

Wireless Access Technologies and Opportunities

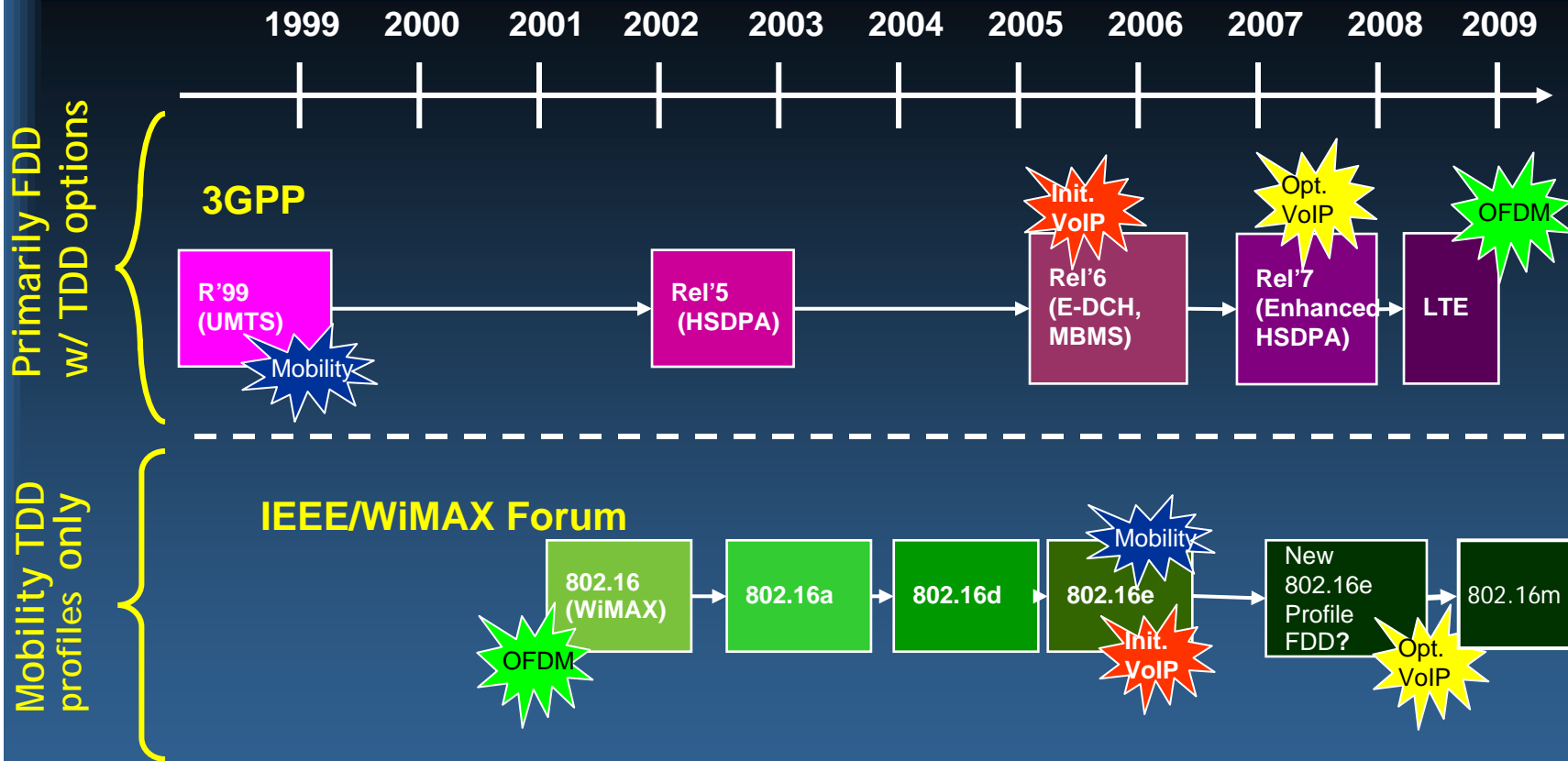
Broadband at a Crossroads Conference

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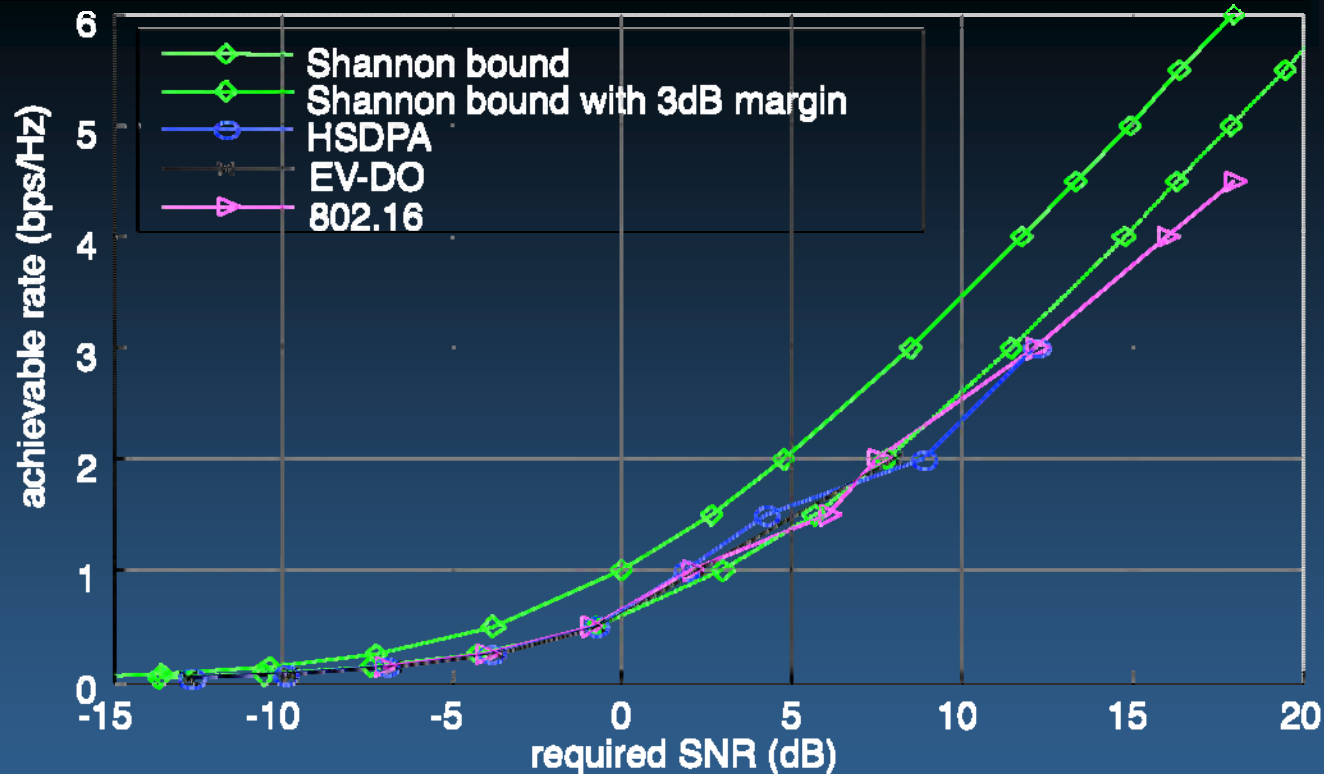
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 - WiMAX & LTE Similarities and Differences
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Standards Technology Evolutions



