Danny Low, Head of Telesat Sales – Asia Pacific, leads the Telesat office in Singapore

Established record of innovation

Telesat is a leading global satellite operator with a growing presence in Asia-Pacific. The company launched a new high throughput satellite (HTS) last September to serve the region, called Telstar 18 VANTAGE, and has already sold significant portions of its capacity. Danny Low, Head of Telesat Sales – Asia-Pacific, leads the Telesat office in Singapore. The following is a recent exchange we had with Danny on Telesat's activities in the region and the company's plans for its global LEO satellite constellation.

Question: Welcome Danny. How does Telesat position itself in today's global satcom market, and which differentiators are key to the company's ongoing success?

Danny Low: Telesat is one of the largest, most successful providers of satellite communications in the world. Headquartered in Ottawa, Canada, Telesat owns and operates a global fleet of 17 GEO satellites along with a robust teleport and terrestrial infrastructure that is seamlessly integrated with our fleet. Through these state-of-the-art space and ground assets, Telesat provides reliable and secure communications solutions – nationally, regionally and globally – to hundreds of broadcast, telecom, corporate and government customers around the world, including many in Asia.

Telesat's success has been driven by the company's deep technical expertise and customer-oriented culture that are backed by an industry leading consultancy and R&D Lab. Relying on these capabilities, Telesat has built a long and established record of innovation, both technical and commercial – a record that has been at the core of the company's growth since its inception. I would like to highlight a few examples:

- 2004 – Telesat launched the first satellite to successfully commercialize consumer Ka-band broadband services. Within two years of its launch, Anik F2 was serving 100,000 subscribers in North America and bringing broadband to many homes and businesses for the first time. Consumer broadband by satellite is now forecasted to exceed 10 million global subs by 2025.
- 2009 – Telesat launched Telstar 11N, the first satellite to provide full Ku-band coverage of the North Atlantic Ocean from the Arctic Circle to the Equator. The success of this payload contributed significantly to a global boom in mobile broadband for both aeronautical and maritime markets.
- 2018 – Telesat launched its Phase 1 LEO satellite: the start of a new global constellation that will revolutionize the delivery of high capacity broadband by leveraging Telesat's patent-pending orbital architecture and global priority spectrum rights. Telesat's LEO

system will use Ka-band, just as we did with Anik F2 last decade, and bring a new level of broadband performance to commercial and government customers worldwide.

Also in 2018, Telesat launched two new HTS: Telstar 19 VANTAGE that serves growing consumer, enterprise and mobility markets across the Americas and Atlantic, in both Ku-band and Ka-band, from Telesat's prime location of 63 degrees West, the same now used by Telesat's Telstar 14R; and Telstar 18 VANTAGE that replaces and expands on Telstar 18 at 138 degrees East with innovative C and Ku payloads to meet growing demand for mobility, enterprise and telecom services across Asia Pacific.

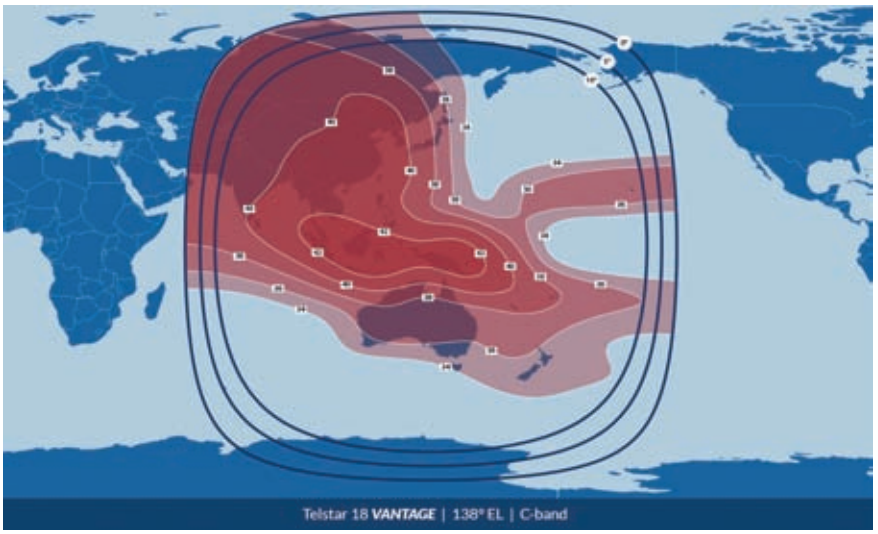
At Telesat, we know that our success is driven by the success of our customers. So our formula is really quite simple – collaborate with and empower our customers versus competing with them – and this approach is working especially well in the Asia-Pacific region.

