RURAL CONNECTIVITY TASK FORCE

FINAL REPORT

MARCH 2021

A PROJECT OF

APAS
Agricultural Producers Association of Saskatchewan

RURAL CONNECTIVITY TASK FORCE

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Agricultural Producers Association of Saskatchewan

For more information about the Rural Connectivity Task Force, visit apas.ca/connectivity.

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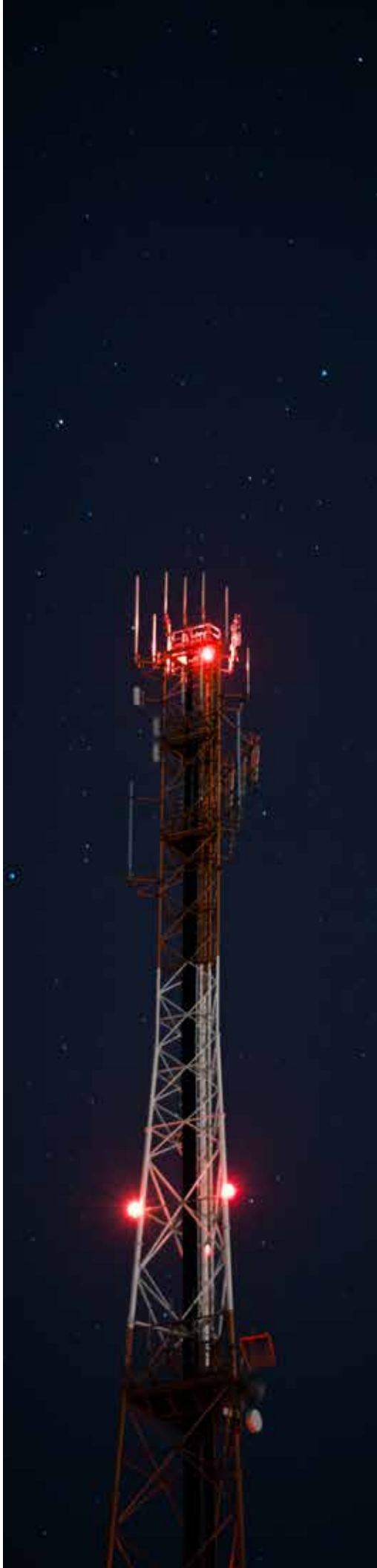


EXECUTIVE SUMMARY

In September 2020, the Agricultural Producers Association of Saskatchewan (APAS) launched the Rural Connectivity Task Force (RCTF) to research the technical and regulatory barriers to good rural connectivity, identify policy solutions, and advocate for change.

After extensive research and many meetings with key industry experts, the RCTF has found that although Canada was once a leader in delivering communications services, we are falling behind other nations in providing cellular and internet services to all areas.

We need to take another look at all policy options and available technologies to meet present and future connectivity needs.

Although Saskatchewan has a major advantage in retaining a publicly owned telecommunications company, when it comes to expanding service levels we face many hurdles due to our widely spread, low-density population.

Connectivity impacts the work, education, health and safety, and overall quality of life of rural residents.

Without good connectivity, rural communities cannot compete with their urban neighbours and risk losing their most important resource: people. In Saskatchewan, where industries like agriculture drive the economy, maintaining and building our vibrant rural communities is crucial.

Many technologies connect us to the internet, including fibre optic and copper wireline, and modems, towers, and satellites that connect us wirelessly. In Saskatchewan, with our immense geographic area and relatively small population, it is necessary to optimize the use of all these technologies.

More importantly, it is crucial that good public policy supports the effective use of public resources and incentivizes fair working relationships between the many players that must partner to ensure a high-functioning telecommunications network.

The RCTF has developed a series of recommendations organized into the following categories:

Working Together

Supporting shared access to infrastructure and fair partnerships between service providers.

Connectivity impacts the work, education, health and safety, and overall quality of life of rural residents. Without good connectivity, rural communities cannot compete with their urban neighbours and risk losing their most important resource: people.

Too Many Cooks in the Kitchen

Simplifying Canada's regulatory structure for greater accountability, transparency, and efficiency.

The Importance of Smaller Internet Service Providers

Supporting competition within the industry to ensure smaller players can survive, thrive, and support universal internet access.

Optimizing Public Resources

Optimizing government funding and managing spectrum effectively.

Regaining and Retaining Canadian Excellence

Ensuring that Canada takes a leadership role to build long-term sustainability within our telecommunications industry and infrastructure.

Taking Control of the Saskatchewan Advantage

Leveraging our Crown Corporations to ensure that Saskatchewan plays a leadership role in achieving universal connectivity and realising the social and economic benefits that come along with it.

Consumer Protection

Ensuring consumers are guaranteed high-quality, affordable internet service.

The Rural Connectivity Task Force has outlined key actions over the next 12 months to advocate for policy changes based on their recommendations. They will report back regularly on their progress to the APAS membership and other stakeholders, including the public.

INTRODUCTION: APAS AND RURAL CONNECTIVITY

APAS began working on the issue of connectivity in 2019, when we surveyed our members about their internet and cellular service levels.

At that time, most survey respondents told us they were dissatisfied with their service and experienced disruptions daily and sometimes several times a day.

Shortly after our initial survey closed the COVID-19 pandemic began, resulting in the move to remote work and education for families across Saskatchewan in the spring of 2020.

This added enormous pressure to the already inadequate connectivity infrastructure in the province. The internet simply could not keep up.

In July 2020, APAS launched a second survey to gather information about how COVID-19 was affecting rural internet and cellular service.

It quickly became clear that the problem of rural connectivity was made much worse by the pandemic. More needed to be done, and urgently. So, in September 2020 APAS launched the Rural Connectivity Task Force (RCTF).

Charged with researching the technological and regulatory barriers to improving rural internet and cellular service and developing policy recommendations to address them, the RCTF is made up of five agricultural producers from across the province:

Jeremy Welter, Chair, Kerrobert SK

Ian Boxall, Tisdale SK

Bev Pirio, Radville SK

Bill Prybylski, Willowbrook SK

Paige Stewart, Fillmore SK

The APAS Internet Speed Test completions to date show that ***over half of test takers are experiencing download speeds of less than 10 Mbps,*** *which is only a fraction of the 50 Mbps considered to be a sufficient internet speed for Canadians.*

Following six months of research and interviews, the RCTF has now completed the research phase of the project. Included in this final report are the Task Force's recommendations and supporting background information.