Link Capacity for Various Rate-Controlled Technologies



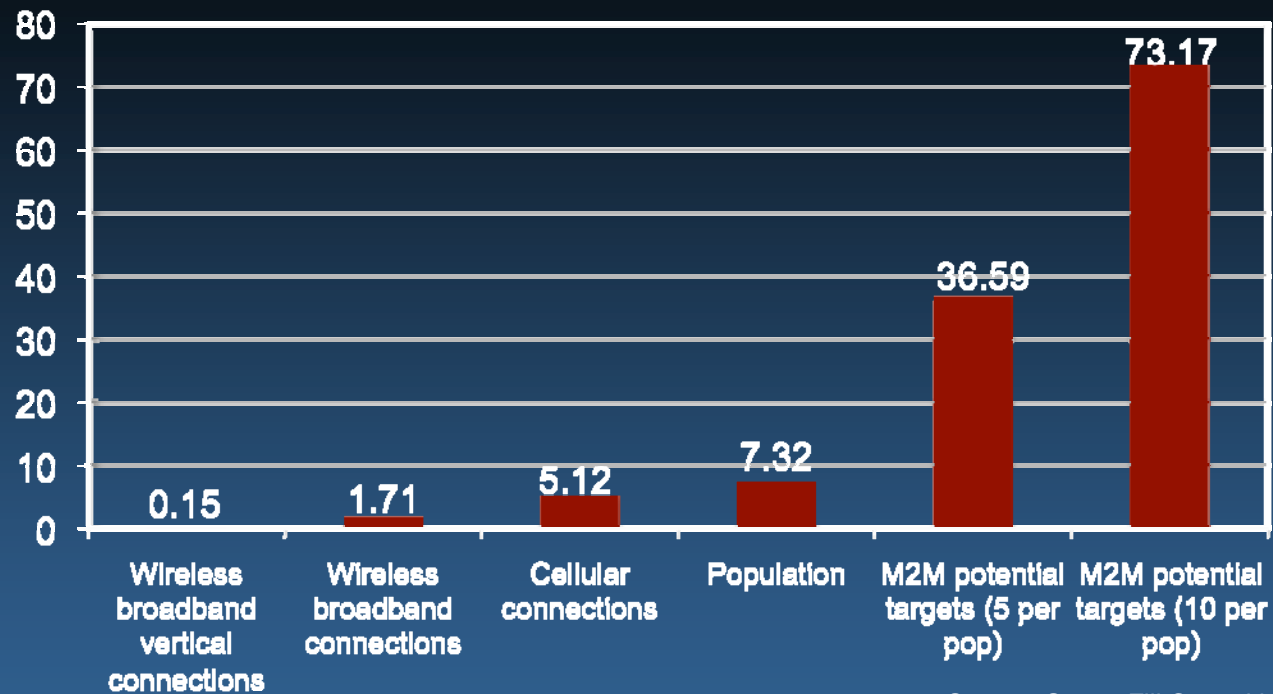
Link Performance of OFDM & 3G Systems are Similar & Approaching the Shannon Bound

WiMAX & LTE Similarities and Differences

	WiMAX	LTE
Downlink	OFDMA	OFDMA
Framing	5ms	1ms
Uplink	SC-FDMA (PAR)	OFDMA
VoIP	Standard Broadband	Optimised (RoHC)
Codec	G711, G729	AMR
Mobility	Developing	Developed
Power Cnt.	MAC Signaling	Fast Power Control