Question: What do you see as the single greatest challenge facing the satcom industry today?

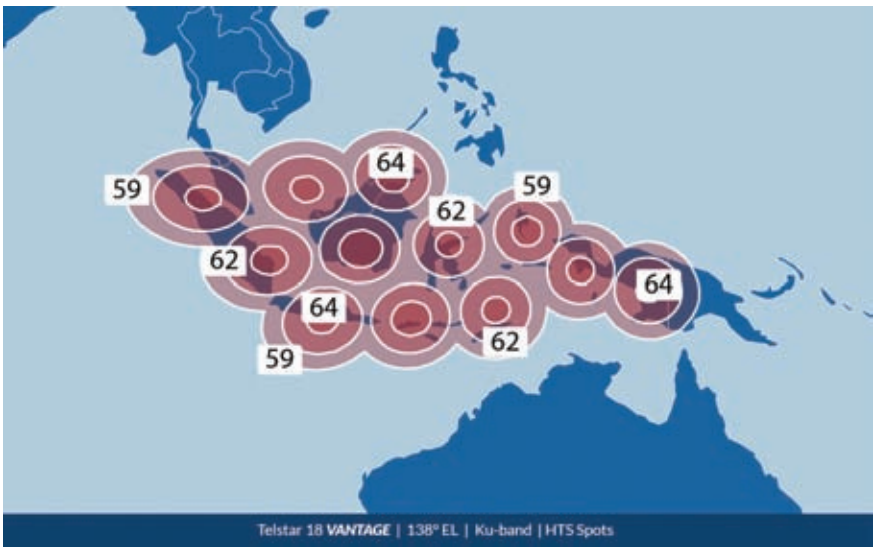
Danny Low: The satcom industry's greatest challenge is capturing a larger share of the global telecom services market that is estimated at US$1.5 trillion annually. This is easy to express but obviously far more difficult to achieve (which is why it's our 'greatest challenge'). Top executives in satellite communications recognize that global revenues in the fixed satellite services (FSS) industry in which Telesat operates are:

- Less than one percent (1 percent) of the global telecom services market; and
- Still below total FSS revenues of 2012-2014 when the industry is estimated to have peaked above US$12 billion annually.

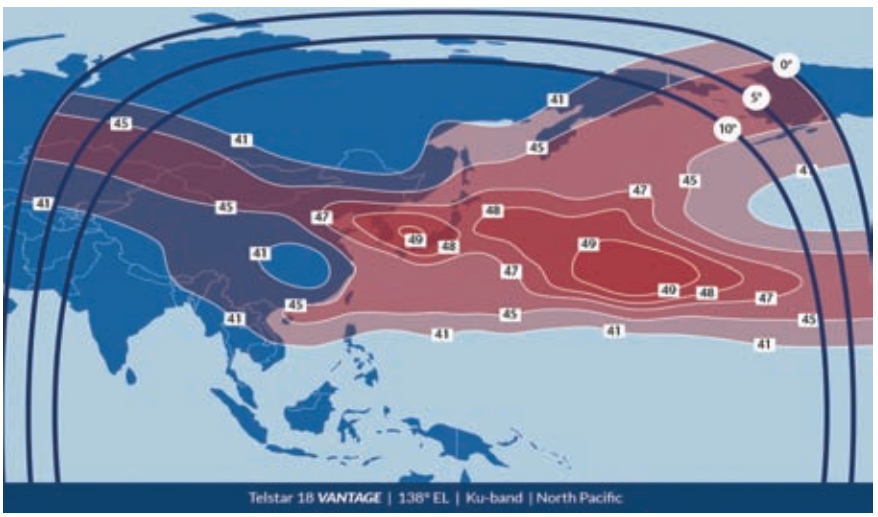
These facts are significant because it means that the huge improvements in cost and performance delivered by high throughput satellites have not yet produced a return to FSS industry revenue growth. Despite rising global FSS demand (which Euroconsult says has more than doubled the last five years in terms of Gbps), our global customer base in still mainly in specialized markets that our industry



