



# GeoSHM Demo - GNSS and EO for Structural Health Monitoring of Bridges

**Dr Xiaolin Meng**  
**Project PI**

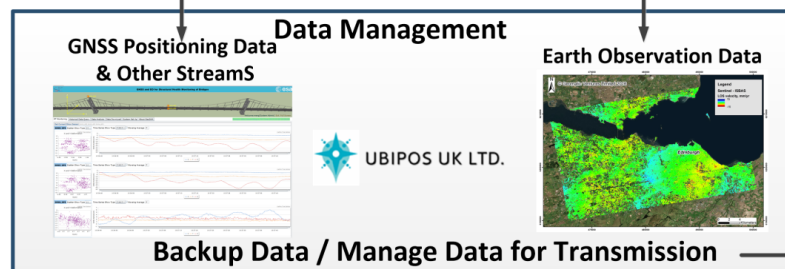
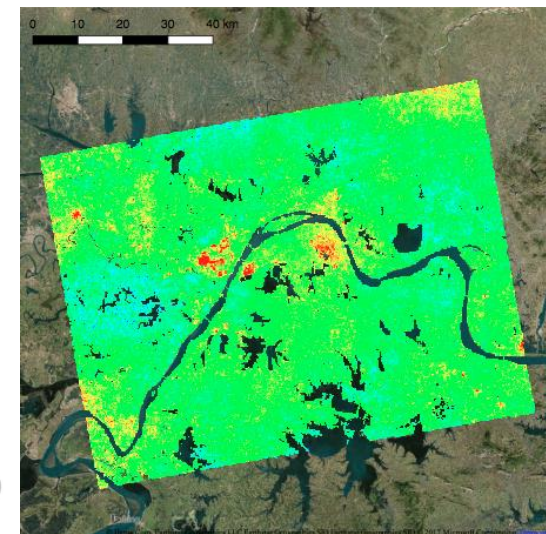
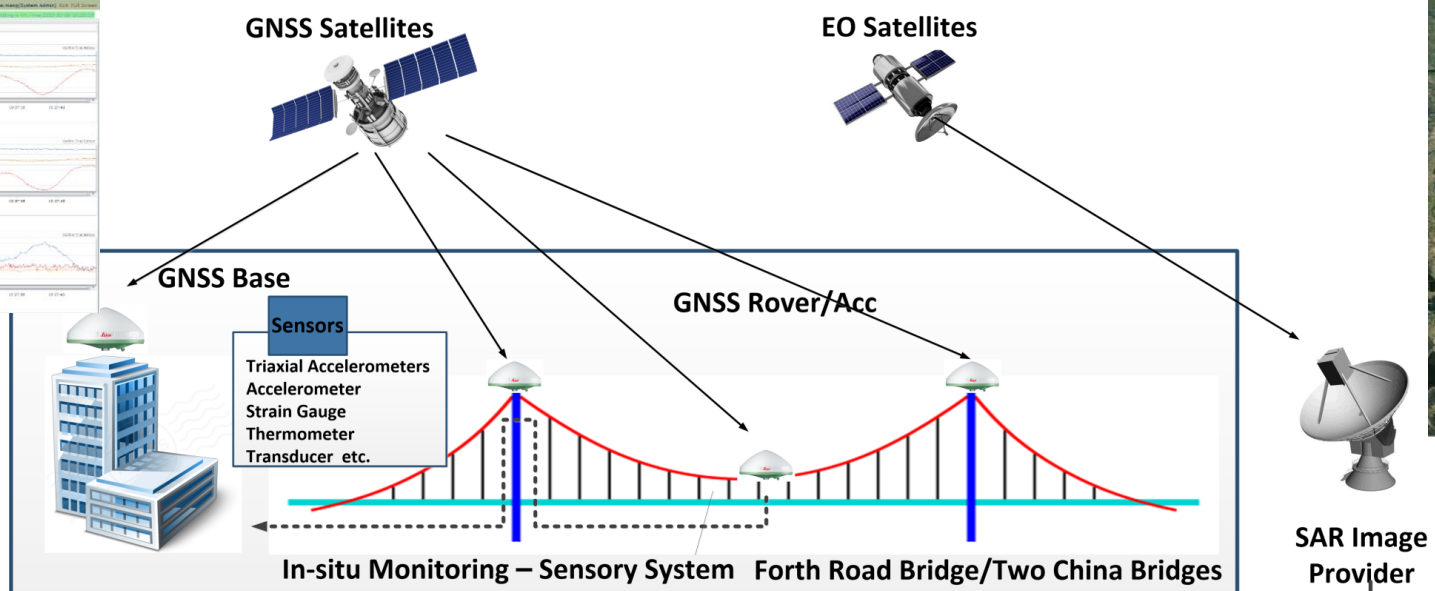
**GeoSHM Feasibility Study Project (August 2013 – March 2015)**

