Evaluation Report

Mobility Data Project – Theme 5

How can telecommunications data help government to understand whether there have been changes to ecotourism behaviours in response to COVID-19, and if behaviour has changed, what impacts are there on ecotourism development including, marketing and infrastructure needs in local economies?

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Queensland Government

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Acknowledgments

Disclaimer

Table of Contents

1 Abstract

A nine-month pilot was conducted to determine the value of deploying population mobility data for long-term all-of-government use. Five pilots were conducted by a consortium of government departments and associated bodies working together through three Queensland universities. The Department of Tourism, Innovation and Sport (DTIS) and Griffith University were assigned theme five, which focussed on utilising telecommunications data to understand ecotourism behaviours and the potential impact of changes on future ecotourism infrastructure, and marketing needs.

Utilising DSpark's proprietary telco-sources and anonymised mobility data, DTIS and Griffith University's Relational and Insights Data Lab (RIDL) team developed a customised "Ecotourism" dashboard that geospatially quantified and visualised population movements based on ecotourism locations across Queensland between 2019 and 2021. Analysis showed that accessing telecommunications data could provide DTIS with previously inaccessible data on changes in ecotourism behaviours. The pilot successfully demonstrated that accessing DSpark insights could accelerate ecotourism development by assisting to short list potential areas for infrastructure development and through demographic insights better target marketing and promotion.

2 Executive Summary

As part of a consortium established in 2021, The Department of Tourism, Innovation and Sport (DTIS) worked with Griffith University to pilot the application of mobility intelligence data to better monitor changes in ecotourism behaviour. The overarching goal of the pilot was to understand the long-term value of DSpark data to DTIS and apply the learnings to a whole-of-government approach to data analytics.

At a departmental level, as the scope of tourism is broad and can encompass a wide range of sectors and industries, DTIS chose to focus specifically on ecotourism. The recently released Action Plan for Tourism Recovery reinforced this decision by identifying 'accelerating ecotourism' as one of the four catalyst for change areas to help reshape the Queensland visitor economy as it recovers from the COVID-19 pandemic and prepares for the 2032 Olympic and Paralympic Games. The aim of the pilot was to assess whether DSpark data could provide useful insights into ecotourism behaviour that could inform future ecotourism infrastructure and marketing development.

The Relational Insights and Design Lab (RIDL) from Griffith University took an innovative, co-design approach and built a customised dashboard that utilised DSpark's proprietary DSpark Application Program Interface (API) and Australian Bureau of Statistics (ABS) data. The dashboard visualises millions of geo-signals to provide visibility on where, why, and how different segments of the ecotourism market move and behave. The granularity of the data insights are showcased by the ability to filter by demographic age groups, collective number of overnight hours stayed and even visitor home locations.

Using DSpark's state-of-the-art algorithms and overarching strategic directions identified in the Action Plan for Tourism Recovery interim and final reports, analysis of dashboard observations revealed insights that showcased the utility of DSpark data in monitoring changes in ecotourism behaviours.

The pilot demonstrated that DSpark mobility intelligence could help DTIS to:

- Support Government consideration of tourism development proposals in or around ecotourism locations
- Inform future ecotourism infrastructure development needs
- Identify high visitation areas with opportunities for ecotourism development adjacent to national parks
- Improve target marketing and promotion to nature-based travellers in ecotourism locations
- Highlight any significant changes in travel behaviour to ecotourism locations due to COVID-19 and severe natural disasters
- Determine whether changes in travel behaviour normalises after significant disruptions

The pilot successfully demonstrated that telecommunications data can be used to monitor changes in ecotourism behaviours and inform data driven, evidence-based decision making. It is noted that in line with the Queensland Tourism Industry Reference Panel's Action Plan for Tourism Recovery recommendation 62, the establishment of a data design group comprising of government, industry and universities could be used to build upon this pilot and further explore and coordinate the application of data for both ecotourism and tourism development generally.

3 Background

Queensland has a natural tourism advantage with over 14.2 million hectares of national parks, 6,900km of mainland coastline and the most biodiverse environment in Australia. In 2019 however, even before the global COVID-19 pandemic brought the tourism industry to a near standstill, Queensland was losing market share to overseas and interstate competitors.

The Queensland Government identified that leveraging data as a strategic asset is increasingly important and has the potential to improve the management and effectiveness of service delivery across all departments and agencies. In 2020, the Government was confronted with managing the COVID-19 pandemic that saw Queensland borders closed to the world and subsequently the rest of Australia for the first time in 100 years. All across the world, the need to access population movement data became critical for managing the global pandemic. To address this challenge, the Government through Queensland Health engaged DSpark, Australia's leading mobility intelligence and insights provider to build an Epidemiology Tool that harnessed telecommunications data to inform evidence-based and data-driven responses to the evolving public health emergency.

Following the success of applying DSpark telecommunications data to the Government's pandemic response, the Government sought to explore how to unlock the value of telecommunications data analytics for the whole of government. This data mobility pilot is part of that process. The overarching aim of the project was to determine the value of DSpark population mobility data for long-term all-of-government use. The project brought together a consortium of government bodies and Queensland universities to pilot the use of telecommunications data in the following five areas:

1. Improved disaster responses, including monitoring COVID-19 restrictions and geographical responses to outbreaks
2. Monitor trends in road usage and traffic movements, including changes during and after the COVID-19 restrictions
3. Understanding movement changes due to COVID-19. Thus, having an impact on the risk of transmission of the virus and the impacts on infrastructure planning.
4. Understanding average activity levels of the population
5. Changes in tourism behaviours in response to COVID-19, and the impacts of transmission risk and infrastructure needs as well as local economies.

The Department of Tourism, Innovation and Sport (DTIS) was assigned theme five and due to Queensland's unique natural endowment and growing desire for regenerative and nature-based tourism, chose to focus on ecotourism[1] broadly, and visitation to national parks in particular. Queensland has over 200 national parks and due to the state's vast geography and the sheer volume of data available (1 December 2018 – 31 December 2021), a case study approach was undertaken to help focus the analysis. Noting that Tourism and Events Queensland (TEQ), a statutory government body already uses DSpark data for dashboards, the Relational Insights and Data Lab (RIDL) built a dashboard[2] prototype for DTIS that could be used as a starting point for collaboration if required. The dashboard visualised DSpark telecommunications data using graphs and heat maps to aid more

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[1] Ecotourism is ecologically sustainable tourism with a primary focus on experiencing natural areas that fosters environmental and cultural understanding, appreciation, and conservation.
[2] RIDL: DSpark Eco-tourism Dashboard (shinyapps.io)

efficient identification of nature-based travellers behavioural changes and how these could be used to improve DTIS planning and deployment of ecotourism recovery and growth strategies.

