Mid West Digital Economy Strategy: Engagement Brief
Submission from Geotourism Australia
Executive Summary

The Mid West region of Western Australia, under the management of the Mid West Development Commission, includes the Murchison GeoRegion (approximately 281,200 sq km in area) which also embraces seven local government shires. The GeoRegion is currently being developed around a connecting regional geotrail, on the basis that one or more centres through which it traverses may be ultimately developed as nominations for a UNESCO Global Geopark, subject to both government and community approval and support.

The Murchison GeoRegion is being supported by Geotourism Australia, an entity of the Australian Geoscience Council, which is implementing a National Geotourism Strategy **(refer Attachment 'A')** The Strategy argues that concept of geotourism, which is detailed in this submission, adds considerable content value to traditional nature-based tourism as well as to cultural tourism, inclusive of Aboriginal tourism, because it is place-based and builds on the characteristics of geology and landscape upon which flora and fauna and cultural attributes can be interpreted. One of the seven strategic goals is the assessment and promotion of new digital technologies to highlight and interpret natural and cultural heritage, highlighting geology and landscape. In this context, Geotourism Australia has a keen interest in the development of a digital economy strategy in alignment with Action 7.7 of the Australian Government's THRIVE 2030 Visitor Economy Strategy to enhance the visitor experience through use and availability of technology.

The submission by Geotourism Australia, as it relates to Mid West Digital Economy Strategy Engagement Brief, focuses on the three areas of a digital society and capability (access to digital technologies and skills), digital infrastructure (enabling digital connectivity), and digital industries and innovation (integrating digital opportunities in business). In regard to the topic of digital society and capability, the submission details the needs of 'geotourists', and the various digital based tools and technologies (e.g., 3D visualisation, augmented reality, virtual reality, holograms, and live streaming using smartphones and drones) and GIS that are being developed to support geotourism around Australia. This includes a national digital platform (the Australian Geotourism Discovery Portal) to enable visitor access to information about places being visited. The potential application of AI to be used on this platform is also discussed.

In addressing the challenges of building reliable digital infrastructure, the submission refers in detail to a range of issues, specifically mobile coverage gaps, safety and communication, access to interpretive content, booking and payment systems, digital inclusion for Aboriginal tour operators, power reliability, and backhaul and satellite limitations. By combining offline-ready tools, proactive safety measures, and industry advocacy, Geotourism Australia believes that the geotourism sector can manage current limitations while pressing for long-term improvements.

The submission makes some specific recommendations in this regard.

- Design visitor experiences for offline use by ensuring that interpretive apps, maps, and booking systems remain functional without live connectivity.

- Strengthen safety culture by mainstreaming the use of satellite messengers and personal locator beacons (PLBs) in outback travel advice and operator practice.

- Advance digital inclusion by prioritising Aboriginal-led geotourism sites and small regional operators in connectivity programs.

- Advocate as a sector by positioning geotourism as a stakeholder in government digital infrastructure initiatives, ensuring priority is given to visitor routes and designated geosites.

- Integrate Infrastructure and geotourism planning by aligning regional tourism development strategies with mobile, satellite, and power investment priorities.

In addition, the submission provides some insights relating to digital infrastructure (**refer Attachment 'B'**) offered by the Australian ICT industry some years ago, lessons learnt from South Korea in establishing a comprehensive digital platform (the highly regarded IT839 program), as well as some observations about the location of the SKA platform within the Mid West.

In incentivising digital industries and innovation in Outback Australia (including the Mid West), Geotourism Australia believes that government agencies can combine infrastructure upgrades, financial incentives, skills programs, innovation ecosystems, and tailored integration with local businesses. The focus should be on offline-capable solutions, Aboriginal inclusion, and cross-sector synergies particularly geotourism, agriculture, and mining.

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The Australian Geoscience Council Inc (AGC) is the Peak Council of geoscientists in Australia. It represents eight major Australian geoscientific societies with a total membership of over 8,000 individuals comprising industry, government, and academic professionals in fields including geology, geophysics, geochemistry, mineral and petroleum exploration, environmental geoscience, geotourism, hydrogeology, geomorphology, and geological hazards. https://www.agc.org.au/

A National Geotourism Strategy (NGS) was launched by the AGC on 7th April 2021 following a period of strategic policy development. In April 2024, the AGC formed a grouping of geotourism interests branded as **Geotourism Australia** to continue the implementation work https://bit.ly/45TpNRE

The recently released **THRIVE 2030 Visitor Economy Strategy (Action 7.5) of the Australian Government** states 'Grow and develop high-quality products and experiences around unique Australian locations and themes, including approaches which integrate sustainable nature tourism with economic opportunities for Traditional Owners, and capitalising on **emerging tourism trends such as geotourism**.'

Action 7.7 also states: '**Enhance the visitor experience through use and availability of technology.'**

Reference: https://bit.ly/4oC5jVP

Purpose of the Submission

Geotourism Australia is seeking to provide information about how the implementation of the National Geotourism Strategy can relate to enhancing the Digital Economy Strategy of the Murchison GeoRegion through a focus on digital society and capability (access to digital technologies and skills), digital infrastructure (enabling digital connectivity), and digital industries and innovation (integrating digital opportunities in business).

In this context, this submission sets out to explain geotourism, the goals of the National Geotourism Strategy and how they are working to support Actions 7.5 and 7.7 of the government approved THRIVE 2030 Visitor Economy Strategy.

Geotourism ('value-add' nature-based tourism)

Geotourism adds considerable content value to traditional nature-based tourism (the primary motivator of travel to Australia) as well as cultural tourism, inclusive of Aboriginal

tourism, thus completing the holistic embrace of 'A' (abiotic – landscape and geology) plus 'B' (biotic – flora and fauna) plus 'C' (culture) aspects. https://bit.ly/46TKxdU

Geotourism has been defined as 'sustainable tourism which focuses on an area's geology and landscape as the basis for providing visitor engagement, learning and enjoyment', but it is not a niche market. It has links with adventure tourism, cultural tourism, ecotourism, astrotourism, and agritourism, but is not synonymous with any of these forms of tourism, although **in broad terms it embraces them all because it is essentially 'place based.'**

However, it needs to be understood that whilst geotourism does promote tourism through visits to geological features (geosites), use of 'geotrails' and viewpoints, guided tours, geo-activities (such as geological time trails, fossil walks, rock gardens etc.), and patronage of visitor centres and museums, it is not geological tourism. Geotourism attractions are now being developed around the world primarily as a sustainable development tool for the development of local and regional communities.

The development of a National Ecotourism Strategy in 1994 and subsequent state/territory-based initiatives is considered as a particularly useful precedent and guide. Of significance internationally is that geotourism is booming, whereas the development of geotourism in Australia lags many countries' approaches, notwithstanding the fact Australia has taken the initiatives in several areas in development of the concepts underpinning geotourism. Nevertheless, geotourism has been supported over the past decade through an industry forum of Ecotourism Australia https://bit.ly/4oIL7lk

According to the National Geographic Society of the USA, geotourism is:

- Environmentally responsible - committed to conserving resources and maintaining biodiversity.
- Culturally responsible - committed to respecting local sensibilities and building local heritage.
- Synergistic - bringing together all elements of geographical character to create a travel experience that is richer than the sum of its parts and appealing to visitors with diverse interests.

