

"Mobile and Wireless: Global Trends and Strategies"

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GLOCOM-Tokyo Forum

**"Socio-Economic Impacts of
Mobile/Wireless Technologies:
Strategies and Policies"**

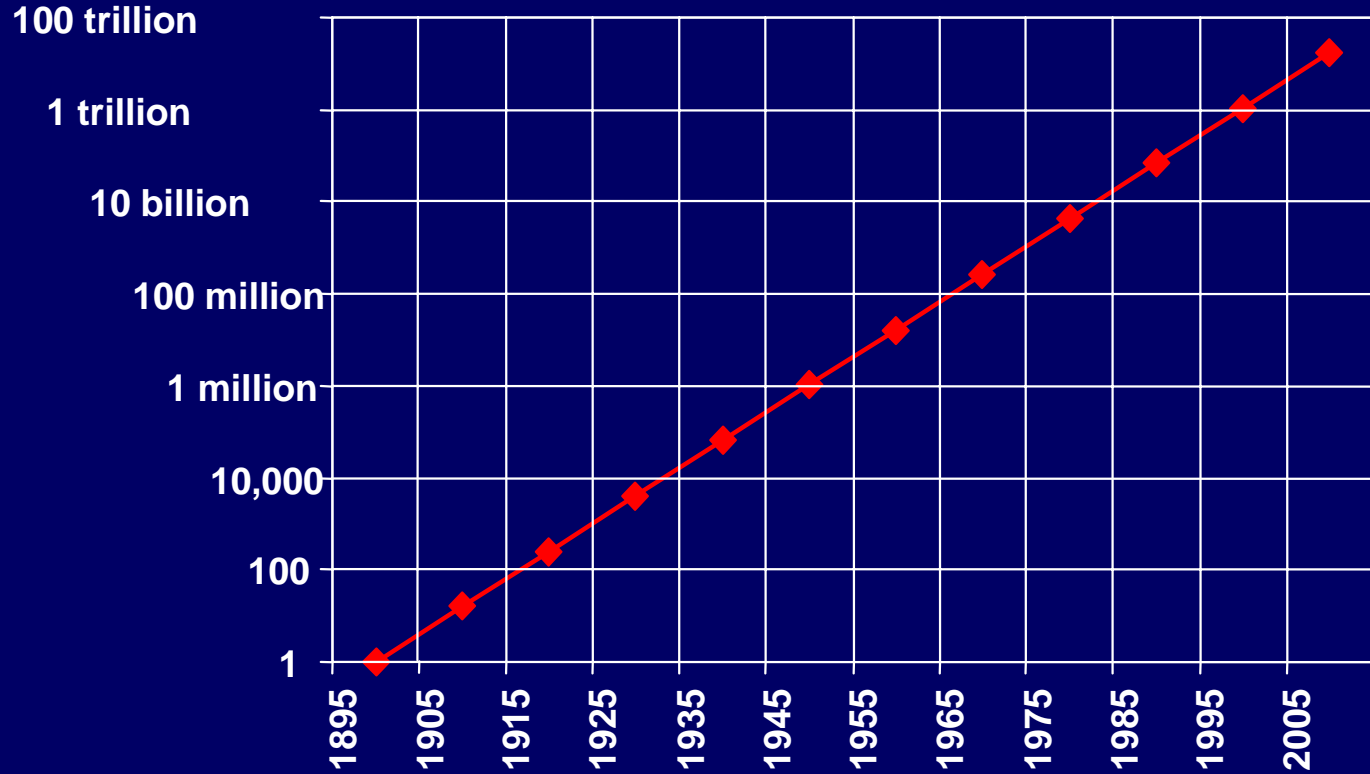
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Some Key Questions

- What is evolving in the wireless landscape?
- Which supply innovations or demand discontinuities might revolutionize business?
- What should policymakers do?

A High-Speed Ubiquitous Wireless Communications Infrastructure is Likely to Evolve

Number of conversations
Global market



Cooper's Law: The number of voice and data conversations have doubled every 2-1/2 years since 1895 when Marconi discovered radio.

Mobile Market Evolution

1st Generation Wireless

Analog cellular, single band, voice only, mostly outdoor coverage



2nd Generation Wireless

Digital, dual-band, voice +ltd text screen, indoor and outdoor coverage

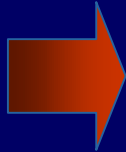


3rd Generation Wireless

Multi-mode, multi-band, voice +multimedia data, global roaming

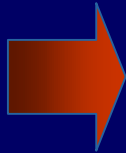
But What does 3G Mean?

Cost structure?



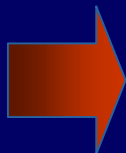
Cost of broadband services on large-scale networks?

Mobile vs. fixed?



