AGENCY FOR LAND ADMINISTRATION AND MANAGEMENT, GEODESY AND CARTOGRAPHY

GNSS Efficient Management and Collaboration with Private and Public Partnerships in a Pilot Project

Helsinki, Finland
2023.10.24

MONGOLIA

SENOR SPECIALIST responsible for GNSS-CORS
ZOLZAYA Lkhamsuren
LEGAL FRAMEWORK

A LAW ON GEODESY AND CARTOGRAPHY, 1997

LONG-TERM DEVELOPMENT POLICY OF MONGOLIA “VISION – 2050” PROJECT

3.6.6 Establish a geodetic measurement infrastructure throughout Mongolia’s territory consisting of stations with regular operation and connected real-time information, deliver information promptly to customers, and provide locational and thematical maps and atlas of one approved pattern in compliance with customers’ demands and needs.

IMPLEMENTATION PLAN OF GOVERNMENT ACTION PROGRAM ON 2020-2024

3.7.2.2 Install a reference station to receive data from navigation satellites and improve location determination accuracy to within 2 cm for geodetic measurement and surveying work.

GOVERNMENT RESOLUTION (No 267) in 2022

To approve the Geodetic coordinate and height system, and projection
- ITRF2020 coordinate system
- UTM mapping projection
- Baltic Sea level height system

In 2000 the first GNSS-CORS (Continuously Operating Reference Station) station was established in Mongolia.
PUBLIC AND PRIVATE GNSS-CORS

- PUBLIC CORS - 43
- PRIVATE CORS - 10
- RESEARCH (Academy of Science) CORS - 12

ITRF2008

ITRF2014

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RTK for Topographic survey

Mining survey

Local coordinate system

Geodynamic
TO INTEGRATE GNSS-CORS in ITRF2020 COORDINATE SYSTEM

- AGENCY CORS - 43
- RESEARCH (Academy of Science) CORS-6

ONGOING PROJECT

1. Adjustment GNSS observation data
2. Calculate Velocity of GNSS-CORS
3. Development of MonPOS system

REPORT TIME SERIES ANALYSIS of CORS DATA
DAILY USAGE OF THE CORS-GNSS in MONGOLIA

United Nations/Finland Workshop on the Applications of Global Navigation Satellite System
ONLINE POSITIONING PROCESSING SERVICES

https://monpos.gazar.gov.mn

1. PROCESSING
   Adjustment of geodetic network by GNSS, GPS technology

2. DOWNLOAD
   To download all GNSS-CORS static data

3. COMPUTING
   GNSS-CORS coordinate changes depending on time

4. MONITORING
   Monitoring for RTK service of CORS

5. CONVERT
   Coordinate conversion tool
   TM-UTM
   UTM-Cartesian
APRGP – Asian Pacific Region Geodetic Project

Mongolia joined the campaign since 1999 - 2023


AnalysisReport-2022

GPS WEEK -2227

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<th>1 std (m)</th>
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LOCAL COOPERATION

Ministry of Construction and Urban Development Mongolia

Institute of Astronomy and Geophysics of the Mongolian Academy of Sciences

Mongolian University of Science and Technology

Mongolian Geospatial Association

Mongolian Association of Geodesy Photogrammetry and Cartography

Law and regulation

Joint research

Capacity building, Human resource

Capacity building, Training

Joint research, technology training

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CHALLENGES GNSS-CORS MANAGEMENT

- Update technique parts
  - UPS – 15, Arrester-5
  - Physical server -1
  - License NTRIP caster - 10
  - Firmware version update -20

- MONREF97 - old
- ITRF2008 – now
- ITRF2014 – other
- ITRF2020 – future

- Antenna location move – 2 cors
- Maintenance – 43 cors
- Control center - Furnished 1 room
- GNSS to improve management (Free of charge-Payment)

- Capacity building for teaching staff in university
- Improve curriculum of university program regarding GNSS technology
- Short and long-term training for Government specialists, particularly in the local level
To implement according:
1. VISION-2050
2. IMPLEMENTATION PLAN OF GOVERNMENT ACTION PROGRAM ON 2020-2024

**TO INSTALL 20 GNSS-CORS**

To improve geospatial data accuracy
DENSIFYING GNSS-CORS NETWORK – TECHNICAL PROJECT

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ESTABLISHED 43
PLANNED 20

REQUIRED BUDGET
725’000 USD
A. GNSS CONTROL CENTER
B. IN OTHER COUNTRIES
C. PLAN DRAWING FOR REFURNISHMENT

REQUIRED BUDGET
7300 USD
THANK YOU FOR ATTENTION

Senior specialist for responsibility GNSS-CORS
ZOLZAYA.LKHAMSUREN

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