The landmark 2003 Geotourism study, sponsored by National Geographic and conducted by the Travel Industry Association of America, found that 65 million American households are predisposed to support the principles of geotourism. As the global population of travelers increases and destinations become more globalised and homogenous, these principles are resonating with travelers across the globe.

The more recent 2017 report 'Unlocking Our Great Outdoors' of the Tourism and Transport Forum (TTF) https://bit.ly/2WgeNLb indicated that international visitors to Australia are increasingly engaging in nature- based tourism. In 2016, it was reported that 5.2 million international visitors, or over two-thirds of all the international visitors to Australia, engaged in some form of nature-based tourism. In addition, nature-based tourism attracted 20.1 million domestic overnight visitors in 2016 and 23.6 million domestic day trip visitors. After recording flat growth between 2005 and 2011, nature-based tourist numbers have accelerated in more recent years. This has occurred for all

three main categories of tourists – international, overnight domestic, and day trippers.

This TTF report also highlighted the potential of 16 identified major landscapes developed by Tourism Australia and Parks Australia as the Australia's National Landscapes program. Many of these landscapes offer the opportunity for particularly younger FITs (increasingly 'digital natives'), eager to combine a geotourism experience obtained through adventurous self-drive tours, by accessing newly developed geotrails as envisaged in the NGS. The upsurge in domestic tourism experienced during the COVID-19 pandemic in recent years has reinvigorated interest by Australians in exploring the best of what regional and outback Australia has to offer, and the adoption of geotourism-focused product development offers the opportunity to excite first time visitors and importantly to encourage repeat visitation.

Geotourism as a driver of place-based regional economic development

Geotourism is increasingly seen globally as an instrument of regional economic development. Through its 'place-based' and holistic approach, geotourism:

1. As previously stated, adds **considerable content value to traditional nature-based tourism** (the primary motivator of travel to Australia) as well as cultural tourism, inclusive of Aboriginal tourism, thus completing the holistic embrace of 'A' (abiotic – landscape and geology) plus 'B' (biotic – flora and fauna) plus 'C' (culture) aspects.

2. **Incorporates other forms of nature-based tourism such as ecotourism, agritourism, and astrotourism, the latter which should preferably focus on how Aboriginal elders have traditionally 'read the stars.'**

3. Celebrates geoheritage and promotes awareness and better understanding of the geosciences, noting that a revised global framework for the application of criterion (viii) of the World Heritage Convention as it applies to World Geological Heritage has recently been released by the IUCN. https://bit.ly/39Zb4vf

4. Contributes to regional development imperatives in areas experiencing social and economic difficulties through increased tourist visitation, particularly from overseas. This factor is of increasing interest to local government and state based, regional development agencies.

5. Provides the means of increasing public access to natural and cultural heritage content through a range of new interactive digital applications on smartphones and other devices that enable advanced and innovative ways of experiencing nature.

6. Engenders an increasing awareness of the importance of geology as a fundamental science that has had and will continue to have major impacts on civilisations.

7. **As already evidenced in the establishment of the Murchison GeoRegion**, promotes tourism through visits to geological features (geosites), use of geotrails and viewpoints, guided tours, geo-activities (such as geological time trails, fossil walks, rock gardens, rail trails, skywalks etc.), and patronage of local visitor centres and museums (both mineral and fossil collections).

8. Encourages attractions to be developed as a sustainable tool for the growth of local and regional communities.

9. Offers the potential for new industries and employment opportunities through the development of major projects within Australia.

Geotourism is also the driver of some 229 UNESCO Global Geoparks currently located in 50 countries in an environment where some 10-15 new global geoparks are being created each year, recognising that in Australia, no UNESCO Global Geoparks have been established to date. As does apply for UNESCO's World Heritage Area program, Global Geoparks have become 'magnets' for overseas tourism attraction.

UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education, and sustainable development. Whilst World Heritage Areas and national parks are created in perpetuity, the status of global geoparks is reviewed by UNESCO every four years. A most helpful infographic about the UNESCO Global Geopark program can be sighted at https://bit.ly/3RzjxZ2

Digital Society and Capability

Quite clearly the communication and experiential needs of visitors to the Murchison GeoRegion, and to other areas of the Mid West, through the mechanism of geotourism represent a major consideration to developing a competitive digital society**, not forgetting the needs of the residents of these areas, many of whom provide a whole range of geotourism services**.

Needs of geotourists

Traditionally, the needs of visitors identified as geotourists (refer https://bit.ly/3HDI116) have been catered for through a range of analogue means. However, the provision of interpretive information via digital devices and the internet is increasingly essential in catering to geotourists, particularly those identified as 'digital natives' (particularly younger travelers). These visitors, who have grown up with technology and expect information to be immediate, interactive, and accessible, are transforming the way geotourism experiences are consumed and interpreted.

Digital tools such as mobile apps, QR codes, augmented reality, and interactive maps allow for layered, engaging storytelling that caters to a wide spectrum of knowledge levels, from casual visitors to more informed enthusiasts. Moreover, digital interpretation enhances both pre-visit planning and on-site engagement, while also encouraging post-visit reflection and

sharing through social media platforms. This not only deepens understanding of geological heritage but also contributes to broader educational and conservation goals. Importantly, digital platforms enable geosite managers to collect valuable visitor data and feedback, allowing for adaptive content delivery and improved site management.

However, to ensure inclusiveness, digital interpretation should be complemented by traditional methods to accommodate varying levels of digital literacy and accessibility. Overall, the integration of digital interpretive tools is becoming a critical component of effective and engaging geotourism, aligning with the expectations and behaviours of a technologically literate visitor demographic.

It has also been argued that education goals about geodiversity and its linkage to human experience through biotic processes can be achieved through active engagement by people i.e. by experiential learning - the process of learning by 'doing.' By engaging visitors in **hands-on experiences**, it is believed that tourists are better able to connect knowledge gained by viewing interpretative signage to real-world situations.

In theory, this realisation is fine, but its practical application will present challenges to geotrail developers. For the casual visitor or tourist, unless there is a co-located interpretation centre equipped with interactive, computer-generated modules, there is no similar process currently available.

Australian Geotourism Discovery Portal and the potential of Artificial Intelligence (AI)

Nevertheless, it is hoped that tourists will be able to access through their smartphones and other devices the Australian Geotourism Discovery Portal https://bit.ly/3SlYObr (currently under development by Geotourism Australia) to interrogate the presented knowledge. Perhaps with the aid of Artificial Intelligence (AI), the functionality of the Portal could be enhanced in several ways, which might include the following.

- Through analysing user preferences and behaviour, AI could suggest tailored geotourism experiences, activities, or sites based on individual interests, previous visits, and demographic information.

- By implementing natural language processing, AI might be able to improve search capabilities, allowing users to ask questions in natural language and receive relevant information about geosites, itineraries, and local geology.

