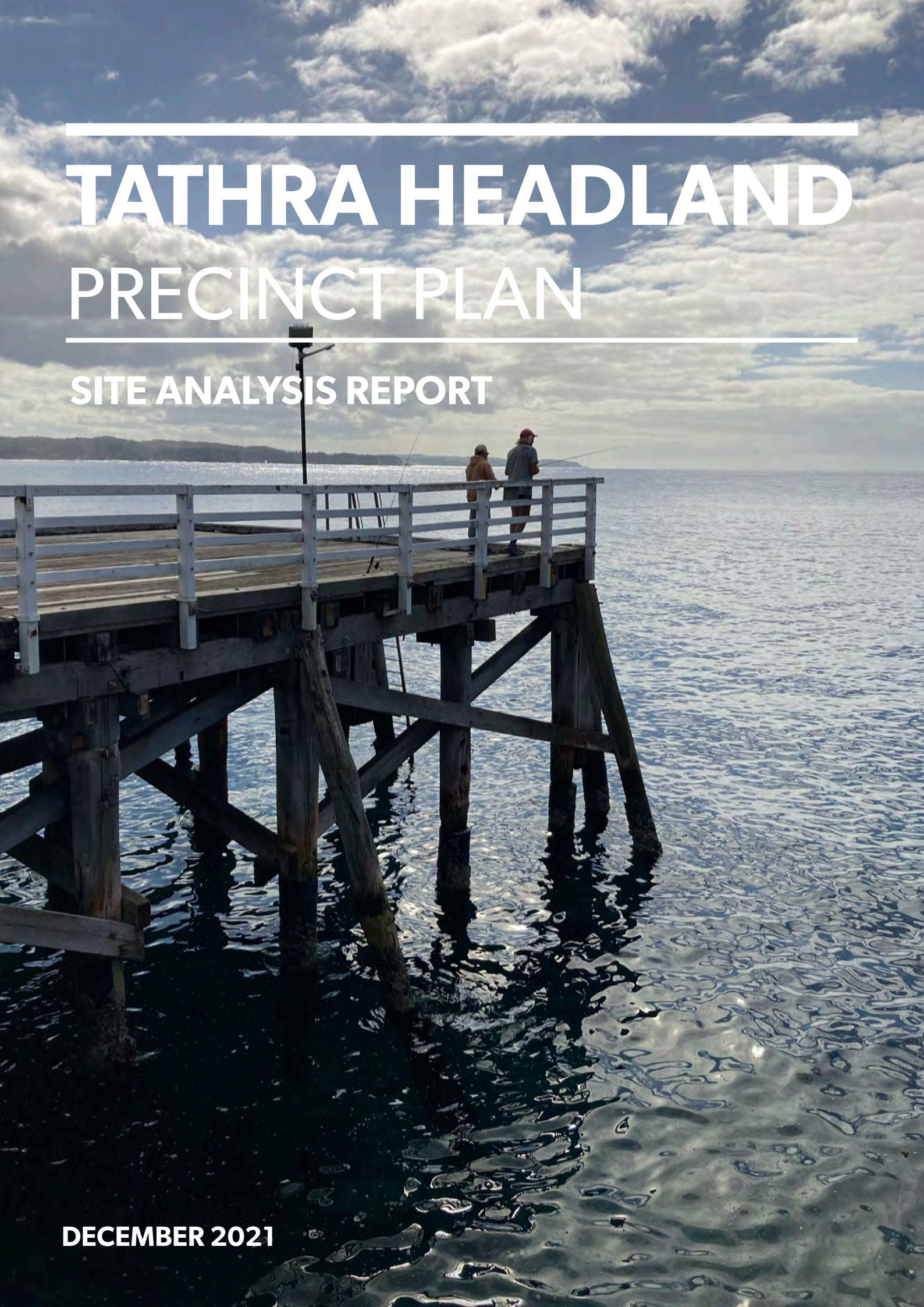


TATHRA HEADLAND
PRECINCT PLAN

SITE ANALYSIS REPORT

DECEMBER 2021

Acknowledgment of Country

The land on which we live and work is aboriginal land. Aboriginal people have lived on the Australian continent for at least 65,000 years. Non-aboriginal people have lived in Australia for just 230 years.

