

## B. Sample Size and Volunteer Selection

The study allowed for a target deployment of up to 10,000 Whiteboxes to volunteer panelists across the United States. The number of volunteers from each participating broadband provider was selected to ensure that the data collected would support statistically valid inferences based on a first order analysis of gathered data. Other methodological factors and considerations influenced the selection of the sample size and makeup including:

- The panel of U.S. broadband subscribers was drawn from a pool of over 75,000 volunteers following a recruitment campaign that ran from May 2010 through February 2011.
- The volunteer sample was organized with a goal of covering major ISPs in the 48 contiguous states across five broadband technologies: DSL, cable, fiber-to-the-home, fixed terrestrial wireless, and satellite.<sup>4</sup>
- Target numbers for volunteers were also set across the four Census Regions—Northeast, Midwest, South and West—to help ensure geographic diversity in the volunteer panel and compensate for network variances across the U.S.<sup>5</sup>
- Each of the four Census Regions was split into the three speed ranges: <3 Millions of bits per second (Mbps), 3<10 Mbps, >=10 Mbps,<sup>6</sup> with each speed tier forming an individual sample ‘cell’ against which a target number of volunteers would be selected.<sup>7</sup>
- A target plan for allocation of Whiteboxes was developed based on the market share of participating ISPs. Initial market share information was based principally on FCC Form 477<sup>8</sup> data filed by ISPs for June 2010.

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<sup>4</sup> The final results included volunteers from all 48 contiguous states as well as Hawaii. Due to the low number of volunteers that subscribed to satellite and fixed terrestrial wireless technology, the results from those consumers’ Whiteboxes were not included in the report. However, data collected from satellite and fixed terrestrial wireless subscribers are included in detailed data files available to the public in the bulk raw data set.

<sup>5</sup> Although we recruited volunteers according to Census Region to ensure the widest possible distribution of panelists throughout the United States, as discussed below we were not able to deploy a sufficient number of testing devices to evaluate regional differences in broadband performance.

<sup>6</sup> These speed ranges were chosen to provide alignment with broadband tiers as categorized in the “Form 477” reports that the Commission uses as its primary tool for collecting data about broadband networks and services. See *Modernizing the FCC Form 477 Data Program*, Notice of Proposed Rulemaking, 26 FCC Rcd 1508, 1512 n.27 (2011), citing *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership*, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691, 9700-01 (2008).

<sup>7</sup> The term cell is used to describe a specific number associated with a set of volunteer attributes (ISP, technology, region, speed tier) that provided a specific sample set of volunteers for the population.

<sup>8</sup> FCC Form 477 data collects information about broadband connections to end user locations, wired and wireless local telephone services, and interconnected Voice over Internet Protocol (VoIP) services. See [http://transition.fcc.gov/form477/inst.htm#\\_PURPOSE](http://transition.fcc.gov/form477/inst.htm#_PURPOSE) for further information.

- An initial set of prospective participants was selected from volunteers who had responded directly to SamKnows as a result of media solicitations. Where gaps existed in the statistical sample plan, SamKnows worked with participating ISPs via email solicitations targeted at underrepresented cells. A miscellaneous cell was created across fiber-to-the-home, DSL and cable technologies, and across all regions and service tiers, to allow additional units to be allocated to accommodate volunteers who did not fit into other cells or who changed ISPs or service tiers during the trial.
- Statistical experts from both the FCC and the ISPs reviewed and agreed to the plan.

The recruitment campaign resulted in the coverage needed to ensure balanced representation of users across the U.S. Table 1 presents the number of volunteers for the month of March 2011 listed by ISP, as well as the percent of total volunteers accounted for by each ISP.

Table 1 ISPs, sample sizes and percentages of total volunteers.

ISP	Sample size	% of total volunteers
AT&T	1,094	16%
Cablevision	162	2%
CenturyLink <sup>9</sup>	315	5%
Charter	625	9%
Comcast	1,109	16%
Cox	581	8%
Frontier	86	1%
Insight	57	1%
Mediacom	116	2%
Qwest	352	5%
TimeWarner Cable	1,214	18%
Verizon	889	13%
Windstream	251	4%
Total	6,851	100%

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<sup>9</sup> Throughout this report, results are recorded separately for CenturyLink and Qwest. These two entities completed a merger on April 1, 2011; however, during the testing in March 2011, they were separate companies.