3.1.1 Research question(s)

The research question initially assigned to DTIS was:

How can telecommunications data help government to understand whether there have been changes to tourism behaviours in response to COVID-19, and if behaviour has changed, what impacts are there to future transmission risk and infrastructure needs of local economies?

Over the course of the project, the research objective evolved, Brisbane won the bid to host the 2032 Olympic and Paralympic games, COVID-19 restrictions eased, and state and international borders reopened. Following these developments, the Government and tourism industry began to pivot focus from the management of COVID transmission risks to recovery and leveraging the "green and gold" highway leading up to the Olympics.

The Queensland Government established an independent Tourism Industry Reference Panel in early 2021 to develop an Action Plan for Tourism Recovery, with terms of reference covering particular areas of focus, including:

- Changes in consumer demand and emerging opportunities
- Enablers of tourism growth, including skills, infrastructure, and technology
- Opportunities for new products and experiences, including shovel ready projects capable of spurring investment, rejuvenation, and visitation
- Opportunities for events to drive visitation, including reginal areas and during off-peak periods

In refining the research question RIDL in conjunction with DSpark produced analysis that sought to complement the reference panel scope and help identify how technology and data can be deployed to assist in identifying future ecotourism infrastructure development opportunities and inform / target marketing efforts. As the analysis covers 2019 – 2021, COVID insights will still feature, however the recommendations will be geared towards recovery objectives.

To cater for this, the research question was adjusted to:

How can telecommunications data help government to understand whether there have been changes to ecotourism behaviours in response to COVID-19, and if behaviour has changed, what impacts are there on ecotourism development including, marketing and infrastructure needs in local economies?

3.1.2 Aims and objectives

The overarching aim of the consortium was to determine the value of DSpark population mobility data for long-term all-of government use. The main DTIS objective for the theme five pilot was to determine whether telecommunications data could provide greater visibility and useful insights into ecotourism behaviour that could inform future ecotourism infrastructure and marketing opportunities.

In particular, the pilot sought to determine whether DSpark data could:

1. Be used to support Government consideration of tourism development proposals in or around ecotourism locations e.g., understanding ecotourism demand and travel behaviour for the area.

2. Inform future ecotourism infrastructure development needs e.g., identifying sites with the potential to grow overnight stays and midweek visitation through accommodation development.

3. Identify high visitation areas with opportunities for ecotourism development adjacent to national parks.

4. Better target marketing and promotion to nature-based travellers in specific ecotourism locations.

5. Highlight any significant changes in travel behaviour to ecotourism locations due to COVID-19 and the likely impacts in any future pandemic / severe natural disasters.

6. Determine whether the changes in travel behaviour are now returning to pre-COVID behaviours and travel patterns.

3.2 Methodology

The pilot was conducted in two stages and involved collaboration between Griffith University's RIDL team, DTIS and DSpark. The quantitative analysis was experimental and began with RIDL exploring the DSpark data, familiarising the team with its dimensions, attributes, and developing script writing ability.

In the initial access period, pre-written inquiries were submitted to DSpark data scientists to assess query logic and ensure the best approach was being used to address the research questions. Another crucial component of the research was establishing context for interpreting the results being pulled from the DSpark Application Program Interface (API). The second stage was comprised of qualitative and qualitative analysis guided by stakeholder engagement sessions between DTIS and DSpark, ensuring that appropriate examples were chosen and that results were accurately interpreted within context.

3.2.1 Design

3.2.1.1 Engagement Model

The pilot parameters for API access were provided by DSpark and are briefly set out below:

- R and Python were the coding languages utilised
- API tokens were provided to each academic and government user
- User tokens were initially restricted to 2 weeks of data and limited to 10 queries per minute
- Longer time ranges required submission and were run by DSpark
- Query scheduled timing was required to ensure resource availability
- Invite only, virtual fortnightly review sessions were held for users with approved API keys

Data access was opened up to the full range and capability for the researchers from July to December 2021, and at all times DSpark supported query writing and output tables.

Further detail can be accessed in the consortium documentation outlining DSpark's processes and advanced API features and queries.

3.2.2 Analysis

The dashboard analysis involved reviewing every ecotourism location (locations include areas such as national parks, beaches, large parklands, lakes, campgrounds, hiking trails etc…) in the 51 Local Government Areas (LGAs) represented on the dashboard to identify trends or outliers.

The results were organised by region, number of ecotourism locations in each LGA, and observed variations based on visitor numbers, visitor demographics, or geographical location.

Where deviations were observed secondary desktop research was conducted to determine possible cause and context. Due to COVID-19 being a major contributing factor to variations, a restriction timeline was created that focussed on ecotourism related policies and orders e.g., the closure of National Parks and camping areas. A three-year calendar of public and school holidays including changes due to COVID-19 restrictions was also created to aid interpretation.

Additional secondary desktop research was also conducted and included reports from the Queensland Tourism Industry Reference Panel, Tourism and Events Queensland's Nature-based Tourism Strategy 2021-2024, DSpark case studies, news articles and tourism websites.

The pilot outputs demonstrated that DSpark mobility intelligence data insights can be deployed to identify changes in ecotourism behaviours and support related planning and development.

The following table summarises the APIs used to build the dashboard and monitor changes.

API	Capability
Discrete Visit	• How many people are at a certain location? • How many unique people are observed in a given location at a given time? • Identify moving and stationary individuals (any observation in area) • Can give a snapshot of an individual every 15 minutes • Can count the same person multiple times with each new discrete visit calculated • Overlooks the difference between moving and stationary agents
Stay Point	• Where do people stop to spend time? • How many people do that for a location and for how long in average? • How does this fluctuate over time? • A Staypoint is generated when a person is stationary (within a small threshold) for 15 minutes or more they are indexed on start time of Staypoint The implication is querying by hour returns how many stays started that hour, not everyone staying in that hour. Behaviour changes between indoor* and outdoor - Indoor cells = 5 mins to generate a Staypoint - Outdoor cells = 15 mins to generate a Staypoint *Not everyone indoors connects to indoor cell
Origin Destination Matrix and Through Links	• Where do people come from & where do they go next? • What mode* of transport did they use? • What route did they take? • Query is possible by origin time or the destination time *The dominant mode is allocated to the trip across all legs
Links Meta	• What links are in a given area? • What links match a road name?

DSpark data extends back to 2017 and it is important to highlight that they use the highest privacy standards, and that their data is fully anonymised. Recency can be close to real-time, as used in the Epidemiology Tool, however this requires special legislative permission granted at a national level. For the purposes of the pilot, the data had a lag of 60-72 hours.

