

Deliverable to:

Nevada Office of
Health Information Technology



Health Information Exchange (HIE)
Broadband Analysis

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1 – Executive Summary

In order for health information exchange (HIE) to become more widely adopted among Nevada's health care providers, access to broadband is a foundational requirement for the provider community. The purpose of this report is to broadly assess broadband capacity within Nevada's health care provider community. It contains findings from a broadband analysis of the State of Nevada and compares this analysis to how health care providers wishing to participate in HIE are impacted by the availability of broadband.

A key finding pertaining to provider access to broadband is that almost 3% of the health care entities in the state of Nevada do not have access to wireline broadband service. As a result, the providers in these areas may have difficulties exchanging health information.

There are 6,011 health care entities in Nevada, of which 91% are located in urban areas. 90% of providers in these areas typically have two or more options for wireline or wireless broadband.

While urban providers typically have multiple options for broadband access, rural providers may find participating in HIE difficult due to slow or limited broadband options. This analysis explores broadband options to providers, associated speeds of broadband, and gaps in broadband access by the provider population.

2 – Broadband Analysis

2.1 Overview

Health information exchange (HIE) allows secure transmission of clinical data – e.g. patient history, lab orders and reports, medical images, prescription data, etc. – between disparate health information systems. Eligible providers and hospitals participating in the Electronic Health Record (EHR) Incentive programs for Medicaid and Medicare must demonstrate “meaningful use” of their EHR system to be eligible for incentive payments.

Broadband requirements for providers will continue to increase as more health information is exchanged electronically and as the meaningful use (MU) requirements for HIE become more demanding in subsequent stages. For example, during Stage 1 MU, providers are required to incorporate 40% of lab results as structured data within their EHR. While Stage 2 and Stage 3 MU requirements have not yet been finalized, the Office of the National Coordinator for Health IT (ONC) is proposing that for Stage 3, 90% of lab results need to be incorporated as structured data within an EHR.

This analysis assesses the current broadband options available to providers in the state of Nevada using data from the National Plan and Provider Enumeration System (NPPES), the State Broadband Initiative, the National Broadband Map, and the Ookla NetIndex. (For more information on the data sources, refer to Appendix A.)

2.2 Nevada Demographics

Nevada is the 7th largest state by total area, 35th by total population, and 42nd by population density. Nearly 72% of the state’s population lives in Clark County (Las Vegas), Washoe (Reno-Sparks) and Lyon (Fernley) counties. The consolidated municipality of Carson City accounts for 20% of the state’s population. It is important to note that

Nevada Demographics at a Glance	
Total area (sq. Miles)	110,572
Population	2,721,138
Households	1,015,191
Health care Entities	6,011
% of population with > 3Mbps broadband access	99.4%

91% of the state's population lives in approximately 15% of the total geographic area.

2.2.1 Broadband Demographics

Broadband coverage is measured by the percent of population that has access to one or more broadband providers, not by total geography covered by broadband. As the 7th largest state and 42nd by population density, Nevada has large swaths of geography with no wireline broadband coverage¹. Despite Nevada's predominately rural geography, over 97% of the population has access to download speeds greater than 3 Mbps and upload speeds greater than 768 kbps.

2.2.2 Health Care Provider Demographics

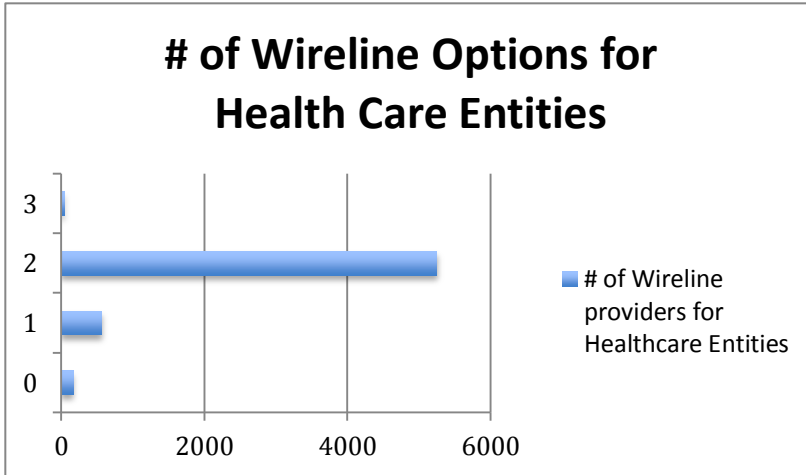
As of March 2011, there are 6,011 health care entities in the state of Nevada, including hospitals, clinics, individual and group practices, and ancillary services. 91% (5,492) of health care entities are located in the urban counties.

