



Australia's National
Science Agency

Communities in Transition

Charters Towers: A Living Transitions Roadmap



Citation

CSIRO, JCU, USQ and TEG. November 2019 Charters Towers: A living transitions roadmap, CSIRO, Australia.

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Acknowledgments

The Clean Growth Choices Consortium would like to thank members of the community, our local experts in the workshop discussions, who made invaluable contributions to the process with their ideas and experiences.

We would also like to extend our sincere thanks for the continued support and help from the Charters Towers Regional Council including Mayor Liz Schmidt, Deputy Mayor Sonia Benneto and all Councillors, CEO Aaron Johansson, and local facilitators Trudi Smith and Melanie Lavelle-Maloney.

The Clean Growth Choices Consortium is comprised of experienced practitioners and researchers from the University of Southern Queensland (USQ), James Cook University (JCU), CSIRO and The EcoEfficiency Group (TEG). The consortium team would like to acknowledge the strong support we received from DES, especially from Georgine Roodenrys, Matthew Arthur, Sandra Avendano and Rosanna Virzi.

The Clean Growth Choices Consortium is delivering the Communities in Transition pilot project with the support of the Queensland Government.



The Communities in Transition pilot project is supported by the Queensland Government

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Charters Towers: A living roadmap summary

This report is a living roadmap designed to support the Charters Towers Region secure a prosperous and sustainable future. It is developed as part of the Communities in Transition (CiT) project through active participation of the Council and community members. This project is supported by a consortium from James Cook University (JCU), the University of Southern Queensland (USQ), Commonwealth Scientific and Industrial Research Organisation (CSIRO) and The Ecoefficiency Group (TEG). The CiT project has been funded by the Queensland Department of Environment and Science as part of a pilot program in supporting economic transition. A three-stage process was implemented in this project (Figure 1):

1. Assessing current state, risks, challenges and opportunities for the Region and identifying broad pathways for the future.
2. Generating and rapid evaluation of innovative ideas and options that enable broad pathways.
3. Embedding these pathways options into a roadmap for transition and developing business case proposals on a priority pathway.

Key challenges and opportunities identified for the Region relate to: a) water availability and waste management issues; b) rural decline, population numbers and composition of the work force; c) extreme weather such as droughts and floods and the potential for these to become more intense; access to telecommunications and benefits from digital technology; e) access to affordable, reliable and sustainable energy; f) geographic location; g) increasing consumer demand for clean and green products; and h) natural and cultural assets and the potential for diverse inclusive and sustainable tourism, small business enterprises and economic development.

The community has articulated a set of values, visions, aspirations and goals for the future of the Region. These relate to the Region's ability to embrace change and overcome challenges to ensure long-term health, prosperity and sustainability through building: a) a resilient and innovative economy; b) a progressive and cohesive community that is supported by an affordable and attractive rural lifestyle for all ages; and c) a well-managed environment that enables a bright future.

Three broad pathways were identified with a set of interventions, mechanisms and outcomes by which the vision and goals could be achieved. The three broad pathways are:

1. Charters Towers as a hub for supply/processing/transport and low impact agriculture.
2. Dynamic business ventures and sector development.
3. School to work: Stronger technology transitions and new career paths for the next generation.

These pathways are complementary and have phases that can be implemented to maintain, modify and transform parts of the Region to achieve the community's vision and goals. Key interventions that relate to all three pathways include: targeted feasibility studies and research, enhanced digital connectivity and more secure, affordable and sustainable energy.

Based on discussions about the prioritisation of these pathways and links between them, two business cases are being developed in this initial stage to set the living roadmap in motion:

1. The *Dynamic Business and Sector Development* initiative: More dynamic and resilient businesses within five priority sectors for economic development.
2. The *Making Water Work* initiative: delivering greater efficiencies and benefit from integrated agricultural water, supply and value chains.

This report is an initial step in developing a dynamic and living roadmap for regional communities in transition. It will require further work to test and refine the details of the proposed pathways. It will also require a continuous monitoring and regular reviews at least every two years to ensure that the set of pathways remain appropriate and sufficient to achieve the vision and goals and are robust enough to changes in global and domestic drivers.

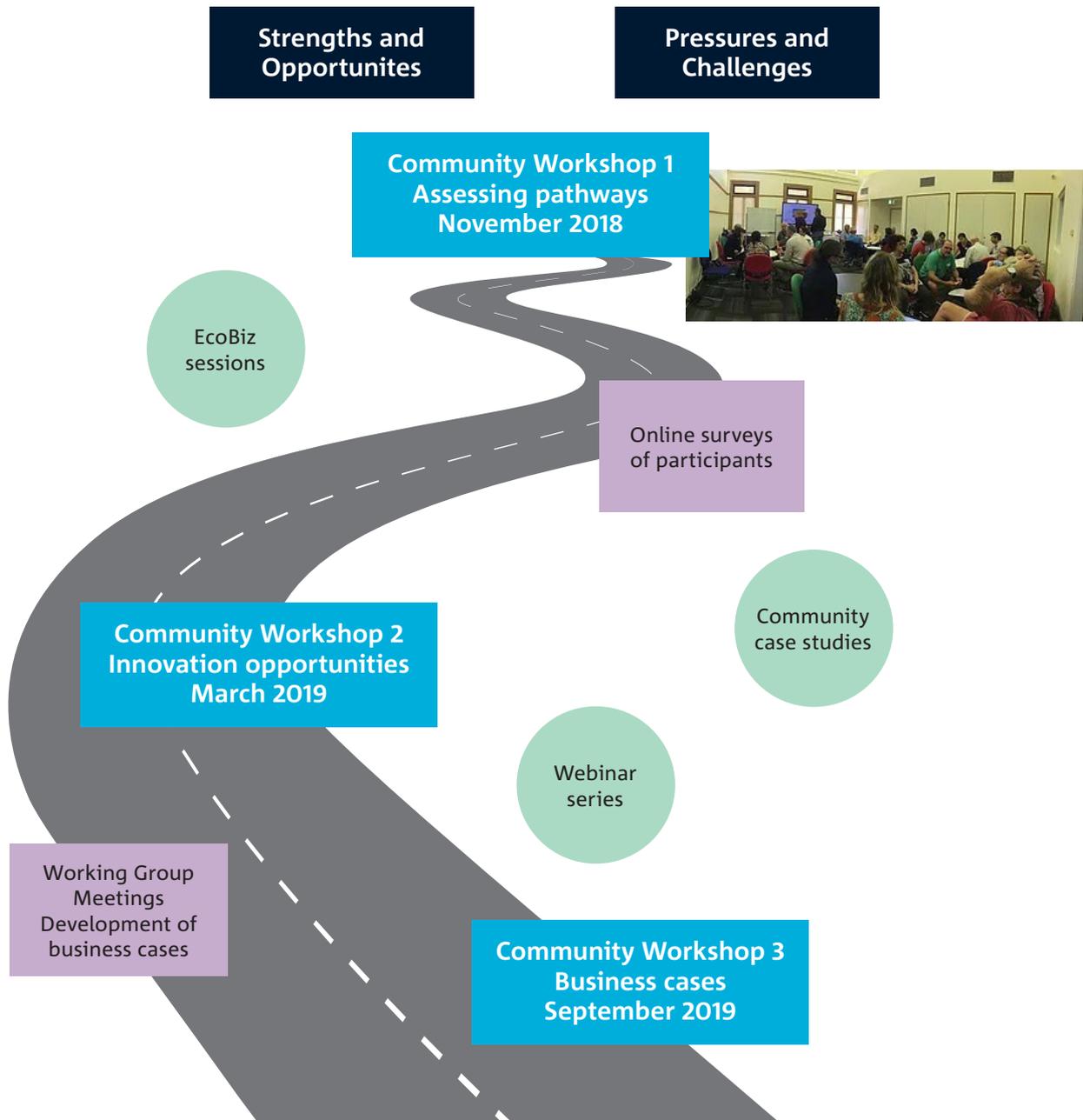


Figure 1. Process for project implementation.