As a practice, we are working towards an understanding of that fact, and how it might inform our relationship to the land, its original people, and the work that we do. We acknowledge that we have a long way to go. Our studios are located on Gadigal, Ngunnawal and Whadjuk country in Sydney, Canberra and Perth respectively.

We wish to acknowledge the Traditional Custodians of the lands and waters of the Shire of Bega, the people of the Yuin-Monaro Nations; the Tadjera-Munji-Djiringanj, Thaua, Bidawahal, Nulliker, and Manaroo, and show our respect to elders past and present.

PLACE LABORATORY

WSP

CLIENT

Bega Valley Shire Council

PROJECT TEAM

Landscape Architecture: PLACE Laboratory

Civil | Traffic and Transport: WSP

Quantity Surveyor: Alex Feng

DOCUMENT CONTROL

Revision	Description	Date of Issue
A	DRAFT ISSUE FOR REVIEW	24.09.21
B	RE-ISSUE FOR REVIEW	15.10.21
C	FINAL ISSUE	10.12.21

CONTENT

PART A
PROJECT DESIGN BRIEF

1. INTRODUCTION

PROJECT BACKGROUND

Under the NSW Government's COVID-19 stimulus program, Bega Valley Shire Council was awarded $7.81 million to contribute towards the restoration of the iconic Tathra Wharf.

Part of this grant is being used to develop the Wharf and Headland Precinct Plan to guide the development of the Wharf and headland area to improve its public amenity.

STUDY AREA

The study area is located at the headland with a particular focus on Wharf Road and Bega Street. The site is bound by the coastline and extends west to Andy Poole Drive.

The scenic and rugged coastline of the Tathra Wharf and headland precinct is set in an iconic coastal town with strong tourism draw cards including excellent vantage points for whale watching, perfect fishing locations, and access to local food and produce. It attracts active people through events such as the Wharf to Waves swim and tracks like the Wharf to Wharf Walk.

While not including the Wharf itself, the study area will ensure the Wharf is completely considered and integrated.

The study area also includes the track down to Tathra Beach, the new accessible walk around the headland and the terminus of the Wharf to Wharf Walk.

Total area of the study area is 65,325m2.

The study area also includes culturally sensitive elements such as the ANZAC Memorial, an indigenous burial site and the Tathra Memorial Park.

The vegetation in the area is also rejuvenated and a reminder of the bushfires of March, 2018.

Image: Tathra Wharf, PLACE Laboratory

2. PROJECT OBJECTIVES

Objective 1

Improve active travel links to create a cycle friendly, walkable and safe precinct

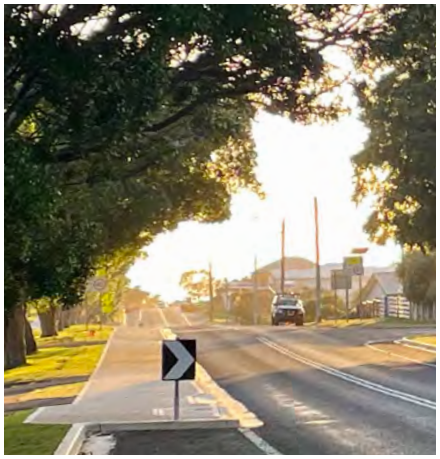
Why is this important to Tathra?

- To slow the pace down, and retain a holiday destination vibe.
- It allows people to get closer to their environment and improves wellbeing.
- The journey is just as important as the destinations, where getting between the destinations is part of the overall experience.
- It encourages social connections, and a healthy lifestyle.

What does this look and feel like?

- More equity in the network for active travel.
- A complete pedestrian and cycle network that connects the destinations.
- Shared paths that are safe for all users and abilities - especially children, people with disability and elderly.
- Pedestrian priority in key areas and crossings at key intersections.
- Infrastructure such as bike racks at each destination.
- Comfortable experience through elements such as wide paths and shade trees.

