Lithgow City Council Smart Places RoadMAP

2025

Lithgow CITY COUNCIL

Acknowledgement of Country

Lithgow City Council acknowledges Wiradjuri Elders past and present of the Wiradjuri nation - the original custodians of the land on which the Lithgow's communities reside. The Council also extends our respects to our neighbouring nations.

We also acknowledge all other Aboriginal and Torres Strait Islander people who now live within the Lithgow Local Government Area.

The Smart Places RoadMAP has emerged from Council's partnership with the *Smart Regional Spaces: Ready, Set Go!* project led by the Department of Regional NSW, The University of Sydney and UNSW Sydney.

Cover image: Blast Furnace Park, Lithgow | Photograph by Penny Vozniak

Foreword

As we progress, we understand that building a Smart Region goes beyond just embracing technology; it's about creating an environment where smart services, places, and people work seamlessly together. The Smart Places RoadMAP, developed in collaboration with our partners, including the Department of Regional NSW, The University of Sydney, and UNSW Sydney, underscores our commitment to leveraging technology to boost productivity, enhance quality of life, and protect our natural environment.

The RoadMAP takes a strategic approach, building on the Lithgow City Council Smart Region Blueprint 2020 and our Community Strategic Plan 2035. With these frameworks in place, we've crafted a plan to transform public open spaces across our Local Government Area (LGA) into smart, sustainable, and responsive places that meet the needs of both residents and visitors.

I encourage you to explore this document, envision the possibilities, and join us in shaping a Smart Region for future generations. Together, we can make Lithgow a place where innovation, community, and technology come together to create a brighter future for all.

Cassandra Coleman

Mayor, Lithgow City Council

Executive Summary

A Smart Region, with smart people, smart services, and smart places

Lithgow City Council (Council) is committed to establishing itself as a world-class Smart Region. Creating a Smart Region relies upon building smart capabilities and implementing smart projects. Beyond technological advancement, smart projects aim to improve the productivity, liveability, and sustainability, of our community and environment, through positive social, physical, environmental, and economic impacts. Leveraging the region's endowments – its proximity to Sydney and the Central West, natural attractions and recreational amenity, a strong economy with industry competitiveness and existing collaborative experience in the delivery of smart projects, – Council is well-positioned to achieve its Smart Region goals.

Building on the aspirations of the *Lithgow City Council Smart Region Blueprint 2020* (the Blueprint), and the *Our Place Our Future Community Strategic Plan 2035* (the CSP), the **Lithgow City Council Smart Places RoadMAP** (hereafter referred to as the Smart Places RoadMAP) is the next step in Council's commitment towards becoming a Smart Region. It aims to support the provision and management of smart public open spaces across the Lithgow Local Government Area (LGA). Public open spaces include parks, playgrounds, nature reserves, gardens, campgrounds, rest stops, open air malls, and historical and cultural locations.

The Smart Places RoadMAP is designed to be a bridge between the *Blueprint* and future detailed implementation plans for specific smart public open space projects. It is intended to be used by Council to evaluate, and prioritise the delivery of projects, build collaborative partnerships, support funding and investment, and inform the preparation of Council plans and policies, in line with our Integrated Planning and Reporting Framework. The Smart Places RoadMAP applies to the entire LGA and uses a five-year timeframe as a forecast.

The Smart Places RoadMAP has emerged from Council's partnership with the *Smart Regional Spaces: Ready, Set Go!* project led by the Department of Regional NSW, The University of Sydney and UNSW Sydney.

Lithgow's Smart Places Framework

The Smart Places RoadMAP identifies four key principles to guide the improvement of our public open spaces – Capacity Building, Social Experience, Environmental Monitoring, and Asset Management.

Capacity building refers to improving Council and the community's knowledge and skills to champion change, implement, and use technology. Social experience focuses on an individual's social, emotional, and physical interactions with a place and how technology can positively influence these. Environmental monitoring refers to the use of technology to analyse natural assets or conditions of a place. Asset management refers to the use of technology for public infrastructure design, operation, and maintenance. For each principle, the Smart Places RoadMAP identifies key goals, and potential smart projects – by place, by type or by leveraging existing projects.

Smart in Practice

There is not one 'right' approach in becoming a Smart Region and knowing where to start can be challenging. A place-based approach utilises the strategic selection of sites within the Lithgow LGA for the implementation of more focused smart projects, which respond to the opportunities and challenges of that place and its community. A project type-based approach involves the selection of a type of smart technology to implement in specific site or across the entire LGA, responding to broader, strategic opportunities and challenges. Finally, a 'Quick Wins' approach guides Council to build upon existing smart projects and associated infrastructure for additional applications, implementation at other locations or at a larger scale.

1 – A Place-based Approach

Taking a place-based approach, Council has identified six sites with potential for smart activation. The sites comprise a variety of open spaces ranging from parks to a plaza to a playground. These places are well-used, well-loved and rate highly in terms of social attributes and physical amenity, making them ideal sites for smart projects. Further, many of these locations already comprise digital technology that can be leveraged or expanded upon. The Smart Places RoadMAP describes each site and identifies existing smart technologies, opportunities for expansion or new smart projects.

Table – Potential Smart Projects by Place

Site	Potential Smart Projects
Cook Street Plaza, Lithgow	• A ChillOUT Hub, • A digital information board, and • Digital placemaking initiatives, such as light shows and choreographed light projections.
Lake Wallace, Wallerawang	• Sensors for counting people and things, for micro-infrastructure asset management (e.g., toilets, barbeques, bins), and for environmental monitoring (e.g., water quality), • Digital placemaking initiatives, and • Smart poles, equipped with Wi-Fi and/or smart lighting.
Queen Elizabeth Park, Lithgow	• Smart lighting, including motion-sensors and solar-power, and • A ChillOUT Hub.
Mick Moore Memorial Park, Portland	• A digital information board, • A ChillOUT Hub, and • A self-cleaning toilet (Exeloo).

Site	Potential Smart Projects
Blast Furnace Park, Lithgow	• Sensors for counting people, and for micro-infrastructure asset management (e.g., toilets, bins), and • Digital placemaking initiatives, such as virtual reality (VR) and augmented (AR) mobile apps.
Adventure Playground and Pump Track, Lithgow	• Sensors for counting people, and for micro-infrastructure management (e.g., toilets, barbeques, bins), and environmental monitoring (e.g., air temperature), • Smart lighting, including motion-sensors and solar-power, and • Free Wi-Fi, as part of, or independently of a ChillOUT Hub.

2 – A Project-type-based Approach

Taking a project-type-based approach, Council has identified additional smart projects it can pursue across the LGA. Many of these projects leverage existing experience or collaborations. A description of each project type, its potential application(s) in the LGA, and key benefits are provided. In addition to the smart projects identified above, potential projects include:

- Mobile applications (Apps),
- The use of drones,
- Quick response (QR) codes, as part of or independent of digital information boards,
- Smart irrigation controllers, and
- Smart parking.

Council acknowledges that the successful implementation of smart projects and the creation of smart places relies upon having the right environment. Council will work towards strengthening physical and digital infrastructure, upskilling staff, and pursuing collaborative partnerships to support these efforts.

Pump Track, Lithgow | Photograph by Nancy Marshall

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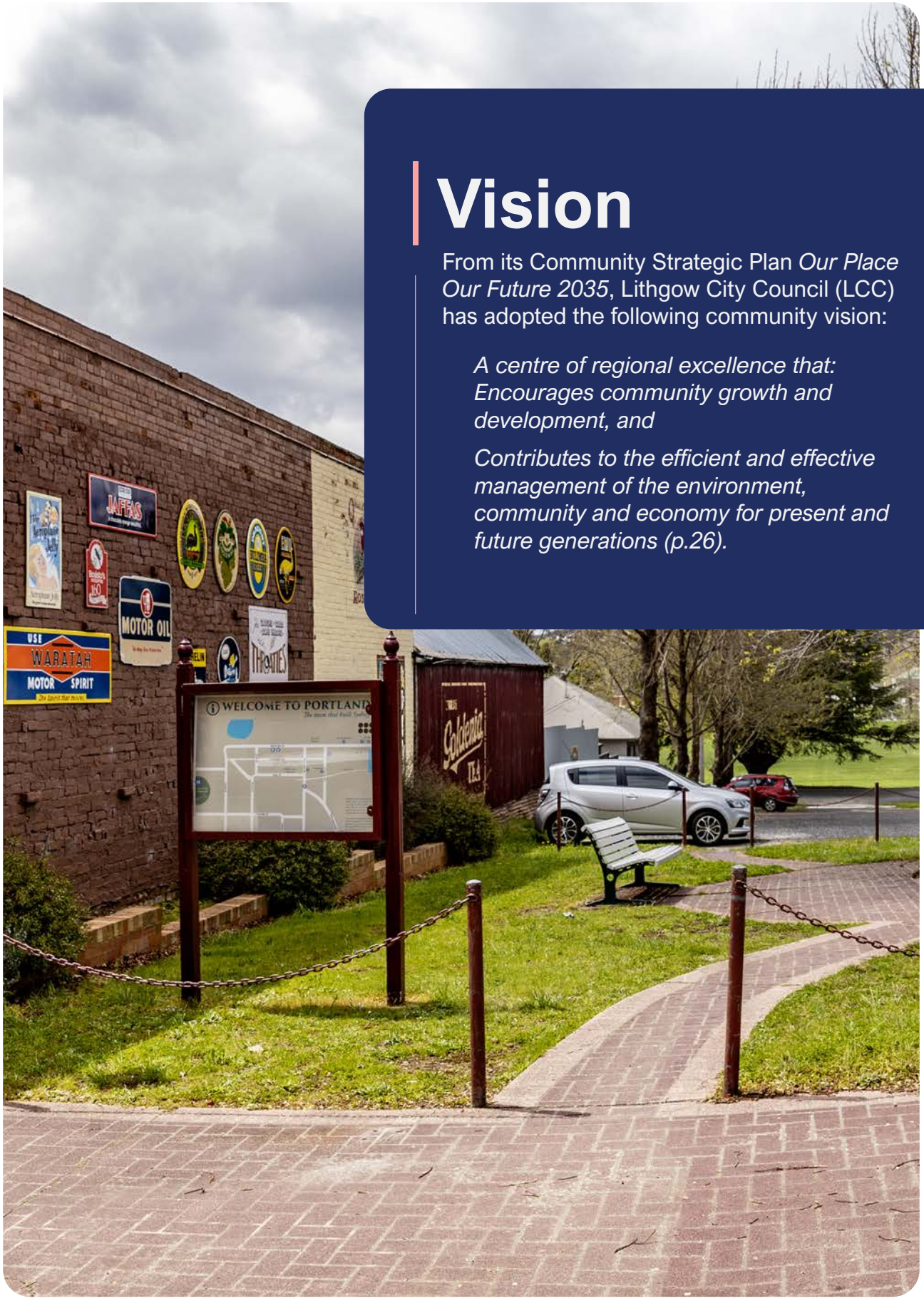
Vision

From its Community Strategic Plan *Our Place Our Future 2035*, Lithgow City Council (LCC) has adopted the following community vision:

> *A centre of regional excellence that:*
> *Encourages community growth and development, and*
>
> *Contributes to the efficient and effective management of the environment, community and economy for present and future generations (p.26).*



Mick Moore Memorial Park, Portland | Photograph by Penny Vozniak

LITHGOW AT A GLANCE

OUR COMMUNITY

20,842 Usual Residence Population 2021 (ABS 2021a, .id)

> 25,500 Target Population 2040 (Lithgow 2040 LSPS)

47 Median Age (ABS 2021b, .id)

8,943 Households (ABS 2021c, .id)

OUR GEOGRAPHY

4,567km² Area (.id)

55% area national parks and state forests (Lithgow 2040 LSPS)

7 Valleys

140km to Sydney

OUR PUBLIC SPACES

77 Open space recreational areas

10 Playing Fields

1 Aquatic Centre

3 Libraries

Lake Lyell, Lake Pillans, Lake Wallace

(Lithgow City Council Strategic Asset Management Plan 2022-23)

OUR ECONOMY

$1.33bn Gross Regional Product 2022 (NIEIR 2023a, .id)

1,534 Local Businesses 2022 (Australian Business Register 2023, .id)

8,073 Local Jobs 2022 (NIEIR 2022a, .id)

50% Labour Force Participation (ABS 2021b, .id)

OUR TOP INDUSTRIES

Health Care & Social Assistance

Public Administration & Safety

Mining

Construction

Education &Training

(NIEIR 2022b, .id)

Lake Wallace Playground, Wallerawang | Photograph by Penny Vozniak

1 Introduction

1.1 About this RoadMAP

The **Lithgow City Council Smart Places RoadMAP** (hereafter referred to as the Smart Places RoadMAP) aims to support the provision and management of smart public open spaces across the Lithgow Local Government Area (LGA). Public open spaces include parks, playgrounds, nature reserves, gardens, campgrounds, rest stops, open air malls, and historical and cultural locations.

Lithgow City Council (Council) is committed to establishing itself as a world-class Smart Region. Council acknowledges the importance of and impact that smart technologies, infrastructure, and data will have over the coming decades. Creating a Smart Region relies upon establishing smart capabilities and implementing smart projects for the benefit of our community and environment. Smart projects use digital technologies to bring together people, provide information, and performance-manage elements of the built and natural environments. A Smart Region is community-centric, and we aim to implement projects based on the needs of the people, and benefits including improved liveability and productivity, to residents, businesses, and visitors alike.

