Broadband wireless, people and the economy

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Asia s explosive growth, due partly to its Internet driven integration into the global economy, has fuelled job creation. These high-paying jobs have stimulated the migration of workers to regions with the best essential services and jobs, bringing crowding and overloading the service structures in these regions. These jobs are terrific for economies and people, but threaten traditional family structures and debilitate the local economies of the regions left behind. Wireless Broadband can inexpensively connect these regions and help reverse this decline.

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Unique problems and opportunities

The Asian broadband market is huge and still swiftly growing. Nearly half of the world s people live in this region, with population growth among the highest in the world.

Many Asian economies are booming, bringing with this growth intense needs for Internet access particularly broadband access.

Clearly, high-speed Internet access is a crucial element in the strategy of Asian businesses. Broadband Internet access enables small firms in Indonesia, for example, to market in Europe or the US effectively.

Asian firms with broadband Internet access increase their opportunities to compete in the global marketplace. South Korean residents enjoy one of the highest penetration rates more than 60 per cent of broadband access in the world. Arguably, its focus on broadband access is a prime component of South Korea s successes in export industries ranging from electronics to automobiles.

India is rapidly becoming the high-tech outsourcing choice for US and European business. The city of Hyderabad is nearly as well known as Silicon Valley.

These opportunities, while exciting, bring problems and disparities to Asian economies and people. Burgeoning growth fuels job creation, happily often in high paying industries.

However, most job growth occurs in areas with the best essential services in place; this accelerates the migration of people seeking opportunity to these areas, bringing increased crowding and load upon these services.

Rapid influxes of populations to and from cities and frequently within cities, create problems ranging from road crowding to overloaded utility services. Even the delivery of mail is impacted.Local school systems struggle to adapt, with minimal budgets, to exploding student populations. Despite these problems, this type of growth is terrific for economies and people.

However, what of those left behind? Even in South Korea, where broadband adoption is strong, large portions of the country have little or no broadband access.

It is common for large underserved areas to exist within cities, even large cities. This problem is magnified in countries where broadband coverage is less prevalent. What are the human costs for inadequate broadband access?

This migration of populations disrupts the traditional family units that are so important in Asian cultures. In addition jobs are lost in the underserved neighborhoods and towns left behind.

These growth area s and economies may falter. Tax bases drop causing disruption and degradation of essential services. It becomes harder for smaller businesses, which traditional-

ly employ most people in Asia, to compete and survive.

Perhaps most importantly, the future of children is at risk in these communities. Schools and classrooms in underserved areas are relegated to inferior Internet access and educational tools.

Opportunities for higher education suffer. Job opportunities become scarcer and pay less. Health care is impacted with reduced access to specialist knowledge and attention.

The ultimate consequence of populations left behind without adequate broadband access is loss of opportunity and reduced quality of life.

But are there solutions?

Existing broadband options in Asia

Certainly solutions exist. However, each possesses strengths and weaknesses.

Traditional broadband DSL services are deployed in major cities across Asia, despite their distance limitations. Cable television systems provide broadband in some Asian countries. Unfortunately cable does not scale well for business use.

Deployments of fibre optic technology are growing, but are still prohibitively expensive for most markets. Remote rural areas may use satellite broadband technology despite significant problems with latency and cost.

Cellular phone equipment is widespread in Asia. However, the deployment of 3G data services remains stalled due to costs.

Additionally, 3G bandwidth capabilities do not meet business class needs. In some countries, traditional fixed wireless technologies fill gaps. These deployments relieve disparities in some communities, but unfortunately not all.

Older broadband wireless technology suffers from line of sight (LOS) problems requiring physical installation of all customer connections and upping operational costs. Older fixed wireless technologies do not offer a path to mobile access.

These tradeoffs suggest that these options should be viewed as complimentary technologies. In fact, recent advances and initiatives in broadband wireless technologies offer unprecedented opportunities to ameliorate these drawbacks and knit these solutions together.

Broadband location flexible wireless technology and WiMAX

Supported by a number of key members, the WiMAX Forum aims to continue to promote the best technologies currently offered by industry leading vendors.

A key goal of the WiMAX Forum is to ensure true interoperability between vendors, allowing each vendor to add specific features that differentiate its products. The value is clear: lower cost gear for all wireless access providers. Consistent standards offer many advantages, not the least of which is identifying existing best in class technologies and building a standard around them.

Many of these advances are already available through commercial deployments in countries such as Mexico, Canada, Brazil and the US. WiMax will help drive this technology to worldwide adoption.

WiMAX designs integrate leading edge non-line-of-sight (NLOS) coverage from current vendors allowing customers to simply plug & play. This essentially eliminates the professional truck-roll installations required with LOS first generation wireless systems. It also increases the potential customer base, resulting in lowered costs for both carriers and subscribers.

The WiMAX Forum“ incorporates technical improvements compared to older broadband wireless systems ranging from robust security to efficient spectrum utilisation, with increased range and throughput.

An equally important new feature is location flexible portability, already being delivered in multiple markets worldwide, including a recent installation in Bangladesh. The ability to travel with a high-speed modem about a city offers innovative capabilities for public safety and emergency response teams.

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Current commercial deployments in Mexico, Bangladesh and North America offer WiMAX features such as long-range NLOS capability, multicarrier segmentation support and enhanced spectrum and data efficiency. WiMax adopted technologies such as Orthogonal Frequency Division Multiplexing (OFDM) and Time Division Duplex (TDD) are already in use in these markets. The WiMAX Forum chose these standards as optimum for high-speed wireless access delivery. The ability to offer true Telco level quality of service (QoS) capability with broadband wireless gives Asian carriers a real choice.