IForte of Indonesia has contracted for multiple C-band transponders on Telesat's Telstar 18 VANTAGE, launched September 2018



IForte of Indonesia has contracted for all of the HTS spot beam capacity on Telstar 18 VANTAGE, launched September 2018



With high performing mobility beams on Telstar 18 VANTAGE, Telesat's winning approach for serving Aero and Maritime markets over the Atlantic is now available in Asia

has served for many years. It's obvious we must go beyond these markets to achieve meaningful revenue growth.

With global video demand for FSS capacity growing slowly, and mainly just in developing regions including parts of Asia, our industry can only achieve meaningful revenue growth by increasing its share beyond the "less than one percent" of global telecom. This is a key objective for Telesat's LEO constellation, it's what "new space" companies are working toward with their novel approaches to broadband delivery, and it's the focus of the industry's R&D spending on flat panel antennas and similar innovations.

Boosting our "less than one percent" share of global telecom is our industry's greatest challenge and one we need to overcome if we want to return to a sustained period of revenue growth.

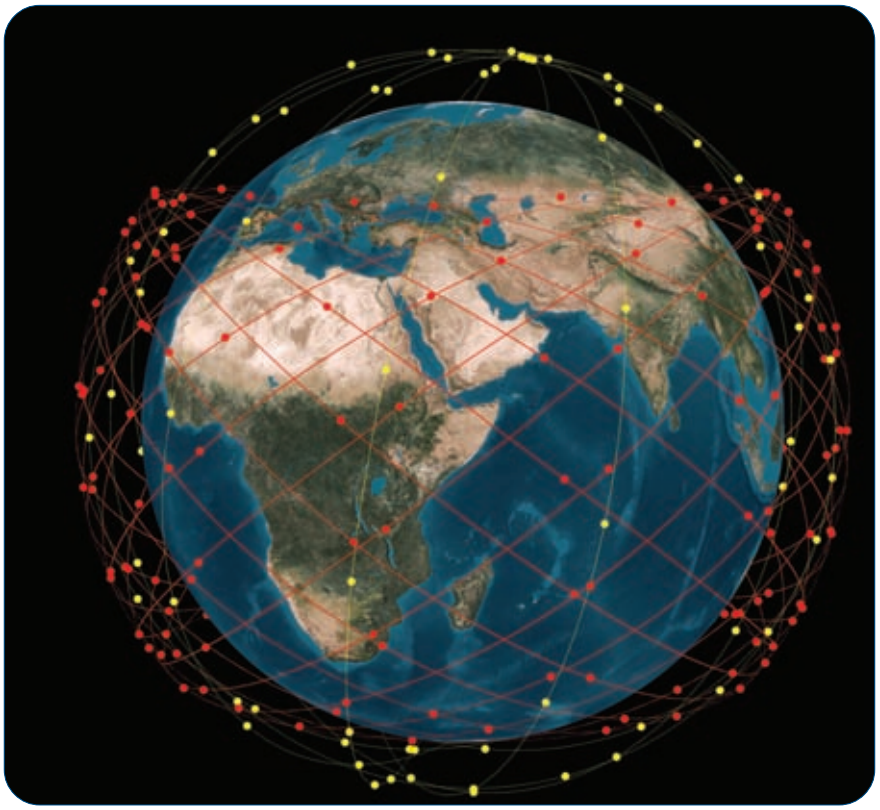
Question: Despite this challenge and others facing the industry, the Asia-Pacific satcom market remains attractive for many operators. What are Telesat's strategies for succeeding in this region?