1 Background

Together with the Charters Towers Regional Council, the team from JCU, USQ, CSIRO and TEG designed a program of work in response to the many pressures and drivers facing regional communities. The regional community and the Queensland Government both anticipate that the economy will need to keep adjusting to stay in step with the changing global economy. Both also assume that Queensland and the Region have a competitive advantage that will assist with economic adjustment and transition, and while this will likely occur over decades, it should start right away to be most cost-effective (e.g. see QDEHP 2017). The state government has said that it will assist regional communities with these processes by:

- creating an environment to shift investment and innovation
- facilitating existing Queensland industries to strengthen and/or transition
- working with Queensland's regional communities to transition (QDEHP 2017).

The dynamics of economic adaptation and transition are complex and challenging. These processes need to be led by the communities themselves in ways that are socially acceptable and build collective agency in shaping the future. This report focuses on the development of an initial and living transition roadmap for the Charters Towers Region as part of the *Communities in Transition* (CiT) pilot program. The program is an active community capacity building process for strengthening regional leadership and resilience in dealing with economic, social and environmental change. It is helping Queensland's regional communities to organise and process what is involved in transitioning over the intermediate to long term to achieve a more resilient and sustainable economy by:

- referring to values, visions and plans to guide each community
- drawing on existing networks, knowledge, skills and capabilities
- canvassing current pressures, opportunities and future scenarios and visions
- identifying broad pathways and options for transitioning and achieving goals
- developing dynamic and future-focused roadmaps and identifying an initial set of business cases that set the roadmap in motion.

With advice from the Charters Towers Council, the project team worked closely with community members to develop an initial transition roadmap and a few business case proposals. With more detailed work, a fully developed roadmap will assist the community with navigating future uncertainties and changes.

2 Developing transition roadmaps

Communities in Transition (CiT) provides a framework to support communities to create roadmaps, set their own directions, navigate their own pathways, and design interventions conceived and implemented by the participants themselves. The roadmap development process was informed by the Resilience Adaptation Pathways and Transformation Approach (RAPTA) (version 1) (O'Connell et al. 2016). This is a design approach to bring best practice in the formulation of programs, projects and other interventions so that they have the desired outcomes. It was modified to suit this context (Maru et al. 2018) and summarised in a three-stage process (Figure 2).

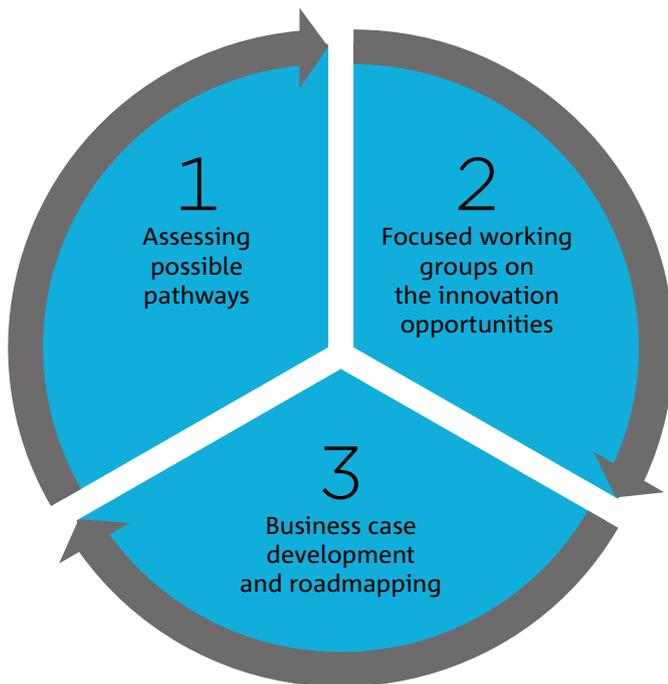


Figure 2. The three stages of the transition planning process.

Stage 1: (Sept – Dec 2018) Assessing broad pathways to the future

The process started with an assessment of the Region's current state, reflecting on community values, heritage and aspirations, and tabling future opportunities and risks. This phase ended with the *Broad Pathways Workshop* which discussed the Region's past, present and future. Participants examined the regional profile as well as key challenges and opportunities prepared by the project team and explored and identified preferred and possible broad pathways forward.

Stage 2: (Jan – June 2019) Focused working groups for innovative ideas and options

Working groups were formed around the domains of focus and broad pathways identified in Stage 1. As part of this stage, the consortium helped the groups to evaluate the real potential of the ideas as well as the enablers needed to overcome barriers and increase chances of success. They then scoped a range of new ideas, settled on the ones that are most likely to be successful, and planned a staged implementation (a 'pathway') including actions to address related enablers and barriers.

Stage 3: (June – November 2019) Road mapping the transition and building business cases

Results from Stage 2 were brought together into a single regional community 'roadmap' of steps/projects. The consortium helped to identify pathways of interdependent actions, plan the timing of these actions, scope short term priorities and prepare initial business cases to set the roadmap in motion. These were reflected upon in a final workshop.

3 Regional profile

Current state of the Region

The Charters Towers Local Government Area has a total land area of 68,571 km² and is a productive agricultural and mining landscape with a rich gold mining history (AEC 2013; RAI 2016). The area has a good supply of water from the Burdekin River, abundant mineral deposits, fertile well-drained soils, about 300 days of sunshine a year and affordable land.

The town of Charters Towers, located 134km south-west of Townsville (Figure 3), is an established agricultural service centre with good quality infrastructure and services including high quality schools. Charters Towers is at the heart of the rail and road corridor to Townsville (AEC 2013).

Queensland Statistical Areas, Level 3 (SA3), 2016 - Charters Towers - Ayr - Ingham (ASGS Code 31801)