The *Lithgow City Council Smart Region Blueprint 2020* (the Blueprint) provides the foundational guide for what it means to become a Smart Region. The Blueprint outlines the potential capabilities and projects that Council could pursue as part of a Smart Region program. It takes a whole of organisation view across Council and community. Potential smart projects are organised by the five strategic themes of the *Our Place Our Future Community Strategic Plan 2035* (the CSP) – Caring for our Community, Strengthening our Economy, Developing our Built Environment, Enhancing our Natural Environment and Responsible Governance & Civic Leadership.

Building on the aspirations of the Blueprint and the CSP, this Smart Places RoadMAP establishes a framework of four key principles to guide the improvement of our public open space – Capacity Building, Social Experience, Environmental Monitoring, and Asset Management. For each principle, the Smart Places RoadMAP identifies key goals, and potential smart projects – by place, by project type or by leveraging existing projects – as starting points for Council. In doing so, it outlines the many benefits of becoming a Smart Region, such as adopting technology to improve visitation to our places and to manage our open spaces more efficiently and effectively.

This Smart Places RoadMAP applies to the entire Lithgow LGA. However, it is particularly relevant for the populated area of Lithgow plus surrounding towns and villages. The Smart Places RoadMAP uses a five-year timeframe as a forecast. Technology evolves continuously and strategies related to smart need to remain dynamic and be regularly reviewed to remain responsive to the latest advancements in smart technology and changing community priorities.

1.2 Preparing the RoadMAP

This Smart Places RoadMAP has emerged from Council's partnership with the *Smart Regional Spaces: Ready, Set Go!* project led by the Department of Regional NSW, The University of Sydney and UNSW Sydney.

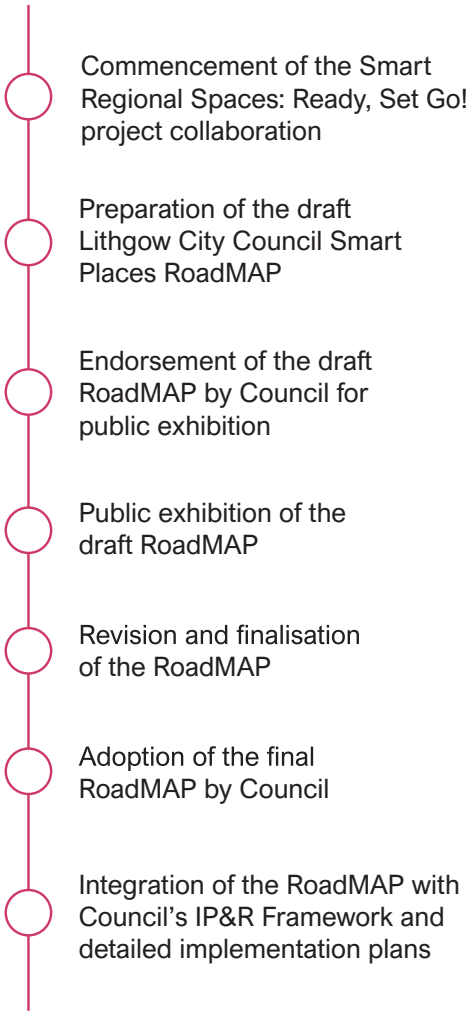
Council and the Smart Regional Spaces team collaborated over a period of 16 months across 2022-23 to identify ways to transform our public open spaces into smart places. This included learning about the LGA and our communities to identify smart opportunities and challenges (refer to Section 2.1) followed by developing a framework with a smart vision and principles (refer to Section 3) to guide the provision and management of potential smart public open space projects (refer to Section 4) across the LGA.

Community Consultation

Council is committed to ensuring our Smart Region is inclusive of our community. To achieve this Council encourages transparency and community participation in its decision-making processes.

'The community' is any individual, group or organisation that identifies or has an interest in a place. It includes residents, landowners, business owners, community organisations, workers, visitors, government agencies and statutory bodies.

The community use and experience places differently, and what are important characteristics or needs to some may be different to others, making the planning for the future of a place more difficult.



Key milestones in the preparation of the *Smart Places RoadMAP*

1.3 Implementing the RoadMAP

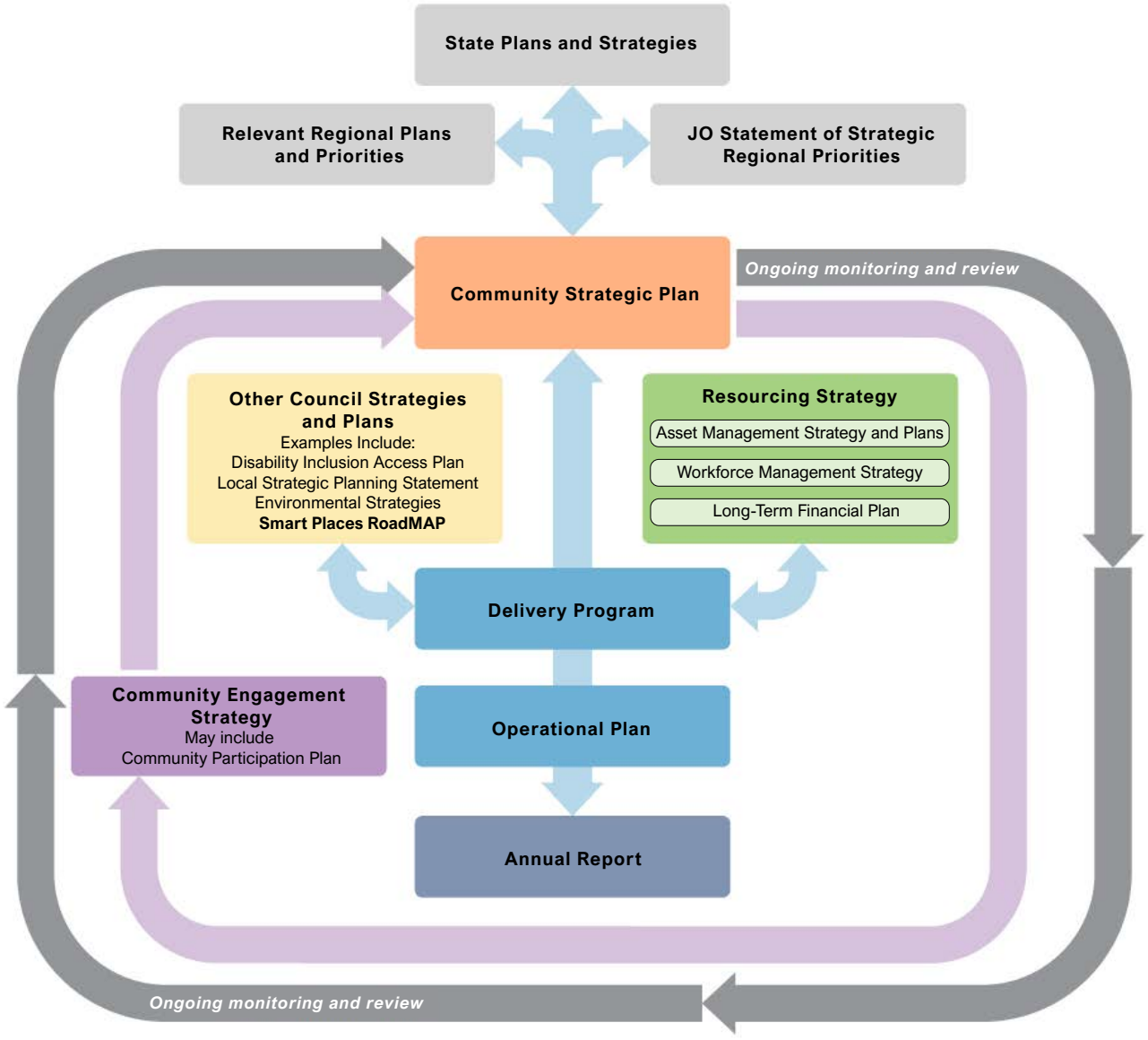
The Smart Places RoadMAP has been created to guide Council, specifically, the Lithgow City Council Smart Region City Working Group, in leading smart place transformation and smart project implementation. It can be used to:

- Initiate discussions and build collaborative partnerships within Council,
- Evaluate and prioritise the delivery of identified smart places and projects,
- Advocate for smart places and projects locally, as well to the state and federal governments,
- Support grant applications and attract investment,
- Guide collaboration between Council and external stakeholders, including the state and federal governments, businesses, academia, and the community, and
- Inform the preparation of plans, policies, strategies, and masterplans.

In line with our Integrated Planning and Reporting Framework (IP&R Framework), this Smart Places

RoadMAP (within the category of 'Other Council Strategies & Plans') responds to Councils existing plans and policies and has the potential to inform the development of future plans and policies. These include our corporate documents such as the Community Strategic Plan, Strategic Management Plan, Long-term Financial Plan, Delivery Program and Operational Plan, as well as place or project specific strategies and masterplans, such as the *ICT Strategy 2021-2025*, *Lithgow Active Transport Plan* and *Lithgow's Electric Car Parks 2022: An EV charging strategy for the Lithgow LGA and Main Street precinct*, and more broadly, the *Lithgow Regional Economic Development Strategy*, the *Maldhan Ngurr Ngurra Lithgow Transformation Hub*, and *Marrangaroo Masterplan*.

The Smart Places RoadMAP is designed to be the bridge between the *Blueprint* and future detailed implementation plans for specific smart public open space projects. As such, implementation of the projects identified within this Smart Places RoadMAP are governed by the 'Smart Regional Governance Model', 'Smart Region Industry Collaboration Framework', 'Smart Region Security Framework' and our commitment to International Smart Region Standards and managing our data as an asset, outlined within the Blueprint.



Lithgow City Council IP&R Framework (amended to include the Smart Places RoadMAP)

5.4 Foundations for Success

Council acknowledges that enabling our vision and achieving our Smart Region goals, relies upon having the right environment – adequate digital connectivity, foundational knowledge, and resource availability – to support the implementation of smart projects. This includes first and foremost, having the physical infrastructure that enables digital connectivity throughout the Lithgow LGA, for example broadband internet. A focus on capacity-building (internally and externally of Council) as well as multidisciplinary/interdepartmental approach are essential to bring these projects to life. In offering optimistic and united leadership, Council acknowledges the financial and legislative limitations within which it works. Council will work towards strengthening physical and digital infrastructure, upskilling staff, and identifying champions to lead the implementation of potential smart places and projects across the Lithgow LGA.

Lithgow | Photograph by Penny Vozniak

Cook Street Plaza, Lithgow | Photograph by Penny Vozniak

2 A Smart Region

2.1 Why Become a Smart Regional LGA?

Lithgow City Council, like all other councils, is increasingly looking for ways to make better decisions with greater positive impacts to improve the liveability and resilience of our towns and regional spaces.

The 'smart places movement' addresses these goals, but so far, has largely focused on urban areas and the challenges experienced by growing cities, including high-density living, traffic congestion, and different types and uses of public spaces. This is in contrast to the regional challenges associated with low population density, depopulation, population aging, and the persistent digital divide. The smart places conversation needs to turn to the bush. Regional and rural councils and their communities also want to realise the benefits of new smart initiatives for governance, evidence-based decision-making, community asset management, public infrastructure, place experience, and place resilience. Smart people, processes, plans, and places are all parts of the RoadMAP needed to achieve these results.

To benefit from the smart places movement, regional councils need context-sensitive thinking and actions that reflect what the movement can offer its district and its residents. Unique local challenges mean that digital information and smart initiatives need to be customised. The Smart Places RoadMAP aims to deliver this in our LGA.

2.2 Smart Opportunities and Challenges

The Lithgow LGA is well-positioned to become a Smart Region, building from a strong base in industry, tourism, and natural assets. The region has seen significant public and private investment, including the positioning of Lithgow as the gateway to the Gardens of Stone State Conservation Area and the Maldhan Ngurr Ngurra Lithgow Transformation Hub. Further, the region is well-placed to benefit from growth in Western Sydney, including the Western Sydney International Airport and Aerotropolis as well as collaborations with the Central NSW Joint Organisation (CNSWJO), of which Council is a member. Investment in the region is expected to create new jobs and assist with the diversification of the region's economic profile. However, significant growth will put pressure on existing infrastructure and resources across the Lithgow LGA.

Building on existing smart capabilities, the Smart Places RoadMAP highlights many opportunities within the above areas, and others, that could be considered as Lithgow moves towards its smart goal. However, learning from past experiences and the smart places movement, the Smart Places RoadMAP also identifies where potential challenges may exist.

Smart Opportunities

Support Council Identity and Transition

Smart capabilities can support the region's transition to a new future-ready economy, beyond coal and electricity generation. Embracing smart technologies can assist with attracting investment, digital-led businesses, and diverse skill sets.

Increase Smart Assets and Infrastructure

Smart technologies, including remote access, automation, and smart sensors, can maximise efficiencies in operation and maintenance of Council assets and infrastructure.

Expand Capacity for Smart

Expand smart capabilities across the LGA by upskilling Council staff in areas such as drone training, exploring partnerships and knowledge sharing with external stakeholders, including digital-led businesses, and hosting community education programs such as traineeships.