From September 2020 to February 2021, the RCTF met with key experts and service providers in the telecommunications industry, including:

Experts

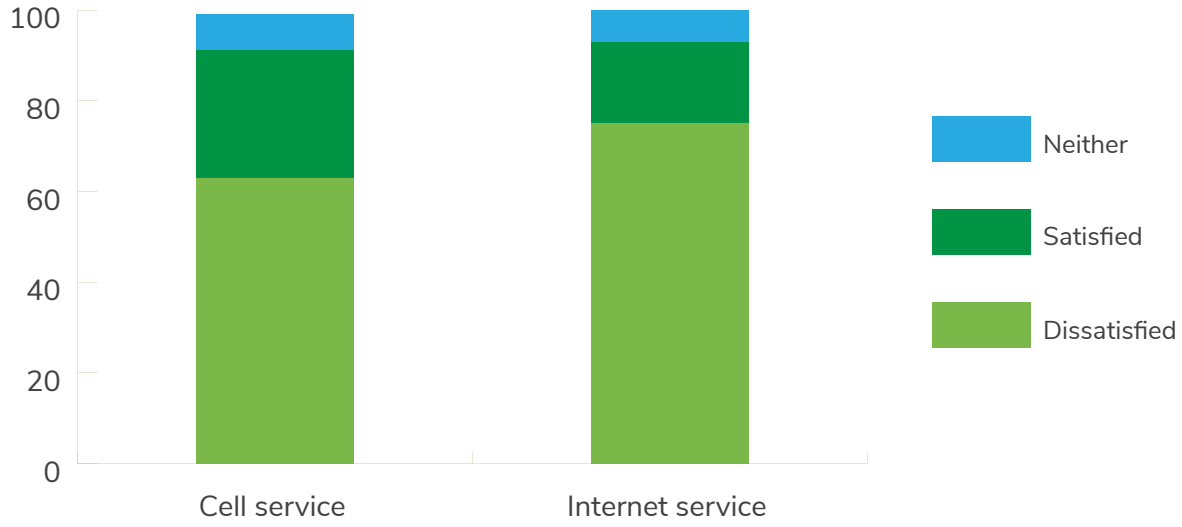
- Craig Dobson, MBA, Taylor Warwick Consulting Limited
- Michael McNally, PhD, Assistant Professor, School of Library and Information Studies, University of Alberta, Edmonton AB
- Reza Rajabiun, PhD, Research Fellow, Ted Rogers School of Management, Ryerson University, Toronto ON
- Gregory Taylor, PhD, Associate Professor, Department of Communication, Media and Film at the University of Calgary, Calgary, AB

Service Providers

- SaskTel
- Access Communications
- FlexNetworks
- Telesat
- Wood River Controls
- Redbird Communications
- KRAKR
- Gopher Net

Rural Connectivity Task Force members (left to right): Ian Boxall, Bev Pirio, Jeremy Welter, Bill Prybylski (missing: Paige Stewart).

2019 RURAL SERVICE SATISFACTION[23] (%)



In addition to meeting the key players, the RCTF wanted to develop a better understanding of existing internet service levels across the province. In other words, is rural internet as bad as we think?

To this end, APAS partnered with the Canadian Internet Registration Authority (CIRA) to develop an Internet Speed Test for Saskatchewan.

The test, which launched in September 2020 and has had over 26,000 tests completed to date, is a quick and easy way for individuals to see how fast their internet is in real-time.

It calculates download speed, upload speed, and latency, and can be repeated multiple times to see how internet speeds vary at different times of day or week, or in different locations on a property.

Take the Internet Speed Test at apas.ca/speedtest.

The Internet Speed Test completions to date show that over half of test takers are experiencing download speeds of less than 10 Mbps, which is only a fraction of the 50 Mbps considered to be a sufficient internet speed for Canadians.

Another goal of the RCTF is to improve public awareness and understanding of poor rural connectivity amongst the general public.

To help achieve this, APAS is partnering with Access Communications to produce *Connecting Saskatchewan*, a 60-minute television show focused on rural connsectivity, which will be broadcast province-wide in Spring 2021.

The importance of good rural connectivity cannot be overstated. Over the past two years, hundreds of rural residents have reached out to APAS to share their stories and frustration over what they see as unreliable and unaffordable internet service.

Many people report not getting the internet service levels they are paying for, and that their businesses, education, health and safety, and overall quality of life is negatively impacted by poor service, especially during COVID-19.

Going forward, APAS will continue to advocate for solutions to address this critical issue facing rural Saskatchewan.

Our internet service is so slow on the farm that our children could not participate in any interactive online learning. Videos won't load, Zoom meetings won't work. Our cell phone service has been a problem for our business for years, but while we were on quarantine after traveling we had to get in our vehicle and drive miles in order to download email or texts.

- APAS survey respondent

BACKGROUND INFORMATION

Internet in Canada

Although Canada was an early leader in internet connectivity, we have fallen well behind other nations when it comes to ensuring that all Canadians – particularly those living in rural and remote locations – can access **affordable** internet that is **fast enough** and **reliable enough** to meet their day-to-day needs.

Internet is a service we all need. This was recognized in 2016 when the Canadian Radio-television and Telecommunications Commission (CRTC) declared high-speed internet to be a basic service no less important than telephone service[1].

At that time, the CRTC also established a goal for universal internet standards in Canada[2]: 50 megabits per second (Mbps) for downloads and 10 Mbps for uploads. This is commonly referred to as "50/10" and is considered fast enough to use streaming services and cloud-based applications, and for multiple users in the same household to use the internet at the same time.