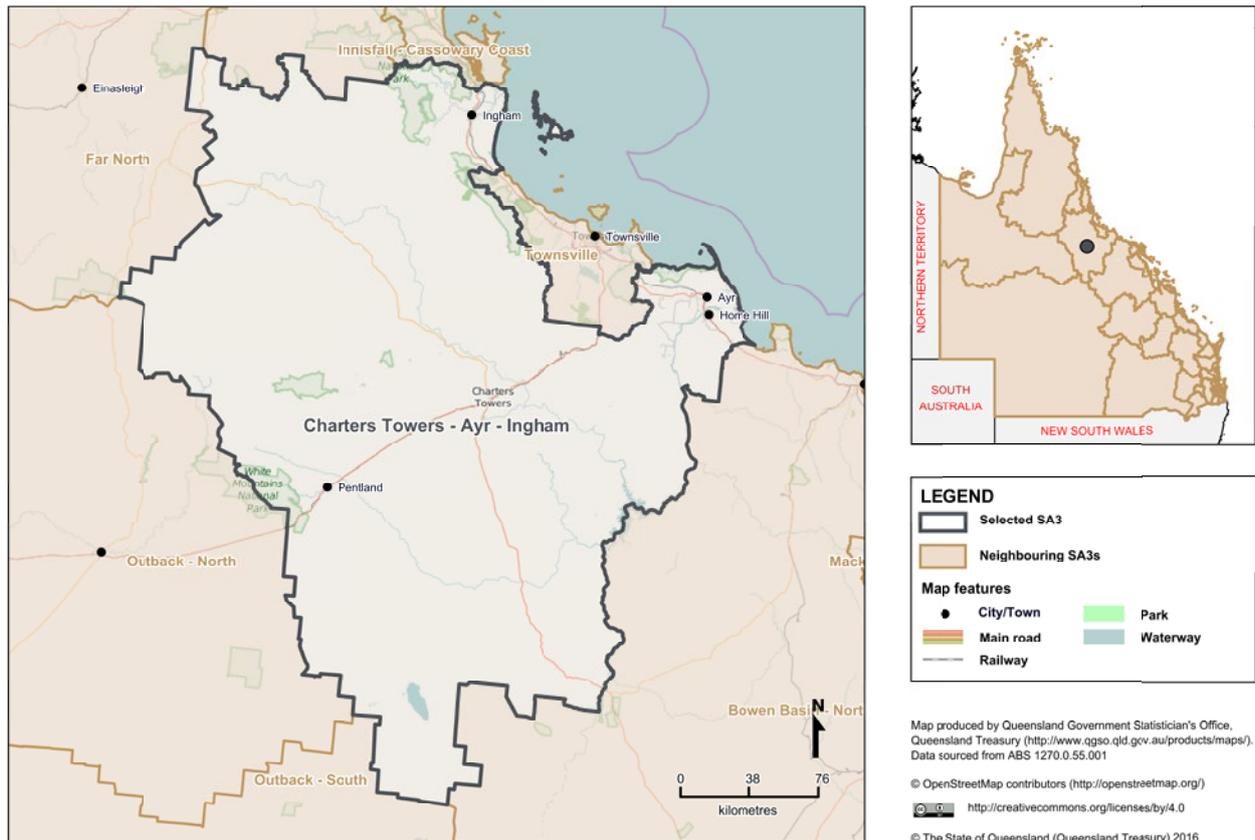


Figure 3. Charters Towers Region (Source: QGSO 2019).

Population composition and dynamics

The 2018 estimated resident population for the Charters Towers Local Government Area was 11,850 (NIEIR 2019), down slightly from 2017. In the 2016 census, 18.5% of the population was aged 65 years or older, and fewer people were in the working age group (20-65) compared with the rest of Queensland. With a very low population density of less than one person per hectare, the Region experiences a persistent loss of younger people and continues a pattern of slow decline seen in other rural communities. The population is projected to increase to 12,409 by 2036, adding only 335 people to the current population of the Region (QGSO 2019). In the 2016 census, 1,031 people identified as Aboriginal and Torres Strait Islander (8.7% of the total resident population), and 10,410 (87.6%) identified as Australian citizens (QGSO 2019).

Landscapes and livelihoods

The Region is located approximately 300m above sea level and has a less humid tropical climate and with greater variation in temperature than coastal Townsville (NQ Dry Tropics 2019). Charters Towers is a regional centre for mining, beef cattle and education industries. Due to its mining history, many sites in Charters Towers have been heritage-listed. Environmental features include Lake Buchanan, White Mountains National Park, Fletcher Creek, Dalrymple National Park, Hidden Valley and Hervey Range, Great Basalt Wall, as well as the Burdekin River (NQ Dry Tropics 2019).

The gross regional product of the Region is approximately \$630M and supports around 5,182 jobs (NIEIR 2019). In 2017-18, the top five industries for employment were: Education and Training (15.4%), Health Care and Social Assistance (12.4%), Agriculture, Forestry and Fishing (11.9%), Mining (10.5%) and Retail Trade (9.4%) (NIEIR 2019). The median total personal income for the Region was \$522 per week (QGSO 2019). For the March 2019 quarter, unemployment was 9.8%, higher than the average for regional Queensland (6.1%) (QGSO 2019).

Challenges and opportunities

Variation in the population age structure in the Region suggests that many people leave the Region to seek employment and do not return until they retire. While the Region is well resourced with individuals and organisations with local knowledge, it seems as if Townsville-based services that cater to the Charters Towers Region are not always well coordinated (CTRC 2019).

By one assessment, the Region would need to increase its economic output by 80% over the next 20 years to achieve substantial economic growth to improve the living standards of its residents (RAI 2016). The main employment sectors rely heavily on external labour, while projections suggest a significant loss of low skill jobs due to technology. Developing stronger technology transitions and career paths for the next generation is fundamental for economic success and critical for reversing a negative population growth trend (RAI 2016).

There are signs that the Region is changing however, providing new opportunities for residents and newcomers to the area. These changes include the NBN™ network rollout, a proposal for a meat processing facility, the Hells Gates Dam Irrigation Project, a transmission line connecting the North West Minerals province to the coastal grid and an associated supply chain strategy, the Sconi Cobalt- Nickel-Scandium Project, the Pentland Bioenergy Project and a new waste management strategy (CGCC 2019). All of these activities, together with the location of Charters Towers at the heart of the rail and road corridor to Townsville (AEC 2013) help to strengthen its position as a major regional transport, supply and services hub. Its potential was demonstrated during the January-February 2019 monsoonal floods which caused widespread damage to properties and livestock. Many regions, including Charters Towers were declared disaster areas (QDAF 2019), however, the Region's southern road networks remained accessible, meaning the logistics supply chain into the Region remained uninterrupted during the event. This strengthens the Region's position as a credible, safe and secure logistic/transport hub and as an industry development base (CGCC 2019).

Climate and extreme weather events

Charters Towers has a hot, semi-arid climate, with an average daily temperature range of 16.6°C to 29.4°C and an average annual rainfall of 632 mm (QGSO 2019). In recent years Queensland summers have brought an increase in severe storms and floods, droughts, heatwaves and bushfires across the state. Climate change is likely to exacerbate the frequency and severity of these events (QDEH 2016). In future, the Charters Towers Region can expect higher temperatures, hotter and more frequent hot days, more intense downpours, and more intense, though less frequent, tropical cyclones (QDEH 2016). Extreme events affect ecosystem health, industries and settlements, disrupting their access to water, sewerage, storm water, transport and communications services. As evaporation rates increase with increasing annual temperatures, there will be higher rates of soil moisture depletion, reduced ground cover and lower livestock carrying capacity.

Higher temperatures and longer dry seasons leading to bushfires may place rural and regional communities in danger. Evidence suggests that extreme weather events can impact on physical and mental wellbeing, and strain limited social support services and key infrastructure in regional, rural and remote areas in Australia (Hossain et al. 2014). The cost of personal and household insurance may also increase as a result (QDEHP 2016).

Rural population decline and new economic development opportunities

The trend of rural population decline suggests a need for greater employment and lifestyle opportunities to attract and retain workers (AEG 2013). Charters Towers Regional Council and its partners have identified the need to build lifestyle infrastructure to attract and retain people and their skills; develop Charters Towers as a major service centre to the rural north and maximise regional tourism opportunities.

New projects and project concepts include a meat processing facility (CTRC 2019). Federal funding of \$54M is allocated for the construction of Stage 1 of Hells Gate Dam which includes construction of Big Rocks Weir on the Burdekin River and \$4.5m is committed to development works for a transmission line connecting the North West Minerals province to the coastal grid. A supply chain strategy for the province will be developed which will include latest developments in energy, transport and infrastructure from Mt Isa to the Port of Townsville (MITEZ 2019).

Tourism and recreation

Many tourists travel through the Region each year, especially during winter. Charters Towers is an access point for travelling west to the Northern Territory, north to the Gulf area and south to the channel country (CTRC 2011). A Charters Towers Regional Council Tourism strategy is being prepared for the Region with an emphasis on historic tourism (e.g. heritage trails; museums; buildings), agritourism (e.g. Texas Longhorn Tours & Safaris), Indigenous tourism, and nature-based tourism.

Two national parks are of interest for Indigenous and nature-based tourism are the White Mountains National Park, to which the Gudjala people have traditional links and offers an opportunity for co-development of eco-tourism based on Indigenous heritage and natural features (QG 2012), and Dalrymple National Park, which affords nature-based activities, historic relics and a diverse geology which provide important educational resources for universities, schools and outdoor education groups (QDNRM 2011).

Communications and technology

More than a third of current jobs in Charters Towers are at risk of technological change in the next 15 years, with low skill positions most at risk (RAI 2016). However, since the completion of the NBN rollout in Charters Towers in 2016, extended mobile broadband coverage may provide more opportunities for employment in Information and Communications Technology (ICT) and electronics.