Leverage Natural, Cultural and Heritage Assets

Smart projects such as digital placemaking can be used to attract visitors to and improve visitor experience of the region's natural, cultural, and historical sites. Smart technologies can be used to protect and enhance our natural environment and biodiversity, as well as manage and recover from natural disasters.

Smart Challenges

Digital Connectivity

Digital connectivity has been a long-standing issue in regional and rural areas. Expanding physical infrastructure that enables digital connectivity, for example, broadband internet is critical in reducing the digital divide and supporting smart capabilities and projects.

Limited Evidence-base

At times there is a lack of (useable) data to support evidence-based decision-making. Council is committed to collecting and managing real-time data on the performance and use of its assets on an open and interoperable basis. We aim to collaborate with other data owners across the region.

Resources, Budget, and Funding

Innovation does have costs associated with it. As such, innovation requires constant capacity-building and network-building due to the changing nature of technology. With it comes the challenges of resourcing for new smart projects and building an internal council culture that can adapt to changes efficiently.

Digital Asset Security

A Smart Region is highly distributed and involves many diverse stakeholders. Security of smart assets and information is a challenge. Council will establish and maintain availability, confidentiality, and integrity of its entire Smart Region.

2.3 Plans and Policy Context

Australia has a series of strategies, plans and policies that establish smart visions, goals, and priorities at the federal, state, territory, and regional levels. In response, many councils have prepared their own strategies, plans and policies to identify local smart visions, goals, and priorities, and to ensure alignment with overarching directions. The relationship of this Smart Places RoadMAP to existing documents is outlined below.

Australia

The Smart Cities Plan (2016) outlines the Federal Government's vision for a 'smarter' Australia. It prioritises the development of smart policies, and the investment in smart infrastructure and technology, across all levels of government. The *Smart Cities Standards Roadmap* (2020) highlights key actions that will support the growth of smart places across Australia, including improved knowledge sharing and collaboration.

New South Wales

The *Smart Places Strategy* (2020) aims to support the digital transformation of NSW. The *SmartNSW Roadmap 2022-2027* provides 14 actions to support consistent planning and the delivery of connected infrastructure and smart solutions across the state. These include the delivery of digital infrastructure, skill development and capability uplift.

Central West and Orana Region

Whilst not realised as a smart plan, the *Central West and Orana Regional Plan 2041* sets out the 20-year vision and strategic planning framework for the broader region. Positioning Lithgow as a Smart Region supports key priorities identified within the plan including high-quality public space, connected communities, economic transformation and diversification, and a sustainable future.

Further, Lithgow City Council is a member of the Central NSW Joint Organisation (CNSWJO). The CNSWJO's principal functions include, strategic planning and priority setting, intergovernmental collaboration, leadership, and advocacy. The *CNSWJO Strategic Plan 2022-2025* identifies key priorities relating to collaboration, infrastructure, and technology, including a focus on electric vehicles, and managing natural assets through water monitoring. Building Lithgow's capacity as a smart region will assist in delivering collaborative projects across Central NSW.

Lithgow Region

Lithgow Regional Economic Development Strategy

The *Lithgow Regional Economic Development Strategy 2018-2022* identified digital connectivity as a key infrastructure priority for the region. The strategy outlined the development of a Smart Region Strategy, a RoadMAP, and a portfolio of actionable Smart Regions projects. The *Lithgow Regional Economic Development Strategy – 2023 Update* points towards the macroeconomic trend of 'Digital Transformation' across various sectors in the region. This Smart Places RoadMAP has been prepared in direct response to the above.

Community Strategic Plan

The key strategic plan for the Lithgow Region is the *Our Place Our Future 2035* CSP. The CSP sets out our community's vision for the future of the Lithgow Region to be a sustainable, economically viable and welcoming community which respects and retains is environment. The CSP identifies the regions key priorities, organised within five themes – Caring for our Community, Strengthening our Economy, Developing our Built Environment, Enhancing our Natural Environment and Responsible Governance & Civic Leadership.

Table - *Our Place Our Future Community Strategic Plan 2035 themes*

Caring for our Community	To retain, respect and strengthen both our overall sense of community, and the unique linked communities of groups, rural areas, villages, and towns that make up the Lithgow LGA.
Strengthening our Economy	To provide for sustainable and planned growth through the diversification of the economic base, the development of diverse job opportunities and the provision of a broad range of formal and non-formal educational services.
Developing our Built Environment	To provide a choice of effective public and private transport options, suitable entertainment and recreational facilities, and lifestyle choices while enhancing the existing rural areas, villages and towns that make up the Lithgow LGA.
Enhancing our Natural Environment	To balance, protect and enhance our diverse environmental elements, both natural and built, for the enjoyment and support of both current and future generations.
Responsible Governance and Civic Leadership	To develop community confidence in the organisation by the way it is directed, controlled, and managed.

This Smart Places RoadMAP responds to key priorities relating to smart capabilities, technology, and open space enhancement of the CSP, including, but not limited to:

- Creating connected communities,
- Becoming a smart, resilient community,
- Developing into a smart city that embraces technology, innovation, and entrepreneurship to support business success and improve liveability,
- Embracing new technologies, creativity, and innovation to grow a network of vibrant, mixed-use centres and services,
- Creating inviting, accessible, and creative parks and public spaces,
- Upgrading and renewing infrastructure, improving appearances of towns & villages, recreation precincts, and
- Improving communication, and customer service.

Smart Region Blueprint

The *Lithgow City Council Smart Region Blueprint 2020* (the Blueprint) provides the foundational guide for what it means to become a Smart Region. It aims to digitalise the Our Place Our Future Community Strategic Plan 2035 (CSP). Similarly, the Blueprint takes a whole of organisation view across Council and community.

The Blueprint outlines potential smart themes, capabilities, and projects that Council could pursue as part of a Smart Regional program. Potential smart capabilities and projects are organised within the five themes of the CSP. Further, the Blueprint outlines a 'Smart Regional Governance Model', 'Smart Region Industry Collaboration Framework', 'Smart Region Security Framework' and our commitment to International Smart Region Standards and managing our data as an asset.

This Smart Places RoadMAP is designed to act as the bridge between the Blueprint and future detailed implementation plans for specific smart projects relating to public open spaces. Smart projects relating to public open space identified within the Blueprint include, but are not limited to:

- Monitoring usage data for parks, recreation areas and visitor attractions,
- Monitoring excess soil moisture on our sports fields and recreation areas,
- Managing smart bin and toilet usage, and
- Ensuring high-speed connectivity for public spaces through public Wi-Fi, light poles, and other street furniture.

Refer to Section 4 for further information on smart projects.

Smart Region Themes | Source: *Lithgow City Council Smart Region Blueprint 2020*

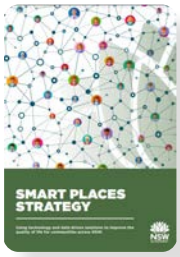
Smart Technology Capabilities | Source: *Lithgow City Council Smart Region Blueprint 2020*

Federal

Federal Government Smart Cities Plan 2016

Standards Australia Smart Cities Standards Roadmap 2020

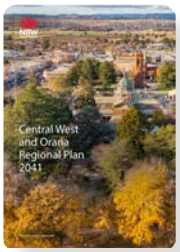
State



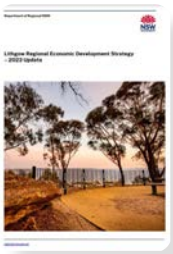
NSW Government Smart Places Strategy 2020

NSW Government SmartNSW Roadmap 2022-2027

Regional



NSW Government Central West and Orana Regional Plan 2041



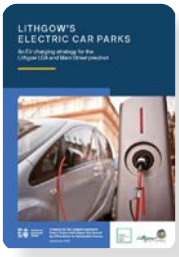
NSW Government Lithgow Regional Economic Development Strategy + Update 2023

Central NSW Joint Organisation Strategic Plan 2022-2025

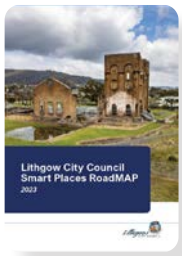
Local

Lithgow City Council, Smart Region Blueprint 2020

Lithgow City Council ICT Strategy 2021-2025



Lithgow City Council Lithgow's Electric Car Parks 2022



Lithgow City Council Smart Places Roadmap 2023

Hierarchy of existing 'smart'and realted strategies, plans and policies at the federal, state, and local levels

Adventure Playground, Lithgow | Photograph by Penny Vozniak

3 Lithgow's Smart Places Framework

Being smart can take many forms and smart plans need a clear vision and a set of guiding principles to support decision-making on the use, provision, and management of public open spaces across the Lithgow LGA. This Smart Places RoadMAP builds on our mission of becoming a Smart Region, and the foundation of the Community Strategic Plan and Smart Region Blueprint, to set a vision and principles to ensure the best outcomes for our public open spaces.

3.1 Lithgow Smart Places Vision

Lithgow – *A Smart Region, with smart people, smart services, and smart places*

Smart capabilities are entrenched within Council operations, and community life, alongside smart technology that is inclusive and that enhances efficiency, management, environmental resilience, and the social experience of our public open spaces.

3.2 Lithgow Smart Places Principles

The smart places principles are intended to guide the use, provision, and management of enhanced public open space, supporting our efforts in becoming a Smart Region. Each principle is described below:

- **Capacity Building** within the Council and the community.
- **Social Experience** of a public open space.
- **Environmental Monitoring** of key components localised in an area.
- **Asset Management** of public infrastructure and facilities.

Smart places principles

Capacity Building

Definition

Capacity building refers to improving an organisation's capacity and expertise to lead and manage the change needed to leverage smart technologies. Capacity building projects include knowledge and skill development as well as upgrading systems and services to the latest technology standards. These projects are aimed at preparing the foundation for the Council's operations and services to become smart, as well as empowering the community to access and use these services. Capacity-building runs as a through line across all the other guiding principles.

Alignment

This principle supports all five themes identified within the *Our Place Our Future 2035* CSP and the *Smart Region Blueprint*.

Alignment

- To establish Lithgow City Council as a regional leader in smart capabilities.
- To expand knowledge and skills to innovate, test, and use smart technologies in the region.
- To increase community access to and use of smart services, infrastructure, and facilities.
- To encourage partnership and collaboration with industry and businesses on smart projects.

Benefits

Smart capacity-building projects can:

- Build a smart culture within Council and the community that responds to the unique dynamics, needs, challenges, and opportunities of the region.
- Upskill Council staff to understand and lead the implementation of smart projects. This can reduce reliance on external consultants, ensure projects cater to local challenges and needs, and encourage Council-led partnerships.
- Contribute to Council staff satisfaction, sense of contribution, and retention.
- Help transform data into useful information that supports evidence-based decision making and transparent governance.
- Support the provision of high-quality services to the community with a focus on customer needs, financial sustainability, and efficient operations.
- Support equitable access to digital technologies and reduce the digital divide within and between our communities.
- Support a thriving business environment that makes it easier to do business, promotes innovation and collaboration, attracts new investment, and strengthens the local economy.
- Help protect and enhance our natural environment and its biodiversity.
- Enhance infrastructure and asset management and investment.

Smart Project Examples

Digital Information Boards, Drones, Free Wi-Fi.

Social Experience

Definition

Social experience is a uniquely personal experience emerging from a person's physical, social, and emotional interactions within different places. Smart social experience projects involve the provision of digital technology into public places to support equitable access and introduce an innovative new layer of amenity into public space which enhances social use and connection. Social experience can be improved through digital placemaking projects, providing innovative sensory experiences, connecting to digital information services, or capturing and learning from user data.

Alignment

This principle supports the themes of Caring for our Community, Developing our Built Environment, and Enhancing our Natural Environment identified within the *Our Place Our Future 2035* CSP and the *Smart Region Blueprint*.

Goals

- To plan for and provide high-quality public open spaces for healthy, vibrant, and connected communities.
- To develop a strong tourism industry that attracts visitors and enhances visitor experience.
- To support equitable access to digital technologies and reduce the digital divide.

Benefits

Smart social experience projects can:

- Support the identity and spirit of diverse communities.
- Encourage varied use of public open spaces to improve community health and well-being.
- Improve public safety using, for example, CCTV, or closures during hazardous conditions.
- Diversify the uses (including time and frequency of use) of public open spaces as well as cultural, historical, and natural attractions.
- Attract increased tourism to the region. Monitoring can provide better visitation data to support the development of new tourism opportunities, target marketing and incentivisation.
- Enhance and strengthen iconic events and attractions, such as LithGlow and plan new events.
- Increase social inclusion and connectedness.
- Reduce the digital divide through the provision of accessible services, such as free public Wi-Fi.
- Increase communication between Council and its communities.

Smart Project Examples

Digital Information Boards, Digital Placemaking, ChillOUT Hubs, Free Wi-Fi

Environmental Monitoring

Definition

Environmental monitoring is the system of using digital technology to collect and convert raw data into useful information that can assist with the protection or enhancement of the environment. Smart environmental monitoring projects use technology to capture data about air, water, and soil quality, natural assets, weather changes, and wildlife in real time.

Alignment

This principle supports the themes of Developing our Built Environment and Enhancing our Natural Environment identified within the *Our Place Our Future 2035* CSP and the *Smart Region Blueprint*.

