



“Deschutes 20260228” Transformation

Introduction:

On February 28, 2026, ODOT performed a mini shift to the Oregon Real-Time GNSS Network (ORGN), from NAD83(2011)Epoch2010.00 MYCS2 to NAD83(2011)Epoch2010.00 MYCS3 applying new coordinates to the ORGN base stations. This shift appears to be minimal in Central Oregon but enough to potentially cause issues with active projects that were started prior to the shift using the “Deschutes 13” Transformation. The “Deschutes 13” transformation was previously used with ORGN NAD83(2011)Epoch2010.00 MYCS2. To correct for ORGN shift the Deschutes County Surveyor’s Office created a new transformation “Deschutes 20260228”.

Method:

In anticipation of the NGS modernization of the National Spatial Reference System (NSRS) the Deschutes County Surveyors Office gathered 4 hour static observations on the same 14 transformation points (6, 15, 22, 24, 35, 38, 39, 42, 48, 49, 54, 62, 516, 550) used for the “Deschutes 13” transformation. These static observations were processed using RINEX data from ORGN bases commonly used in central Oregon (MDRS, P387, REDM, PNVL, BNDM, P389, LAPN). An additional receiver was set on point GRANTHAM located at the Deschutes County Surveyor’s Office. This point was not used as constraining control but was a common point to generate repetition and aid with processing and least squares adjustments. The resulting coordinates of this point have been used and will be used as control for future county survey projects. After the ORGN MYCS3 shift, the new coordinate values for the 7 ORGN bases were held fixed in a least squares network adjustment to adjust the processed baselines obtaining updated NAD83(2011)EPOCH2010.00 MYCS3 values for the 14 transformation points. A Classical 3D Transformation was then performed using Leica Infinity software, transforming/calibrating these 14 points (System A of attached report) to the Central Oregon Coordinate System (System B of attached report), to produce the “Deschutes 20260228” transformation.

This method will be repeated for future transformations required due to NGS modernization and changes to the ORGN. The same observations will be adjusted using new updated base coordinates and transformed to the Central Oregon Coordinate System.

Background Information:

The COCS is a low distortion projection developed by the Deschutes County Surveyors office in the early 1990s which has been adopted and used by many local surveyors over the intervening years. The COCS was designed to reduce the distortion between ground distances and grid distances and is defined as follows:

Linear unit: International foot (ift)
Geodetic datum: North American Datum of 1983 (1991)
Vertical datum: National Geodetic Vertical Datum of 1929 (NGVD29)
System: Central Oregon Coordinate System
Projection: Transverse Mercator
Latitude of grid origin: 43° 00' 00" N
Longitude of central meridian: 121° 17' 00"W
Northing at grid origin: 0.000 ift
Easting at central meridian: 3,300,000.000 ift
Scale factor on central meridian: 1.00016 (exact)

Note: This transformation was produced to be used by the Deschutes County Surveyor’s Office as a method to carry out required duties. This transformation may or may not be best suited for all users utilizing the Central Oregon Central System (COCS) due to project requirements, equipment, software, etc. Other methods to get onto the COCS may be a better option for the individual user.

See attached System Values report and Coordinate System report from Leica Infinity for the Central Oregon Coordinate System “Deschutes 20260228” transformation. Please contact this office with any questions about the “Deschutes 20260228” transformation.

Sincerely
Jacob D. Powell, PLS, CFedS
Deschutes County Deputy Surveyor



Deschutes 20260228 Transformation

SYSTEM VALUES - ORGN Mini Shift (MYCS3)

System A NAD83(2011)Epoch2010.0000 MYCS3

Geodetic

Local Grid (Transformed)

