2.4.22 Pricing Structure (Highly-Desirable)	**1**	No Comments
2.4.23 Billing Capability (Essential)	**1**	• RADIUS is a very well used industry standard for billing.
2.4.24 Contract Term (Essential)	**1**	No Comments
2.4.25 Location and Device Identification (Desirable)	**1**	No Comments
2.4.26 Coverage (Highly-Desirable)	**1**	There is one clarification pertaining to this clause, which the ACT Government should make with iiNet: iiNet state that *"iiNet is pleased to advise that all significant business districts in the ACT will be covered by iiNet VDSL 2 by February 2014"*. What percentage of ACT business districts does "all significant business districts" represent? 60%, 80% 90%?
2.4.27 Infrastructure Access (Highly-Desirable)	**2**	The ACT Government states in this section that *"Details such as type of access, space, weight, wind load and power requirements, commercial fees and conditions and any other assumptions used in their proposed solution are to be clearly identified."* iiNet have not responded with details about wind how they will comply with wind loading requirements. Huawei's mesh AP data sheets do not specify any certification for wind ratings, therefore iiNet would need to engage an engineering firm to assess the wind loading of the new Huawei APs they are proposing. iiNet state that they have *"engaged GHD engineering to perform structural assessments of Wi-Fi access points on street lights and other structures in Adelaide. GHD will again be engaged to ensure that previous positive findings are applicable to the ACT."* The assessment of wind loading for the APs has not been mentioned specifically, this needs to be clarified with iiNet as to whether this will be included with their engagement of GHD engineering to perform structural assessments. It is assumed this will be, but this assumption needs to be verified.
2.5 Key Performance Indicators (Desirable)	**5**	iiNet states that *"iiNet will use its own internal customer experience measurement systems to determine the service levels for customers, including those that use the Wi-Fi networks."*

		This statement however, contradicts this ACT Government's clause which states *"These minimum contract management service levels will be developed in conjunction with the successful supplier and will be designed to ensure that the network functions as proposed."* On the facts, it appears that iiNet are going to use their own performance metrics, and not take into account any ACT Government input into defining performance metric levels and how they will be measured. For this reason, a risk level of 5 (extreme) has been assigned, until such a time as this is clarified. The ACT Government should enquire into this.
2.6 Contract Management (Highly-Desirable)	**1**	No Comments
2.7 Quality Requirements (Desirable)	**1**	• ISO9001: 2008 Certificate No: FS 582814
2.8 Experience (Highly-Desirable)	**1**	Excellent experience with multiple Adelaide wireless mesh projects.
2.9 Implementation (Highly-Desirable)	**3**	• o With regards to the coverage site surveys, it is expected to take a single person 4 months to complete 645 individual surveys (indoor pus outdoor) in total. This would exceed the 2 months assigned by iiNet for this task. In order to achieve the 2 months allocated by iiNet, they would need to put at least 2 staff members on this job full-time. Dynamic Wireless recommends that the ACT Government ask iiNet for a detailed site survey schedule, and how many staff they plan to assigned to this task.

2.10 Whole of Life Support (Essential)	**2**	• iiNet states that *"iiNet proposes to maintain a stock of current-model devices to self-spare."* The ACT Government should enquire as to what percentage of the total deployed APs will be set aside as spares? When disaster strikes, iiNet's supply chain would only be as strong as its weakest link. If the equipment isn't readily available via the primary channel, then paying for expedited support will do little if there isn't enough supply to go around. From this aspect Huawei stock would not be so prominent in Australia as Cisco. For this reason, a slightly higher risk level of 2 was assigned.
2.11 Sub Contractors (Essential)	**1**	• Visionstream Pty Ltd - Dynamic Wireless has extensive experience with working onsite with Visionstream, Adelaide over the past 2 years. Our own experience working with them, has found them to be a very professional, organised, well run company. They appear to spare no effort and resources into ensuring their projects have been completed to the highest degree of quality. • Huawei Technologies Australia Pty Ltd - Dynamic Wireless has not had experience in dealing with Huawei, and as such our only assumption would be that the service and support from Cisco would likely be higher than that of Huawei, as Cisco has established offices in all states (excluding the Northern Territory and Tasmania) and has a very large well established Technical Assistance Centre (TAC) in Sydney, which services the whole Asia region including Australia.
2.12 References (Essential)	**1**	• Four solid references provided, all based in South Australia.
2.13 Industrial Relations/Occupational Health, Welfare and Safety (Essential)	**3**	•
2.14 Environmental Management (Essential)	**1**	No Comments
2.15 Innovation (Desirable)	**3- If Huawei chosen 1- If Cisco chosen**	Again, iiNet proposes *"to build Australia's most technologically advanced Wi-Fi network in Canberra, using technology borrowed from gigabit-speed LTE standards that have not yet been deployed outside of trials at this time."* As there is no publicly available information (none that Dynamic Wireless could find) at this time, nor has this information been supplied by iiNet as part of their proposal; there is no way of evaluating