Goals

- To balance, protect and enhance our natural environment and its biodiversity.
- To create informed, prepared, and resilient communities.
- To minimise the environmental footprint of the region, use resources more wisely and live more sustainably.
- To collect data that supports evidence-based decision making.

Benefits

Environmental monitoring projects can:

- Provide data to support evidence-based decision-making that balances the need for growth and development with the protection of the natural environment.
- Foster partnerships between Council, government bodies, and organisations to promote cross-boundary approaches, knowledge-sharing projects.
- Improve public safety by distributing emergency information to the community.
- Monitor and respond to changing environmental conditions in real time, for example:
  - » Detect changes in weather conditions to inform emergency warning and response such as risk of landslide or fire evacuation.
  - » Monitor water levels and flows in upstream catchments to provide early warnings of flood events downstream.
  - » Monitor water quality to detect and raise alerts for algal blooms or other contaminants.
- Monitor longer-term environmental conditions to help plan for the future.
- Help assess the state of environmental areas.
- Detect illegal activities, such as waste dumping in public open spaces.
- Protect natural, cultural, and historical areas from misuse or overuse.
- Inform community education programs on sustainable practices, and emergency response.

Smart Project Examples

Drones, Sensors for Environmental Monitoring, Smart Lighting

Asset Management

Definition

Asset management is the use of digital technology for predictive maintenance, infrastructure performance assessment, and lifecycle estimation. Smart asset management projects include attaching sensors to physical infrastructure to collect data about its performance. Data is collated via an Internet of Things (IoT) network and often displayed on a dashboard. Asset management extends the concept of automated monitoring to assess the condition of assets and remotely manage operations, making it easier to track and manage assets in real time.

Alignment

This principle supports all five themes identified within the O*ur Place Our Future 2035* CSP and the *Smart Region Blueprint*.

Goals

- To plan for and provide high-quality, well-maintained services, infrastructure, and facilities.
- To optimise resource management to ensure efficient operations and financial sustainability.
- To collect data that supports evidence-based decision making.

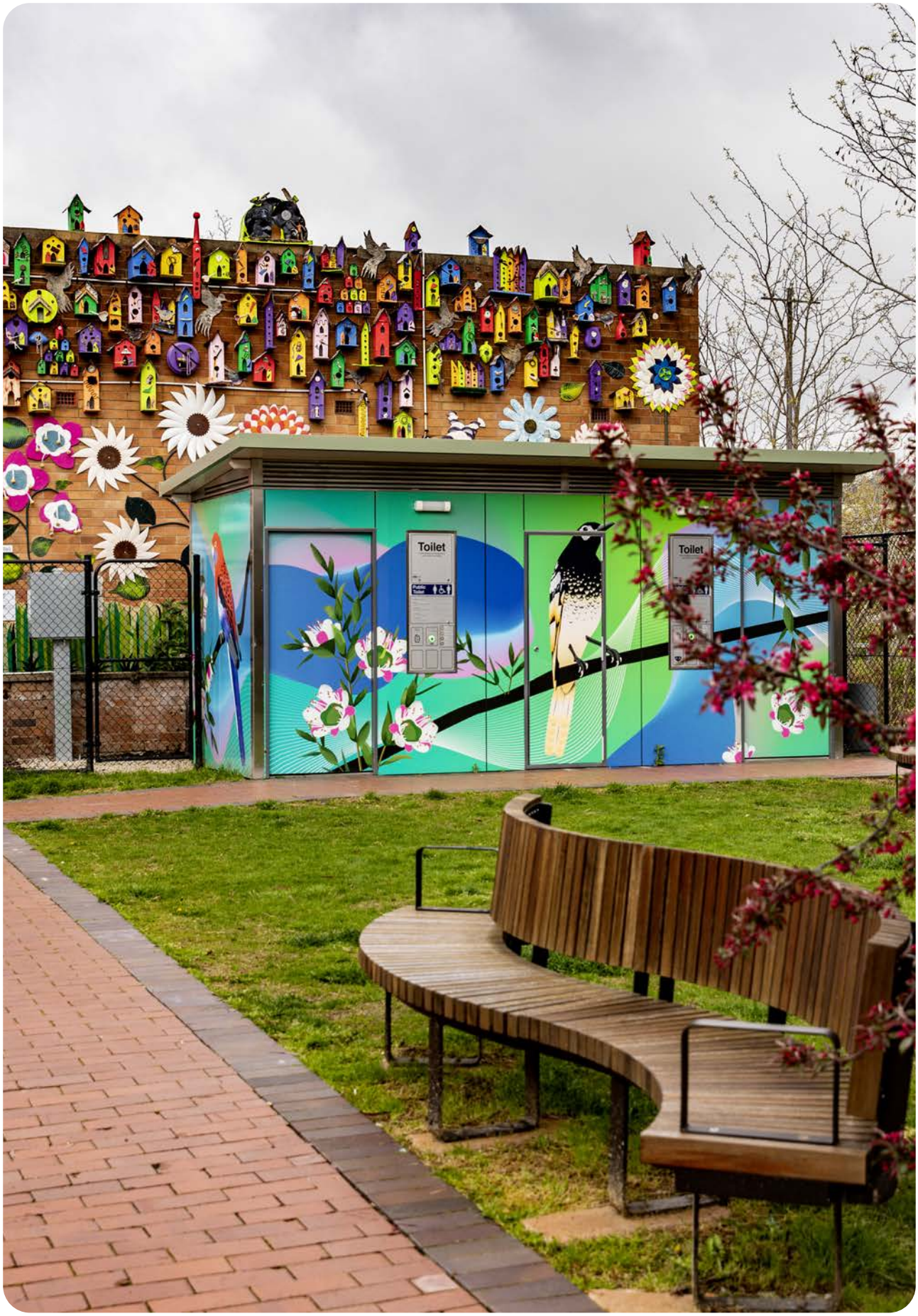
Benefits

Smart asset management projects can:

- Determine utilisation of services and infrastructure to better understand the value of these assets to the community, plan ways to encourage increased use, remove or add assets.
- Improve the design and user experience of infrastructure and facilities.
- Improve public safety. For example, smart bins include sensors to determine fill levels and alert for fire.
- Optimise resource use and asset management in the operations and management of infrastructure. This can include usage data, remote access, dashboards, and digital twins.
- Monitor, assess and manage the condition of assets, particularly those in difficult to reach areas. This might include the use of aerial mapping and drone imagery.
- Enable better calculation of return on investment for existing assets and inform planning for future investment.
- Support grant funding applications or future plans with real data.
- Lay the foundational hardware for the future installation of IoT equipment.

Smart Project Examples

Drones, Sensors for Asset Management, Smart Lighting, Smart Water Meters



Rotary Park, Lithgow | Photograph by Penny Vozniak

4 Smart in Practice

Council believes in the benefits of becoming a ‘Smart Region’ and has begun implementing smart plans, policies, and projects across many of its internal operations, citizen-based services, and infrastructure.

There is no 'right' approach to becoming a smarter region, and knowing where to start can be challenging. This Smart Places RoadMAP documents three approaches, or starting points:

- ‘Quick Wins’ – this approach identifies where existing smart projects or infrastructure can be leveraged, by building on what is already there, extending the project or adopting the technology in other locations, or at a larger scale. Other quick wins might be very short-term, easy to adopt technology with good impact on a place or the community.
- Smart Projects by Place – a place-based approach utilises the strategic selection of open space(s) within the LGA for the implementation of more smart projects, which respond to the opportunities and challenges of that place and its community (see to Section 4.2).
- Smart Projects by Project Type – a type-based approach involves the selection of a type of smart technology to implement in key open spaces, or across the entire LGA, responding to broader, strategic opportunities and challenges of the Council and our communities (see Section 4.3).

This section documents existing smart projects within the Lithgow LGA, and opportunities for future projects.

4.1 Smart Projects to Date

Multiple smart place pilot projects have been undertaken and are currently being undertaken across the Lithgow LGA. These projects, and the lessons learnt, lead the way for current and future smart projects identified in this Smart Places RoadMAP.

Exeloo Public Toilets

Council has installed Exeloo toilets in six public open spaces, including Blast Furnace Park and the Adventure Playground & Pump Track, Lithgow and Savell Park, Portland. The Exeloos are prefabricated, self-cleaning public toilets with automation features. They are accessible, have touch-free sensor-operated facilities, and are vandalism-resistant. The exterior cladding of these toilets has been customised to showcase the natural and heritage assets of the region. The Exeloos have been programmed to automatically open and close each day using the Exeloo Web Based Monitoring system, ExeWeb. This eliminates the need for separate security visits.

QUICK WINS

Data collected by the Exeloo (via ExeWeb) can be used to determine usage (e.g., number and frequency of use within a certain period), as well as monitor operational requirements (e.g., frequency of cleaning or repairs) to further enhance resource efficiencies.

Exeloo at Blast Furnace Park, Lithgow | Photograph by Penny Vozniak

Smart Water Meters Program

Council has completed the rollout of the Taggle smart water metering system/ Automatic Metering Reading (AMR) system, or smart water metering, across the LGA. The project was funded through Council's Water Fund.

A smart water meter monitors, collects, and transmits data on the flow and use of water. Smart water meters allow Council and residents to detect changes occurring within the system that require attention such as leaks, freezing, no water, meter tampering; let customers monitor their own usage through the online 'MiWater' portal by providing near real-time data on consumption and excess use alarms via SMS or email; and extends the lifespan of the network through optimised operations and proactive maintenance. Smart meters can collect and send data every 7 seconds. The online user portal, MiWater, aims to create greater sense of community awareness and responsibility towards the use of water, while reducing the cost to residents by minimising loss of water by about 36 per cent, generating savings worth approximately $1 million a year.

As a phase two of Council's broader Water Loss Management Planning initiative, Lithgow City Council installed flow meters at each water reservoir in the LGA.

Electric Vehicle [EV] Charging Station

In 2019, the State Government and the NRMA initiated Lithgow's journey of becoming a part of the state's EV charging network by funding the installation of an EV charging station. The charging station located at the Lithgow Workies Club on Tank Street is aimed at encouraging EV motorists to stop, recharge, and enjoy Lithgow.

This pilot project has prompted the development of Council's EV Charging Strategy, *Lithgow's Electric Car Parks 2022: An EV charging strategy for the Lithgow LGA and Main Street precinct*, that provides a detailed plan for 35 charging points near Main Street, Lithgow, and the opportunity for additional charging points across 21 of our town centres and villages.

Electric Vehicle Charging Station | Photograph by Penny Vozniak

Soundtrails App

Commissioned by the Portland Business Association following a private funding grant, the immersive soundwalk involves digital storytelling of local history of the industrial town of Portland. Launched in April 2023, the tour includes way-finding signage at the main sites around the heritage precinct, 'The Foundations', as well as laneways and main attractions of the town. It provides permanent in-situ access to the GPS-enabled app via a smartphone. Visitors interact with each place as they explore the site through a 90-minute audio or landscape documentary (as sound fields). An accompanying website provides further information.

QUICK WINS

The Soundtrails App, or similar, could be expanded to other sites of historical significance to create multiple online guided heritage walks across the LGA.

Drone Training

Council staff have undertaken training to receive Civil Aviation Safety Authority (CASA) licensing for drone operation. The training aims to develop internal capacity within Council to operate drones for various purposes (see Section 4.3).

Drone training for Lithgow City Council | Photograph by Penny Vozniak

Free Public Wi-Fi

Improving digital connectivity is critical in reducing the digital divide that exists between cities and the regions. The provision of free Wi-Fi in strategic locations across the LGA aims to make digital services accessible to all. Our community currently has access to free Wi-Fi in Lithgow's libraries, as well as through five of Telstra's Wi-Fi enabled payphones in public open spaces.