3.2.2.1 Overview of RIDL Dashboard Analysis

Queensland is the most bio-diverse state in Australia with over 200 national parks and five UNESCO World Heritage sites. Considering the vast scope of ecotourism locations, and DTIS priorities, RIDL focussed on national parks, and devoted a significant part of the project to develop a dashboard prototype that showcased the potential utility of DSpark data to provide greater visibility of visitor behaviour in these locations. Due to data sensitivity and the DSpark API query and data structures, the most granular level of data available for extraction was at the statistical area 1 (SA1) level[3]. Because SA1s are population based statistical geographies assigned by the ABS, in more rural or sparsely populated areas there was occasionally more than one ecotourism destination in a single SA1. It is also important to note that because some SA1s are quite large, an ecotourism location may only cover a small portion of a given SA1, when this is the case, the number of visitors counted are for the entire SA1 as it was not possible to query areas smaller than an SA1. This means that some of the visitors counted may not have been visiting the ecotourism destination per se but were simply recorded as being seen within the queried SA1. Visitors are defined as people seen within an SA1 with an ecotourism destination inside it, who do not live (have a derived home location) or work (have a derived work location) within that SA1. This approach for defining and counting visitors acts as a suitable and actionable proxy for understanding visitor trends and movement behaviours and was validated by DSpark's data science team.

The dashboard was purpose built to be easy-to-digest and share with external stakeholders such as regional and local tourism organisations involved in planning, analysing, or reporting on ecotourism infrastructure and marketing development.

The table below provides an overview of dashboard features based on each tab. Sample screenshots of dashboard outputs are provided in section 4 of the report.

Dashboard Tab	Functionality
Top Eco Destinations	**Top ten ecotourism destinations by number of visitors per year in 2019, 2020 and 2021** Data are aggregated by SA1[4] which means some destinations may contain smaller national parks/destinations. There is a function to hover over the bars for individual counts, and if applicable contained SA1s.
Changes in Visitor Numbers	**Top ten ecotourism destinations by percentage increase and decrease.** The following periods are covered: • 2019-2020 and 2020-2021 • Before and after the onset of the pandemic in March 2020

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[3] An SA1 is the smallest ABS statistical area. SA1s are designed to be either a predominantly rural or predominantly urban in character, with SA1s in rural and remote areas generally having a lower population than in urban areas. Areas without permanent population (such as lakes, commercial areas, national parks etc.) are often represented by "zero SA1s" - these are SA1s with an effective design population of zero. SA1s generally have a population of 200 to 800 persons, and an average population of about 400 persons.

[4] An SA1 is the smallest ABS statistical area covering a population of between 200 – 800 people (see more above).

Dashboard Tab	Functionality
Monthly Visitors	**Monthly visitor counts per ecotourism destination with the ability to filter by 51 local government areas.**
Mid-week and Weekend Visitors	**Greatest and least variations between weekday and weekend median visitor totals** By default, destinations with less than 1000 median visitors in total are removed with the option to reinclude them if required. There is also the ability to compare the weekend and weekday times-series of each destination based on the greatest and least variation of visitors.
Top Visitor Home Locations	**Top 10 home SA4[5] locations of visitors by the number of visitors per year.**
Visitor Overnight Stays	**Top ecotourism destinations by the collective number of hours stayed overnight.** This provides the ability to select any combination of year and age group and view their preferred top 10 ecotourism destinations based on the total number of hours stayed overnight. To aid comparison, there are two graphs placed side by side that can be independently manipulated. Each graph provides the capability to view the home locations (SA4s) of visitors
Distance Travelled	**Average trip distance per SA1 by visitor origin location** Represented as a time-series graph covering the period 2019 – 2021 Filters are available based on: • Local government area (LGA) • Ecotourism destinations contained within the LGA
Unique Trips	Heat maps showing the number of unique visitors with the ability to filter based on: • SA1 • Period of the week (Weekday and Weekend) • Month and Year Two maps are presented side by side and can be individually manipulated for comparison.

[5] SA4s are the largest sub-state regions and are designed for the output of regional data. Most have a population above 100,000 people

The dashboards are available via RIDL: DSpark Eco-tourism Dashboard (shinyapps.io). For privacy and security reasons dashboard access requires authentication to review, this can be requested from RIDL.

4 Findings

This section is designed to provide a snapshot of the pilot findings through sample visualisations and insights gained. It begins with insights into overnight visitors and bushfire recovery in Tamborine Mountain and ends with insights into visitor responses to COVID-19 lockdowns in urban and regional areas.

4.1.1 Overnight Visitors and Bushfire Recovery

4.1.1.1 Wickham National Park –Tamborine Mountain

Objective: Support Government consideration of tourism development proposals in or around ecotourism locations e.g., understanding ecotourism demand and travel behaviour for the area.

In the exploratory phase of the analysis, Wickham National Park was an unexpected outlier. It came up as the top ecotourism location in Queensland based on total overnight hours stayed for visitors under 35 in 2021, and it was ranked fourth for those over 35.

What was even more surprising was that according to the Department of Environment and Science website there are no camping, ablution or refuse facilities[6] at Wickham National Park. The park is said to be a popular bush retreat amongst locals which is reflected in the dashboard, with the majority of under 35 visitor home locations based in Logan, Gold Coast and Brisbane.

Further investigation is warranted and could reveal a catchment aberration or a genuine need for additional visitor infrastructure such as toilet blocks and refuse facilities. There may also be opportunity to investigate the need for the development of accommodation facilities in areas adjacent to the national park.

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[6] https://parks.des.qld.gov.au/parks/plunkett-wickham

Changes in behaviour during and after a natural disaster

In 2019, bushfire events across Australia and Queensland had devastating effects on the communities, wildlife, and the environment. Whilst Tamborine Mountain was spared the brunt of impact, the graph below shows a sharp decline in visitor numbers to Tamborine National Park in November during the fire period. Numbers quickly rebounded and returned to normal the following month. This indicates that visitors to the Tamborine Mountain area heeded advice to restrict travel and once the danger was past, and likely aided by the minimal environmental impact to the areas, local tourism rebounded.

4.1.2 Response to COVID Lockdowns

In January 2020, as the nation began to recover from the 2019 bushfire seasons, the COVID-19 pandemic began to unfold. Queensland declared a public health emergency on January 29th, and by March 26th, all camping areas within Queensland national parks, state forests and all recreation areas were closed under public health orders.

The following dashboard screenshots provide insights into changes in behaviour observed on the Gold Coast following the prohibition of non-essential travel on April 2nd and the closure of Surfers Paradise, Coolangatta, and the Spit on April 6th. It is followed by regional and outback examples in Carnarvon Gorge, Birdsville, and Mount Isa. A timeline of COVID-19 restrictions and their ecotourism impacts can be found in Appendix 1.