The distribution of boxes by state is found in Table 2.<sup>10</sup>

Table 2: Distribution of Whiteboxes by state

State	Total Boxes	% Total Boxes	% of Total U.S. Broadband Subscribers in State	State	Total Boxes	% Total Boxes	% of Total U.S. Broadband Subscribers in State
AL	71	1.0%	1.3%	MT	5	0.1%	0.3%
AR	52	0.8%	2.1%	NC	303	4.4%	3.2%
AZ	270	4.0%	0.7%	ND	3	0.04%	0.2%
CA	848	12.5%	11.9%	NE	50	0.7%	0.6%
CO	125	1.8%	1.8%	NH	35	0.5%	0.5%
CT	84	1.2%	1.4%	NJ	190	2.8%	3.4%
DC	21	0.3%	0.2%	NM	52	0.8%	0.6%
DE	15	0.2%	0.3%	NV	77	1.1%	0.8%
FL	315	4.6%	6.9%	NY	445	6.5%	7.0%
GA	210	3.1%	2.8%	OH	309	4.5%	3.9%
HI	28	0.4%	0.4% <sup>11</sup>	OK	75	1.1%	1.0%
IA	91	1.3%	1.0%	OR	132	1.9%	1.3%
ID	20	0.3%	0.4%	PA	216	3.2%	4.5%
IL	269	4.0%	4.1%	RI	28	0.4%	0.4%
IN	98	1.4%	1.9%	SC	107	1.6%	1.4%
KS	53	0.8%	0.9%	SD	2	0.03%	0.2%
KY	125	1.8%	1.3%	TN	106	1.6%	1.8%
LA	52	0.8%	1.3%	TX	381	5.6%	7.2%
MA	154	2.3%	2.6%	UT	59	0.9%	0.8%
MD	126	1.9%	2.1%	VA	255	3.7%	2.7%
ME	24	0.4%	0.5%	VT	5	0.1%	0.2%
MI	204	3.0%	3.1%	WA	165	2.4%	2.4%
MN	162	2.4%	1.8%	WI	199	2.9%	1.9%
MO	152	2.2%	1.8%	WV	18	0.3%	0.5%
MS	20	0.3%	0.6%	WY	3	0.04%	0.2%

<sup>10</sup> Subscriber data in this report is based on the FCC’s Internet Access Services Report, as of June 2011. Data in this report does not include subscriber data for the state of Hawaii. The report is accessible at [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2011/db0520/DOC-305296A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db0520/DOC-305296A1.pdf). There were no volunteers for the project from Alaska.

<sup>11</sup> Percent of total U.S. broadband subscribers living in Hawaii based on FCC analysis of Current Population Survey Internet Use 2010, Table 4, accessible at: [http://www.ntia.doc.gov/data/CPS2010\\_Tables](http://www.ntia.doc.gov/data/CPS2010_Tables).

The distribution of boxes by Census Region is found in table 3.

Table 3: Distribution of boxes by Census Region

Census Region	Total Boxes	% Total Boxes	% of Total U.S. Broadband Subscribers
<b>Northeast</b>	1181	17%	21%
<b>Midwest</b>	1592	23%	21%
<b>South</b>	2252	33%	35%
<b>West</b>	1784	26%	23%

### C. Panelist Recruitment Protocol

Panelists were recruited using the following method:

- A significant proportion of volunteers were recruited via an initial public relations and social media campaign led by the FCC. This included discussion on the FCC website and on technology blogs, as well as articles in the press regarding the study.
- We reviewed the demographics of this initial panel to identify any deficiencies with regard to the sample plan described above. These goals were set to produce statistically valid sets of volunteers for demographics based on ISP, speed tier, technology type, and region. This initial pool of volunteers was then supplemented by the participating ISPs, who sent out an email to customers in desired demographics that were under-represented in the pool of publicly-solicited volunteers. Emails directed interested volunteers to contact SamKnows in regards to participation in the trial. At no time during this recruitment process did the ISPs have any knowledge regarding which of their customers might be participating in the trial. In almost all cases, ISP engagement in soliciting volunteers enabled us to meet desired demographic targets.

The mix of panelists recruited using the above methodologies varied by ISP.

A multi-mode strategy was used to qualify volunteers for this trial. The key stages of this process were as follows: