RIDBC Planning Proposal

Sustainability Strategy

Table of Contents

Schedule of Figures

1 Introduction

To be truly sustainable, a development must consider social, environmental, and economic performance - to deliver a sustainable proposition with life, purpose, and longevity. Sustainability must be a key driver for every new development delivered in Greater Sydney, especially when that development is on a scale of the North Rocks Village site. This site, along with the growth areas in Western Sydney provide the opportunity to establish new benchmarks in sustainable development.

The planning proposal for the Royal Institute for the Deaf & Blind ("RIDBC") site integrates sustainability at its core and seeks to be an exemplar for future sustainable development in Greater Sydney and beyond.

The location of the site in the north west of Sydney traditionally could be described as a car centric, low density residential area, where services, facilities and amenities are located some distance from most residents. The planning proposal for the subject site provides a transition to a more sustainable urban model, where there is increased density close to services, facilities, and amenities. The public domain can provide the quality open spaces and connections that lead to residents having a heathier, more active lifestyle. The advances in building design, materials and construction can deliver improved outcomes for environmental performance and energy consumption, in addition to creating a healthier and happier place for people to live.

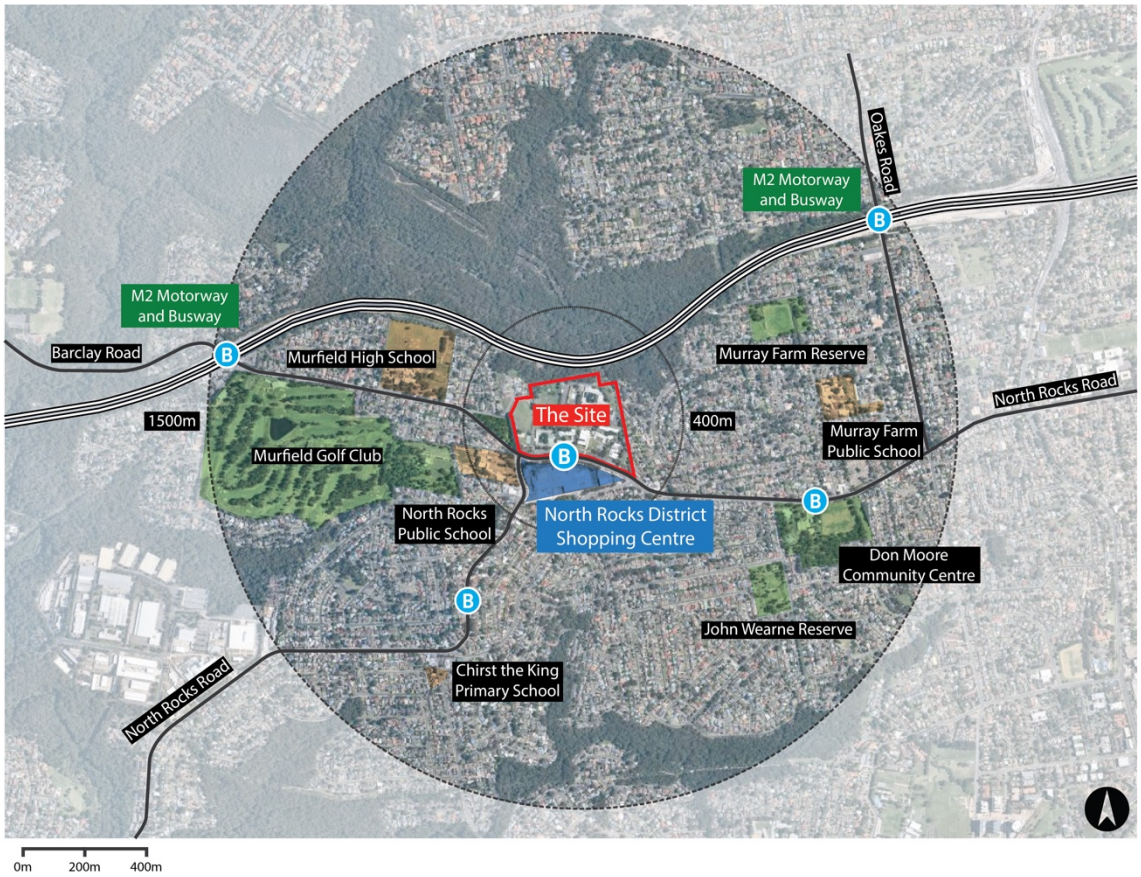

Figure 1: Site context relative to Greater Sydney CBDs

The planning proposal for the RIDBC site establishes sustainability principles at both the precinct and the building level. Considering sustainability from the precinct level provides a far greater opportunity than a typical building by building approach, allowing solutions that address sustainable infrastructure, urban environment,

active transport as well as social and wellness outcomes. This broader context magnifies the benefits of simply delivering sustainable buildings.

The North Rocks planning proposal aims to demonstrate a commitment to:

- deliver social infrastructure and enable a social dividend to facilitate ongoing curation;
- create active connections that enhance wellbeing and drive a genuine transport modal shift;
- enhance ecological connections within a green open space network
- provide energy solutions ready for a zero-carbon world; and
- have a positive water impact.

Figure 2: North Rocks Village proposed development

These commitments are made to ensure real, beneficial outcomes, and deliver a sustainability approach that achieves real-world delivery and performance.

By integrating these sustainability strategies within this early stage of planning for the project, there is the ability to commit to the objectives and manage their deliverability within a comprehensive master plan, and will deliver the City of Parramatta and the Greater Sydney area and beyond an exemplar that embraces the objectives both multiple levels of government, and those representing the best practice within the development industry.

These commitments are made to ensure real, beneficial outcomes and a sustainability approach that achieves real-world delivery and performance.

By integrating these sustainability strategies at the earliest planning of the precinct the project is able to commit to the objectives and ensure deliverability without disruption and will deliver the City of Parramatta and the Greater Sydney area and beyond an exemplar that is representative of the objective multiple levels of government planning and industry has been working towards.

1.1 North Rocks Urban Renewal Opportunity

The planning proposal seeks to create North Rocks Village, a Housing Diversity Precinct (HDP) as expressed in Council's Local Strategic Planning Statement (LSPS). It will deliver a genuine mix of housing opportunities within a green village setting that complements existing neighbourhood character, with the intention to revitalise the North Rocks Local Centre. The project will provide:

- diverse housing options including freestanding houses, townhouses, terraces, large private garden and terrace style apartments, low-rise apartments as well as seniors living and affordable housing.
- The mix of housing typologies allowing the opportunity for a truly diverse community, providing for families, younger residents, elderly residents - all within a green environment that encourages walking, sporting activities, social interaction, and wellbeing.
- Multiple community spaces to provide for the development of cultural, community and arts programs, including co-working areas, multi-purpose facilities and Hear the Children (RIDBC) Early Intervention service.
- Publicly accessible open spaces including a full-sized oval able to accommodate multi-purpose sporting activity, In addition to operating as a village green for the community.
- The creation of a village square opposite the oval and community hub with a direct pedestrian connection to North Rocks Shopping Centre.
- Expansion of the adjoining Council reserve to improve functionality and diversity of the open space in the area.
- Creation of community gardens, walking trails, green connections and public access throughout the site.
- Improved transport connections to major bus interchange at the M2/Barclay Road Interchange and other transport initiatives.
- Cycleway upgrades including along on North Rocks Road providing the missing connection to the existing cycle network.