Tathra is a great destination for cyclists, their experience can be improved through better connections and infrastructure.



The nearby bike path is disconnected, but has great shade trees

Community bike repair stands are a great addition to boost traffic

Shared paths that are wide enough for both pedestrians and cyclists.

Provide bike racks at each destination.

Objective 2

Improve wayfinding and connectivity to enhance visitor experience whilst visiting iconic destinations

Why is this important to Tathra?

- It identifies the choice of activities and encourages people to stay longer.
- It reveals the destinations through intuitive legibility.
- It recognises the local experience against the visitor experience (local needs vs visitor needs).
- It brings the stories of the Tathra headland to life with interpretation that responds to all users.
- It ensures a hierarchy of access routes that are logical and terminate safely.

What does this look and feel like?

- Easy navigation to each destination.
- Cohesive design language through wayfinding elements.
- Business opportunities through guided walking tours.
- Local story telling through authentic and engaging methods.

Stories should be told in different ways that can engage all different people - Cairns Foreshore

The stories of the place can be told in engaging way

Newer interpretative signage on the Headland walk incorporate the local indigenous knowledge.

Use interactive sculpture to tell the stories

A cohesive design language can act as wayfinding and navigation

Objective 3

Improve functionality of traffic circulation and carparking to create more efficient use of space

Why is this important to Tathra?

- It creates easy to navigate routes for visitors to explore the town's destination.
- It improves storm water management by reducing areas of hard pavement.
- It improves pedestrian safety.
- It reduces the visual impact on the view corridors caused by wide roads, large car parks and overhead infrastructure.
- It responds to the seasonal visitor number fluctuations.
- It frees up space to provide better public amenity.

What does this look and feel like?

- A road network that is intuitive to navigate and responds to the unique destinations.
- A green link between the shops and the headland.
- Clearly defined car bays.
- Safe pedestrian spaces and shared zones.
- Alfresco areas and street events.
- Attractive and easy to maintain streetscapes.

Tathra has large road reserves that could be re-allocated to improve parking locations and access to frequently used locations.

Green links connect places of interest and aid in way-finding

Shared zones can provide access to vehicles for events and services

Movable furniture allows for the street to host different types of events and programs

Reduced hard surfaces present opportunities for increased green spaces

Objective 4

Improve the visual amenity and viewing corridors to enhance the nature landscape of the headland

Why is this important to Tathra?

- It enhances the visual quality and identity of the headland and Tathra for both residents and tourists.
- It improves ocean views.
- It allows new and surviving vegetation to improve.
- It reduces stormwater erosion and damaged storm water infrastructure.
- It integrates bushfire protection management.

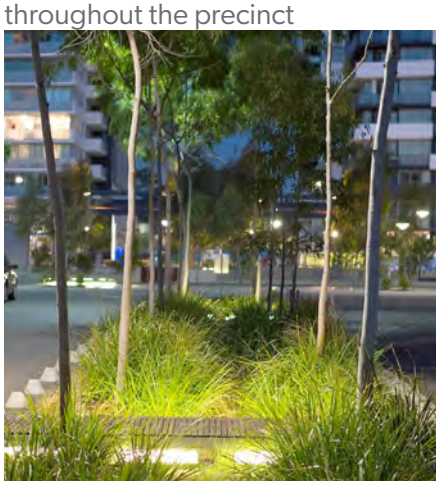
What does this look and feel like?

- A clean and well maintained space.
- A greenlink that showcases the cultural heritage and Tathra's natural vegetation.
- Water Sensitive Urban Design integrated into the streetscapes.
- Beautiful viewing windows capturing the beauty of the coastline.
- Upgraded infrastructure and underground services

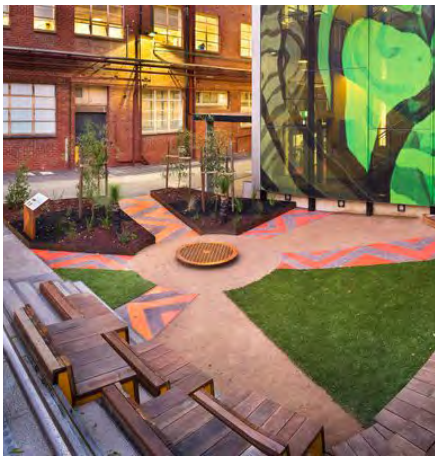
Tathra has amazing vistas that deserve to be celebrated throughout the town.

