



# Conceptual Framework of CORS Network for Precise Point Positioning Applications in Pakistan

Syed Zahid Jamal  
Manager

Pakistan Space & Upper Atmosphere  
Research Commission (SUPARCO)

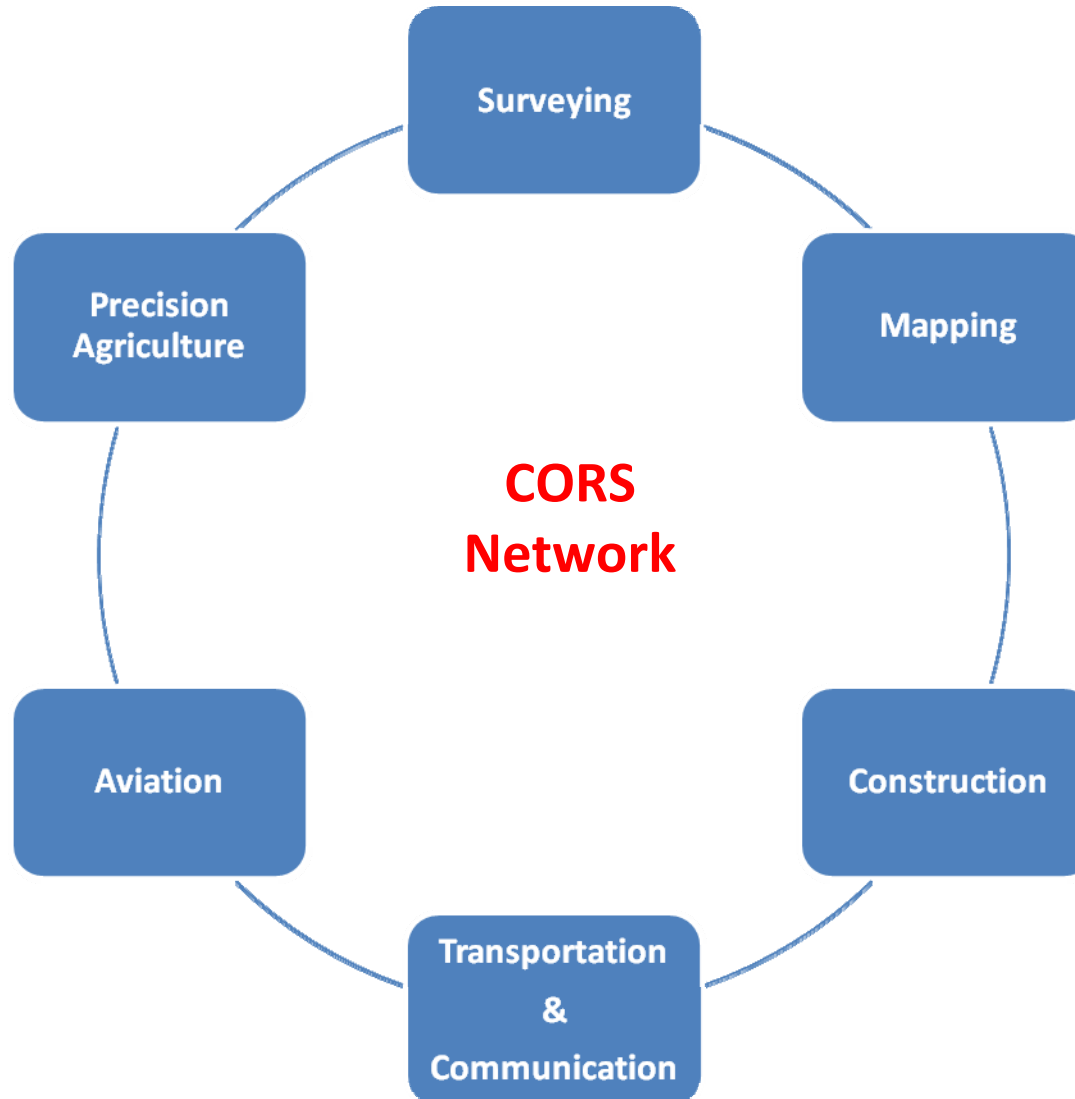
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# Background

- GNSS Technology is being used for standard positioning & tracking applications and precise point positioning applications in Pakistan
- Government and Private sectors are employing Real Time Kinematic (RTK) technique for precise point positioning applications
- Core inclusion areas are Surveying, GIS and Construction
- No homogeneous grid available
- Uncoordinated and Ad-hoc approach, therefore not meeting the long term demand of government and private sector
- Individual setup has limited the RTK technology to fewer companies and institutions
- There is no CORS network to fully exploit the RTK technology and it's applications