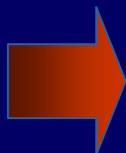
Do mobile users or fixed wireless networking drive demand?

Nature of demand?



Is the killer app medium band services (cable/DSL today) or true broadband applications?

Role in overall network?

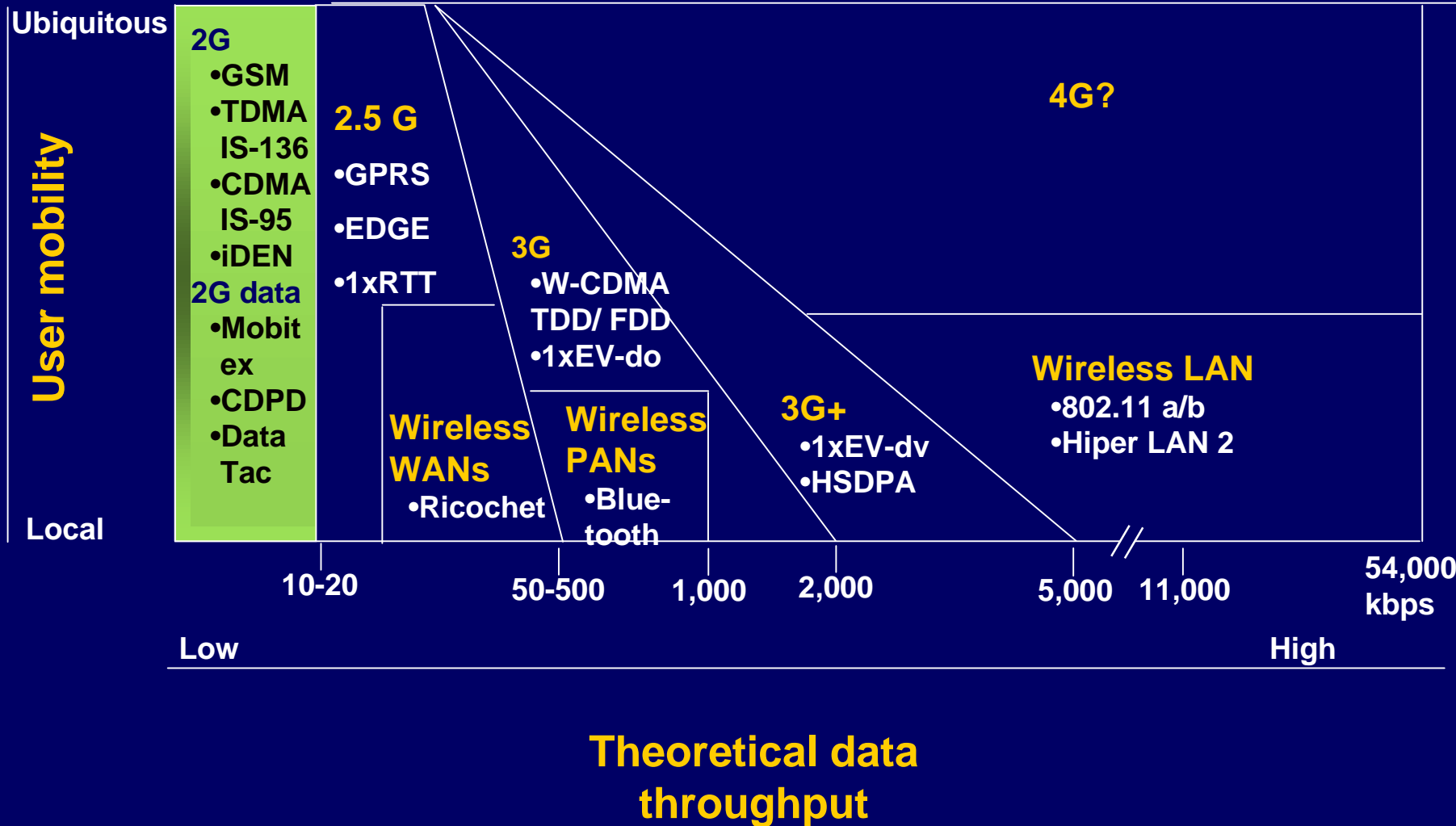


Does 3G network play key role in overall network or is it one piece of “end-to-end” network?

The answers will determine winners & losers.

- **Simple mobile messaging (SMS story)?**
- **Next I-mode & GPS for mobile and broadband (mobility or ubiquity)?**
- **True mobile broadband?**

Current View of Landscape . . .



Core Issues That Impact the Shape & Content of Wireless Networks

- Technical Considerations
- Policy Issues
- Business Models

Internet and Wireless Data Suggest Unexpected Sources of Traffic will Drive Growth

- Chat



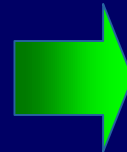
- E-commerce



- SMS messaging



- SMS gaming



- New user experiences that might promote wireless data services and drive growth?