1.2 Smart City Infrastructure

The proponent, EG, understands the importance of good quality data to help drive good decision making. However, the data available for many aspects for our urban environment is limited In both quality and quantity. We believe that the next generation of efficiency and amenity will be unlocked using sensors backed by intelligent management tools to create a truly smart city.

As such It is proposed to deploy sensors that will monitor a range of inputs, continuously, providing data to facility operators, residents and visitors, and importantly the City of Parramatta. We propose to monitor:

- Air temperature within built up zones and green spaces
- Humidity
- Wind
- Air quality including monitoring for particles smaller than 10 microns (PM10)
- Water demand, harvesting, storage and production
- Energy demand, production, storage and peak loads
- Pedestrian, active transport and vehicle movements
- Waste volumes

Where possible, and relevant, sensors will be bought online prior to any construction or at the earliest possible time to enable effective monitoring of conditions both before and after construction.

It is our intention that logged data will be made available for open analysis.

The notion of a smart city continues to evolve. The data that is derived from the data sensing reigime provides the opportunity to:

- Optimise energy efficiency
- Minimise potable water consumption
- Provide relevant information to inform residents and visitors of opportunities to
- reduce their own environmental footprints
- Inform building managers of ongoing performance, and allow opportunities to
- improve operational performance
- Benchmark and demonstrate environmental benefits of the sustainability initiatives
- Integrate with broader City of Parramatta "Smart City" initiatives

Once the planning proposal is approved, it would be our intention to initiate a workshop with the City of Parramatta to agree initial sensor installation priorities and preferred reporting mechanisms for logged data.
A smart city design brief will be developed and implemented as a mandatory component of each design package.

A smart city implementation review will be conducted on each building prior to seeking planning approval which will include sensor requirements, locations, and interfacing requirements.

2 Social Infrastructure

Whilst the site is located in close proximity to the higher order social infrastructure facilities the feature within the Parramatta CBD, and other surrounding centres, there is understandable benefit in providing local facilities and amenities for the new residents and surrounding community. These spaces and places can provide opportunities for recreation as well as learning and working. The consideration of the social fabric extends beyond just providing a nominal "community room" type facility, but rather looks at the opportunity present across the community, from open spaces through to the planning of different apartment types so that a diversity is promoted amongst the residents.

Whilst many developments provide nominal spaces for community use, the North Rocks Village recognises the concept challenges to implement the necessary curation and ongoing activation of spaces and facilities over the life of a community to achieve the desired legacy outcomes of the social infrastructure. EG have an approach to their developments called Build In Good ("B.I.G.) thinking, which is intended to be implemented at North Rocks. The B.I.G. approach establishes a sustainable focus on facilities and management of spaces and places to ensure the ongoing benefits associated with social activity and enterprises is captured and embraced within the community.

2.1 Strategy

Social infrastructure elements are integrated within the master plan and are incorporated throughout the site. This will include:

- The opportunity for a learning hub (neighbourhood library) and multi-purpose community facility.
- Village Square for use by on-site and North Rocks residents.
- Sports oval for mixed sports.
- Running and cycle paths.
- A community garden.
- Community workshop/shed.
- Local pocket parks and passive open space within a network of green streets.

2.2 Benefits

Having an integrated view on the provision of both facilities, programs and curation of the social infrastructure provides the opportunity for a myriad of benefits to the community, including:

- Improved diversity, sense of community, and health and wellbeing.
- Custodianship of the public space by the community.
- Safer, active, and better utilised spaces.

2.3 Implementation

Key infrastructure elements are already incorporated within the planning proposal. This ensures necessary space is created within the planning.

EG would seek to implement its B.I.G approach to any development, bringing the community management, wellbeing, and curation strategies to North Rocks Village, ensuring the successful delivery of both programs and facilities that will seek to bring the community out, together and create an identifiable shift in the mindset of what a successful community can be. The project will engage on an ongoing basis with local stakeholders (including other community organisations) and Council to refine the proposal and optimise the uses and diversity of the spaces, matching these with identified short and long term needs of the community.

Figure 3: WSUD to enhance biodiversity

3 Active Connections

Planning to promote and prioritise walking, running, cycling and personal electric vehicles improves health, affordability and accessibility. Active connections within and beyond the site to make these transport modes preferred by occupants are integrated within the planning proposal.

Active connections enable improved patterns of movement, supporting improved accessibility and allows opportunities for better healthy living options for residents. The provision of strong active connections both facilitates and builds from the increased densification around centres.

The ability to promote a modal shift away from private vehicle transport provides the opportunity to reduce congestion and noise whilst promoting better air quality. Active connections enable enhanced health and wellbeing through the promotion of a more active community; providing safe recreational options for walking, running and cycling; and engendering more active use of the open space areas.

With private vehicle transport being one of the most significant household costs, the provision of active connections also promotes opportunities for improved affordability. The master plan provides the opportunity for residents to no longer be reliant on a private vehicle for access to key services and facilities.

A preliminary analysis has been performed for the site using heatmap data harvested by the fitness platform Strava. This data shows visually where key active routes currently exist, with the brightest (most yellow) routes being most utilised.