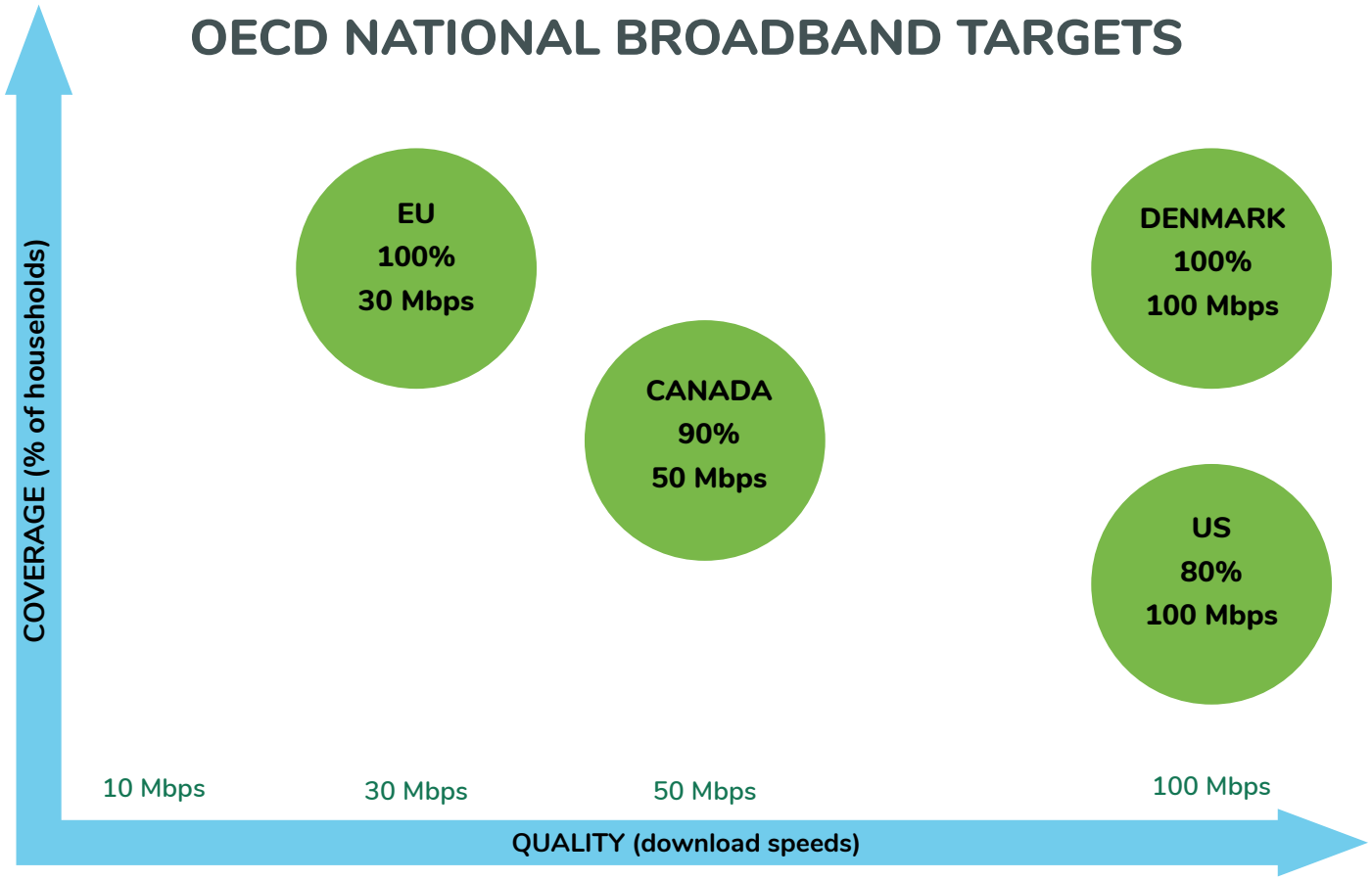
The federal government has committed to achieving 50/10 access for 90% of Canadians by 2021, 95% by 2026, and 100% by 2030. And to date they have promised over $7 billion (delivered through five different government programs) towards meeting this goal[3].

The government's own estimates are that it will take approximately $8 billion in investments to reach their goal of universal high-speed internet access[4]. It remains to be seen whether $8 billion will be enough, exactly when all Canadians will have access, and whether 50/10 will be sufficient to meet our ever-evolving connectivity needs.

Internet in Saskatchewan

It has long been clear that poor internet and cellular coverage are major problems facing agricultural producers and other rural residents across Saskatchewan.

Because of its large size and relatively small population, Saskatchewan faces unique challenges when it comes to achieving universal high-speed internet access. It has also been difficult to keep up with expanding demand as new applications and services become available.



The federal government has committed to achieving 50/10 access for 90% of Canadians by 2021, 95% by 2026, and 100% by 2030. And to date they have promised over $7 billion towards meeting this goal.

Whether through fibre optic networks, towers, or satellites, the infrastructure required to connect people to the internet is expensive to build and maintain. In order to be financially sustainable long-term, telecommunications companies need enough customers to cover their costs and make a profit.

In Saskatchewan, where many people live in rural and remote locations such as farms, villages, and First Nations, populations are often too small and distances too far for high-speed internet service to be profitable. As a result, many service providers prioritize bringing service to more densely populated areas.

Saskatchewan is also unique in that we are the only remaining province in Canada to have a Crown Corporation responsible for delivering telecommunications services[5]. SaskTel is the province's largest service provider and currently provides just under 60% of wireless service in the province[6].

There are also many other service providers—both small and large—operating in Saskatchewan that provide a variety of services that are crucial to the province's connectivity.

The Impacts of Poor Connectivity

Poor rural connectivity creates barriers to economic growth in rural communities, which is a major problem in Saskatchewan, which relies heavily on agriculture and other rural industries to drive the economy.

There have been efforts to put a dollar value to what poor connectivity is costing Saskatchewan. According to the Canadian Wireless Telecommunications Association[7], the economic value of connecting rural Saskatchewan could be up to $1.2 billion in additional Gross Domestic Product (i.e., economic activity) for the province.

But it is not only the economy that is suffering. Poor connectivity also negatively affects the quality of life of rural residents. The social costs of poor connectivity include impacts on health, education, safety, and the environment. The COVID-19 pandemic has brought these issues into sharp focus and has highlighted the inequalities between rural and urban communities.

