \div H$	"	
H			$\Delta\lambda$	° ' "	
a | b			Central Meridian		
ϕ	° ' "		λ = C.M. – $\Delta\lambda$	° ' "	

Station

X			Y		
C	–		$P(\frac{X'}{10,000})^2 + d$	–	
X'			Y_o		
P			Approx. $\Delta\lambda = X' \div H$	"	
d			$\Delta\lambda = (X' \mp ab) \div H$	"	
H			$\Delta\lambda$	° ' "	
a | b			Central Meridian		
ϕ	° ' "		λ = C.M. – $\Delta\lambda$	° "	

When ab is $\frac{+, \text{decrease}}{-, \text{increase}}$ X' numerically.

Constants for New York

Constant	Zone			
	East	Central	West	Long Island
Central Meridian	74°20'00".000	76°35'00".000	78°35'00".000	74°00'00".000
log R	-144.8	-271.4	-271.4	
Scale reduction (Central Meridian)	1 : 30,000	1 : 16,000	1 : 16,000	
$\log\left(\frac{1}{6\rho_o^2}\right)_g$	4.580 7400 -20	4.580 7483 -20	4.580 7825 -20	
$\log\left(\frac{1}{6\rho_o^2 \sin 1''}\right)_g$	9.895 1651 -20	9.895 1734 -20	9.895 2076 -20	
$\left(\frac{1}{6\rho_o^2 \sin 1''}\right)_g$	0.7855×10^{-10}	0.7855×10^{-10}	0.7856×10^{-10}	
C				2,000,000.00 ft.
R_b				24,462,545.30 ft.
y_o				227,544 ft.
ℓ				0.654 08209
$\frac{1}{2\rho_o^2 \sin 1''}$				2.358×10^{-10}
$\log \frac{1}{2\rho_o^2 \sin 1''}$				0.372 4603 -10
$\log \ell$				9.815 63226 -10
log K				7.605 43607

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
40 00	0.00	101.185 50	77.823 740	315.45	1.212 832	2.10	-1.000
40 01	6 071.13	101.186 00	77.804 813	315.58	1.212 958	2.08	-.996
40 02	12 142.29	101.186 17	77.785 878	315.67	1.213 083	2.07	-.993
40 03	18 213.46	101.186 33	77.766 938	315.78	1.213 207	2.08	-.990
40 04	24 284.64	101.186 83	77.747 991	315.88	1.213 332	2.07	-.986
40 05	30 355.85	101.187 00	77.729 038	316.00	1.213 456	2.07	-.982
40 06	36 427.07	101.187 33	77.710 078	316.12	1.213 580	2.05	-.979
40 07	42 498.31	101.187 67	77.691 111	316.23	1.213 703	2.03	-.976
40 08	48 569.57	101.187 83	77.672 137	316.32	1.213 825	2.05	-.972
40 09	54 640.84	101.188 33	77.653 158	316.45	1.213 948	2.03	-.968
40 10	60 712.14	101.188 50	77.634 171	316.55	1.214 070	2.02	-.965
40 11	66 783.45	101.188 83	77.615 178	316.68	1.214 191	2.02	-.961
40 12	72 854.78	101.189 17	77.596 177	316.77	1.214 312	2.02	-.958
40 13	78 926.13	101.189 33	77.577 171	316.88	1.214 433	2.00	-.954
40 14	84 997.49	101.189 67	77.558 158	317.00	1.214 553	1.98	-.951
40 15	91 068.87	101.190 00	77.539 138	317.08	1.214 672	2.00	-.947
40 16	97 140.27	101.190 33	77.520 113	317.22	1.214 792	1.97	-.943
40 17	103 211.69	101.190 67	77.501 080	317.33	1.214 910	1.98	-.940
40 18	109 283.13	101.190 83	77.482 040	317.42	1.215 029	1.98	-.936
40 19	115 354.58	101.191 17	77.462 995	317.55	1.215 148	1.95	-.933
40 20	121 426.05	101.191 50	77.443 942	317.65	1.215 265	1.95	-.929
40 21	127 497.54	101.191 83	77.424 883	317.77	1.215 382	1.95	-.926
40 22	133 569.05	101.192 00	77.405 817	317.87	1.215 499	1.93	-.922
40 23	139 640.57	101.192 33	77.386 745	317.98	1.215 615	1.95	-.918
40 24	145 712.11	101.192 67	77.367 666	318.10	1.215 732	1.92	-.915
40 25	151 783.67	101.193 00	77.348 580	318.18	1.215 847	1.92	-.912
40 26	157 855.25	101.193 17	77.329 489	318.32	1.215 962	1.92	-.908
40 27	163 926.84	101.193 67	77.310 390	318.43	1.216 077	1.90	-.904
40 28	169 998.46	101.193 83	77.291 284	318.52	1.216 191	1.92	-.901
40 29	176 070.09	101.194 17	77.272 173	318.63	1.216 306	1.88	-.898
40 30	182 141.74	101.194 33	77.253 055	318.75	1.216 419	1.88	-.894
40 31	188 213.40	101.194 83	77.233 930	318.87	1.216 532	1.88	-.891
40 32	194 285.09	101.195 00	77.214 798	318.95	1.216 645	1.87	-.887
40 33	200 356.79	101.195 33	77.195 661	319.08	1.216 757	1.87	-.884
40 34	206 428.51	101.195 67	77.176 516	319.18	1.216 869	1.85	-.880
40 35	212 500.25	101.195 83	77.157 365	319.28	1.216 980	1.87	-.877
40 36	218 572.00	101.196 17	77.138 208	319.42	1.217 092	1.83	-.874
40 37	224 643.77	101.196 50	77.119 043	319.52	1.217 202	1.83	-.870
40 38	230 715.56	101.196 83	77.099 872	319.62	1.217 312	1.85	-.867
40 39	236 787.37	101.197 17	77.080 695	319.73	1.217 423	1.82	-.863
40 40	242 859.20	101.197 33	77.061 511	319.83	1.217 532	1.82	-.860
40 41	248 931.04	101.197 67	77.042 321	319.97	1.217 641	1.80	-.856
40 42	255 002.90	101.198 00	77.023 123	320.05	1.217 749	1.80	-.853
40 43	261 074.78	101.198 33	77.003 920	320.17	1.217 857	1.80	-.850
40 44	267 146.68	101.198 67	76.984 710	320.27	1.217 965	1.78	-.846
40 45	273 218.60	101.198 83	76.965 494	320.38	1.218 072	1.80	-.842
40 46	279 290.53	101.199 17	76.946 271	320.50	1.218 180	1.77	-.839
40 47	285 362.48	101.199 50	76.927 041	320.62	1.218 286	1.77	-.836
40 48	291 434.45	101.199 67	76.907 804	320.70	1.218 392	1.77	-.932
40 49	297 506.43	101.200 17	76.888 562	320.83	1.218 498	1.75	-.828
40 50	303 578.44	101.200 33	76.869 312	320.92	1.218 603	1.75	-.825
40 51	309 650.46	101.200 67	76.850 057	321.05	1.218 708	1.73	-.822
40 52	315 722.50	101.201 00	76.830 794	321.15	1.218 812	1.73	-.818
40 53	321 794.56	101.201 17	76.811 525	321.25	1.218 916	1.73	-.814
40 54	327 866.63	101.201 50	76.792 250	321.37	1.219 020	1.72	-.811
40 55	333 938.72	101.202 00	76.772 968	321.47	1.219 123	1.72	-.808
40 56	340 010.84	101.202 17	76.753 680	321.58	1.219 226	1.70	-.804
40 57	346 082.97	101.202 33	76.734 385	321.70	1.219 328	1.70	-.800
40 58	352 155.11	101.202 83	76.715 083	321.80	1.219 430	1.70	-.797
40 59	358 227.28	101.203 00	76.695 775	321.92	1.219 532	1.68	-.794
41 00	364 299.46		76.676 460		1.219 633		-.790

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
41 00	364 299.46	101.203 33	76.676 460	322.02	1.219 633	1.68	-.790
41 01	370 371.66	101.203 67	76.657 139	322.13	1.219 734	1.67	-.787
41 02	376 443.88	101.203 83	76.637 811	322.23	1.219 834	1.65	-.784
41 03	382 516.11	101.204 17	76.618 477	322.33	1.219 933	1.67	-.780
41 04	388 588.36	101.204 50	76.599 137	322.45	1.220 033	1.65	-.776
41 05	394 660.63	101.204 83	76.579 790	322.57	1.220 132	1.65	-.773
41 06	400 732.92	101.205 17	76.560 436	322.67	1.220 231	1.63	-.770
41 07	406 805.23	101.205 50	76.541 076	322.77	1.220 329	1.62	-.766
41 08	412 877.56	101.205 67	76.521 710	322.90	1.220 426	1.63	-.763
41 09	418 949.90	101.206 00	76.502 336	322.98	1.220 524	1.62	-.759
41 10	425 022.26	101.206 33	76.482 957	323.10	1.220 621	1.62	-.756
41 11	431 094.64	101.206 50	76.463 571	323.22	1.220 718	1.58	-.753
41 12	437 167.03	101.207 00	76.444 178	323.32	1.220 813	1.60	-.749
41 13	443 239.45	101.207 17	76.424 779	323.43	1.220 909	1.60	-.746
41 14	449 311.88	101.207 50	76.405 373	323.53	1.221 005	1.58	-.742
41 15	455 384.33	101.207 67	76.385 961	323.63	1.221 100	1.57	-.739
41 16	461 456.79	101.208 17	76.366 543	323.77	1.221 194	1.57	-.736
41 17	467 529.28	101.208 33	76.347 117	323.85	1.221 288	1.57	-.732
41 18	473 601.78	101.208 67	76.327 686	323.98	1.221 382	1.55	-.729
41 19	479 674.30	101.209 00	76.308 247	324.07	1.221 475	1.55	-.725
41 20	485 746.84	101.209 33	76.288 803	324.18	1.221 568	1.53	-.722
41 21	491 819.40	101.209 50	76.269 352	324.30	1.221 660	1.53	-.719
41 22	497 891.97	101.210 00	76.249 894	324.40	1.221 752	1.53	-.715
41 23	503 964.57	101.210 17	76.230 430	324.50	1.221 844	1.52	-.712
41 24	510 037.18	101.210 33	76.210 960	324.63	1.221 935	1.52	-.708
41 25	516 109.80	101.210 83	76.191 482	324.72	1.222 026	1.50	-.705
41 26	522 182.45	101.211 00	76.171 999	324.83	1.222 116	1.50	-.702
41 27	528 255.11	101.211 33	76.152 509	324.93	1.222 206	1.48	-.698
41 28	534 327.79	101.211 67	76.133 013	325.07	1.222 295	1.48	-.695
41 29	540 400.49	101.212 00	76.113 509	325.15	1.222 384	1.48	-.691
41 30	546 473.21	101.212 17	76.094 000	325.27	1.222 473	1.47	-.688
41 31	552 545.94	101.212 67	76.074 484	325.37	1.222 561	1.47	-.685
41 32	558 618.70	101.212 83	76.054 962	325.48	1.222 649	1.45	-.681
41 33	564 691.47	101.213 17	76.035 433	325.58	1.222 736	1.45	-.678
41 34	570 764.26	101.213 33	76.015 898	325.70	1.222 823	1.45	-.674
41 35	576 837.06	101.213 83	75.996 356	325.78	1.222 910	1.43	-.671
41 36	582 909.89	101.214 00	75.976 809	325.92	1.222 996	1.42	-.668
41 37	588 982.73	101.214 33	75.957 254	326.02	1.223 081	1.42	-.664
41 38	595 055.59	101.214 67	75.937 693	326.13	1.223 166	1.43	-.661
41 39	601 128.47	101.214 83	75.918 125	326.23	1.223 252	1.40	-.657
41 40	607 201.36	101.215 33	75.898 551	326.35	1.223 336	1.40	-.654
41 41	613 274.28	101.215 50	75.878 970	326.43	1.223 420	1.40	-.651
41 42	619 347.21	101.215 83	75.859 384	326.57	1.223 504	1.38	-.647
41 43	625 420.16	101.216 00	75.839 790	326.65	1.223 587	1.38	-.644
41 44	631 493.12	101.216 50	75.820 191	326.78	1.223 670	1.37	-.640
41 45	637 566.11	101.216 67	75.800 584	326.87	1.223 752	1.38	-.637
41 46	643 639.11	101.217 00	75.780 972	327.00	1.223 835	1.35	-.634
41 47	649 712.13	101.217 33	75.761 352	327.08	1.223 916	1.35	-.630
41 48	655 785.17	101.217 67	75.741 727	327.22	1.223 997	1.37	-.627
41 49	661 858.23	101.217 83	75.722 094	327.30	1.224 079	1.33	-.623
41 50	667 931.30	101.218 17	75.702 456	327.42	1.224 159	1.33	-.620
41 51	674 004.39	101.218 50	75.682 811	327.52	1.224 239	1.32	-.617
41 52	680 077.50	101.218 83	75.663 160	327.62	1.224 318	1.32	-.613
41 53	686 150.63	101.219 17	75.643 503	327.73	1.224 397	1.32	-.610
41 54	692 223.78	101.219 33	75.623 839	327.85	1.224 476	1.30	-.607
41 55	698 296.94	101.219 67	75.604 168	327.95	1.224 554	1.32	-.604
41 56	704 370.12	101.220 00	75.584 491	328.07	1.224 633	1.28	-.600
41 57	710 443.32	101.220 33	75.564 807	328.15	1.224 710	1.28	-.597
41 58	716 516.54	101.220 67	75.545 118	328.28	1.224 787	1.28	-.594
41 59	722 589.78	101.220 83	75.525 421	328.38	1.224 864	1.27	-.590
42 00	728 663.03		75.505 718		1.224 940		-.587