**GeoSHM Demo Project (March 2016 – Sept 2018)**

Demo Project Team:



# GeoSHM System and Services

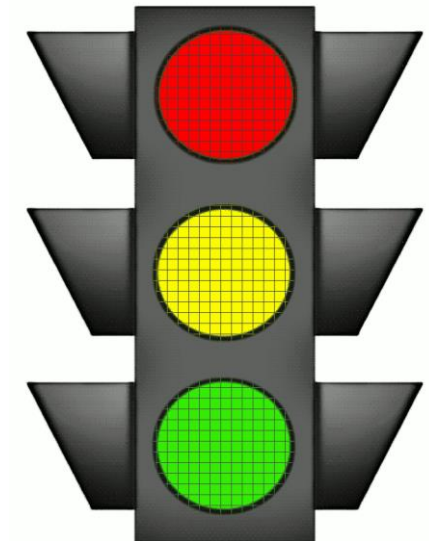
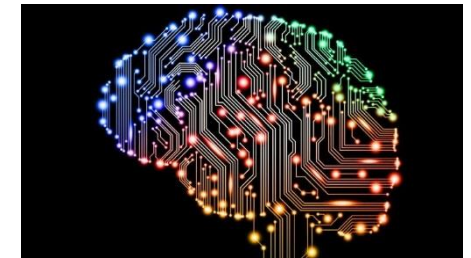
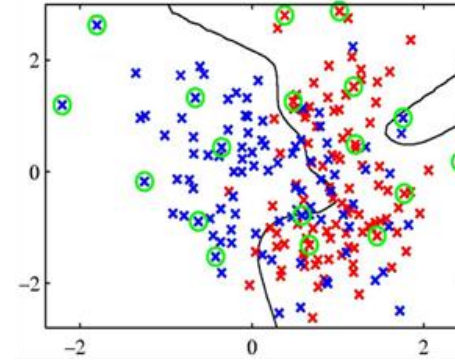


# Proposed System and Services

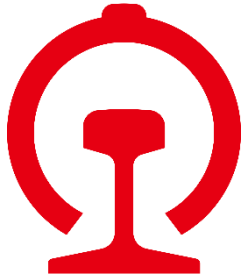
## Building blocks (BLs) of GeoSHM services:

- BL1: The sensory system
- BL2: The data acquisition and transmission system
- BL3: The monitoring and control system
- BL4: The structural evaluation and notification system
- BL5: The data management system

## GeoSHM Data Strategy



# Customers and Business Model



## Business Model in Pre-operational Period

- GeoSHM has two key end-users/testbeds (Amey & China Railway);
- Address the needs for safety, through establishment of interaction of environment, loading and response;
- Verify design codes;
- Provide a base for market entry and expansion.

## Business Model during full operations

- Revenues from three installations and ongoing services; consultation; system purchase/lease; new system installations; training; technical support; maintenance contracts/upgrades; subscription services



# Customers from Day 1 – Chongqing, China



# Customers from Day 1

- Chongqing – “**City of Bridge in China**”
- One city has **13,000+** bridges
- Owns 34 long bridges over total 136 built bridges over the Yangtze River
- Strategic visit by ESA GeoSHM officer in May 2017
- Return visit to UK bridge site and Nottingham for GeoSHM exploitation – joint venture by 2017