As we work towards universal high-speed internet access, specific areas of enormous opportunity for Saskatchewan include agricultural technology, economic growth, and rural revitalization.

Agricultural Technology

Saskatchewan has long been a major innovator in agricultural technology. Cutting edge advancements in plant genetics, zero tillage systems, and hi-tech machinery have been developed by Saskatchewan researchers and entrepreneurs.

The Government of Saskatchewan continues to be a leader in supporting these innovations, with an investment of $15 million in 2020 to further support this growing industry[8].

Much of the newest agricultural technology requires reliable high-speed internet[9] to make use of applications such as precision input calculation, yield mapping, and monitoring for machinery malfunctions. Unfortunately, without universal access to high-speed internet in rural Saskatchewan, agricultural producers will not be able to take full advantage of the technologies built specifically for them.

New research shows that high-speed internet is associated with higher producer yields[10], growth that the provincial government is relying on to achieve its economic targets over the next decade[11].

As a teacher I relied on connectivity to teach my students. Many times during Zoom meetings I would be kicked out of the session and experience freezing. My students could not hear me at times or else they could not connect due to no access or very poor service at their homes.

- APAS survey respondent

INTERNET SPEED BY TECHNOLOGY

Data provided by Michael McNally, University of Alberta

Economic Growth

Growing internet access has been a major driver of the global economy, with 21% of economic growth in developed economies between 2006 and 2011 being related to internet use[12].

Economic growth takes the form of increased productivity, dynamic and flexible supply chains, job growth, enhanced education and skills upgrading, better options for the delivery of telehealth services and aging in place, rural sourcing (i.e., businesses taking advantage of the lower cost of living in rural communities), and greater community involvement[13].

Rural Revitalization

Like schools, healthcare, telephone, electricity, and safe water, high-speed internet is a crucial basic service that is required for people to move to and remain in a community.

Research shows a relationship between access to high-speed internet and population growth in rural areas. Over time, poor internet is associated with decreased population, while communities with better internet access see their populations grow or stay the same[14].

Without vibrant economies and strong social services, rural communities cannot compete with their urban neighbors and eventually lose their most important resource: people. And it is not only population growth that is affected, but also income[15]. In Canada, high-speed internet has helped reduce the urban-rural economic divide and promote wage and job growth[16].

Internet Technology 101: Wireline Versus Wireless

Although internet is a basic service that is used by the vast majority of Canadians, few of us understand the technologies that allow us to connect. Part of the role of the RCTF is to help increase the public's understanding of telecommunications technologies.

There are two ways to connect to the internet: **wireline** and **wireless**. Wireline systems use cables to connect devices to the internet. The two main types of wireline are **fibre optic** and **copper** cable.

Fibre optic cables use light to transfer digital information 200,000 kilometers per second. While fibre optic wireline is the gold standard in terms of internet speed, quality, and longevity, it is not necessarily a practical or affordable option for individual farms and other remote locations.

Historically, copper wireline was used to deliver telephone and television service to almost all households.

As a result, copper wireline is still installed almost everywhere, making it an affordable way to deliver internet service. Unfortunately, copper wireline transmits information much more slowly than fibre optic wireline.

Most Saskatchewan households still use copper wireline to connect their homes to a larger fibre optic network. This direct connection to the home is known as "last mile" service.

Wireless systems use radio waves (known as spectrum) to connect devices to the internet. Spectrum uses different frequencies (measured in hertz and gigahertz) to send signals between wireless devices and connecting points like modems, cellular towers, or satellites. These signals eventually make their way to a fibre optic network and continue their journey from there.

Of particular interest in Saskatchewan are recent developments in satellite technology to offer wireless internet. For many years geostationary satellites have provided wireless internet from Earth's orbit. Recently, however, there have been major developments in low-earth orbit (LEO) satellites that are much closer to Earth and can therefore provide much better connectivity. Companies like SpaceX, Amazon, and Telesat are making huge investments in this area.

Wireless internet is not possible without spectrum, but there are many factors that limit its use. For example, radio waves can easily be blocked by physical objects, weather conditions, and other electromagnetic waves. In addition, higher frequency spectrum (like that used to deliver 5G service) travels shorter distances than lower frequency spectrum, making it less practical for use in the delivery of rural and remote internet.

Spectrum is also a limited, publicly owned resource that is managed and distributed by the federal government. In Canada, the use of spectrum is regulated by Innovation, Science and Economic Development Canada (ISED), and the federal government leases spectrum to ISPs through auction.

Spectrum auctions have raised billions of dollars of revenue for the federal government, with the last auction in 2019 bringing in over $3 billion[17].

How effectively spectrum is managed has a direct impact on our options for fast, reliable, and affordable internet, particularly in rural and remote communities.

The Economics of Connectivity

One of the most important things to understand about connectivity are the economics that drive it. In short, unless there is a business case to connect a community, it is unlikely to happen without government support. And the more rural or remote the community is, the less attractive the business case will be.

There are many solutions to this problem. Letting smaller service providers play a role is one, but this requires policy changes at both the provincial and federal level. In Saskatchewan, our provincial Crown Corporation SaskTel (which provides nearly 60% of wireless service in the province) needs support and incentives to be able to effectively partner with smaller providers.

Federal funding can also help *if* it is delivered in the right way. Right now, over $7 billion in federal funds have been committed towards getting connectivity projects up and running. But for rural internet service to be financially sustainable over the long term, funding for operations and maintenance is also needed. Unfortunately, ongoing operational funding is not currently available, which undercuts the business case for developing projects in the most underserved communities.

An attractive business case is not the only (or best) way to think about connecting rural and remote communities. We also need to see investments into rural connectivity as investments into local economies with important economic and social returns.

Currently, only a few of Canada's connectivity funding programs evaluate the social and economic benefits of proposed projects, and most do not.

Economics aside, the fact remains that since 2016 high-speed internet has been considered a basic service no less important than telephone service. This means that every Canadian needs to be connected as soon as possible.