- By utilising image recognition technology, at some future time, users might be able to upload photos to identify geological features, thus enhancing engagement.

- AI can enhance accessibility by providing real-time translations, audio descriptions, or tailored content for users with disabilities.

All of the above might be readily achievable in settings currently well serviced by mobile phone coverage ('mobile starlink' excepted), but of course in the Mid West, this level of service cannot currently be provided outside of townships where mobile coverage might be accessible and/or internet access is made available to visitors through dedicated facilities

provided by visitor information centres. This consideration is particularly significant for the Murchison Geotrail (forming part of the Murchison GeoRegion) which connects 21 key geosites and as well as the townships of Cue, Mount Magnet, Sandstone, Paynes Find, Yalgoo, Meekatharra, and Murchison Settlement. The Geotrail is also serviced by an App. https://murchisongeoregion.com/map/

Application of digital technologies

The application of digital tools in recent geotrail development for tourism in New South Wales https://nswgeotours.stqry.app/ is outlined in the following two video presentations.

- Warrumbungle National Park https://www.youtube.com/watch?v=_V1oZeqdUg0
- NSW Geological Survey https://www.youtube.com/watch?v=Fkdbez3Meh8

In South Australia, visitors can now search the Google Play Store or Apple App Store for 'South Australia Geotrails' or simply scan a QR code downloadable from https://bit.ly/46Y9fdm

Recent developmental work in support of the Flinders Ranges WHA nomination from South Australia highlights the use of virtual reality https://ab.co/2TW8Fty

The following link details an interesting example of a virtual tour from Rottnest Island, Western Australia https://bit.ly/3HCsjPl Other examples elsewhere in Western Australia can be located at https://bit.ly/4mrV0Ck

In another prime geotourism location (the Ku-ring-gai GeoRegion), drone technology has been used to highlight coastal geomorphology and sedimentary rock features https://www.youtube.com/watch?v=holu30ie8OE

The application of immersive virtual tools to geotourism is explained in the following presentations.

- https://www.youtube.com/watch?v=GzhjHq4XQ7Q&t=5s
- https://bit.ly/45EpfyR
- https://www.youtube.com/watch?v=KqC_r7esrj0

Launched in January 2024 within the **Glen Innes Highlands GeoRegion**, the Glen Innes Highlands Skywalk represents a demonstration of how combining technology, infrastructure,

innovation, and creativity creates an immersive sensory experience that drives not only economic benefits through increased visitation and longer stays but social and wellbeing benefits for the local community. The Skywalk, a boardwalk extending over 80 m in length, provides visitors with spectacular views of the surrounding Glen Innes rural landscape and the township of Glen Innes. Overlooking the famous 'Australian Standing Stones' monument, it highlights both Celtic connections and Ngarabul Aboriginal culture.

The Skywalk is an exemplary world-class geotourism experience. The contracted production group has delivered 22 audio stories and 360-degree drone-captured footage with augmented reality integrated into a hyper-local mapping platform comprising three primary viewing points as well as points of interest further afield through the use of video footage. This footage, delivering the abiotic, biotic, and cultural stories, enables the visitors to place themselves 'virtually' at those points of interest. Access to this digital information is obtained by using a smartphone to capture a QR code located on each of the three interpretation signs which are erected at these viewing points.

To support and enhance the delivery and interpretation of high-quality natural and cultural heritage content, with a focus on geology and landscape, the National Geotourism Strategy (NGS) was established in 2021. As a result, there is a growing need for a technology platform that can provide an up-to-date inventory of Australian geotrails, geosites, mining areas, and cultural sites.

A digital platform prototype has been developed, known as the Australian Geotourism Discovery Portal. This platform serves as an information hub for various user personas, enabling them to discover and explore a wide range of attractions and destinations across Australia. The platform boasts a user-friendly interface and easy navigation. Users can explore the platform by state or GeoRegion, and each geosite, geotrail, mining site, or cultural site is accompanied by detailed descriptions, photos, and available amenities. This allows travelers to gain a sense of what to expect before their visit. The platform is accessible through desktop and mobile browsers, ensuring that travelers can plan their trips conveniently while on the go. Furthermore, the platform can potentially integrate with other travel tools, such as booking and transportation services, to offer a seamless travel experience. https://lnkd.in/ga4deQar

Subject to funding and agreement as to the hosting arrangements, it is proposed that the Portal project will provide access to all key geosites and geotrails located within the Murchison GeoRegion.

In effect, the outcomes arising from the implementation of Goal 1 represents a direct response to Action 7.7 of the THRIVE 2030 Visitor Economy Strategy.

Digital Infrastructure Challenges for Geotourism in Outback Areas of Australia

Geotourism in the outback is expanding as travellers seek immersive experiences that combine geological heritage, Aboriginal culture, and remote landscapes. Digital technologies, ranging from mobile connectivity and interpretive apps to online booking systems, are increasingly central to visitor engagement and safety.

However, the vastness and remoteness of Australia's outback present persistent digital infrastructure challenges. This briefing outlines the key issues affecting visitors and operators, followed by recommended responses for the geotourism industry, noting however that some of these are equally of interest to residents within the Mid West area.

Mobile coverage gaps

Issue:

- Mobile coverage remains limited outside townships and major transport corridors.
- Many scenic drives, geotrails, and geosites fall into blackspots.
- Visitors relying on smartphones for navigation, information, or emergency calls often find themselves cut off.

Recommendation:

- Promote offline mapping apps encourage travellers to download data before departure.
- Advocate for priority coverage expansion under the Mobile Black Spot Program along key geotourism routes.
- Develop partnerships with telcos to co-invest in towers near high traffic geosites.

Safety and emergency communications

Issue:

- Visitors in remote areas may be unable to summon assistance in medical emergencies, vehicle breakdowns, or during floods and bushfires.
- Few travellers carry satellite phones or personal locator beacons (PLBs).

Recommendation:

- Embed safety messaging in visitor information, stressing the need for paper maps, pre-downloaded data, and emergency beacons.
- Promote rental or purchase of satellite messengers via visitor centres, hire outlets, or tourism operators.
- Collaborate with emergency services to map priority areas for safety-focused communications infrastructure.

Access to interpretive content

Issue:

- Increasing reliance on QR codes, online story maps, and augmented reality at visitor sites fails in blackspots.

- Visitors miss out on interpretive storytelling when content is not accessible offline.

Recommendation:

- Design interpretation to be offline-first, with downloadable story packages or app-based guides.
- Establish download hubs at visitor centres, roadhouses, and entry points where travellers can preload materials before heading out.
- Incorporate low-data solutions such as audio guides or PDF trail notes that require minimal connectivity.

Booking and payment systems

Issue:

- Online bookings, cashless payments, and QR-ticketing are increasingly standard, but cannot always be processed in remote areas.
- Operators and visitors risk lost transactions, failed bookings, or reliance on cash (which many travellers no longer carry).