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	$\triangle y_o$ per second	H	$\triangle H$ per second	V	$\triangle V$ per second	a
42 00	728 663.03	101.221 17	75.505 718	328.48	1.224 940	1.27	-.587
42 01	734 736.30	101.221 50	75.486 009	328.60	1.225 016	1.25	-.584
42 02	740 809.59	101.221 83	75.466 293	328.70	1.225 091	1.25	-.580
42 03	746 882.90	101.222 00	75.446 571	328.82	1.225 166	1.25	-.577
42 04	752 956.22	101.222 33	75.426 842	328.90	1.225 241	1.22	-.573
42 05	759 029.56	101.222 67	75.407 108	329.05	1.225 314	1.23	-.570
42 06	765 102.92	101.223 00	75.387 365	329.12	1.225 388	1.22	-.567
42 07	771 176.30	101.223 33	75.367 618	329.23	1.225 461	1.22	-.563
42 08	777 249.70	101.223 50	75.347 864	329.33	1.225 534	1.22	-.560
42 09	783 323.11	101.224 00	75.328 104	329.45	1.225 607	1.20	-.556
42 10	789 396.55	101.224 17	75.308 337	329.55	1.225 679	1.20	-.553
42 11	795 470.00	101.224 50	75.288 564	329.67	1.225 751	1.18	-.550
42 12	801 543.47	101.224 67	75.268 784	329.77	1.225 822	1.17	-.546
42 13	807 616.95	101.225 17	75.248 998	329.88	1.225 892	1.18	-.543
42 14	813 690.46	101.225 33	75.229 205	329.98	1.225 963	1.17	-.540
42 15	819 763.98	101.225 67	75.209 406	330.10	1.226 033	1.17	-.536
42 16	825 837.52	101.226 00	75.189 600	330.18	1.226 103	1.15	-.533
42 17	831 911.08	101.226 17	75.169 789	330.30	1.226 172	1.13	-.530
42 18	837 984.65	101.226 50	75.149 971	330.40	1.226 240	1.15	-.527
42 19	844 058.24	101.226 83	75.130 147	330.52	1.226 309	1.13	-.523
42 20	850 131.85	101.227 17	75.110 316	330.62	1.226 377	1.13	-.520
42 21	856 205.48	101.227 50	75.090 479	330.73	1.226 445	1.10	-.517
42 22	862 279.13	101.227 83	75.070 635	330.83	1.226 511	1.12	-.513
42 23	868 352.80	101.228 00	75.050 785	330.95	1.226 578	1.10	-.510
42 24	874 426.48	101.228 33	75.030 928	331.03	1.226 644	1.10	-.507
42 25	880 500.18	101.228 67	75.011 066	331.18	1.226 710	1.10	-.504
42 26	886 573.90	101.229 00	74.991 195	331.25	1.226 776	1.07	-.500
42 27	892 647.64	101.229 17	74.971 320	331.37	1.226 840	1.08	-.497
42 28	898 721.39	101.229 50	74.951 438	331.47	1.226 905	1.07	-.494
42 29	904 795.16	101.229 83	74.931 550	331.58	1.226 969	1.07	-.490
42 30	910 868.95	101.230 17	74.911 655	331.68	1.227 033	1.05	-.487
42 31	916 942.76	101.230 50	74.891 754	331.78	1.227 096	1.05	-.484
42 32	923 016.59	101.230 67	74.871 847	331.90	1.227 159	1.05	-.480
42 33	929 090.43	101.231 00	74.851 933	332.02	1.227 222	1.03	-.477
42 34	935 164.29	101.231 33	74.832 012	332.10	1.227 284	1.03	-.474
42 35	941 238.17	101.231 67	74.812 086	332.22	1.227 346	1.02	-.470
42 36	947 312.07	101.232 00	74.792 153	332.32	1.227 407	1.02	-.467
42 37	953 385.99	101.232 17	74.772 214	332.43	1.227 468	1.00	-.464
42 38	959 459.92	101.232 50	74.752 268	332.52	1.227 528	1.00	-.461
42 39	965 533.87	101.232 83	74.732 317	332.65	1.227 588	1.00	-.457
42 40	971 607.84	101.233 17	74.712 358	332.73	1.227 648	.98	-.454
42 41	977 681.83	101.233 50	74.692 394	332.87	1.227 707	.98	-.451
42 42	983 755.84	101.233 67	74.672 422	332.95	1.227 766	.97	-.448
42 43	989 829.86	101.234 00	74.652 445	333.07	1.227 824	.97	-.444
42 44	995 903.90	101.234 33	74.632 461	333.15	1.227 882	.97	-.441
42 45	1 001 977.96	101.234 67	74.612 472	333.30	1.227 940	.95	-.438
42 46	1 008 052.04	101.235 00	74.592 474	333.37	1.227 997	.93	-.435
42 47	1 014 126.14	101.235 17	74.572 472	333.48	1.228 053	.93	-.432
42 48	1 020 200.25	101.235 50	74.552 463	333.60	1.228 109	.95	-.428
42 49	1 026 274.38	101.235 83	74.532 447	333.70	1.228 166	.92	-.425
42 50	1 032 348.53	101.236 17	74.512 425	333.80	1.228 221	.92	-.422
42 51	1 038 422.70	101.236 33	74.492 397	333.90	1.228 276	.90	-.419
42 52	1 044 496.88	101.236 83	74.472 363	334.02	1.228 330	.90	-.415
42 53	1 050 571.09	101.237 00	74.452 322	334.13	1.228 384	.90	-.412
42 54	1 056 645.31	101.237 17	74.432 274	334.20	1.228 438	.90	-.409
42 55	1 062 719.54	101.237 67	74.412 222	334.35	1.228 492	.88	-.406
42 56	1 068 793.80	101.238 00	74.392 161	334.43	1.228 545	.87	-.402
42 57	1 074 868.08	101.238 17	74.372 095	334.55	1.228 597	.87	-.399
42 58	1 080 942.37	101.238 50	74.352 022	334.63	1.228 649	.87	-.396
42 59	1 087 016.68	101.238 83	74.331 944	334.77	1.228 701	.85	-.392
43 00	1 093 091.01		74.311 858		1.228 752		-.389

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
43 00	1 093 091.01	101.239 00	74.311 858	334.87	1.228 752	.85	-.389
43 01	1 099 165.35	101.239 50	74.291 766	334.97	1.228 803	.83	-.386
43 02	1 105 239.72	101.239 67	74.271 668	335.07	1.228 853	.83	-.383
43 03	1 111 314.10	101.240 00	74.251 564	335.18	1.228 903	.83	-.379
43 04	1 117 388.50	101.240 33	74.231 453	335.28	1.228 953	.82	-.376
43 05	1 123 462.92	101.240 67	74.211 336	335.37	1.229 002	.82	-.373
43 06	1 129 537.36	101.240 83	74.191 214	335.48	1.229 051	.80	-.370
43 07	1 135 611.81	101.241 17	74.171 085	335.60	1.229 099	.80	-.367
43 08	1 141 686.28	101.241 50	74.150 949	335.70	1.229 147	.80	-.363
43 09	1 147 760.77	101.241 83	74.130 807	335.80	1.229 195	.78	-.360
43 10	1 153 835.28	101.242 17	74.110 659	335.92	1.229 242	.78	-.357
43 11	1 159 909.81	101.242 33	74.090 504	336.02	1.229 289	.77	-.354
43 12	1 165 984.35	101.242 67	74.070 343	336.12	1.229 335	.75	-.351
43 13	1 172 058.91	101.243 00	74.050 176	336.23	1.229 380	.77	-.347
43 14	1 178 133.49	101.243 33	74.030 002	336.33	1.229 426	.75	-.344
43 15	1 184 208.09	101.243 67	74.009 822	336.43	1.229 471	.75	-.341
43 16	1 190 282.71	101.243 83	73.989 636	336.53	1.229 516	.73	-.338
43 17	1 196 357.34	101.244 17	73.969 444	336.65	1.229 560	.72	-.335
43 18	1 202 431.99	101.244 50	73.949 245	336.75	1.229 603	.73	-.331
43 19	1 208 506.66	101.244 83	73.929 040	336.85	1.229 647	.72	-.328
43 20	1 214 581.35	101.245 17	73.908 829	336.97	1.229 690	.72	-.325
43 21	1 220 656.06	101.245 33	73.888 611	337.07	1.229 733	.70	-.322
43 22	1 226 730.78	101.245 67	73.868 387	337.17	1.229 775	.68	-.318
43 23	1 232 805.52	101.246 00	73.848 157	337.28	1.229 816	.70	-.315
43 24	1 238 880.28	101.246 33	73.827 920	337.37	1.229 858	.68	-.312
43 25	1 244 955.06	101.246 67	73.807 678	337.48	1.229 899	.68	-.308
43 26	1 251 029.86	101.246 83	73.787 429	337.58	1.229 940	.67	-.305
43 27	1 257 104.67	101.247 17	73.767 174	337.70	1.229 980	.65	-.302
43 28	1 263 179.50	101.247 50	73.746 912	337.80	1.230 019	.67	-.299
43 29	1 269 254.35	101.247 83	73.726 644	337.90	1.230 059	.65	-.295
43 30	1 275 329.22	101.248 17	73.706 370	338.02	1.230 098	.65	-.292
43 31	1 281 404.11	101.248 33	73.686 089	338.10	1.230 137	.62	-.289
43 32	1 287 479.01	101.248 67	73.665 803	338.22	1.230 174	.63	-.286
43 33	1 293 553.93	101.249 00	73.645 510	338.32	1.230 212	.62	-.283
43 34	1 299 628.87	101.249 33	73.625 211	338.43	1.230 249	.62	-.280
43 35	1 305 703.83	101.249 50	73.604 905	338.53	1.230 286	.62	-.276
43 36	1 311 778.80	101.250 00	73.584 593	338.62	1.230 323	.58	-.273
43 37	1 317 853.80	101.250 17	73.564 276	338.75	1.230 358	.60	-.270
43 38	1 323 928.81	101.250 50	73.543 951	338.83	1.230 394	.58	-.267
43 39	1 330 003.84	101.250 67	73.523 621	338.95	1.230 429	.58	-.264
43 40	1 336 078.88	101.251 17	73.503 284	339.05	1.230 464	.57	-.261
43 41	1 342 153.95	101.251 33	73.482 941	339.15	1.230 498	.57	-.258
43 42	1 348 229.03	101.251 67	73.462 592	339.25	1.230 532	.55	-.255
43 43	1 354 304.13	101.252 00	73.442 237	339.37	1.230 565	.57	-.251
43 44	1 360 379.25	101.252 33	73.421 875	339.48	1.230 599	.53	-.248
43 45	1 366 454.39	101.252 67	73.401 506	339.57	1.230 631	.53	-.245
43 46	1 372 529.55	101.252 83	73.381 132	339.67	1.230 663	.53	-.242
43 47	1 378 604.72	101.253 17	73.360 752	339.78	1.230 695	.52	-.239
43 48	1 384 679.91	101.253 50	73.340 365	339.88	1.230 726	.53	-.235
43 49	1 390 755.12	101.253 83	73.319 972	339.98	1.230 758	.50	-.232
43 50	1 396 830.35	101.254 00	73.299 573	340.10	1.230 788	.50	-.229
43 51	1 402 905.59	101.254 50	73.279 167	340.18	1.230 818	.50	-.226
43 52	1 408 980.86	101.254 67	73.258 756	340.30	1.230 848	.48	-.223
43 53	1 415 056.14	101.255 00	73.238 338	340.40	1.230 877	.48	-.220
43 54	1 421 131.44	101.255 17	73.217 914	340.52	1.230 906	.48	-.217
43 55	1 427 206.75	101.255 67	73.197 483	340.62	1.230 935	.47	-.214
43 56	1 433 282.09	101.255 83	73.177 046	340.70	1.230 963	.45	-.210
43 57	1 439 357.44	101.256 17	73.156 604	340.83	1.230 990	.45	-.207
43 58	1 445 432.81	101.256 50	73.136 154	340.92	1.231 017	.47	-.204
43 59	1 451 508.20	101.256 83	73.115 699	341.03	1.231 045	.43	-.201
44 00	1 457 583.61		73.095 237		1.231 071		-.198