We need to see investments into rural connectivity as investments into local economies with important economic and social returns. Currently, only a few of Canada's connectivity funding programs evaluate the social and economic benefits of proposed projects, and most do not.

High Cost Service Areas

In general, it is more expensive for service providers to provide service to areas with low population density. This is because service to low population areas does not generate enough revenue over time to cover the cost of maintaining the service.

To address this problem, the CRTC has historically given financial support to telephone service providers operating in areas that are more expensive to serve (i.e., "high cost service areas").

In Saskatchewan, the most important of these programs has been the Universal Voice Subsidy, which provided money to service providers making telephone service available to roughly 100,000 residents living in "high cost" areas including many rural communities[18].

In 2019, the CRTC began to phase out the Universal Voice Subsidy and transform it into the Broadband Fund. This change resulted in a loss of $16 million from SaskTel's operations in 2019[19].

The Broadband Fund will not be sufficient to ensure financial sustainability for service providers serving high cost areas. Re-establishing a new High Cost Service Area fund for high-speed internet will be necessary to build and maintain rural service into the future.

Wholesale Rates

Some internet service is provided to customers directly by large service providers. In other cases, smaller service providers pay bigger companies a wholesale fee to access infrastructure and provide service on a smaller or more regional scale. The amount of this fee can be the difference between a local service provider having a business case for connecting a rural area or not.

In 2015 the federal government began investigating the wholesale rate that large service providers charge to smaller providers[20]. As a result, the CRTC set a new rate in 2019 and required large service providers to repay smaller providers they had overcharged.

The large service providers challenged the decision, arguing that lower wholesale rates could reduce investment in the telecommunications industry. Recently, the Supreme Court of Canada declined to consider the case, which means that the CRTC is now in control of the final decision[21].

Lower wholesale rates could ultimately help to create more competition in the industry, which could in turn lead to lower rates for consumers and better service plans.

Looking Ahead: The Future of Connectivity

It has only been five years since the CRTC established 50/10 as the goal for service levels across Canada, but since then technology and the way Canadians use the internet have continued to evolve at a rapid pace.

We rely on high-speed internet for every part of our lives, including education, work, health and safety, and family and community connections. COVID-19 has served to highlight this increasing reliance, with internet capacity being pushed to its limit during the pandemic.

Many countries have much more ambitious goals than Canada when it comes to universal internet access. Denmark, for example, aimed to achieve twice the speed (100 Mbps) for 100% of its citizens by 2020. And South Korea, which Canada used to rival as the best-connected country on the planet, has now left us in the dust, delivering 100 Mbps service to all residents, and 1 Gigabit service to urban residents[22].

Moving forward, we must ensure that we build a system that is sustainable and scalable in the long-term. It is already time for Canada to re-evaluate our goals to ensure they are sufficient to meet the needs of Canadians now and into the future.

RECOMMENDATIONS

Meeting the federal government's goals of universal 50/10 service by 2030 will require ambitious, coordinated action at all levels of government. Based on the results of its research, the Rural Connectivity Task Force has developed a series of recommendations that are organized into several major themes, including:

- **Working Together** - Supporting shared access to infrastructure and fair partnerships between service providers.
- **Too Many Cooks in the Kitchen** - Simplifying Canada's regulatory structure for greater accountability, transparency, and efficiency.
- **The Importance of Smaller Internet Service Providers** - Supporting competition within the industry to ensure smaller players can survive, thrive, and support universal internet access.
- **Optimizing Public Resources** - Optimizing government funding and managing spectrum effectively.
- **Regaining and Retaining Canadian Excellence** - Ensuring that Canada takes a leadership role to build long-term sustainability within our telecommunications industry and infrastructure.
- **Taking Control of the Saskatchewan Advantage** - Leveraging our Crown Corporations to ensure that Saskatchewan plays a leadership role in achieving universal connectivity and realising the social and economic benefits that come along with it.
- **Consumer Protection** - Ensuring consumers are guaranteed high-quality, affordable internet service.

Working Together

Telecommunications infrastructure is massive in scale, extends across provincial and national borders, and is costly to establish and maintain.

Service providers and all levels of government must work together to ensure effective sharing of resources

Service providers and all levels of government must work together to ensure effective sharing of resources and infrastructure including cellular towers, fibre optic networks, telephone poles, and more.

Canada would benefit from looking for ways to reorganize government roles and responsibilities to make things clearer, simpler, and more transparent. This would allow for improved accountability and efficiency.

and infrastructure, including cellular towers, fibre optic networks, telephone poles, and more.

Creating and enforcing good policy that encourages these partnerships and ensures they are fair is key to getting fast, reliable, and affordable internet to all Canadians, regardless of where they live.

Recommendations:

1. Save money and enhance capacity by ensuring that all levels of government use a "dig once" policy to coordinate their utility and infrastructure upgrades to put more fibre optic cable into the ground when other services are being upgraded.
2. Ensure that service providers have easier access to related infrastructure (e.g., telephone poles).
3. Create and enforce policies that ensure a timely response when third parties request access to data transport facilities.
4. Grant CRTC jurisdiction under *The Telecommunications Act* for setting rates and resolving disputes regarding access to electrical utility poles and ducts, when related to telecommunications use (as outlined in the Broadcasting and Telecommunications Legislative Review)[24].
5. Vary competition policies to fit smaller markets.
6. Investigate the potential for provincially and municipally owned buildings and infrastructure to be used as passive infrastructure for service deployment.

Too Many Cooks in the Kitchen

For the most part, Canadian telecommunications—including internet connectivity—are regulated at the federal level through *The Radiocommunications Act* and *The Telecommunications Act*[25]. The responsibility for telecommunications regulation, policy, and funding is shared across the following areas of the federal government:

- Canadian Radio-television and Telecommunications Commission (CRTC)—arm's length agency whose parent Ministry is Heritage Canada.
- Innovation, Science and Economic Development Canada (ISED)
- Minister of Rural Economic Development Canada

This structure of shared responsibility makes the process of finding and implementing connectivity solutions very complex. Canada would benefit from looking for ways to reorganize government roles and responsibilities to make things clearer, simpler, and more transparent. This would allow for improved accountability and efficiency.

