



**Telecommunications
Research Group**
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Broadband Demand and Wireless

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March 7, 2003
International Symposium on Advanced Radio Technologies, Boulder, Colorado



From Today's BBC News... **Dog's dinner boosts broadband**

- Mr Taylor, information technology manager with Derbyshire-based consultancy Equation, was fed up with being cut off from the broadband revolution....
- So he set out to find a neighbour in an area where you can get broadband willing to help him with the initial connection...
- When he found a good neighbour, he set up a connection through a wireless transmitter to send the internet signal the two and a half kilometres to his office.
- [Various tin can antenna attempts] ended in disaster as the metal could not withstand the elements of the Derbyshire weather... eventually he hit upon the idea of dog food cans to send the internet signal to his home.



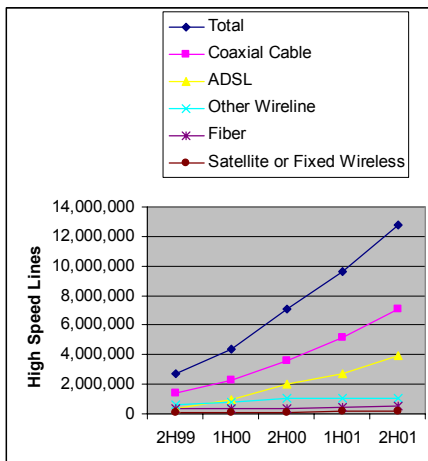
**Dog food cans offers
excellent broadband
antennae**



- The state of broadband demand
- A consumer survey
- Broadband demand and wireless

State of Broadband Demand

- Broadband = “high speed lines” = greater than 200 kbps in at least one direction
- Internet Penetration > 50%
- Broadband in General Population
 - 17% (2/03)
- Small Business
 - 40% (WIPP 5/02)
 - 56% (Cahners 4/01)
- Medium and Large Business
 - 85% (Cahners 4/01)



FCC, "High Speed Services for Internet Access: Status as of December 31, 2002."

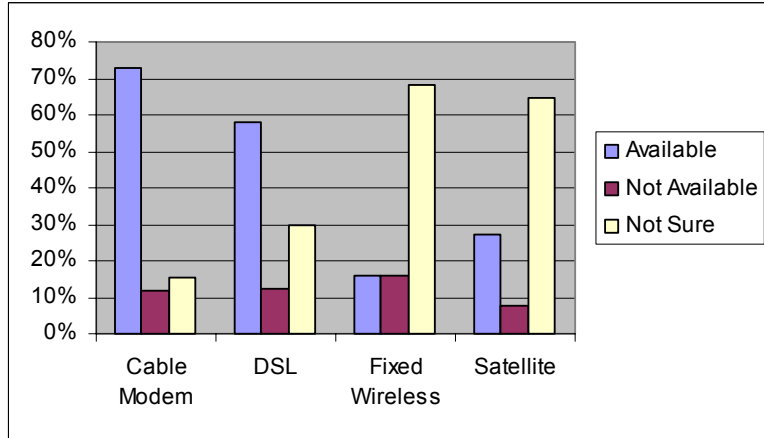
Observations

- Uptake is “robust” but slowed appreciably in 2001 (usual explanation is cost).
- Broadband is widely available by zipcode but less available by anecdote; in any case basic availability is not a major inhibitor.
- Broadband uptake is fast in comparison to earlier consumer adoptions; but consumer adoptions have been accelerating.
- Broadband lacks a killer app but it isn’t clear that one is necessary.

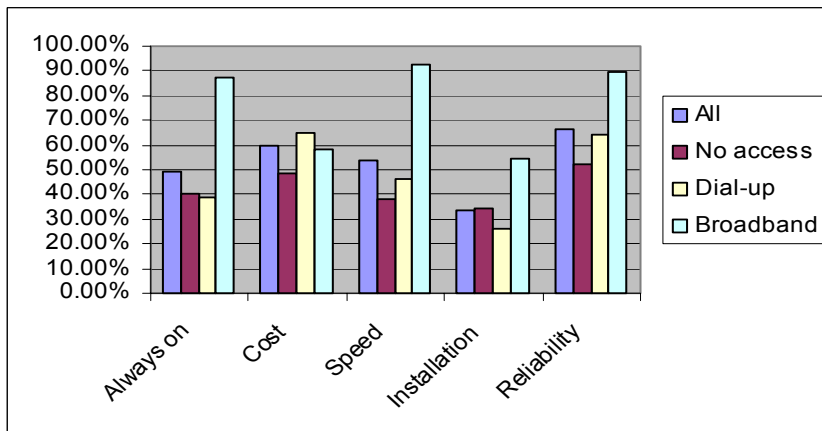
Consumer Survey – Demand and Attributes

- Fall 2002
- Survey US residences
- Questionnaire
 - Cognitive build up
 - Choice task
 - demographics
- Response
 - 378 complete (response rate 32 %)
 - 26 minute completion time
- Provides insight into some attributes and demographics relevant to wireless (social disadvantage, awareness, role of reliability, etc.)
- Further data collected in January 2003, being evaluated.

Awareness



Attributes



Percentage saying "extremely important" or "very important"

Inter-Modal Competition Policy

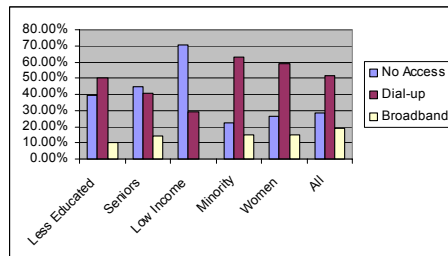
- One theme in FCC policy is around a focus on competition between types of broadband access (note recent decision to stop forcing RBOC's to unbundle DSL access).
- Fixed wireless is one of a few possibly viable alternatives to cable modems and DSL.
- Viability of significant businesses begs question of spectrum policy...

Spectrum Policy

- FCC considering spectrum policy reform.
- Market based mechanisms to allocate spectrum (though this may or may not align with competition policy).
- Technology advances to increase efficiency (software defined radios, ultra wideband).
- Generally positive for wireless broadband.

Decentralization

- 802.11 in particular has emerged in unusual civic and business configurations (community co-ops, local governments) in addition to traditional ones.
- Some conflicts emerging
 - property boundaries exclusivity for localized networks.
 - Nature of backhaul contracts
- Fixed wireless and access for disadvantaged communities.
- Potential for wireless access as a public good?



Mobility and Network Externalities

- Broadband can also be supplied to mobile devices.
- Including mobile users in an application's community can benefit adoption:
 - Supply side economies of scale
 - Demand side economies of scale
- Applies to typical broadband application taxonomies
 - Entertainment
 - Information/Education
 - National Security and Digital Government
 - Teleworking
 - Telehealth

Public Safety

- Wireless is a key utility for first responders.
- Also has the attribute of quick and temporary networks.
 - Example: FM subcarrier/Wi-Fi for medical data to an ambulance based base station.
- Private-public partnerships might facilitate deployment of broadband wireless that is immediately useful for public safety.

Conclusion

- Wireless is playing a minor role in broadband today, but it could be important
 - Inter-modal competition
 - Digital divide and decentralization
 - Mobility and public safety
- To get there, we need
 - To match attribute requirements (cost, reliability, ...)
through technology and business models
 - Continued spectrum policy evolution, especially
space for innovation