4.1.2.1 Burleigh Heads National Park

Objective: Highlight any significant changes in travel behaviour to ecotourism locations as a result of COVID-19 and the likely impacts in any future pandemic.

The analysis of Burleigh Heads National Park showed that whilst in 2019 visitor numbers increased over Easter holidays (March to April), the corresponding period in 2020 shows a noticeable decline in visitor numbers. Easter holidays were a week later in 2020, however this would not account for the decrease which is most likely due to the April lockdown orders.
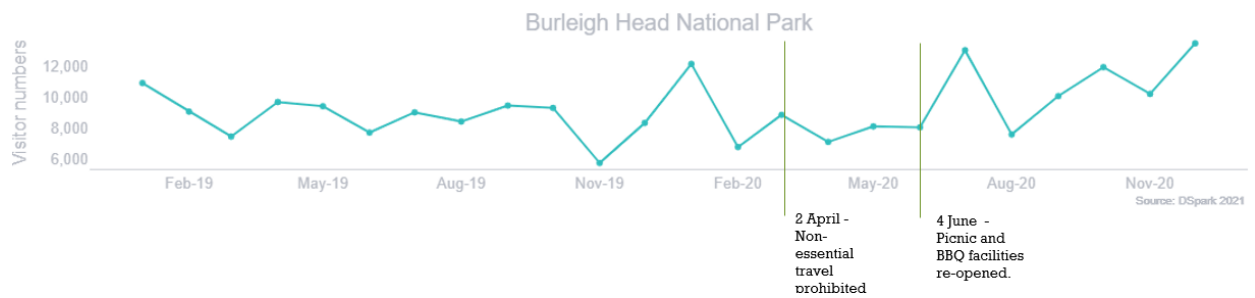
Although visitor numbers are still above 6,000 during the lockdowns, it illustrates that there was a level of compliance. Further research and analysis would be required to tell whether this behaviour would be repeated and what the likely impact would be in a future pandemic. DSpark data can be used to create bespoke predictive models and it is recommended that this be explored.

4.1.3 Regional and Outback Local Government Areas

Objective: Determine whether the changes in travel behaviour are now returning to pre-COVID behaviours and travel patterns

The outback covers two thirds of Queensland stretching across an area of one million square kilometres. In an era of pandemic-necessitated social distancing, it was one of the frontiers explored by intrastate travellers as restrictions eased in June 2020. The national parks explored in this section were selected based on their proximity to key destinations identified on the Outback Queensland site[7]
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[7] Outback Australia | Start your outback adventure in Queensland (outbackqueensland.com.au)

4.1.3.1 Carnarvon Gorge

According to Outback Travel Australia, Carnavon Gorge is one of the most well-known national parks in Australia[8]. It is located in the Central Highlands LGA along with Blackdown Tableland and Minerva National Park. Carnavon's steep rise in popularity began directly after camping and facilities reopened in Queensland. It's relative proximity to Brisbane was likely a contributing factor to its popularity and the maintenance of above average visitor numbers. The dashboard pilot and analysis could be expanded on to further explore opportunities for individual locations of interest, in collaboration with local and regional tourism organisations.

Increase in Monthly Visitor Count – Central Highlands (LGA)
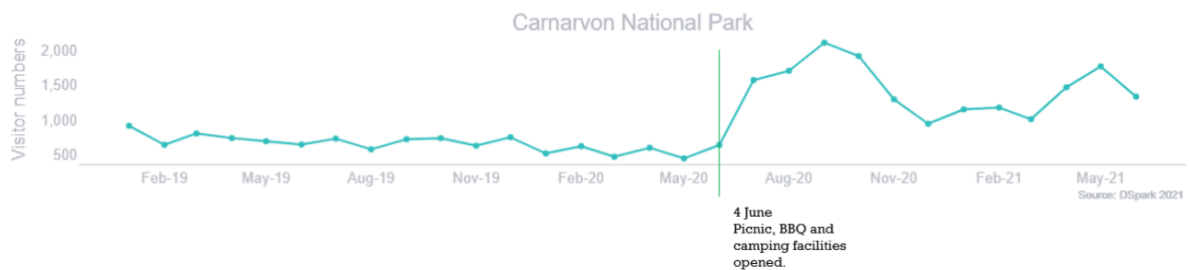
4.1.3.2 Birdsville

Further afield in Munga-Thirri National Park (Simpsons desert), although there was an uptick, after restrictions eased in June, it is not comparable to the scale or volume of visitors seen at Carnarvon National Park. Further analysis was outside the scope of the pilot, however engagement and collaboration with regional tourism operators would be recommended.

Monthly Visitor Count – Diamantina (LGA)
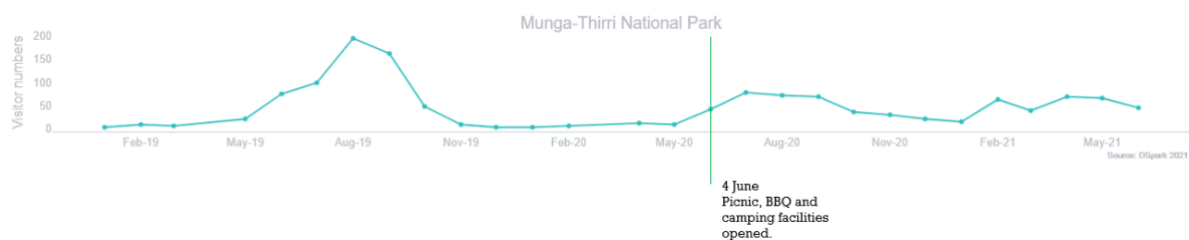
4.1.3.3 Mount Isa

Objective: Better target marketing and promotion to nature-based travellers in specific ecotourism locations

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[8] Carnarvon National Park (outbacktravelaustralia.com.au)

Camooweal Caves National Park in Mount Isa was an intriguing example as there is no significant change in visitor behaviour during the pandemic. Visitor numbers markedly drop in November 2020 which corresponds with the previous year, reflecting off-peak season and Mount Isa's hottest months[9], however, the recovery rate is significantly less and would warrant further monitoring.