		these latest APs from Huawei in order to determine how exactly they have borrowed technology from gigabit-speed LTE standards, and to also evaluate and compare their AP radio specifications (RSSI, transmit power, environmental ratings etc) against other leading carrier-grade wireless mesh hardware in the market.
2.16 Financial Viability	**1**	
2. Insurance (Essential)	**1**	• iiNet exceeds the ACT Government's insurance requirements.
3. Conflict of Interest (Essential)	**1**	No Comments
4. Any Other Matters	**1**	No Comments
5. Financial Model and ACT Government Contribution (Essential)	**2**	iiNet's proposed costs are reasonable, as calculations have shown in that review section. However it has been assigned a risk level of 2 (Low-Risk). A risk level of 1 (Very-Low Risk) can only be assigned if iiNet were to provide a complete breakdown of costs, which they are not expected to provide. By only providing high-level pricing with no breakdown of each individual component, this will always carry some level of risk, hence the risk assignment has been increased from 1 (Very-Low Risk) to 2 (Low-Risk).
7. Direct Cost to the ACT Government	**2**	Need to evaluate cost
8. Any Other Cost to the ACT Government	**1**	Same Comments As Above
9. SMALL-TO-MEDIUM ENTERPRISE (SME)	**1**	No Comments

4. TECHNICAL REVIEW

4.1 SUMMARY

The table below provides a summary of the detailed technical review that follows. This summary provides a quick overview, and can be delved into further by going to the appropriate section.

Note: Due to iiNet essentially having a N+1 proposal, whereby if their Huawei proposal is not accepted then they will offer an alternative backup Cisco proposal; the Risk Assignment for some categories will vary depending on whether Huawei or Cisco are chosen as the final solution.

Technical Review	Risk (1-Very Low,2-Low, 3-Medium Risk, 4- High Risk, 5-Extreme Risk)	Comments
Solution Quality Review		
Wi-Fi Technology Design		
Radio Specification Evaluation		
Hardware Environmental Ratings/Specifications		
Wireless Network Management System		
Additional Hardware Features		

		transportation communications space and a social
Solution Upgradeability		
Hardware Upgradeability		Neither Huawei or Cisco outdoor mesh APs have upgradeable radios, which arguably is more important than the indoor coverage.
Firmware Upgradeability		Both Huawei and Cisco hardware (controllers and APs) are firmware upgradeable, and both vendors release updates on a regular basis.
Client Security Features		
Wireless Encryption and/or Authentication	1	The encryption and authentication methods being offered by iiNet below for each user type are sufficient, and generally used in similar deployments around the world.
Firewalls	1	
Filtering Capability (Viruses and Malware)	5	iiNet's proposal does not mention any hardware appliances or methods used to filter and protect users from viruses, which is a mandatory requirement by the ACT Government. For this reason, the highest risk of 5 has been assigned.
Solution Scalability		
Coverage Scalability	1	The latest 802.11ac standard is initially designed to support up to 1.69 Gbit/s (Cisco's 3700 Series supports up to 1.3 Gbit/s for example), and eventually a theoretical 6.77 Gbit/s; iiNet's installed Gigabit fibre optic links to mesh APs would immediately be able to support 802.11ac mesh APs when they arrive to market, and with an upgrade to 10 Gbit/s Ethernet without additional works, be able to support all future MCS data rates included within the 802.11ac standard.
Client Capacity Scalability	1	iiNet has designed the network to support a high number of simultaneous connections (20,000 clients / (330 outdoor + 315 indoor APs = 31 clients per AP). Further calculations are provided in this report.
Open Networks Standards Compliance		
Wireless Technology based on Open Standards		Huawei or Cisco (alternative) APs all use dual-band radios to support 2.4 GHz and 5 GHz Wi-Fi, supporting 802.11a, 802.11g and 802.11n protocols.
Integration with Open Network Standards		Huawei and Cisco AP are both standards compliant, adhering to all major IEEE, wireless and security standards.
Technical Feasibility		
Proven Technology or Cutting-Edge		Lack of details and technical/radio specifications about the two new APs from Huawei (WA251DT-NE and WA201DK-

Technology		NE) which draws on Wireless access equipment that draws on LTE-Advanced small-cell technology. Also, Huawei mesh deployments mostly limited to China. For this reason a medium (3) risk was assigned.
History of Technology being used in Wireless Broadband Deployments		Huawei are recent entrants to the carrier-grade Wi-Fi mesh market, releasing their first products in 2013.