Recommendations:

7. Work to further coordinate connectivity funding across government into a single agency, with a streamlined application process for ease of access to funding.
8. Encourage the federal government to select a dedicated agency or office responsible for overseeing the development and implementation of a simplified funding structure.
9. Clarify the role of CRTC and ISED to reduce regulatory overlap, and create greater transparency, accountability, and cooperation.

The Importance of Smaller Service Providers

The "Big Three"—Telus, Rogers, and Bell—are some of the most profitable companies in the country and con-

The best way to support healthy competition within the Canadian telecommunications industry is to make sure—through good policy—that smaller service providers have a fair shot to stay in business, and that municipalities have the opportunity to provide their own service if they choose.

trol the vast majority of the Canadian telecommunications market[26]. Unfortunately, this near monopoly has resulted in Canadians paying notoriously high prices for relatively poor service compared to other countries around the world[27].

The lack of competition in Canadian telecommunications has also contributed to the problem of poor connectivity in rural and remote communities.

Most large service providers prioritize getting internet service to places with high population densities because it results in a greater return on their investment. But while a large company may look at a rural community as a bad investment, a smaller service provider might see a worthwhile business opportunity. Several such service providers currently provide solutions in rural Saskatchewan.

There is no doubt that competition in the telecommunications industry benefits consumers: it leads to lower prices and better service. It can also be argued that competition benefits the industry as a whole, leading to more innovation and greater flexibility, investment, and fairness in the market.

The best way to support healthy competition within the Canadian telecommunications industry is to make sure—through good policy—that smaller service providers have a fair shot to stay in business, and that municipalities have the opportunity to provide their own service if they choose.

Recommendations:

10. Reduce spectrum fees for new entrants and smaller providers.

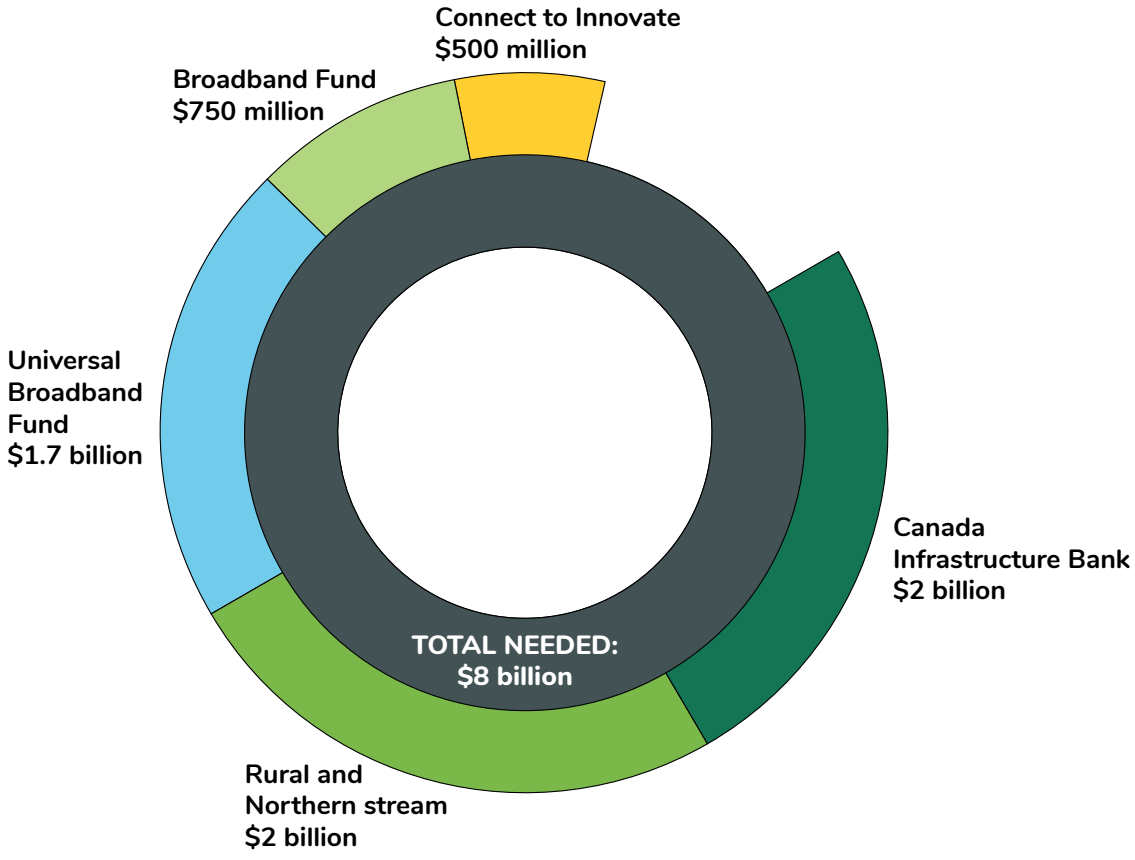
11. Where technically feasible, consider reducing the size of spectrum tiers to ensure that service is provided in areas that are not the most profitable.

12. Improve access to federal connectivity funding by lowering the threshold for eligible projects and allowing multiple projects in a single application.

13. Adjust the rules to better allow municipalities to access the Broadband Fund to build and operationalize local networks.

14. Dedicate a minimum of 15% of funding to small providers.

CANADA'S CONNECTIVITY FUNDING PROGRAMS



It is crucial that government funds are not only limited to deploying new service, but that funding is also reinstated for maintaining service in areas that are less profitable to serve over time.

15. Require the CRTC to reverse the stay on wholesale rates for high-speed internet.

Optimizing Public Resources

The Government of Canada has committed nearly $7 billion to achieve the goal of universal access to fast, reliable, and affordable high-speed internet access for all Canadians[28]. It has also raised billions of dollars in revenue by auctioning off the use of spectrum for wireless communications[29].

Unfortunately, throwing money at the problem will not be enough if the funds are not supported by effective policy. This is especially true in rural and remote areas, where there is often no sustainable business case to be made for connecting communities without public investments or incentives.

