Ottawa County

Department of Strategic Impact

Starlink vs Fiber

Why a new fiber optic network is a better option for Ottawa County and its citizens

Why Starlink satellite internet won't solve Ottawa's connectivity woes

Our world is increasingly wireless. The business of life is conducted via our phones, laptops, tablets – all thanks to a high-speed internet connection over Wifi.

With so much of our lives completely untethered, one might question why Ottawa County's Digital Inclusion Strategy efforts are focused on physical solutions – such as fiber optic cables and hybrid wired/wireless systems – to deliver affordable and reliable broadband internet service to residents and businesses in need. After all, isn't **Starlink** well on the way to providing affordable and reliable wireless internet service worldwide?

Not exactly. Elon Musk himself has said Starlink service isn't meant to replace other technologies.[1] "You can think of Starlink as filling in the gaps between 5G and fiber, and really getting into parts of the world that are hardest to reach," Musk told Justin Springham, publisher of tech magazine Mobile World Live, in a 2021 interview.

It's true satellite internet is a gamechanger for millions without access worldwide. But compared to fiber connections from conventional internet service providers (ISPs), Starlink service is sub-par and expensive. Over the next four pages, we will explain why.

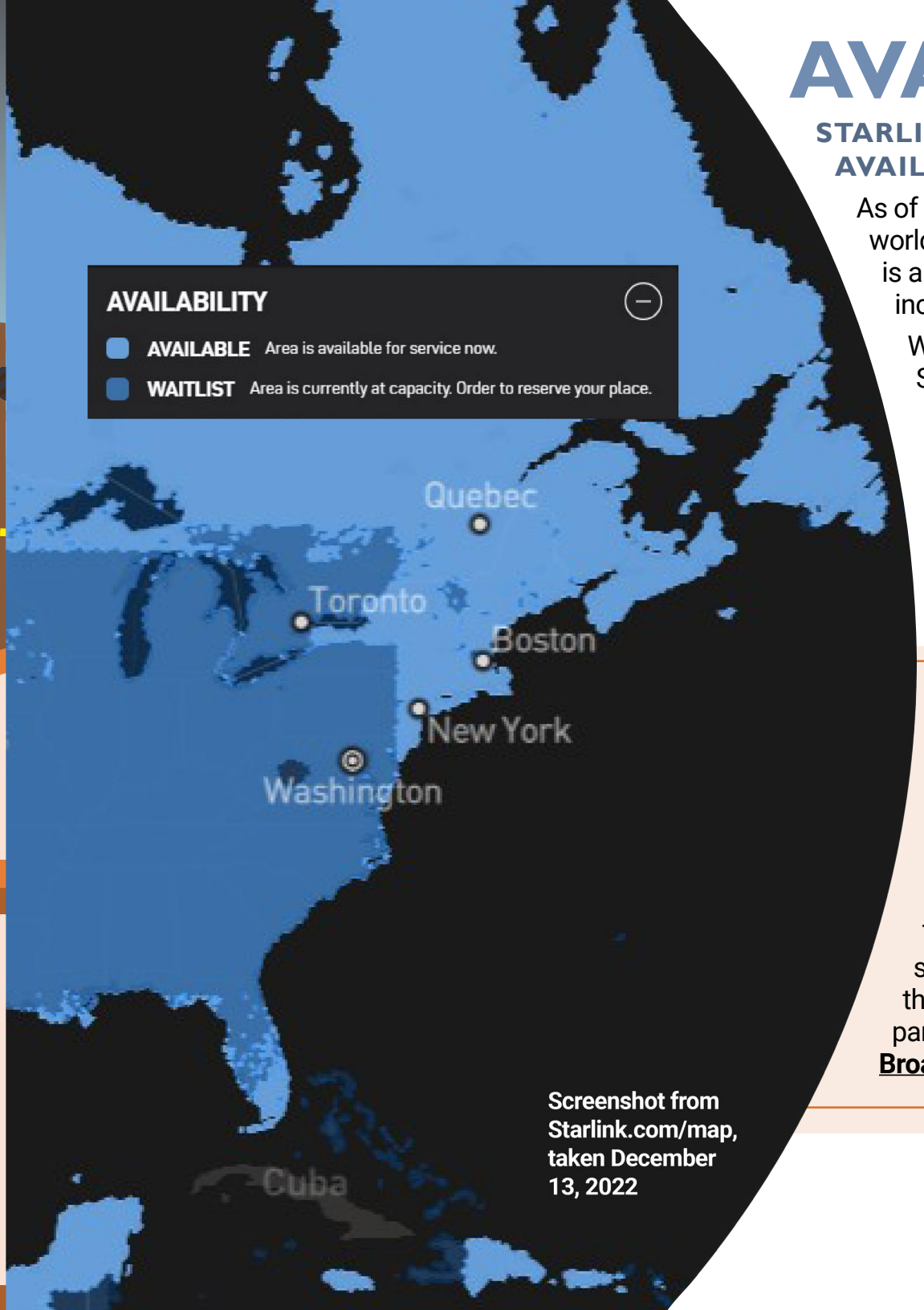
AVAILABILITY

STARLINK IS NOT READILY AVAILABLE IN WEST MICHIGAN

As of spring 2023, Starlink's subscriber base was about 1 million worldwide. Ottawa County's population is nearly 300,000. Starlink is also only available in select regions. Most of the eastern U.S. – including the Lower Peninsula – is on a indeterminate wait list.

Why? There aren't nearly enough satellites. As of February 2023, Starlink had more than **3,900 satellites in orbit.**[2] That sounds like a large number, but SpaceX (Starlink's parent company) has stated that it may take as many as **42,000** to provide consistent and reliable global service.