- I-mode -- an unexpected new source of demand

- Large bets on location-based services.

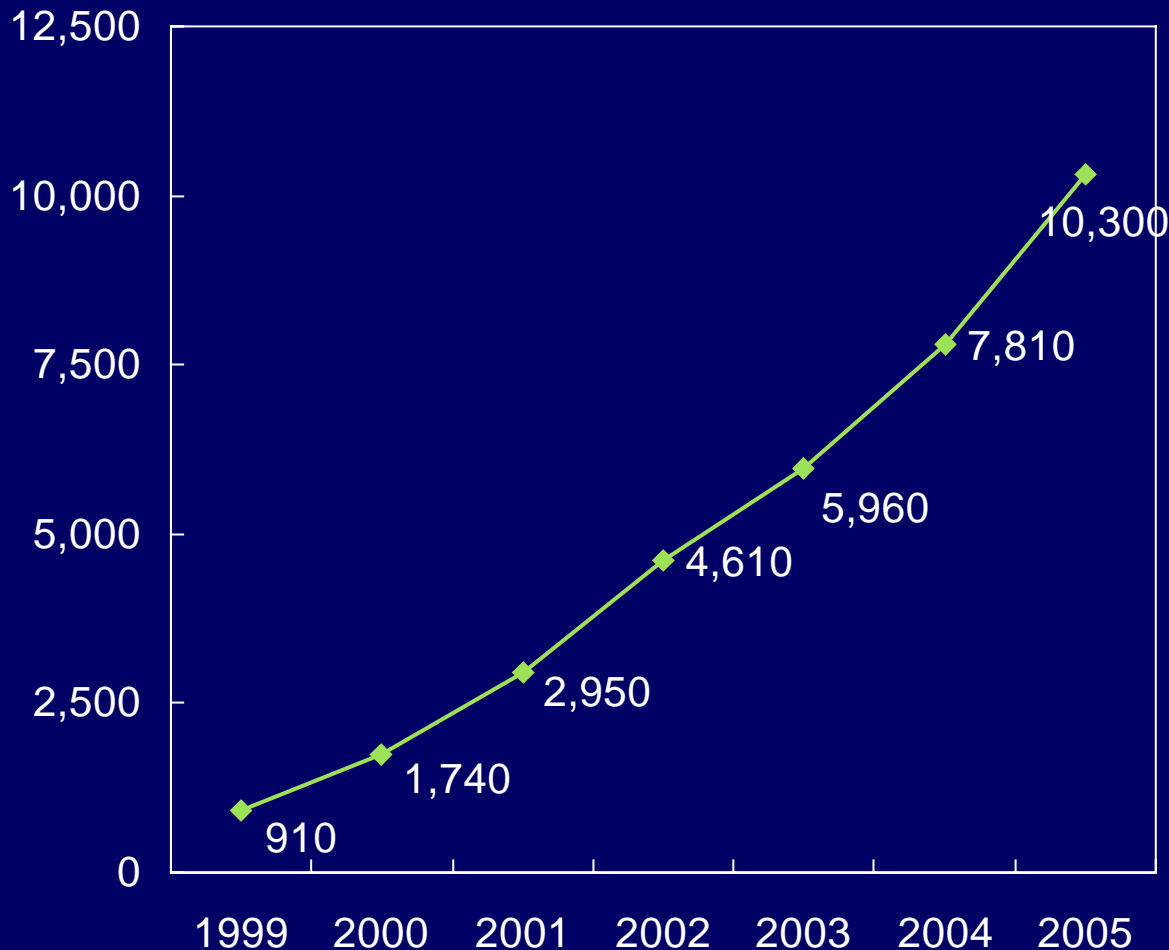
- Other “unexpected” sources of demand?