Existing vegetation that is native to the area can be identified and used throughout the precinct

Green corridors provide shade, shelter and habitat



Water sensitive design can bring the qualities of the headland back into the street



Cultural areas aid in highlighting the importance of Tathra's landscape

PART B
SITE ANALYSIS

Preliminary investigations have been undertaken reviewing GIS, public mapping, existing masterplan reports and Dial Before You Dig (DBYD) data.

The gap analysis identifies missing information currently not publicly available online or in the Bega Valley Shire Council (BVSC) supplied documentation, leading to some comments and recommendations regarding acquiring or supplying the information.

3. HERITAGE

FIRST NATION PEOPLE

The area is situated within an ancient landscape, surrounded by three mountains - Biamanga, Gulaga and Balawan. These mountains and surrounds have spiritual significance for Indigenous peoples.

Tathra is on the traditional lands of the Djiringanj people. The Djiringanj people currently have a language revival program and dictionary. Due to contentions in the literature, the exact origins of the name Tathra is contested. Oral histories strongly suggest that 'Tathra' is based on the traditional Aboriginal word for the area meaning place of the Quoll.

Tathra is home to many tangible heritage sites such as middens that are commonly found along the east coast. Middens are small mounds of shells, bones and matter that represent places of gathering. Sometimes they also contain stone tools and burials. Middens provide Aboriginal people today with an important link to their culture and their past.

Within the town there is existing interpretation signage, artworks and memorials. The Wharf Museum holds Aboriginal cultural items in their collections that are currently on loan from local Indigenous persons.

During civil works in the 1960's, the 800 year old ancestral remains of two Aboriginal men were unearthed near the now standing Newsagent. Due to government policy at the time, the remains were sent to museums for research purposes.

In July of 2013, the ancestral remains were repatriated and the Yuin people held a sacred smoking ceremony together with the townspeople to return the remains to Country. This event was an opportunity for non-indigenous people to share in one of Aboriginal culture's most sacred ceremonies and be part of the ongoing reconciliation journey. The interest and care from the broader community on the day showcases the capacity of the township to support Indigenous livelihoods. The graves stand before the Southernmost Norfolk Island Pine tree.

Tathra has a deep and rich cultural history and is positioned to be part of supporting Indigenous histories and conceptions of landscape within the precinct.

Locations of important Aboriginal sites

TOWNSHIP HISTORY

BEGINNINGS

While always being Yuin Country, the Coast was discovered by Europeans during Captain James Cook's explorations in 1770.

When pastoralists moved into the area in the 1820's-30s, Tathra started to service the district as a place to exchange goods.

Tathra has buildings with long historical ties to the beginning of the town, including the Surf Life Saving Club in 1912, the current Tathra Hotel in 1888, and the Post Office in 1880. These historical links are important to the town's identity and are key destinations for visitors.

TATHRA HOTEL

Originally named the Ocean View Hotel, the existing Tathra Hotel was built in 1888 and has long since been a central hub for the town.

The local watering hole originally acted as the transport hub for passengers using the steamboat ferries; and recently during the 2018 bushfires was a pivotal place where the community banded together and rejuvenated themselves.

In 2015, the Hotel was purchased and extensive refurbishments were added including boutique accommodation, a microbrewery and a small theatre. Notably, the TAB and poker machines were removed in an effort to shift the perception of the Hotel to be a family friendly tourist hotspot.

With plenty of rooms, classic verandas and deck, function spaces and a beautiful lawn, the Tathra Hotel is a pivotal destination for visitors. With its own playground for the kids, the Hotel is a popular place for all visitors especially in summer.