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
44 00	1 457 583.61	101.257 00	73.095 237	341.15	1.231 071	.43	-.198
44 01	1 463 659.03	101.257 50	73.074 768	341.25	1.231 097	.42	-.195
44 02	1 469 734.48	101.257 67	73.054 293	341.32	1.231 122	.42	-.192
44 03	1 475 809.94	101.258 00	73.033 814	341.45	1.231 147	.42	-.188
44 04	1 481 885.42	101.258 33	73.013 327	341.55	1.231 172	.40	-.185
44 05	1 487 960.92	101.258 50	72.992 834	341.65	1.231 196	.42	-.182
44 06	1 494 036.43	101.258 83	72.972 335	341.75	1.231 221	.38	-.179
44 07	1 500 111.96	101.259 17	72.951 830	341.85	1.231 244	.38	-.176
44 08	1 506 187.51	101.259 50	72.931 319	341.95	1.231 267	.38	-.172
44 09	1 512 263.08	101.259 83	72.910 802	342.05	1.231 290	.37	-.169
44 10	1 518 338.67	101.260 17	72.890 279	342.18	1.231 312	.37	-.166
44 11	1 524 414.28	101.260 33	72.869 748	342.28	1.231 334	.35	-.163
44 12	1 530 489.90	101.260 67	72.849 211	342.35	1.231 355	.35	-.160
44 13	1 536 565.54	101.261 00	72.828 670	342.48	1.231 376	.35	-.157
44 14	1 542 641.20	101.261 17	72.808 121	342.58	1.231 397	.32	-.154
44 15	1 548 716.87	101.261 67	72.787 566	342.68	1.231 416	.33	-.150
44 16	1 554 792.57	101.261 83	72.767 005	342.78	1.231 436	.32	-.147
44 17	1 560 868.28	101.262 17	72.746 438	342.88	1.231 455	.32	-.144
44 18	1 566 944.01	101.262 50	72.725 865	342.98	1.231 474	.32	-.141
44 19	1 573 019.76	101.262 83	72.705 286	343.08	1.231 493	.30	-.138
44 20	1 579 095.53	101.263 17	72.684 701	343.22	1.231 511	.30	-.135
44 21	1 585 171.32	101.263 33	72.664 108	343.30	1.231 529	.27	-.132
44 22	1 591 247.12	101.263 67	72.643 510	343.40	1.231 545	.28	-.129
44 23	1 597 322.94	101.264 00	72.622 906	343.52	1.231 562	.28	-.126
44 24	1 603 398.78	101.264 33	72.602 295	343.62	1.231 579	.25	-.123
44 25	1 609 474.64	101.264 50	72.581 678	343.70	1.231 594	.27	-.120
44 26	1 615 550.51	101.264 83	72.561 056	343.82	1.231 610	.25	-.116
44 27	1 621 626.40	101.265 17	72.540 427	343.93	1.231 625	.25	-.113
44 28	1 627 702.31	101.265 50	72.519 791	344.00	1.231 640	.23	-.110
44 29	1 633 778.24	101.265 83	72.499 151	344.12	1.231 654	.23	-.107
44 30	1 639 854.19	101.266 17	72.478 504	344.23	1.231 668	.23	-.104
44 31	1 645 930.16	101.266 33	72.457 850	344.35	1.231 682	.20	-.101
44 32	1 652 006.14	101.266 67	72.437 189	344.42	1.231 694	.20	-.098
44 33	1 658 082.14	101.267 00	72.416 524	344.55	1.231 706	.22	-.095
44 34	1 664 158.16	101.267 33	72.395 851	344.63	1.231 719	.18	-.092
44 35	1 670 234.20	101.267 50	72.375 173	344.73	1.231 730	.20	-.088
44 36	1 676 310.25	101.267 83	72.354 489	344.85	1.231 742	.17	-.085
44 37	1 682 386.32	101.268 17	72.333 798	344.95	1.231 752	.18	-.082
44 38	1 688 462.41	101.268 50	72.313 101	345.05	1.231 763	.17	-.079
44 39	1 694 538.52	101.268 83	72.292 398	345.13	1.231 773	.17	-.076
44 40	1 700 614.65	101.269 17	72.271 690	345.27	1.231 783	.15	-.073
44 41	1 706 690.80	101.269 33	72.250 974	345.37	1.231 792	.15	-.070
44 42	1 712 766.96	101.269 67	72.230 252	345.45	1.231 801	.15	-.067
44 43	1 718 843.14	101.270 00	72.209 525	345.57	1.231 809	.15	-.064
44 44	1 724 919.34	101.270 33	72.188 791	345.67	1.231 818	.12	-.061
44 45	1 730 995.56	101.270 50	72.168 051	345.77	1.231 825	.12	-.058
44 46	1 737 071.79	101.270 83	72.147 305	345.87	1.231 832	.12	-.055
44 47	1 743 148.04	101.271 17	72.126 553	345.98	1.231 839	.10	-.052
44 48	1 749 224.31	101.271 50	72.105 794	346.07	1.231 845	.12	-.049
44 49	1 755 300.60	101.271 83	72.085 030	346.17	1.231 852	.06	-.046
44 50	1 761 376.91	101.272 00	72.064 260	346.28	1.231 857	.08	-.043
44 51	1 767 453.23	101.272 50	72.043 483	346.40	1.231 862	.07	-.040
44 52	1 773 529.58	101.272 67	72.022 699	346.47	1.231 866	.08	-.037
44 53	1 779 605.94	101.273 00	72.001 911	346.58	1.231 871	.07	-.034
44 54	1 785 682.32	101.273 33	71.981 116	346.70	1.231 875	.05	-.031
44 55	1 791 758.72	101.273 50	71.960 314	346.78	1.231 878	.05	-.028
44 56	1 797 835.13	101.274 00	71.939 507	346.88	1.231 881	.03	-.024
44 57	1 803 911.57	101.274 17	71.918 694	347.00	1.231 883	.05	-.021
44 58	1 809 988.02	101.274 50	71.897 874	347.10	1.231 886	.03	-.018
44 59	1 816 064.49	101.274 67	71.877 048	347.18	1.231 888	.02	-.015
45 00	1 822 140.97		71.856 217		1.231 889		-.012

TRANSVERSE MERCATOR PROJECTION

NEW YORK
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
45 00	1 822 140.97	101.275 17	71.856 217	347.32	1.231 889	+.02	-.012
45 01	1 828 217.48	101.275 33	71.835 378	347.40	1.231 890	.00	-.009
45 02	1 834 294.00	101.275 67	71.814 534	347.50	1.231 890	.00	-.006
45 03	1 840 370.54	101.276 00	71.793 684	347.60	1.231 890	.00	-.003
45 04	1 846 447.10	101.276 33	71.772 828	347.70	1.231 890	.00	.000
45 05	1 852 523.68	101.276 50	71.751 966	347.82	1.231 890	-.02	+.004
45 06	1 858 600.27	101.277 00	71.731 097	347.92	1.231 889	-.03	+.007
45 07	1 864 676.89	101.277 17	71.710 222	348.02	1.231 887	-.03	+.010
45 08	1 870 753.52	101.277 50	71.689 341	348.12	1.231 885	-.03	+.013
45 09	1 876 830.17	101.277 67	71.668 454	348.20	1.231 883	-.05	+.016
45 10	1 882 906.83	101.278 17	71.647 562	348.33	1.231 880	-.05	+.019
45 11	1 888 983.52	101.278 33	71.626 662	348.42	1.231 877	-.07	+.022
45 12	1 895 060.22	101.278 67	71.605 757	348.52	1.231 873	-.07	+.025
45 13	1 901 136.94	101.279 00	71.584 846	348.62	1.231 869	-.07	+.028
45 14	1 907 213.68	101.279 33	71.563 929	348.72	1.231 865	-.08	+.031
45 15	1 913 290.44	101.279 67	71.543 006	348.83	1.231 860	-.10	+.034
45 16	1 919 367.22	101.279 83	71.522 076	348.93	1.231 854	-.10	+.038
45 17	1 925 444.01	101.280 17	71.501 140	349.03	1.231 848	-.10	+.041
45 18	1 931 520.82	101.280 50	71.480 198	349.13	1.231 842	-.10	+.044
45 19	1 937 597.65	101.280 83	71.459 250	349.22	1.231 836	-.12	+.047
45 20	1 943 674.50		71.438 297		1.231 829		+.050