- User-led media

THE WLAN MARKET IS GROWING RAPIDLY

Wireless LAN users – a lowball forecast

Thousands

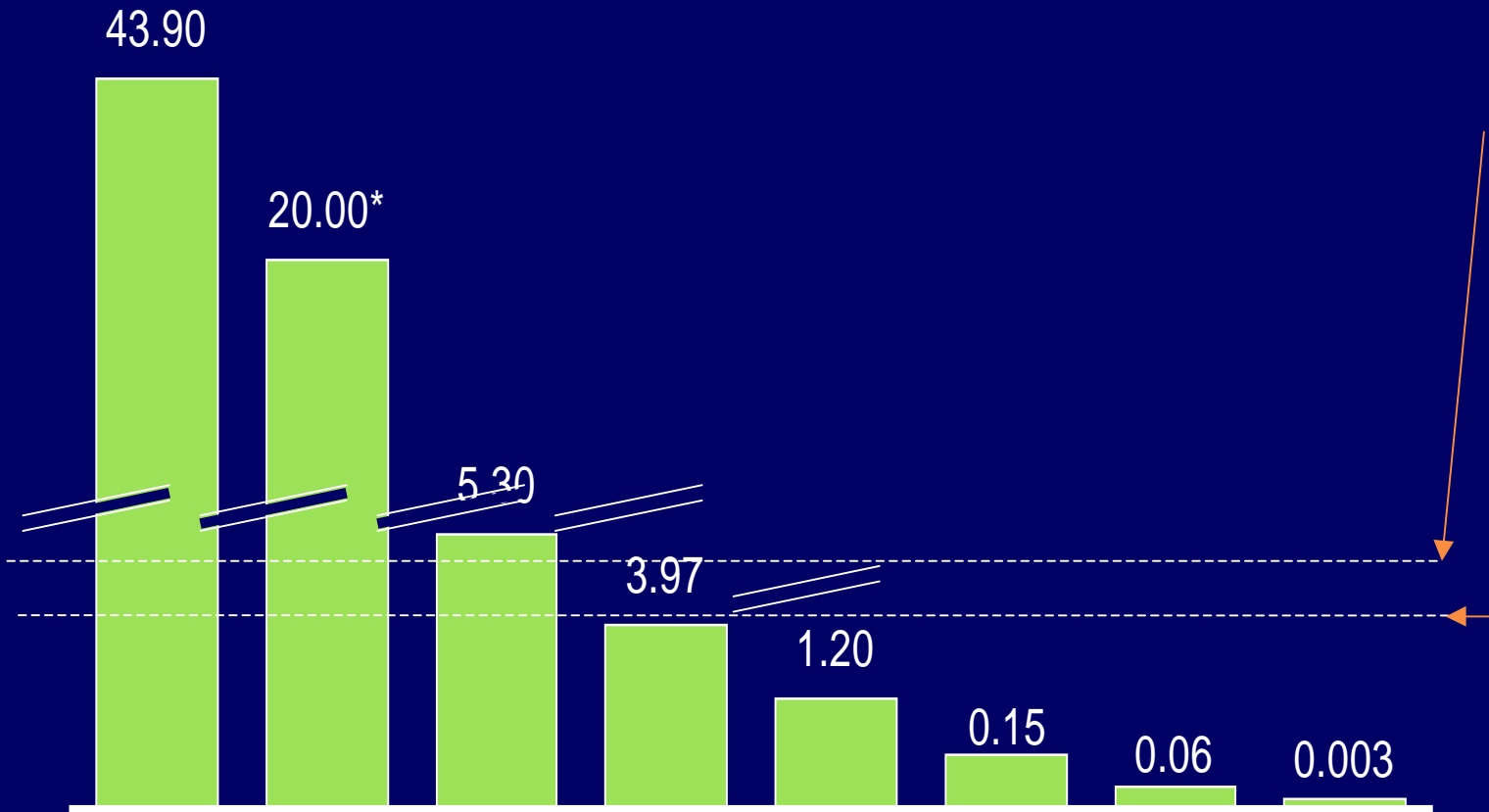


- Adoption drivers
- Increased speed: 2.4 GHz products offer speeds of up to 11 Mbps; .
- Lower price: prices were \$1000/node and up for enterprise products have dropped, soon to below \$250/node.
- Standards: 802.11 widely adopted standard
- Growing laptop usage: as primary PCs in enterprises
- Interoperability with wireline networks will exponentially increase users

3G VS. WLANS

Projected consumer willingness to pay

\$ per Mbyte



- **Cost of 3G: \$.20-.30/MB**

- **Cost of wireless LAN: \$.03-.06/MB**

- SMS
- iMode data
- Still pictures
- Highly-compressed video clip
- Voice
- Teleconference (VHS-quality)
- Music (MP3-quality)
- Movies (broadcast-quality)

KEY QUESTIONS ABOUT FUTURE GROWTH IN THE WIRELESS INDUSTRY

Nature of Demand

- Will enterprise or consumer applications drive wireless use?
- What is market sweet spot for various services?

Spectrum

- Will 802.11 stay unlicensed and free?
- Will additional spectrum be made available for 3G?

Ownership Structure

- Will the structure of services and operating networks remain integrated?
- How will wireless carriers offer 802.11b services?

Applications

- Will applications driving growth be consumer or enterprise focused?
- Which applications will drive growth (e.g. email, messaging, gaming, streaming, etc.)

Equipment

- What is best IP strategy for component and equipment makers?

Business Models

- Should revenue models change to reach small consumer vs enterprise consumer?