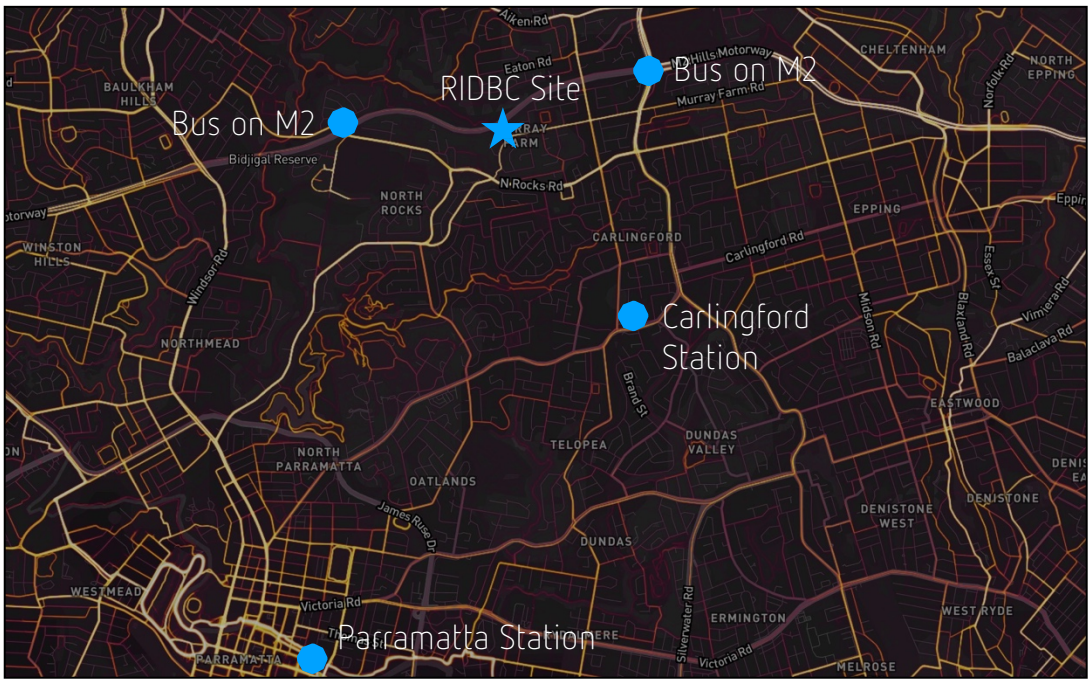

Figure 4 Cycling heat map (existing usage data) Source: Strava

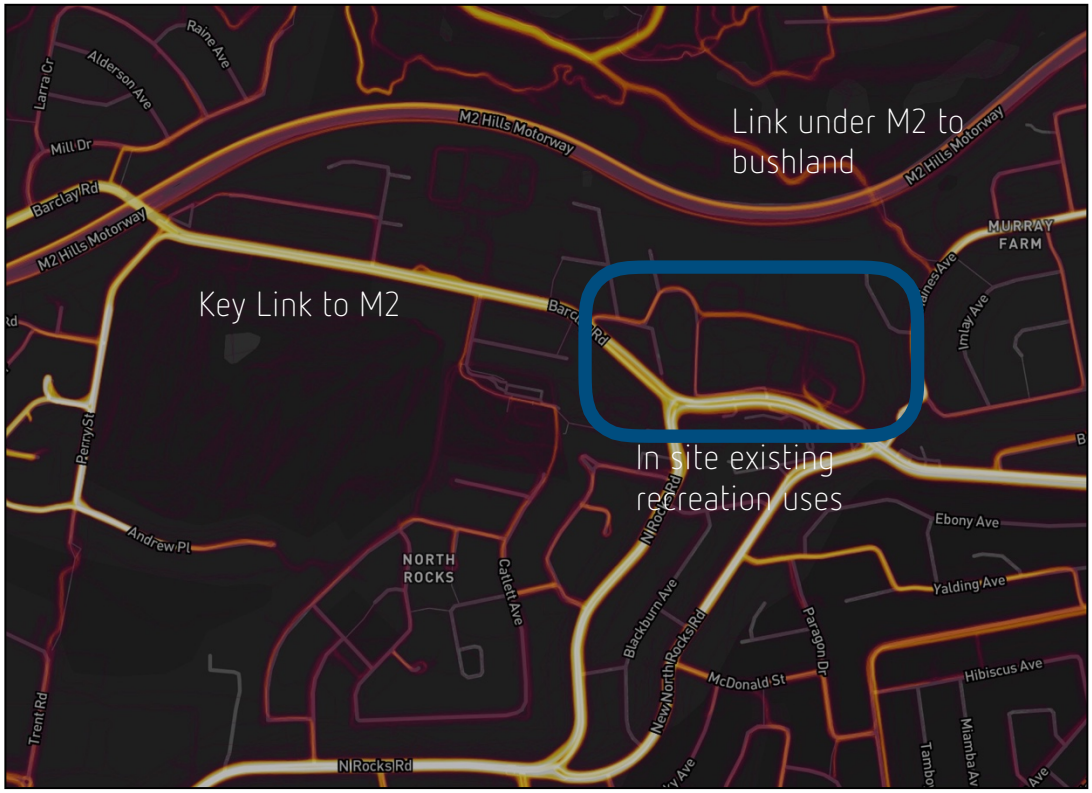

Figure 5 Active use heat map (existing usage data) Source: Strava

It can be seen in the mapping that people are already utilising routes that pass the subject site and there is already an informal running/walking route around the existing RIDBC site that can be formalised and enhanced as part of the proposed redevelopment. Despite the limited existing infrastructure, this demonstrates both the desire for effective active connections and the demand for infrastructure to be created within the redeveloped precinct.