Based on national trends, it is estimated that up to 244 new professional-level jobs and 89 new managerial-level positions could be added to the Charters Towers ICT sector in the near future (RAI 2016). In addition to employment, emerging telecommunications services across Australia can support an array of services to rural and remote communities and industries provided that adequate and affordable infrastructure and equipment are available. For example, telehealth can assist in the long-distance diagnosis, treatment and prevention of disease and injuries by providing clinical support to improve health outcomes by connecting patients and clinicians who are not in the same physical location (Bradford, Caffery & Smith, 2015).

Consumer demands

Changing consumer preferences present challenges and opportunities for the Region in a number of areas. In the agricultural sector, connecting consumer preference to farm profitability is seen as increasingly important for maintaining farmer profitability, as demonstrated by the growing demand for organic food (Perry 2017). Digital technologies have the potential to enable consumers to precisely track the provenance of food, from the field to the pantry. At the same time, commodity crop farmers will be able to match consumer demand for products and produce to create a more valuable crop. The essential connection between agricultural practice and consumer preference is expected to dramatically accelerate the adoption of new sustainable technologies in agriculture (Perry 2017). This is significant for Charters Towers as a key beef-producing region. Australians tend to prefer lean, pasture grown beef, but many overseas consumers, particularly in northern Asia, prefer marbled, grain-fed beef produced through long periods (up to 120 days) of feed-lotting (Greenwood, Gardner & Ferguson 2018). 40% of Australia's total beef supply and 80% of beef sold in major domestic supermarkets is sourced from the cattle feedlot sector (ALFA 2018). Maintaining Australia's preferred status as a quality assured supplier of high value beef produced under environmentally sustainable systems from 'disease-free' cattle is increasingly competitive and expensive (Greenwood, Gardner & Ferguson 2018).

Shifts in consumer behaviour also affect retail trade, another key economic sector for Charters Towers. The increasing trend of shopping online is exerting pressure on brick-and-mortar retailers. Profit margins for online retailers are now roughly double that of bricks-and-mortar stores and will likely continue to grow into the future (Carter 2019; Aussie Broadband 2018). An extra challenge that has been identified for retailers and customers in Charters Towers is the difficulty in accessing shops located in heritage-listed buildings. Although adding to the character and charm of the city, these older buildings are not well designed for people with impaired mobility – such as wheelchair users, the elderly, and others who need assistance with using steps. Possible solutions for addressing some of the challenges for retailers associated with online shopping include showrooming to drive online sales; moving into logistics, with different delivery options; using local e-commerce as a stepping stone to targeting overseas markets, to meet demands for high quality health and food products; and offering a more personalised service including individualised consumer offers and free expert advice to in-store shoppers (Aussie Broadband 2018).

The demand for raw materials which are used in a variety of existing and emerging industries is growing. The growing global demand for ‘critical commodities’ corresponds with increased demand for photovoltaics, wind turbines, magnets and batteries for electric vehicles, high speed trains and solar batteries (Skirrow et al. 2013). The Sconi deposit near Greenvale currently has two of the world’s three known commercially viable deposits of scandium, a high value but scarce metal used to produce aluminium alloys (Business Queensland 2017; AML 2017), as well as substantial deposits of cobalt and nickel, both important in making batteries for electric vehicles (AML 2018). The Queensland Government declared Prescribed Project status for the proposed \$1.4B mining and processing operation called the Sconi Cobalt-Nickel-Scandium Project, which is expected to generate 500 jobs during construction, and 300 full-time employment opportunities for the initial 18-year life of the proposed (Proactive Investors 2019). However, these projections must also account for the risks of commodity price volatility from increasing competition and unforeseen supply shocks nationally and globally.

Energy: electricity and fuel

Changes in the energy sector make solar energy especially relevant to the Region, given its favourable climate. In addition to having a low environmental footprint, solar power offers substantial savings to households, the ability to hedge against future electricity price rises, and possible marketing and tax advantages. Across the Region there are 25,930 dwellings with rooftop solar panels, indicating a solar density of 30% (AGCER 2018). The Region sits within the federal electorate of Kennedy, which ranks 30/150 electorates for rooftop solar panel installations (Solar Citizens 2018), indicating higher proportions of Charters Towers residents switching to rooftop solar compared with other Australian electorates. As at September 2018, there were 7686 small scale solar generation installations (<100 kW) generating 32,474 kW of energy, as well as 1136 heat pump installations and 1434 solar hot water installations. (AGCER 2018). The \$330M Kidston solar hydro project, in the Etheridge Shire Council, is expected to be completed by 2021, with its infrastructure corridor traversing the Charters Towers Region near Greenvale. The project will allow energy to be stored and harnessed on demand (QDSDMIP 2019) and has highlighted the need for a second power line to accommodate potential solar farms and wind generators in the Charters Towers Region.

Bioenergy is also slated for growth in the Region, with plans under way to develop a fully integrated sugarcane farming, processing and ethanol distillation facility near Charters Towers called the Pentland Bioenergy Project (RDA 2019). Feedstock will be grown on-site and controlled within the project (RDA 2019). The potential of electric vehicles (EVs) is also high, but largely untapped. This is likely to change as EVs become more affordable, and with greater choice in vehicle types, for example utes and 4WDs are preferred in many regional and rural centres (Colmar Brunton 2017). In addition, infrastructure for EVs is expanding across the state. The recently completed Queensland Electric Super Highway enables the use of EVs from Coolangatta to Cairns and from Brisbane to Toowoomba. It provides a number of fast chargers in convenient, safe locations with existing amenities, such as cafes, restaurants and shops (QG 2017).

Water availability and waste management

The city of Charters Towers and the smaller towns of Greenvale and Ravenswood access water from the Charters Towers weir on the Burdekin River 14km north of Charters Towers. The weir also supplies water for agriculture, local manufacturing, engineering and other commercial operations including Pajingo Mine. The weir relies on seasonal filling cycles and continual inflows from the Burdekin River, which are generally sufficient for around six or seven months, but then the weir level is slowly reduced through a combination of water use, evaporation and natural seepage losses. Late wet seasons and low yielding wet seasons pose a risk to supply security (QDEWS 2016). The weir has no recorded water supply shortfalls since it was raised in 1996, although water levels have fallen to low levels several times since then (QDEWS 2016). Level 1-4 water restrictions are introduced across the Region in response to drought or other temporary water shortage events and lifted when conditions return to normal (CTRC 2015). The Federal Government recently committed \$54M towards Phase 1 of the Hells Gates Dam Irrigation Project, a large, irrigated agricultural and power project (SMEC Australia Pty Ltd 2018). The project aim is to provide long-term water security and hydro-electricity for the Region, and ultimately facilitate the development of 50,000ha of irrigated land for high value crops (e.g. avocados, citrus and capsicums).

Within the Region, up to 20% of households have no kerbside collection and are serviced by self-haul sites. There are four landfill sites within the Region located at Greenvale, Pentland, Ravenswood and Stubley Street, Charters Towers (QG 2014). The Queensland Government's new waste management strategy aims to increase recycling and create new jobs, new products, new industries and new markets. The strategy's waste disposal levy – which at present does not apply to the more remote parts of the state, including Charters Towers – will reduce the incentive to dispose of waste to landfill, and provide opportunities to create new industries based on recycled materials. The Waste Reduction and Recycling Amendment Bill (2017) enabled a container refund scheme introduced into Queensland in 2018. This provides an opportunity for community organisations to make money from collecting bottles and cans and at the same time significantly reduce litter. The program also encourages social enterprises and potentially creates new jobs and regional business opportunities (Boomerang Alliance 2018).

4 Vision, aspirations, values and goals

The community aspirations articulated in the first workshop include:

- Equipping young people in the Region with skills to keep them in the Region, address skills shortages, grow the population and adjust the composition of the work force - all critical factors for economic growth;
- Balancing old with new to try to ensure the Region stays sustainable into the future; and
- Building a creative industries centre to make the Region a major service, transport, storage and distribution hub for rural north Queensland.