Recommendation:

- Equip operators with offline-capable booking/payment systems that synchronise when connectivity is restored.
- Encourage mixed-mode systems that allow cash or card fallback.
- Advocate for investment in reliable connectivity at tourism hubs (visitor centres, campsites, roadhouses).

Digital inclusion for Aboriginal tour operators

Issue

- Many areas of 'country' and cultural tourism sites are located in mobile blackspots.
- Limited connectivity hinders digital storytelling, marketing, and online sales, constraining growth in the ability of Aboriginal people to contribute to geotourism.

Recommendation:

- Partner with government and technology providers to expand connectivity for Aboriginal tour operators.

- Support Aboriginal businesses with training and resources in offline-friendly platforms (apps, e-commerce, interpretive tools).

- Ensure Aboriginal communities have a voice in regional digital infrastructure planning.

Power reliability

Issue:

- Power supply in remote areas is fragile, affecting Wi-Fi, EV charging stations, and device recharging.

- Prolonged outages disrupt both visitor services and operator business continuity.

Recommendation:

- Encourage tour operators to install solar pane/ battery backup systems to maintain connectivity and charging capacity.

- Promote portable power solutions for travellers (power banks, foldable solar kits etc.).

- Advocate for government-backed upgrades to outback power reliability, particularly in visitor hotspots.

Backhaul and satellite limitations

Issue:

- Remote towers often rely on microwave or satellite backhaul, limiting capacity and reliability.

- GEO satellite services can suffer from latency and congestion, reducing visitor confidence in digital access.

Recommendation:

Support adoption of Low Earth Orbit (LEO) satellite services (e.g., Starlink, Project Kuiper) by operators for low-latency connectivity at geosites.

- Promote subsidies or shared-use facilities for small businesses and visitor centres.

- Advocate for backhaul investment on key regional routes to reduce single points of failure.

Strategic recommendations

- Design visitor experiences for offline use by ensuring that interpretive apps, maps, and booking systems remain functional without live connectivity.

- Strengthen safety culture by mainstreaming the use of satellite messengers and personal locator beacons (PLBs) in outback travel advice and operator practice.

- Advance digital inclusion by prioritising Aboriginal-led geotourism sites and small regional operators in connectivity programs.

- Advocate as a sector by positioning geotourism as a stakeholder in government digital infrastructure initiatives, ensuring priority is given to visitor routes and designated geosites.

- Integrate Infrastructure and geotourism planning by aligning regional tourism development strategies with mobile, satellite, and power investment priorities.

Conclusion

Geotourism thrives on remote, immersive landscapes, but without reliable digital infrastructure, visitor safety, satisfaction, and tour operator viability are at risk. By combining offline-ready tools, proactive safety measures, and industry advocacy, the sector can manage current limitations while pressing for long-term improvements.

This dual approach of adaptation and advocacy will help ensure that outback geotourism within the Murchison GeoRegion and other areas of the Mid West remains both accessible and resilient, while delivering world-class visitor experiences.

Some Pointers - Background to the development of ICT (digital) infrastructure

Refer Attachment 'B'

Incentivising Digital Industries and Innovation in Outback Australia

In outback Australia, government agencies face the dual challenge of closing the digital gap and stimulating innovation in places where distance, low population density, and high service delivery costs are barriers.

Infrastructure as an enabler

- Digital industries need reliable foundations before they can thrive.

- Targeted connectivity upgrades: Prioritise outback towns and geotourism corridors in mobile blackspot programs, backhaul investments, and low-latency satellite deployments.

- Shared digital hubs: Fund regional innovation hubs with co-working spaces, high-speed LEO satellite internet, and training facilities, enabling local businesses to access "city-grade" connectivity.

- Energy reliability: Invest in renewable microgrids to ensure power resilience for digital enterprises.

Financial incentives for innovation

- Tax offsets and grants: Extend R&D Tax Incentive and create dedicated 'Remote Digital Innovation Grants' for businesses trialling new digital products or services in the outback.

- Digital voucher schemes: Offer vouchers that small enterprises (ecotourism operators, pastoralists, Aboriginal businesses) can redeem for digital upgrades (e.g., e-commerce systems, drone monitoring, Virtual Reality/Augmented Reality interpretation).

- Procurement preferences: Use government purchasing power by favouring suppliers who base or test digital services in remote regions.

Skills and workforce development

- Targeted training: Fund place-based digital skills programs tailored to local industries (e.g., geotourism storytelling, 'agri-tech,' mining services).

- Remote internships and placements: Incentivise urban-based tech students and start-ups to spend time in outback communities through stipends and subsidised accommodation.

- Support Aboriginal digital enterprises: Back Aboriginal-led training in cultural heritage mapping, digital geotourism content, and e-commerce.

Stimulating innovation ecosystems

- Challenge-based innovation funds: Sponsor competitions where digital solutions are sought for outback-specific problems (e.g., remote health delivery, bushfire early warning, visitor safety). Winning ideas receive seed funding.

- Regional testbeds: Position the outback as a low-regulation test environment for new digital tech (drones, autonomous vehicles, satellite communications), attracting national and international innovators.

- Cluster development: Encourage collaboration between local councils, Aboriginal corporations, geotourism operators, universities, and tech firms in digital innovation clusters. Refer to the Ausindustry report, 'AEEMA – Enhancing National Economic Benefits Through a New Cluster Paradigm' https://www.leisuresolutions.com.au/wp-content/uploads/2020/05/FinalDocument2.pdf

Integration with business and industry

- E-commerce enablement: Provide incentives for outback businesses (geotourism, arts, agriculture) to integrate digital platforms for sales, marketing, and bookings.

- Digital geotourism tools: Fund co-development of offline-first visitor apps, AR/VR geotourism products, and smart signage.

- Agriculture and mining synergies: Promote cross-sector digital adoption — e.g., mining camp connectivity benefiting nearby geotourism or pastoral operations.

Policy and governance enablers

- Digital Inclusion frameworks: Ensure Aboriginal communities are equal partners in planning, with support for local content creation and data sovereignty.

- Long-term incentive programs: Provide multi-year funding cycles to give certainty for investors and innovators (short-term grants are often insufficient in remote regions).

- Monitoring and metrics: Establish clear KPIs (e.g., number of regional businesses online, digital revenue growth, local employment in digital roles).

Examples of incentives already in place

- Queensland's Remote Area Board funding has piloted digital tourism apps linking Indigenous cultural interpretation with tourism routes https://bit.ly/47766YK

- NT Digital Territory Strategy is experimenting with satellite-enabled "smart outstations."

- Federal 'Agri-Tech' grants have already driven adoption of remote sensors and drones, showing how targeted incentives can spill over into other industries.

Summary

Government agencies can incentivise digital industries in outback Australia (including the Mid West) by combining infrastructure upgrades, financial incentives, skills programs, innovation ecosystems, and tailored integration with local businesses. The focus should be on offline-capable solutions, Aboriginal inclusion, and cross-sector synergies particularly geotourism, agriculture, and mining.

This approach positions the Mid West as a testbed for frontier innovation, benefiting both local communities and national competitiveness.

