

Feasibility of Fixed Wireless Access

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Introduction



Demand for High-Speed Internet is increasing



Incumbents not adequately fulfilling this demand

Solution – Fixed Wireless Access

Regulatory Factors

- Licensed and Unlicensed Frequencies
- Policies
 - Section 704 of the Telecommunications Act of 1996
 - Base Station guidelines
 - Section 207 of the Telecommunications Act of 1996
 - Customer Premise Equipment (Antennas) guidelines

Technical Factors

Technical Characteristics of FWA Solutions

Common Name	Wi-Fi	Wi-Fi5	MMDS	LMDS
IEEE Standard	802.11b	802.11a	802.16.3	802.16.1
Frequency Bands (US)	2.4 - 2.43825GHz	5.15 - 5.35GHz 5.725 - 5.835GHz	2.1 - 2.2GHz 2.5 - 2.7GHz	27.5 - 28.35GHz 31.0 - 31.30GHz
Speed and Capacity				
Data Rates (theoretical)	1-11Mbps	6-54Mbps	3Mbps-1Gbps	5Mbps-1.25Gbps
Channels and channel size	12 channel; 6Mhz 3 non-overlapping	6Mhz 8 non-overlapping	33 channels; 6Mhz 4 non-overlapping	Up to 1.3GHz
Coverage				
Distance (max.)	10 miles	3-5 miles	35 miles	3-5 miles
Line-of-sight (LOS)	Near-LOS	Near-LOS	Non-LOS	LOS
Reliability				
Weather	Minimal Interference	Minimal Interference	Minimal Interference	Large Interference
Interference	Highly Congested	Minimal Congestion (at this time)	Little to no Congestion	Little to no Congestion

Economic Factors

- Broadband adoption increased 25% first 6 months of 2002
- Currently 24 million US household have broadband access
- Studies have shown that price for broadband is elastic

Other Factors and Analysis

Comparison of Licensed versus Unlicensed Spectrum

Metric	Weight	Licensed Spectrum		Unlicensed Spectrum	
		MMDS	LMDS	ISM	UNII
Regulatory Factors	0.10				
Acquiring Spectrum	0.05	4 ±1	4 ±1	6 ±2	6 ±2
Legal Protection from Interference	0.05	9 ±1	9 ±1	2 ±1	2 ±1
Technical Factors	0.40				
Performance (Speed and Capacity)	0.1	5 ±2	9 ±1	5 ±1	6 ±2
Line-of-Sight (LOS)	0.1	7 ±2	4 ±1	5 ±2	5 ±2
Coverage	0.05	7 ±2	3 ±1	6 ±1	5 ±1
Interference	0.05	8 ±1	8 ±1	2 ±2	4 ±2
Reliability	0.05	7 ±2	7 ±2	7 ±1	7 ±1
Security	0.05	5 ±1	5 ±1	3 ±1	3 ±1
Economic Factors	0.20				
CPE Cost (Variable)	0.10	5 ±2	2 ±1	8 ±1	6 ±2
Infrastructure Cost (Fixed)	0.05	5 ±2	3 ±1	7 ±1	6 ±1
Cost for Spectrum	0.05	4 ±2	4 ±2	9 ±1	9 ±1
Other Factors	0.30				
Ease of Infrastructure Deployment	0.05	5 ±2	2 ±1	5 ±2	5 ±2
CPE Installation Ease	0.15	8 ±2	3 ±1	7 ±1	7 ±1
Scalability	0.05	7 ±1	3 ±2	4 ±1	4 ±1
Total (Range)	1.00	(4.75-7.85)	(3.30-5.70)	(4.05-6.55)	(3.75-6.65)
Total (Uncertainty)	1.00	6.30 ± 0.52	4.50 ± 0.40	5.30 ± 0.59	5.20 ± 0.64

Key: Quantitative Score: Poor - 0 ... Excellent - 10 (Uncertainty)

Analysis of Previous FWA Solutions

- Premature technology
- Issues with scalability
- Expensive CPE cost
- Required professional installation