Monthly Visitor Count – Mount Isa (LGA)

Camooweal Caves National Park

Visitor numbers

7,000
6,000
5,000
4,000
3,000

Feb-19   May-19   Aug-19   Nov-19   Feb-20   May-20   Aug-20   Nov-20   Feb-21   May-21

Source: DSpark 2021

Summer Bushfires

4 June
Picnic, BBQ and
camping facilities
opened.
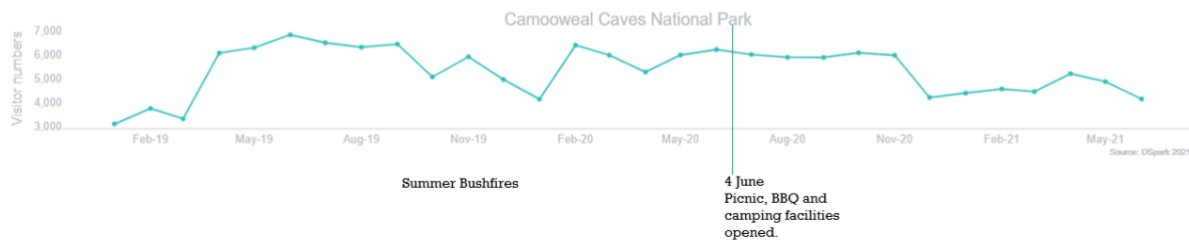
Despite the decline, the consistent traffic, rescinding of camping rights[10] and relative outback proximity (2hr drive) to the paleo Riversleigh World Heritage site could present an opportunity for ecotourism infrastructure development that benefits both sites.

In addition, collaborating with TEQ to better market and potentially package experiences with the Drovers Festival in Mount Isa could be worth exploring to attract more domestic and international tourists.

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[9] Best time to go to Mount Isa, Queensland (weather2travel.com)
[10] Wiliyan-ngurru National Park | Parks and forests | Department of Environment and Science, Queensland (des.qld.gov.au)

5 Conclusions

5.1 Summary of Key Findings

The findings revealed that Wickham National Park, was the leading ecotourism location in Queensland based on overnight hours for visitors under 35 and the fourth for visitors over 35. The park's overnight popularity was a surprising considering camping was prohibited and it has no ablution or refuse facilities. This example showed how greater data visibility could help identify high visitation areas, support government consideration of development proposals and potentially better target marketing and promotion to different demographics.

It also showed however, that data analytics only provides part of the solution, access to local knowledge and collaboration with other government departments such as the Department of Environment and Science is required to form a true picture of what is happening on the ground and why.

The next example was Burleigh National Park, which showed how people behaved in response to COVID lockdown orders in an urban area. The results showed that although visitors continued to go to the park, numbers declined when lockdown orders were given. There was also a more than proportionate increase in visitors when restrictions were lifted. This example would not be enough to determine future behaviours, however DSpark data could be used to look at a wider sample of locations and potentially produce a predictive model that could be utilised should future pandemics occur.

The final examples showcased changes in ecotourism behaviours in regional areas. DTIS was aware of anecdotal information that intrastate and interstate outback travel had increased during the pandemic and wanted to investigate this further. The results were mixed, however Carnarvon National Park, located relatively close Brisbane showed a consistent and sustained increase in visitor numbers compared to the period before COVID. This is a positive example of travel behaviour not returning to normal and instead resulting in greater visitation to an ecotourism destination.

Overall, the pilot findings demonstrated that DSpark mobility intelligence data insights can be deployed to identify changes in ecotourism behaviours, however, there is no one size fits all analysis as localised factors need to be taken into consideration for each destination. Whilst DSpark data would assist to pinpoint where changes are occurring, further collaboration and engagement with industry, and other government departments and bodies, such as the Department of Environment and Science and Tourism and Events Queensland, is crucial to fully understand visitor behaviour to inform future ecotourism infrastructure development and marketing needs and opportunities.

5.2 Implications for Policy, Practice and Research

The pilot demonstrated that DSpark mobility intelligence could help DTIS to:

- Support Government consideration of tourism development proposals in or around ecotourism locations
- Inform future ecotourism infrastructure development needs
- Identify high visitation areas with opportunities for ecotourism development adjacent to national parks
- Improve target marketing and promotion to nature-based travellers in ecotourism locations
- Highlight any significant changes in travel behaviour to ecotourism locations due to COVID-19 and severe natural disasters
- Determine whether changes in travel behaviour normalises after significant disruptions

It showed that accessing DSpark insights could accelerate ecotourism development by deploying innovation, technology, and data to identify future investment opportunities for tourism infrastructure development and marketing.

It is recommended by RIDL, Griffith University that DTIS acquires ongoing access to DSpark mobility data in partnership with Tourism and Events Queensland.

Recognising the breadth of stakeholders involved, RIDL also recommend that a coordinated approach that utilises the Queensland Tourism Industry Reference Panel recommendations around technology and data use be adopted as a next step.

Specifically, that a design group comprising of government, industry and universities be established to build upon this pilot and further explore and coordinate the application of data for both ecotourism and tourism development generally.

Pending review of the pilot by the whole of government committee, and the Queensland Government's formal consideration of the Tourism Industry Reference Panel's recommendations in their *Towards 2032* report, the table below outlines the specific recommendations that could contribute to, or be informed and enhanced by, further development of the pilot findings.

Towards 2032: Reshaping Queensland's Visitor Economy to Welcome the World	Demand, Supply and Connectivity	Catalysts for Change	Enablers for Change
Recommendation	2, 4, 5, 8 & 20	24, 26, 28-29 & 42	50, 56, 62, 64, 66, 68-9 70 & 73

References

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2. Department of Environment and Science. Parks and forests | Department of Environment and Science, Queensland (des.qld.gov.au). Accessed 13 July 2022.

3. DSpark. How Queensland Health Uses Mobility Data to Manage Public Health Policy in Response to the COVID-19 Pandemic. 2022.

4. DSpark. How DSpark helped the City of Gold Coast Better Understand Movement in the City. 2022.

5. DSpark. Advanced API Features and Queries. 2021.

6. DSpark. Queensland Government: API Pilot Background and Engagement Model. 2021.

7. Tourism and Events Queensland. Tourism and Events Queensland's Nature-based Tourism Strategy 2021-2024. 2021.

8. Queensland Tourism Industry Reference Panel. Towards 2032: Reshaping Queensland's Visitor Economy to Welcome the World. 2022.