2.3 Broadband Landscape for Health Care Providers

2.3.1 Wireline Access

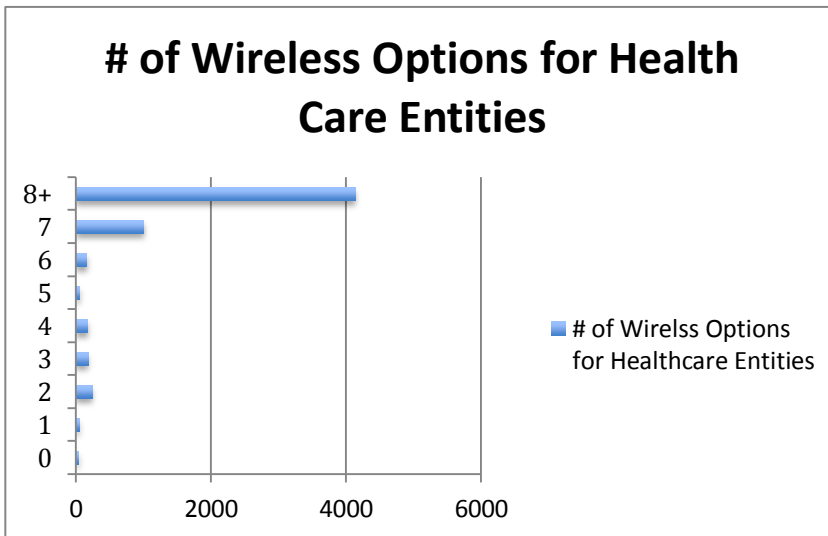
97% of the state's population has wireline broadband access with download speeds greater than 3 Mbps and upload speeds greater than 768 kbps. In addition, 97% of the health care entities in the state have this same level of access. The following graph illustrates the number of wireline options available to the general population and health care entities within the state.

¹ Satellite broadband is available in nearly all geographic regions of Nevada. Speeds for satellite broadband currently max out at 1.5 Mbps for download and 256 kbps for upload. In August 2011, a new ViaSat 1 satellite will go online, promising much higher bandwidth – 8 Mbps download and 2 Mbps upload.



2.3.2 Wireless Access

Nearly 70% of the population and health care entities have access to eight or more wireless providers. This includes terrestrial wireless services, as well as satellite broadband services. The following graph illustrates the number of wireless options available to the general population and health care entities.



2.3.3 Broadband Map for Health Care Provider Community

As part of this analysis, a map of broadband availability for health care providers in Nevada was developed using an online GIS tool offered through Google. The map can be found at the following link: <http://www.google.com/fusiontables/DataSource?snapid=S207096qqqT>

Below is the map color-coding for wireline options available to health care providers:

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- Red: 0 wireline options
- Yellow: 1 wireline option
- Green: 2 or more wireline options

2.4 Broadband Availability by County

Broadband availability is extensive in the urban areas of Las Vegas, Reno-Sparks, and Carson City. Nearly all the population in these areas has at least one option for broadband with download speeds greater than 3 Mbps. The following table illustrates the levels of broadband penetration in these areas. 93% of the state's health care entities are located in these five counties.

County	Population	Health Care Entities	Download > 3 Mbps
Carson City	53,672	204	100.00%
Churchill	25,794	56	99.96%
Clark	1,952,384	4,173	99.91%
Washoe	413,880	1,041	99.70%
Douglas	46,157	104	97.95%

The five counties with the lowest broadband availability are listed below. Nye County, which is fifth on the list below, has broadband available for more than 90% of the county population. Thirteen of Nevada's seventeen counties have broadband availability for 90% or more of population.

County	Population	Health Care Entities	Download > 3 Mbps
Esmeralda	725	1	31.66%
Eureka	1,516	6	59.00%
Mineral	5,110	19	85.64%
White Pine	10,428	27	88.64%
Nye	51,813	91	90.50%

2.5 Real-world Broadband Speeds and Cost

Real-world broadband speeds can vary significantly from maximum advertised speeds. This section attempts to quantify some of these differences using real-world data from the Ookla NetIndex, which is based on actual SpeedTest.net results. SpeedTest.net is a Web site for checking download and upload speeds, as well as latency. Broadband users can use the site to ensure the bandwidth they are paying for is the bandwidth they are receiving. The NetIndex is a benchmark of broadband speeds world-wide based on SpeedTest.net results. The following table describes current results in the state of Nevada².

Average Download Speed	10.13 Mbps
Average Upload Speed	2.7 Mbps
Average Price/Mbps	\$6.39
Promise Index	88.8%

The Promise Index is a measure of how close the actual download/upload speeds are to the advertised download/upload speeds. In the state of Nevada, the typical speed is 89% of the promised (advertised) speed. For example, a broadband connection advertised as a 10Mbps in Nevada would, on average, provide 8.88 Mbps of real-world performance. The average price/Mbps can be used to approximate the cost for specific level of service. For example, a 10Mbps connection would cost, on average, \$63.90 in the state of Nevada.