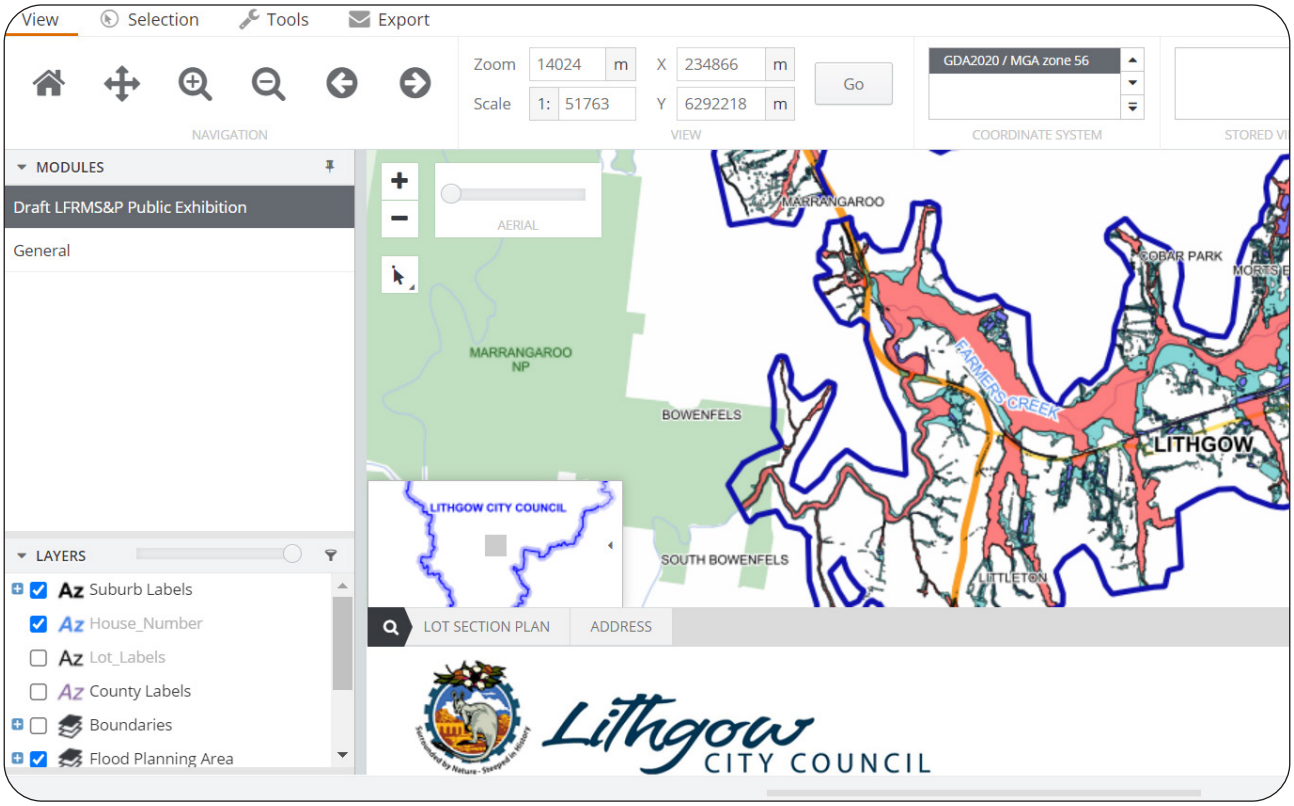
QUICK WINS

The Wi-Fi network can be extended to publicly accessible natural, cultural or heritage areas. In addition to improved connectivity, Wi-Fi can enable the implementation of app-based and digital placemaking initiatives that encourage increased visitation, as well as frequency, and duration of visits.

Intramaps – Public access to Council Geographic Information System (GIS)

Intramaps is an accessible online platform containing interactive mapping, spatial and business information. Through the Intramaps portal the public can access Council's Geographic Information System (GIS) data on services and facilities, planning and zoning information, land parcels, underground assets, aerial imagery, and topographical mapping. The platforms search and query functions are used to view GIS layers and mapped data.

Council staff in various departments have undertaken training in the use of Intramaps since the implementation of the portal.



Intramaps webpage | Source: Lithgow City Council

OneRoad Traffic Alert System

OneRoad is a cloud-based system that collects and shares real-time traffic information for roads in NSW including traffic conditions, incidents, hazards, planned and unplanned roadworks, and major events. OneRoad feeds this information into the Live Traffic NSW app and website, and navigation systems like Google Maps and Apple Maps, allowing users to make better-informed travel decisions. OneRoad and the Live Traffic NSW app and website are funded and maintained by Transport for NSW.

Vehicle Tracking for Council Fleet

Lithgow City Council has incorporated Global Positioning System (GPS) into its fleet assets to help establish a safer and more efficient fleet, to reduce accidents, and to save money. Council uses an electronic GPS-based oversight system to manage its fleet that allows online vehicle booking and can collect vehicle-use data while safeguarding privacy concerns. The system allows direct communication with vehicle drivers all at the same time via messaging. It is also able to run pre-start checks and defect reporting. This has resulted in more efficient use of Council's fleet and has helped improve safety of users.

Electronic Fine Issuing

Lithgow City Council has enabled electronic infringement notices (EIN) to be issued in the LGA since 2016. It allows Council rangers to issue fines via email and mobile text message.

Customer Request Management System Project

Council is committed to improving how we listen and respond to our community. A new customer request management portal is being developed as a one-stop online shop to allow residents to lodge and track the status of their requests. The system is directly integrated with Council's Customer Experience team, allowing requests to be actioned faster and more effectively.

Tech Savvy Seniors Program

In partnership with the NSW Government and Telstra, Council conducted its 'Tech Savvy Seniors' program at Lithgow, Portland, and Wallerawang Libraries from February to April 2023. Geared at bringing digital assistance to seniors, the program ran sessions on subjects such as introduction to smartphones and tablets, internet skills, emails, social media, and video calling.

Digital Drop-In Sessions

In 2021, Council partnered with the Strengthening Business Program to facilitate the Digital Drop-In sessions. It included 30-minute fortnightly master classes run by local experts that focused on networking and building a foundation for small business owners, using digital technology.

4.2 Potential Smart Projects by Place

There are multiple approaches to becoming 'smarter.' A place-based approach involves implementing smart projects at a particular *location*.

Why a Place-based Approach?

A place-based approach uses the social, environmental, and economic characteristics and functions of a particular place as the starting point for future planning and development. In doing so, a place-based approach encourages targeted smart projects that respond to current and future needs of that place and its community, avoiding a 'cookie-cutter' or 'one-size-fits-all' response. This can help address local concerns, such as accessibility, operational issues, or anti-social behaviour. Further, place-based smart projects provide the opportunity for 'living labs' or 'test-beds', to pilot new technology at a manageable scale. This is often most cost effective and can help determine a project's success prior to wider-scale implementation, reducing risk. Finally, a place-based approach may encourage greater community participation and collaborative decision-making; again, helping to tailor smart projects to the end-users.

Priority Locations

Council has identified six sites with potential for smart activation. The sites comprise a variety of open spaces ranging from parks to plazas and playgrounds. These places are well-used, well-loved and rate highly in terms of social attributes and physical amenity, making them ideal locations for smart projects. Further, many of these locations already comprise of digital technology that can be leveraged or expanded further.

The six sites identified for potential smart place-based projects are:

1. Cook Street Plaza, Lithgow
2. Lake Wallace, Wallerawang
3. Queen Elizabeth Park, Lithgow
4. Mick Moore Memorial Park, Portland
5. Blast Furnace Park, Lithgow
6. Adventure Playground and Pump Track, Lithgow

These locations are described below. For each location existing smart technologies, opportunities for expansion and new smart projects have been identified.

Potential projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. Where a project is existing, it has been identified accordingly. The projects support one or more of the smart guiding principles outlined in the previous section. (shown in the table below).

Table - Alignment of place-based projects with guiding principles and delivery timeframe

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
	✓	✓	✓	✓	

Priority Locations for Potential Smart Place-based Projects, Lithgow LGA

1 Cook Street Plaza, Lithgow

Description

Cook Street Plaza is located on the main thoroughfare within Lithgow town centre. Recent revitalisation has seen the installation of new seating, lighting, and Exeloo public toilets. The Plaza's central location supports increased place activation, to encourage increased visitation and use by tourists and locals alike, daily and during community events, like Halloween.

Cook Street Plaza, Lithgow | Photograph by Penny Vozniak

Existing smart technology and potential for expansion

Cook Street Plaza contains Exeloo public toilets, a static signage board with a QR code linked to a webpage with further information about Lithgow's key attractions, as well as light projectors (for place activation), and smart parcel lockers operated by Australia Post. Further, water connections to the Exeloo have been fitted with smart water meters.

QUICK WINS

Data collected by the Exeloos (via ExeWeb) can be used to determine usage (e.g., number and frequency of use within a certain period), as well as monitor operational requirements (e.g., frequency of cleaning or repairs) to further enhance resource efficiencies.

Potential smart projects include, but are not limited to:

- Installation of a ChillOUT Hub, with a digitally enabled, multi-purpose seating area and free Wi-Fi, to improve the site's amenity and encourage increased frequency and duration of use.
- A digital information board (for example, a large community notice board) to provide information on Lithgow's current and upcoming events and display critical information in times of emergencies and disasters.
- Digital placemaking initiatives, such as light shows and choreographed light projections (for example, as a way of digital storytelling), to further activate the site and promote visitation.

A description of each is provided in Section 4.3.

QUICK WINS

The existing light projectors can be used for themed light shows and projections on surrounding buildings as a standalone event, or part of other events and festivals such as LithGlow.

Exeloo (left) and light projectors (right), Cook Street Plaza, Lithgow | Photograph by Penny Vozniak

Alignment with principles and delivery timeframe

The potential smart projects support one or more of the smart guiding principles outlined above. The projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years.

Legend

Short-term project Medium-term project Long-term project

ChillOUT Hub	✓	✓	✓	✓	
Digital Information Board	✓	✓			
Digital Placemaking	✓	✓			*Existing +*
Exeloo Public Toilet	✓	✓		✓	*Existing*
QR Code with linked webpage	✓				*Existing*
Light Projectors	✓	✓			*Existing*
Smart Water Meter System	✓	✓	✓	✓	*Existing*
Smart Lockers (by Australia Post)		✓			*Existing*

2 Lake Wallace, Wallerawang

Description

Lake Wallace is a popular recreation and camping area, located off the Great Western Highway, and a 2-minute drive or 10-minute walk from the Wallerawang town centre. Amenities include a campground, playground, playing field, off-leash dog area, accessible floating platform (for fishing etc.), barbeque facilities, RV dump point, public toilets, and showers (open 24 hours). The area is privately owned but leased and managed by Council.

Lake Wallace playground (left) and accessible floating pontoon (right), Wallerawang | Photograph by Penny Vozniak

Potential for inclusion of smart technology

The implementation of smart technology initiatives at Lake Wallace presents the opportunity to assess the usage of the site and its amenities during peak and off-peak camping periods. This will enable evidence-based planning for site upgrades, as well as introduce efficiencies in Council's management of facilities. In partnership with the landowner, Council could explore the following smart projects:

- Sensors, for counting people and things, to monitor usage of campground; for micro-infrastructure asset management, to monitor usage of toilet blocks, barbeque facilities, bins, and RV dump point; for environmental monitoring, to monitor weather conditions and water quality of Lake Wallace. Sensor data can assist with maintenance and infrastructure planning for the site.
- Digital placemaking initiatives, such as light shows and light projections, could be implemented at the site as standalone events or as part of existing events and festivals for site activation and to encourage further use by residents and visitors.
- Smart poles equipped with free public Wi-Fi, smart lighting and sensors could be installed in collaboration with the owners of the site. Free public Wi-Fi will enable site users to remain digitally connected while camping, using the playground etc.

A description of these smart projects is provided in Section 4.3.

Alignment with principles and delivery timeframe

Potential smart projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short-term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. These projects support one or more of the smart principles.

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Lake Wallace, Wallerawang					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, barbeques, bins, RV dump point)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
Digital Placemaking	✓	✓			
Smart Poles (with or without Smart Lighting, Free Wi-Fi)	✓	✓			
Smart Water Meter System	✓		✓	✓	*Existing*

3 Queen Elizabeth Park, Lithgow

Description

Located in the centre of the city, Queen Elizabeth Park is Lithgow's oldest park. Attractive and well-maintained, the park has toilets, picnic facilities, playground, vegetation, and garden displays, making it frequently used by the community.

Bandstand, Queen Elizabeth Park, Lithgow | Photograph by Penny Vozniak

Existing smart technology and potential for expansion

Queen Elizabeth Park has a static signage board with a QR code linked to a webpage with information about Lithgow's key attractions. Further, water fixtures within the park have been fitted with smart water meters.

Potential smart projects include, but are not limited to:

- Smart Lighting, including motion-sensors and solar-power. This project can improve asset management, environmental sustainability, and public safety.
- A ChillOUT Hub, with a digitally enabled, multi-purpose seating area, could be installed to improve the sites amenity, enable digital connectivity, and encourage increased frequency and duration of use.

A description of these smart projects is provided in Section 4.3.

Alignment with principles and delivery timeframe

Potential smart projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short-term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. These projects support one or more of the smart principles.

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Queen Elizabeth Park, Lithgow					
Smart Lighting (including motion-sensing technology and solar-power)	✓	✓	✓	✓	
ChillOUT Hub	✓	✓	✓	✓	
Smart Water Meter System	✓		✓	✓	*Existing*
QR code with linked webpage	✓	✓			*Existing*

Playground, Queen Elizabeth Park, Lithgow | Photograph by Penny Vozniak

4 Mick Moore Memorial Park, Portland

Description

Portland, the ‘Town that Built Sydney', is known for its heritage assets and creative spaces including The Foundations of Portland, the painted Silos of the Foundations, and The Boiler House, which are part of the state heritage-listed former Portland cement works. The cement works have been a place of significant cultural and economic importance to the region for over 100 years.

The Mick Moore Memorial Park is located on Wolgan Street in the Portland town centre. The park comprises well-maintained gardens, grass, and paved pathway with bench seating. The pathway provides a connection from Wolgan Street and local shops to the adjoining public carpark accessed from Cullen Street.

Mick Moore Memorial Park, Portland | Photograph by *Penny Vozniak*

Existing smart technology and potential for expansion

Portland’s cultural and historical sites have been showcased via an immersive audio-based and GPS-enabled tour in the Soundtrails App. The park has a static signage board with a QR code linked to a webpage with information about Lithgow’s key attractions. Further, water fixtures within the park have been fitted with smart water meters.