9. Queensland Tourism Industry Reference Panel. Interim Action Plan for Tourism Recovery. 2021.

Appendix 1

2020 Initial Covid Lockdown Timeline

COVID Timeline	General Restriction	Domestic Ecotourism Impact
January 29	Queensland declared a public health emergency	
March 26	Stage 1: Travel in and out of the state restricted to residents / exempt persons	All camping areas within QLD National Parks, State Forests and Recreation Areas closed
April 2	Non-essential travel prohibited. No gatherings in non-residences.	
April 6		Closure of QLD waters to cruise ships. Closure of Surfers Paradise, Coolangatta and the Spit
April 9	Non-essential business activity prohibited, including camping grounds	Closure of day use and visitor centres and all high visitation parks including Fraser Island
April 11	Stage 4 border permits introduced	
4 June		Picnic, BBQ and camping facilities opened. Public shower facilities remain closed

Tourism Industry Reference Panel: Action Plan for Tourism Recovery Summary

Towards 2032:

Reshaping Queensland's visitor economy to welcome the world

SUMMARY

There are clear opportunities ahead of us – the reopening of the world after the pandemic lockdowns; the green and gold runway ahead of the Brisbane 2032 Olympic and Paralympic Games; and the chance to grow Queensland's visitor economy.

The Panel engaged a body of work to be undertaken to look at two key scenarios – maintain 2019 share through to 2032 or restore and maintain the peak market share through to 2032. This presents a difference of $12 billion in visitor expenditure for Queensland.

The Panel proposes these expenditure figures be adopted as our aspirational growth goals for Queensland's visitor economy.

While expenditure continues to be the primary measure of success, the Panel recommends a balanced scorecard – so community, environment and customer experience support the economic benefit.

Forecast total visitor expenditure to Queensland by growth scenario

$44 Billion
$12 Billion 'Opportunity Gap'
$32 Billion
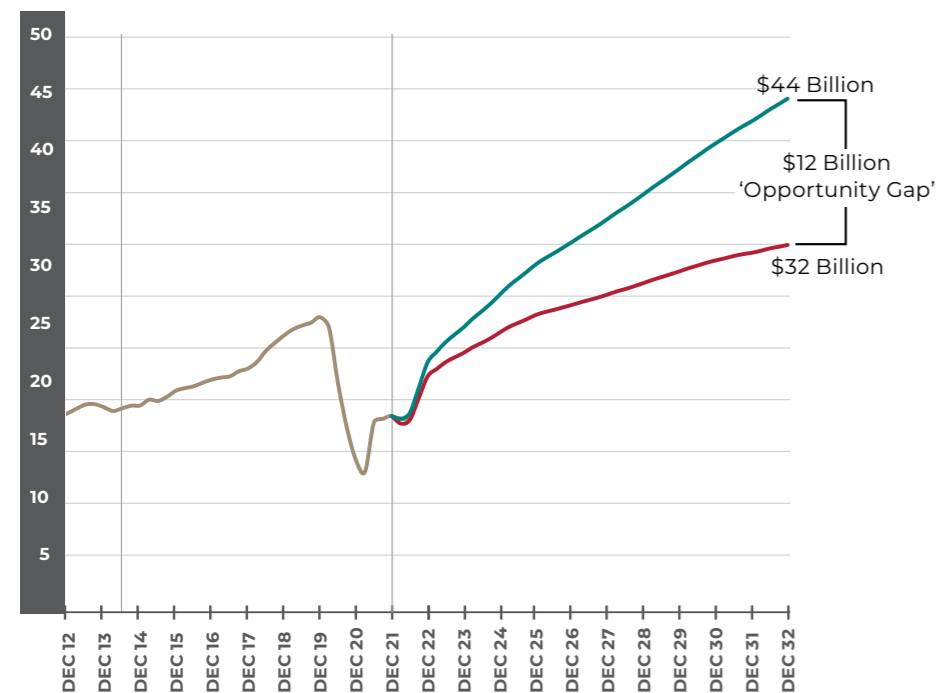
VISION

By 2032 Queensland will be Australia's destination of choice for domestic and global visitors seeking the world's best experiences.

MISSION

We'll encourage people to visit again and again by remaining 'cutting-edge relevant' – continuously reimagining and reinventing our offering for the benefit of visitors, our communities and the environment.
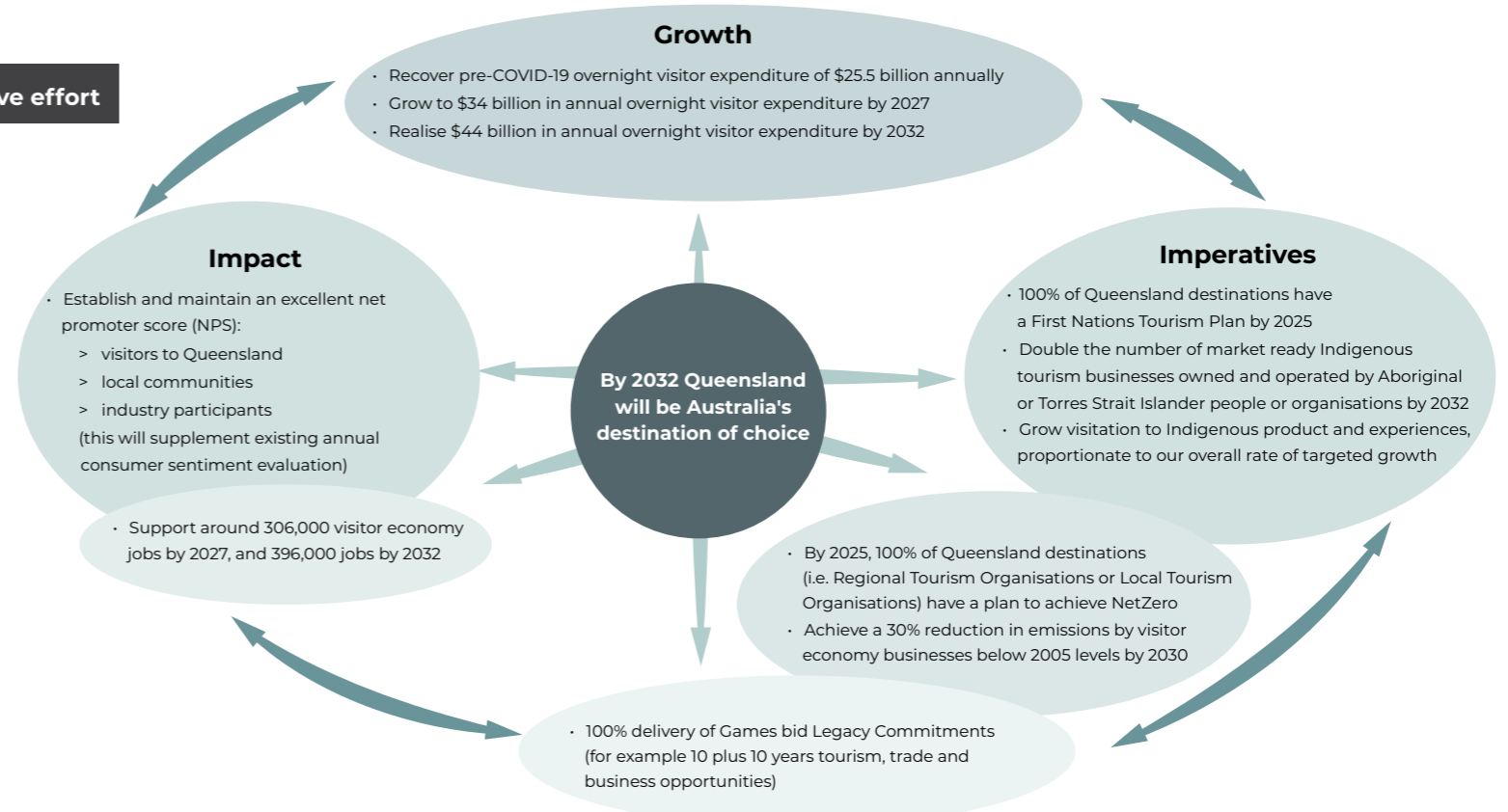