The NetIndex provides average download/upload speeds for a number of communities within the state of Nevada. Where available, price per Mbps and Promise Index are also included in the table.

Area	Samples	Download (in Mbps)	Upload (in Mbps)	\$/Mbps	Promise Index
Carson City	1,807	14.95	1.78		95.7%
Incline Village	369	14.83	2.40		

² 2,038,078 speed tests were performed in the state of Nevada between May 4, 2011 and June 2, 2011. The NetIndex is based on a random sampling of 63,276 of these tests.

Area	Samples	Download (in Mbps)	Upload (in Mbps)	\$/Mbps	Promise Index
Boulder City	128	13.49	3.99		
Fallon	321	12.86	2.00		
Fernley	431	12.82	1.66		
Gardnerville	620	12.63	1.40		
Reno	11,332	11.33	1.34	\$6.52	88.8%
Sparks	2,733	10.47	1.57	\$6.03	93.6%
Henderson	6,077	10.40	3.56	\$5.76	87.0%
Minden	306	9.78	1.19		
Las Vegas	34,857	9.51	3.31	\$6.58	86.1%
Mesquite	449	9.50	3.16		
North Las Vegas	2,629	8.67	2.85	\$6.21	81.1%
Pahrump	165	3.88	0.48		
Elko	190	3.39	0.93		
Totals					

2.6 Conclusion

Broadband speeds in Nevada, particularly in urban areas, appear quite sufficient to support current levels of HIE. Most health care entities in the state have more than one option available for broadband access. However, some rural areas – and even some pockets within urban areas – are underserved for broadband. Health care entities in these areas may find the HIE components of MU difficult to achieve with insufficient broadband available.

Currently, nearly 3% (162) of the health care entities in state are unable to get any kind of wireline broadband service. Wireless may potentially fill these gaps, particularly as new satellite technologies (e.g., ViaSat 1) go online.

Appendix A - Broadband Analysis Methodology

Data Sources

The following data sources were used to perform this broadband analysis:

- NPPES NPI database (March 2011 release)
- Google Geocoding API (<http://code.google.com/apis/maps/documentation/geocoding/>)
- National Broadband Map – Census API (<http://www.broadbandmap.gov/developer/>)
- National Broadband Map – Geography Lookup API (<http://www.broadbandmap.gov/developer/>)
- National Broadband Map – Speed Test API (<http://www.broadbandmap.gov/developer/>)
- National Broadband Map – Wireless Broadband API (<http://www.broadbandmap.gov/developer/>)
- National Broadband Map – Wireline Broadband API (<http://www.broadbandmap.gov/developer/>)
- Ookla NetIndex (<http://www.netindex.com/download/3,99/Nevada/>)

Methodology

NPI data (as of March 2011) was downloaded from the National Plan and Provider Enumeration System (NPPES). Data was filtered on providers whose business practice locations are in the state of Nevada.

Each unique Nevada address was geocoded using the Google Geocoding API, providing an exact latitude and longitude for nearly all Nevada practice addresses³.

Geocoded addresses were mapped to data from the State Broadband Initiative⁴ and National Broadband Map⁵. Using the latitude and longitude, practice addresses were mapped to counties, census blocks and census places. Speed test data was downloaded by state, county, and census place and cross-referenced to practice addresses. Wireline and wireless provider

³ Less than 0.2% of addresses in the NPI database could not be geocoded because the address was incorrect.

⁴ <http://www2.ntia.doc.gov/SBDD>

⁵ <http://www.broadbandmap.gov/>

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data (May 2010) reported to the State Broadband Data and Development program was downloaded for every practice address (using latitude and longitude).

Appendix B - Broadband Task Force

In July 2009, Governor Jim Gibbons issued an Executive Order establishing the 12-member Nevada Broadband Task Force to ensure broadband accessibility, availability, affordability, and reliability across the State. The mission of the Broadband Task Force is to identify and remove barriers to broadband access and identify opportunities for increased broadband applications and adoption in un-served or underserved areas of Nevada. The Broadband Task Force has provided oversight of the ARRA funding received for broadband mapping and data management, and is charged with ensuring grant compliance.

Broadband connectivity for health care providers is critical to successful HIE implementation, EHR adoption, and meaningful use. Without broadband connectivity for HIE, it will be difficult for certain eligible providers to qualify for EHR incentive payments. Providers in Nevada's rural counties are often underserved by broadband service or have no service available. The Broadband Task Force has been coordinating efforts with the State Health IT Coordinator and the Nevada Health IT Blue Ribbon Task Force, since November 2009, regarding overlapping priorities and goals. The State Health IT Coordinator anticipates overlaying the results of this assessment with those of the State broadband mapping project to determine how the Office of Health IT and the Broadband Task Force can collaborate effectively to meet HITECH Act requirements.