Danny Low: Telesat began serving the Asia-Pacific region in the late 1990s with Telstar 10. We then launched Telstar 18 at 138 East in 2004. Last September we expanded on this widely used satellite with the launch of Telstar 18 VANTAGE that brought HTS spot beam capacity and new coverages in Ku-band to our customers and replaced our C-band footprint on T18.

Telesat's strategies for the Asia-Pacific region are centered on the following priorities: (1) leveraging our expertise in mobility services – Telstar 18 VANTAGE has attractive mobility beams that cover high demand aero and maritime routes; (2) teaming with major customers in-region on new business opportunities that we can jointly exploit; (3) providing attractive solutions for direct connectivity from Asia to the Americas through the 138 East location; and (4) selling our Asia capacity to customers in the Americas and EMEA regions who seek to extend their connectivity needs to the countries and peoples across Asia.

Here are some examples of these priorities in practice:

- iForte and Indonesia – Telesat recently announced that PT iForte Solusi Infotek (iForte), a leading provider of USO (Universal Service Obligation) VSAT services in Indonesia, has signed major contracts for Ku-band HTS and C-band capacity on Telesat's new Telstar 18 VANTAGE satellite. The contracts resulted from iForte's recent selection by Indonesia's Ministry of Communication and Information Technology to support the Ministry's program of providing "Internet Fixed Broadband and Mobile Cellular Backhaul over Indonesia via a GEO Fixed Satellite Services (FSS) system." After iForte received notice of its selection under the Ministry's procurement process, it contracted with Telesat for multiple C-band transponders on Telstar 18 VANTAGE for the life of the satellite and entered into a separate multi-year contract for all of Telesat's HTS spot beams on the same satellite.
- High Performing Mobility Beams – With demand for aeronautical and maritime broadband continuing to grow across the Asia-Pacific region, there is strong interest in Telesat's powerful Ku-band mobility beams on Telstar 18 VANTAGE. Our new North Pacific beam effectively serves both commercial and government requirements and our new Australia/New Zealand beam is helping mobile broadband providers fill in a major coverage gap over Asia.
- Meeting Growing Demand for C-band Capacity – Demand for C-band is still strong in Asia as many customers still prefer to use C-band to support their networks, including mobile operators. The C-band capacity on Telstar 18 VANTAGE delivers highly efficient services for all applications running a C-band platform.



Telesat's LEO Constellation Will Use Hundreds of Advanced Satellites in a Patent Pending Design of Polar and Inclined Orbits

Given these and other examples, Telesat's strategic priorities in the Asia region are succeeding and we will continue to pursue them as we prepare for the launch of our new LEO constellation.

Question: What can you tell us about Telesat's LEO constellation, and progress to date?

Danny Low: Telesat is developing a highly innovative constellation that will transform the delivery of high capacity broadband on a global basis by leveraging Telesat's patent-pending orbital architecture, priority spectrum rights, and the most advanced antenna,

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optical, launch and manufacturing technologies and processes. It will offer an unsurpassed combination of capacity, speed, affordability, security and resiliency with latency that is equal to, or better than, the most advanced terrestrial networks.

Telesat LEO will satisfy many of the world's most challenging communications requirements. It will accelerate 5G expansion, bridge the digital divide with fiber-like high speed services into rural and remote communities, and set new levels of performance for commercial and government connectivity on land and in key maritime and aeronautical broadband markets, which are among the fastest growing in today's satcom industry.

We are building a world-class supplier team that, per recent announcements, includes Alphabet's Loon to design a Network Operating System and Blue Origin to provide launch services. We're now in the late stages of a spacecraft procurement process involving two leading satellite industry teams – Airbus and the consortium of Thales Alenia Space and Maxar Technologies, the owner of SSL and MDA. Following recent System Requirements Reviews with both of these manufacturing teams, Telesat confirmed our confidence that the cost and performance goals set for Telesat LEO can be achieved.

Question: What do you see as Telesat's LEO advantages compared with similar planned systems?