The regional vision cast in 2011 in the document *Charters Towers: our region, our future 2035* (CTRC 2011) states that the Region is recognised and respected for its ability to embrace change and overcome challenges to ensure long-term health, prosperity and sustainability through:

- A resilient economy with diverse, innovative and knowledge-based businesses and industries, highly skilled local professional, trade and labour workforce and in synergy with the region's environmental and lifestyle values and priorities.
- A progressive and cohesive community, attractive, secure and affordable lifestyle, excellent regional facilities, services and resources, a strong sense of community pride and participation within a healthy, caring and inclusive society.
- An environment that will be a valued reflection of the Region's past, an appreciated expression of the Region's present and a strong stimulus for the Region's future; secure, healthy and attractive place for fauna and flora, people, business and industry to be nurtured and have a range of opportunities to prosper and develop; and resilient and responsive to changing technologies and the impacts of climate change (CTRC 2011).

The first workshop produced a clear consensus on values that show a strong sense of community, connectedness, liveability, and a sense of place based on heritage, culture and education. The vision provides a broad goal of building an innovative, diverse and resilient economy, a cohesive and inclusive community with attractive secure and affordable lifestyle underpinned by a healthy and sustainable environment.

5 Plausible scenarios

During the first workshop participants identified and discussed current and future pressures and opportunities in detail. A summary is presented in Table 1.

Table 1. Current and future pressures, challenges, strengths and opportunities identified for the Region.

CURRENT PRESSURES AND FUTURE CHALLENGES	CURRENT STRENGTHS AND OPPORTUNITIES
<ul style="list-style-type: none"> • Low recognition as an investment destination • Small local market • Competition from Townsville for residents, investment & recognition • Low numbers of people in working age groups (20-65) compared with the rest of Queensland • Strong dependence on external labour • Below average literacy, numeracy & adult learning • Need more services (Services with Townsville are not well coordinated) 	<ul style="list-style-type: none"> • Stable economic base from mining (13.7%), education and training (11.1%) retail (10%) and health care (10%) • Opportunities in Big Rock Weir Irrigation Scheme –Ag growth and development • Great natural assets for diverse economic activities – steady water supply, abundant mineral deposits, abundant solar energy • Opportunities to explore new sectors e.g. light industry, energy, service industry • Excellent schools and good access to James Cook University • Local Traditional Owners hold key information about country and culture • Charters Towers central location
<ul style="list-style-type: none"> • Many older buildings – difficult to access and barrier for retail and tourism • Indications of weak connectivity/communication among key Fed/State governance domains • Currently weak links between social and economic development planning efforts 	<ul style="list-style-type: none"> • High quality of life for many residents – affordable, safe, friendly – pleasant climate • High numbers of retirees – good opportunity for community involvement • High proportion of residents have roof top solar • Strong history of connected leadership and increasingly strong capacity within and across Council planning systems • Strong governance associated with catchment & landscape planning

6 Priorities and pathways

To develop the broad pathways, it is important to recap the goal - to build a *prosperous, sustainable and equitable Charters Towers Region* – as well as current and future challenges and opportunities. There is uncertainty around some of these challenges and opportunities: how and when they may unfold, as well as how they will interact. To address this uncertainty, the pathways developed need to be robust and flexible in order to build a prosperous, sustainable and equitable Region.

Priorities

Based on discussions of current strengths and opportunities for the future and taking into consideration some of the weaknesses and challenges identified earlier, Charters Towers workshop participants identified seven linked priority themes for building broad pathways to a prosperous and resilient Region. These priority themes are shown in Figure 4.

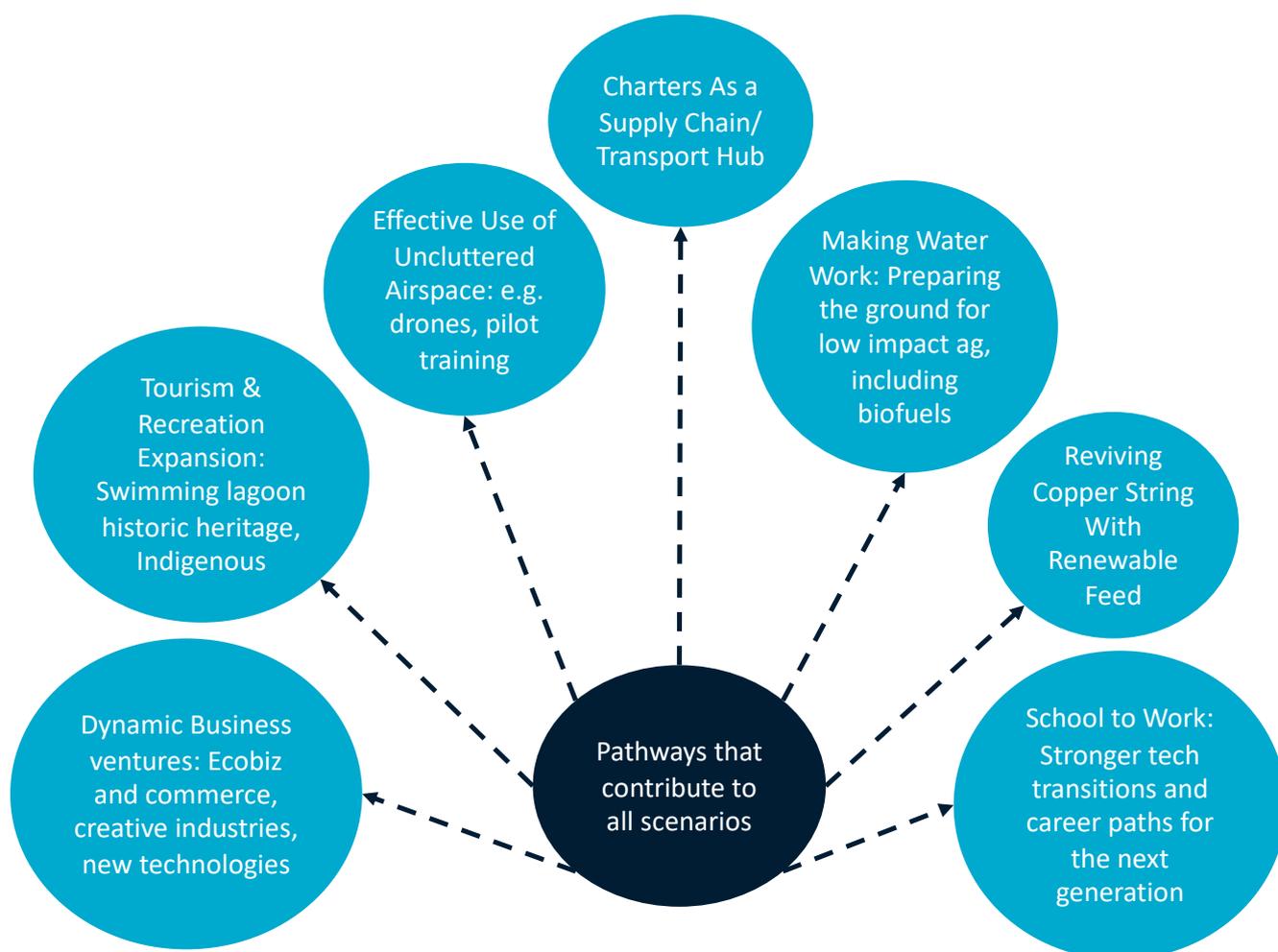


Figure 4. Seven linked priority themes for building broad pathways to a prosperous and resilient Region.

Broad pathways

The priority areas were further refined and merged into two major pathways and a third that supports and underpins the first two:

- Charters Towers as a supply chain/processing/transport hub and a centre for low impact agriculture (derived from the Making Water Work theme).
- Dynamic business ventures and sector development.
- Supporting school to work transition by building stronger technology transitions and new career paths for the next generation (Figure 5).

