America’s Broadband Heroes
Fixed Wireless Broadband Providers
Matt Larsen, Vistabeam

Against the Odds

- WISP’s added Some 800,000 Customers Last 12 months
  - Continue to bring Broadband to the Unserved as we have done for the last decade
- Growth with Minimal Federal or State Financial Support – Stimulus, USF etc
- What Could Have Been Achieved with ~$7Billion Broadband Stimulus?
  - At $500 an Install, 14 Million Homes Connected
White Paper: Intro

• The current system is broken
  – Competition has been narrowed down to duopoly
  – USF is rife with abuse
  – Lack of network access for competitive entrants
  – Result: US is 15th out of 34 OECD nations in broadband penetration
• WISPs are changing the system
  – Fixed Terrestrial Wireless (FTW)
  – Best way to improve broadband penetration is to foster the development of companies that can move faster and use more efficient technology

Fixed Wireless Advantages Over Mobile

• Fixed wireless has a long, and colorful history in America
• Bandwidth is dependent on being able to maintain a high signal to noise ratio
• Physics are on our side – high gain, fixed antennas can deliver more reliable broadband to more customers than mobile
• Mobile broadband networks degrade quickly as more users are put on the systems
• Smartphones and aircards have their uses, but they are not a substitute for a fixed wireless or wireline broadband system
Victory of the Commons

- Unlicensed spectrum has enabled the rapid growth and evolution of fixed wireless broadband
- Resilient system design, clever RF engineering, better modulation schemes, interference mitigation and higher gain antennas enable fixed wireless providers to overcome the weaknesses of unlicensed
- Instead of investing money into spectrum “assets”, WISPs are investing in networks
- Adding more unlicensed and lightly licensed spectrum will let WISPs deliver faster and more reliable broadband to more Americans

Evolution vs. Stagnation

- Compared to DSL and Cable, fixed wireless is evolving faster and is cheaper to deploy
- Since 2001, DSL and cable have seen about a 3x increase in capacity. Fixed wireless has increased by 20x
- Modern fixed wireless platforms such as AirMax and Canopy are far beyond DSL capabilities and on par with cable
- Everyone has capacity issues, including wireline providers. WISPs have an easier and less expensive upgrade path than wireline
Success Without Subsidies

- The majority of WISPs succeed without subsidies like USF – even while competitors are receiving massive amounts of subsidy
- Many consider broadband to be like rural electrification, but they are quite different when fixed wireless is part of the equation
- Wireline networks must pass everyone and are dependent on a high take rate to be economically feasible
- Wireline has fixed expenses and variable income. Fixed wireless has variable expenses based on income
- USF supports untenable business models and suppresses potential competitors
- Until the system is changed, USF has the potential to do more harm than good to rural broadband deployment

WISPs Bridge the Digital Divide

- NTIA has released and continues to update the National Broadband Map
- First time that we have been able to quantify the impact of fixed wireless on broadband penetration in the US
- Brian Webster of wirelessmapping.com was commissioned by WISPA to put together maps that show the areas in each state where fixed wireless providers are the ONLY source for broadband
- The results are quite powerful….
<table>
<thead>
<tr>
<th>State</th>
<th>Occupied Households Passed by WISP's 2008</th>
<th>Total Occupied Households 2008</th>
<th>% Households passed by WISP's only</th>
<th>Land Area in Sq. Mi.</th>
<th>Uniquely passed by WISP's</th>
<th>% land area uniquely covered by WISP's</th>
<th>Households Per Square Mile</th>
<th>Households Per Square Mile of WISP Only Served Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE</td>
<td>77,845</td>
<td>730,577</td>
<td>10.66%</td>
<td>45,227.25</td>
<td>77,243.02</td>
<td>58.55%</td>
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<td>IN</td>
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<td>35,870.00</td>
<td>70,910</td>
<td>15.30%</td>
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<td>WI</td>
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<td>58,000.00</td>
<td>25.55%</td>
<td>70.57</td>
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<td>OR</td>
<td>142,760</td>
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<td>96,003.00</td>
<td>32.60%</td>
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<tr>
<td>WY</td>
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<td>77.05%</td>
<td>58.55%</td>
<td>9.46</td>
<td>1.72</td>
</tr>
</tbody>
</table>

The Numbers

Nebraska

[Map Image]

[Table Image]

- Nebraska
- The Numbers
- State data
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Telco Bypass Surgery

- Traditional landline connectivity is expensive and hard to obtain in many unserved and underserved areas
- $500/meg rural vs $1/meg (or less) in urban
- Fixed wireless is can be independent of wireline up to a point
- Building your own networks gives you leverage and will help with pricing
- 100meg unlicensed – 350meg licensed links seem like enough for now, but we will need Gig speeds in the very near future
- Getting access to fiber networks will become more important. Access to middle-mile is critical to us

The Third Pipe

- Government policy has lead to “intermodal” competition between types of connectivity instead of between providers
- Result – duopoly, higher prices, long term contracts, net neutrality legislation, bundles – all bad for consumers
- Fixed wireless breaks the duopoly
- With modern platforms, WISPs can deliver the “third pipe” and dynamic competition
Conclusion

• Fixed wireless is NOT mobile wireless – it is healthy for America – sizzle vs steak
• WISPs are dynamic users of spectrum – fastest way to turn empty spectrum into usable broadband is to make it available to WISPs
• WISPs need affordable middle mile access
• WISPs are the ONLY source of broadband in many areas
• WISPs can restore competition into stagnant markets and stimulate innovation

Thank You!