New Market Opportunities

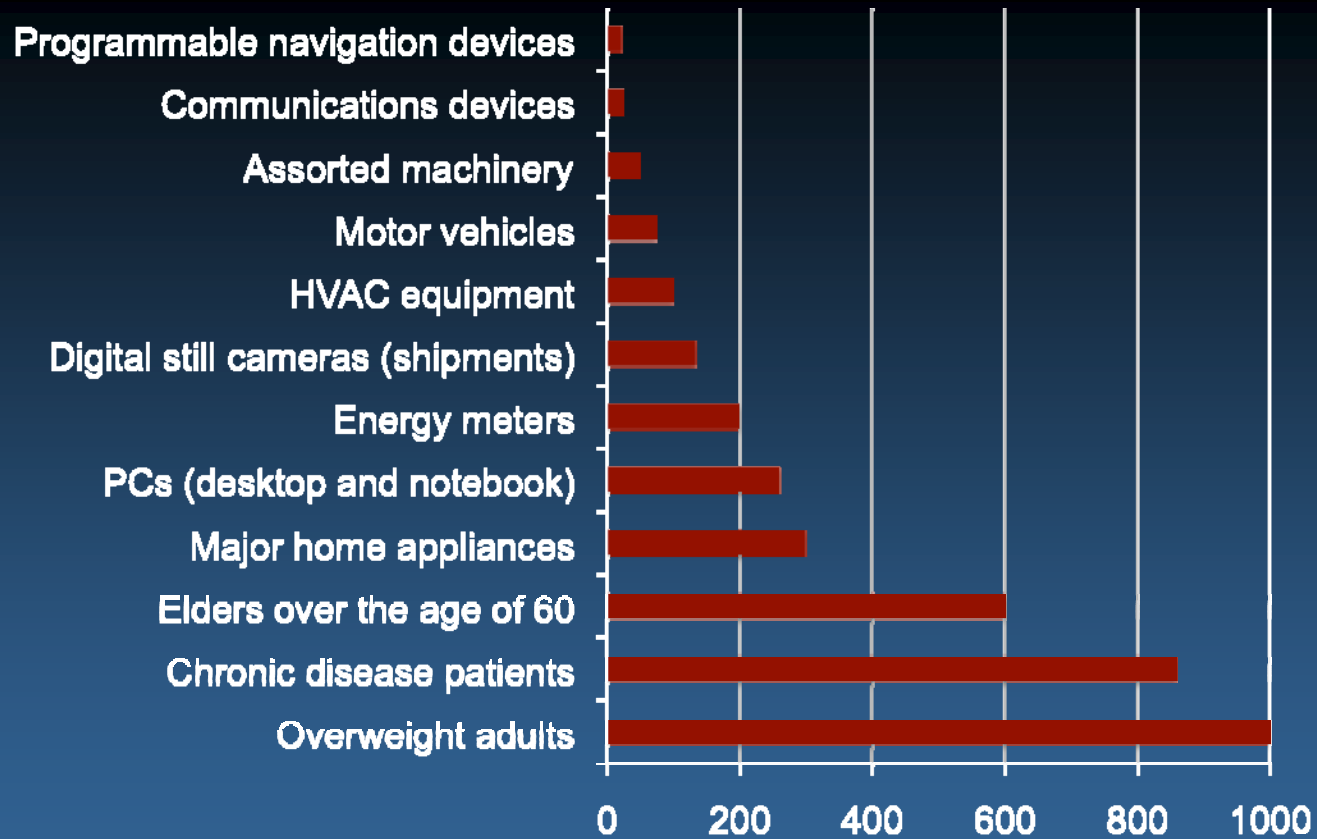
Addressable Market for Wireless Broadband Vertical connections in 2014 (billions)



Source: Senza Fili Consulting

In NZ this equates to a market potential of between 20M to 40M devices

Examples of the Addressable market opportunities for M2M devices and services (millions)



Source: ABI Research, Berg Insight, Continua Health Alliance, IDC, Korea Investment & Securities

Retail vs Vertical

Retail services	Vertical services
High churn	Low churn
High customer acquisition costs	Low acquisition costs
High ARPU	Low ARPU
Short-term contracts	Long-term contracts
Individual or family contracts	High No. of devices per contract
Growing traffic per user	Very predictable traffic
Mass Market	Fragmented markets
Best efforts	Performance requirements
Subsidised devices	Devices paid by customer

Existing Paradigm

- Fixed voice, mobile, broadband operators mostly target individual devices – one device; bundling
- Main KPIs are ARPU and Churn
- Vertical Applications, especially M2M, impact main KPIs

WiMAX and LTE enable M2M

- Mobile operators had issues addressing this market – capacity, QoS
- Newer networks provide large amount of capacity and are inherently better equipped for M2M
- Demand for enterprise vertical applications is rapidly growing:
 - Cut costs, new revenue streams.
 - Industry or Government mandates,

Applications, Devices and Traffic Profile

	Device Type			Traffic Profile			
	M2M Module	In-Vehicle	Personal		Uplink	Downlink	Volume
Telemetry							
Vehicle Telematics							
Financial Trans							
Building monitoring							
Surveillance							
Content delivery							
Mobile workforce							