It is crucial that government funds are not only limited to deploying new service, but that funding is also reinstated for maintaining service in areas that are less profitable to serve over time (i.e., "high cost service areas").

Rural Connectivity Task Force meeting in November 2020.

It is also necessary for improvements to be made to how the government manages spectrum, to ensure that available spectrum is used to connect communities that need service most.

Since Fall 2020, the Standing Committee on Industry, Science, and Technology has been studying the "*Accessibility and Affordability of Telecommunications Service*"[30]. Many key players in the telecommunications industry have presented to the Committee, and a recurring theme of anti-competitive behaviour has emerged, with accusations of bad faith tactics between competitors. Better sharing between the CRTC and the Competition Bureau could be one way to reduce bad faith between providers.

Recommendations:

16. Ensure that available spectrum is made available to rural communities first since they are most in need of wireless service.

17. Improve the rules and regulations associated with spectrum auctions to better support the goal of universal minimum service as defined by the CRTC, by:

    a. Ensuring that all roll-out conditions prioritize universal access and are enforced.

    b. Enforcing the "use it or lose it" provision to make sure that all spectrum is used.

    c. Ensuring that an adequate amount of spectrum is set aside for non-incumbents (i.e., smaller service providers) to be active and successful in the market.

    d. Ensuring that future revenue generated through spectrum auctions be used for connectivity funding to ensure universal access for all Canadians.

18. Investigate the possibility of reallocating existing underused spectrum, such as bands in the 3-5 Ghz range.

19. Ensure that funding is allocated based on the greatest need and impact for rural communities, while ensuring that the process for allocating funds is transparent.

20. Ensure that when public funds are used to build projects that additional fibre is laid to help guarantee future capacity.

It is necessary for improvements to be made to how the government manages spectrum, to ensure that available spectrum is used to connect communities that need service most.

21. Require service providers to provide wholesale access to their networks when public funds are used to build projects.

22. Expand the powers of the CRTC to ensure compliance from service providers, such as improved information sharing with the Competition Bureau.

23. Re-establish a new High Cost Service Area fund for high-speed internet, and ensure that the funding formula allows for the creation of a sustainable business environment in rural areas.

24. When adjudicating connectivity funding applications, include an evaluation of the economic spin-offs and growth from broadband deployment.

Regaining and Retaining Canadian Excellence

Though Canada was once a world leader in high-speed internet[31], we have fallen far behind, with Canada in eighth place internationally in terms of overall deployment of high-speed internet to a fixed location, and 28th place in terms of fibre optic deployment[32].

This downward trend has led to high consumer frustration, and the COVID-19 pandemic has brought the need for universal access to fast, reliable, and affordable internet service into even sharper focus. With the right investments supported by sound policy decisions, Canada can regain and retain our status as an international leader, all while supporting the COVID-19 recovery.

Recommendations:

25. Expand the "Shovel-Ready" stream of the Universal Broadband Fund, which is designed to allow service providers to move forward quickly on projects that are ready to go.

26. In consideration of the COVID-19 pandemic, revaluate and shorten the timetable laid out in the Canada Connectivity Strategy to ensure that 100% of Canadians are connected as soon as possible.

27. Consider adopting a timeline for the regular review and renewal of the target broadband speeds, and consider expanding metrics to include latency, cost parity between urban and rural areas, and network performance.

28. Ensure accountability by requiring that ISED publish an annual report outlining the progress made towards achieving universal high-speed internet access. This report should outline progress on:

    - Upload and download speeds
    - Latency
    - Consumer cost

29. Revaluate the total funding committed to Canada's connectivity programs in 2022 and commit additional funds if needed to ensure that Canada exceeds its connectivity targets.

Taking Control of the Saskatchewan Advantage

Saskatchewan's telecommunications Crown Corporation SaskTel is the largest service provider in the province and provides just under 60% of wireless service[33]. However, it is clear that to achieve universal high-speed internet access for everyone in the province (regardless of where they live), SaskTel will not be able to do it alone.

The need to partner is reflected in SaskTel's history. Connecting the province to telephone service over 100 years ago required collaboration, partnership, and local community involvement, and achieving universal high-speed internet is no different.

*Though Canada was once a world leader in high-speed internet, we have fallen far behind. This downward trend has led to high consumer frustration, and the COVID-19 pandemic has brought the need for universal access to **fast**, **reliable**, and **affordable** internet service into even sharper focus.*

Saskatchewan is one of the last provinces in Canada to retain public control over its utilities, and this creates a unique opportunity to become a leader in internet and cellular service.

With the right investments and policy, Saskatchewan could exceed the service goals set out by the federal government and generate huge economic growth—estimated at $1.2 billion—for the province.

Saskatchewan is one of the last provinces in Canada to retain public control over its utilities (e.g., SaskTel, SaskPower), and this creates a unique opportunity to become a leader in internet and cellular service. With the right investments and policy, Saskatchewan could exceed the service goals set out by the federal government and generate huge economic growth—estimated at $1.2 billion—for the province[34].

Recommendations:

30. Reduce SaskTel's dividend transferred to the Government of Saskatchewan and redirect the revenue to service deployment.
31. Clarify the mandate of SaskTel to better understand their role and responsibility to connect rural Saskatchewan.
32. Ensure immediate negotiations between SaskTel and Telesat to use the Universal Broadband Fund to ensure service to Saskatchewan's 400+ communities with no fibre optic service[35].
33. Ensure that fibre optic service is deployed to the 434 Saskatchewan communities that do not have access to a fibre network[36].
34. Recharacterize SaskTel in the CRTC's annual Communications Monitoring Report to more accurately report on Saskatchewan's unique market conditions.

35. Ensure fair access to SaskTel's fibre optic backbone to allow for local and smaller companies to be able to expand into rural Saskatchewan.

36. Encourage SaskTel to immediately reach out to Saskatchewan's small providers and engage them in discussion on how they can work together to provide service at a reasonable rate to rural and underserved residents.

37. Ensure that the Minister Responsible for SaskTel produces an annual report for the Government of Saskatchewan on the progress of bridging the digital divide and the Saskatchewan Broadband Strategy.