Point	Latitude	Longitude	Eloipsoid HT		Northing	Easting	Ortho HT
6 STATIC	44 17 32.853977 N	121 19 52.756370 W	2976.062		471204.5529	3287432.4100	3042.493
15 STATIC	44 15 43.389224 N	121 08 54.904751 W	2984.328		460142.9866	3335307.4215	3049.935
22 STATIC	44 06 53.980094 N	121 17 27.309742 W	3372.908		406494.9492	3298007.2791	3438.274
24 STATIC	44 01 12.537081 N	121 22 09.961233 W	3816.061		371925.6887	3277347.2468	3880.703
35 STATIC	44 10 17.528060 N	121 06 08.354813 W	3177.369		427162.5577	3347502.4236	3242.206
38 STATIC	43 36 58.736950 N	121 32 51.290746 W	4202.070		224792.2869	3230007.2143	4267.124
39 STATIC	43 40 56.603730 N	121 41 15.576738 W	4288.775		249030.7664	3193020.8388	4353.958
42 STATIC	43 50 14.565254 N	121 25 23.654325 W	4143.955		305308.0073	3263078.8195	4207.933
48 STATIC	43 48 49.794624 N	120 36 01.001161 W	4573.786		297435.9430	3480331.8026	4634.965
49 STATIC	43 56 39.141194 N	121 01 44.790924 W	3562.780		344328.1639	3366971.0063	3626.474
54 STATIC	44 18 20.445208 N	121 33 21.220218 W	3107.565		476139.6099	3228635.0077	3174.119
62 STATIC	44 02 12.886043 N	121 15 27.116840 W	3638.779		378026.9701	3306786.1803	3703.470
516 STATIC	44 23 02.734050 N	121 11 05.833751 W	2693.455		504627.8342	3325724.4024	2759.299
550 STATIC	44 38 02.207332 N	121 07 40.235106 W	2176.078		595755.7630	3340484.4838	2242.593

Ortho Heights for System A derived using GEOID 12A

System B Central Oregon Coordinate System NAD83(91)

Local Geodetic

Local Grid

Point	Latitude	Longitude	Elipsoid HT		Northing	Easting	Ortho Ht
6	44 17 32.850723 N	121 19 52.756796 W	2972.477		471204.5285	3287432.4449	3042.592
15	44 15 43.386378 N	121 08 54.906147 W	2980.635		460142.9905	3335307.3727	3049.944
22	44 06 53.977038 N	121 17 27.310597 W	3369.203		406494.9562	3298007.2601	3438.363
24	44 01 12.534255 N	121 22 09.961864 W	3812.180		371925.7339	3277347.2376	3880.676
35	44 10 17.524826 N	121 06 08.355788 W	3173.634		427162.5259	3347502.3924	3242.228
38	43 36 58.733021 N	121 32 51.290795 W	4198.025		224792.2695	3230007.2117	4267.185
39	43 40 56.599809 N	121 41 15.576201 W	4284.750		249030.7554	3193020.8947	4353.999
42	43 50 14.562182 N	121 25 23.654347 W	4139.829		305308.0476	3263078.8370	4207.776
48	43 48 49.791559 N	120 36 01.000599 W	4569.819		297435.9172	3480331.8140	4634.974
49	43 56 39.137761 N	121 01 44.791381 W	3558.851		344328.1249	3366970.9824	3626.444
54	44 18 20.442118 N	121 33 21.221571 W	3103.827		476139.6198	3228634.9885	3174.058
62	44 02 12.883093 N	121 15 27.117117 W	3634.931		378026.9918	3306786.1927	3703.465
516	44 23 02.731185 N	121 11 05.834703 W	2689.759		504627.8293	3325724.4021	2759.229
550	44 38 02.205018 N	121 07 40.236110 W	2172.631		595755.7894	3340484.5059	2242.615

Local Grid System B data derived from published county control

Coordinate System Report

Report created: 03/10/2026 10:17:29

Coordinate System: DESCHUTES 20260228

Summary

Transformation:	DESCHUTES 20260228	Projection:	COCS
Transformation Type:	Classical 3D	Projection Type:	Transverse Mercator
Residual Distribution:	None	Geoid Model:	Geoid12A
Ellipsoid:	GRS 1980	CSCS Model:	None

