

# CITY OF NORTH LAS VEGAS

## OFFICIAL COORDINATE SYSTEM AND VERTICAL DATUM

### Vertical Datum

The official vertical datum of the City of North Las Vegas Vertical Datum is the Nevada Coordinate System of 1983, based upon the North American Datum of 1983 as defined within NRS Chapter 327.

### General Information

In an effort to standardize the Las Vegas Valley's local coordinate system, the City of North Las Vegas has adopted the City of Las Vegas' Nevada Coordinate Reference System (NCRS) as its official local coordinate system. As of January 1, 2021, all new projects within the City of North Las Vegas will be required to use the NCRS. Any projects currently in progress using the City's previous User Defined Transverse Mercator (UDTM) projection may continue to use it until the end of the project.

### Links to Nevada Coordinate Reference System (NCRS)

[City of Las Vegas City Engineering \(lasvegasnevada.gov\)](http://lasvegasnevada.gov)

[NCRS Overview \(lasvegasnevada.gov\)](http://lasvegasnevada.gov)

[NCRS Las Vegas Zone Distortion Map \(lasvegasnevada.gov\)](http://lasvegasnevada.gov)

[NCRS Las Vegas High Elevation Zone Distortion Map \(lasvegasnevada.gov\)](http://lasvegasnevada.gov)

[NCRS Zone Specifications \(lasvegasnevada.gov\)](http://lasvegasnevada.gov)

### NCRS' Two Zones

Due to the size and elevation variance, the City of Las Vegas has created two zones to be able to meet the desired distortion and accuracies. These zones are NCRS Las Vegas Zone and NCRS Las Vegas High Elevation Zone. Other than a few, small areas, North Las Vegas is covered by the NCRS Las Vegas Zone. The two zones were designed with parallel grids, meaning bearings produced by either zone's coordinates are the same.

### The NCRS and Elevations

It should be known that the NCRS coordinate systems do not provide formal elevations. Any surveys requiring elevations within the City of North Las Vegas, public or private, should be referenced to the City of North Las Vegas Vertical Control Network of published benchmarks. The regional GPS networks broadcast ellipsoid heights that can produce orthometric heights (elevations) when used with a geoid model. These resulting elevations can come very close to matching benchmark elevations, but should never be used as a replacement for directly tying surveys to city benchmarks.

### NCRS Basis of Bearings

Below is suggested language for a basis of bearings statement. These statements are intended to be universal to both zones, as the two zones are "parallel" to one another. It is required on any survey performed by the city to include a coordinate definition statement with the basis of bearings whenever coordinates are shown.

**Example 1:**

**NEVADA COORDINATE REFERENCE SYSTEM  
LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES  
BASIS OF BEARINGS STATEMENT  
BASIS OF BEARINGS**

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983 (NAD83); SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN

**Example 2:**

**NEVADA COORDINATE REFERENCE SYSTEM  
LAS VEGAS ZONE – NAD83(2011) EPOCH 2010.0  
COORDINATE SYSTEM DEFINITION STATEMENT  
COORDINATE SYSTEM DEFINITION**

DATUM/REFERENCE FRAME: NAD83(2011) EPOCH 2010.0  
MAPPING PROJECTION PARAMETERS:  
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)  
ZONE: LAS VEGAS ZONE  
PROJECTION TYPE: TRANSVERSE MERCATOR  
STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36° 15' 00" N  
LONGITUDE OF CENTRAL MERIDIAN: 114° 58' 00" W  
LINEAR UNIT: US SURVEY FOOT (SFT)  
FALSE NORTHING: 656,166.6667 SFT (200,000.000 m)  
FALSE EASTING: 328,083.3333 SFT (100,000.000 m)  
SCALE FACTOR AT CENTRAL MERIDIAN: 1.0001 (EXACT)

**Example 2:**

**NEVADA COORDINATE REFERENCE SYSTEM  
LAS VEGAS HIGH ELEVATION ZONE – NAD83(2011) EPOCH 2010.0  
COORDINATE SYSTEM DEFINITION STATEMENT  
COORDINATE SYSTEM DEFINITION**

DATUM/REFERENCE FRAME: NAD83(2011) EPOCH 2010.0  
MAPPING PROJECTION PARAMETERS:  
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)  
ZONE: LAS VEGAS HIGH ELEVATION ZONE  
PROJECTION TYPE: TRANSVERSE MERCATOR  
STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36° 15' 00" N  
LONGITUDE OF CENTRAL MERIDIAN: 114° 58' 00" W  
LINEAR UNIT: US SURVEY FOOT (SFT)  
FALSE NORTHING: 1,312,333.3333 SFT (400,000.000 m)  
FALSE EASTING: 984,250.0000 SFT (300,000.000 m)  
SCALE FACTOR AT CENTRAL MERIDIAN: 1.000135 (EXACT)

**Legacy Coordinate System (UDTM)**

The Survey Division has developed a User Defined Transverse Mercator projection for all land surveys and design and construction surveys performed within the City before January 1, 2021. Any projects started after this date will need to be performed within the Las Vegas coordinate system and appropriate zone. The parameters of the UDTM are as follows:

**BASIS OF BEARINGS:**

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CENTRAL MERIDIAN OF THE CITY OF NORTH LAS VEGAS USER DEFINED TRANSVERSE MERCATOR PROJECTION; SAID MERIDIAN BEING COINCIDENT WITH 115°05' 53.00" WEST OF THE GREENWICH MERIDIAN. ORIENTATION IS DEFINED BY THE HIGH ACCURACY REFERENCE NETWORK OF NEVADA, NATIONAL GEODETIC SURVEY. ( EPOCH 2010 )

**CITY OF NORTH LAS VEGAS USER DEFINED TRANSVERSE MERCATOR PROJECTION PARAMETERS:**

CENTRAL MERIDIAN = 115°05' 53.00" WEST  
LATITUDE OF ORIGIN = 36°15' 00.00" NORTH  
ORIGIN NORTHING = 75000.0000 U.S. FEET  
ORIGIN EASTING = 75000.0000 U.S. FEET  
SCALE ALONG CENTRAL MERIDIAN = 1.000093468437

REFERENCE ELLIPSOID = GRS-80  
SEMI-MAJOR AXIS = 20,925,604.474 U.S. FEET  
FLATTENING ( 1/f ) = 298.25722154  
X TRANSLATION = 0.0000  
Y TRANSLATION = 0.0000  
Z TRANSLATION = 0.0000

**VERTICAL ADJUSTMENT PARAMETERS:**

A VERTICAL ADJUSTMENT HAS BEEN APPLIED USING A PRIMARY RESIDUAL GEOID MODEL BASED UPON THE ORIGINAL PARAMETERS OF GEOID '96 AND FURTHER REFINED USING LOCAL ELEVATIONS. THE ORTHOMETRIC ELEVATIONS USED TO DEVELOP SAID PRIMARY RESIDUAL MODEL ARE IN REFERENCE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AND WERE TAKEN FROM THE CITY OF NORTH LAS VEGAS BENCHMARK BOOK.