4.2 SOLUTION QUALITY REVIEW

4.2.1 Wi-Fi Technology Design

iiNet states that they *"intend to deploy Huawei carrier-grade Wireless access equipment that draws on LTE-Advanced small-cell technology. This follows a successful trial of the equipment in Canberra at the TransACT labs."*

The Huawei models being proposed are:

Hardware	Function
WA251DT-NE	With external 5 GHz antennas for outdoor deployment
WA201DK-NE	For deployment under outdoor ceilings or indoor settings

Both of these AP's are capable of 450Mbps aggregate throughput.

However at the time of performing this evaluation, no data sheets or detailed technical specifications could be obtained about the above two access points, therefore making the evaluation process for the proposes Huawei hardware difficult. Due to this limitation, Dynamic Wireless has conducted the hardware/radio specification evaluation component (and comparison against Cisco's hardware, iiNet's alternative solution), on their existing older wireless mesh products as this will be a good indication of their radio technology. Usually the radio specifications (such as Receive Sensitivity Values) of a vendors radios are similar for all products across the board if they own their own silicon, which Huawei does and Cisco also does.

In iiNet's proposal they state that they have *"prepared a Cisco solution as an alternative to the Huawei solution functionally identical to the solution deployed in Adelaide, South Australia."*

What iiNet has essentially done is eliminate any risk associated with proposing Huawei hardware, therefore for the purposes of evaluating this proposal, any risks posed by implementing a Cisco solution must also be taken into account.

In summary, the Cisco solution uses the following different components:

As an experienced wireless consulting company who does a lot of Cisco wireless consulting and design across a wide-range of industries, the above Cisco hardware types are exactly what I would also propose for the ACT Government's Free Wi-Fi Project. In providing wireless consulting services to airports and mining sites in Australia, the above Cisco wireless infrastructure has been previously recommended by Dynamic Wireless as being suitable for larger campus/municipal deployments.

Further justifications for the above hardware selection is provided below:

4.2.2 Radio Specifications Evaluation

Receive (RX) Sensitivity

It is important to note that the Receive (RX) Sensitivity of a client radio has the greatest impact on whether a client radio card is able to communicate back to the mesh AP, and thus determines the maximum coverage that a mesh AP can provide. This is discussed in quite some detail below, due to its importance to coverage and throughput.

While receive sensitivity may often be an overlooked technical specification when it comes to evaluating wireless mesh hardware, it is one of the key determinants of the performance and economics of a municipal Wi-Fi mesh network. Receive sensitivity indicates how faint an RF signal can be successfully be received by the receiver. The lower the power level that the receiver can successfully process, the better the receive sensitivity. For example, a 3 dB improvement in receive sensitivity can translate into a mesh AP density, and capital expenditure reduction of up to 30% depending on the terrain. Furthermore, a 6 dB improvement in receive sensitivity can yield a mesh AP density reduction of up to 50%. Thus, the RSSI differences between vendors can yield wide differences in the amount of coverage and throughput achieved surrounding each vendors AP.

To put this in perspective, an RF predictive survey for a mesh AP located 10 metres atop a cribb hut at a mining site, is shown below. A 3-6 dBm improvement in receive sensitivity, results in significantly more coverage and at a higher data rate.

3-6 dBm Less Rx Sensitivity	3-6 dBm More Rx Sensitivity
	

KEY:

Coverage >24 Mbps

Coverage <24 Mbps

Therefore, as shown in the table below for example, Cisco's mesh APs are typically 3-4 dB higher than competitor mesh products, potentially resulting in a 30+% reduction in mesh AP density.

A higher RX Sensitivity value (e.g. -84 dBm as opposed to -80 dBm) will result in client radio cards being able to connect from a further distance, or at the same distance but with a higher date rate. Therefore, in an outdoor environment where longer distances are involved, a higher RX Sensitivity will provide for more reliable coverage and better overall throughput to clients.