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
40 00	0.00	101.182 67	77.821 470	315.43	1.212 797	2.10	-1.000
40 01	6 070.96	101.182 83	77.802 544	315.58	1.212 923	2.08	-.996
40 02	12 141.93	101.183 17	77.783 609	315.65	1.213 048	2.07	-.993
40 03	18 212.92	101.183 50	77.764 670	315.77	1.213 172	2.08	-.990
40 04	24 283.93	101.183 83	77.745 724	315.90	1.213 297	2.07	-.986
40 05	30 354.96	101.184 17	77.726 770	315.98	1.213 421	2.07	-.982
40 06	36 426.01	101.184 33	77.707 811	316.10	1.213 545	2.05	-.979
40 07	42 497.07	101.184 67	77.688 845	316.22	1.213 668	2.03	-.976
40 08	48 568.15	101.185 00	77.669 872	316.32	1.213 790	2.05	-.972
40 09	54 639.25	101.185 33	77.650 893	316.43	1.213 913	2.03	-.968
40 10	60 710.37	101.185 50	77.631 907	316.53	1.214 035	2.01	-.965
40 11	66 781.50	101.185 83	77.612 915	316.68	1.214 156	2.02	-.961
40 12	72 852.65	101.186 17	77.593 914	316.75	1.214 277	2.02	-.958
40 13	78 923.82	101.186 50	77.574 909	316.88	1.214 398	2.00	-.954
40 14	84 995.01	101.186 80	77.555 896	316.98	1.214 518	2.00	-.951
40 15	91 066.22	101.187 00	77.536 877	317.08	1.214 638	1.98	-.947
40 16	97 137.44	101.187 33	77.517 852	317.22	1.214 757	1.98	-.943
40 17	103 208.68	101.187 67	77.498 819	317.32	1.214 876	1.97	-.940
40 18	109 279.94	101.188 00	77.479 780	317.42	1.214 994	1.97	-.936
40 19	115 351.22	101.188 17	77.460 735	317.53	1.215 112	1.97	-.933
40 20	121 422.51	101.188 50	77.441 683	317.63	1.215 230	1.95	-.929
40 21	127 493.82	101.188 82	77.422 625	317.77	1.215 347	1.95	-.926
40 22	133 565.15	101.189 17	77.403 559	317.85	1.215 464	1.93	-.922
40 23	139 636.50	101.189 33	77.384 488	317.97	1.215 580	1.95	-.918
40 24	145 707.86	101.189 67	77.365 410	318.10	1.215 697	1.92	-.915
40 25	151 779.24	101.190 00	77.346 324	318.18	1.215 812	1.92	-.912
40 26	157 850.64	101.190 33	77.327 233	318.30	1.215 927	1.92	-.908
40 27	163 922.06	101.190 67	77.308 135	318.42	1.216 042	1.90	-.904
40 28	169 993.50	101.190 83	77.289 030	318.50	1.216 156	1.92	-.901
40 29	176 064.95	101.191 17	77.269 920	318.63	1.216 271	1.88	-.898
40 30	182 136.42	101.191 50	77.250 802	318.73	1.216 384	1.88	-.894
40 31	188 207.91	101.191 83	77.231 678	318.87	1.216 497	1.87	-.891
40 32	194 279.42	101.192 17	77.212 546	318.95	1.216 609	1.88	-.887
40 33	200 350.95	101.192 33	77.193 409	319.07	1.216 722	1.87	-.884
40 34	206 422.49	101.192 67	77.174 265	319.18	1.216 834	1.85	-.880
40 35	212 494.05	101.193 00	77.155 114	319.27	1.216 945	1.85	-.877
40 36	218 565.63	101.193 17	77.135 958	319.40	1.217 056	1.83	-.874
40 37	224 637.22	101.193 50	77.116 794	319.52	1.217 166	1.85	-.870
40 38	230 708.83	101.193 83	77.097 623	319.60	1.217 277	1.83	-.867
40 39	236 780.46	101.194 17	77.078 447	319.73	1.217 387	1.82	-.863
40 40	242 852.11	101.194 50	77.059 263	319.82	1.217 496	1.82	-.860
40 41	248 923.78	101.194 83	77.040 074	319.97	1.217 605	1.80	-.856
40 42	254 995.47	101.195 00	77.020 876	320.03	1.217 713	1.80	-.853
40 43	261 067.17	101.195 33	77.001 674	320.15	1.217 821	1.80	-.850
40 44	267 138.89	101.195 67	76.982 465	320.28	1.217 929	1.78	-.846
40 45	273 210.63	101.195 83	76.963 248	320.37	1.218 036	1.80	-.842
40 46	279 282.38	101.196 17	76.944 026	320.48	1.218 144	1.77	-.839
40 47	285 354.15	101.196 50	76.924 797	320.60	1.218 250	1.77	-.836
40 48	291 425.94	101.196 83	76.905 561	320.70	1.218 356	1.77	-.832
40 49	297 497.75	101.197 17	76.886 319	320.82	1.218 462	1.75	-.828
40 50	303 569.58	101.197 50	76.867 070	320.92	1.218 567	1.75	-.825
40 51	309 641.43	101.197 67	76.847 815	321.03	1.218 672	1.73	-.822
40 52	315 713.29	101.198 00	76.828 553	321.13	1.218 776	1.73	-.818
40 53	321 785.17	101.198 33	76.809 285	321.23	1.218 880	1.73	-.814
40 54	327 857.07	101.198 67	76.790 011	321.37	1.218 984	1.72	-.811
40 55	333 928.99	101.198 83	76.770 729	321.47	1.219 087	1.72	-.808
40 56	340 000.92	101.199 17	76.751 441	321.57	1.219 190	1.70	-.804
40 57	346 072.87	101.199 50	76.732 147	321.70	1.219 292	1.70	-.800
40 58	352 144.84	101.199 83	76.712 845	321.77	1.219 394	1.70	-.797
40 59	358 216.83	101.200 00	76.693 539	321.92	1.219 496	1.68	-.794
41 00	364 288.83		76.674 224		1.219 597		-.790

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
41 00	364 288.83	101.200 33	76.674 224	322.02	1.219 597	1.68	-.790
41 01	370 360.85	101.200 83	76.654 903	322.12	1.219 698	1.67	-.787
41 02	376 432.90	101.201 00	76.635 576	322.22	1.219 798	1.65	-.783
41 03	382 504.96	101.201 17	76.616 243	322.33	1.219 897	1.67	-.780
41 04	388 577.03	101.201 50	76.596 903	322.45	1.219 997	1.65	-.776
41 05	394 649.12	101.201 83	76.577 556	322.55	1.220 096	1.65	-.773
41 06	400 721.23	101.202 17	76.558 203	322.67	1.220 195	1.63	-.770
41 07	406 793.36	101.202 50	76.538 843	322.75	1.220 293	1.62	-.766
41 08	412 865.51	101.202 83	76.519 478	322.88	1.220 390	1.63	-.763
41 09	418 937.68	101.203 00	76.500 105	322.98	1.220 488	1.62	-.759
41 10	425 009.86	101.203 33	76.480 726	323.10	1.220 585	1.62	-.756
41 11	431 082.06	101.203 67	76.461 340	323.20	1.220 682	1.58	-.753
41 12	437 154.28	101.204 00	76.441 948	323.30	1.220 777	1.60	-.749
41 13	443 226.52	101.204 17	76.422 550	323.42	1.220 873	1.60	-.746
41 14	449 298.77	101.204 50	76.403 145	323.53	1.220 969	1.58	-.742
41 15	455 371.04	101.204 83	76.383 733	323.63	1.221 064	1.57	-.739
41 16	461 443.33	101.205 17	76.364 315	323.75	1.221 158	1.57	-.736
41 17	467 515.64	101.205 50	76.344 890	323.83	1.221 252	1.57	-.732
41 18	473 587.97	101.205 67	76.325 460	323.97	1.221 346	1.55	-.729
41 19	479 660.31	101.206 00	76.306 022	324.07	1.221 439	1.55	-.725
41 20	485 732.67	101.206 33	76.286 578	324.18	1.221 532	1.53	-.722
41 21	491 805.05	101.206 67	76.267 127	324.27	1.221 624	1.53	-.719
41 22	497 877.45	101.207 00	76.247 671	324.40	1.221 716	1.53	-.715
41 23	503 949.87	101.207 17	76.228 207	324.50	1.221 808	1.52	-.712
41 24	510 022.30	101.207 50	76.208 737	324.62	1.221 899	1.52	-.708
41 25	516 094.75	101.207 83	76.189 260	324.70	1.221 990	1.50	-.705
41 26	522 167.22	101.208 17	76.169 778	324.83	1.222 080	1.50	-.702
41 27	528 239.71	101.208 33	76.150 288	324.93	1.222 170	1.48	-.698
41 28	534 312.21	101.208 67	76.130 792	325.03	1.222 259	1.48	-.695
41 29	540 384.73	101.209 00	76.111 290	325.15	1.222 348	1.48	-.691
41 30	546 457.27	101.209 33	76.091 781	325.25	1.222 437	1.47	-.688
41 31	552 529.83	101.209 50	76.072 266	325.37	1.222 525	1.47	-.685
41 32	558 602.40	101.209 83	76.052 744	325.47	1.222 613	1.45	-.681
41 33	564 674.99	101.210 17	76.033 216	325.58	1.222 700	1.45	-.678
41 34	570 747.60	101.210 50	76.013 681	325.68	1.222 787	1.45	-.674
41 35	576 820.23	101.210 83	75.994 140	325.78	1.222 874	1.43	-.671
41 36	582 892.88	101.211 17	75.974 593	325.92	1.222 960	1.42	-.668
41 37	588 965.55	101.211 33	75.955 038	326.00	1.223 045	1.42	-.664
41 38	595 038.23	101.211 67	75.935 478	326.13	1.223 130	1.43	-.661
41 39	601 110.93	101.212 00	75.915 910	326.22	1.223 216	1.40	-.657
41 40	607 183.65	101.212 33	75.896 337	326.33	1.223 300	1.40	-.654
41 41	613 256.39	101.212 50	75.876 757	326.43	1.223 384	1.40	-.651
41 42	619 329.14	101.212 83	75.857 171	326.55	1.223 468	1.38	-.647
41 43	625 401.91	101.213 17	75.837 578	326.65	1.223 551	1.38	-.644
41 44	631 474.70	101.213 50	75.817 979	326.75	1.223 634	1.37	-.640
41 45	637 547.51	101.213 83	75.798 374	326.87	1.223 716	1.38	-.637
41 46	643 620.34	101.214 00	75.778 762	326.98	1.223 799	1.35	-.634
41 47	649 693.18	101.214 33	75.759 143	327.08	1.223 880	1.35	-.630
41 48	655 766.04	101.214 67	75.739 518	327.20	1.223 961	1.37	-.627
41 49	661 838.92	101.215 00	75.719 886	327.30	1.224 043	1.33	-.623
41 50	667 911.82	101.215 33	75.700 248	327.40	1.224 123	1.33	-.620
41 51	673 984.74	101.215 50	75.680 604	327.50	1.224 203	1.32	-.617
41 52	680 057.67	101.215 83	75.660 954	327.63	1.224 282	1.32	-.613
41 53	686 130.62	101.216 17	75.641 296	327.72	1.224 361	1.32	-.610
41 54	692 203.59	101.216 33	75.621 633	327.83	1.224 440	1.30	-.607
41 55	698 276.57	101.216 83	75.601 963	327.93	1.224 518	1.32	-.604
41 56	704 349.58	101.217 00	75.582 287	328.05	1.224 597	1.28	-.600
41 57	710 422.60	101.217 33	75.562 604	328.17	1.224 674	1.28	-.597
41 58	716 495.64	101.217 67	75.542 914	328.27	1.224 751	1.28	-.594
41 59	722 568.70	101.218 00	75.523 218	328.37	1.224 828	1.27	-.590
42 00	728 641.78		75.503 516		1.224 904		-.587