Heritage listed in 2013 (I182), the new additions, using recycled timber and sandstone, are an exemplar of how classic buildings can integrate late Victorian architecture with a modern outlook.

Founders of the Tathra Surf Life Saving Club

The Tathra Hotel as the Ocean View Hotel and current day photos

Sources:

- https://tathrahotel.com.au/
- *Researching the quirky local history of Tathra*, Bega District News, 2015
- *Family's historian records stories of the Tathra wharf in the era of coastal steamers*, ABC, 2017

THE WHARF

The Tathra Wharf is the only remaining open timber wharf on the East Coast. It is currently listed on the NSW State Heritage register among only six other Timber wharves. The wharf is a key destination for tourists and has a strong link with the community's identity.

MARITIME HISTORY

The first Tathra wharf was built in 1862, in order to service the coastal steamers from the newly formed Illawarra and South Coast Steam Navigation Company. Coastal shipping was a vital supply chain as the roads were not of good quality and the rail network didn't and wouldn't ever service this far south.

Tathra was at the time a high exporter of Pigs and their byproducts, averaging 82 pigs being exported a week. This high pig population is where the name 'Pig and Whistle' became known from.

By 1913, the steam ships were arriving twice a week from Sydney with Passengers, Mail and cargo. The export/import trends saw the wharf evolving, adding cranes, livestock yards, a two-storey shed, and a passenger shelter.

The wharf was located here due to the protection from the Easterly coastal winds. However the difficult underwater terrain led to several additions and extensions and widenings being required.

POTENTIAL DEMOLITION AND RESTORATION

After the shipping services ended in 1954, the wharf became a popular fishing and swimming spot for many years, however later in 1973 the Department of Public Works declared the wharf unsafe and began the demolition process. Daisy and Ray Bearlin formed the Tathra Wharf Action Movement and worked together with other committees to gain the lease and restore the wharf. In 1988, the wharf was officially reopened to the public.

THE WHARF TODAY

The wharf today stands as a strong piece of history in the town, it draws people during whale season, fishers and swimmers for the annual Wharf to Waves swim and also is the starting point for the 27km coastal Wharf to Wharf walk.

Source:

- Tathra Wharf Museum
- Tathra Headland Statement of Heritage Impact, NSW Archaeology, 2018
- Moruya and District Historical Society

Cobargo, One of the last ships to load cargo at the wharf

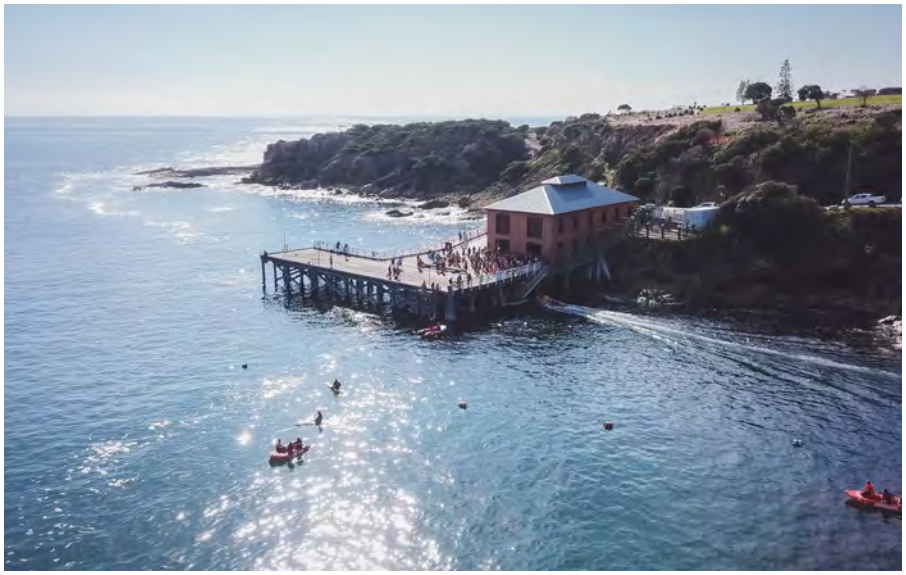
Credit: Bega Pioneer's Museum

Light Horse recruits leaving from Tathra wharf for WWI on the Star (1914)

Credit: Moruya & District Historical Society

Horse-drawn wagons traveled to Tathra wharf to load coastal steamers with regional produce for export and returned with goods from Sydney.