The table below summarises the difference in wireless mesh radio RX Sensitivities between Huawei's wireless mesh AP and a selection of the leading carrier-grade wireless mesh products in the market. For example, if a client laptop (2.4 GHz) were to connect to the wireless mesh at -78 dBm, a Cisco mesh router would connect the client at 54 Mbps, whilst a Huawei mesh AP would connect the client at a lower data rate of 36 Mbps.

Data Rate	Huawei AP6610DN-AGN	Cisco 1552E	Tropos 7320	Aruba AirMesh MSR4000	Ruckus ZoneFlex 7782-N	Which Vendor RX Sensitivity is Stronger?
IEEE 802.11g/n radio						
54 Mbps	-75 dBm	-78 dBm	-84 dBm	-83 dBm	-	Tropos
48 Mbps	-76 dBm	-79 dBm	-85 dBm	-85 dBm	-	Tropos/Aruba
36 Mbps	-80 dBm	-84 dBm	-89 dBm	-89 dBm	-	Tropos/Aruba
24 Mbps	-83 dBm	-86 dBm	-92 dBm	-92 dBm	-	Tropos/Aruba
18 Mbps	-87 dBm	-90 dBm	-95 dBm	-95 dBm	-	Tropos/Aruba
12 Mbps	-90 dBm	-92 dBm	-96 dBm	-95 dBm	-	Tropos
9 Mbps	-91 dBm	-93 dBm	-	-96 dBm	-	Aruba
6 Mbps	-92 dBm	-94 dBm	-96 dBm	-96 dBm	-	Tropos/Aruba
MCS0 (HT20)	-92 dBm	-93 dBm	N.A	-94 dBm	-	Aruba
MCS1 (HT20)	-89 dBm	-91 dBm	N.A	-93 dBm	-	Aruba
MCS2 (HT20)	-86 dBm	-89 dBm	N.A	-92 dBm	-	Aruba
MCS3 (HT20)	-82 dBm	-86 dBm	N.A	-89 dBm	-	Aruba
MCS4 (HT20)	-79 dBm	-82 dBm	N.A	-85 dBm	-	Aruba
MCS5 (HT20)	-74 dBm	-78 dBm	N.A	-81 dBm	-	Aruba
MCS6 (HT20)	-73 dBm	-77 dBm	N.A	-80 dBm	-	Aruba
MCS7 (HT20)	-71 dBm	-75 dBm	N.A	-78 dBm	-	Aruba
MCS8 (HT20)	-92 dBm	-93 dBm	N.A	-94 dBm	-	Aruba
MCS9 (HT20)	-89 dBm	-91 dBm	N.A	-93 dBm	-	Aruba
MCS10 (HT20)	-86 dBm	-89 dBm	N.A	-92 dBm	-	Aruba
MCS11 (HT20)	-82 dBm	-86 dBm	N.A	-89 dBm	-	Aruba
MCS12 (HT20)	-79 dBm	-82 dBm	N.A	-85 dBm	-	Aruba