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
42 00	728 641.78	101.218 17	75.503 516	328.48	1.224 904	1.27	-.587
42 01	734 714.87	101.218 50	75.483 807	328.58	1.224 980	1.25	-.584
42 02	740 787.98	101.218 83	75.464 092	328.70	1.225 055	1.25	-.580
42 03	746 861.11	101.219 17	75.444 370	328.80	1.225 130	1.25	-.577
42 04	752 934.26	101.219 50	75.424 642	328.90	1.225 205	1.23	-.573
42 05	759 007.43	101.219 67	75.404 908	329.03	1.225 279	1.22	-.570
42 06	765 080.61	101.220 00	75.385 166	329.10	1.225 352	1.22	-.567
42 07	771 153.81	101.220 33	75.365 420	329.23	1.225 425	1.22	-.563
42 08	777 227.03	101.220 67	75.345 666	329.32	1.225 498	1.22	-.560
42 09	783 300.27	101.220 83	75.325 907	329.45	1.225 571	1.20	-.556
42 10	789 373.52	101.221 17	75.306 140	329.53	1.225 643	1.20	-.553
42 11	795 446.79	101.221 50	75.286 368	329.67	1.225 715	1.18	-.550
42 12	801 520.08	101.221 83	75.266 588	329.77	1.225 786	1.17	-.546
42 13	807 593.39	101.222 17	75.246 802	329.87	1.225 856	1.18	-.543
42 14	813 666.72	101.222 50	75.227 010	329.97	1.225 927	1.17	-.540
42 15	819 740.07	101.222 67	75.207 212	330.08	1.225 997	1.17	-.536
42 16	825 813.43	101.223 00	75.187 407	330.18	1.226 067	1.15	-.533
42 17	831 886.81	101.223 17	75.167 596	330.28	1.226 136	1.13	-.530
42 18	837 960.20	101.223 67	75.147 779	330.38	1.226 204	1.15	-.527
42 19	844 033.62	101.224 00	75.127 956	330.52	1.226 273	1.13	-.523
42 20	850 107.06	101.224 17	75.108 125	330.62	1.226 341	1.13	-.520
42 21	856 180.51	101.224 50	75.088 288	330.72	1.226 409	1.10	-.517
42 22	862 253.98	101.224 83	75.068 445	330.82	1.226 475	1.12	-.513
42 23	868 327.47	101.225 00	75.048 596	330.95	1.226 542	1.10	-.510
42 24	874 400.97	101.225 50	75.028 739	331.02	1.226 608	1.10	-.507
42 25	880 474.50	101.225 67	75.008 878	331.17	1.226 674	1.10	-.504
42 26	886 548.04	101.226 00	74.989 008	331.23	1.226 740	1.07	-.500
42 27	892 621.60	101.226 33	74.969 134	331.37	1.226 804	1.08	-.497
42 28	898 695.18	101.226 50	74.949 252	331.47	1.226 869	1.07	-.494
42 29	904 768.77	101.226 83	74.929 364	331.57	1.226 933	1.07	-.490
42 30	910 842.38	101.227 17	74.909 470	331.67	1.226 997	1.05	-.487
42 31	916 916.01	101.227 50	74.889 570	331.78	1.227 060	1.05	-.484
42 32	922 989.66	101.227 83	74.869 663	331.88	1.227 123	1.05	-.480
42 33	929 063.33	101.228 17	74.849 750	332.00	1.227 186	1.03	-.477
42 34	935 137.02	101.228 33	74.829 830	332.10	1.227 248	1.03	-.474
42 35	941 210.72	101.228 67	74.809 904	332.22	1.227 310	1.02	-.470
42 36	947 284.44	101.229 00	74.789 971	332.30	1.227 371	1.02	-.467
42 37	953 358.18	101.229 33	74.770 033	332.42	1.227 432	1.00	-.464
42 38	959 431.94	101.229 50	74.750 088	332.52	1.227 492	1.00	-.461
42 39	965 505.71	101.229 83	74.730 137	332.63	1.227 552	1.00	-.457
42 40	971 579.50	101.230 17	74.710 179	332.73	1.227 612	.98	-.454
42 41	977 653.31	101.230 50	74.690 215	332.83	1.227 671	.98	-.451
42 42	983 727.14	101.230 83	74.670 245	332.95	1.227 730	.97	-.448
42 43	989 800.99	101.231 17	74.650 268	333.07	1.227 788	.97	-.444
42 44	995 874.86	101.231 33	74.630 284	333.13	1.227 846	.97	-.441
42 45	1 001 948.74	101.231 67	74.610 296	333.28	1.227 904	.95	-.438
42 46	1 008 022.64	101.231 83	74.590 299	333.37	1.227 961	.93	-.435
42 47	1 014 096.55	101.232 33	74.570 297	333.48	1.228 017	.93	-.432
42 48	1 020 170.49	101.232 67	74.550 288	333.57	1.228 073	.95	-.428
42 49	1 026 244.45	101.232 83	74.530 274	333.70	1.228 130	.92	-.425
42 50	1 032 318.42	101.233 17	74.510 252	333.78	1.228 185	.92	-.422
42 51	1 038 392.41	101.233 50	74.490 225	333.90	1.228 240	.90	-.419
42 52	1 044 466.42	101.233 67	74.470 191	334.02	1.228 294	.90	-.415
42 53	1 050 540.44	101.234 00	74.450 150	334.12	1.228 348	.90	-.412
42 54	1 056 614.48	101.234 33	74.430 103	334.20	1.228 402	.90	-.409
42 55	1 062 688.54	101.234 67	74.410 051	334.33	1.228 456	.88	-.406
42 56	1 068 762.62	101.235 00	74.389 991	334.42	1.228 509	.87	-.402
42 57	1 074 836.72	101.235 33	74.369 926	334.55	1.228 561	.87	-.399
42 58	1 080 910.84	101.235 50	74.349 853	334.63	1.228 613	.87	-.396
42 59	1 086 984.97	101.235 83	74.329 775	334.75	1.228 665	.85	-.392
43 00	1 093 059.12		74.309 690		1.228 716		-.389

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
43 00	1 093 059.12	101.236 17	74.309 690	334.85	1.228 716	.85	-.389
43 01	1 099 133.29	101.236 50	74.289 599	334.97	1.228 767	.83	-.386
43 02	1 105 207.48	101.236 83	74.269 501	335.05	1.228 817	.83	-.383
43 03	1 111 281.69	101.237 00	74.249 398	335.15	1.228 867	.83	-.379
43 04	1 117 355.91	101.237 33	74.229 289	335.28	1.228 917	.82	-.376
43 05	1 123 430.15	101.237 67	74.209 172	335.38	1.228 966	.82	-.373
43 06	1 129 504.41	101.238 00	74.189 049	335.47	1.229 015	.80	-.370
43 07	1 135 578.69	101.238 17	74.168 921	335.58	1.229 063	.80	-.367
43 08	1 141 652.98	101.238 50	74.148 786	335.70	1.229 111	.80	-.363
43 09	1 147 727.29	101.239 00	74.128 644	335.78	1.229 159	.78	-.360
43 10	1 153 801.63	101.239 17	74.108 497	335.90	1.229 206	.78	-.357
43 11	1 159 875.98	101.239 50	74.088 343	336.02	1.229 253	.77	-.354
43 12	1 165 950.35	101.239 67	74.068 182	336.10	1.229 299	.75	-.351
43 13	1 172 024.73	101.240 00	74.048 016	336.23	1.229 344	.77	-.347
43 14	1 178 099.13	101.240 33	74.027 842	336.32	1.229 390	.75	-.344
43 15	1 184 173.55	101.240 67	74.007 663	336.43	1.229 435	.75	-.341
43 16	1 190 247.99	101.241 00	73.987 477	336.52	1.229 480	.73	-.338
43 17	1 196 322.45	101.241 17	73.967 286	336.63	1.229 524	.72	-.335
43 18	1 202 396.92	101.241 67	73.947 088	336.75	1.229 567	.73	-.331
43 19	1 208 471.42	101.241 83	73.926 883	336.83	1.229 611	.72	-.328
43 20	1 214 545.93	101.242 17	73.906 673	336.95	1.229 654	.72	-.325
43 21	1 220 620.46	101.242 33	73.886 456	337.07	1.229 697	.70	-.322
43 22	1 226 695.00	101.242 67	73.866 232	337.15	1.229 739	.68	-.318
43 23	1 232 769.56	101.243 17	73.846 003	337.27	1.229 780	.70	-.315
43 24	1 238 844.15	101.243 33	73.825 767	337.38	1.229 822	.68	-.312
43 25	1 244 918.75	101.243 67	73.805 524	337.47	1.229 863	.68	-.308
43 26	1 250 993.37	101.244 00	73.785 276	337.57	1.229 904	.67	-.305
43 27	1 257 068.01	101.244 17	73.765 022	337.68	1.229 944	.65	-.302
43 28	1 263 142.66	101.244 50	73.744 761	337.80	1.229 983	.67	-.299
43 29	1 269 217.33	101.244 83	73.724 493	337.88	1.230 023	.65	-.295
43 30	1 275 292.02	101.245 17	73.704 220	338.00	1.230 062	.65	-.292
43 31	1 281 366.73	101.245 50	73.683 940	338.10	1.230 101	.62	-.289
43 32	1 287 441.46	101.245 67	73.663 654	338.20	1.230 138	.62	-.286
43 33	1 293 516.20	101.246 00	73.643 362	338.32	1.230 175	.63	-.283
43 34	1 299 590.96	101.246 33	73.623 063	338.42	1.230 213	.62	-.280
43 35	1 305 665.74	101.246 67	73.602 758	338.52	1.230 250	.62	-.277
43 36	1 311 740.54	101.247 00	73.582 447	338.62	1.230 287	.58	-.273
43 37	1 317 815.36	101.247 17	73.562 130	338.73	1.230 322	.60	-.270
43 38	1 323 890.19	101.247 50	73.541 806	338.83	1.230 358	.58	-.267
43 39	1 329 965.04	101.247 83	73.521 476	338.93	1.230 393	.58	-.264
43 40	1 336 039.91	101.248 17	73.501 140	339.03	1.230 428	.57	-.261
43 41	1 342 114.80	101.248 50	73.480 798	339.15	1.230 462	.57	-.258
43 42	1 348 189.71	101.248 67	73.460 449	339.25	1.230 496	.55	-.255
43 43	1 354 264.63	101.249 00	73.440 094	339.35	1.230 529	.57	-.251
43 44	1 360 339.57	101.249 33	73.419 733	339.45	1.230 563	.53	-.248
43 45	1 366 414.53	101.249 67	73.399 366	339.57	1.230 595	.53	-.245
43 46	1 372 489.51	101.250 00	73.378 992	339.67	1.230 627	.53	-.242
43 47	1 378 564.51	101.250 17	73.358 612	339.77	1.230 659	.52	-.239
43 48	1 384 639.52	101.250 50	73.338 226	339.87	1.230 690	.53	-.235
43 49	1 390 714.55	101.250 83	73.317 834	339.98	1.230 722	.50	-.232
43 50	1 396 789.60	101.251 17	73.297 435	340.08	1.230 752	.50	-.229
43 51	1 402 864.67	101.251 50	73.277 030	340.18	1.230 782	.50	-.226
43 52	1 408 939.76	101.251 67	73.256 619	340.28	1.230 812	.48	-.223
43 53	1 415 014.86	101.252 00	73.236 202	340.40	1.230 841	.48	-.220
43 54	1 421 089.98	101.252 33	73.215 778	340.50	1.230 870	.47	-.217
43 55	1 427 165.12	101.252 67	73.195 348	340.60	1.230 898	.48	-.214
43 56	1 433 240.28	101.253 00	73.174 912	340.70	1.230 927	.45	-.210
43 57	1 439 315.46	101.253 17	73.154 470	340.82	1.230 954	.45	-.207
43 58	1 445 390.65	101.253 50	73.134 021	340.92	1.230 981	.47	-.204
43 59	1 451 465.86	101.253 83	73.113 566	341.02	1.231 009	.43	-.201
44 00	1 457 541.09		73.093 105		1.231 035		-.198

