internet access

• Internet access as a public policy issue
• Background on terms and key concepts
• Current state
Where could we go?

- e-government

- For more instructional and case study videos, visit the Wisconsin Broadband Channel on YouTube - [WIBroadband1](#)

Available Services

- WIRED
  - Dial-up
  - Digital Subscriber Line (DSL)
  - Cable modem
  - Fiber optic, to home or business

- WIRELESS
  - Satellite
  - Cellular
  - Wi-Fi (Fixed Wireless)
Dial up
• Speed range: less than 56 Kbps
• Advantages
  – Uses existing, widely available land (phone) lines
• Challenges
  – SLOW!
  – So slow that most connections TIME OUT
  – Copper wiring is deteriorating and not being re-invested

DSL
• Speed range: 500 Kbps to 6 Mbps
• Advantages
  – Uses existing Land Lines BUT – must be within XX distance from phone company’s electronics
  – Relatively affordable for residences
• Challenges
  – Speed depends on distance from central office;
  – no service at greater distances from CO
  – Shared Bandwidth with your neighbors
### Cable modem

- **Speed range:** 5Mbps – 30 Mbps Download  
  – 200 – 400 Kbps Upload
- **Advantages**
  – Uses cable TV infrastructure
  – Faster speeds
- **Challenges**
  – Usually available only where there is high population density
  – More people on the line = slower service

### Fiber optic

- **Speed range:** 10Mbps, 1 Gig, 100Gig, ?
- **Advantages**
  – Awesome Speed! Just buy faster optics
  – Consistent and reliable
- **Challenges**
  – Very expensive to bury or hang new fiber
  – Plowed 2” conduit $4/foot
  – Bored $14/foot
  – Bored Cobble $35/Cobble
  – Bored Rock $82/foot
Satellite
• Speed range: 6-15 Mbps Down/.5-3Mbps Up
• Advantages
  – Relatively universal availability
• Challenges
  – Latency (delay of signal)
  – Reliability – weather and sunspot activity
  – Requires clear path
  – Higher cost (relative)
  – VPN and VoIP often not available (often required for business applications)

Cellular Residential
• Speed range: 400Kbps-700Kbps
• Advantages
  – More coverage in our county than DSL
• Challenges
  – Trees
  – Still have parts of county with no cell coverage
Cellular Mobile (aircards and Mifi)
- Speed range: 3G 1Mbps/.25Mbps
- 4G
- Advantages
  - Flexible
- Challenges
  - Speeds go up and down radically as you move around AND as other usage peaks
  - Geographic coverage

Wi-Fi
- Speed range: 1Mbps-4Mbps
- Advantages
  - Available in some rural areas without cell or DSL
- Challenges
  - Blocked by terrain or trees
  - Rapid signal deterioration; requires more repeaters
  - Capacity is often oversubscribed
  - Might not be there for you when you need it
Speed Examples

- 7 Mg board packet from May 2013
- 3G Mifi – 3 Minutes
- Good DSL – 16 seconds
- Satellite – 17s
- Cable – 11s
- Fiber – <3s

Other Examples

- Note – Movie varies from 3Gig-26Gig.
- It could take 18-40 Hours to download on a lower speed connection
- I took 339 pictures on vacation. On Mifi, would take 10 hours to upload
Coverage Maps

- Wired  http://www.co.marathon.wi.us/Portals/0/Departments/CCD/Documents/BGA_Appendix-G_WiredBroadbandCoverage.pdf
- Cellcom  http://www.cellcom.com/coverage_map.html
- Forested  http://www.co.marathon.wi.us/Portals/0/Departments/CCD/Documents/BGA_Appendix-L_ForestedAreasMarathonCounty.pdf
- For more maps, see the broadband gap analysis report  http://www.co.marathon.wi.us/Departments/InformationTechnology/BroadbandGapAnalysis.aspx

Current State

- Rural Areas still have gaps – Cellcom map
- Rural areas with coverage often find it too slow or not reliable enough to telecommute
- Not many free hotspots
broadband access as a public policy issue

• Educate yourself and your colleagues
• Inform decision makers and residents, dispel misinformation
• Inform public policy with legislators, Public Service Commission
• Support outreach activities

• Know your providers, develop relationship
• Conduct demand surveys
• Host technology fairs, tech advisory committees
• Cultivate public/private partnerships

broadband access as a public policy issue (2)

• Develop policy on access to public infrastructure, such as towers, access in public places
• Promote “Dig Once” policies
• Coordinate public works projects
• Foster CANs, cooperatives (e.g. “pole funding”)
• Set a minimum speed and reliability goal
• Tie economic development priorities to improved access, telecommuting