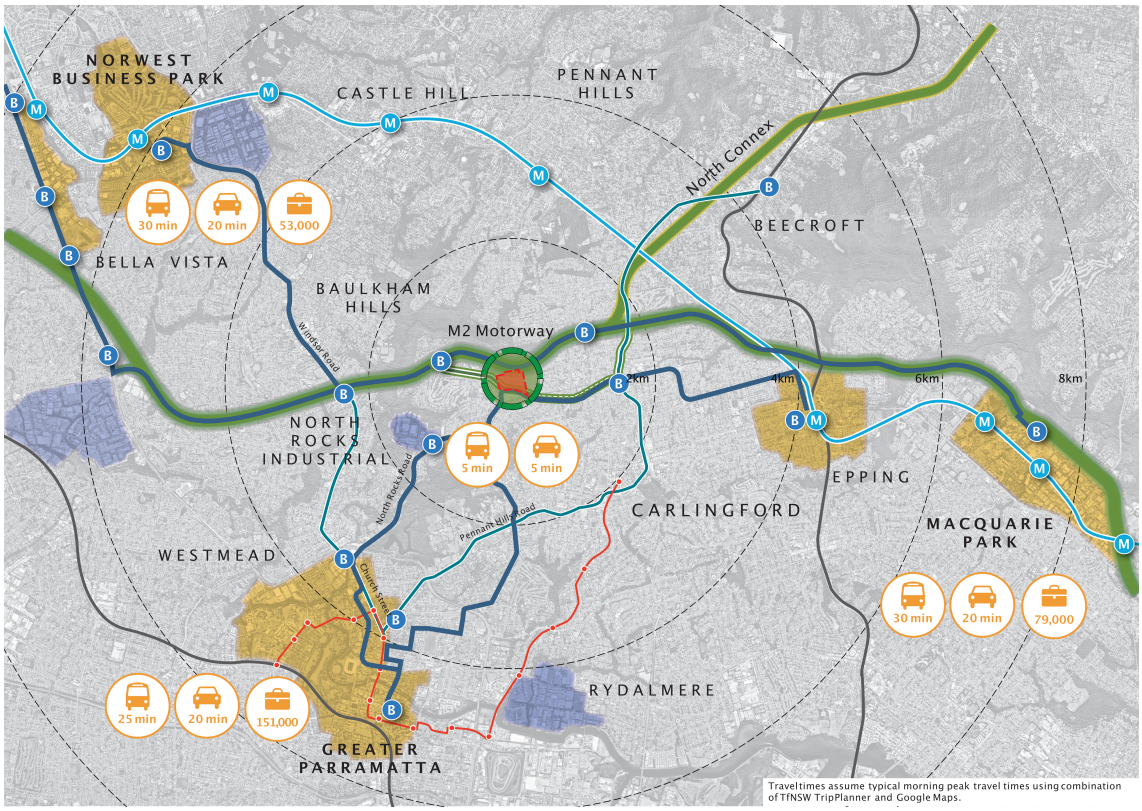

Figure 6: Transport map

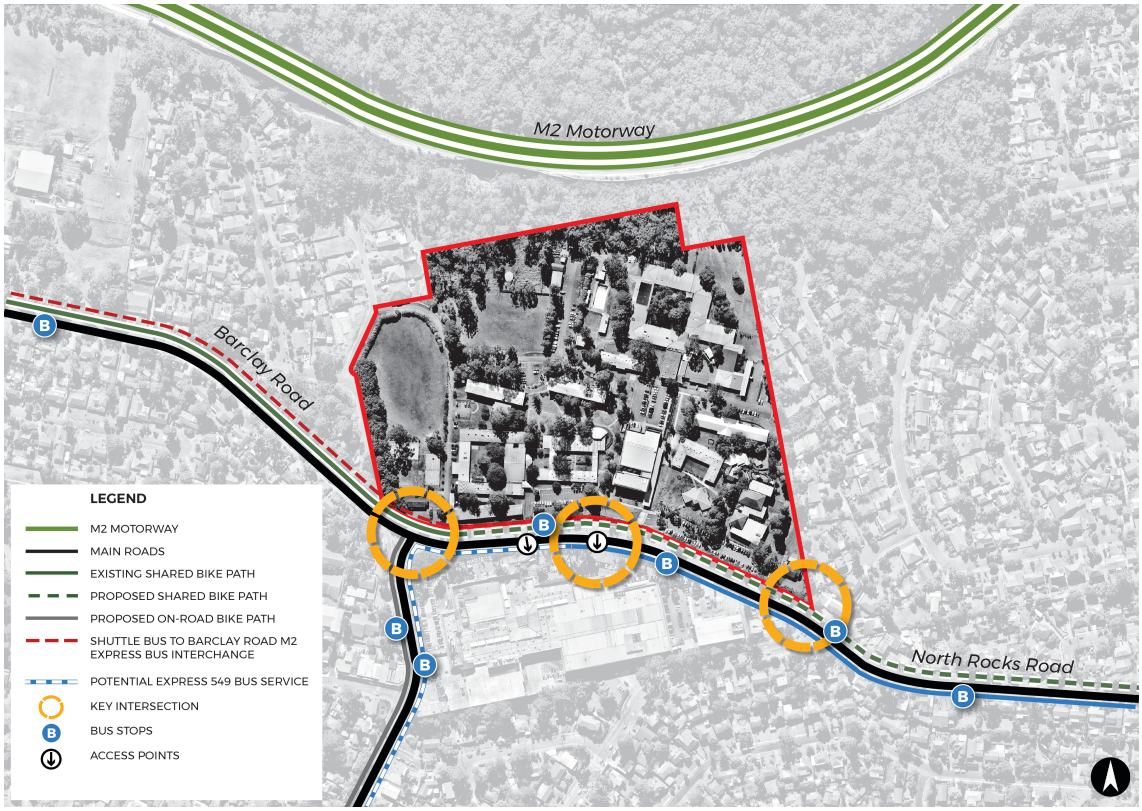

Figure 7: Transport nodes

3.1 Final Mile Solutions

3.1.1 Strategy

The North Rocks Village site is located close to major transport links to the Sydney, Macquarie Park, Norwest and Parramatta CBD's, including the M2 Express Bus Service, accessed via the nearby Barclay Rd M2 Bus Interchange. The proponent is also committed to improving local bus access to this interchange in addition to pedestrian and cycle access. Given this proximity, the implementation of "final mile solutions" provides opportunities to encourage a modal shift away from private vehicles. In addition to active options such as walking and cycling, shared E-bike and E-scooters (if ongoing trials in NSW legalise their use) can be installed onsite; and the project team will work with council to develop the appropriate strategy including the provision of storage at transport nodes.

Figure 8: VW developed urban mobility solution

3.1.2 Benefits

- Supports and promotes public transport options, reducing congestion.
- Improves affordability for residents within the precinct.
- Zero GHG solution.

3.1.3 Implementation

Facilities and connections will be planned into the site. The proponent will work with Council to incorporate an appropriate strategy for bike/scooter share platforms, including appropriate facilities at transport hubs and augmented connections between the local centre and the transport nodes.

3.2 30 Minute City

3.2.1 Strategy

The project team have recognised the strategic desire to have the majority of the workforce living on site to have realistic employment opportunities where they have a commute time of less than 30 minutes, as outlined by the Greater Sydney Commission. North Rocks Village demonstrates the potential to achieve this vision by:

- Recognising the large number of employment generating centres in close proximity to the site, providing a diversity of employment opportunities including Macquarie Park and Norwest all within a 30 minute commute of the site.
- Connection with the M2 bus transit way to the Sydney CBD (walk 10 minutes + bus 22(off peak) / 42(peak) minutes) including the proposed provision of a dedicated shuttle bus service from the site to the interchange.
- Connection with the Parramatta CBD by active transport options (e-bike 15 minutes, bicycle 15-30 minutes) or public transport (20 - 30min).
- Macquarie Park and Norwest connections are provided by the M2/M7.
- Direct Aerotropolis connections are provided by the M2/M7.

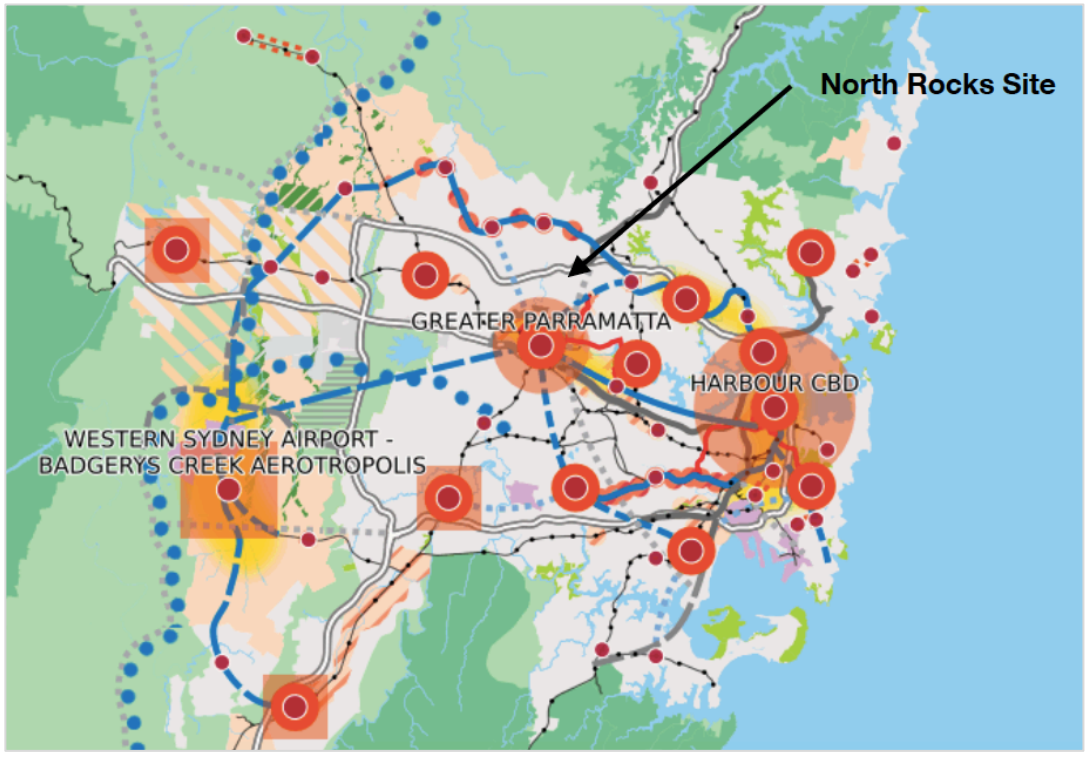

Figure 9: Greater Sydney Commission 30 minute city key links

3.2.2 Benefits

- Delivers the Greater Sydney Commission vision of a 30 minute city
- Promotes public transport and active transport as faster and more convenient than private vehicle options

3.2.3 Implementation

Collaboration with council on opportunities to enhance connectivity beyond the core site infrastructure.

3.3 Recreation

3.3.1 Strategy

Heatmaps of running, walking and cycling activities logged on the fitness platform Strava shows that there significant desire for recreation (walking, running, cycling) usage around the RIDBC site, despite the limitations of the existing connections and constraints. The concept seeks to build from this by providing new facilities and spaces, along with enhanced connections through and around North Rocks Village.

Figure 10: High quality open space for recreation safe form vehicles

3.3.2 Benefits

- Integration with the existing community and enhancement of existing desire lines through new connections.
- New facilities and spaces that promote health and wellbeing of new and existing residents.
- Connections with bushland and community infrastructure both on and beyond the site.