TOP 10 GAME CHANGERS

- Reimagine our Coast, Beach and Island offering
- Enhance our appeal to families, couples and students
- Deliver tech-wonderment
- Create more touring opportunities
- Own tropical and marine adventure
- Become a regenerative tourism leader
- Refresh and develop our places to stay
- Hero authentic culture, including via new venues
- Visitor-first mindset
- Enabled via sustainable funding

Within the Plan, the Panel recommends 75 actions across three key areas:

- **Demand, Supply and Connectivity**
- **Catalysts for Change**
- **Enablers of Change**

2032 GAMES
FIRST NATIONS
NEW WAYS OF WORKING
TALENT & SKILLS
INVESTMENT & FUNDING
SUSTAINABILITY

DEMAND
SUPPLY
CONNECTIVITY
VISITORS

Goals to focus our collective effort

Growth
- Recover pre-COVID-19 overnight visitor expenditure of $25.5 billion annually
- Grow to $34 billion in annual overnight visitor expenditure by 2027
- Realise $44 billion in annual overnight visitor expenditure by 2032

Impact
- Establish and maintain an excellent net promoter score (NPS):
  > visitors to Queensland
  > local communities
  > industry participants
  (this will supplement existing annual consumer sentiment evaluation)
- Support around 306,000 visitor economy jobs by 2027, and 396,000 jobs by 2032

Imperatives
- 100% of Queensland destinations have a First Nations Tourism Plan by 2025
- Double the number of market ready Indigenous tourism businesses owned and operated by Aboriginal or Torres Strait Islander people or organisations by 2032
- Grow visitation to Indigenous product and experiences, proportionate to our overall rate of targeted growth

By 2032 Queensland will be Australia's destination of choice

- By 2025, 100% of Queensland destinations (i.e. Regional Tourism Organisations or Local Tourism Organisations) have a plan to achieve NetZero
- Achieve a 30% reduction in emissions by visitor economy businesses below 2005 levels by 2030

- 100% delivery of Games bid Legacy Commitments (for example 10 plus 10 years tourism, trade and business opportunities)

Towards 2032: Reshaping Queensland's visitor economy to welcome the world
RECOMMENDATIONS SUMMARY

Panel recommendations

Demand, supply and connectivity

Experience Development Fund

1. Establish a new $140 million fund to develop significant new and visionary products and experiences, including a contemporary refresh of existing iconic products and experiences, to meet tomorrow's visitor expectations

2. Co-fund projects in line with the opportunities set out in this plan that meet economic, community impact and sustainability criteria

3. Fund to be governed by an independent commercial entity with a skilled and diverse Board, including First Nations representation

Growing Tourism Infrastructure Fund

4. An injection of $50 million into the Growing Tourism Infrastructure Fund to enable critical tourism infrastructure investment, including in accommodation as a priority

5. Deliver amenities, improve accessibility and deliver built assets that improve the 'lived experience' of the visitor

6. Future-proof our infrastructure, particularly with regards to sustainability credentials and climate resilience

7. Funding to be available to upgrade and overhaul existing critical tourism-related infrastructure as well as new projects

Events and marketing investment

8. An $80 million increase in contestable funding for events and destination marketing

9. Grow the year-round events calendar with distinct funding for the development of homegrown events including to promote dispersal and off-peak visitation

10. Maximise the so-called "green and gold runway" opportunity for enhancing tourism and trade in conjunction with culture, lifestyle, business and sporting events, in the long lead-time to the 2032 Games

11. Ensure the domestic visitor opportunity is fully captured through new campaign and partnership activities – pivoting to international opportunities when the time is right

International education and training

12. Build a more competitive position for Queensland's various study destinations with international students and their networks of influencers, by better aligning state, commonwealth and local government efforts

13. Leverage Queensland's research, innovation and industry strengths including appealing new fields in which Queensland has a compelling advantage, like sports science in the lead-up to Brisbane 2032, or marine science on the Great Barrier Reef

14. Develop tourism experiences and career pathways that appeal to international students and their influencers and promote available travel options to students

Aviation Fund deployment

15. Maximise the $100 million government investment to rebuild aviation access to Queensland

16. Apply a new, "whole-of-plane" assessment criteria for deploying the fund

17. Secure new, direct international routes, ensuring that our targeted visitors can access Queensland's destinations. Promote regional dispersal.

18. Recapture and then maintain or exceed our pre-pandemic peak market share of domestic and international aviation seat capacity

Improve access throughout Queensland

19. Align aviation route priorities with other modes of transport (for example, accelerating the rebuild of the cruise industry) to support the flow of visitors into and throughout Queensland

20. Further develop a Queensland Touring Strategy, including better promotion of established drive routes

Business Events Strategy

21. Create a shared Business Events Strategy to position Queensland to leverage our state's diverse offerings and competitive strengths to build on the doubling of investment

22. Better align Queensland's industry and research strengths and trade and investment activities to improve the value proposition for event organisers

23. Longer term funding commitments to better support the bidding cycle

Catalysts for change

Accelerate ecotourism

24. Investment to establish and maintain world-class National Park and protected area infrastructure (including, walking/hiking trails, mountain bike trails, trailhead facilities, wayfinding, signage, interpretation, expert guides, and other facilities)

25. Through First Nations consultation, seek to open more areas of National Parks to overnight public stays (and infrastructure) including reasonably limited access in partnership with private operators as accepted in other states

26. A funding stream specific to incentivising ecotourism projects (with increased gearing for projects which are regenerative) as part of the Destination Development Fund to be managed by Destination Development Queensland

27. Consideration of new category of protected area when adding to protected estate

28. Continued realisation of opportunities in areas adjacent to National Parks

29. Review Queensland's legislative and policy framework and approvals process in the context of national and international competitors and progress changes to position Queensland as an ecotourism leader and capture market share

30. Ensure all on-country tourism involves deep First Nations consultation and results in financial and non-financial benefits accruing to Traditional Owners

31. Enhance transparency and build a sense of urgency in approval processes, including with clear KPIs to guide agency consideration and reduce wait times

Sustainability and Climate Adaptation Plans

32. Develop Sustainability and Climate Adaption Plans for Queensland's visitor economy (and local variations) that encompass:
   · actions on climate change adaptation and transition
   · actions to reduce carbon emissions to net-zero by 2050
   · social impact and governance (such as diversity, equality, and wellness),
   · energy, plastics, water and waste management
   · circular economy operations and biodiversity management.

