



# The Differences between Land Surveyed Coordinates and the GIS Applied Coordinates in Palestine

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**Abstract:** Infrastructures for integrating diverse types and sources of coordinates without creating effective changes in positions is required by recent improvements in geographic data collecting, management, and software. Nowadays, GNSS data collectors based on the WGS84/ITRF reference systems are used to acquire locations. The data is then transformed and projected to a system that is used locally. Direct data gathering based on the local coordinate system by traditional surveys such as land surveying, photogrammetry, laser scanning, and so on is another option. Geographic Information Systems (GIS) software is extensively used in geographic data management for mapping, analysis, planning, and other activities. To ensure consistency of coordinates across all systems and tools, conversions between multiple coordinate systems should be carefully specified. Classical and local surveys in Palestine are all based on the Pal1923Grid local coordinate system for engineering, cadastral, and planning purposes. The Land Authority has adopted a set of parameters to be implemented on the Global Navigation Satellite Systems (GNSS) data collectors that do not fit with Palestine1923Grid properties, whereas the different GNSS RTK-service providers use different definitions and transformation methods between WGS84 or the International Terrestrial Reference Frames (ITRF) and the local Palestine1923Grid. Additionally, in GIS applications, multiple transformation algorithms are utilized to transfer coordinates between different systems utilizing WGS84 as an intermediary system.