3.3.3 Implementation

The proponent would engage the community and work with council to identify key paths and connection and seek to maintain and enhance these within the master plan and deliver a significantly improved outcome upon completion.

4 Ecological Connections

One important focus within the objectives of the Greater Sydney Commission is the creation and enhancement of a "Green Grid", a network of tree canopy across Sydney that provides fauna habitat, reduces the urban heat island effect, improves air quality, promotes biophilia, and provides spaces for recreation. The concept of the Green Grid is further enhanced by the "Blue Grid", the necessary water cycle infrastructure to further enhance biodiversity, support a vibrant green grid and naturally treat waste water and runoff.

With the subject site located adjacent to remnant bushland that supports a vibrant ecological community, we believe our approach to the redevelopment of the brownfield site provides opportunities for restorative outcomes, achieved through being a good neighbour and creating links for fauna, people, and water.

4.1 Green Grid

4.1.1 Strategy

The project will incorporate significant green canopy and ground scape within the site.

The planned redevelopment of the site (as indicated by the masterplan) will achieve close to a 40% tree canopy, along with understory and garden plantings. This has the potential to deliver a diverse native species selection appropriate to the area.

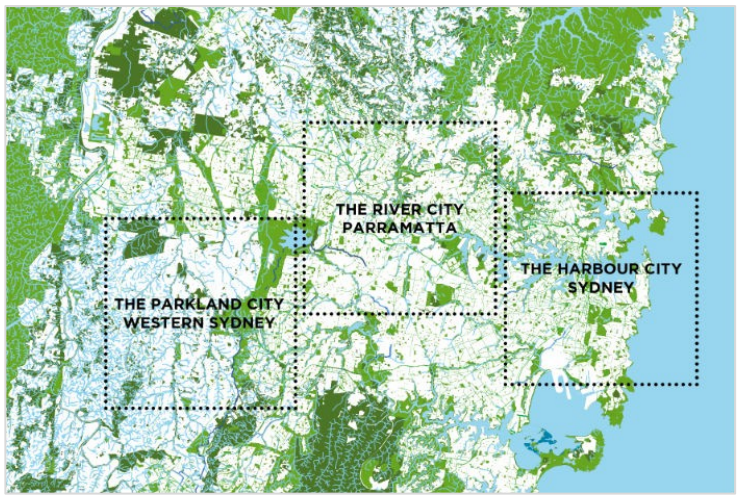

Figure 11: Greater Sydney Commission Green Grid

4.1.2 Benefits

- Reduced urban heat island effect.
- Support the delivery of the GSC vision.
- Provides for the improved health and wellbeing of occupants.

4.1.3 Implementation

The landscape master plan demonstrates the ability to achieve the target percentage of tree canopy cover and accommodates key connections within and to the existing remnant bushland. This will be further developed through consultation and detailed investigations as the design of the public domain is progressed following rezoning as part of the normal approvals process.

4.2 Contributing to the Blue Grid

4.2.1 Strategy

The site is located along a ridgeline and near the top of a drainage catchment with limited existing surface waterways being present. A gully to the centre north of the site provides the opportunity to capture water and address runoff as part of the water sensitive urban design strategy.

This will allow the creation of a naturalised water management process within the site addressing both water quality and quantity. Supported by opportunities to utilise street verges and open space planting strategies to permit natural water infiltration, including the selection of appropriate plant species to manage floatables, particulates and dissolved contaminates, North Rocks Village has the potential to establish new benchmarks for water sensitive urban design. This approach will support the green grid, work towards mitigating irrigation requirements, and promote biodiversity by creating aquatic habitat.

Figure 12: WSUD to enhance biodiversity

4.2.2 Benefits

- The approach to water complements and supports the Green Grid.
- Creates habitat and promotes biodiversity.
- Assists passive water treatment of urban rainwater runoff.

4.2.3 Implementation

The water sensitive urban design strategies will be developed in conjunction with the broader landscape and public domain strategy following the rezoning of the site consistent with the normal approval process.

4.3 Fauna

4.3.1 Strategy

The existing brownfield site condition with large areas of underutilised grassland provides limited habitat opportunities. The redevelopment of the site will create new opportunities for fauna, both within the site and through the enhanced green connections to the neighbouring remnant bushland. This strategy facilitated through sensitive landscape design, will be used to both enhance the local biodiversity, as well as provide a level of natural pest control helping mitigate impacts of invasive species.

4.3.2 Benefits

- Enhanced and strengthened biodiversity potential for the site and the surrounding area.
- Natural pest control.
- Promotion and protection of native species.

4.3.3 Implementation

Detailed design of landscape will consider opportunities for protecting, creating habitats and connecting fauna with existing bushland, including the potential for bird boxes as well as enhance habitats for ground dwelling fauna.

5 Ready for a Zero Carbon World

Like many cities around the world, the authorities at both a local, state and national level with purview over Sydney, are identifying climate as the emergency to define this century. It is probable that within the lifespan of the proposed development there will be the need to exist in a zero-carbon world to help ensure the impacts of this climate emergency are to be addressed.

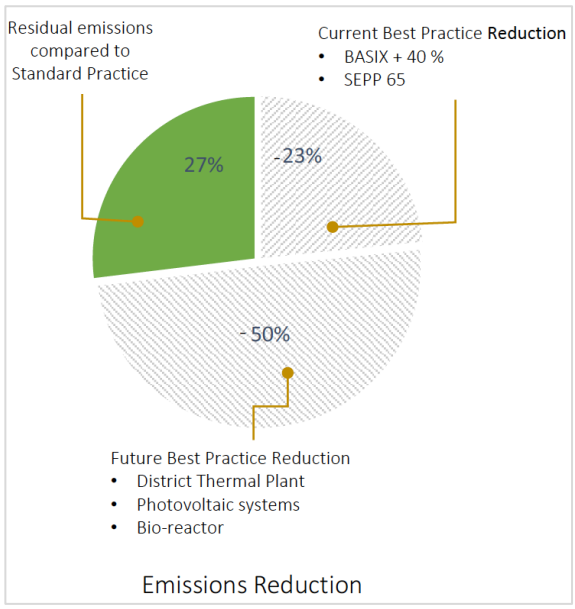

Figure 13: North Rocks emissions reduction approach

In order to be ready for a zero-carbon world, North Rocks Village will need to:

- Eliminate fossil fuel reliance within the buildings and public domain operation.
- Promote zero carbon transport options and ensure all private transport accommodation is EV (Electric Vehicle) ready.
- Implement smart city infrastructure to monitor and manage systems in the urban environment.
- Deliver best practice efficient buildings.
- Incorporate renewable energy generation backed by sustainable infrastructure that generates a social dividend.
- Ensure ecosystem resilience including responsive strategy to the impacts of global heating and the resultant impact on weather systems.