High



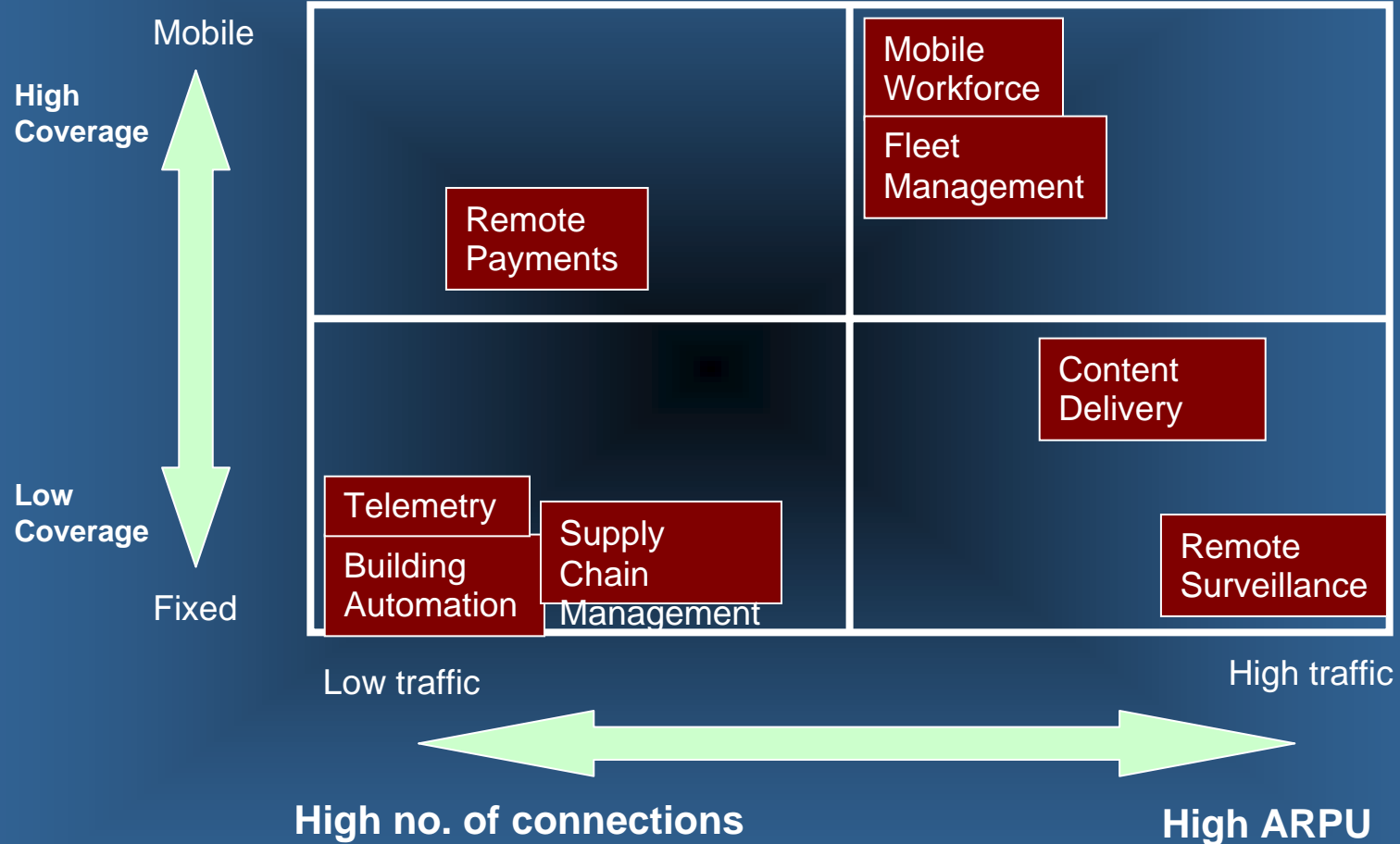
Medium



Low

Source: Senza Fili Consulting

M2M and Vertical Application Characteristics



Source: Senza Fili Consulting

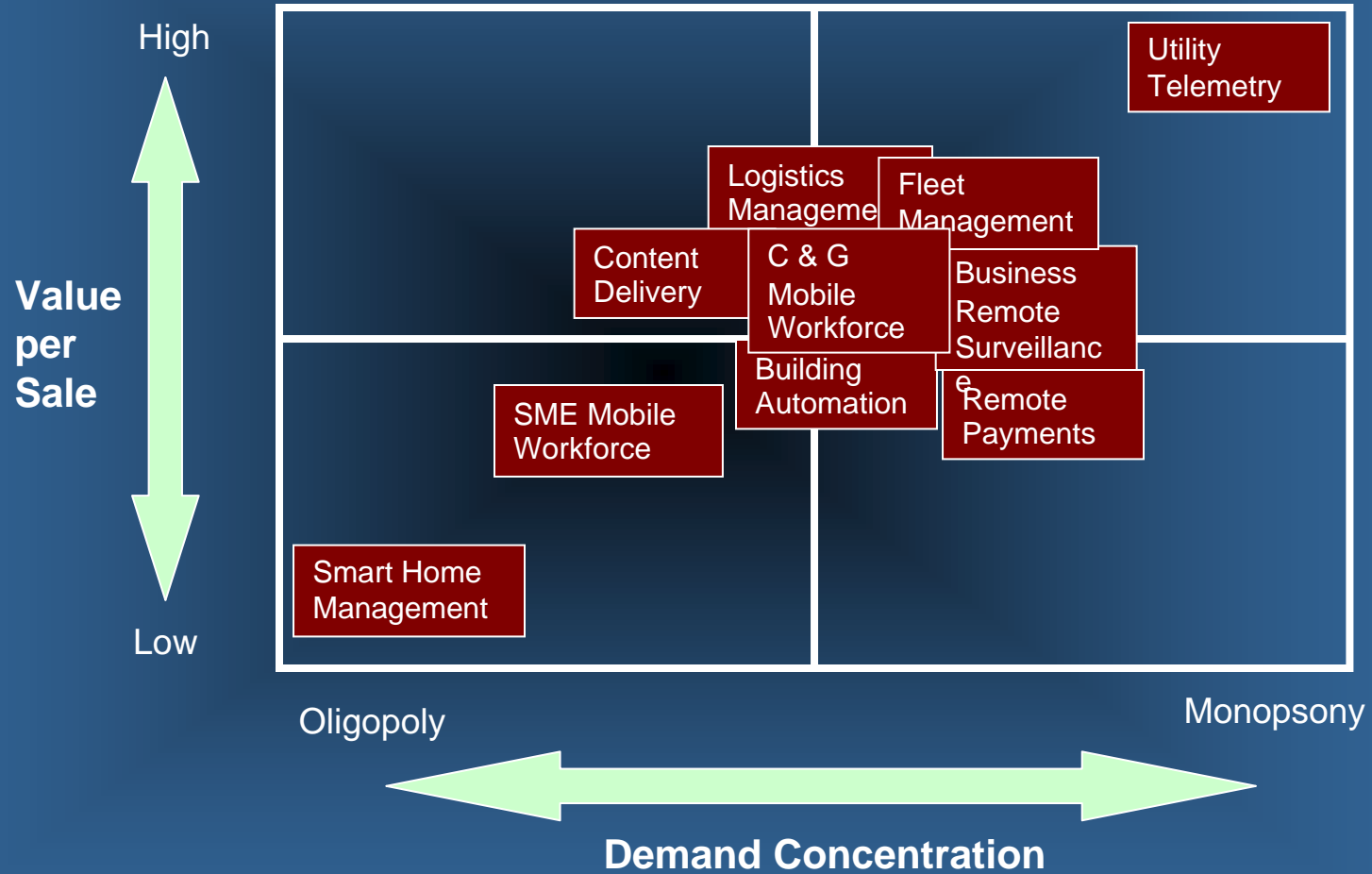
How to Price!

Tariff Type

	Flat Device	Transactional	Data Volume
Telemetry	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vehicle Telematics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Financial Trans	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Building monitoring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Surveillance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Content delivery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mobile workforce	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Appropriate
 Somewhat Appropriate
 Not Appropriate

Who to Target!



Energy Distribution

- Energy distribution challenges:
 - High cost of peak supply
 - Growing household and business demand
- Smart Grid
- Smart Metering
- For new entrants - network partnering opportunities.
- For incumbents – millions of new connections

Spectrum Thoughts

- Newer Technologies - WiMAX, LTE
- Saturation of Wireless Broadband
- Impact of M2M – capacity, data session
- Suitability of existing spectrum, 2G, 3G

Conclusions

- Economic conditions and delays in deploying WiMAX now favour LTE as dominant '4G' standard
- The vertical markets represent a significant opportunity and challengers for Wireless Broadband operators.

Thank you

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Backup

Standards Conclusions

- LTE focused on continued efficient mobile voice and further enhancing Wireless Broadband.
- WiMAX focus on Wireless Broadband but not much has been deployed
- In slowing global economic conditions – incumbents advantaged – most favour LTE

Application Adoption Across Segments

	Utilities	Transportation	Healthcare	Enterprise	Education	Security	Government
Telemetry							
Vehicle Telematics							
Financial Trans							
Building monitoring							
Surveillance							
Content delivery							
Mobile workforce							

High
 Medium
 Low adoption