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Attachment 'A'
The National Geotourism Strategy (NGS)

Launched in April 2021 by the AGC, the NGS is being implemented to support the orderly development of major geotourism projects and activities in line with overseas trends and domestic regional development imperatives.

The NGS has seven strategic goals. These span pathways for identifying and implementing major geotourism projects, to the development of digital platforms to provide information for travelers on geological features in this region. Strategy can recognise their significant geoheritage and enable the establishment of new geotrails.

Key documents relating to the launch and further development of the NGS can be downloaded.

- NGS Goals https://bit.ly/34IfCjq
- Media Release, Launch of the National Geotourism Strategy, 7 April 2021 https://bit.ly/3HEcyaB
- Media Release Explanatory Notes and Contact Details for Participating in Working Groups https://bit.ly/3n6yiT2
- Media Release, THRIVE 2030, 7th April 2022 https://bit.ly/3ufYI9w

The seven strategic goals of the NGS are as follows.

1. **Assessment and promotion of new digital technologies to highlight and interpret natural and cultural heritage, highlighting geology and landscape.**
2. To define an approval pathway for major geotourism projects such as the establishment of approved geoparks.
3. **To establish a framework for creating high quality, sustainable geotrails.**
4. To establish a national listing for geoheritage sites suitable for geotourism.
5. Develop geotourism in regional mining communities with potential **geoheritage and cultural heritage sites.**
6. To strengthen Australia's international geoscience standing through geotourism excellence.
7. To develop and enhance geoscience interpretation and communication skills for everyone actively involved in the presentation of geosites, enabling the provision of accurate and thematic information in an accessible manner.

NGS Goal 1: Innovative, digital new products (as previously described in this submission)

In developing the NGS for Australia through the implementation of Goal 1, the AGC has recognised that state-based geotourism maps, supplemented by publications, may well be eventually replaced by digital technologies (e.g., 3D visualisation, augmented reality, virtual reality, holograms, and live streaming using smartphones and drones) and GIS technologies as a cost-effective means of accessing and better communicating geological content for tourists.

There exists a major challenge to structure digital frameworks which capture and interpret key elements of natural and cultural heritage sourced from a wide range of directories, and which define the holistic nature of geotourism, having regard to the process of digital transformation which is impacting on all industries. The imperative driving this goal will be meeting consumer needs, particularly international visitors, who are now increasingly accustomed to the use of digital devices to underpin all aspects of their tourism experience.

Moreover, it is recognised that these technologies provide a means of interpreting geosites (including sites of cultural significance) where measures need to be put in place to protect geological heritage or have regard to Aboriginal cultural sensitivities.

NGS Goal 2: Define an approval pathway for major geotourism projects.

Back in November 2009, Australian governments advised that they had significant concerns with the application of the UNESCO Geoparks concept in Australia and to take no further action to recognise any future proposals to further progress geoparks initiatives within Australia.

Since then and as a result of discussions with the government Geological Surveys, the AGC has recognised that this decision represented the only formal policy decision of all Australian Governments relating to geoparks. Hence in framing a key goal of the National Geotourism Strategy launched in April 2021, the AGC obtained the support of these Geological Surveys and Geoscience Australia, through the auspices of the grouping of their Chief Geologists (GWG), to review an approval pathway for major geotourism projects which could possibly lead to geopark nomination at state and national levels and, as approved by governments, at a UNESCO Global Geopark level.

The AGC had recommended that any geopark proponent should, in the initial stages of geopark assessment, adopt a nomenclature which removes reference to the word ‘geopark’ and focus instead on communicating the concept of a ‘GeoRegion.’ In Australia, GeoRegions can be single, unified geographical areas where sites and landscapes of geological significance are linked together around a central natural or cultural value. Their intended ‘bottom-up’ approach of combining conservation with sustainable development aims to involve local communities.

The establishment of GeoRegions as a first exploratory and consultative step for potential geopark development has now been accepted by the State/Territory Geological Surveys and Geoscience Australia.

On 27th November, the GWG has subsequently approved the release of a document setting out guidelines for the development of GeoRegions https://bit.ly/47Nappn . It is worth noting that the Guidelines stipulate that assessment and input into the further development of established GeoRegions are the responsibility of individual States and Territories, as legislation and tenure arrangements for land access are quite different in each jurisdiction. Any group wishing to establish a geopark from within an established GeoRegion will need to make representations to the designated State/Territory government agencies to determine how a proposal can be assessed, and the types of works to be undertaken within a GeoRegion before it can be processed for approval.

Currently Australia has only **three approved GeoRegions** under active consideration for potential geopark development, one of which is located in Western Australia i.e. The **Murchison GeoRegion**, located some 550 kms north of Perth within the Mid West Region of WA, a 281,200 sq km area embraced by seven Shires, co-supported by the Mid West Development Commission https://bit.ly/3XYXKfe

NGS Goal 3: Delivering geotourism products and experiences through Geotrails

Geotrails are journeys that offer the advantages of

- relating directly to the tourism experience linking destinations particularly of geological or geographical interest;
- having universal appeal, and do not compete with or impact on land access issues;
- being easy to establish and representing a cost-effective means of enhancing regional development.
- forming logical journeys linking accommodation destinations where available;
- melding the geological heritage features of a region with a **cohesive story**; and
- incorporating the biodiversity and cultural components (including mining heritage) of the region through which the geotrail traverses.

Geotrails not only link natural landscapes, wilderness, and protected areas, but also include human modified environments like quarries, road sections and urban settings. Geotourism argues that to fully understand and appreciate the environment, visitors firstly learn about the Abiotic elements of climate, landscape, geology, and soils, as these determine the distribution of Biotic elements of animals and plants. Both components influence the cultural landscape of how people inhabited the area in the past, as well as how they live there today. These become the key ABC (Abiotic, Biotic, Cultural) elements of geotourism/geotrails, which provides a cohesive approach to interpreting natural areas.

In NSW over recent years, the Geological Survey of New South Wales (GSNSW) has developed in conjunction with the NSW National Parks and Wildlife Service, Councils, universities, and community groups, four outstanding localised geotrails https://bit.ly/4m90gue

- The Newcastle Coastal Geotrail linking 14 geosites along about 10 km of coastal walk from near Newcastle CBD at Nobbys Beach in the north, to **Glenrock State Conservation Area** to the south;

- the **Port Macquarie Coastal Geotrail** covering about 4 km of coastline from Port Macquarie CBD south to the Sea Acres National Park;

- a series of geotrails of the **Warrumbungle National Park** have been captured in a video production ; and

- the newly established **Mutawintji National Park Geotrail**, located some 130 km north-east of Broken Hill in far west NSW, follows existing walking tracks, and using the NSW GeoTours App, tourists will be led back through time. This project was delivered in partnership with NSW National Parks and Wildlife Service, and with guidance from the Mutawintji Board of Management, Mutawintji Local Aboriginal Land Council, local Aboriginal elders, and members of the wider community. https://bit.ly/4mVee39

Geotrails are also an effective vehicle for promoting broader community interest in geoscience and recognition of it as one of the four fundamental sciences along with physics, chemistry, and biology. As such there are long-term educational and cultural benefits in fostering the appreciation of how our Earth influences landscape, ecology, and our lifestyles.