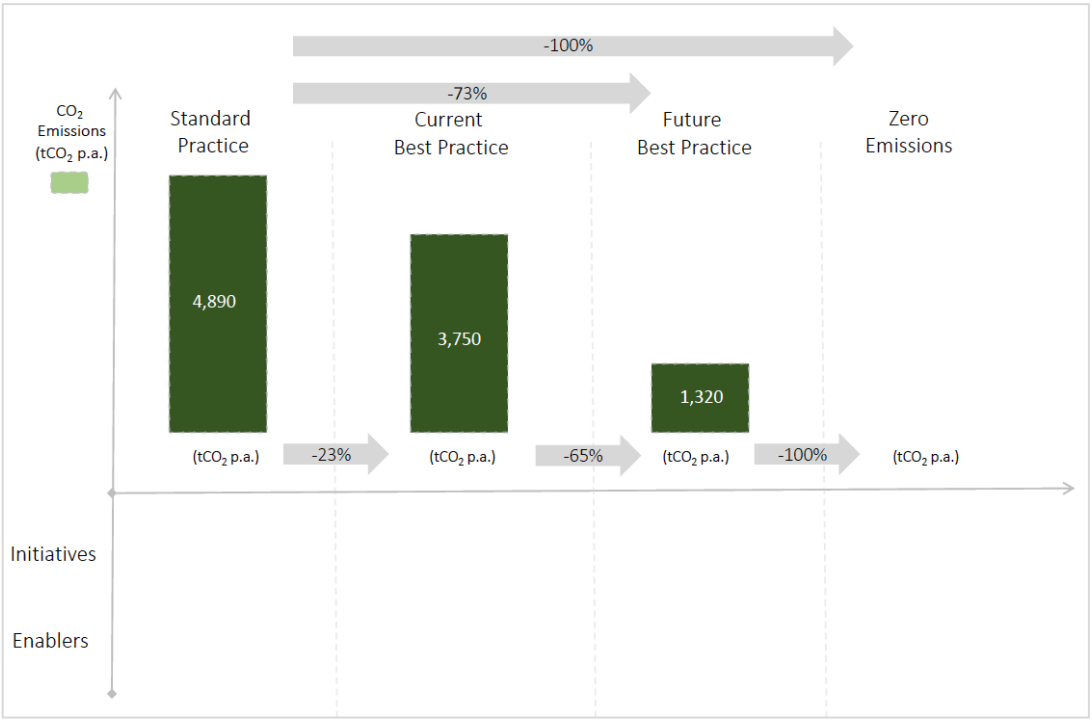

Figure 14: A Zero carbon pathway

Current best practice in emissions reduction on a building-by-building basis is an improvement on the current standard practice, however without a precinct level approach, will yield only an indicative 23% reduction in carbon emissions.

To meet the future best practice goals, and ultimately be ready for zero-carbon, a precinct level response is required, and this is what is proposed for North Rocks Village. This will establish the project to be ready for a zero-carbon world, working in conjunction with broader City level strategies that we can anticipate being implemented over time, such as addressing the emissions of regional level power production.

The future best practice carbon model provides the opportunity further social benefit by converting running cost savings into further onsite investment. A community sustainability model will allow the project to establish and maintain sustainability leadership in line with best practice for the life of the precinct.

5.1 Eliminate the reliance on Fossil Fuels within the built environment

5.1.1 Strategy

The buildings and public spaces within North Rocks Village should be developed with the ability to operate at zero net carbon.

5.1.2 Benefits

- The site infrastructure will be future ready, resulting in residents not carrying the future liability of retrofitting, infrastructure augmentation and increases in fossil fuel costs as carbon-based fuel sources are exhausted and/or deemed unacceptable due to their climate impact.
- With green power purchase and or offsets the site can be immediately carbon neutral. Viability of a mechanism for achieving this will be assessed as part of creating a social dividend for the site.

5.1.3 Implementation

Building design briefs will be produced to optimise energy efficiency and future proof the design.

An operational model for the public domain will be developed which will include opportunities for electric service vehicles and machinery, and allowances will be made for equipment charging.

5.2 Zero Carbon Transport and EV Readiness

5.2.1 Strategy

North Rocks Village will prioritise movement without reliance on vehicles, or where vehicle use is unavoidable that zero carbon transport options and infrastructure is provided for both public and private vehicles. This will include:

- A master plan and public domain network that encourages a walking within and around the neighbourhood.
- Improved connections to nearby active transport nodes for pedestrians, cyclists and commuters.
- Opportunities for shared bicycle and electric bike facilities.
- Priority within the design for pedestrian and cycle links to local community facilities, shops and public transport nodes.
- Transport links (refer Active Connections section).
- End of trip facilities including electric bike charging in private buildings and in the public domain.
- Fast EV chargers in the public domain.
- Power and communication infrastructure provision to car parking areas, facilitating owners to install EV charging systems.

Figure 15: EV charging

Figure 16: Shared electric bikes

5.2.2 Benefits

- The opportunity to embrace a modal shift will encouraged residents to have access to services without reliance on a privately owned vehicle.
- The design of the project will promote that it is easier, cheaper and safer for residents to choose e-bikes, walking or cycling for neighbourhood journeys.
- Owners will be able to purchase EV's confidently knowing they can install their charger at their parking spot.
- Communication infrastructure at the charging locations will be able to manage load sharing across electrical systems.

5.2.3 Implementation

Design briefs will be prepared to incorporate end of trip facilities, storage locations and charging infrastructure. Public domain design will ensure walking and bike access are provided in the most convenient locations and given appropriate priority compared to private vehicles. The opportunities for the utilisation of shared electric bikes will also be explored.

5.3 Efficient Buildings

5.3.1 Strategy

All buildings will be developed to deliver maximum energy efficiency.

North Rocks Village will incorporate:

- Effective cross ventilation or buoyancy driven natural ventilation to apartments and other dwellings.
- Northern, Eastern and Western oriented glazing will be shaded at a ratio of 1:2 (horizontal to vertical).
- Building fabric (including thermal mass and insulation) will be optimised to minimise energy. consumption not peak load (which will be managed by renewable energy).
- Centralised heating and cooling will be provided to enable maximum efficiency and eliminate. heat rejection from balconies.
- All lighting will be LED's and all non-occupied commons spaces will be provided with occupancy sensors.

5.3.2 Benefits

- The approach to the building will reduced resultant carbon emissions.
- Energy costs will be reduced, leading to improved affordability.
- Less reliance on offsite infrastructure.

5.3.3 Implementation

The project will commit to implementing initiatives resulting in the built form exceeding BASIX requirements as part of the post rezoning design process. Design briefs will incorporate the requirements to consider shading, daylighting, natural and managed ventilation systems, and utilise 3d dynamic thermal modelling investigation to optimise the performance and material selection for the dwellings across the site.

5.4 Renewable Energy and Sustainable Infrastructure

5.4.1 Strategy

Future energy networks are anticipated to rely on both localised and large-scale grid style infrastructure. The project strategy will embed local solutions to complement the expected future zero emissions electricity grid.

North Rocks Village will incorporate:

- Onsite solar will be installed on a number of rooftops. The solar will be designed to both optimise generation AND manage peak loads, seeking to match peak generation at the same time as peak load.
- A sustainable infrastructure strategy will be implemented, including the potential for a private wire network. This strategy will be proactive in demand management to match loads to solar generation (e.g. enabling car charging, precooling thermal networks). This approach would allow costs to be managed, and will enable a value capture of the onsite generation. It is this value capture that can contribute to delivering the sustainability dividend and fund social infrastructure as well as continued sustainability investment.
- The private wire network and building infrastructure would be battery ready. Within the lifespan of the project embedded batteries and particularly EV integration appears a likely outcome.

Current estimates based on the master plan indicate that onsite solar will be approximately 1MW (approximately 5,000sqm) and generate 1600MWh per year.

Figure 17: Example of building solar - Fusion Apartments, Ultimo

5.4.2 Benefits

- The strategy provides a reduced dependence on conventional grid electricity.
- Zero emissions ready.
- Creates opportunities for continued investment in precinct/community.