Site visit and F2F meeting with key end users



Visit by Chongqing Government Delegations to the UK from 13-16 Sept 17

# Market Opportunities

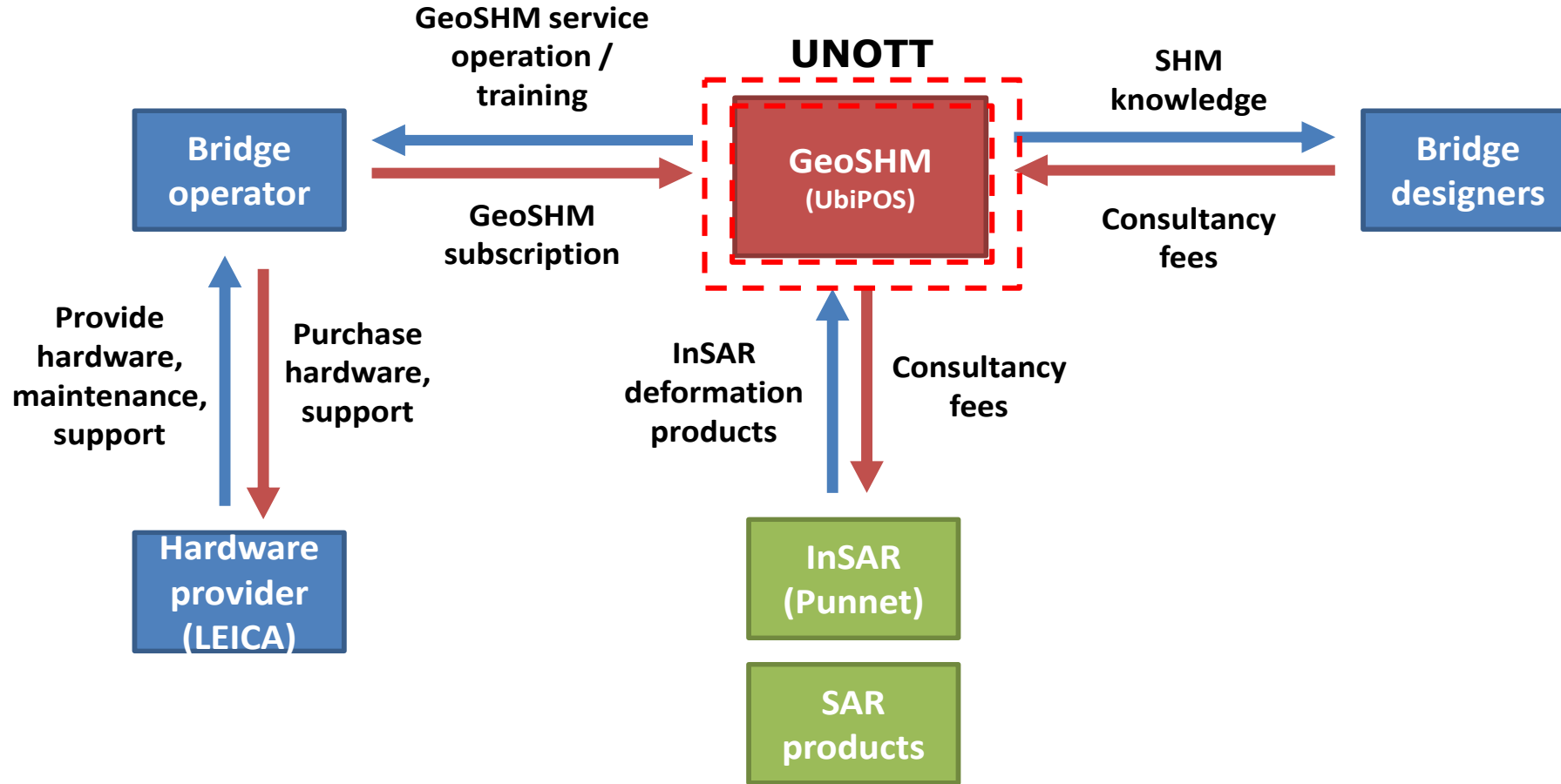
## Market Opportunities (span > 400m)

Bridge type	UK	China	Total
Suspension	3	39	42
Cable-stayed	2	86	88
Arch	0	16	16
Total	5	141	146

- Transport Scotland and China Railway/BRDI open the opportunities for future installations and service delivery across the infrastructure networks that they are responsible for;
- They provide a powerful baseline for the marketing, promotion and showcasing of the GeoSHM system and services;
- GeoSHM will mainly focus on large bridge monitoring market;
- Seek cooperation with potential investors and users to expand commercialisation of the system.

**Spin-out second company after GVL**

# GeoSHM Roadmap





# Conclusions

## Ongoing work – Intelligent Data Strategy

- Commissioning of full instrumentation set
- Developing methodology to separate effects of wind, traffic and temperature
- Comparisons with analytical models
- Identification and analysis of non-stationary loading and response

## Exploitation & Roadmap

- Full engagement with potential GeoSHM users/stakeholders
- Other opportunities