In summary**, Goal 3** of the NGS seeks to establish a framework for creating high quality, sustainable geotrails across Australia supported by innovative hardcopy and/or digital-based interpretation tools.

A feature of the Murchison GeoRegion is an extensive geotrail that links 21 key geosites and is supported by an App https://murchisongeoregion.com/map/

NGS Goal 4: Geodiversity values in the Murchison GeoRegion - the link between natural geodiversity and biodiversity values

A focus on biodiversity values is invariably given significant attention in destination management planning. However, it is also worth recognising that the underlying geodiversity of any ecosystem may be as influential upon flora and fauna as the ambient climate and provide a proxy measure for biodiversity.

In evaluating geoheritage, there are three key land management concerns of interest to the geoscientific professions:

1. Geodiversity is significant for a wide range of reasons; ranging from pure geoscientific interest, through provision of ecosystem services including habitat diversity and onwards to a cultural perspective that includes landscape as ancestor and visitor attractions.

2. Aspects of geodiversity can be susceptible to degradation because of

human disturbance. In many cases such degradation is permanent and irreversible. Only active landforms have any potential for recovery, which may be imperceptibly slow on a human timescale.

3. Geodiversity must first be valued to conserve and protect it.

Criterion (viii) of the World Heritage Convention as it applies to World Geological Heritage has recently been released by the IUCN. https://bit.ly/39Zb4vf . Its application in Australia is recommended when considering geoheritage considerations as it relates to areas such as the Ku-ring-gai GeoRegion and areas within it such as Hornsby Shire.

With these factors in mind, the Working Group for **Goal 4** has finalised criteria to be applied in defining geoheritage sites deemed suitable for geotourism https://bit.ly/3NjMDco

NGS Goal 5: Developing geotourism in regional mining communities with potential geoheritage and cultural heritage sites

This goal recognises the significant opportunities for geotourism that occur in unprotected areas outside of national parks and reserves. This goal is concerned with geodiversity, landforms, and places, that:

1. Have been exposed or modified by human activities (especially mining & quarrying).

2. Possess significant *additional* value to people, through cultural history, recreational use, or educational opportunity.

This goal focuses on geotourism opportunities in regional areas which occur outside parks and reserves, but which may contain interesting features and narratives including geological, biological, and cultural elements. Goal 5 is designed to develop geotourism in areas with regional communities (especially past and present mining communities) are not covered by significant conservation legislative protections, but which are still worthy of recognition and promotion.

Key concepts

Primary geodiversity refers to 'natural' geology, landforms, and other landscape elements, some of which are conserved because of being rare or special to science i.e. 'geoheritage'. Secondary geodiversity refers to 'human-modified' versions of these elements that possess important additional values, such as:

- cultural heritage related to Aboriginal and post European settlement values;
- aesthetic values which may be visually rather than scientifically significant;
- educational values which explain the place, its history and relevance; and
- 'System support elements' including geomorphological features which result from its geology and associated aspects.

UNESCO defines cultural landscapes as 'cultural properties that represent the combined work of nature and of man.' In Australia, the phrase 'cultural landscape' incorporates many

secondary geodiversity elements as part of the diverse social landscape including mining, Aboriginal and Torres Strait Islander (Aboriginal), pioneer, agricultural, and artistic elements; the resultant-built forms; and the role in which the physical landscape plays shaping the social landscape. Secondary geodiversity sites or elements are perfect for geotourism, as they are often unencumbered by legislative protections, and such diverse cultural elements often form part of the identity of many regional mining communities, past and present.

Mining cultural landscapes

Geotourism opportunities could also arise from the consequences of mine closure, much of which is currently oriented towards environmental remediation. There is scope to include the preservation of mining heritage in situ with the geotourism or geoheritage potential being accepted as the rationale for conserving these assets as important cultural heritage assets for new geotourism product development.

Aboriginal cultural elements and landscapes

Aboriginal cultural elements and landscapes cut across widely accepted, post-settlement landforms and landmarks, and have values specific to various groups and individuals. Therefore, there is potential to incorporate and/or communicate (with permission or via collaboration) creation stories and narratives of landscapes and features through geotourism. In this context, there is an opportunity to see a greater emphasis put on the connection across geotourism, geoheritage and the cultural heritage of Aboriginal people and the potential for future collaborations. Implicit in this approach is the need to protect and preserve the cultural heritage of Aboriginal people, and in particular a recognition of the potential need to adhere to legislation designed to protect the environment, biodiversity, and cultural heritage of Australia.

Native Title means a higher level of acknowledgement than any other group that has had a period of history in a place, including involvement in planning and development opportunities such as geotourism. There could be scope in this space to develop Aboriginal Land Use Agreements to access some sites and places with local Aboriginal guides. In many cases, these places are off limits to the public. By doing so, these initiatives could develop economic bases for the local Aboriginal communities who have custodial responsibilities over the places that could be visited.

It is considered that Goal 5 recognises the six Larrakia Declaration Principles that seem to be widely accepted in Aboriginal tourism development. These principles were developed at the World Indigenous Nations Tourism Association conference in Darwin in 2012 and are foundations for Queensland's First Nations Tourism Plan, with Canadian and NZ parallels. These principles focus on leveraging a flourishing 'First Nations' tourism economy by sharing authentic, memorable, and culturally enriching experiences. The principle requiring 'that equitable partnerships between the tourism industry and Indigenous (sic) people will include the sharing of cultural awareness and skills development which support the well-being of communities and enable enhancement of individual livelihoods', seems particularly relevant to Goal 5.

Potential enablers and collaboration

The acknowledgement of Aboriginal cultural heritage beyond the benefits offered through geotourism includes the need to ensure it is appropriately protected. This will ensure clarity on the strategy that the preservation of Aboriginal cultural heritage is equally as important as that of mining and other aspects of cultural landscapes, thus leading to improving the public perception of geoscientists and the industries in which they work. Acknowledging Aboriginal communities and spirituality in relation to landscapes is appropriate, and in a contemporary spirit of reconciliation, respect and understanding previous injustices.

The need for collaboration with other professionals, with expertise in these areas, to address these issues is considered highly relevant. Of particular relevance to this need is the THRIVE 2030 Visitor Economy Strategy (Action 7.5) of the Australian Government (supported by the Western Australian Government) which states, 'Grow and develop high-quality products and experiences around unique Australian locations and themes, including approaches which integrate sustainable nature tourism with economic opportunities for Traditional Owners, and capitalising on emerging tourism trends such as geotourism.'

It needs to be recognised that geoheritage has little statutory protection. Encouraging visitor access to geoheritage sites has the potential to invite damage to geoheritage values, an issue that needs to be addressed in Goal 4. In constructing a framework to identify those sites that are suitable for geotourism (including sites also of cultural significance), it needs to be recognised that the best protection for a geoheritage site may be through protection of its Aboriginal cultural values. Therefore, if geosites have significantly recognised cultural values, it makes it easier to put in place appropriate geodiversity site protections.