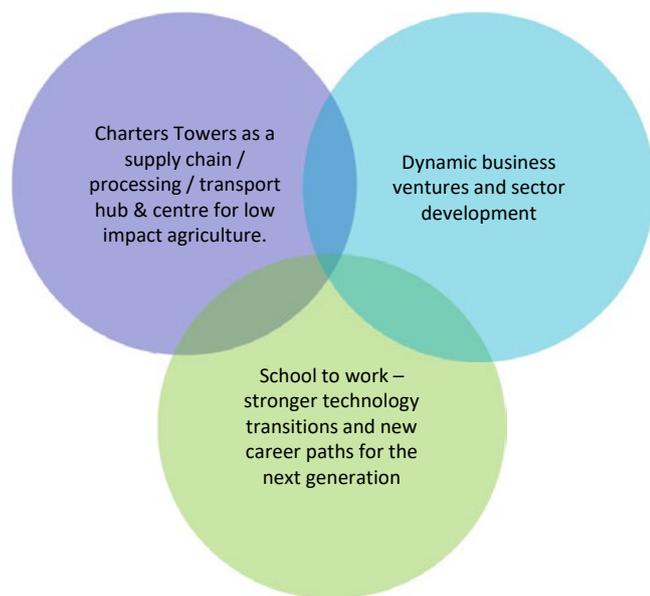


Figure 5. Three core areas of focus towards prosperous, sustainable and equitable Charters Towers.

Charters Towers as a transport/processing/supply and low impact agriculture hub

This pathway will focus effort on improving efficiency and resilience of existing and new supply chains particularly in the context of creating new opportunities for expanding high value agricultural production and processing initiatives. The Charters Towers Region is central for road, rail and air transport across north Queensland, and is therefore well positioned as a supply chain, transport and processing hub. The city of Charters Towers sits at the intersection of major roads heading north-south and east-west. Transport by trucks is critical for the ongoing viability of several industries, and the location of the city and its airport is also important for disaster management. Townsville airport is both civil & defence. The road south from Charters Towers is flood proof and not much work is needed to flood proof the roads heading north. The most important part of the road to upgrade is from Charters Towers to Greenvale – especially given new agricultural potential (CGCC 2019).

This broad pathway also involves the Making Water Work theme - preparing the ground for low impact agriculture including biofuels – making Charters Towers Region a hub of low environmental impact, high value and diversified agriculture. Increasing water allocations would provide crop diversification and enhance the grazing industry. This would build on plans for the Hells Gates Dam Irrigation Project on the upper Burdekin River, which is planned to include irrigated agricultural and power supply, potentially worth of \$5.35B (SMEC Australia Pty Ltd 2018). The project aim is to provide long-term water security and hydro-electricity for the Region, and ultimately facilitate the development of 50,000ha of irrigated land for high value crops (e.g. avocados, citrus and capsicums) (SMEC Australia Pty Ltd 2018). The Federal Government has committed \$54M towards the construction of Big Rocks Weir as part of the Hells Gate development. This multi-billion-dollar project will be subjected to a comprehensive risk assessment, including new regulatory requirements to protect the Great Barrier Reef (GBR) and to achieve ‘no net decline’ in GBR water quality (Queensland Parliament 2019). For the project to deliver a direct and enduring positive impact on the economy, society and the environment of Charters Towers and North Queensland, the design, implementation and assessment of the project will need to apply principles of circular economy and systemic innovation. Among other things this will mean strengthening demand driven sustainable supply chain (from production, transport, processing, value adding, retailing and export preparation) that deliver greater energy and nutrient use efficiency, less waste and low emissions profile.

Dynamic business ventures and sector development

This pathway is expected to play into urban renewal of Charters Towers as well as regional agriculture, tourism and mining. One key focus of the pathway is expanding existing and developing new lines of tourism. This will be assisted by a Charters Towers Regional Council Tourism strategy. The strategy is expected to emphasise historic tourism (e.g. heritage trails; museums; buildings), outback and agritourism (e.g. Texas Longhorn Tours & Safaris), Indigenous tourism, and nature-based tourism including ‘dark sky’ experiences (CGCC 2019). Charters Towers Region also has significant potential for new social service businesses including health and aged care as increasing number of retirees come to the Region because of the pleasant weather, relative liveability and affordability housing. The transport/supply/processing hub and low impact agriculture pathway will also expand the scope of business and investment in the Region, including vertical integration of existing businesses and resources providing agritech and digital opportunities, emerging ecosystem services, advanced manufacturing and mining services as well as disaster resilience services.

Improved school to work transition via stronger technology transitions and new career paths for the next generation

This pathway is considered fundamental to the success of the preceding two pathways and is critical for reversing a negative population growth trend, increasing the available work force and reducing high levels of unemployment. Given digital disruption, this needs to be done in a way that addresses changes in the nature of jobs in the future. One proposal is to build a local centre of excellence that leverages the Region’s schools and links with a new trade training centre and James Cook University. These links are a strength that can be further developed to include exchange students from and to overseas especially from trading partners. The centre can also help to prepare a workforce for digital disruption and new employment business opportunities. Due to its uncluttered airspace the Region may also be a testing site for some digital technologies (e.g. drones) and a training centre for pilots.

Pressures from changing climate, population, markets and opportunities from product demands, natural and cultural sources and technology and regional capacity

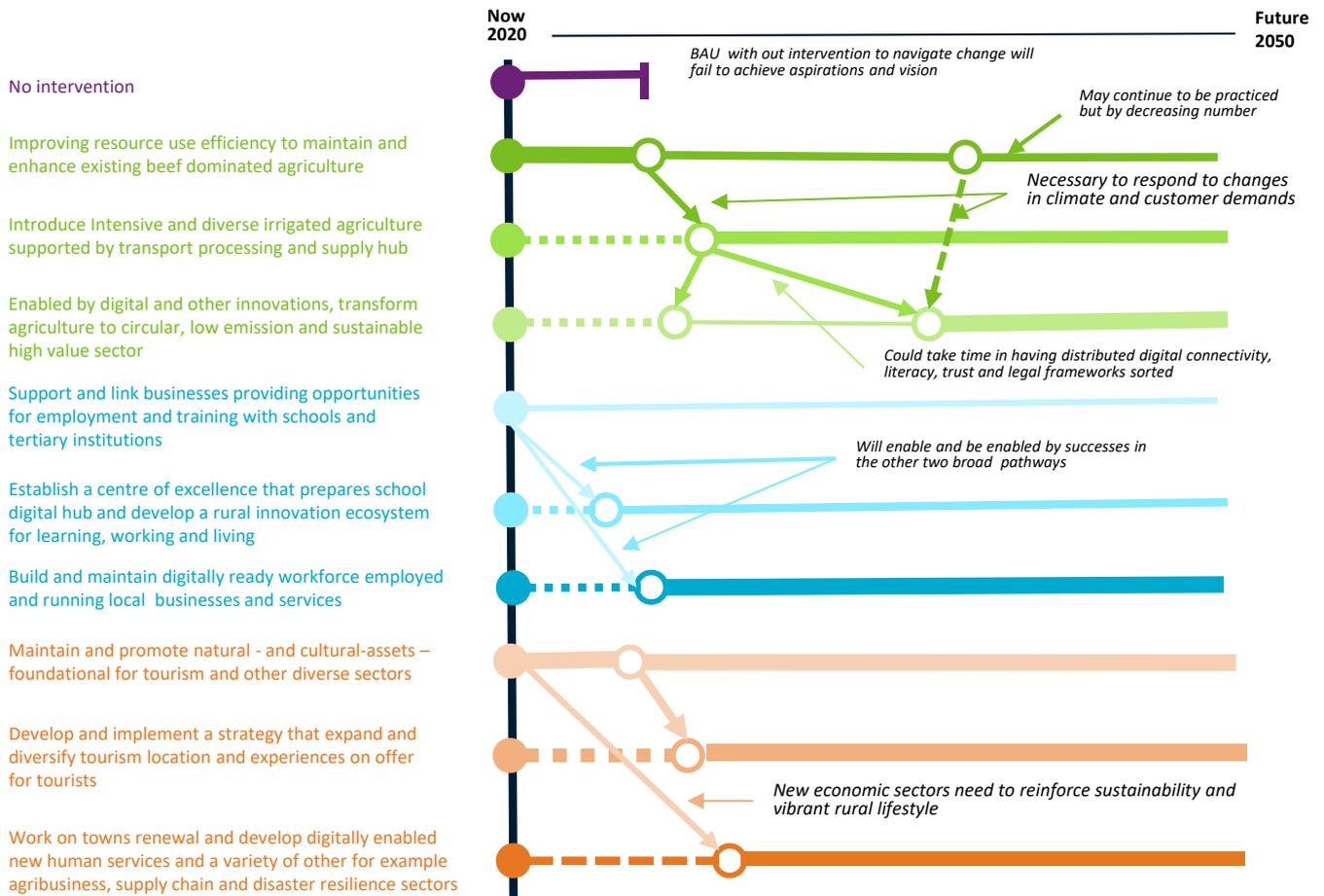


Figure 6. Sets of intervention options in each of the three broad pathways and their projected contributions.