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
44 00	1 457 541.09	101.254 17	73.093 105	341.13	1.231 035	.43	-.198
44 01	1 463 616.34	101.254 50	73.072 637	341.23	1.231 061	.42	-.195
44 02	1 469 691.61	101.254 67	73.052 163	341.33	1.231 086	.42	-.192
44 03	1 475 766.89	101.255 00	73.031 683	341.43	1.231 111	.42	-.188
44 04	1 481 842.19	101.255 33	73.011 197	341.53	1.231 136	.40	-.185
44 05	1 487 917.51	101.255 67	72.990 705	341.63	1.231 160	.42	-.182
44 06	1 493 992.85	101.256 00	72.970 207	341.73	1.231 185	.38	-.179
44 07	1 500 068.21	101.256 17	72.949 703	341.87	1.231 208	.38	-.176
44 08	1 506 143.58	101.256 50	72.929 191	341.93	1.231 231	.38	-.172
44 09	1 512 218.97	101.256 83	72.908 675	342.03	1.231 254	.37	-.169
44 10	1 518 294.38	101.257 17	72.888 153	342.17	1.231 276	.37	-.166
44 11	1 524 369.81	101.257 50	72.867 623	342.27	1.231 298	.35	-.163
44 12	1 530 445.26	101.257 67	72.847 087	342.37	1.231 319	.35	-.160
44 13	1 536 520.72	101.258 00	72.826 545	342.47	1.231 340	.35	-.157
44 14	1 542 596.20	101.258 33	72.805 997	342.57	1.231 361	.32	-.154
44 15	1 548 671.70	101.258 67	72.785 443	342.67	1.231 380	.33	-.150
44 16	1 554 747.22	101.259 00	72.764 883	342.77	1.231 400	.32	-.147
44 17	1 560 822.76	101.259 17	72.744 317	342.90	1.231 419	.32	-.144
44 18	1 566 898.31	101.259 50	72.723 743	342.97	1.231 438	.32	-.141
44 19	1 572 973.88	101.259 83	72.703 165	343.07	1.231 457	.30	-.138
44 20	1 579 049.47	101.260 17	72.682 581	343.20	1.231 475	.30	-.135
44 21	1 585 125.08	101.260 50	72.661 989	343.30	1.231 493	.27	-.132
44 22	1 591 200.71	101.260 67	72.641 391	343.38	1.231 509	.28	-.129
44 23	1 597 276.35	101.261 00	72.620 788	343.50	1.231 526	.28	-.126
44 24	1 603 352.01	101.261 33	72.600 178	343.60	1.231 543	.25	-.123
44 25	1 609 427.69	101.261 67	72.579 562	343.72	1.231 558	.27	-.120
44 26	1 615 503.39	101.261 83	72.558 939	343.80	1.231 574	.25	-.116
44 27	1 621 579.10	101.262 33	72.538 311	343.92	1.231 589	.25	-.113
44 28	1 627 654.84	101.262 50	72.517 676	344.00	1.231 604	.23	-.110
44 29	1 633 730.59	101.262 83	72.497 036	344.10	1.231 618	.23	-.107
44 30	1 639 806.36	101.263 17	72.476 390	344.23	1.231 632	.23	-.104
44 31	1 645 882.15	101.263 33	72.455 736	344.33	1.231 646	.20	-.101
44 32	1 651 957.95	101.263 67	72.435 076	344.40	1.231 658	.20	-.098
44 33	1 658 033.77	101.264 17	72.414 412	344.53	1.231 670	.22	-.095
44 34	1 664 109.62	101.264 33	72.393 740	344.63	1.231 683	.18	-.092
44 35	1 670 185.48	101.264 50	72.373 062	344.73	1.231 694	.20	-.089
44 36	1 676 261.35	101.265 00	72.352 378	344.83	1.231 706	.17	-.085
44 37	1 682 337.25	101.265 33	72.331 688	344.93	1.231 716	.18	-.082
44 38	1 688 413.17	101.265 50	72.310 992	345.03	1.231 727	.18	-.079
44 39	1 694 489.10	101.265 83	72.290 290	345.13	1.231 738	.15	-.076
44 40	1 700 565.05	101.266 00	72.269 582	345.25	1.231 747	.15	-.073
44 41	1 706 641.01	101.266 50	72.248 867	345.37	1.231 756	.15	-.070
44 42	1 712 717.00	101.266 67	72.228 145	345.43	1.231 765	.13	-.067
44 43	1 718 793.00	101.267 00	72.207 419	345.57	1.231 773	.15	-.064
44 44	1 724 869.02	101.267 33	72.186 685	345.65	1.231 782	.12	-.061
44 45	1 730 945.06	101.267 67	72.165 946	345.75	1.231 789	.12	-.058
44 46	1 737 021.12	101.268 00	72.145 201	345.87	1.231 796	.12	-.055
44 47	1 743 097.20	101.268 33	72.124 449	345.97	1.231 803	.10	-.052
44 48	1 749 173.30	101.268 50	72.103 691	346.07	1.231 809	.12	-.049
44 49	1 755 249.41	101.268 67	72.082 927	346.15	1.231 816	.08	-.046
44 50	1 761 325.53	101.269 17	72.062 158	346.28	1.231 821	.08	-.043
44 51	1 767 401.68	101.269 50	72.041 381	346.37	1.231 826	.07	-.040
44 52	1 773 477.85	101.269 67	72.020 599	346.47	1.231 830	.08	-.037
44 53	1 779 554.03	101.270 00	71.999 811	346.58	1.231 835	.07	-.034
44 54	1 785 630.23	101.270 33	71.979 016	346.67	1.231 839	.05	-.031
44 55	1 791 706.45	101.270 67	71.958 216	346.78	1.231 842	.05	-.028
44 56	1 797 782.69	101.271 00	71.937 409	346.88	1.231 845	.03	-.024
44 57	1 803 858.95	101.271 17	71.916 596	347.00	1.231 847	.05	-.021
44 58	1 809 935.22	101.271 50	71.895 776	347.07	1.231 850	.03	-.018
44 59	1 816 011.51	101.271 83	71.874 952	347.18	1.231 852	.02	-.015
45 00	1 822 087.82		71.854 121		1.231 853		-.012

TRANSVERSE MERCATOR PROJECTION

NEW YORK
CENTRAL AND WEST ZONES

Lat.	y_o feet	$\triangle y_o$ per second	H	$\triangle H$ per second	V	$\triangle V$ per second	a
45 00	1 822 087.82	101.272 17	71.854 121	347.30	1.231 853	+.02	-.012
45 01	1 828 164.15	101.272 50	71.833 283	347.40	1.231 854	.00	-.009
45 02	1 834 240.50	101.272 67	71.812 439	347.48	1.231 854	.00	-.006
45 03	1 840 316.86	101.273 00	71.791 590	347.60	1.231 854	.00	-.003
45 04	1 846 393.24	101.273 33	71.770 734	347.70	1.231 854	.00	.000
45 05	1 852 469.64	101.273 67	71.749 872	347.78	1.231 854	-.02	+.004
45 06	1 858 546.06	101.274 00	71.729 005	347.90	1.231 853	-.03	+.007
45 07	1 864 622.50	101.274 17	71.708 131	348.02	1.231 851	-.03	+.010
45 08	1 870 698.95	101.274 50	71.687 250	348.10	1.231 849	-.03	+.013
45 09	1 876 775.42	101.274 83	71.666 364	348.20	1.231 847	-.05	+.016
45 10	1 882 851.91	101.275 17	71.645 472	348.32	1.231 844	-.05	+.019
45 11	1 888 928.42	101.275 50	71.624 573	348.42	1.231 841	-.07	+.022
45 12	1 895 004.95	101.275 67	71.603 668	348.50	1.231 837	-.07	+.025
45 13	1 901 081.49	101.276 00	71.582 758	348.62	1.231 833	-.07	+.028
45 14	1 907 158.05	101.276 33	71.561 841	348.72	1.231 829	-.08	+.031
45 15	1 913 234.63	101.276 67	71.540 918	348.80	1.231 824	-.10	+.034
45 16	1 919 311.23	101.277 00	71.519 990	348.92	1.231 818	-.10	+.038
45 17	1 925 387.85	101.277 17	71.499 055	349.03	1.231 812	-.10	+.041
45 18	1 931 464.48	101.277 50	71.478 113	349.12	1.231 806	-.10	+.044
45 19	1 937 541.13	101.277 83	71.457 166	349.22	1.231 800	-.12	+.047
45 20	1 943 617.80		71.436 213		1.231 793		+.050

TRANSVERSE MERCATOR PROJECTION

NEW YORK

Table for b and c, East, Central and West Zones

Δλ"	b	Δb	c	Δλ"	b	Δb	c
0	0.000	+0.124	0.000				
100	+0.124	+0.123	0.000	3100	+2.224	-0.036	-0.133
200	+0.247	+0.123	-0.001	3200	+2.188	-0.046	-0.135
300	+0.370	+0.121	-0.002	3300	+2.142	-0.056	-0.136
400	+0.491	+0.121	-0.003	3400	+2.086	-0.068	-0.135
500	+0.612	+0.118	-0.005	3500	+2.018	-0.078	-0.133
600	+0.730	+0.116	-0.007	3600	+1.940	-0.090	-0.131
700	+0.846	+0.114	-0.010	3700	+1.850	-0.101	-0.128
800	+0.960	+0.112	-0.014	3800	+1.749	-0.114	-0.124
900	+1.072	+0.108	-0.018	3900	+1.635	-0.126	-0.120
1000	+1.180	+0.105	-0.022	4000	+1.509	-0.140	-0.115
1100	+1.285	+0.101	-0.027	4100	+1.369	-0.154	-0.109
1200	+1.386	+0.098	-0.032	4200	+1.215	-0.167	-0.101
1300	+1.484	+0.093	-0.038	4300	+1.048	-0.181	-0.091
1400	+1.577	+0.089	-0.043	4400	+0.867	-0.196	-0.078
1500	+1.666	+0.084	-0.049	4500	+0.671	-0.209	-0.063
1600	+1.750	+0.079	-0.055	4600	+0.462	-0.225	-0.045
1700	+1.829	+0.074	-0.061	4700	+0.237	-0.237	-0.025
1800	+1.903	+0.068	-0.067	4800	0.000	-0.248	0.000
1900	+1.971	+0.062	-0.073	4900	-0.248	-0.260	+0.026
2000	+2.033	+0.056	-0.079	5000	-0.508	-0.280	+0.053
2100	+2.089	+0.049	-0.085	5100	-0.788	-0.296	+0.084
2200	+2.138	+0.042	-0.091	5200	-1.084	-0.314	+0.117
2300	+2.180	+0.034	-0.096	5300	-1.398	-0.332	+0.153
2400	+2.214	+0.027	-0.101	5400	-1.730	-0.350	+0.191
2500	+2.241	+0.020	-0.106	5500	-2.080	-0.369	+0.232
2600	+2.261	+0.010	-0.111	5600	-2.449	-0.389	+0.275
2700	+2.271	+0.002	-0.116	5700	-2.838	-0.410	+0.321
2800	+2.273	-0.007	-0.121	5800	-3.248	-0.431	+0.371
2900	+2.266	-0.016	-0.125	5900	-3.679	-0.454	+0.426
3000	+2.250	-0.026	-0.130	6000	-4.133		+0.487

$$F = 7.15 \times 10^{-13}$$

TRANSVERSE MERCATOR PROJECTION

TABLE FOR g

$$\Delta\alpha'' = \sin\phi\,(\Delta\lambda'') + g$$

Latitude	$\Delta\lambda''$						
	0"	1000"	2000"	3000"	4000"	5000"	6000"
24°	0".00	0".00	0".02	0".07	0".17	0".33	0".58
25	0	0	0.02	0.07	0.17	0.34	0.59
26°	0.00	0.00	0.02	0.08	0.18	0.35	0.60
27	0	0	0.02	0.08	0.18	0.35	0.61
28	0	0	0.02	0.08	0.18	0.36	0.62
29	0	0	0.02	0.08	0.19	0.37	0.63
30	0	0	0.02	0.08	0.19	0.37	0.64
31°	0.00	0.00	0.02	0.08	0.19	0.37	0.64
32	0	0	0.02	0.08	0.19	0.38	0.65
33	0	0	0.02	0.08	0.19	0.38	0.65
34	0	0	0.02	0.08	0.19	0.38	0.65
35	0	0	0.02	0.08	0.19	0.38	0.65
36°	0.00	0.00	0.02	0.08	0.19	0.38	0.65
37	0	0	0.02	0.08	0.19	0.38	0.65
38	0	0	0.02	0.08	0.19	0.38	0.65
39	0	0	0.02	0.08	0.19	0.37	0.64
40	0	0	0.02	0.08	0.19	0.37	0.64
41°	0.00	0.00	0.02	0.08	0.19	0.37	0.63
42	0	0	0.02	0.08	0.18	0.36	0.63
43	0	0	0.02	0.08	0.18	0.36	0.62
44	0	0	0.02	0.08	0.18	0.35	0.61
45	0	0	0.02	0.08	0.18	0.35	0.60
46°	0.00	0.00	0.02	0.07	0.17	0.34	0.59
47	0	0	0.02	0.07	0.17	0.33	0.58
48	0	0	0.02	0.07	0.17	0.33	0.56
49	0	0	0.02	0.07	0.16	0.32	0.55
50	0.00	0.00	0.02	0.07	0.16	0.31	0.54

$$g = \left[\frac{C\,(\sin 1'')\,\cos^3\phi}{2A^2} + F\right](\Delta\lambda'')^3$$

A, C and F are position factors.