Traditional wireline broadband options offer functional solutions in special cases. Broadband wireless extends this capability at the edge and at the core. The clear vision for the near future is being able to board a plane in Mexico City with a small wireless modem and touch down in Beijing, where the user can immediately connect through another wireless network, both of which are fed by fibre optics.

How can current commercial gear, shortly to be enhanced with WiMAX interoperability, be successful? More importantly, what capabilities can it bestow to the Asia of the twenty-first century?

The real world impact of broadband wireless on people s lives

The analysis firm of InStat/MDR reports that globally the total number of broadband wireless subscribers is expected to jump 500 per cent from 2002 to 2006. Many of these new customers will be in Asia. Partially due to cost constraints, many Asian countries were unable to widely deploy older telecom technologies.

Forced to play catch up, many Asian countries have actually leapfrogged the West in terms of infrastructure. Cellular wireless is often chosen over wireline solutions. Early stage broadband wireless technologies were used, as were the most recent fibre optic systems. Likewise, Asian access firms choosing WiMAX compatible technology to extend their markets can achieve superior capabilities relative to the world.

However, what is the every day impact of this technology in people s lives?

The capability exists now and could be widespread soon for a traveller in a Chinese city to board a train surfing the web with inexpensive high-speed wireless Wi-Fi access in the car. This, in turn, is fed by robust carrier class WiMAX radios spaced along the route all supported by fibre optics buried along the railroad right of way.

People could literally travel for hours shifting seamlessly from one regional carrier to another along the way. The leverage that people and society receive by being connected and productive during commuting alone is enormous when multiplied by millions travelling daily.

No other existing technology offers this promise. People can work, shop, talk to their families, receive weather reports and hear public safety advisories all from a PDA or laptop virtually anywhere.

Benefits go far deeper, however, because increased broadband access opens the world to people. Educational opportunities for school children to view advanced seminars, classes and lectures taught interactively over the web via a broadband wireless connection are unlimited. With broadband access doctors can access extensive databases maintained only at teaching universities.

Specialists can consult, nearly instantly, on cases involving trauma or illness from hundreds of miles away. Remote surgical operations are even possible when the proper instruments and a broadband wireless connection are available.

Being enabled and connected to the larger world brings jobs and the sense of pride that comes with the ability to compete in the global economy. Perhaps, however, some of the most impressive benefits will come in the areas of public safety and emergency response.

Public safety

Imagine a fire raging in a building in a mid-size Chinese city. The police respond along with fire, rescue and other emergency personnel. All emergency vehicles are equipped with broadband wireless connections, providing instant access to shared data. The police are routed for traffic and

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crowd control by central dispatch, which can view traffic cams (as can officers) to anticipate problems and choose re-routes.

The firemen are fed access to the building s floor plans, exit routes and ventilation systems to most efficiently save lives and evaluate the building s structural integrity. A plan is formed before they even arrive. Victims receive personalised treatment on the scene, via instant access to individual medical records.

Citizenry in the area receive advisories to avoid the danger and traffic alerts automatically go out to radio stations via broadband connections. All of this convenience serves many ends: faster coordinated response, preservation of property, public safety and a greater ability to save lives when every second counts.

The future you say? Not so. The core technology for each piece of this scenario exists today. The missing piece is widespread broadband wireless connectivity.

Selecting the right technology

Asian countries possess widely varying terrain and broadband needs. One key element in evaluating broadband wireless radio systems for Asian deployments is to examine current extensive and successful, commercial deployments in a variety of markets worldwide.

Vendors learn practical lessons working with carriers on actual deployments that are not otherwise understood. Deployments over large geographies such as existing installations in Mexico, Bangladesh and North America offer a practical proving ground. Tried and true is the watchword for the Asian carrier looking for a proven solution to build a business around.

Asian carriers should view case studies of actual deployments in both urban and rural settings, such as Iowa farm communities and Bangladeshi villages.

Solutions proven to deliver cash positive business performance for rural and remote carriers are essential in Asia. So too must actual urban deployments meet their planned business metrics.

A successful NLOS track record is vital. The proven ability, in actual working markets, to provide customers with a radio they can literally plug in and use immediately is rare. Performance ranges of up to 30 km from a base station site are reasonable.

Depending on the business model of the carrier, the vendor s technology should be compatible with multiple independent service carriers or just one. Cross-carrier roaming capability between access providers is the standard customers will expect.

The OFDM standard offers numerous optimisations that enhance the always on broadband experience and network performance. Some technologies require build-up and tear down processes that add unnecessary overhead to connections.

The carrier s approach to mobility should be prudent and not overreaching. Current technology amply supports location flexible service whereby customers, such as a public safety officer, can drive around a city or town and immediately connect to the network seamlessly.

Totally mobile service has been verified. However, it may require more coverage than is initially viable economically. For most current users, location flexible portability is more than sufficient.

Conclusion

Greater access to broadband connectivity throughout Asia promises many opportunities and benefits to the people who live there. Providers need effective solutions for each specific market need and situation.

Clearly, plug and play location flexible broadband solutions offer the key to successful business models that deliver on this promise with reliable, flexible and affordable service. Expect broadband wireless to play a major role in creating new opportunities for social and economic growth in Asia.