MCS13 (HT20)	-74 dBm	-78 dBm	N.A	-81 dBm	-	Aruba
MCS14 (HT20)	-73 dBm	-77 dBm	N.A	-80 dBm	-	Aruba
MCS15 (HT20)	-71 dBm	-75 dBm	N.A	-78 dBm	-	Aruba
IEEE 802.11a radio						
54 Mbps	-71 dBm	-76 dBm	-76 dBm	-80 dBm	-	Aruba
48 Mbps	-72 dBm	-77 dBm	-78 dBm	-82 dBm	-	Aruba
36 Mbps	-77 dBm	-81 dBm	-83 dBm	-86 dBm	-	Aruba
24 Mbps	-81 dBm	-85 dBm	-86 dBm	-88 dBm	-	Aruba
18 Mbps	-84 dBm	-87 dBm	-89 dBm	-94 dBm	-	Aruba
12 Mbps	-87 dBm	-89 dBm	-92 dBm	-96 dBm	-	Aruba
9 Mbps	-89 dBm	-91 dBm	-93 dBm	-96 dBm	-	Aruba
6 Mbps	-90 dBm	-92 dBm	-94 dBm	-97 dBm	-	Aruba
MCS0 (HT20)	-84 dBm	-92 dBm	N.A	-97 dBm	-	Aruba
MCS1 (HT20)	-81 dBm	-89 dBm	N.A	-94 dBm	-	Aruba
MCS2 (HT20)	-79 dBm	-87 dBm	N.A	-91 dBm	-	Aruba
MCS3 (HT20)	-76 dBm	-85 dBm	N.A	-87 dBm	-	Aruba
MCS4 (HT20)	-72 dBm	-81 dBm	N.A	-86 dBm	-	Aruba
MCS5 (HT20)	-68 dBm	-77 dBm	N.A	-81 dBm	-	Aruba
MCS6 (HT20)	-67 dBm	-76 dBm	N.A	-79 dBm	-	Aruba
MCS7 (HT20)	-67 dBm	-75 dBm	N.A	-77 dBm	-	Aruba
MCS8 (HT20)	-84 dBm	-90 dBm	N.A	-97 dBm	-	Aruba
MCS9 (HT20)	-81 dBm	-87 dBm	N.A	-94 dBm	-	Aruba
MCS10 (HT20)	-79 dBm	-85 dBm	N.A	-91 dBm	-	Aruba
MCS11 (HT20)	-76 dBm	-82 dBm	N.A	-87 dBm	-	Aruba
MCS12 (HT20)	-72 dBm	-78 dBm	N.A	-86 dBm	-	Aruba
MCS13 (HT20)	-68 dBm	-74 dBm	N.A	-81 dBm	-	Aruba
MCS14 (HT20)	-67 dBm	-73 dBm	N.A	-79 dBm	-	Aruba
MCS15 (HT20)	-67 dBm	-72 dBm	N.A	-77 dBm	-	Aruba

Table 1: Receive Sensitivity Comparison Of Outdoor Mesh Access Points

The table below summarises the difference in wireless mesh radio RX Sensitivities between Huawei's indoor wireless AP and a selection of equivalent corporate wireless indoor APs on the market. For example, if a client laptop (2.4 GHz) were to connect to the indoor wireless at -79 dBm, a Huawei indoor AP would connect the client at 54 Mbps, whilst a Huawei mesh AP would connect the client at a lower data rate of 36 Mbps.

Data Rate	Huawei AP5030DN	Cisco 3602I	Tropos 3320	Aruba 220 Series	Ruckus ZoneFlex 7982	Which Vendor RX Sensitivity is Stronger?
IEEE 802.11g/n radio						
54 Mbps	-74 dBm	-79 dBm	-84 dBm	-75 dBm	-	Tropos
48 Mbps	-76 dBm	-80 dBm	-85 dBm	-	-	Tropos
36 Mbps	-80 dBm	-85 dBm	-89 dBm	-	-	Tropos
24 Mbps	-83 dBm	-87 dBm	-92 dBm	-	-	Tropos
18 Mbps	-86 dBm	-90 dBm	-95 dBm	-	-	Tropos
12 Mbps	-89 dBm	-91 dBm	-96 dBm	-	-	Tropos
9 Mbps	-90 dBm	-91 dBm	-	-	-	Cisco
6 Mbps	-91 dBm	-91 dBm	-96 dBm	-88 dBm	-	Tropos
MCS0 (HT20)	-91 dBm	-90 dBm	N.A	-88 dBm	-	Cisco
MCS1 (HT20)	-88 dBm	-90 dBm	N.A	-	-	Cisco
MCS2 (HT20)	-86 dBm	-90 dBm	N.A	-	-	Cisco
MCS3 (HT20)	-81 dBm	-88 dBm	N.A	-	-	Cisco
MCS4 (HT20)	-78 dBm	-85 dBm	N.A	-	-	Cisco
MCS5 (HT20)	-74 dBm	-80 dBm	N.A	-	-	Cisco
MCS6 (HT20)	-72 dBm	-78 dBm	N.A	-	-	Cisco
MCS7 (HT20)	-71 dBm	-77 dBm	N.A	-71 dBm	-	Cisco
MCS8 (HT20)	-89 dBm	-90 dBm	N.A	-88 dBm	-	Cisco
MCS9 (HT20)	-88 dBm	-90 dBm	N.A	-	-	Cisco
MCS10 (HT20)	-86 dBm	-89 dBm	N.A	-	-	Cisco
MCS11 (HT20)	-82 dBm	-86 dBm	N.A	-	-	Cisco
MCS12 (HT20)	-79 dBm	-82 dBm	N.A	-	-	Cisco
MCS13 (HT20)	-74 dBm	-78 dBm	N.A	-	-	Cisco
MCS14 (HT20)	-73 dBm	-77 dBm	N.A	-	-	Cisco
MCS15 (HT20)	-71 dBm	-75 dBm	N.A	-71 dBm	-	Cisco
IEEE 802.11a radio						
54 Mbps	-71 dBm	-77 dBm	-76 dBm	-75 dBm	-	Cisco
48 Mbps	-73 dBm	-78 dBm	-78 dBm	-	-	Cisco/Tropos