5.4.3 Implementation

A renewable energy and sustainable infrastructure strategy will be produced for the site. This will establish the optimal integrated system design and detail sizes, capacities, and potential revenue streams during operation.

5.5 Resilient to Urban Heating

5.5.1 Strategy

Urban heating is a major issue, resulting from green space (especially tree canopy) being progressively replaced with hard roofs that reflect or radiate solar radiation. This is demonstrated in the below thermal imagery of Parramatta, showing the clear, stark contrast between areas of dense hardscape and areas of vegetation.

North Rocks Village proposes to provide extensive green landscaping across the site including large canopy tree species to minimise hard surfaces and utilise shade to manage the impact of reflective and absorptive materials.

Facades will be designed to minimise solar reflection and utilise significant overhangs and shading strategies to manage reflective glazed elements while still employing strategies where appropriate for heat absorption and storage (such as thermal mass, ground coupling and hydraulic absorption systems).

Figure 18: Parramatta City Council heat map data

The project will feature:

- Retained mature trees
- Planting of large canopy trees within streets, park areas and private/communal areas to shade people at street level, hard surfaces, and buildings.
- A building design and materials strategy (including the potential use of planted/green facades) to manage heat absorption and re-radiation.
- The use of water through the site to manage heat and humidity, promoting a stable thermal Environment.

- A diversity of parkland within a green street network.
- Minimisation of active heat rejection systems.

Figure 19: North Rocks open site area

5.5.2 Benefits

- Provision of improved microclimate, enhancing the comfort for users in the public domain.
- A reduction of the heat island impact on the broader environment.
- Improved the resilience of the project to external environmental factors.

5.5.3 Implementation

An urban heat model will be developed as part of the ongoing design process following rezoning to inform requirements for materials and shading, optimise the potential project performance, and complement the landscaping proposal.

5.6 Resilience to Climatic Changes

5.6.1 Strategy

The three most significant concerns associated with the impacts of climate change that have been identified for the site are:

- Increased weather extremes (especially heatwaves, more violent storms/hail).
- Increased average temperatures.
- Reduced water availability, with increased variability in rainfall.

Each of these primary impacts have overlapping issues and mitigations. Importantly however it is recognised:

- Onsite water production and storage will assist in managing water supply, which will in turn assist to maintain a vibrant urban ecology.
- Buildings will be designed with recognition that weather extremes (including increased hail and lighting storms) is anticipated as a result of the changing climatic conditions.

A climate adaptation strategy will be developed as the project progresses, considering the likely impacts and putting in place a mitigation strategy that will inform future planning applications.

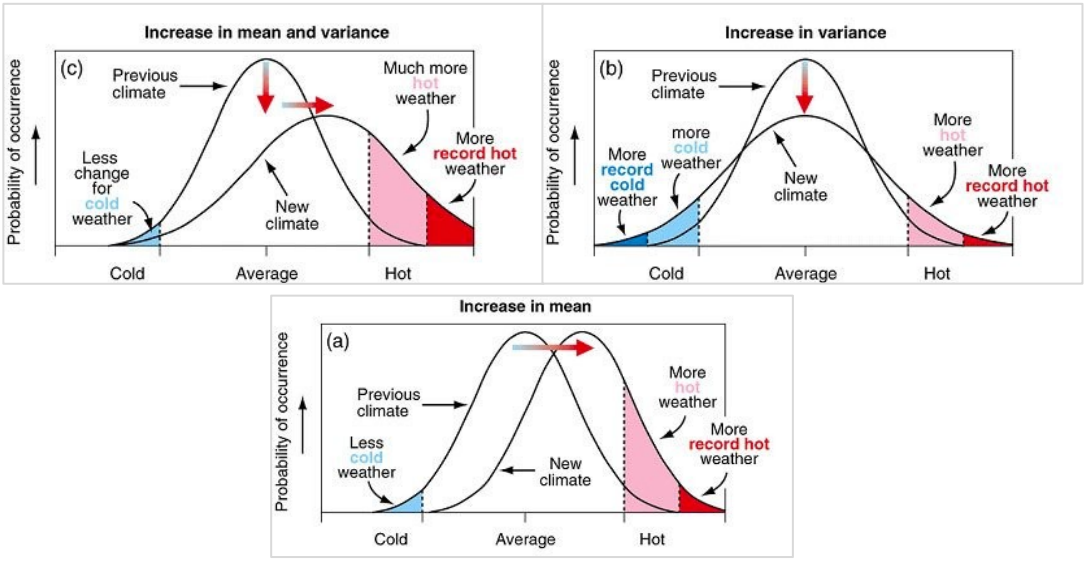

Figure 20: Global heating impact on weather extremes

5.6.2 Benefits

- Improved safety and comfort for occupants.
- Avoid future repair and retrofitting costs.
- Improved quality of environment for surrounding neighbourhoods.

5.6.3 Implementation

Core mitigations are included within the current proposal. Recognition of the requirements on building design strategies and construction elements will be incorporated within the future design briefs. A detailed climate adaptation strategy will be developed to address potential risks and opportunities.

5.7 Zero Carbon Waste Management

5.7.1 Strategy

Operational waste generation creates a legacy impact for the project that can be effectively managed and minimised during the planning and design phases. Waste cycle modelling based on proposed dwelling numbers for the project has estimated that there is the potential for residents to generate 1000t per annum of waste, 60t of which will be organic waste.

North Rocks Village will:

- Implement source separation of recyclables and organics to minimise waste to landfill
- Investigate the potential for centralised waste management to better facilitate collection, management, distribution and where possible site utilisation of waste in order to reduce onsite emissions and increase efficiencies.
- Investigate the potential for onsite use of appropriate waste, including opportunities for energy generation including the use of onsite bioreactors. Waste utilisation can also include on site composting for fertilising private gardens and public landscape.

During construction phase contractors will be required to meet or achieve best practice or established benchmarks for landfill diversion of demolition and construction waste.

5.7.2 Benefits

- Less waste to landfill.
- Less waste transported offsite.
- Less truck movements.
- Reduced carbon emissions.

5.7.3 Implementation

Waste generation data will be developed and used in detail planning as the project develops. The feasibility of alternate strategies for waste management, including the potential cost offsets of improved strategies and centralised handling will be developed and presented collaboratively with Council.

6 Deliver a Positive Water Impact

As Sydney continues to grow, it is recognised that there are limited possibilities to proportionally expand the water catchment servicing the city, and therefore water supply restrictions have the potential to more frequent impact the lives of the residents of the city. It is essential that new developments take a responsible approach to the dependence on potable water, and look to the collection, generation, and usage systems to ultimately have a positive impact on water availability.

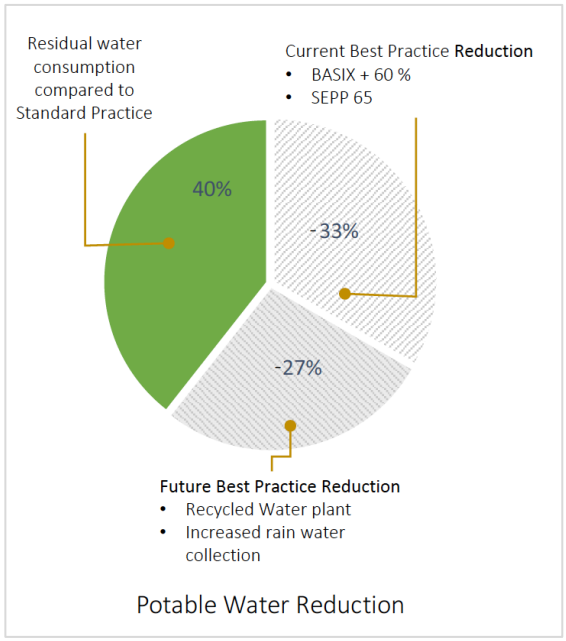

Figure 21: North Rocks Village Potable Water reduction potential

The North Rocks Village is seeking to optimise water collection, management and usage regimes, with a stretch target to be able to export more recycled water than the amount of potable water it imports and therefore deliver a positive impact on water availability.