# Motivation





# CORS Network for Pakistan

*“CORS Network for Pakistan addresses the establishment of CORS all over the Pakistan streaming GNSS correction to authorized users and consequently achieving centimeter to millimeter accuracy nationwide on a common datum.”*



# Vision & Mission

- Vision
  - Be a pioneer in providing and maintaining high accuracy positioning services nationwide through high level of ethical and professional values
- Mission
  - To develop, operate and maintain the RTK network as a National Positioning Service for public and corporate sectors delivering economic, environmental and social benefits



# Scope

- Network RTK approach
- Reliable, Accurate, Robust and Economical (RARE) Positioning Service
- 80 to 100 base station across the country
- Backbone for providing common datum



# Target

- Positional accuracy
  - 2 to 5 centimeter in real time
  - 2 to 5 millimeter in post-processing
- Interoperable Service

# Objectives

- A national standard for location based information.
- To provide fast, economical and accurate position, velocity and time services for authorized users on a variety of platforms.
- To maximize the benefit of satellite based precise positioning and timing information for Pakistan.
- To improve technology of surveying, mapping, GIS and town planning
- Enhance national scientific and technical capabilities.
- Continuously model the size of the effects of different error sources in the GNSS.
- Plate tectonic movement study





# Deliverable

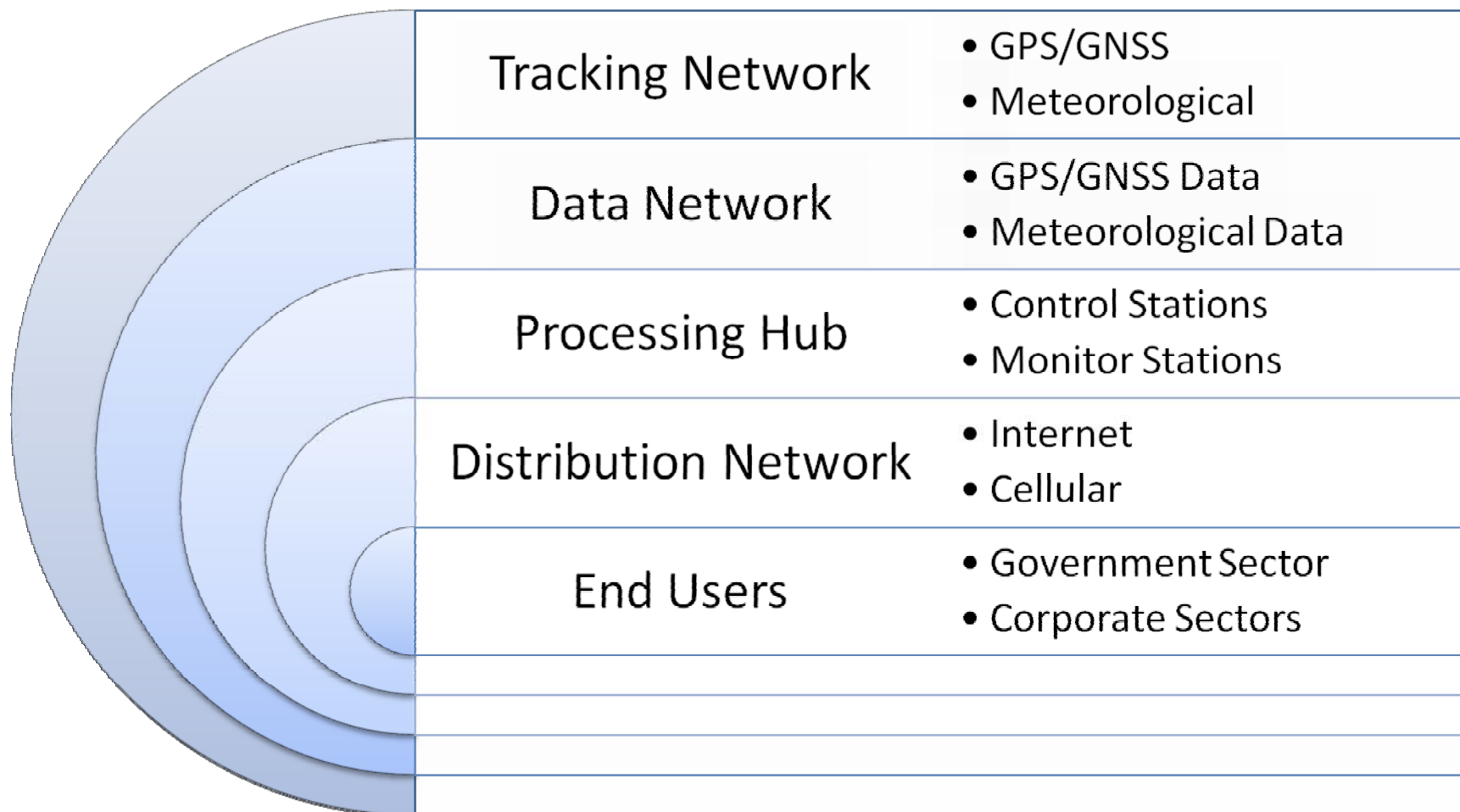
- Precise homogeneous geodetic position to subscribed user
- Scientific studies, especially related to atmospheric and plate tectonic