Transformation: DESCHUTES 20260228 - Classical 3D

Parameters

Height Mode:	Ellipsoidal
Model:	Molodensky
Common Points:	14
Δx :	1.2759 ft
Δy :	2.1746 ft
Δz :	-2.8822 ft
Rx:	-0.27748 "
Ry:	0.22827 "
Rz:	-0.04064 "
Scale:	1.000000038449
x0:	-7,814,768.6442 ft
y0:	-12,872,554.3741 ft
z0:	14,485,383.1032 ft

Common Points

System A

#	Point Id	Point Role	Use	WGS84 Cartesian X [ft]	WGS84 Cartesian Y [ft]	WGS84 Cartesian Z [ft]
1	15 STATIC	Adjusted	Position & Height	-7,765,427.0093	-12,848,250.1034	14,532,893.1234
2	22 STATIC	Adjusted	Position & Height	-7,816,876.6017	-12,861,094.7259	14,494,716.6754
3	24 STATIC	Adjusted	Position & Height	-7,847,179.1416	-12,871,178.7246	14,470,177.4645
4	35 STATIC	Adjusted	Position & Height	-7,767,010.7125	-12,874,341.7283	14,509,374.0622
5	38 STATIC	Adjusted	Position & Height	-7,940,643.9019	-12,933,831.5408	14,364,207.1629
6	39 STATIC	Adjusted	Position & Height	-7,963,539.8083	-12,900,283.4008	14,381,698.1117
7	42 STATIC	Adjusted	Position & Height	-7,883,488.6744	-12,903,457.0413	14,422,411.2989
8	48 STATIC	Adjusted	Position & Height	-7,700,529.2408	-13,020,739.6055	14,416,514.9032
9	49 STATIC	Adjusted	Position & Height	-7,780,406.8058	-12,933,882.7668	14,450,077.5905
10	516 STATIC	Adjusted	Position & Height	-7,757,374.5824	-12,816,542.4418	14,564,523.7594
11	54 STATIC	Adjusted	Position & Height	-7,850,800.7922	-12,783,333.3923	14,544,366.7071
12	550 STATIC	Adjusted	Position & Height	-7,711,390.6129	-12,769,284.3194	14,629,128.6493
13	6 STATIC	Adjusted	Position & Height	-7,802,337.3207	-12,816,801.7633	14,540,825.0886
14	62 STATIC	Adjusted	Position & Height	-7,819,755.8149	-12,882,739.6828	14,474,448.8475

System B

#	Point Id	Point Role	Use	X [ft]	Y [ft]	Z [ft]
1	15	Control	Position & Height	-7,765,425.8321	-12,848,247.9593	14,532,890.3387
2	22	Control	Position & Height	-7,816,875.3843	-12,861,092.6028	14,494,713.8718
3	24	Control	Position & Height	-7,847,177.8324	-12,871,176.4886	14,470,174.5624
4	35	Control	Position & Height	-7,767,009.5072	-12,874,339.5927	14,509,371.2237
5	38	Control	Position & Height	-7,940,642.5166	-12,933,829.2775	14,364,204.0844
6	39	Control	Position & Height	-7,963,538.3908	-12,900,281.1797	14,381,695.0459
7	42	Control	Position & Height	-7,883,487.2363	-12,903,454.6844	14,422,408.2159
8	48	Control	Position & Height	-7,700,527.8572	-13,020,737.3469	14,416,511.9316

9	49	Control	Position & Height	-7,780,405.5017	-12,933,880.5341	14,450,074.6152
10	516	Control	Position & Height	-7,757,373.3784	-12,816,540.3190	14,564,520.9652
11	54	Control	Position & Height	-7,850,799.5909	-12,783,331.2483	14,544,363.8725
12	550	Control	Position & Height	-7,711,389.4920	-12,769,282.3230	14,629,126.0602
13	6	Control	Position & Height	-7,802,336.1321	-12,816,799.7513	14,540,822.3482
14	62	Control	Position & Height	-7,819,754.5048	-12,882,737.4855	14,474,445.9580