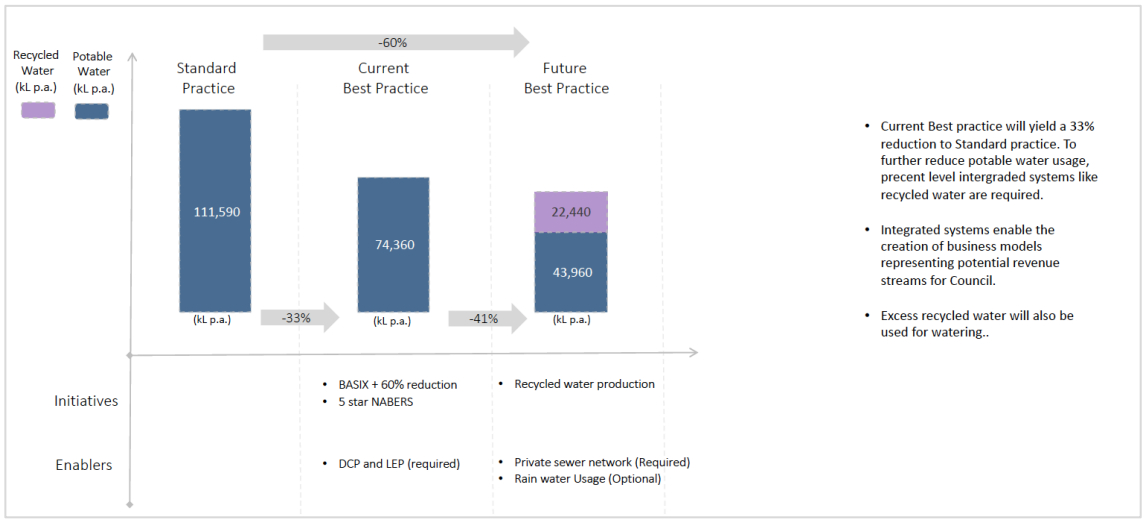

Figure 22: RIDBC water reduction pathway

6.1 Water Demand Reduction

6.1.1 Strategy

Optimised WELs rated fittings and fixtures will be installed across the North Rocks Village. While basic requirements are recognised, the project will seek to exceed the BASIX minimum targets. A water balance will be developed to minimise potential for potable water to be used for irrigation, toilet flushing or other non-potable uses.

Figure 23: WELS ratings and recycled water implementation

6.1.2 Benefits

- Less water consumption and reduced utility costs for residents.
- Increased resilience.

6.1.3 Implementation

Building design briefs will be developed incorporating the management of water and water systems to address water demand implement reduction initiatives as nominated above.

6.2 Active Water Recycling

6.2.1 Strategy

The master plan strategically anticipates the utilisation of private wastewater collection system (or systems) with active treatment, with the objective to produce more recycled water than the quantum of potable water imported. This strategy has the ability to deliver a positive water outcome for development. Any active water recycling strategy will incorporate storage tanks for the recycled water.

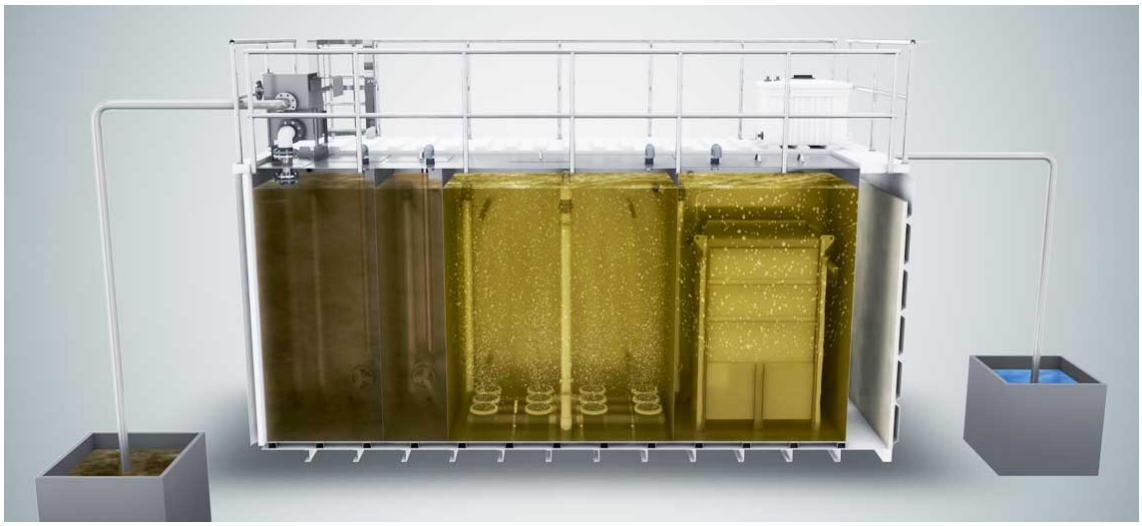

Figure 24: Containerised active water recycling and non-potable uses

6.2.2 Benefits

- Water positive outcome.
- Increased resilience, minimise potential for potable water used for any non-potable use.
- Opportunity to export recycled water (e.g. to sports fields and parks).

6.2.3 Implementation

Active water recycling and the associated private wastewater collection system will be investigated as part of a Sustainable Infrastructure model and appropriate business case assessments and understanding of the contribution to a sustainability dividend will be developed in line with that study.

6.3 Passive Water Treatment

6.3.1 Strategy

Water Sensitive Urban Design will be employed within the public domain manage stormwater and urban runoff, leading to healthy waterways and providing for localised biodiversity.

Figure 25: WSUD to provide passive water treatment

6.3.2 Benefits

- Stormwater is retained on site.
- Energy cost of treatment zero.
- Enhanced biodiversity within the public domain.

6.3.3 Implementation

The development of a naturalised water collection, movement, management and infiltration / discharge network will be integrated within the landscape design strategy, to be progressed as part of the future design works following the rezoning of the project site.

7 Conclusion

The planning proposal for North Rocks Village is committed to delivering robust outcome, featuring robust sustainability outcomes with real operational benefits. The impacts of the climate change emergency and associated global warming are a significant issue for the life of a major urban infill renewal project such as this.

The Sustainability Strategy positions the new community to be ready to address these issues and will provide significant benefits including:

- Preparedness for a zero-carbon world.
- Improved affordability due to reduced reliance on private vehicles and protection from increasing conventional utility costs.
- An ecologically vibrant site that embeds the concepts of Green and Blue Grids, and seeks to regenerate the green environment and enhance the remnant bushland adjoining the site.
- Provides quick and efficient connections to local employment hubs and strategic centres within the Greater Sydney area without reliance on private vehicles whilst achieving the potential of a 30-minute city.
- Be future proof and resilient.