



Status Report

Broadband Advisory Committee

City of Horseshoe Bay, Texas

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Background	3
Technology Context	4
HSB Consumer Expectations	5
Current HSB Residential Providers	6
Summary & Recommendations	6
Wired Service	6
Northland Cable	7
Frontier	7
Wireless Service	7
VGI Technology	7
Zeecon	7
National Cellular Providers	7
Satellite Providers	8
Expanding HSB Broadband Coverage	9
Wired	9
Background	9
Density	9
Installation Cost	9
Recommendations	10
New Conduit Installation	10
Existing Conduit Reuse	10
Wireless	11
Background	11
Terrain	11
Other recommendations	11
Immediate	11
Long-range	11
Expanding Frontier Coverage	12
Selective Investment	12
Conclusion	12
Appendix A - Committee Members	13



Background

In 2015, the City of Horseshoe Bay established a Long-Range Planning Advisory Committee. A survey¹ of Horseshoe Bay citizens to collect priorities discovered improved residential broadband service was a high priority goal:

- **91% of respondents** described their need for high speed internet access as **high or moderate**.²
- **81% of respondents strongly support** prioritizing efforts to improve broadband options
- Broadband improvement was the **second-highest priority of 19 initiatives**; only surpassed by protecting Lake LBJ from environmental threats.
- In the open comments section, one respondent described broadband service as “*the most inconvenient thing about living in HSB!*”

On 18 Oct 2016, the City approved the Comprehensive Long Range Plan³. A key action in that plan was to establish a Municipal Broadband Advisory Committee (MBAC) to explore options for improved broadband service. The City’s Long Range Plan⁴, approved 18 Oct 2016, describes the Committee’s charter as:

Goal: Ensure high quality broadband internet access to support the professional and social needs of all citizens.

Action Items:

1. Establish a Municipal Broadband Committee (MBAC) drawn from local high level talent in the field and regional resources to explore potential service options
 - a. Inventory existing internet coverage and assets within the city’s internal services and the community at large
 - b. Explore potential partnerships to ensure high speed internet services with flexibility for growth
 - c. Present a recommendation to the city council for consideration to provide increased broadband internet
2. Leverage regional, state, and industry relationships and identify feasibility options for increased broadband internet services

The MBAC was kicked off in January 2017.

¹ <http://horseshoe-bay-tx.gov/DocumentCenter/View/1247>

² In the survey, “high” was defined as “*full time employment from home office, frequent leisure streaming, gaming, etc.*” and moderate as “*some leisure streaming, online shopping, tracking investments, etc.*” Respondents could also choose “*low or not at all: emailing, social media, reading news, etc.*”

³ <http://horseshoe-bay-tx.gov/DocumentCenter/View/1270>

⁴ <http://horseshoe-bay-tx.gov/DocumentCenter/View/1270>



Technology Context

There are two categories of broadband Internet access types: wired and wireless. Each has three primary sub-categories:

- **Wired Internet Services**
 - **Fiber To The Home (FTTH)** - service provided over fiber optic cabling to the home
 - **Cable Internet** - service provided over cabling historically used for cable TV service
 - **Digital Subscriber Line (DSL)** - service provided over cabling historically used for telephone service
- **Wireless Internet Services**
 - **National Cellular Operators** - service provided by national cell phone operators such as Verizon, AT&T or Sprint
 - **Local Fixed Wireless Operators** - service provided by local fixed wireless operators, using a combination of unlicensed line-of-sight radios, licensed line-of-sight radios or licensed cellular radios.
 - **Satellite Operators** - service provided by satellite operators such as Exede or HughesNet.

Historically, the Internet access preference is: fiber, cable, DSL, local fixed wireless, cellular wireless, satellite wireless. It is possible but unlikely this preference order will change as technology evolves. The order has been roughly stable for many years, through many iterations of technology.

Wired Internet access options have higher speeds and fewer restrictions, but require physical cabling to each home. Wireless options do not require cabling, but frequently have lower speeds and a variety of other technology or business constraints.

For example, unlicensed wireless service can be rapidly deployed, but since it is unlicensed, the service is subject to interference at any time, degrading or destroying service.

The national cellular and satellite wireless operators use licensed frequencies and are not subject to spectrum interference, but their packages often include “data caps.” A typical data cap is around 20 gigabytes (GB) transferred per month, with slower transfer rates or per-GB fees thereafter. A 2 hour Netflix movie in High Definition uses about 6 gigabytes, so after three Netflix movies per month, service is either significantly more costly (not unusual to be \$15/GB or \$45/movie!) or speeds are significantly reduced.

HSB Consumer Expectations

Consumer expectations of Internet service are evolving every year. Anyone who moves to Horseshoe Bay from a developed urban or suburban area will expect internet service with cost and speeds roughly equivalent to cable internet service, the most common suburban internet access method.

For example, Spectrum offers 100Mbps Internet service in Lakeway for \$45/month with no data caps. By contrast, a typical package from a local fixed wireless operator might be 5 Mbps for \$45/month.