Credit: Jerry Johnson, ABC

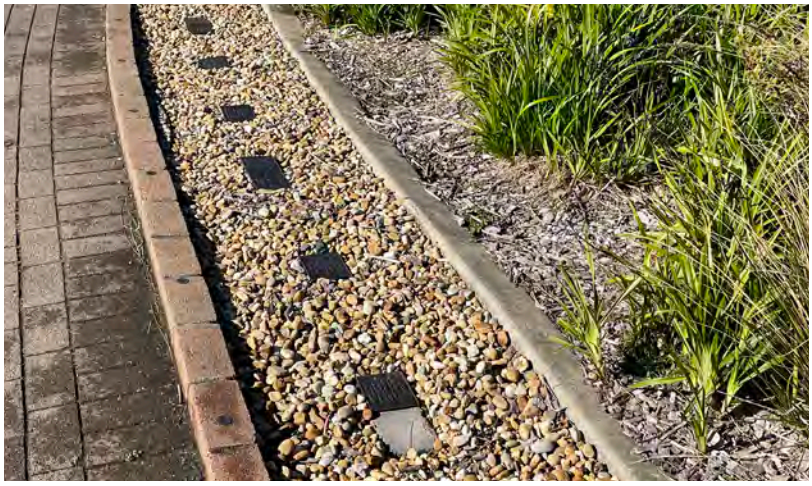


Tathra Wharf hosting the Wharf to Waves swim

Credit: Tathra Wharf to Waves

HERITAGE PLAN

The recent war memorial construction can be improved with safer pedestrian access