Y CORRECTION FOR COMPUTATION OF GEOGRAPHIC POSITIONS FROM PLANE COORDINATES TRANSVERSE MERCATOR PROJECTION, NEW YORK-EAST ZONE

$$P(x'/10{,}000)^2 + d = V(\Delta y/100)^2 + c$$

P taken out for y-coordinate
d taken out for x'

y	P	ΔP	x'	d
0	2.00196	1951	0	0.00
100,000	2.02147	1970	50,000	+ 0.01
200,000	2.04117	1985	100,000	+ 0.02
300,000	2.06102	2002	150,000	+ 0.04
400,000	2.08104	2017	200,000	+ 0.07
500,000	2.10121	2033	250,000	+ 0.08
600,000	2.12154	2053	300,000	+ 0.08
700,000	2.14207	2070	350,000	+ 0.04
800,000	2.16277	2086	400,000	- 0.03
900,000	2.18363	2106		
1,000,000	2.20469	2123		
1,100,000	2.22592	2143		
1,200,000	2.24735	2163		
1,300,000	2.26898	2182		
1,400,000	2.29080	2202		
1,500,000	2.31282	2222		
1,600,000	2.33504	2243		
1,700,000	2.35747			

Y CORRECTION FOR COMPUTATION OF GEOGRAPHIC POSITIONS FROM PLANE COORDINATES TRANSVERSE MERCATOR PROJECTION, NEW YORK-CENTRAL & WEST ZONES

$$P(x'/10{,}000)^2 + d = V(\Delta y/100)^2 + c$$

P taken out for y-coordinate
d taken out for x'

y	P	ΔP	x'	d
0	2.00202	1953	0	0.00
100,000	2.02155	1969	50,000	+ 0.01
200,000	2.04124	1985	100,000	+ 0.02
300,000	2.06109	2001	150,000	+ 0.04
400,000	2.08110	2018	200,000	+ 0.07
500,000	2.10128	2034	250,000	+ 0.09
600,000	2.12162	2052	300,000	+ 0.08
700,000	2.14214	2069	350,000	+ 0.05
800,000	2.16283	2087	400,000	- 0.02
900,000	2.18370	2106		
1,000,000	2.20476	2124		
1,100,000	2.22600	2143		
1,200,000	2.24743	2162		
1,300,000	2.26905	2182		
1,400,000	2.29087	2203		
1,500,000	2.31290	2222		
1,600,000	2.33512	2243		
1,700,000	2.35755	2264		
1,800,000	2.38019	2286		
1,900,000	2.40305			

TRANSVERSE MERCATOR PROJECTION

New York

$$\Delta\alpha = Mx' - e$$

y	East zone		Central and west zones	
	M	ΔM	M	ΔM
0	0.008 2595	806	0.008 2598	805
100,000	0.008 3401	812	0.008 3403	813
200,000	0.008 4213	819	0.008 4216	819
300,000	0.008 5032	826	0.008 5035	825
400,000	0.008 5858	832	0.008 5860	832
500,000	0.008 6690	839	0.008 6692	840
600,000	0.008 7529	847	0.008 7532	847
700,000	0.008 8376	854	0.008 8379	854
800,000	0.008 9230	861	0.008 9233	861
900,000	0.009 0091	869	0.009 0094	869
1,000,000	0.009 0960	876	0.009 0963	876
1,100,000	0.009 1836	884	0.009 1839	884
1,200,000	0.009 2720	892	0.009 2723	892
1,300,000	0.009 3612	901	0.009 3615	901
1,400,000	0.009 4513	908	0.009 4516	908
1,500,000	0.009 5421	917	0.009 5424	917
1,600,000	0.009 6338	926	0.009 6341	926
1,700,000	0.009 7264	934	0.009 7267	934
1,800,000	0.009 8198	943	0.009 8201	943
1,900,000	0.009 9141		0.009 9144	

e

y \ x'	100,000	200,000	300,000	400,000
0	0.0	0.1	0.3	0.6
1,000,000	0.0	0.1	0.4	0.8
2,000,000	0.0	0.1	0.4	1.0

Transverse Mercator Projection for New York

EAST

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio	x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
0	-144.8	0.9999667	175,000	+7.1	1.0000017
5,000	-144.7	0.9999667	180,000	+15.9	1.0000037
10,000	-144.3	0.9999668	185,000	+25.0	1.0000058
15,000	-143.7	0.9999669	190,000	+34.3	1.0000079
20,000	-142.8	0.9999671	195,000	+43.9	1.0000102
25,000	-141.7	0.9999674	200,000	+53.7	1.0000124
30,000	-140.3	0.9999677	205,000	+63.7	1.0000147
35,000	-138.7	0.9999681	210,000	+74.0	1.0000171
40,000	-136.9	0.9999685	215,000	+84.5	1.0000195
45,000	-134.8	0.9999690	220,000	+95.3	1.0000220
50,000	-132.4	0.9999695	225,000	+106.4	1.0000245
55,000	-129.8	0.9999701	230,000	+117.7	1.0000272
60,000	-126.9	0.9999708	235,000	+129.2	1.0000298
65,000	-123.8	0.9999715	240,000	+141.0	1.0000325
70,000	-120.5	0.9999723	245,000	+153.0	1.0000353
75,000	-116.9	0.9999731	250,000	+165.3	1.0000381
80,000	-113.0	0.9999740	255,000	+177.8	1.0000410
85,000	-109.0	0.9999749	260,000	+190.6	1.0000439
90,000	-104.6	0.9999759	265,000	+203.6	1.0000469
95,000	-100.0	0.9999770	270,000	+216.9	1.0000500
100,000	-95.2	0.9999781	275,000	+230.4	1.0000531
105,000	-90.1	0.9999793	280,000	+244.2	1.0000563
110,000	-84.8	0.9999805	285,000	+258.2	1.0000595
115,000	-79.2	0.9999818	290,000	+272.4	1.0000628
120,000	-73.4	0.9999831	295,000	+287.0	1.0000661
125,000	-67.3	0.9999846	300,000	+301.7	1.0000695
130,000	-61.0	0.9999860	305,000	+316.7	1.0000730
135,000	-54.4	0.9999875	310,000	+332.0	1.0000765
140,000	-47.6	0.9999891	315,000	+347.5	1.0000801
145,000	-40.5	0.9999907	320,000	+363.2	1.0000837
150,000	-33.2	0.9999924	325,000	+379.2	1.0000874
155,000	-25.6	0.9999942	330,000	+395.5	1.0000911
160,000	-17.8	0.9999960	335,000	+412.0	1.0000949
165,000	- 9.7	0.9999978	340,000	+428.7	1.0000988
170,000	- 1.4	0.9999997	345,000	+445.7	1.0001027

Transverse Mercator Projection for New York

EAST

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
350,000	+463.0	1.0001067
355,000	+480.5	1.0001107
360,000	+498.2	1.0001148
365,000	+516.2	1.0001189
370,000	+534.4	1.0001231
375,000	+552.9	1.0001274
380,000	+571.6	1.0001317
385,000	+590.6	1.0001360
390,000	+609.8	1.0001405
395,000	+629.3	1.0001450
400,000	+649.0	1.0001495
405,000	+669.0	1.0001541
410,000	+689.2	1.0001587
415,000	+709.7	1.0001635
420,000	+730.4	1.0001682
425,000	+751.3	1.0001730
430,000	+772.6	1.0001779
435,000	+794.0	1.0001829
440,000	+815.7	1.0001879
445,000	+837.7	1.0001929
450,000	+859.9	1.0001980
455,000	+882.3	1.0002032
460,000	+905.0	1.0002084
465,000	+928.0	1.0002137
470,000	+951.2	1.0002190
475,000	+974.6	1.0002244

Transverse Mercator Projection for New York

CENTRAL and WEST

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio	x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
0	-271.4	0.9999375	175,000	-119.5	0.9999725
5,000	-271.3	0.9999375	180,000	-110.7	0.9999745
10,000	-270.9	0.9999376	185,000	-101.6	0.9999766
15,000	-270.3	0.9999378	190,000	-92.3	0.9999787
20,000	-269.4	0.9999380	195,000	-82.7	0.9999810
25,000	-268.3	0.9999382	200,000	-72.9	0.9999832
30,000	-266.9	0.9999385	205,000	-62.9	0.9999855
35,000	-265.3	0.9999389	210,000	-52.6	0.9999879
40,000	-263.5	0.9999393	215,000	-42.1	0.9999903
45,000	-261.4	0.9999398	220,000	-31.3	0.9999928
50,000	-259.0	0.9999404	225,000	-20.2	0.9999953
55,000	-256.4	0.9999410	230,000	-8.9	0.9999980
60,000	-253.5	0.9999416	235,000	+2.6	1.0000006
65,000	-250.4	0.9999423	240,000	+14.4	1.0000033
70,000	-247.1	0.9999431	245,000	+26.4	1.0000061
75,000	-243.5	0.9999439	250,000	+38.7	1.0000089
80,000	-239.6	0.9999448	255,000	+51.2	1.0000118
85,000	-235.6	0.9999458	260,000	+64.0	1.0000147
90,000	-231.2	0.9999468	265,000	+77.0	1.0000177
95,000	-226.6	0.9999478	270,000	+90.3	1.0000208
100,000	-221.8	0.9999489	275,000	+103.8	1.0000239
105,000	-216.7	0.9999501	280,000	+117.6	1.0000271
110,000	-211.4	0.9999513	285,000	+131.6	1.0000303
115,000	-205.8	0.9999526	290,000	+145.8	1.0000336
120,000	-200.0	0.9999539	295,000	+160.4	1.0000369
125,000	-193.9	0.9999554	300,000	+175.1	1.0000403
130,000	-187.6	0.9999568	305,000	+190.1	1.0000438
135,000	-181.0	0.9999583	310,000	+205.4	1.0000473
140,000	-174.2	0.9999599	315,000	+220.9	1.0000509
145,000	-167.1	0.9999615	320,000	+236.6	1.0000545
150,000	-159.8	0.9999632	325,000	+252.6	1.0000582
155,000	-152.2	0.9999650	330,000	+268.9	1.0000619
160,000	-144.4	0.9999668	335,000	+285.4	1.0000657
165,000	-136.3	0.9999686	340,000	+302.1	1.0000696
170,000	-128.0	0.9999705	345,000	+319.1	1.0000735

Transverse Mercator Projection for New York

CENTRAL and WEST

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
350,000	+336.4	1.0000775
355,000	+353.9	1.0000815
360,000	+371.6	1.0000856
365,000	+389.6	1.0000897
370,000	+407.8	1.0000939
375,000	+426.3	1.0000982
380,000	+445.0	1.0001025
385,000	+464.0	1.0001068
390,000	+483.2	1.0001113
395,000	+502.7	1.0001158
400,000	+522.4	1.0001203
405,000	+542.4	1.0001249
410,000	+562.6	1.0001295
415,000	+583.1	1.0001343
420,000	+603.8	1.0001390
425,000	+624.7	1.0001438
430,000	+646.0	1.0001487
435,000	+667.4	1.0001537
440,000	+689.1	1.0001587
445,000	+711.1	1.0001637
450,000	+733.3	1.0001688
455,000	+755.7	1.0001740
460,000	+778.4	1.0001792
465,000	+801.4	1.0001845
470,000	+824.6	1.0001899
475,000	+848.0	1.0001953

LAMBERT PROJECTION FOR LONG ISLAND

TABLE I.

y'