Starlink is launching more satellites into space regularly. However, there is no way to know when/if Starlink will achieve the blanket coverage needed to reach all areas. Hurdles include rocket costs and federal regulations.



Screenshot from Starlink.com/map, taken December 13, 2022

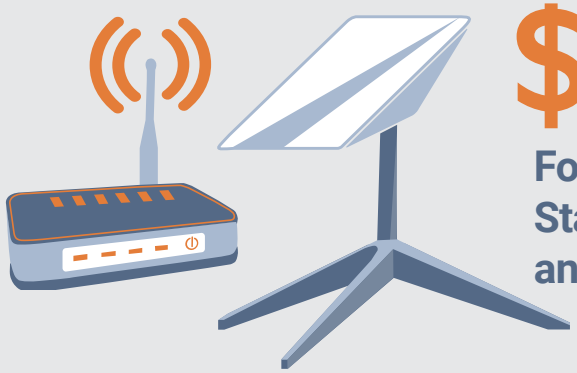
FIBER LINES CAN BE DEPLOYED QUICKLY

Unlike satellite internet, fiber is a proven and reliable technology. Once network plans are finalized, and necessary funding is obtained, Ottawa County and its partners will be able to build a fiber network quickly.

It is true that after the fiber network goes live, there will be some areas it will not directly or immediately reach. These areas may need to continue to rely on fixed wireless solutions. To ensure better service in those more rural areas, the County plans to boost wireless signals by recruiting partners to build more towers. Learn more at **MiOttawa.org/Broadband.**

AFFORDABILITY

A HIGH COST OF ENTRY



$599

For proprietary Starlink router and dish

and **$110** monthly service fee

VS. TRADITIONAL ISPS

Spectrum

AcenTek Ascending Technology

xfinity

123NET

at&t

Average around **$50** per month for basic wired service

$10-$80 per month for wireless service

verizon

T-Mobile HOME INTERNET

STARLINK IS EXPENSIVE

Starlink charges new customers $599 for ground-based proprietary equipment, including a small dish antenna and router. After that, the basic subscription fee is $110 a month.

Starlink is increasing capacity. In December 2022 the FCC issued a key authorization[3] permitting SpaceX to launch up to 7,500 more satellites. However, to achieve their objective of five million subscribers, Starlink has estimated they will need more than 40,000 satellites. Until Starlink reaches that blanket coverage, costs will likely remain high.

GROUND-BASED ISPS ARE LESS EXPENSIVE

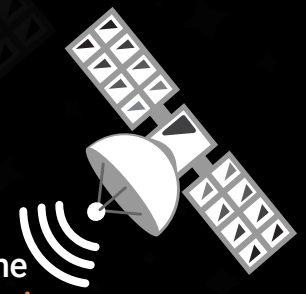
Conventional internet service providers cost significantly less than Starlink. For example, local business AcenTek (which serves the Allendale area) starts at $29.95 per month; Comcast Xfinity starts at $60; Charter's Spectrum starts at $50 per month; AT&T starts at $50 per month; and Ottawa newcomer 123NET promises $59 per month (once it becomes available in West Michigan).