Danny Low: The ability of LEO satellites to deliver the same fast and highly responsive broadband that fiber and cable customers enjoy is a major reason why advanced LEO constellations, such as the one Telesat is developing, are the future of our industry. As mentioned, demand for traditional broadcast video services that drove the success of GEO satellites for decades is slowing, while demand for broadband connectivity from customers in corporate, mobility, government and telecom markets – demand best served by LEO satellites – is accelerating.

Telesat's LEO system will be compliant with Metro Ethernet Forum standards, allowing our LEO services to be integrated seamlessly into existing telecommunications networks. This standards-based approach will make it easy for our customers to implement Telesat LEO as a core component in their broadband infrastructure and operations.

Your readers may have seen the Telesat announcement that an independent technical study, led by members of the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology (MIT), concluded that the design of Telesat's global LEO constellation is far more efficient compared to those of OneWeb and SpaceX. The study was presented at a major European space conference last fall.

But even with that assessment, I think it's important to keep in mind that the market opportunity is large, especially if LEO systems are able to deliver on their performance advantages and capture a greater share of global telecom that I've already highlighted. So there will likely be more than one major LEO system deployed.

As for comparing Telesat LEO with other non-GEO systems, it's is a topic that can quickly go beyond the scope of this article but let's briefly consider some of the more important attributes needed for these systems to be successful. Telesat LEO will have Inter-Satellite links which are ideal for mobility services, both maritime and aero, a key market for non-GEO systems. Telesat will use hundreds of advanced satellites with capabilities that will result in more usable/sellable capacity that other constellations while providing increased efficiencies and lower costs per bit. And Telesat's patent pending combination of polar and inclined will offer unsurpassed coverage, speed, capacity, security, reliability and latency.

Summing up, we believe Telesat

LEO is very well positioned to disrupt and transform global communications given our superior design with other advantages I've discussed. It will bring a huge leap forward in satellite broadband performance that opens a new era of better economics and faster growth for the satellite industry. This will all lead to far greater penetration in global telecom than the satcom industry enjoys today.

Question: This new constellation will grant Telesat a considerable fleet in both GEO and LEO. Do you see these technologies competing or complementing each other?

Danny Low: We believe LEO satellite services will be transformative for two-way data applications. The capability to reliably connect from anywhere to anywhere, with low latency, high speeds and at low cost, is a very compelling value proposition for new LEO constellations like Telesat is developing. GEO satellites will continue to play a role in broadcast services and for consumer broadband given the huge investments made in GEO HTS platforms to serve consumers. As LEO networks mature and as LEO ground terminals become lower priced, we expect LEO satellites will also be an attractive option for high quality consumer broadband. By focusing on the markets where each fleet has its advantages, we will see how the two constellations can work together to best serve our customers.

Question: Do you expect LEO to become the 'orbit of choice' for broadband applications? If so, what's your time horizon for this to occur?

Danny Low: For reasons discussed, Telesat definitely believes LEO will become he 'orbit of choice' for broadband requirements. We expect the transition to begin in the first part of the next decade.

Question: There is so much happening at Telesat and within our industry. What are some things that are likely to stay the same for Telesat in Asia and globally in the near future?

Danny Low: I would not expect Telesat to change our winning formula of collaborating with and empowering our customers versus competing with them. This approach is really paying off for us in Asia as highlighted by the example I mentioned of our close ties to iForte in Indonesia. I expect Telesat will remain focused on bringing our LEO constellation to market in Asia and worldwide. Telesat will of course continue to innovate, both technically and commercially – innovations that deliver meaningful competitive or operational advantages. Telesat's recent contract awards from US government's DARPA (Defense Advanced Research Projects Agency) are a tremendous validation of our company's technical depth. DARPA has been studying LEO systems intensively and chose to work with Telesat. This could lead to the US government using Telesat's LEO system for its global broadband connectivity needs.

Telesat is doing a lot of things right, in Asia and worldwide, and each of us is working hard to assure we continue to build on our record of success in the years to come. ■

Artist rendering of Telesat's Phase 1 LEO satellite, credit SSTL

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