Options and project ideas

Each of these three pathways needs an ensemble of feasible and effective intervention options (investment, policies, programs, projects, and practice change) that are prioritised, sequenced, collated and implemented to transition the current state of the Region into the vision. The pathways can be complementary or alternative to allow flexibility in addressing uncertainty in how the challenges and opportunities may unfold in the future.

The second stage of the program involved further community conversations and an online survey of stakeholders to elicit preferences of options and project ideas within the three pathways. The list of options and project ideas for each pathway that were identified are:

Charters Towers as a transport, supply chain, processing and agricultural hub

- New infrastructure (road, rail and air transportation networks and dams and irrigation schemes) and supply chain development.
- Engineering solutions and new infrastructure to enable water recycling.
- Effective water trading and local management;
- Visionary land use and infrastructure planning to reduce costs and impacts.
- New forms of zero emission aquaculture, including macro algae to treat waste water.
- New protected cropping systems for agriculture (e.g. greenhouses, shade structures).
- Low carbon energy – new forms of local, secure, affordable, dispatchable and low carbon energy to drive agricultural growth.
- Best management and monitoring practices, including regional composts and nutrient management.
- Stronger digital data hubs and value chain resilience and innovation.

Dynamic business and sector development

- Dynamic tourism products, marketing and enterprise.
- EcoBIZ in support of more circular small business and not-for-profit enterprises.
- Building small business innovation capacity.
- Stronger human services sector together with cultural services and community liveability.

School to work via stronger technology transitions and new career paths for the next generation

- Linking schools, vocational education, universities and private enterprises in driving workforce development and new career paths for local residents.
- Establishing a centre of excellence for digital and next generation skills for emerging businesses and industry sectors.

7 Dynamic Roadmap for the future

Types of change pathways

Each pathway will build and enhance existing resource use and livelihood systems in the Region in the short term, modifying some aspects gradually and even transforming other aspects by changing and/or adding some significant new components into the regional economy. Therefore, it is possible to envisage each proposed pathway as having different stages or aspects to maintain, modify and transform the Region that will require different types of interventions.

Table 2 is a summary of a suggested focus of each stage, without precluding work that could be initiated for the other stages as part of the roadmap. To aid visualisation of the broad pathways, Figure 6 shows sets of strategic intervention options that would maintain, modify and transform aspects of the Region to realise the vision and goals.

Table 2. Three proposed pathways and potential interventions/stages to ‘maintain,’ ‘modify’ and ‘transform.’

BROAD PATHWAY	MAINTAIN	MODIFY	TRANSFORM
A supply chain/ processing/ transport hub and a centre for low impact agriculture	Maintain and expand existing livestock and crop industry and rural lifestyle Maintain existing road, rail and air transport	Expand intensive and diverse irrigated agriculture and supply chains Expand and diversify transport networks	Low emission and circular agriculture. New high value horticultural products and food value chains. New and well networked transport/supply/storage and distribution hub, also providing service for disaster resilience
Dynamic business ventures and Sector development	Maintain and promote natural and cultural assets foundational to tourism and other industries Improve efficiencies in water, energy and other input use and reduce waste from businesses and industries	Implement diversified tourist experiences Building on existing beef production intensify and diversify agricultural production and value chains businesses	Newlines of tourism integrating natural and cultural over lander experiences. Build dynamic transport, supply, storage and agricultural value chain businesses and new supporting sectors
School to work transition via stronger technology transitions and new career paths for the next generation	Support and strengthen current linkages between schools, tertiary institutions with businesses and sectors providing mentorship, training and employment opportunities	Establish centre of excellence that attracts and build digitally literate, reliable local workforce for existing and new businesses and sectors	New career paths and workforce that generates the digital and other new generation businesses

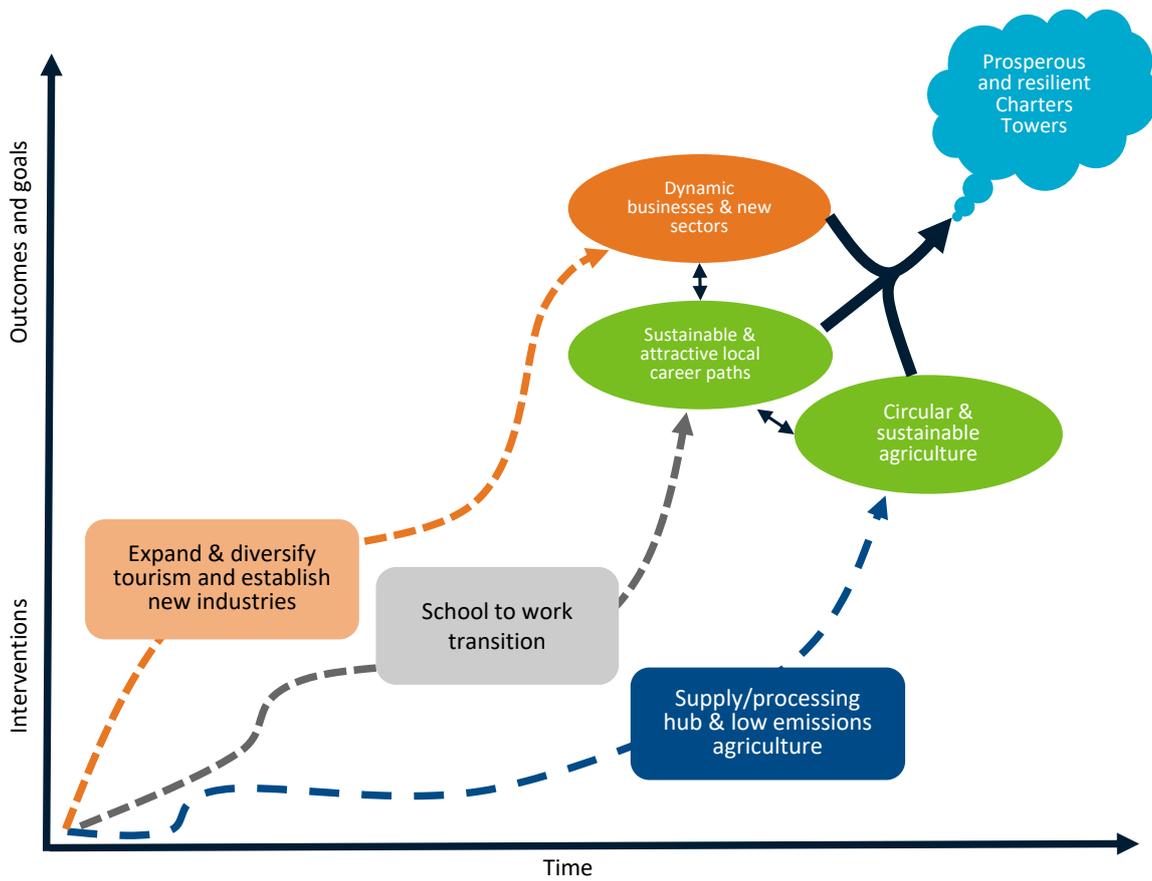


Figure 7. Pathways towards prosperity and resilience for Charters Towers.