Most of these ISPs allow you to rent necessary equipment, such as routers and modems, for fees ranging from $5-$15 per month. And, eligible households can receive up to $30 per month toward internet service if they qualify for the FCC's Affordable Connectivity Program, which most providers participate in.

Initial costs for wireless cellular data "hotspot" plans from providers like T-Mobile and Verizon range from as little as $10 per month to $80 per month, plus equipment rental fees.

However, connection charges are often waived if consumers are willing to sign a contract.

PERFORMANCE

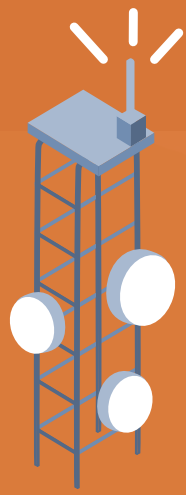


STARLINK SPEEDS ARE NOT CONSISTENT, AND AVERAGE SLOWER THAN FIBER.

Starlink promises download speeds ranging from 50Mbps-250Mbps. But the average download speed for Starlink service at the end of 2022 was around 53 Mbps, according to Ookla, a network testing and analysis company.[4] Upload speeds are advertised to be at least 20Mbps. During the same time period, the average speed for all other U.S. ISPs, according to Ookla, was between 150-160 Mbps.

Ookla also reported from the second quarter of 2021 to the second quarter of 2022, the number of unique Starlink users in the U.S. increased 200%. These kind of spikes have stressed the system, and have caused periodic drops in speeds and increases in latency, hence the need for more satellites.

The key to better performance is proximity to the receiver. Because of the sheer distance data needs to travel from your home to space and back, Starlink speeds will not reach fiber optic speeds any time soon. And, just like satellite TV, signal can be greatly affected by weather and terrain.



GROUND-BASED SERVICE IS FASTER, MORE RELIABLE

Wired service is reliable and consistent because service is only limited by the ability to install new cable. When connectivity problems do occur, it typically stems from equipment damage from animals, humans, or weather.

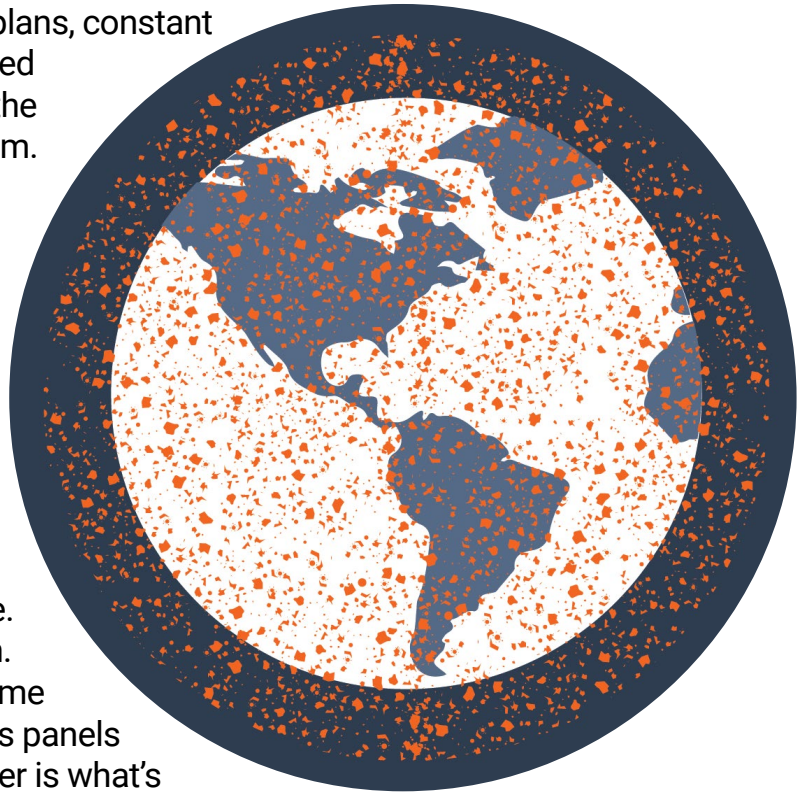
On the fixed wireless side, towers can be installed anywhere from a few hundred feet away from the end user to a mile or two, resulting in a much stronger and reliable signal. Weather, foliage, and terrain can affect performance, but the closer one is to the transmitter, the less of an issue they are.