38. Streamline the process for accessing SaskPower poles by:

    a. Conducting an audit and replacement of the poles that are no longer structurally sound.

    b. Consulting with Saskatchewan-based providers to set a standard fair market rate for accessing SaskPower poles.

39. Increase the accessibility of the "dig once" policy to allow smaller providers to also lay fibre in new developments and when lines are being replaced.

40. Conduct a third-party investigation into the SaskPower and SaskTel fibre networks to ensure that both are being used to best deliver service to Saskatchewan.

41. Undertake a provincially-funded study on the economic potential that could be unlocked by expanding broadband coverage. Use existing research institutions such as the University of Regina or University of Saskatchewan.

Consumer Protection

When it comes to cellular and internet service, Canada is known for high costs and relatively poor service.

Rural residents in particular are often faced with high fees, service that does not meet their needs, data caps and overage fees, and slower speeds than what their contracts promise.

While Canada has established an Internet Code, a Wireless Code, and a Commissioner for Complaints for Telecommunications Services to help protect consumers, these steps are not enough, with a 2016 survey indicating extremely low awareness and compliance[37].

To ensure affordable, accessible service, it is necessary to establish and guarantee basic minimum standards for service and rates.

Recommendation:

42. Ensure affordable and accessible service to rural customers by reviewing and improving the consumer complaints process and establishing basic minimum standards for service and rates.

Possible Future Considerations

Allowing service providers to increase their effective radiated power (ERP) on shared bands of spectrum could extend the range of individual cellular sites in rural areas where there is minimal traffic and interference. This could provide greater wireless coverage in underserved areas, while potentially increasing the number of service providers.

Additional recommendation for consideration:

43. Allow for higher effective radiated power (ERP) limits in rural and remote areas where it does not create significant interference.

When it comes to cellular and internet service, Canada is known for high costs and relatively poor service.

To ensure affordable, accessible service, it is necessary to establish and guarantee basic minimum standards for service and rates.

CONCLUSION: BUILDING LONG-TERM SUSTAINABILITY

Achieving universal high-speed internet access for all Canadians will take many different strategies and technologies. It is not an easy job, but it is possible and the benefits will be significant, particularly as we begin to emerge from the COVID-19 pandemic and focus on Canada's economic recovery.

To further the goal of universal access, the Rural Connectivity Task Force has focused on improving public understanding of the barriers to good rural connectivity, identifying policy solutions that address key technical and regulatory issues, and creating a plan to advocate for changes at the federal and provincial level.

At the end of its research phase, the Task Force has identified several key areas that require strategic policy changes, including:

- Supporting fair partnerships between key industry players.
- Simplifying Canada's regulatory structure for greater accountability, transparency, and efficiency.
- Supporting competition within the industry to ensure smaller service providers can survive and thrive.
- Optimizing public resources, including government funding and spectrum.
- Ensuring that Canada takes a leadership role to build long-term sustainability within our telecommunications industry and infrastructure.
- Leveraging Saskatchewan's Crown Corporations to ensure that they play a leadership role in achieving universal connectivity and realising the social and economic benefits that come with it.
- Ensuring consumers are protected by guaranteeing high-quality, affordable internet service.

Both Saskatchewan and Canada have a unique opportunity to invest in the growth of their economies and communities by taking a leadership role in bringing fast, reliable, and affordable high-speed internet access to everyone. These investments have significant potential to positively impact the work, education, health and safety, and overall quality of life for every Canadian, regardless of where they live.

For more information about the Rural Connectivity Task Force, visit apas.ca/connectivity.

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GLOSSARY OF TERMS

Backhaul: the part of a telecommunications network that connects the main body of the network with smaller subnetworks.

Bandwidth: the maximum capacity of an internet connection (as opposed to the speed). For example, if you have a 100 Mbps internet package, your bandwidth is 100 Mbps, meaning the most data your connection can download at one time is 100 Mbps. Your actual internet speed is likely to be less than your bandwidth most of the time because of network congestion and other external factors.

Broadband: any high-speed internet access that is always on and faster than dial-up access.

Download speed: refers to how many megabits of data per second (Mbps) it takes to download data from a server in the form of images, videos, text, files, and audio.

Internet Service Provider (ISP): a company that provides access to the internet to the general public.

Last mile: the final leg of the telecommunications networks that deliver services to retail end-users (customers). Specifically, the portion of the telecommunications network chain that physically reaches the end-user's premises.

Latency: the amount of delay (or time) it takes to send information from one point to the next. When you put in a request to your internet connection (e.g., search for something on Google, check social media), it sends a signal to the server to retrieve the information and then brings it back to you. Since this usually happens pretty quickly, latency is measured in milliseconds (ms). Also referred to as a ping rate.

LEO satellite: a low earth orbit (LEO) satellite is a piece of electronic equipment that circles the earth at altitudes of 200-2000 kms. LEO satellites are being used increasingly to deliver wireless internet service (e.g., Starlink). They are much closer to earth than geosynchronous satellites, which orbit the earth at altitudes of 36,000 kms. (An example of geosynchronous satellite internet is Xplornet.) Because LEO satellites are closer to the earth, information can travel to and from them much more quickly, resulting in reduced latency. On the other hand, because LEOs orbit the earth more quickly, they have a reduced range of communication, meaning that more of them are needed to provide the required coverage.

Spectrum: refers to the invisible radio waves that wireless information travels over. Wireless devices (e.g., smartphones, tablets, etc.) use spectrum to transmit information. Different frequencies of spectrum are used to carry other types of information, including television and AM and FM radio. Spectrum is grouped into "bands" based on its frequency. The portion of spectrum used for wireless communication ranges from 20 KHz to 300 GHz. Lower-frequency spectrum travels longer distances with little interruption, whereas higher-frequency spectrum is much faster, but can travel much shorter distances. Spectrum is managed by the CRTC and is allocated to ISPs through auction.

Upload speed: refers to how many megabits of data per second (Mbps) it takes to send information from your computer to another device or server on the internet.

Wireless: using radio waves, microwaves, etc. (as opposed to wires or cables) to transmit information.

Wireline: using cables or data lines, (e.g., fibre optic, cable) to transmit information.

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