

“Space4Houston” Event – 13-14 October 2014

Current Partners

- Satellite Applications Catapult (The Catapult)
- UK Science & Innovation Network (SIN)
- Rice Space Institute
- Greater Houston Partnership
- The City of Houston
- Houston Technology Centre
- NASA/ CASIS

Broad Objectives

- Identify new market opportunities for satellite-enabled services in non-space sectors that are of key importance in Houston.
- Showcase space capabilities in the development of new downstream space applications and services.
- Drive international collaboration, create new business opportunities and generate economic growth and jobs for the UK and US.

Event Structure

Preparatory Work - meetings (during August /early September 2014) with key representatives from each of the sectors identified, forming a focus for the main event in October 2014. The objective of these meetings will be to identify the top issues relating to each of the sectors and to help structure the workshops at the main event.

12 January – Evening Plenary/ Opening session – showcasing how space can support the Smart City agenda and the maritime sector. The session will involve all participants and a broader group than those involved in the two workshops, including political representatives. It will be followed by a drinks reception with canapés. Ideally, a ‘celebrity’ speaker from a private space company/ other should be secured (Joe Kerwin/ Tim Peake?), with an interest in the development of the Houston Spaceport and the broader development of the space sector in the Houston area.

13 January – Workshop Sessions

Held as two separate sessions in the morning and afternoon. The objective is to use the meetings in August to identify approximately 6-7 topics for each workshop. These are likely to be guided from the lists below, but it is expected that the August/ early September meetings could generate new opportunity areas. The target is to have no more than 20 potential users for each workshop.

Workshop Sessions

1.) “Managing the Built Environment from Space” – *Using satellite data to provide an overview of: how a city is growing, the rate of change and the identification of ‘pinch points’ that will impact on traffic movement and emergency response, etc.*

Critical Infrastructure and Disaster Response and Risk Management

- Emergency response data
- Data fusion for pre-flood warning and post event assessment
- Energy, water and transport security
- Ground movement and subsidence
- Soil sealing and surface imperviousness (e.g. flash flooding)

Town Planning & Land Management

- Urban change detection for planning enforcement
- Identification of primary land uses
- Calculation of urban growth (Urban land takes)
- Sustainability, planning and city management
- Infrastructure planning and development

Air Quality Monitoring

- Local air quality (including dispersion along major routes)
- Plume composition from major polluters or fires
- Inference of ground based pollutants and any potential movements

Transport Management

- Intelligent traffic management
- Detection of deteriorating roads/ sidewalks
- Logistics tracking and monitoring – links with port/ maritime workshop below

Potential End User Group:

- *City Council departments*
- *Town Planning authorities*
- *Environmental agencies*
- *Major landowners*
- *Emergency responders/ disaster relief*
- *Insurance organisations*

2.) “Space enabled maritime operations and knowledge of the marine environment”

- **Near and real time situational awareness derived from:**
 - Earth Observation (EO) techniques including optical and Synthetic Aperture Radar (SAR) technologies
 - Automated Information Systems (AIS)

- Satellite communications
- Electronic intelligence opportunities
- Fusing space based data sets with specialist terrestrial data sources
- **Understanding the marine environment:**
 - Environmental monitoring using space based sensors, primarily EO technologies
 - Mapping the sea bed using Satellite Derived Bathymetry (SDB) techniques
 - Understanding the water column through crowd sourcing techniques
- **Achieving cost effective maritime operations through:**
 - Supply chain transparency including asset tracking and condition monitoring
 - Transmodal logistics opportunities across land and sea
 - Improving port and complex sea space management
 - The 'maritime cloud' – an improved communications and data transfer infrastructure for the maritime environment
 - Digital navigation – the eNavigation revolution
 - Positive control of shipping and autonomous shipping opportunities

Port Expansion

- *Topics tbc*

Potential End User Group:

- *Port Authorities*
- *Ports/ maritime transport service providers*
- *Ocean surveyors*
- *Emergency responders, e.g. Marine Response Alliance*
- *Maritime security companies*
- *Oil and gas companies*
- *Marine renewable energy providers*
- *Fishing, aquaculture and seafood processing*

Each of these topics will involve end-users of space-enabled services. The Catapult will provide experts for each. The objective is that each workshop will generate 2-3 opportunities that the satellite expert considers the Catapult/ UK SMEs and US counterparts could explore further, potentially resulting in the development of an appropriate prototype application or service. The opportunities will then be investigated further in the UK/ US and matured to a proof of concept, if practical.

Issues Relevant to these Topics in Houston

Environmental/Planning:

- Susceptible to tropical storms and hurricanes
- Much of the city has been built on marshes and swamps and the flatness and low altitude of the terrain has made flooding a recurring problem for the city
- Subsidence is an issue due to water being pumped out of the ground for many years
- Houston has excessive ozone levels and is routinely ranked as among the most ozone-

polluted cities in the US. Ground-level ozone, or smog, is Houston's predominant air pollution problem. The American Lung Association rates the metropolitan ozone level as 8th worst in the US

- Low density urban sprawl and lack of pedestrian friendliness are considered to be problems
- Traffic congestion is a major problem for the city
- The city has one of the largest concentrations of industrial/ office space in the US

Economic:

- Houston is known as the “Energy Capital of the World” with almost half its economic activity driven by the energy industry.
- Houston is recognised worldwide for its energy industry and for biomedical research and aeronautics - for this reason it is designated as a global city.
- **The Port of Houston** ranks first in the US in international commerce and is the 10th largest port in the world:
 - The Port of Houston is the largest container port in the Gulf Coast, handling 67% of Gulf Coast container traffic.
 - Total value of foreign trade through the Port in '11 was estimated at \$169.0 billion, up 29 percent from 2010.
 - The top five commodities traded (by value) — petroleum and petroleum products, industrial machinery, organic chemicals, articles of iron or steel, and plastics— represent 75.3 percent of the value of foreign shipments through the Port in 2011.
 - The Port of Houston is a 25-mile (40-kilometer) complex of diversified public and private facilities.
 - Three major railroads and 150 trucking lines connect the Port to the balance of the continental United States, Canada and Mexico.
 - The Port of Houston was the first US port to achieve both ISO14001 and ISO28000.
 - The Port of Houston needs to double in size to become a “Port of Choice” and to accommodate the new larger tankers that are being developed, due to the widening of the Panama Canal.