LONGEVITY & ENVIRONMENTAL IMPACT

MORE SATELLITES = MORE 'SPACE JUNK', RAISE SAFETY QUESTIONS

The life expectancy of a Starlink satellite is approximately five-seven years. As of December 2022, there were less than 6,000 satellites orbiting Earth[5]. The FCC's recent approval of up to 7,500 additional Starlink satellites means SpaceX tech will quickly dominate the skies.

With potentially 42,000 satellites needed to provide the ultimate coverage Starlink plans, constant replacement will be needed. But replacement does not mean swapping tech – retired satellites are not retrieved. They are simply left to float around space or burn up in the atmosphere, creating "space junk," which is a growing and well-documented problem.



"The rising population of space debris increases the potential danger to all space vehicles, including to the International Space Station and other spacecraft with humans aboard ..." — NASA blog post, May 26, 2021[6]

While the number and effect satellites have on the outer space environment is still widely unknown, it is a concern. The number of live satellites circling the Earth is also an issue,[7] for astronomers – they are finding it more and more difficult to view the universe through the clutter.

FIBER OPTICS AND FIXED WIRELESS ARE MORE ECO-FRIENDLY

Compared to satellites, fiber optic cables are much more environmentally friendly. First, let's talk materials: the key component of a fiber optic cables is silicon dioxide. Typically sourced from sand, silicon is the second-most common element on Earth. Secondly, with an estimated lifespan of 40 years[8] , fiber is durable. When it does come time for a replacement, fiber can be upgraded or replaced with ease through access panels in buried conduit, reducing the frequency of major construction projects. Finally, fiber is what's referred to as a "passive" technology, meaning it does not need electricity to power it. Like sunshine traveling through a window pane, pulses of data-containing light travel through the glass fibers instantaneously.

In the world of fixed wireless, waste is also not much of an issue. Yes, some argue these create visual pollution, but with careful planning and public-private partnerships, towers can be more strategically placed. Additionally, as technology changes, tower users simply replace antennas or other equipment – much less expensive than rocket launches. With a life expectancy of at least 50 years, towers can be refitted numerous times. And, As towers become obsolete, they can be dismantled and scrapped.

TAKEAWAYS

BOTTOM LINE: STARLINK IS NOT THE CURE FOR OTTAWA COUNTY CONNECTIVITY

There is no doubt Starlink is helping hundreds of thousands in remote locales and conflict-ridden areas of the world. With its world-famous billionaire Elon Musk at the helm, the groundbreaking satellite service will continue to make headlines and be a player in the industry, as evidenced by its partnership with T-Mobile[9].

But with high upfront costs compared to conventional providers, lower-than-average speeds, waiting lists, and longevity questions, Ottawa County and its partners do not believe Starlink will be a solution for the masses. Ottawa County citizens need affordable and reliable access to high-speed internet today.