Pioneer elements and built heritage

Even though other types of heritage protections exist for old buildings and post-European built heritage, there is an overlap between these elements and secondary geodiversity. Such areas could incorporate geotourism narratives or be included in geotouristic experiences. The notion of including 'pioneer' elements within this mix is exemplified by the emergence of the Victorian Goldfields World Heritage listing bid, a project in which the AGC has been providing advice about geotourism and mining heritage opportunities. The project is a partnership between local governments, regional organisations, academia, and the private sector on behalf of the Victorian Goldfields community. The bid seeks to achieve a World Heritage listing to celebrate the history and heritage of the region. However, because a World Heritage Listing precludes existing mining activities, the proponents may well need to consider making use of alternative mechanisms such as the UNESCO International Geoscience and Geoparks Program to further the intent of a project of this type.

Attachment 'B'
Some Pointers - Background to the Development of ICT (Digital) Infrastructure [1]

[1] The Coordinator of Geotourism Australia performed the role as inaugural Honorary Secretary of the National ICT Industry Alliance (2001-2007) https://www.linkedin.com/in/angusmrobinson/ During this period, he also participated in an industry working group providing input into the early development of the SKA project.

1. Extract from the Report 'Energising Australian Innovation' published by the then National ICT Industry Alliance in 2007 [2]

[2] **https://bit.ly/4oIL7lk**

In 2007, the then National ICT Industry Alliance (NICTIA) with membership that represented a wide cross section of the Australian information and communications technology industry, developed and published for submission to Australian governments, a 10-year strategic vision for the Australian information and communications technology (ICT) sector. The vision document had the title 'Energising Australian Innovation'.

NICTIA provided a 'clearing house' where organisations representing the interests of industry, ICT professionals and public R&D institutions could meet to exchange views and discuss initiatives to advance promotion and development of ICT in Australia.

NICTIA members included the Australian Computer Society, Australian Electrical and Electronic Manufacturers' Association (AEEMA), Australian Information Industry Association, Australian Interactive Media Industry Association, Australian Mobile Telecommunications Association, Australian Telecommunications Users Group, Communications Alliance, Council of ICT CRCs, CSIRO ICT Centre, Defence Science and Technology Organisation, Females in Information Technology and Telecommunications, Internet Industry Association, Internet Society of Australia, Medical Software Industry Association, National Electrical and Communications Association, National ICT Australia (NICTA), Small Enterprise Telecommunications Centre Limited, Smartcard Information Security Australia, Standards Australia, TEDICORE, and the Telecommunication Society of Australia

These member organisations believed that Australia needed a national ICT strategy, noting that economies that have developed and vigorously pursued national ICT strategies, such as Ireland, Singapore, Korea, Taiwan, India and Canada have been demonstrably successful in establishing thriving ICT sectors with flow on effects across all sectors of their economies.

The published document represented the collective views of NICTIA members on issues considered to be fundamental to Australia's success as an innovator and producer of commercial ICT products and services. These issues (highlighted by 12 vision statements) recognised as key considerations in the development of a proposed 10-year ICT strategy and policy framework for Australia. It was argued then that they should be central to documents being prepared and implemented by the Australian Government and by State, Territory and Local Governments.

Vision Statement 9 addressed ICT INFRASTRUCTURE

A high speed, affordable national broadband infrastructure and complementary e-security network that puts Australia amongst the leaders in the OECD in terms of its broadband capabilities; and be one of the first nations to gain the benefits from migrating to IPv6.

And in detail, "In the emerging era of ubiquitous computing and the new information economy, communications is the enabler and must be seen in the same light as other essential infrastructure in terms of its necessity for future industry development. All homes and businesses should have access to high-speed Internet connectivity at reasonable prices, and by high speed we mean not less than one and, ultimately, not less than 30, Gigabits per second (Gb/s) bandwidth.

Singapore's recently announced IN2015 manifesto promised that every household in Singapore would receive free of charge from the Government ultra-high speeds of symmetric 1Gbps or more, with initial provisioning of 100Mbps internet connection. Such is the appreciation of the extent to which broadband infrastructure is conducive to innovation and technological proficiency. South Korea started making national plans for broadband deployment in 1998 when it provided the equivalent of A$40 billion over 12 years to provide national access for VDSL or fibre to more than 80% of homes. South Korea thus moved from having less than 1% penetration in 1995 to become one of the most advanced broadband nations in the world ten years later. South Korea also invested in reducing the digital divide by ensuring that all sectors of society benefited from the infrastructure.

Broadband will catalyse the emergence of a whole new range of products and services. Mobile communications and hardware convergence will create new user markets and a market for software and content: areas where Australian ICT is strong and provides leading solutions.

If left to industry alone, consensus amongst key industry players is that it is likely to take 10 to 15 years for the appropriate broadband infrastructure to be in place. Regrettably, by then Australia may well have missed the opportunity to be at the forefront of software and content development for communications-based industries.

Additionally, Australia should commit to a timeframe to migrate to next generation Internet technology IPv6 as a priority. IPv6 improves security and has potential to reduce the complexity of administering networks, spark innovation and create new services and job opportunities.

It will provide the means to deliver fully networked homes, offices and communities. Initiatives such as the Australian IPv6 Summit and the ITOL IPv6 for e-Business project have begun this process.

The Australian Government and the State and Territory Governments have a clear and urgent mandate to co-operate to drive installation of a national, high speed, broadband infrastructure network for the benefit of all Australians.

Importantly, achieving a strong digital content industry will require a comprehensive and trustworthy e-security framework so that the community and business can have full confidence

in migrating to on-line business models. Implementing a comprehensive 'state of the art' e-security framework for Australia must be undertaken as a complementary component of introducing ubiquitous broadband infrastructure.

Australia's success in maximising information society benefits has been based strongly on private sector involvement, with effective government support through limited regulatory intervention while ensuring consumer safeguards and funding of key areas where market forces were insufficient. This approach provided a substantial boost to Australia's early development of the Internet and our capacity for interoperable connections with the world. It allowed Australia to take advantage of new open technologies that were created by the Internet community worldwide.

With the massive growth of popularity of the Internet worldwide, now a number of international processes have taken an interest in the future development of the Internet. Australia has increased its international reputation by well informed and effective participation in these forums, particularly the World Summit on the Information Society and the Internet Governance Forum. Now the OECD is working on a process that will debate the 'Future of the Internet' at Ministerial level. Australia needs to continue an approach to these discussions that is fully engaged with the worldwide Internet community and allows full multi-stakeholder participation, including governments, business, the Internet community and civil society. NICTIA is in a strong position to support this participation on a national level.

Openness, user choice and control, and edge-based intelligence are central to a thriving Internet. Any discussion of the future of the Internet should be to ensure that these principles are taken into account so that the Internet continues to provide individual users with as many choices and as much flexibility as possible while preserving the end-to-end architecture of the network.