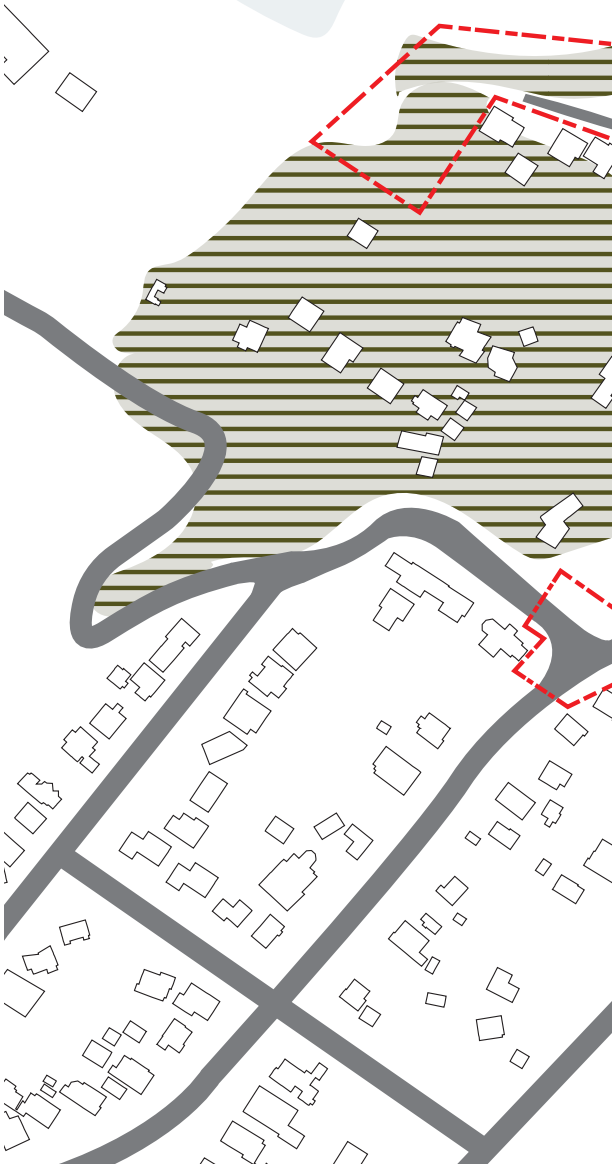


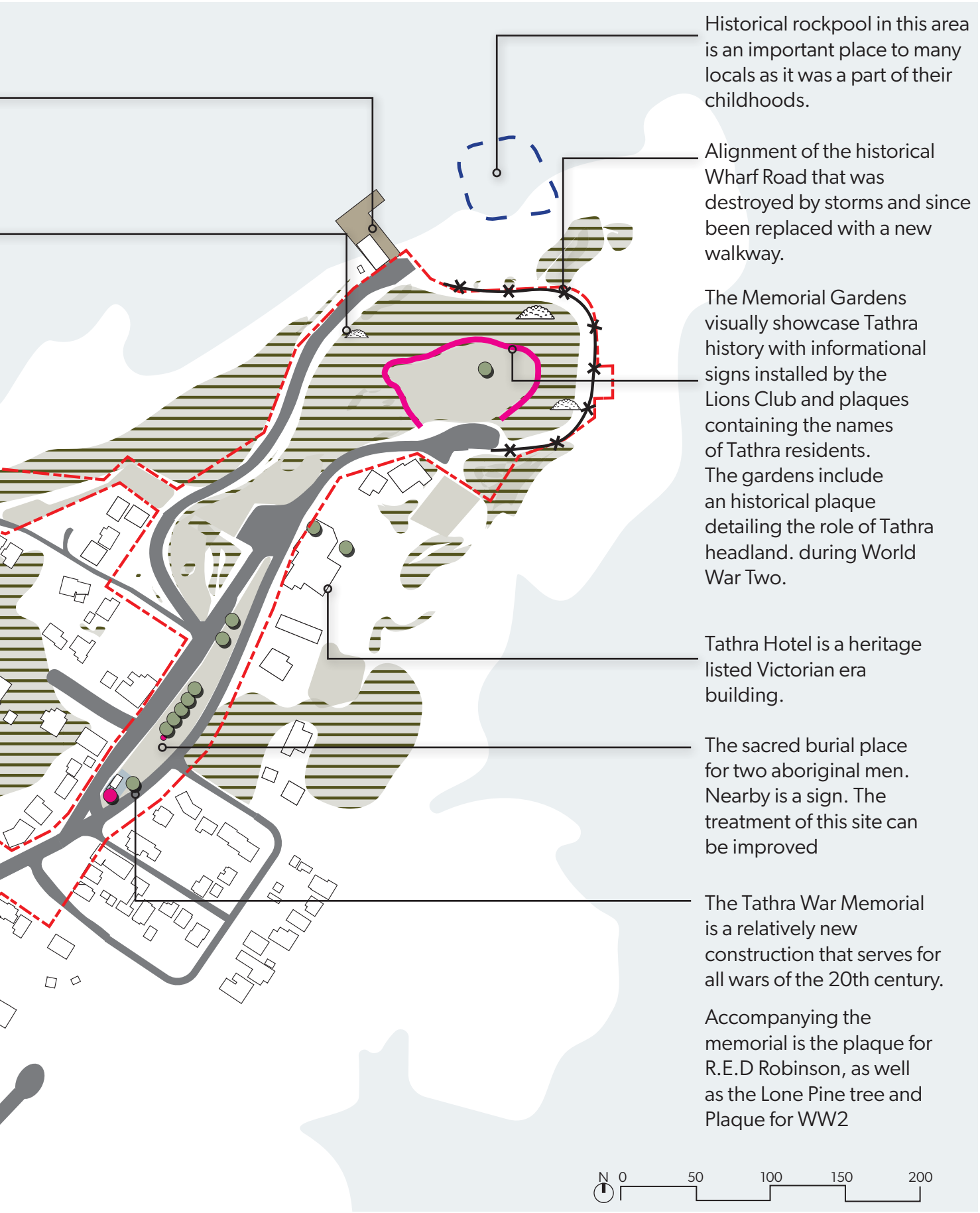
The Lion's Club memorial garden is respectful, certain amenity could be improved such as pedestrian links, materials and signage.