In 2015, the FCC defined “broadband” as minimum speeds of 25Mbps down and 3 Mbps up.⁵ For the purposes of planning, the committee defines four levels of consumer expectations:

- **Excellent Internet:** greater than 100 Mbps down and 10Mbps up
- **Good Internet:** greater than 25 Mbps down and 3 Mbps up⁶
- **Acceptable Internet:** greater than 4Mbps down and 1 Mbps up⁷
- **Minimum Internet:** greater than 768kbps down

Data usage caps of any kind are unacceptable.

We believe all areas the City have at least **Acceptable Internet** available today at a reasonable cost.

⁵ <https://www.fcc.gov/document/fcc-finds-us-broadband-deployment-not-keeping-pace>

⁶ Matching the FCC’s minimum definition of “broadband”

⁷ These were the FCC’s “broadband” minimum thresholds prior to 2015

Current HSB Residential Providers

Below are the primary companies currently providing residential Internet service to Horseshoe Bay via first-party infrastructure: cabling in the ground or wireless infrastructure. Businesses, especially those on 2147 where cabling is more easily available, may have access to a wider variety of service providers. Residential customers may also be able to negotiate custom services.

Summary & Recommendations

If Northland Cable provides wired **Cable Internet service** to your home, it is most likely your best option.

If Frontier provides wired **DSL Internet service** to your home and **Acceptable Internet** speeds are available, it is most likely the next best option.

If your home is not covered by Northland or Frontier, **local fixed wireless service** from VGI Technology or Zeecon are probably the next best option. Service from these providers will be the most likely option for the majority of Horseshoe Bay homes.

In the unlikely event your home is not covered by one of these four providers, a national cellular or satellite provider may be your only option.

Provider	Type	Preference
Northland Cable	Cable Internet	Best option, if available
Frontier	DSL Internet	Second best option, if Acceptable Internet speeds available
VGI or Zeecon	Local fixed wireless	Most likely the best option for the majority of HSB homeowners
Satellite or National Cellular	Satellite or National Cellular	Last resort options

If your home or business is along 2147 or another roadway with above-ground utilities, you may have a wider variety of options.

Wired Service

Wired service is available to a small percentage of HSB citizens.

Northland Cable

Northland Cable provides **Cable Internet Service** to a subset of homes in Horseshoe Bay Proper. Availability and package options are available at <http://yournorthland.com>.

Good Internet speeds are available, though relatively few HSB homes are within Northland's coverage area.

Frontier

Frontier provides service via **Digital Subscriber Lines** to several neighborhoods in Horseshoe Bay. Availability and package options are available at <http://frontier.com>.

Frontier covers more homes than Northland, but speeds are generally lower.

Wireless Service

Wireless service from at least one provider is available to all homes in Horseshoe Bay.

VGI Technology

VGI Technology provides local fixed wireless Internet access via unlicensed line-of-sight radios and licensed cellular. Availability and package options are available at <https://vgitechnology.com/>.

Good Internet speeds are available. Plans do not include data caps.

Zeecon

Zeecon provides local fixed wireless Internet access via unlicensed line-of-sight radios. Availability and package options are available at <http://www.zeecon.com/>.

Acceptable Internet speeds are available. Plans do not include data caps.

National Cellular Providers

All major national cellular providers have service available in Horseshoe Bay: AT&T, Sprint, Verizon and others. Availability and packages are available from the carriers websites.

Good Internet speeds are available, but none of the major cellular providers offer service that is generally suitable as the primary Internet connection in a home. All plans include data caps ("Unlimited" data plans may be throttled) and some providers may not sell the hardware necessary to serve as a WiFi bridge.

Satellite Providers

Exede and HughesNet both provide satellite Internet service to Horseshoe Bay. Availability and coverage options are available at <https://www.exede.com/> or <https://www.hughesnet.com/>.

Good Internet speeds are available. Most plans include data caps. Even with good speeds, satellite service experience can be negatively affected by high latency: it may take a couple seconds for your system to respond after a click.



Expanding HSB Broadband Coverage

Wired

Background

Meeting the expectations of citizens relocating from a suburban or urban area requires wired Internet service to the home, something available to only a small fraction of Horseshoe Bay homes today.

When an Internet Service Provider considers investment in cabling infrastructure in an area, there are two primary metrics:

- **Density:** number of potential new customers
- **Installation Cost:** cost of installing the new infrastructure

Density

In a typical neighborhood with above-ground utilities, providers generally require **50 homes per mile** to justify the investment.

Horseshoe Bay has about 3400 homes on 150 miles of roadway, or **23 homes per mile**. In general, ISPs cannot justify the installation cost of new cabling until the number of homes in Horseshoe Bay doubles.

While there are certain neighborhoods in the City with more than 50 homes per mile that still do not have cabling to the home, those neighborhoods are separated from the main roadway by miles of roadway with low density, increasing the overall cost of installation.

Installation Cost

In addition to the low density, Horseshoe Bay has a higher than average cabling installation cost. In a typical neighborhood with above-ground utilities, cabling is strung from the poles along with power lines.