Smart technology can be used to leverage these assets by providing information about the heritage, with the Mick Moore Memorial Park becoming a stopping point for visitors. Inclusion of smart technology in Mick Moore Park can also assist with further activation of the adjoining Main Street.

Potential smart projects include, but are not limited to:

- Digital placemaking initiatives such as light shows, installations, and digital projections of images and artwork on the ground and surrounding walls, as a standalone event, or part of other events and festivals, such as LithGlow. Placemaking initiatives encourage increased visitation, use and activation of the site (and surrounding area) by visitors and locals alike.

- A ChillOUT Hub and Exeloo public toilet could increase the amenity of the site, as well as the frequency and duration of visits by the community.
- Installation of sensors e.g., for counting people, to monitor the weather, independently or as part of a ChillOUT Hub can provide Council with valuable data on site usage and can assist with maintenance and infrastructure planning for the site.
- A digital information/community notice board could be installed. The board could provide information on Lithgow's current and upcoming events or display critical information in times of emergencies and disasters.

A description of these smart projects is provided in Section 4.3.

Alignment with principles and delivery timeframe

Potential smart projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short-term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. These projects support one or more of the smart principles.

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Mick Moore Memorial Park, Portland					
Digital Placemaking	✓	✓			
ChillOUT Hub	✓	✓	✓	✓	
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
Exeloo Public Toilet	✓	✓		✓	
Digital Information Board	✓	✓			
App - Soundtrails	✓	✓			*Existing*
QR code with linked webpage	✓	✓			*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*

5 Blast Furnace Park, Lithgow

Description

Blast Furnace Park is a heritage-listed public open space developed around the remains of the former iron and steel works, including the pump house and foundations of the furnace – a monument to Lithgow's industrial history. The park is located on Inch Street, adjacent to the Main Western railway line. It comprises bench seating, a drinking water fountain, public toilets, ramps, and railing. The park's natural, heritage and cultural attractions, including the annual LithGlow light and music festival, makes it popular amongst visitors and locals alike.

Visitors at Blast Furnace Park (left) and LithGlow festival (right), Lithgow | Photograph by Penny Vozniak

Existing smart technology and potential for expansion

Blast Furnace Park contains Exeloo public toilets, which are clad with historical images of the park and historical remains. An interpretative signage trail provides an historical tour of the site. Signage boards include QR codes that link to webpages with additional information. Further, smart lighting is being trialled at Lake Pillans adjoining the park.

Potential smart projects include, but are not limited to:

- Sensors for counting people and things, to collect data on the park's usage, and sensors for micro-infrastructure asset management, to monitor usage of toilet blocks and bins. Sensor data can assist with maintenance of infrastructure and event planning for the park.
- Digital placemaking initiatives such as Virtual Reality (VR) and Augmented Reality (AR) mobile apps, linked to QR codes at the site, that allow users to view computer generated 3D-models and images of how the site's buildings once looked could be explored. Digital placemaking projects could also be used to enhance the LithGlow festival initiatives and be retained as permanent features of the site.

QUICK WINS

Data collected by the Exeloo (via ExeWeb) can be used to determine usage (e.g., number and frequency of use within a certain period), as well as monitor operational requirements (e.g., frequency of cleaning or repairs) to further enhance resource efficiencies.

QUICK WINS

Light and sound installations, at the site, as part of the LithGlow festival, could be enhanced with smart motion sensors, which trigger lighting and sound effects. This infrastructure could be retained in the park year-round to encourage night-time visitation and viewing of the historical ruins.

QUICK WINS

Drones can be used for photography and videography during major events and festivals held in the park. This media can be used in Council internal and external communications, including social media, festival promotions and in corporate documents.

A description of these smart projects is provided in Section 4.3.

Alignment with principles and delivery timeframe

Potential smart projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short-term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. These projects support one or more of the smart principles.

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Blast Furnace Park, Lithgow					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
App - VR or AR for Digital Placemaking	✓	✓			
Drones (e.g., aerial photography and videography)	✓	✓		✓	
Interpretive signage with QR codes linked to webpage	✓	✓			*Existing*
Exeloo Public Toilet	✓	✓		✓	*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*
Digital Placemaking	✓	✓			*Existing*

6 Adventure Playground and Pump Track, Lithgow

Description

The Adventure Playground and Pump Track are located in Endeavour Park, on the Great Western Highway. The Adventure Playground is an all-abilities playground offering a variety of play equipment and play features. The adjoining Pump Track is a circuit for BMX, bike, and other riders. Facilities include shaded seating, bins, smart public toilets (Exeloos), and barbeques. It is a primary open space destination for users of all ages.

Adventure Playground seating and barbeque facilities (left) and playground equipment (right) | Photograph by Penny Vozniak

Existing smart technology and potential for expansion

The site contains Exeloo public toilets. The introduction of the Exeloos has increased park usage. Water fixtures within the site have been fitted with smart water meters. Existing infrastructure, including mains power, provide a strong foundation for the addition of smart project overlay.

QUICK WINS

Data collected by the Exeloo (via ExeWeb) can be used to determine usage (e.g., number and frequency of use within a certain period), as well as monitor operational requirements (e.g., frequency of cleaning or repairs) to further enhance resource efficiencies.

Potential smart projects include, but are not limited to:

- Sensors for counting people and things, for micro-infrastructure asset management, and for environmental monitoring. Sensors can be installed to existing, or new, infrastructure and amenities, to determine how the site is or is not used. This data can assist with park maintenance and provide a basis for future open space decision-making and investment across the LGA.

- Smart lighting, including motion-sensors and solar-power, in the playground, car park and pathways. Smart lighting can enhance public safety and promote more responsible energy usage.
- A ChillOUT Hub, equipped with water fountain and smart bins could be installed to further improve youth-friendliness of the site by providing a new digitally connected hangout spot with free Wi-Fi and USB charging. Parents and guardians can utilise the facilities offered by the ChillOUT Hub while children spend time in the playground. The Hub could also include smart sensors.
- Free Wi-Fi, as part or independently of a ChillOUT Hub could increase digital connectivity at the site, and encourage alternative uses, including remote working.

A description of these smart projects is provided in Section 4.3.

Alignment with principles and delivery timeframe

Potential smart projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short-term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. These projects support one or more of the smart principles.

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Adventure Playground and Pump Track					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature)	✓	✓	✓		
Smart Lighting (including motion-sensing technology and solar-power)	✓	✓	✓	✓	
ChillOUT Hub	✓	✓	✓	✓	
Free Wi-Fi (as part of a ChillOUT Hub or independently)	✓	✓		✓	
Exeloo Public Toilet	✓	✓		✓	*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*

4.3 Potential Smart Projects by Type

There are multiple approaches to becoming a Smart Region. A place-based approach was presented in the above section, while this section focusses on a type-based approach, which involves implementing a particular type of smart technology. Neither is right or wrong, but they have different considerations and impacts.

Why a Project-type-based Approach?

A project-type-based approach focuses on the implementation of a specific smart technology. Implementation may occur across multiple locations or the Lithgow LGA. A project-based approach offers the opportunity to build expertise in a specific project type such as drone use or electric vehicles. This approach is particularly useful in achieving economies of scale through an LGA-wide rollout of a particular type of smart technology. With IoT technology, data collection from LGA-wide smart projects can be facilitated to improve planning decisions. A project-based approach can also assist with raising awareness within the community on the use and benefits of a particular smart system to encourage community buy-in of smart technology.

Potential Smart Projects

Potential smart projects are detailed in the tables below. For each project type a description of the technology, its potential application(s) within the LGA and key benefits are provided.

[Note: projects are listed in alphabetical order]

ChillOUT Hubs	Self-cleaning Toilets
Computer or Mobile Applications (Apps)	Sensors for Counting People and Things
Digital Information Boards	Sensors for Environmental Monitoring
Digital Placemaking	Sensors for Micro-Infrastructure Asset Management
Drones	Smart (Automated) Irrigation Controllers
Electric Vehicle (EV) Charging Station	Smart Lighting
Free Wi-Fi	Smart Parking
Quick Response (QR) Codes	Smart Poles

Project	**ChillOUT Hubs**
About	ChillOUT Hubs are multifunctional, open-air community spaces where residents and visitors can meet, work and play. They are modular systems enabled with a variety of smart technologies that can be customised to meet local needs. Each Hub integrates a powered shade structure and different types of smart street furniture. The Hubs can be enabled with environmental sensors to capture data on the microclimate around the Hub. User numbers and utility usage can also be collected. These sensors and their data can be linked to a web-based dashboard application, enabling a digital twin of the ChillOUT Hub to be monitored to understand how and when each asset is being used. ChillOUT Hub features can include: • Smart Tree shade structures, which include mains power outlets, • Seats and tables, • USB charging points, • IoT-enabled sensors, • Public Wi-Fi,

Project	ChillOUT Hubs, continued

About

- Solar power,
- Smart drinking fountains, smart bins, lighting, misters for cooling,
- Public art
- Greenery for shade.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Cook Street Plaza, Queen Elizabeth Park, Mick Moore Memorial Park, and the Adventure Playground and Pump Track, have been identified as potential locations for a ChillOUT Hub, as part of smart place-based projects.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Increase digital connectivity with Wi-Fi and device charging points.
- Reduce the digital divide by facilitating access to Wi-Fi and digital services.
- Increase opportunities for social interaction.
- Monitor smart bins with sensors to determine fill levels and temperature.
- Track the use of water fountains and monitor them for leaks and faults.
- Record local weather conditions via climate sensors.
- Monitor power usage to remotely capture consumption and faults.
- Deliver IoT-enabled sensor data to staff and council via a dashboard to provide an evidence base for future design and planning decisions.
- Share data with other councils, researchers, and technology entrepreneurs.

Project	Computer or Mobile Applications (Apps)

About

An Application (App) is a software program that allows you to perform specific tasks. Apps can be downloaded onto computers tablets or smartphones. Some Apps provide information (e.g., weather apps, disaster dashboards), while others enable a service (e.g., online banking, paying for parking). Others allow governments to engage the community on proposed policies or projects, announcing events, or reporting local issues.

Examples of Apps used by local governments include:

- Service request apps to report local issues,
- Emergency updates (e.g., local Disaster Dashboard apps),
- Parking apps to enable easy payment or find available spaces,

Project	Computer or Mobile Applications (Apps), continued

About

- Transit and traffic flows (e.g., transit use, the availability of buses or trains), and
- Historic or cultural tours (e.g., self-guided audio or augmented reality tours using mobile apps or QR codes on paper maps).

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Portland's cultural and historical sites have been showcased via an immersive audio-based and GPS-enabled tour via the Soundtrails app.

An app incorporating Virtual Reality (VR) and Augmented Reality (AR) technology to view how the Blast Furnace and surrounding buildings once looked has been identified as part of the smart place-based activation of Blast Furnace Park (see Section 4.2).

QUICK WINS

In collaboration with the Portland Business Association, Council could expand the Soundtrails app to include other natural, cultural and heritage locations across the LGA.

Further, apps could be developed for Council services, visitor information, reporting of local issues, in collaboration with stakeholders, including local businesses, to promote the Lithgow LGA and for emergency preparedness, management and response.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Distribute a range of real-time information, especially during emergencies or natural disasters.
- Enable residents and visitors to learn about and participate in local initiatives.
- Provide a one-stop-shop for tourists to access essential visitor information, as well as local marketing and promotions.
- Help people navigate to specific locations and explore what different neighbourhoods or towns have to offer.
- Showcase historical landmarks, educate the community about their significance, and promote a sense of place and place attachment.
- Galvanise and educate the community around environmental or conservation matters.
- Provide community residents with an opportunity to get involved with local storytelling past and present.

Project	Digital Information Boards

About

Digital or electronic information boards are a dynamic means of sharing information. The boards use display technologies like LED screens that can be pre-programmed to display websites or feed important, real-time information to the community. This could include time and temperature data, transit or parking information, safety conditions at the beaches or in the mountains, upcoming community events, and emergency information related to fires, floods, or road conditions. Digital information boards can be equipped with interactive features, such as touch screens, that allow users to select relevant information depending on their location. Digital signage boards also include scoreboards and advertising screens.

Digital Information Boards can include:

- Community and visitor noticeboards,
- Emergency information during natural disasters or severe weather events,
- Holiday messaging or event promotion,
- Scoreboards in arenas or on playing fields, and
- Transit, parking, and safe driving messages.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Cook Street Plaza and Mick Moore Memorial Park have been identified as potential locations for digital information boards (with or without QR codes), as part of smart place-based projects. In addition, a digital information board could be installed at the gateway to Lithgow, e.g., the Visitor Information Centre, and surrounding town centres. The boards could contain key visitor information, promote LGA events and encourage visitors to take a break and visit Lithgow.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		

Key Benefits

- Distribute a range of real-time information, especially during emergencies or natural disasters.
- Enable residents and visitors to learn about and participate in local initiatives.
- Provide a one-stop shop for tourists to access essential visitor information, as well as local marketing and promotions.
- Help people navigate to specific locations and explore what different neighbourhoods or towns have to offer.

Project	Digital Placemaking

About

Placemaking is an approach to the planning, design, and management of public spaces that take advantage of a community's assets, aspirations, and potential to strengthen community connections. Digital placemaking involves the use of technology to enhance traditional placemaking practices. Digital placemaking can include functional or artistic installations that invite people to interact with the environment in educational and playful ways. This can include light projections, sound installations, and interactive digital artwork, as well as virtual reality (VR) or augmented reality (AR) technology.

