Astrium is the satellite subsidiary of EADS and considers that the NGA consultation is poorly informed on the potential use of satellite technology to provide PON like capabilities to the UK consumer thus avoiding a new digital divide. Astrium has contributed to and supports the Intellect response to the specific questions but offers this brief overview of the potential satellite complementary solution.

SATELLITE PROVISION OF HIGH DEFINITION BROADBAND ACCESS SERVICES IN UK

22 November 2007

The BSG Report was light on the role of satellite systems, as was the Westminster eForum. Yet satellites are complementary to fixed infrastructure and have the enviable ability to provide near universal access.

The European satellite operators have somewhat lagged behind their American counterparts in deploying satellite capacity dedicated to broadband users due to the high cost of leased Ku band capacity. Aramiska, for example, was unable to continue in business, leaving disappointed satellite users.

In the USA regulatory intervention to require TV service providers to include local content has had the by-product of promoting satellite broadband systems (eg Wild Blue) with small spot beams (which carry the local content).

WildBlue equipment recommended retail price is US$ 299 plus installation at US$ 179.

In Europe Avanti Communications' HYLAS satellite system is planned to be deployed in 2009.

Three key advances enable a step change in satellite data rate, capacity and cost for the UK beyond that of Wild Blue or Hylas:

a. *Evolution of satellite antennas to smaller beams with increased frequency reuse.*
b. *Constellations of (nominally) identical multi-spot beam satellites distributed around the geostationary orbit coupled with two-way user terminals capable of spatially discriminating between these satellites*
c. *Small low cost satellites tailored to the power needs of a UK next generation access satellite system*

Users have a 60 cm dish with two feeds. One points to their prime satellite and the second to their redundant satellite. The constellation is self-sparing through a 2 feed user terminal. The headline user download speed for the basic offer would be up to 500Mbps with a headline user upload speed of up to 10 Mbps. Larger terminals could increase both of these headline rates to 5Gbps

A single small satellite could be used as a pilot and the system would have close to 100% UK geographic coverage with approximately 4 satellites.

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A constellation based on currently available satellites and scaled for larger antenna apertures could provide Ka-band capacity for the UK as tabulated below at a typical system capital cost per household of 730€ including satellite, gateways, user outdoor unit, modem and installation.

	2008-2012	**2012-2015**	**Beyond 2015**
Ratio of capacity increase for UK due to antenna scaling (c.f. 2.5 m antenna)	6	23	100
Constellation evolution	Up to 6 in orbit	30 in-orbit	60 in-orbit
Capacity for the UK	Up to 72 Gbps	1380 Gbps	12000 Gbps
Number of users with 10 Mbps 2 way links	0.36 million	6.9 million	60 million

Table: Scenarios For Ka-band Satellite Capacity Evolution

Satellite technology will continue to develop and such a constellation would be an evolving infrastructure, capable of supporting wholesale and retail business models.

The proposed solution has many benefits:-

- Fully complementary to ADSL2+, DOCSIS 3.0 and FTTH deployment
- Low carbon cost (satellites run on sunshine)
- No congestion or cost from street works
- No delay for green field building sites
- Mobile and transportable terminals for terrestrial backup and disaster recovery
- It is an exportable solution with large UK content
- There is the possibility of sharing of costs at European level
- Significant UK coverage with relatively few satellites
- Flexible rollout thereafter
- Future proof solution with ever larger satellite antennas providing smaller beams, higher data rates and increased capacity.