33. Funding for regions to ensure capability to develop and implement plans

34. Establish guidelines to deliver the Plan including:
   · metrics and criteria for Environment, Social and Governance (ESG) outcomes
   · alignment with the United Nations Sustainable Development Goals (SDG) for new product development.

35. Communications to explain the industry pathway to visitors, residents and investors

First Nations leadership

36. Support regions to develop and implement a First Nations Tourism Action Plan, led by First Nations people, to map a practical way forward

37. Support the creation of new Indigenous-owned and operated businesses through programs identified and led by First Nations people

38. Extend cultural understanding via, for example, similar programs to those run during the Year of Indigenous Tourism

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RECOMMENDATIONS SUMMARY (continued)

39. Continue to create access to opportunities for Indigenous peoples in the tourism industry

40. Maintain commitment to Destination IQ, an initiative of QTIC hosted by the QTIC Indigenous Champions Network, which has grown to become a stunning annual showcase of First Nations Tourism activity in Queensland

Brisbane 2032 Olympic and Paralympic Games

41. Create a plan to maximise the Brisbane 2032 opportunity for Queensland's visitor economy

42. Leverage the 10-year runway to the Games to deepen relationships within key international source markets, especially India, which has a population of 1.3 billion people, 60% of whom are under 35

43. Appoint a representative tourism industry panel to engage with a united voice on material opportunities of development, legacy and impact

44. Use our hosting of the Paralympic Games as a driver for the State to become a leader in accessible tourism

Enablers

Attract and facilitate investment

45. Review investment processes, including cross-government approvals, with the objective of increasing transparency, reducing complexity and speeding up approval gateways

46. Embed an 'industry-as-a-customer' approach to government service delivery, including actively pursuing and supporting investors and proponents

47. Annual investment conference to showcase opportunities, including to superannuation fund managers and other private sector participants

48. Maintain a prospectus for investment in Queensland's destinations, and proactively promote visitor economy investment opportunities

49. Continue to urgently advocate for a national approach to insurance to ensure that critical tourism businesses have access to affordable commercial property and public liability insurance

Enable priority developments

50. Government creates a pathway to prioritise approvals for tourism infrastructure projects, potentially drawing on disaster recovery legislation, priority economic development legislation, including the Economic Development Act and/or the Planning Act

51. Government consider simplifying lease conditions or offering freehold title to attract renewed investment and enhance the viability of island reports

52. A priority pathway should be available for at least the first three years of recovery as a trial with the aim of reducing hurdles, increasing speed and creating transparent conditions of approval for developments

Grow talent and skills

53. Extend funding to enable proven Business Capability Programs to continue and scale

54. Form a working group of government, universities and private sector organisations skilled at identifying emerging talent to design and facilitate short and long term-solutions including:
    - Accelerate skills pathways (professionalising careers in the visitor economy), including funding unaccredited training and micro-credentials to enable rapid, 'on-the-job' pathways to roles in industry
    - Future skills mapping to inform future education and training requirements for the industry and to highlight the role tourism can play as part of the solution in the state's skills transition, particularly in remote and regional areas
    - Establish new programs specifically designed to ensure world-best practice in the delivery of customer service.

55. Maintain and create new mentoring opportunities to accelerate know-how and talent readiness

56. Establish a Queensland Tourism Knowledge Hub in conjunction with our universities to coordinate visitor economy research and development activities

57. Incentivise supply of worker accommodation in visitor hotspots – e.g. Noosa/Airlie Beach, potentially accompanied by packaged-up 'job plus accommodation' for workers

58. Advocate to the Australian Government the relaxation of visa and employment restrictions around extended-stay international travellers, including right-to-work after studying, to fortify the supply of talent

Deploy innovation, technology and data

59. Incentivise technology adoption and data use with seed funding and grants

60. Encourage tourism businesses to apply for innovation grants and secure funding via the Advance Queensland initiative

61. Pilot automation and other disruptive technologies, to unlock industry productivity and enhance the visitor experience

62. Establish a design group (government, industry and universities working together, including via innovative partnerships), to explore:
    - the application of open-source data for predictive demand, distribution and planning
    - the use of data to understand and personalise engagement with future visitors - putting the visitor at the centre.

63. Consider specific tourism applications and needs when fostering digital skills and capabilities in the Queensland workforce at large

64. Support tourism businesses to use and deploy technology, and transition to digital through capability programs

Funding the future

65. Legislative change to provide local governments with the ability to implement a visitor levy guided by the following principles:
    - Visitor pays
    - 'Line-of-sight' expenditure – revenue raised is hypothecated for tourism purposes
    - Locally (by destination) determined charging basis and amount/rate.

66. Levy, where appropriate, fees and charges to recoup running costs and re-invest in our national parks and protected areas (e.g. similar to existing park use fees and marine park visitor fees)

New ways of working

67. Expand representation of 'tourism' in planning and decision-making forums to include a wider range of aligned industries working in the visitor economy

68. Pursue strategic delivery partnerships, common user infrastructure platforms and accelerate engagement with newer partners (including those that cross traditional industry boundaries)

69. Develop new mechanisms for sharing knowledge and information and working collectively to realise opportunities, in particular:
    - mentoring (industry peers and outside sector leaders)
    - knowledge-sharing events
    - think tanks and advisory panels, including a Youth Council and International Markets Panel of representatives from target international source markets.

Coordinating delivery across the tourism network

70. Confirm the roles and responsibilities of organisations within the visitor economy ecosystem and align operations to best meet the needs to industry and visitors

71. Ensure sustainable funding for regional and local tourism organisations

72. Build stronger relationships between the STO, RTOs and LTOs with the aim of having regional resources working as closely together as possible

Staying on Course

73. Adopt a balanced scorecard of goals and measures to guide collective action and behaviour

74. Review and present progress against this plan annually, at *DestinationQ Forum*

75. Establish a 'Towards 2032' Cabinet Committee with relevant Queensland Government Ministers to fast-track implementation of the plan