Residuals

#	Point Id (A)	Point Id (B)	Use	Residual X [ft]	Residual Y [ft]	Residual Z [ft]
1	15 STATIC	15	Position & Height	0.0433	-0.0228	-0.0084
2	22 STATIC	22	Position & Height	0.0459	0.0390	-0.0651
3	24 STATIC	24	Position & Height	-0.0180	-0.0473	-0.0147
4	35 STATIC	35	Position & Height	0.0462	0.0160	0.0077
5	38 STATIC	38	Position & Height	0.0319	0.0471	-0.0301
6	39 STATIC	39	Position & Height	-0.0271	0.0625	-0.0224
7	42 STATIC	42	Position & Height	-0.0891	-0.1124	0.0807
8	48 STATIC	48	Position & Height	0.0021	0.0255	0.0138
9	49 STATIC	49	Position & Height	0.0242	-0.0063	0.0472
10	516 STATIC	516	Position & Height	-0.0246	-0.0413	0.0539
11	54 STATIC	54	Position & Height	-0.0096	-0.0525	0.0349
12	550 STATIC	550	Position & Height	-0.0204	0.0091	-0.0343
13	6 STATIC	6	Position & Height	0.0155	0.0926	-0.0509
14	62 STATIC	62	Position & Height	-0.0203	-0.0094	-0.0123

#	Point Id (A)	Point Id (B)	Use	Residual E [ft]	Residual N [ft]	Residual Height [ft]
1	15 STATIC	15	Position & Height	0.0488	-0.0040	-0.0080
2	22 STATIC	22	Position & Height	0.0190	-0.0070	-0.0864
3	24 STATIC	24	Position & Height	0.0092	-0.0452	0.0256
4	35 STATIC	35	Position & Height	0.0312	0.0317	-0.0216
5	38 STATIC	38	Position & Height	0.0025	0.0174	-0.0619
6	39 STATIC	39	Position & Height	-0.0559	0.0107	-0.0436
7	42 STATIC	42	Position & Height	-0.0174	-0.0403	0.1586
8	48 STATIC	48	Position & Height	-0.0112	0.0259	-0.0071
9	49 STATIC	49	Position & Height	0.0240	0.0389	0.0276
10	516 STATIC	516	Position & Height	0.0003	0.0049	0.0720
11	54 STATIC	54	Position & Height	0.0193	-0.0098	0.0600
12	550 STATIC	550	Position & Height	-0.0222	-0.0263	-0.0221
13	6 STATIC	6	Position & Height	-0.0349	0.0244	-0.0979
14	62 STATIC	62	Position & Height	-0.0124	-0.0217	0.0048

Ellipsoid: GRS 1980

Semi-Major Axis (a): 20,925,646.3255 ft
 Reciprocal Flattening (1/f): 298.2572221009

Projection: COCS

Type: Transverse Mercator
 False Easting: 3,300,000.0000 ft
 False Northing: 0.0000 ft
 Latitude of Origin: 43° 00' 00.00" N
 Central Meridian: 121° 17' 00.00" W
 Scale Factor at Origin: 1.000160000000
 Zone Width: 3° 00' 00.00"

Geoid Model: Geoid12A

Ellipsoid: GRS 1980
 Apply on Local Side: N/A
 Coordinate Type: Geodetic
 Interpolation Type: Bi-quadratic
 Description: Geoid12A

North-East Corner

Latitude: 44° 24' 03.25" N
 Longitude: 119° 52' 43.49" W

South-West Corner

Latitude: 43° 35' 11.97" N
 Longitude: 122° 01' 18.11" W

Spacing

North-South: 0° 00' 13.03"
East-West: 0° 00' 18.11"