Lat.	R ft.	y value on central meridian ft.	Tabular difference for 1 sec. of lat. ft.	Scale in units of 7th place of logs.	Scale expressed as a ratio.
40° 20'	24,423,264.45	39,280.85	101.19800	+153.8	1.0000354
21	24,417,192.57	45,352.73	101.19817	+142.6	1.0000328
22	24,411,120.68	51,424.62	101.19833	+131.8	1.0000303
23	24,405,048.78	57,496.52	101.19850	+121.4	1.0000280
24	24,398,976.87	63,568.43	101.19850	+111.3	1.0000256
25	24,392,904.96	69,640.34	101.19867	+101.6	1.0000234
40° 26'	24,386,833.04	75,712.26	101.19867	+ 92.2	1.0000212
27	24,380,761.12	81,784.18	101.19900	+ 83.2	1.0000192
28	24,374,689.18	87,856.12	101.19900	+ 74.6	1.0000172
29	24,368,617.24	93,928.06	101.19900	+ 66.4	1.0000153
30	24,362,545.30	100,000.00	101.19900	+ 58.5	1.0000135
40° 31'	24,356,473.36	106,071.94	101.19933	+ 50.9	1.0000117
32	24,350,401.40	112,143.90	101.19933	+ 43.7	1.0000101
33	24,344,329.44	118,215.86	101.19950	+ 36.9	1.0000085
34	24,338,257.47	124,287.83	101.19967	+ 30.5	1.0000070
35	24,332,185.49	130,359.81	101.19983	+ 24.6	1.0000057
40° 36'	24,326,113.50	136,431.80	101.19983	+ 19.0	1.0000044
37	24,320,041.51	142,503.79	101.20017	+ 13.8	1.0000032
38	24,313,969.50	148,575.80	101.20033	+ 8.8	1.0000020
39	24,307,897.48	154,647.82	101.20050	+ 4.3	1.0000010
40	24,301,825.45	160,719.85	101.20083	0.0	1.0000000
40° 41'	24,295,753.40	166,791.90	101.20100	- 3.8	0.9999991
42	24,289,681.34	172,863.96	101.20117	- 7.3	0.9999983
43	24,283,609.27	178,936.03	101.20133	- 10.4	0.9999976
44	24,277,537.19	185,008.11	101.20167	- 13.1	0.9999970
45	24,271,465.09	191,080.21	101.20183	- 15.5	0.9999964
40° 46'	24,265,392.98	197,152.32	101.20217	- 17.5	0.9999960
47	24,259,320.85	203,224.45	101.20233	- 19.1	0.9999956
48	24,253,248.71	209,296.59	101.20267	- 20.4	0.9999953
49	24,247,176.55	215,368.75	101.20300	- 21.4	0.9999951
50	24,241,104.37	221,440.93	101.20317	- 21.9	0.9999950
40° 51'	24,235,032.18	227,513.12	101.20350	- 22.1	0.9999949
52	24,228,959.97	233,585.33	101.20383	- 21.9	0.9999950
53	24,222,887.74	239,657.56	101.20417	- 21.4	0.9999951
54	24,216,815.49	245,729.81	101.20450	- 20.5	0.9999953
55	24,210,743.22	251,802.08	101.20467	- 19.2	0.9999956

LAMBERT PROJECTION FOR LONG ISLAND

TABLE I - CONT'D.

y'

Lat.	R ft.	y value on central meridian ft.	Tabular difference for 1 sec. of lat. ft.	Scale in units of 7th place of logs.	Scale expressed as a ratio.
40° 56'	24,204,670.94	257,874.36	101.20517	- 17.5	0.9999960
57	24,198,598.63	263,946.67	101.20550	- 15.5	0.9999964
58	24,192,526.30	270,019.00	101.20583	- 13.2	0.9999970
59	24,186,453.95	276,091.35	101.20633	- 10.4	0.9999976
41° 00	24,180,381.57	282,163.73	101.20650	- 7.3	0.9999983
41° 01'	24,174,309.18	288,236.12	101.20700	- 3.8	0.9999991
02	24,168,236.76	294,308.54	101.20733	0.0	1.0000000
03	24,162,164.32	300,380.98	101.20767	+ 4.2	1.0000010
04	24,156,091.86	306,453.44	101.20817	+ 8.8	1.0000020
05	24,150,019.37	312,525.93	101.20867	+ 13.7	1.0000032
41° 06'	24,143,946.85	318,598.45	101.20900	+ 19.0	1.0000044
07	24,137,874.31	324,670.99	101.20950	+ 24.7	1.0000057
08	24,131,801.74	330,743.56	101.20983	+ 30.9	1.0000071
09	24,125,729.15	336,816.15	101.21017	+ 37.2	1.0000086
10	24,119,656.54	342,888.76	101.21083	+ 44.0	1.0000101
41° 11'	24,113,583.89	348,961.41	101.21133	+ 51.1	1.0000118
12	24,107,511.21	355,034.09	101.21183	+ 58.6	1.0000135
13	24,101,438.50	361,106.80	101.21217	+ 66.5	1.0000153
14	24,095,365.77	367,179.53	101.21250	+ 74.7	1.0000172
15	24,089,293.02	373,252.28		+ 83.3	1.0000192

LAMBERT PROJECTION FOR LONG ISLAND

1" of Long. = 0".65408209 of θ

TABLE II.

Long.	θ	Long.	θ	Long.	θ
71°40'	+1°31' 34".28960				
41	+1 30 55.04468	72°16'	+1°08' 01".47227	72°51'	+0°45' 07".89987
42	+1 30 15.79975	17	+1 07 22.22735	52	+0 44 28.65495
43	+1 29 36.55482	18	+1 06 42.98242	53	+0 43 49.41002
44	+1 28 57.30990	19	+1 06 03.73750	54	+0 43 10.16510
45	+1 28 18.06497	20	+1 05 24.49257	55	+0 42 30.92017
71°46'	+1 27 38.82005	72°21'	+1 04 45.24765	72°56'	+0 41 51.67525
47	+1 26 59.57512	22	+1 04 06.00272	57	+0 41 12.43032
48	+1 26 20.33020	23	+1 03 26.75779	58	+0 40 33.18539
49	+1 25 41.08527	24	+1 02 47.51287	59	+0 39 53.94047
50	+1 25 01.84034	25	+1 02 08.26794	73°00	+0 39 14.69554
71°51'	+1 24 22.59542	72°26'	+1 01 29.02302	73°01'	+0 38 35.45062
52	+1 23 43.35049	27	+1 00 49.77809	02	+0 37 56.20569
53	+1 23 04.10557	28	+1 00 10.53317	03	+0 37 16.96077
54	+1 22 24.86064	29	+0 59 31.28824	04	+0 36 37.71584
55	+1 21 45.61572	30	+0 58 52.04331	05	+0 35 58.47091
71°56'	+1 21 06.37079	72°31'	+0 58 12.79839	73°06'	+0 35 19.22599
57	+1 20 27.12586	32	+0 57 33.55346	07	+0 34 39.98106
58	+1 19 47.88094	33	+0 56 54.30854	08	+0 34 00.73614
59	+1 19 08.63601	34	+0 56 15.06361	09	+0 33 21.49121
72°00	+1 18 29.39109	35	+0 55 35.81869	10	+0 32 42.24629
72°01'	+1 17 50.14616	72°36'	+0 54 56.57376	73°11'	+0 32 03.00136
02	+1 17 10.90123	37	+0 54 17.32883	12	+0 31 23.75643
03	+1 16 31.65631	38	+0 53 38.08391	13	+0 30 44.51151
04	+1 15 52.41138	39	+0 52 58.83898	14	+0 30 05.26658
05	+1 15 13.16646	40	+0 52 19.59406	15	+0 29 26.02166
72°06'	+1 14 33.92153	72°41'	+0 51 40.34913	73°16'	+0 28 46.77673
07	+1 13 54.67661	42	+0 51 01.10421	17	+0 28 07.53181
08	+1 13 15.43168	43	+0 50 21.85928	18	+0 27 28.28688
09	+1 12 36.18675	44	+0 49 42.61435	19	+0 26 49.04195
10	+1 11 56.94183	45	+0 49 03.36943	20	+0 26 09.79703
72°11'	+1 11 17.69690	72°46'	+0 48 24.12450	73°21'	+0 25 30.55210
12	+1 10 38.45198	47	+0 47 44.87958	22	+0 24 51.30718
13	+1 09 59.20705	48	+0 47 05.63465	23	+0 24 12.06225
14	+1 09 19.96213	49	+0 46 26.38973	24	+0 23 32.81733
15	+1 08 40.71720	50	+0 45 47.14480	25	+0 22 53.57240

LAMBERT PROJECTION FOR LONG ISLAND

1" of Long. = 0".65408209 of θ

TABLE II. - CONT'D.

Long.	θ		Long.	θ		Long.	θ	
73°26'	+0°22'	14".32747	74°01'	-0°00'	39".24493	74°36'	-0°23'	32".81733
27	+0 21	35.08255	02	-0 01	18.48985	37	-0 24	12.06225
28	+0 20	55.83762	03	-0 01	57.73478	38	-0 24	51.30718
29	+0 20	16.59270	04	-0 02	36.97970	39	-0 25	30.55210
30	+0 19	37.34777	05	-0 03	16.22463	40	-0 26	09.79703
73°31'	+0 18	58.10285	74°06'	-0 03	55.46955	74°41'	-0 26	49.04195
32	+0 18	18.85792	07	-0 04	34.71448	42	-0 27	28.28688
33	+0 17	39.61299	08	-0 05	13.95941	43	-0 28	07.53181
34	+0 17	00.36807	09	-0 05	53.20433	44	-0 28	46.77673
35	+0 16	21.12314	10	-0 06	32.44926	45	-0 29	26.02166
73°36'	+0 15	41.87822	74°11'	-0 07	11.69418	74°46'	-0 30	05.26658
37	+0 15	02.63329	12	-0 07	50.93911	47	-0 30	44.51151
38	+0 14	23.38837	13	-0 08	30.18403	48	-0 31	23.75643
39	+0 13	44.14344	14	-0 09	09.42896	49	-0 32	03.00136
40	+0 13	04.89851	15	-0 09	48.67389	50	-0 32	42.24629
73°41'	+0 12	25.65359	74°16'	-0 10	27.91881	74°51'	-0 33	21.49121
42	+0 11	46.40866	17	-0 11	07.16374	52	-0 34	00.73614
43	+0 11	07.16374	18	-0 11	46.40866	53	-0 34	39.98106
44	+0 10	27.91881	19	-0 12	25.65359	54	-0 35	19.22599
45	+0 09	48.67389	20	-0 13	04.89851	55	-0 35	58.47091
73°46'	+0 09	09.42896	74°21'	-0 13	44.14344	74°56'	-0 36	37.71584
47	+0 08	30.18403	22	-0 14	23.38837	57	-0 37	16.96077
48	+0 07	50.93911	23	-0 15	02.63329	58	-0 37	56.20569
49	+0 07	11.69418	24	-0 15	41.87822	59	-0 38	35.45062
50	+0 06	32.44926	25	-0 16	21.12314	75°00	-0 39	14.69554
73°51'	+0 05	53.20433	74°26'	-0 17	00.36807			
52	+0 05	13.95941	27	-0 17	39.61299			
53	+0 04	34.71448	28	-0 18	18.85792			
54	+0 03	55.46955	29	-0 18	58.10285			
55	+0 03	16.22463	30	-0 19	37.34777			
73°56'	+0 02	36.97970	74°31'	-0 20	16.59270			
57	+0 01	57.73478	32	-0 20	55.83762			
58	+0 01	18.48985	33	-0 21	35.08255			
59	+0 00	39.24493	34	-0 22	14.32747			
74°00	0 00	00.00000	35	-0 22	53.57240			

CORRECTIONS TO NATURAL SCALE RATIOS*
(in units of the 7th decimal place)

For Lambert Projection

$\Delta\phi'$ as argument

$\Delta\phi'$	Corr'n (Plus)	$\Delta\phi'$	Corr'n (Plus)
1	0	31	34
2	0	32	36
3	0	33	38
4	1	34	40
5	1	35	43
6	1	36	45
7	2	37	48
8	2	38	51
9	3	39	53
10	4	40	56
11	4	41	59
12	5	42	62
13	6	43	65
14	7	44	68
15	8	45	71
16	9	46	74
17	10	47	77
18	11	48	81
19	13	49	84
20	14	50	88
21	15	51	91
22	17	52	95
23	19	53	98
24	20	54	102
25	22	55	106
26	24	56	110
27	26	57	114
28	27	58	118
29	29	59	122
30	32	60	126

$\Delta\phi'$ is the difference in latitude in minutes of the ends of the line.

For Lambert or transverse Mercator Projection

Δy or Δx	Corr'n (Plus)
10,000	0
20,000	0
30,000	1
40,000	2
50,000	2
60,000	3
70,000	5
80,000	6
90,000	8
100,000	10
110,000	11
120,000	14
130,000	16
140,000	19
150,000	21
160,000	24
170,000	27
180,000	31
190,000	34
200,000	38
210,000	42
220,000	46
230,000	50
240,000	55
250,000	59
260,000	64
270,000	69
280,000	74
290,000	80
300,000	86
310,000	91
320,000	97
330,000	103
340,000	110
350,000	116

*Scale ratio interpolated for mean latitude or mean x' of the ends of a line and corrected by the above table is a true mean value accurate to within one in the seventh decimal place.

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