36 Mbps	-77 dBm	-83 dBm	-83 dBm	-	-	Cisco/Tropos
24 Mbps	-80 dBm	-86 dBm	-86 dBm	-	-	Cisco/Tropos
18 Mbps	-83 dBm	-89 dBm	-89 dBm	-	-	Cisco/Tropos
12 Mbps	-86 dBm	-90 dBm	-92 dBm	-	-	Tropos
9 Mbps	-88 dBm	-90 dBm	-93 dBm	-	-	Tropos
6 Mbps	-89 dBm	-90 dBm	-94 dBm	-88 dBm	-	Tropos
MCS0 (HT20)	-90 dBm	-91 dBm	N.A	-	-	Cisco
MCS1 (HT20)	-85 dBm	-90 dBm	N.A	-	-	Cisco
MCS2 (HT20)	-84 dBm	-89 dBm	N.A	-	-	Cisco
MCS3 (HT20)	-78 dBm	-86 dBm	N.A	-	-	Cisco
MCS4 (HT20)	-75 dBm	-83 dBm	N.A	-	-	Cisco
MCS5 (HT20)	-71 dBm	-78 dBm	N.A	-	-	Cisco
MCS6 (HT20)	-70 dBm	-77 dBm	N.A	-	-	Cisco
MCS7 (HT20)	-68 dBm	-75 dBm	N.A	-	-	Cisco
MCS8 (HT20)	-88 dBm	-91 dBm	N.A	-	-	Cisco
MCS9 (HT20)	-88 dBm	-89 dBm	N.A	-	-	Cisco
MCS10 (HT20)	-85 dBm	-87 dBm	N.A	-	-	Cisco
MCS11 (HT20)	-82 dBm	-84 dBm	N.A	-	-	Cisco
MCS12 (HT20)	-79 dBm	-80 dBm	N.A	-	-	Cisco
MCS13 (HT20)	-74 dBm	-76 dBm	N.A	-	-	Cisco
MCS14 (HT20)	-73 dBm	-75 dBm	N.A	-	-	Cisco
MCS15 (HT20)	-71 dBm	-73 dBm	N.A	-	-	Cisco

Table 2: Receive Sensitivity Comparison Of Indoor Access Points

802.11n MIMO Capability

The table below lists the MIMO rates of Huawei, Cisco and other leading vendor products in the market. The MIMO rates are provided here for comparison.

Of the leading carrier-grade outdoor wireless mesh vendors, Huawei's latest proposed mesh AP has the highest MIMO rate of 3x3 with 3 spatial streams; whilst for indoor APS, Cisco has the highest MIMO rate of 4x4 with 3 spatial streams.

Vendor	Model	MIMO Type	Ranking
Outdoor Mesh APs			
Huawei	WA251DT-NE (latest proposed model)	3x3:3 spatial streams	1st
	AP6610DN-AGN (older model)	2x2:2 spatial streams	3rd
Cisco	1552E	2x3:2 spatial streams	2nd
	1530E	2x2:2 spatial streams	3rd
Tropos	7320	Only support for 802.11n MRC	4th
Aruba	AirMesh MSR4000	2x2:2 spatial streams	3rd
Ruckus	ZoneFlex 7782-N	2x2:2 spatial streams	3rd
Indoor APs			
Huawei	WA201DK-NE (latest proposed model)	3x3:3 spatial streams	2nd
	AP5030DN (older model)	3x3:3 spatial streams	2nd
Cisco	3600/3700 Series	4x4:3 spatial streams	1st
Tropos	3320	Only support for 802.11n MRC	4th
Aruba	220 Series	3x3:2 spatial streams	3rd
Ruckus	ZoneFlex 7982	3x3:3 spatial streams	2nd

It is important to note that although MIMO is important to the speed of clients, these higher data rates are only supported if the client is also able to support a higher MIMO rate with the newer 802.11n standards. A more important metric is the receive sensitivity (RSSI) of a mesh AP radio, as discussed in the previous section, which is of more importance to the area of coverage and throughput at a given distance from the mesh AP.