Digital storytelling using street furniture is another way that communities are building a sense of place and making neighbourhood connections.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide
Existing				*Existing*		

Cook Street Plaza, Lake Wallace, and Mick Moore Memorial Park have been identified as potential locations for digital placemaking projects as part of smart place-based activation. More broadly, digital placemaking initiatives can support the expansion of key events and festivals, including LithGlow, Halloween and Christmas Lights across the LGA.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		

Key Benefits

- Build pride of place.
- Attract increased tourism to the region.
- Showcase local art, nature, and history by using an interactive format that directly engages people.
- Diversify the time and frequency of use of public open spaces and cultural, historical, and natural attractions.
- Encourage the active and passive use of public open spaces to improve community health and well-being.
- Increase social inclusion and connectedness.
- Build social capacity among participants to encourage place-based collective action for community improvement.
- Persuade people through play to perform actions and activities that have an impact on health, traffic, energy consumption, or social behaviour.
- Monitor placemaking events to demonstrate to the council, local businesses, and the community the benefits of investing in them.

Project	Drones

About

Drones, also known as unmanned aerial vehicles (UAVs), are operated remotely by drone pilots, who must be licensed by the Civil Aviation Safety Authority (CASA). Drones can be equipped with a variety of sensors. These include cameras, microphones, ultrasonic technology, or light detection and ranging (LiDAR) sensors to measure distances and detect objects, thermal sensors to measure heat; and ground penetrating radar (GPR) sensors to identify buried structures.

Drones can be used for civil, military, and commercial applications. In a regional setting, drones are increasingly being used for:

- Photography and videography,
- Land use mapping (often in collaboration with artificial intelligence and GIS),
- Project management e.g., capturing stages of work, looking at land slips
- Asset management,
- Farming, and land care
- Coastline, mountain, mining, or pipeline surveillance, and
- Disaster management e.g., to help with firefighting.

Their compact size and ability to tolerate harsh environments make them ideal for use in inaccessible or less accessible locations.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

The potential use of drones at Blast Furnace Park to document the LithGlow Festival has been identified as part of the sites potential smart place-based projects. However, the use of drones can be applied more broadly across the LGA, and to many of Councils functions and services, including asset management, project management, and land use mapping.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Manage council assets and infrastructure in remote or harsh environments.
- Manage and report progress on projects.
- Analyse environmental conditions.
- Enhance Council communication materials by using drone images or videos for websites, corporate documents, and social media campaigns.
- Use drone imagery and data to:
  - » Map land uses, infrastructure, and building features,
  - » Analyse data manually or with the assistance of artificial intelligence (AI),
  - » Map damage caused by natural disasters such as floods or bushfires,
  - » Map vegetation to identify crops and weeds, and conduct aerial spraying,

Project	Drones, continued
Key Benefits	» Photograph upstream and downstream conditions in river networks, » Count pedestrian traffic or vehicle movements, and » Provide new perspectives on events or festivals by capturing images from unique aerial vantage points.

Project	Electric Vehicle (EV) Charging Stations
About	Electric vehicles (EVs) are growing in popularity for personal or business use and are increasingly being installed in public places. EVs can be used as municipal fleet vehicles, which can also use public charging stations. Municipal EV charging stations can be strategically located to draw people to areas or attractions within a local government area. There are three types of EV chargers: 1. EVSE Chargers – Electric Vehicle Supply Equipment (EVSE) ports can provide an emergency electricity supply when there are no public chargers nearby. Portable units about the size of a small suitcase are appropriate for smaller batteries such as those in petrol-hybrid EVs or when a longer charging time is acceptable. 2. Wall Chargers – Wall chargers connect EVs to the electrical network through a special socket and plug on a dedicated circuit. This common type of charger works quickly but requires special housing to handle the heat it generates. 3. DC Fast Chargers – Fast Chargers using direct current require significant panel and service upgrades and are expensive to install. Fast chargers are recommended for petrol station operators, motorways, street-side charging, fleet vehicles, and commercial users.
Potential Locations	Cook Street Plaza; Lake Wallace; Queen Elizabeth Park; Mick Moore Memorial Park; Blast Furnace Park; Adventure Playground and Pump Track; LGA-wide *Existing* Council has prepared its EV Charging Strategy, *Lithgow's Electric Car Parks 2022*. The strategy identifies where destination charge points should be located, the type of charge points to install, how many to install, and when their installation should take place.
Alignment with Smart Places Principles	Capacity Building ✓ · Social Experience ✓ · Environmental Monitoring ✓ · Asset Management
Key Benefits	• EV charging stations at strategic locations can encourage users to explore adjacent businesses, parks, or other attractions. • A network of EV chargers across the region can encourage the use of EVs and reduce greenhouse gas emissions. • Contribute to a regional or state-wide network of EV charging routes. • Add one or more EVs to the municipal fleet and possibly contribute to a regional EV car-sharing system during off hours.

Project	Free Wi-Fi
About	Free Wi-Fi in public places enables people with mobile phones, tablets, or laptops to connect to the Internet at no cost. Wi-Fi can be provided by setting up 4G or 5G hotspots at strategic locations within public open spaces such as parks, plazas, playing fields, historic or cultural sites, rest stops, or gathering places. Hotspots provide Internet access through a Wireless Local Area Network (WLAN). They can be created by installing routers supplied by Internet service providers or by integrating router functionality within smart poles, other micro-infrastructure, and street furniture, including ChillOUT Hubs.
Potential Locations	Cook Street Plaza | Lake Wallace | Queen Elizabeth Park | Mick Moore Memorial Park | Blast Furnace Park | Adventure Playground and Pump Track | LGA-wide *Existing* The provision of free Wi-Fi can be explored within the Lithgow town centre e.g., Main Street, and other strategic locations across the LGA, separately to, or in combination with smart poles. Free Wi-Fi can also be combined with the ChillOUT Hub installation in Cook St Plaza, Queen Elizabeth Park, Mick Moore Memorial Park, and the Adventure Playground and Pump Track.
Alignment with Smart Places Principles	**Capacity Building** ✓ | **Social Experience** ✓ | **Environmental Monitoring** | **Asset Management**
Key Benefits	• Reduce the digital divide by providing free public Internet access. • Incentivise telecommunications providers to provide public Wi-Fi hotspots by allowing municipal assets such as light poles to hold necessary routers. • High-speed, reliable Internet connectivity in public places can: » Diversify the use of public open spaces, » Enhance the user experience of public open spaces, » Improve access to online services and information for marginalised and vulnerable individuals or those living further from town centres, » Support economic growth by attracting digital businesses, start-ups, and entrepreneurs to the area, » Facilitate employment for gig workers who can wait for calls in public areas near where they are likely to be needed, and » Promote the digital services offered within the region by directng Wi-Fi users to council webpages or services when they first connect.

Project	Quick Response (QR) Codes

About

A Quick Response (QR) code is a barcode that stores information as a series of pixels in a square grid. QR codes can be easily scanned by digital devices using a built-in camera or a QR code reader app. By scanning QR codes placed on signage, notice boards, windows, maps, or products, the user is directed to an app or website where they can receive more information about the product, service, upcoming event, or location.

QR codes can be used to track information about products in a supply chain and are often used in marketing and advertising campaigns. They also provide a quick and easy way to engage the community. For example, QR codes in parks (e.g., digital tree tags) can generate interest in preserving the natural environment. Local governments can add QR codes to advertising materials that are then placed in visible locations (e.g., in public facilities; places of worship, and grocery stores). QR codes can also direct people to surveys about municipal programs or policies.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide
Existing		*Existing*	*Existing*	*Existing*		*Existing*

QR codes are a feature of interpretative signage panels across the LGA. QR codes can be incorporated within digital information boards or other smart micro-infrastructure, including a ChillOUT Hub.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		

Key Benefits

- Present digital information on local government services.
- Promote upcoming events.
- Provide detailed information about local products or services.
- Stimulate interest in protecting the natural environment.
- Generate interest among locals, new residents, and visitors in the history and culture of local places, structures, or landmarks.

Project	Self-cleaning Toilets

About

Self-cleaning toilets are prefabricated modular units that come in a variety of configurations to suit the needs of different kinds of public spaces. They can be stand-alone units or integrated into an existing structure. Options range from low-tech manual designs to fully automated systems with pre-programmed door-locking systems and a cubicle auto-wash function. The exterior cladding can be customised with artwork or imagery to give the units a contemporary appearance or highlight the natural or heritage assets of the city or region.

Project	Self-cleaning Toilets, continued

About

Self-cleaning toilets are accessible and have touch-free, sensor-operated toilets and sinks. As they are self-cleaning, they are safe and hygienic, and reduce the human resourcecosts associated with routine maintenance. They are also vandalism resistant. Automated units can be programmed to open and close at set times each day. This eliminates the need for separate security visits to permit or prevent entry to the facilities. Automated units use a web-based monitoring system, where the sensor data collected can track usage and remotely assess the condition of the cubicle.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide
Existing				*Existing*	*Existing*	*Existing*

An Exeloo (a type of self-cleaning toilet) has been installed in Cook Street Plaza, Blast Furnace Park and the Adventure Playground and Pump Track. Given the success of these pilot locations, Council can explore installation of Exeloos at other key destinations across the LGA or when older toilet blocks need to be replaced.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		✓

Key Benefits

- Provide an essential public amenity.
- Save on security and maintenance costs through automation.
- Track asset usage and facility conditions with sensors.
- Customise the appearance to suit the location and profile local artists, regional history, or natural assets.

Project	Sensors for Counting People and Things

About

Sensors are low-cost, standalone, micro-electronic devices attached to a radio transceiver. Sensors connect to the Internet and transmit data, which is stored and processed in the Cloud. The analysed data is presented on a dashboard in an easy-to-understand format. Sensors can be used to count a variety of things including pedestrian footfalls, traffic congestion, vehicle flow, available parking spots, and IP addresses.

For example, the Broken Hill City Council installed sensors that monitor parking bays. The data is displayed on a public-facing dashboard, which allows drivers to determine how many available parking spaces are in the car park. Cameras using artificial intelligence can also quickly count people in crowded public places (e.g., airports, beaches) or during festivals or other public events. The use of this technology increased significantly during Covid-19, when crowd control became part of an overall public health response.

Project	Sensors for Counting People and Things

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Lake Wallace, Blast Furnace Park, Mick Moore Memorial Park and the Adventure Playground and Pump Track have been identified as potential locations for sensors, as part of smart placed-based projects (see Section 4.2). More broadly, Council can install sensors to collect data on the use of other public open spaces across the LGA. This data can assist with infrastructure maintenance, and evidence-based planning, and decision-making.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		✓

Key Benefits

- Use sensor data for immediate, time-series, or trend analysis to support evidence-based planning, decision-making, and emergency management by asset managers and council.
- Count pedestrian footfalls at various times of the day and week.
- Analyse traffic patterns by counting vehicles.
- Display the location of empty parking spots to help drivers quickly find parking to access local businesses and amenities.
- Use people counters to monitor for overcrowding in public gathering places and during festivals or other large public events.

Project	Sensors for Environmental Monitoring

About

Sensors can be used for environmental monitoring by tracking features like temperature, humidity, ground moisture levels, soil pH levels, airflow, air pressure, ground vibration, and water levels. For example, moisture sensors in agricultural settings or public parks can activate irrigation systems when the soil becomes excessively dry. Sensors can be embedded in infrastructure, added to the natural environment, integrated with street furniture, or situated independently. For example, the use of air quality sensors to identify carbon dioxide and nitrogen dioxide levels can help to identify health risks.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

The provision of sensors for environmental monitoring can be explored for public spaces, including parks, and playing fields across the LGA.

Project	Sensors for Environmental Monitoring, continued

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	

Key Benefits

- Use sensor data for immediate, time-series, or trend analysis to support evidence-based planning, decision-making, and emergency management by asset managers and council.
- Monitor weather indicators such as temperature, precipitation, wind, or beach conditions at specific sites across the region.
- Monitor air quality to determine accurate local health risks.
- Monitor local water quality.
- Evaluate soil moisture levels in public open spaces to determine appropriate irrigation needs.
- Automate site-specific watering when used with Smart (Automated) Irrigation Controllers.

Project	Sensors for Micro-Infrastructure Asset Management

About

Micro-infrastructure generally refers to smaller assets located within the public domain. Examples include street furniture such as multi-use poles, seating, lighting, picnic tables, barbeques, rubbish bins, lighting, and water fountains.

Networked sensors can be added to existing micro-infrastructure or built into customised smart micro-infrastructure. Sensor data can be analysed to show how and when each asset is being used, assisting with routine cleaning and maintenance, and the documentation of overall performance. Data can be displayed as a digital twin of the asset on a local government dashboard.

Smart bins, for example, use sensors to detect fill levels to enable efficient scheduling for bin emptying rather than using fixed routes or schedules. They can also record the internal bin temperature to monitor for heat and fire hazards. Similarly, electric barbeques can record the date and time of power consumption to determine usage levels and patterns.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Smart micro infrastructure, with smart sensors can be installed in strategic locations across the LGA, including main streets, sports fields, and playgrounds.