Regulatory Feasibility

- Interviews with Experts
 - Little to no regulatory barriers
- Local Policy Implications
 - Home Owner Associations

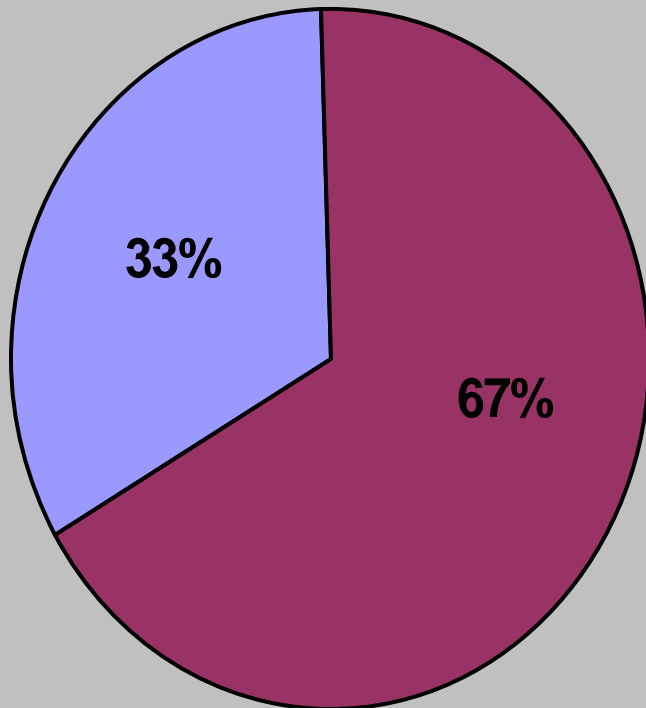
Technical Feasibility

Feasibility Considerations for FWA

- Reliability
- Weather and Climate
- Line-of sight
- Interference

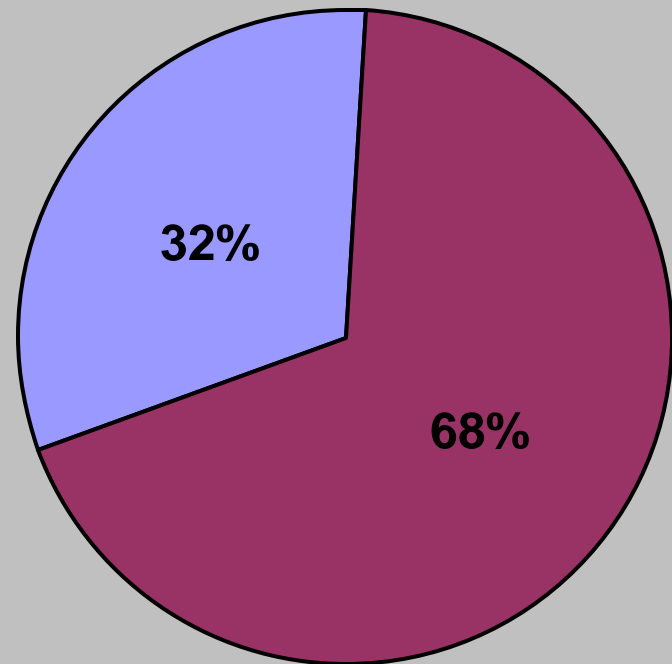
Economic Feasibility Survey Results

Buying versus Renting CPE



■ Rent (\$10/month) ■ Buy (\$200)

Willingness to Pay for Monthly Service



■ Under \$30 ■ Over \$30

Economic Feasibility

Financial Forecasts

- Profitable in year three
- Sensitive Variables
- Scalable

Feasibility of Other Factors

■ Scalability

- Microcell or cellular approach
- Backhaul
- Franchise Business Model
- Multi-mode CPE

■ Spectrum Availability

- Available at discounted rates
- Further spectrum policy reform

Conclusion

**Fixed Wireless Access is a feasible
high-speed Internet access solution**

Questions?