Open standards and open processes enable anyone with good ideas to develop, propose, and promote new standards and applications and provide a strong foundation for further innovation. The focus for government, therefore, should be to foster open, competitive markets, support research and education, and use the Internet to expand egovernment services."

2. Lessons Learnt from the Implementation of the IT839 Strategy of South Korea

The **IT839 strategy**, introduced in 2004 by the Ministry of Information and Communication, was an ambitious initiative to catalyse Korea's transformation into a 'ubiquitous information society'.

It aimed to create a virtuous cycle across three interlinked dimensions:

- **8 New Services**: including WiBro (wireless broadband), DMB (digital multimedia broadcasting), home networks, telematics, RFID-based services, W-CDMA, terrestrial digital TV, and VoIP internet telephony.

- **3 Core Infrastructures**: namely Broadband Convergence Network (BcN), Ubiquitous Sensor Networks (USN), and next-generation Internet protocol (IPv6).

- **9 Growth Engines**: covering areas such as next-gen mobile communication, digital TV, SoC, next-gen PCs, embedded software, digital content, telematics, and intelligent service robots.

The strategy's rationale was that promoting innovative services would drive investment in infrastructure, which in turn would stimulate development of related devices and industries, creating a reinforced value chain.

Implementation outcomes and critiques

1. Visionary but overly optimistic projections.

2. Underwhelming adoption of planned services.

3. Role of Government as catalyst, not dominant funder.

- Government investment mainly functioned as 'seed' or strategic stimulus.
- The 'Informatization Promotion Fund' (established earlier) played a key enabling role in supporting ICT adoption through both government and private contributions.

Key Lessons for digital infrastructure development arising from the IT839 Strategy as follows.

1. Integrate services, infrastructure, and industry but ground ambitions in market realities.

The concept of synchronising services, networks, and hardware/software is sound. However, setting adoption targets must be realistic, demand-informed, and adaptable to changing market dynamics.

2. Ensure private sector engagement with strategic government support.

Government funding should act as a catalyst—creating enabling conditions (standards, licensing, pilot projects) that spur substantial private investment. Korea's model shows how to efficiently leverage public resources to unlock broader investment.

3. Allow flexibility and iteration.

The IT839 strategy needed mid-course adjustments (e.g., transitioning to 'u-IT839') to align with evolving technology and market conditions. Such responsiveness is critical to keep strategies relevant.

4. Avoid politically driven or inflated projections.

Overly ambitious forecasts can create unrealistic expectations, backlash, and eventual

credibility loss. Rigorous, evidence-based targets and transparent communication are vital for sustained support.

5. Account for consumer demand and address the digital divide.

It is understood that some services failed owing to poor alignment with consumer needs or their availability. In Korea's case, despite high infrastructure readiness, service take-up lagged, highlighting that inclusion, usability, affordability, and demand-side factors are as important as supply.

In summary, the IT839 experience has been regarded globally as a compelling blueprint. For countries (and regions) aiming to build digital infrastructure, it underscores the importance of strategic government role, private sector engagement, flexibility, realistic goal setting, and demand-oriented design. When harmonised, it is believed that these elements can foster impactful and sustainable digital transitions.

Moreover, for outback Australia**, the IT839 Strategy reinforces the need to consider other 'next -gen' technologies to supplement the core broadband network when building the digital infrastructure platform**. In Australia, next-gen, infrastructure–related digital technologies refer broadly to cutting-edge digital innovations that enhance, modernise, and future-proof how infrastructure is delivered, managed, and utilised across sectors such as transportation, energy, telecommunications, and public services. Those that may be relevant to the Mid West include the following.

<u>Connectivity and networks</u>

- 5G and Beyond (e.g., 6G): Australia's 5G rollout supports industrial, enterprise, and consumer use cases, enabling real-time communications and smart infrastructure applications.

- Regional Resilience: New South Wales is piloting nomadic mesh Wi-Fi, satellite-enabled services, and emergency-grade data systems to improve connectivity during disasters.

<u>Data centres and cloud infrastructure</u>

- Massive investments are reshaping Australia's digital backbone. It is understood that Amazon Web Services alone is committing A$20 billion to expand data centre and cloud capacity by 2029.

- The Supernode Project in Queensland is one of the country's largest endeavours: a renewables-powered data centre plus battery storage to advance carbon-neutral digital infrastructure.

Digital twins and spatial analytics

- In Victoria, it is reported that partially enabled digital twins are being deployed for infrastructure planning, asset management, and emergency response enhancements.

- It is also reported that the Australian Government is also developing a Digital Atlas, a 3D platform that integrates infrastructure, land, health, and environmental data into a cohesive national data asset.

AI, Machine Learning, and digital twins for resilience

- Recent reports underscore the role of AI in infrastructure resilience—using AI-driven digital twins, hazard early-warning systems, and post-disaster recovery tools to reduce damage costs.

- Broader integration of AI across engineering systems, analytics, and decision support is becoming mainstream.

Internet of Things (IoT), robotics, and automated monitoring

- IoT applications in manufacturing, mining, and logistics are widespread.

- Robots like the SPIR (submersible pile inspection robots) are being used to inspect and clean bridge structures, improving safety and precision in maintenance.

Cybersecurity & Secure Infrastructure

- It is believed that institutions such as the Australian Cyber Collaboration Centre (Aus3C) in Adelaide are pivotal in developing secure systems, testing infrastructure components, and educating the workforce.

- Energy-Digital Integration & Renewable Infrastructure.

- Technologies merging renewable energy infrastructure with digital systems—like virtual power plants, large-scale batteries, and green data centres—are gaining traction through funding streams like the Australian Renewable Energy Agency (ARENA).

- The proposed Australia–Asia Power Link blends embedded renewable energy generation with long-distance transmission (including the world's longest undersea cable), representing a fusion of energy and digital infrastructure.

3. The SKA Project - Key Benefits & Services (digital infrastructure related) for Regional Development

Infrastructure upgrades and digital connectivity

- Construction of the SKA-Low telescope has enabled extensive deployment of power and fibre networks, significantly enhancing digital connectivity for nearby communities such as Murchison Settlement and Pia Wadjarri.

- A substantial $64.4 million investment supports the Australian SKA Regional Centre (AusSRC) in Perth, providing advanced computing facilities and enabling robust data processing and science-ready outputs.

- As a mega-science project, SKA aims to help develop transferable skills in big data analytics, software engineering, and remote operations.

Spin-off technologies and cross-sector innovation

- Data processing demands (e.g., up to 700 GB/s) drive innovation in supercomputing, signal processing, and algorithmic development, benefiting sectors like mining, energy, transport, and healthcare.

- SKA strengthens regional resilience by introducing advanced digital infrastructure and skills that support economic diversification beyond traditional sectors.

In summary, as it relates to digital infrastructure development, **the SKA project offers a transformative suite of services to the Mid West region of Western Australia**, dramatically upgrading digital infrastructure, enabling better connectivity and regional integration. It creates jobs and economic opportunities, especially for local and Indigenous communities. The project also catalyses technological innovation and spin-offs with cross-sector potential, and strengthens regional resilience through diversification into space, defense, and advanced computing sectors.