QUICK WINS

Sensors can be installed to existing infrastructure across the LGA e.g., park benches, bins. Data collected can assist with infrastructure maintenance, and evidence-based planning, investment, and decision-making.

Project	Sensors for Micro-Infrastructure Asset Management, continued

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓		✓

Key Benefits

- Track the use of micro-infrastructure to understand when and how it is used, plan ways to encourage greater use, and determine when to add or remove assets.
- Optimise resource management with self-diagnostic features that indicate when an asset needs repairs or maintenance. For example, schedule waste removal only when bins are nearly full to save money on unnecessary collection and improve aesthetics by not having bins spill over if they become too full.
- Improve public safety.
- Enable automation of some functions. (e.g., misters are only activated by high ambient air temperature readings).

Project	Smart (Automated) Irrigation Controllers

About

About half of the water used for landscape irrigation is wasted. This is because traditional irrigation controllers operate on a pre-set schedule using programmed timers to start and stop watering. In contrast, smart irrigation controllers automatically adjust the use of sprinklers and subsurface irrigation systems to reflect actual weather or soil conditions.

Ground sensors can measure the amount of moisture in the soil and determine how much watering is required based on soil type, vegetation, topography, and other conditions. Alternatively, weather sensors can measure air temperature, wind, solar radiation, humidity, and rainfall to determine how much watering is needed.

Based on the information transmitted by the sensors, smart irrigation controllers can activate sprinklers and subsurface irrigation systems. Controllers can use solar power and multiple controllers can be digitally linked to a central control system. Controllers can manage multiple zones with different vegetation types and water needs.

Government staff can use mobile apps or internet-based software to turn watering systems on and off. Studies have shown significant cost savings when either ground or weather sensor systems are used to feed data into smart irrigation controllers.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide
						Existing

The provision of smart irrigation controllers can be explored for public spaces, including parks, and playing fields across the LGA.

Project	Smart (Automated) Irrigation Controllers, continued

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Reduce water waste.
- Save on irrigation costs.
- Allow remote-controlled watering based on actual site conditions rather than watering at pre-set fixed intervals.
- Adopt more sustainable municipal practices.

Project	Smart Lighting

About

Smart lighting can be used in public open spaces to turn on lights after dark or when activity is taking place. Smart lighting is suitable for parks, pathways, playing fields, parking lots, and near public buildings or other infrastructure, where intermittent use or use at certain periods during the day or week is anticipated. Smart lighting can include motion sensors, solar power, and remote operation capabilities (e.g., turning lights on via text message controls or automated programming).

Motion-activated sensors installed on light poles can detect movement using microwave or ultrasonic energy, which activates a response. A visual response to a motion sensor can turn on a light, whereas an auditory response can sound an alarm and a mechanical response can engage a door opener. The sensitivity of new smart motion sensor technology can be adjusted to improve accuracy, resulting in better performance that meets local needs.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide

Queen Elizabeth Park and the Adventure Playground and Pump Track have been identified as potential locations for smart motion sensor lighting, as part of smart place-based projects. Further, smart lighting can be installed within other public spaces across the LGA.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Reduce energy consumption.
- Decrease light pollution.
- Improve public safety.
- Manage lights remotely or through fully automated controls, streamlining maintenance and resource management.
- Adopt more sustainable municipal practices.

Project	Smart Parking
About	Smart parking uses technology to achieve faster, easier, and denser parking while minimising the time and fuel used to find a place to park. Ground sensors using radar technology can be installed into the concrete under each parking space. When a vehicle enters the stall, the sensor will identify the presence of an object and register that parking space as occupied. Sensors transmit this information, which is displayed in real-time on a public-facing dashboard. The display shows the number of available stalls and where vacant stalls exist. As drivers travel through the car park to find a vacant space, overhead or in-ground lights remain green when a stall is empty, and sensors turn them red when a stall is occupied. Other systems use Artificial Intelligence (AI) to recognise vehicles. By registering your name, vehicle information, and credit card to a specific parking app, the AI system recognises the car and automatically signs it in when it is parked, signs it out when it leaves, and charges the credit card for the parking time used.
Potential Locations	Cook Street Plaza / Lake Wallace / Queen Elizabeth Park / Mick Moore Memorial Park / Blast Furnace Park / Adventure Playground and Pump Track / LGA-wide: ✓ The provision of smart parking can be explored at high-use locations across the LGA e.g., the Main Street in Lithgow.
Alignment with Smart Places Principles	Capacity Building ✓ / Social Experience ✓ / Environmental Monitoring ✓ / Asset Management ✓
Key Benefits	• Optimise parking. • Reduce traffic congestion. • Decrease pollution emitted when searching for a parking spot. • Enhance the user experience for drivers. • Integrate payments with a point-of-sale system at the car park. • Promote the patronage of other area businesses. • Collect real-time data to display to drivers and to use for trend analysis.

Project	Smart Poles
About	Smart poles are typically traditional light standards with the ability to provide other mechanisms inside or attached to the poles. They can be regular street lighting or strategically placed in public open space. Because of their power supply, smart poles can integrate other devices and technology, including motion-activated sensors that detect movement and turn lights on after dark when visitors are present. Onboard storage capacity can collect data from IoT-enabled devices that can be analysed to understand maintenance needs.

Project	Smart Poles, continued

About

The addition of power outlets, USB chargers, and free Wi-Fi signals that provide high-speed Internet access can improve digital connectivity. Sensors can be added to record power use, mobile device charging, and weather conditions. Cameras can be added to provide closed-circuit television (CCTV), while artificial intelligence (AI) can be used for facial recognition, vehicle recognition, or reading license plates.

Smart poles can also incorporate components that mitigate heat effects such as shade structures that may be automated to block direct sun, or misting stations that are activated at certain temperatures. Sensors can be added to count the presence of smartphones as a proxy for people, and analysing Media Access Control (MAC) addresses can estimate their length of stay. Data collected can be used by council for operational and strategic planning and decision-making.

Potential Locations

Cook Street Plaza	Lake Wallace	Queen Elizabeth Park	Mick Moore Memorial Park	Blast Furnace Park	Adventure Playground and Pump Track	LGA-wide
	○					○

The provision of smart poles within public spaces can be explored as part of smart place-based activation. However, more broadly, the provision of smart poles, as carriers of other smart technologies e.g., Free Wi-Fi and Smart Lighting, can be explored within the town centre e.g., Main Street, Lithgow, and other strategic locations across the LGA.

Alignment with Smart Places Principles

Capacity Building	Social Experience	Environmental Monitoring	Asset Management
✓	✓	✓	✓

Key Benefits

- Reduce electricity consumption from lighting public open spaces.
- Save on operating costs.
- Reduce the digital divide with free Wi-Fi and high-speed Internet access.
- Provide charging stations, USB ports, and power outlets.
- Increase public safety and deter crime with lighting and CCTV.
- Count traffic, people, license plates, and so on.
- Collect data from nearby or integrated sensors, IoT devices, and CCTV to inform government planning and decision-making.

4.4 Smart Projects Summary

The following table provides a summary of all the existing and potential smart projects (by location) within the region. A description of these smart projects is provided in Section 4.2, and Section 4.3.

Potential projects have been divided into short- (green), medium- (yellow) or long- (orange) term projects to inform planning and delivery. Short term projects have a timeframe of <1-year, medium-term projects 1-3 years and long-term projects >3-years. Where a project is existing, it has been identified accordingly. The projects support one or more of the smart guiding principles.

Table - Potential smart projects summary

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Cook Street Plaza, Lithgow					
ChillOUT Hub	✓	✓	✓	✓	
Digital Information Board	✓	✓			
Digital Placemaking	✓	✓			*Existing +*
Exeloo Public Toilet	✓	✓		✓	*Existing*
QR Code with linked webpage	✓	✓			*Existing*
Light Projectors	✓	✓			*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*
Smart Lockers (by Australia Post)		✓			*Existing*
Lake Wallace, Wallerawang					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, barbeques, bins, RV dump point)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
Digital Placemaking	✓	✓			
Smart Poles (with or without Smart Lighting, Free Wi-Fi)	✓	✓			

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Lake Wallace, Wallerawang, continued)					
Smart Water Meter System	✓		✓	✓	*Existing*
Queen Elizabeth Park, Lithgow					
Smart Lighting (including motion-sensing technology and solar-power)	✓	✓	✓	✓	
ChillOUT Hub	✓	✓	✓	✓	
Smart Water Meter System	✓		✓	✓	*Existing*
QR code with linked webpage		✓			*Existing*
Mick Moore Memorial Park, Portland					
Digital Placemaking	✓	✓			
ChillOUT Hub	✓	✓	✓	✓	
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
Exeloo Public Toilet	✓	✓		✓	
Digital Information Board	✓	✓			
App - Soundtrails	✓	✓			*Existing*
QR code with linked webpage	✓	✓			*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*

Legend

Short-term project | Medium-term project | Long-term project

Site and Project Type	Capacity Building	Social Experience	Environment Monitoring	Asset Management	Timeframe
Blast Furnace Park, Lithgow					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature, water quality)	✓	✓	✓		
App - VR or AR for Digital Placemaking	✓	✓			
Drones (e.g., aerial photography and videography)	✓	✓		✓	
Interpretive signage with QR codes linked to webpage	✓	✓			*Existing*
Exeloo Public Toilet	✓	✓		✓	*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*
Digital Placemaking	✓	✓			*Existing*
Adventure Playground and Pump Track					
Sensors for Counting People and Things	✓	✓		✓	
Sensors for Micro-infrastructure Asset Management (e.g., toilets, bins)	✓	✓		✓	
Sensors for Environmental Monitoring (e.g., temperature)	✓	✓	✓		
Smart Lighting (including motion-sensing technology and solar-power)	✓	✓	✓	✓	
ChillOUT Hub	✓	✓	✓	✓	
Free Wi-Fi (as part of a ChillOUT Hub or independently)	✓	✓		✓	
Exeloo Public Toilet	✓	✓		✓	*Existing*
Smart Water Meter System	✓		✓	✓	*Existing*

Queen Elizabeth Park, Lithgow | Photograph by Penny Vozniak

5 Glossary

Artificial Intelligence refers to actions and movements that normally require human intelligence, which are now done by machines such as computers and robots.

Physical Asset refers to a physical piece of infrastructure, such as a building, a piece of land, equipment, machinery or other architectural structures (e.g., sheds, toilet blocks).

Augmented Reality (AR) refers to an interactive experience in which a real-world environment is enhanced with computer-generated visual elements or sounds. Some AR applications require the use of a headset, while others can be accessed on a mobile device.

Automated technology refers to machines and equipment that run using minimal human intervention.

Cloud computing refers to the use of remote services, including servers, software programs and databases hosted on the Internet to store, manage, and transfer information to and from an electronic device.

Dashboards are a visual display of data or information, which can take many forms. They are meant to show data in a way that makes it easy to see the status of various assets, projects, or situations "at a glance" (Kitchin, Lauriault and McArdle 2015).

Data is a broad term that generally refers to facts and figures that can be represented as numbers, text, graphics, sound, or video, as well as how these are interpreted. Data can also take different forms, can pertain to a range of topics and can be broken down by type or purpose, (NSW Government 2021).

Digital connectivity describes the ability to connect an electronic device such as a mobile phone or computer to a broadband or mobile Internet network.

Digital divides refer to the gap between different individuals, communities, or areas based on their ability to access and use digital technology, such as a mobile phone (smartphone) or computer, broadband or mobile Internet, and online services. Discussions about urban versus rural divides are common.

Digital twins are digital models of a physical object, process, or system (Batty 2018).

Geographic Information Systems (GIS) use "digital software to capture, store, manipulate, analyse, manage, and present geographical data" (Loukaitou-Sideris 2018: 208). Each layer of information is overlaid on top of a two- or three-dimensional digital map.

Global Positioning System (GPS) is a satellite-based radio navigation system that uses positioning, navigation, and timing (PNT) services between satellites and electronic devices (equipped with GPS technology) to determine an exact location.

Information and Communications Technology (ICT) is a "diverse set of technological tools and resources used to transmit, store, create, share, or exchange information" such as computers, and the internet (UNESCO Institute for Statistics 2009: 120).

Internet of Things (IoT) refers to the "physical devices that are connected to the internet, collecting and sharing data. It is the global network of infrastructure, vehicles, wearable devices, home appliances, medical technologies, and other objects that are embedded with electronics, software, sensors, and actuators, enabling these 'things' to share and exchange data to perform their functions more efficiently and effectively" (NSW Government 2019:1).

Internet Protocol (IP) addresses have a unique numerical number that identifies an electronic device on a local network or Internet network, which allows information to be sent between devices.

Remote access is the ability to access a digital device or network from any location.

Smart places are local areas where 'smart' technologies (e.g., sensors, data, and dashboards) are used to improve local economies, environments, and the delivery of services while providing a better quality of life for residents.

Sensor is defined as "a low-cost, standalone, micro-electronic component with limited computational ability, built-in sensing components, and a radio transceiver. When a large number of sensors are deployed over a site for monitoring purposes, they form what is called a wireless sensor network (Difallah, Cudré-Mauroux and McKenna 2013: 40).

Wi-Fi is a wireless technology that allows electronic devices such as computers and mobile phones to connect to the Internet. Wi-Fi uses radio waves to send information between the device and the internet using a router or modem.

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