Horseshoe Bay is primarily buried utilities, and there are only three conduits in ground:

- power conduits owned by Perdnales Electric Co-op,
- water pipes owned by the City and
- sewer pipes also owned by the City.

There are no conduits specifically dedicated to data cabling installation. Already costly, installation of new conduit in Horseshoe Bay is further increased by the rocky terrain. A Rough Order of Magnitude estimate from a trenching contractor estimates the cost of new conduit installation at \$30 per foot. That's \$23M to cover all of the City's 150 miles of roadway, and \$8M for the most densely populated 53 miles of roadway.

Since new buried cabling installation costs are significantly higher for Horseshoe Bay than typical above ground utilities, the density threshold for an ISP to justify the business case is likewise increased above the typical 50 homes per mile.

Recommendations

New Conduit Installation

New housing developments in Horseshoe Bay should include conduits for not only power, water and sewer, but also data. When installed at the same time as other utilities, data conduits are a relatively insignificant cost. While a provider may not have existing conduit to the neighborhood entrance, the cost of a single new conduit to attach to an already-wired neighborhood is a more feasible investment.

Similarly, new homes should include data conduits from the street to the home. When a data conduit is available at the street, it will further decrease the cost of installation for the provider and encourage investment.

Finally, the City should consider installation of data conduits along the roadway for all new roadwork. Since the majority of conduit installation cost is trenching and not the conduit itself, installation alongside other projects significantly lowers cost. Not only will it gradually increase overall conduit density, conduits in certain areas may provide the opportunity for connecting high density but currently disconnected neighborhoods. In some cases, that new connectivity may be sufficient for an ISP to justify their own investment within the neighborhood.

For example, the recent roadway renovation project could have enabled the installation of conduit through a large percentage of the City with a fractional increase in cost.

Existing Conduit Reuse

In some areas, it may be possible to use PEC's electric conduit for both power as well as data cabling. PEC has recently launched a strategic study to assess feasibility of such initiatives. The City should closely track PEC's study and ensure the City's feedback is duly considered.

Some municipalities around the country have run cabling through existing water and sewer pipes. However, in the typical installation the sewer and water pipes are large 18" to 36" pipes. Since the cost of digging is so high, Horseshoe Bay uses a pressurized sewer system with 4" pipes. Water pipes are also a more typical 4". The smaller size of these pipes makes their

reuse unlikely, but the City should investigate the feasibility with a contractor familiar with those services.

Wireless

Background

Wireless Internet service will be a critical part of the City's Internet access plan for many years to come. The ability of wireless services to cover a wide geographic area, irrespective of the density and conduit availability, means it will be the primary option for many parts of the City.

While there are national level wireless Internet providers (such as the major cellular companies and satellite Internet companies), local fixed wireless providers are the strongly preferred option.

Most areas of the City today have coverage available from one or more local fixed wireless providers. The primary challenge that routinely arises is terrain / line of sight.

Terrain

The most ubiquitous wireless internet equipment requires a clear line of sight from an antenna on your home to the provider's antenna. The varied terrain, especially in HSB West, combined with plentiful trees, can make clear line of sight potentially challenging.

The City leases space on City water towers to local fixed wireless providers. The water towers provide good line of sight to most homes in Horseshoe Bay, though properties in HSB West and along the waterfront may be restricted. Homes in other areas may be restricted due to trees or other obstacles.

Other recommendations

Immediate

The City should establish annual business reviews with all HSB Internet Service Providers. Regular discussion and relationships will ensure the City and the quality of our internet service remains a recognized priority.

The City should consider an Internet infrastructure fund. Today, there is no dedicated funding available to finance Internet infrastructure projects. One revenue source to consider could be the new Municipal Access Fee.

Long-range

Expanding Frontier Coverage

Frontier has several dormant DSL stations around Horseshoe Bay. Activation of these stations would provide improved DSL service to a larger number of HSB homes. We recommend the City work with Frontier to accelerate activation of these stations and improve the quality and availability of DSL service.

Selective Investment

While it is currently impractical for the City to fund a major wired cabling project, there may be opportunities to selectively install cabling conduit at a reasonable cost that notably improves service within a neighborhood. We recommend the City continue to explore creative opportunities with service providers to improve service through selective investment.

Closing

In closing, we recommend the Horseshoe Bay Municipal Broadband Advisory Committee continue operating through at least 2018. The City's collective internet access capabilities are complex and solutions unclear. However, we are optimistic we can improve the quality of internet access for Horseshoe Bay citizens with continued investigation and review.

The committee welcomes feedback, ideas or collaboration from anyone with telecoms experience that may help navigate the complexities and develop creative solutions.

Finally, we encourage the citizens of Horseshoe Bay to continue to raise their concerns with current Internet access options. There are no simple solutions. Substantively improving our internet access will require courage, creativity and grit over multiple years. As a community, we need the continued discussion to inspire ourselves and the community leadership to finding a path forward.

Horseshoe Bay Municipal Broadband Advisory Committee
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Appendix A - Committee Members

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