GNSS Applications

Dinesh Manandhar
Center for Spatial Information Science
The University of Tokyo
Contact Information: dinesh@iis.u-tokyo.ac.jp
GNSS Applications - 1

• Surveying, Mapping and Geodesy
• Transportation
  • Car Navigation, ITS, ADAS, V2X
  • Railway Network
  • Marine : AIS, VMS
  • Aviation : GBAS
  • UAV
• Legal and Law Enforcement
  • Fishing Zone, Crime Prevention
• Taxation / Insurance
  • Taxation based on location or distance traveled
• Vehicle Accidents / Emergency Services
  • eCall/ ERA-GLONASS / E-911
GNSS Applications - 2

• Agriculture
  – Precise farming, Auto-Driving of Tractors
• Personal Navigation
• Location Based Applications
  – Services, Entertainment, Advertisement, Gaming, Marketing
• Warning during Disasters
• Geo-Fencing / Geo-Securities
• Robotics
  • Navigation, Actions based on Location
• Scientific Applications
• Space Weather: Scintillation, Radio Occultation, Plasma Bubble
GNSS Applications - 3

- **Telecommunication**
  - Synchronize cell towers, microsecond order for CDMA
  - Network Time Protocol, millisecond order

- **Power Grid**
  - Phase Synchronization between grids is required for higher efficiency and avoid power failures

- **Time Stamping of**
  - Financial and Banking Transactions
  - Legal, Clerical, Shipping Documents

- **Scientific Timing Applications**
  - Time stamping of events
    - e.g. Global VLBI Observation, earthquake occurrences, arrival of neutrino in particle physics