# Services

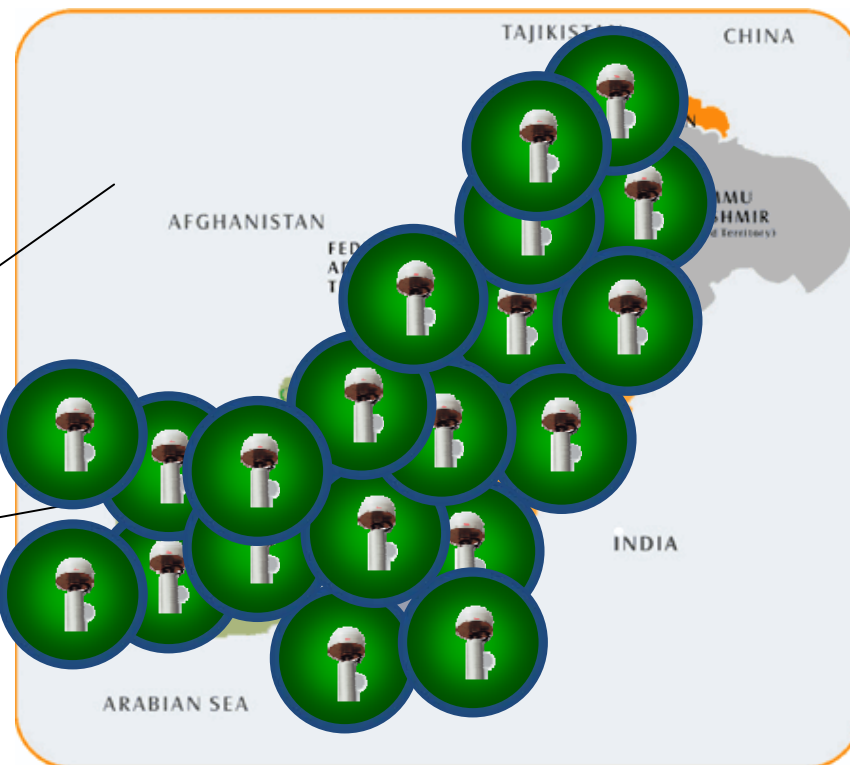
- Post-processing data through a WWW/FTP (Internet) service (Accuracy 2 to 5 millimeter)
- PRNPS Automatic Computation Service on the server (Accuracy 2 to 5 millimeter)
- Real-time CORS network service (Accuracy 2 to 4 centimeter)
- Training courses for end users, state officials and international students in GNSS applications

# Strata



# Infrastructure

GNSS raw observation  
(and ephemeris) data  
from  
the reference stations



Control centre

Reference data (RTCM)

GNSS  
position  
(NMEA)



User

# SWOT Analysis

## Strengths

- ▶ National standard for location based information
- ▶ Independent and vendor neutral
- ▶ Enhance national scientific and technical capabilities

## Weakness

- ▶ Low end user knowledge base
- ▶ Reluctance to adapt newer technology

## Opportunities

- ▶ Pioneer in RTK Networks
- ▶ Project cooperation with CAA, mapping agencies and other govt. agencies etc
- ▶ Common datum

## Threats

- ▶ Communications uncertainty
- ▶ Inadequate IT, Electricity and business systems
- ▶ Technology developing rapidly

# Conclusion

- Utilizing the modern technology for geo-positioning applications
- Enhance the technological and scientific boundaries of the country
- Unfolding the potential applications in Pakistan e.g., Common datum, Up-to-date mapping infrastructure, Modern technology in mining and agriculture and disaster management



Thanks for your attention

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