

Broadband Access: Technologies for the Last Mile

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Broadband Initiatives

--Fixed Broadband Access

1. Who?

- Residents of the US who have only limited (i.e. dial-up) or no Internet access (unavailable vs unsubscribed)

2. What (is Broadband Internet Access)?

- FCC: >200 kbps
- NTIA: >768 kbps downstream/200 kbps upstream
- YouTube recommendation: >500 kbps
- Multimedia: >10 Mbps downstream
 - Unicast/broadcast

3. Where?

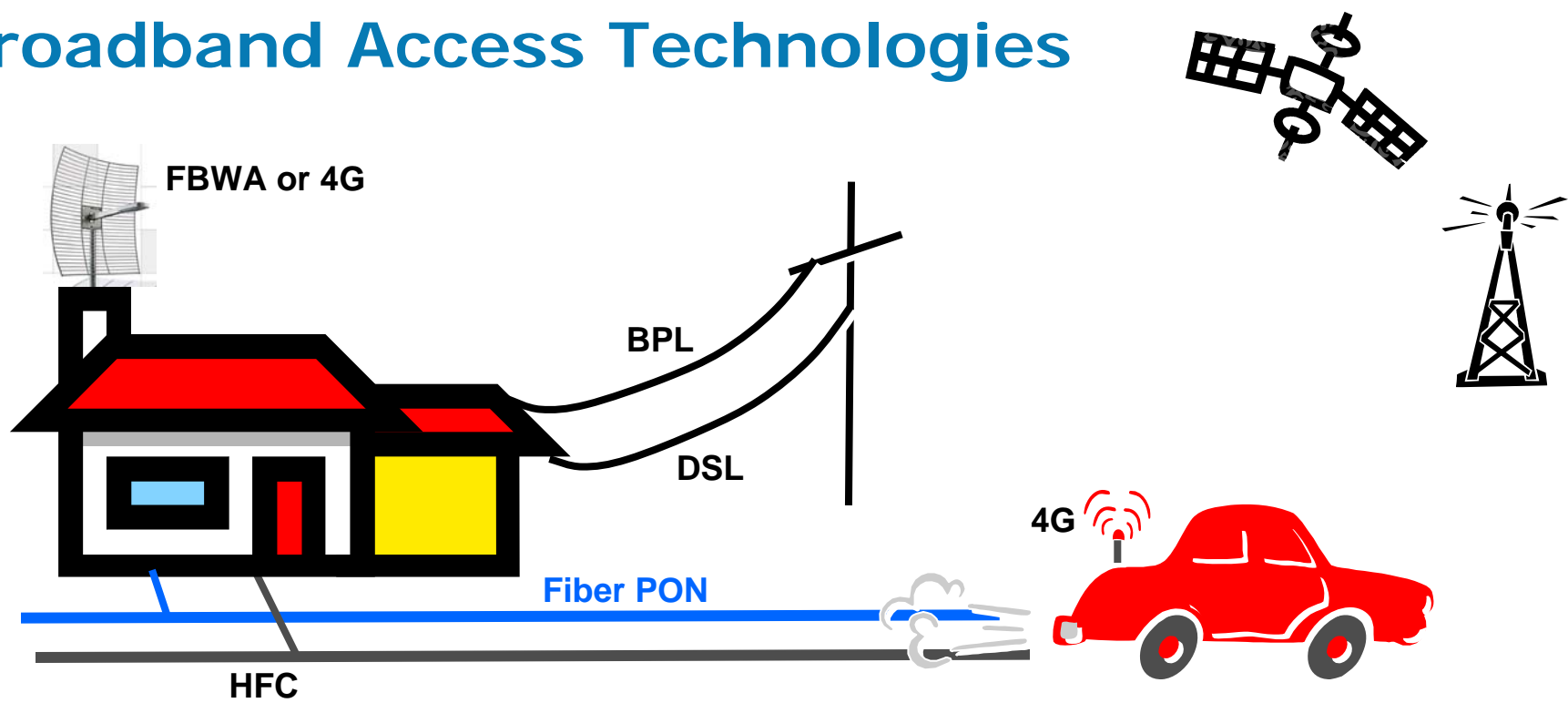
- Rural: Low density (<100 pop/sq km)
 - Minimize fixed infrastructure cost
- Urban: High density (>1000 pop/sq km; >10,000 in cities)
 - Maximize Mbps/sq km

4. How?

- Many possible technologies



Broadband Access Technologies



Digital Subscriber Line

- Telco or ILEC
- 10s of Mbps
- Entertainment, data, voice

Hybrid Fiber Coax

- CableCo (MSO)
- Entertainment, data, voice
- 10s of Mbps

Fiber -- Passive Optical Network

- Telco or ILEC
- ~75 Mb/s
- Futureproof?

Broadband Power Line

- PowerCo
- Data, voice
- ~few Mbps

Fixed Broadband Wireless Access

- Wireless ISP
- WiMAX or LTE:
-10s of Mbps
- Satellite: few Mbps

4G/LTE

- Cellular operators
- 5-10 Mbps (100 kph)



**No silver
bullet**