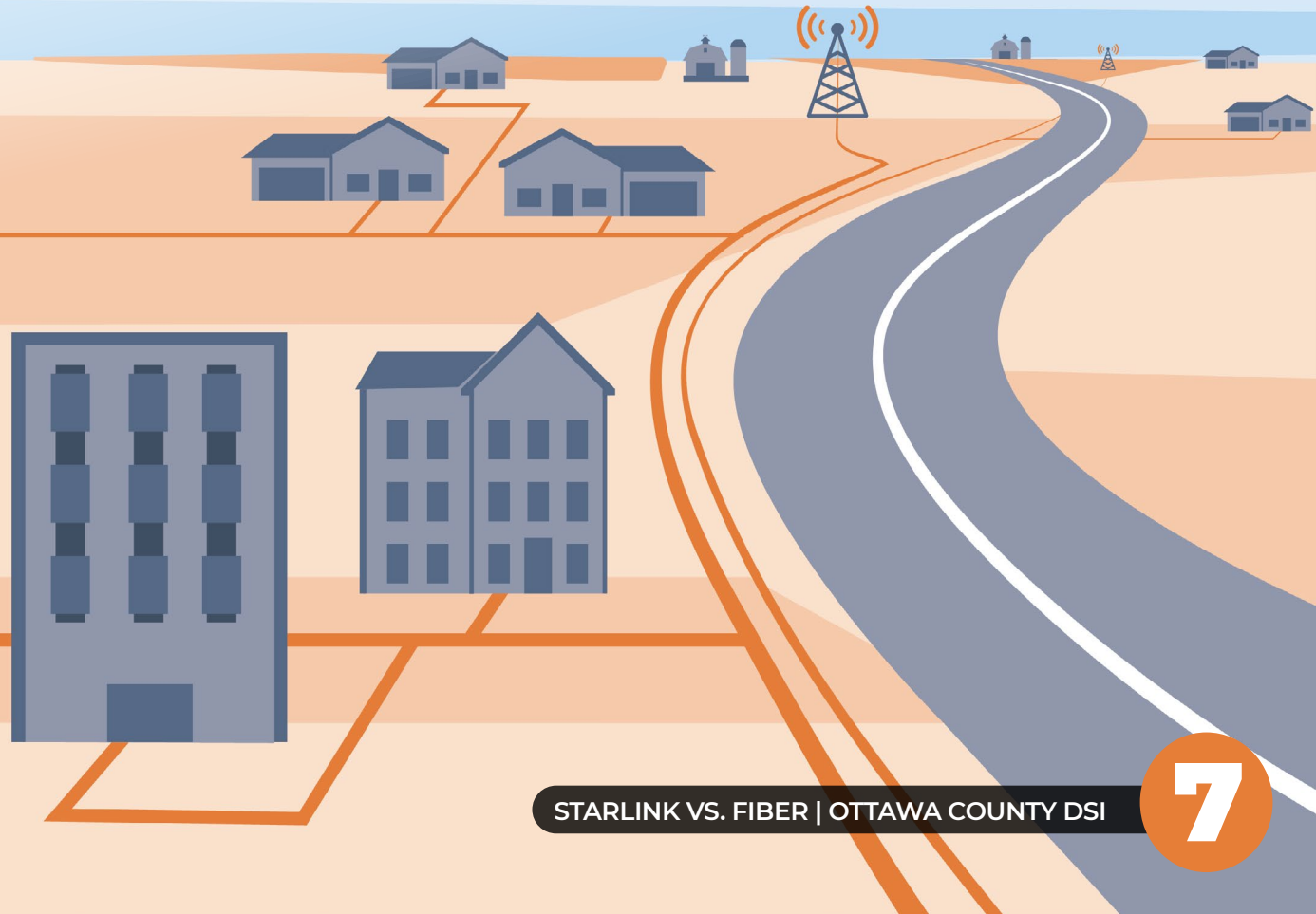
THE DIGITAL INCLUSION STRATEGY

The County and its strategic stakeholders are moving aggressively to improve and expand broadband service in order to achieve reliable and affordable access for all through its Digital Inclusion Strategy, which was launched in 2020.

Working with Urban Wireless Solutions, the Ottawa Area Intermediate School District, and additional community partners, Ottawa County conducted a Broadband Data Collection Survey in 2021. This survey revealed 10.5% of County households do not have access to fixed (wired or wireless) high-speed internet. Furthermore, 26% of those with fixed broadband access it at speeds slower than the FCC's minimum broadband threshold.

Armed with the data, the County and its partners are pursuing grants and other funding sources to build a new fiber optic network to bring high-speed internet access to those with no or insufficient access. This new network will be both open-access and carrier-neutral, meaning any provider can utilize the network, regardless of which company built it.

Additionally, to improve fixed wireless service in more rural areas, the County is planning to augment the new fiber network with additional towers.



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ACKNOWLEDGMENTS

Starlink vs. Fiber: Comparing and contrasting Elon Musk's satellite internet and broadband

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The purpose of Ottawa County's Digital Inclusion Strategy is to ensure all area residents and communities have access to affordable and reliable broadband internet service, necessary equipment, and digital literacy training.

Learn more at www.MiOttawa.org/Broadband

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