Interventions useful across pathways

There are three cross-cutting intervention domains identified in the participant workshops and working group discussions that could enable the realisation of the pathways (Table 3). These are:

Feasibility study and research

Feasibility studies for select project ideas are needed to confirm each proposed business case. It will be important to take stock of what has been done so far in Charters Towers and elsewhere and how much each project will likely contribute to each pathway.

Digital connectivity

Digital technology is expected to offer significant opportunities to improve efficiencies in existing businesses, industries and services as well as supporting the emergence of new ones. Digital innovation will also replace low skill and repetitive jobs. This will require preparing and building digitally literate workforces and businesses.

Affordable, secure and renewable energy

Low impact agriculture, dynamic businesses and diverse sectors will require expansion of affordable and renewable energy from different sources and across the Region. This will be important for the Region and the different industries to contribute to emission reductions. The construction and maintenance of these energy resources will need development of local skills and will provide employment opportunities.

Table 3. Project ideas and potential benefits from a matrix of broad pathways and cross-cutting interventions.

BROAD PATHWAYS			
Cross-cutting intervention domain	A supply chain/ processing/ transport hub and a centre for low impact agriculture	Dynamic business ventures and sector development	School to work – stronger technology transitions and new career paths for the next generation
Feasibility studies and research	Detailed feasibility study on making the Region a transport/ supply/distribution hub and a centre of low impact agriculture	Conduct research on what it takes to create business dynamism and new and diversified sector development	Take stock of existing and potential workforce requirements to service expanded and new businesses and industries from all pathways
Digital connectivity	Supporting digitally enabled transport, agriculture and value chains	Supporting digitally enabled tourism and other diverse businesses, services and industries	Digital ready workforce and businesses including businesses providing digital services
Affordable, secure and renewable energy	Making hubs energy-efficient and effective. Contributing to circularity of hub operations and lowering the impacts of agriculture	Cost and emission reductions for existing businesses and industries in new and diverse sectors. New renewable energy installation, operations and maintenance businesses	New skills and employment opportunities

8 Options selected for business cases

Of the three broad pathways proposed by the Charters Towers workshop participants and working groups, two were selected for business case development. These are:

Dynamic Business and Sector Development Initiative

The Charters Towers Region and community is building on its economic, human and natural assets to create a stronger and more resilient economy for the future. It seeks to tackle multiple pressures and opportunities, including significant transitions in workforce and population, ever increasing cost pressures, and the need to reduce the environmental cost of, while increasing the social benefit from, production. At the same time, new approaches to older industries are possible as well as significant new economic opportunities. The Region seeks to successfully navigate these challenges.

On the back of a broad assessment of regional pressures and potential options for securing the future economic resilience for Charters Towers, a priority development pathway was identified that acts to strengthen the capacity, innovation levels and workforce of several revitalised, new and emerging industry sectors. These sectors include: (i) tourism and cultural services; (ii) agri-tech (including digital) opportunities; (iii) human services and education; (iv) mining services, energy and advanced manufacturing; and (v) emerging ecosystem services. The most significant challenge for building economic resilience in the Region involves strengthening these individual sectors, their constituent businesses and the associated human capital. This approach also involves building stronger cross-sector linkages and ensuring the required workforce is available to sustain effective economic momentum and innovation within and across these sectors. The *Dynamic Business and Sector Development* initiative will explore, scope and deliver into four key areas of strategic effort, including:

- *Building Collaborative Industry Clusters:* Supporting the identification of key leaders and participants in the supply and value chain of each priority sector, the development and monitoring of an industry benchmark, and the development and active delivery of cohesive and implementable collaborative action strategies for developing each sector.

- *Creating a Stronger Innovation Platform for Emerging Businesses:* Working across the priority sectoral clusters, Council, industry, State agencies and universities identifying appropriate mechanisms to support locally-based business innovation and expansion.
- *Cohesive Workforce Forecasting and Coordinated Response:* Across each of the priority sectors, developing more cohesive workforce forecasting and targeted strategies (from workforce development to strategic migration) to secure the required workforce, and the coordination of appropriate service delivery models across the education sector.
- *Strengthening Our Economic Governance:* Scoping and establishing stronger, locally-based governance arrangements to facilitate economic development in the Region.

Priority outcomes from the progression of this approach are intended to include:

- targeted and sustained growth in each of these key sectors over the next five years
- a reversal of population decline and the loss of key workforce capacities from the Region
- improved retention of younger people and existing skills within the Region
- greater integration across new and existing economic sectors within the Region
- improved business confidence, skills, investment and innovation across the Region
- a demonstrable and reduced cost/environmental footprint against existing business models.

Other key benefits of adopting the *Dynamic Business and Sector Development* initiative, include:

- the chance to grow upon a stable economic base from mining (13.7% of economic activity), agriculture (11.1%), education and training (11.5%), retail (10%) and health care (10%)
- better utilisation of new water-based opportunities in Big Rocks Weir Irrigation Scheme and the growth of an allied service sectors (e.g. light industry, energy and agri-service industries)

- a higher number of retirees becoming mobilised to help increase civic capacity (e.g. arts and crafts, youth mentoring, volunteering in schools, libraries, parks and gardens)
- the transition of many prospective attractions for new/potential residents, including affordable housing and land, excellent schools and access to universities, a high quality of life (safe, friendly communities and a pleasant climate) and strong energy self-sufficiency
- the promotion of great natural assets to enhance diverse activities (including steady water supply, abundant mineral deposits, abundant solar energy and nature-based tourism)
- the creation of opportunities for Indigenous tourism and environmental services through local Traditional Owners who hold the keys to information about country and culture
- continuing to build a strong history of connected leadership and an increasingly strong capacity within and across the Council planning system (CGCC 2019).

Making Water Work for Charters Towers: Delivering Greater Benefit from Agricultural Water, Supply and Value Chains

This *Making Water Work* initiative will focus effort on the creation of new opportunities in the agricultural production and associated processing sectors. It will do this through improving demand-driven approaches to supply chain analysis, planning and development, while also monitoring the expected growth and resource use efficiency benefits. The Hells Gate Dam Project will have a direct and enduring positive impact upon the economy of Charters Towers and North Queensland.

The multi-million dollar project, however, will be subject to a comprehensive risk assessment, including proposed new regulatory requirements to protect the Great Barrier Reef (GBR) and to achieve “no net decline” in GBR water quality (Queensland Parliament 2019). At the same time, increasing water prices and declining water availability are driving renewed interest from other irrigation regions in northern Australia. Recent related supply chain analysis for the Region suggests significant unmet demand for typical agricultural products across key markets, including South East Asia, China and the Middle East. Of relevance to Charters Towers, that work identified five priority products, including intensive beef cattle, legumes and pulses, with nearly \$3B of currently unmet demand in global markets (KPMG 2019). Consequently, the most significant challenge for the development of agriculture will be effective management of water allocations to enable higher value and much more efficient, low impact agricultural ventures and supply chains, whether they be large or small in scale. This pathway will explore, scope and strategise the:

- required agricultural supply chain visions and potential production system models
- visionary land use and infrastructure planning that can deliver on this water promise, including innovative road, airport, port and communication solutions
- integration with reliable, affordable and low-carbon energy and integrated waste options to service this development
- potential for protected cropping, small scale farming and farm services innovation
- next generation sub-catchment approaches and production system practices that will be needed to meet the proposed new GBR regulations.

Focusing on strengthening all aspects of the supply and value chain, the project will deliver greater economic benefits, energy and nutrient use efficiency, less waste and an improved emissions profile relative to the Region’s GDP.

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