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OPINION PIECE

## The ins and outs of Hong Kong mobile TV

*Determining the right level of coverage is a critical step in mobile TV network design. Chris Jaeger, Managing Director Broadcast Australia International Business Group, and Paul Chan, Engineering Director of Hong Kong-based Radio Frequency Engineering Ltd, explore the challenges presented by Hong Kong's unique outdoor and indoor environments.*

There is almost a sense of inevitability in Hong Kong when it comes to broadcast mobile TV. Technical trials of DVB-H and MediaFLO platforms have been successfully undertaken, and the Hong Kong Telecommunications Authority has announced preparations for mobile TV licence auctions in 2009. Add to this a culture that habitually embraces new technology, and a high penetration of wireless data and value-added services, and the outlook for mobile TV in Hong Kong seems very bright.

Much has been made of the debate about whether or not a broadcast mobile TV business model exists—or, assuming it does exist, how does one define it? Whatever the answer, any successful business model is certain to depend heavily on four critical factors that are becoming known as ‘the four Cs’: content, convenience, coverage and, ultimately, cost.

In a society as diverse as Hong Kong's, it stands to reason that the *content* offered by mobile TV services must exhibit similar diversity. Popular international sports, news and entertainment programs will need to be complemented by local programming in Cantonese, Mandarin and English. In turn, this content will need to be adapted to the shorter viewing segments expected to suit mobile TV viewers during periods such as lunch breaks and commutes.

User *convenience* is related largely to handset performance; but it is also linked to the quality of service and the extent of *coverage* achieved by the mobile TV network. Mobile TV subscribers will demand a perfect picture everywhere, all the time—whether out on the streets, travelling on the Hong Kong Mass Transit Railway (MTR), or shopping in one of the city's massive malls. The

quality of the picture will be a function of many factors, some related to the design and functionality of the handset, others related to the performance and design of the network itself.

### **Getting the balance right**

For network operators, determining the appropriate balance between quality of service, coverage level, and infrastructure deployment will be a critical challenge. Essentially this is a balancing act between factors that will dictate subscriber take-up, and those that will impact network *cost*. This places a high degree of importance on network planning and design to wring the most out of the mobile TV infrastructure.

The 'right level of coverage' is a key factor. Depending on the overall business plan, different locations will have different coverage requirements. For example, peak viewing is expected in homes, offices and busy public places such as the MTR or airport terminals. In such cases, network design will be heavily influenced by the reception environment—whether 'outdoor', 'indoor', or in a moving vehicle (such as a car or train)—and the required grade of coverage. The difference between 'good' and 'acceptable' grades of coverage has significant impact on infrastructure requirements.

From a practical point-of-view, the mobile TV network can be broken down into two elements. The first of these is the 'outdoor' or 'macro' network, comprising a mix of high-power transmission sites, supplemented by lower-power 'gap-filler' repeater stations to maintain a high signal strength for handset reception. For this type of network, Hong Kong has one of the most challenging environments in the world, owing to its mountainous terrain, large harbour and dense building clutter. It is anticipated that the city's mere 1000 square kilometres may require mobile TV gap-filler sites numbering in the hundreds.

However, the vast majority of mobile TV viewing is expected to take place 'indoors'. Although homes and some office buildings may be serviced by the 'macro/outdoor' network, other key venues—such as Chek Lap Kok airport terminal, and the MTR among others—cannot be adequately penetrated by the signal. This demands the second element of network coverage: the 'micro' or confined-space indoor coverage network, where dedicated infrastructure is deployed to distribute the mobile TV signal indoors. The success of mobile TV business models is likely to hinge upon the provision of confined-space coverage in key high-traffic locations.

### **Hong Kong: world leader indoors**

Fortunately for Hong Kong, the city already has a good head start, with confined-space coverage infrastructure already in place to support mobile phone, wireless data, and various radio services in

many key buildings. These include all MTR tunnels and stations, road tunnels and most major buildings, making the city a regional and world leader in confined-space coverage solutions. Such systems typically utilise broadband infrastructure that, with the right expertise, can be reengineered to introduce cost-effective coverage solutions for mobile TV.

Delivering the 'right level' of mobile TV coverage in Hong Kong will not be a simple matter of deploying network infrastructure until coverage objectives are met. A significant level of network fine-tuning will be required to ensure synchronisation between the 'micro' indoor 'cells' and the 'macro' outdoor broadcast network. Each macro and micro transmission site will be operating in single-frequency network (SFN) mode, demanding the tightest control of signal levels and timing to minimise interference and to optimise network coverage.

Nevertheless, due to the confined-space coverage infrastructure that already exists in Hong Kong, the city is in a strong position to establish a high-performance broadcast mobile TV network—both indoors and out—with the minimum deployment of new infrastructure. Assuming this can help keep costs under control, it should contribute significantly towards the commercial success of new mobile TV services in Hong Kong, where consumers are ready and waiting to embrace the latest multi-media technologies.

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Hong Kong's Chek Lap Kok airport terminal is expected to be an important indoor high-traffic location for mobile TV viewers, requiring dedicated infrastructure to provide coverage.



The mountainous terrain of Hong Kong provides many broadcast coverage challenges, both outdoors and inside major public buildings such as the Hong Kong Convention and Exhibition Centre.

### **Company background**

With over 70 years' experience as the owner and operator of one of the most extensive terrestrial broadcast transmission networks in the world, Broadcast Australia provides end-to-end transmission services for radio and television (analogue and digital) broadcasters. The company's core competencies include planning and network design, engineering design and project management, complex systems integration, site development and installation, operations and network management and in-house repairs and maintenance.

Broadcast Australia also develops world-class solutions and applications for new and emerging technologies—such as Infocasting, Digital Radio and Mobile TV—working with strategic partners throughout the Asia Pacific region. Subsidiary companies include Hong Kong-based confined space coverage group, Radio Frequency Engineering Limited (RFE), and systems integration and product supply specialist, The Bridge Networks. Broadcast Australia is a 100% owned subsidiary of Macquarie Communications Infrastructure Group, an entity listed on the Australian Stock Exchange (ASX code: MCG).

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