The burial site shows a great desire and opportunity to build the relationship with the local indigenous people.

Tathra Wharf is a registered AHIMS site. Restoration and renovation works are planned in the future.

Registered Midden sites containing shells, tools and potentially burial sites. Further middens are found along the headland but are not registered





Historical rockpool in this area is an important place to many locals as it was a part of their childhoods.

Alignment of the historical Wharf Road that was destroyed by storms and since been replaced with a new walkway.

The Memorial Gardens visually showcase Tathra history with informational signs installed by the Lions Club and plaques containing the names of Tathra residents. The gardens include an historical plaque detailing the role of Tathra headland. during World War Two.

Tathra Hotel is a heritage listed Victorian era building.

The sacred burial place for two aboriginal men. Nearby is a sign. The treatment of this site can be improved

The Tathra War Memorial is a relatively new construction that serves for all wars of the 20th century.

Accompanying the memorial is the plaque for R.E.D Robinson, as well as the Lone Pine tree and Plaque for WW2

N 0 50 100 150 200

4. COMMUNITY PROFILE

TATHRA - KALARU COMMUNITY PROFILE 2016

The Tathra-Kalaru district is a beautiful coastal area with a diverse range of people living there. This diverse make up of population will require the precinct plan to address a broad range of needs.

The 2016 census illustrated some of the key characteristics of the local population:

- Significantly higher percentages (17.2%) of empty nesters and retirees (60-69) live in Tathra compared to Regional NSW (13.1%)
- Significantly lower percentage of young people aged between 18-24 (4.7%) live in this area compared to greater Sydney area (7.9%).
- The area is appears to attract the older generations with people aged over 60 representing 32.1% of the town's population.

Residents and visitors are commonly seen around Tathra, with electric bikes becoming more prevalent. However cycling facilities around the town are scarce, and dedicated paths don't reach fully into the headland.

Source:

- https://profile.id.com.au/
- Local Strategic Planning Statement 2040 - Bega Valley Shire

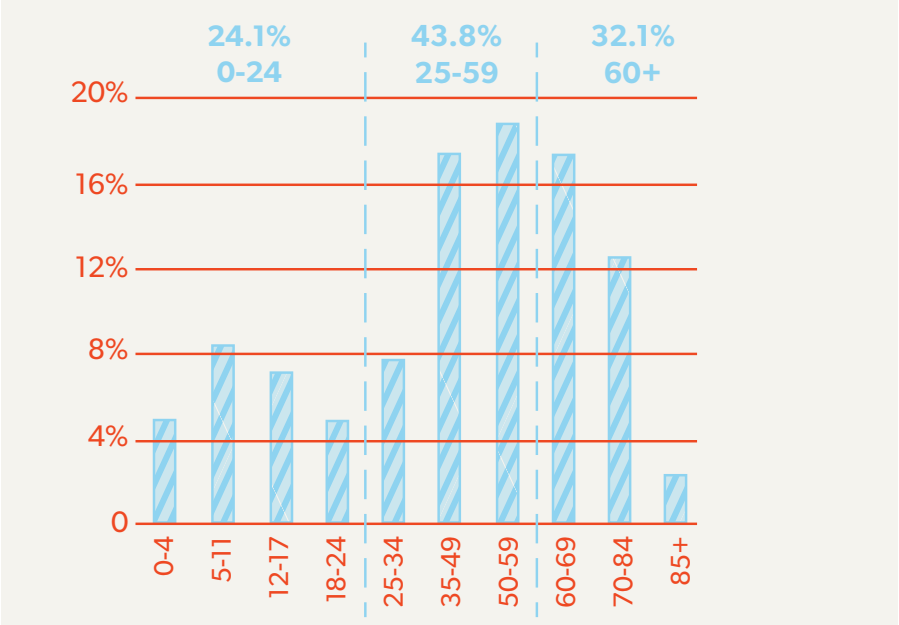
Estimated Resident Population for 2020 is **3,482**

More than **6 in 7** residents are people aged **under 70** years old

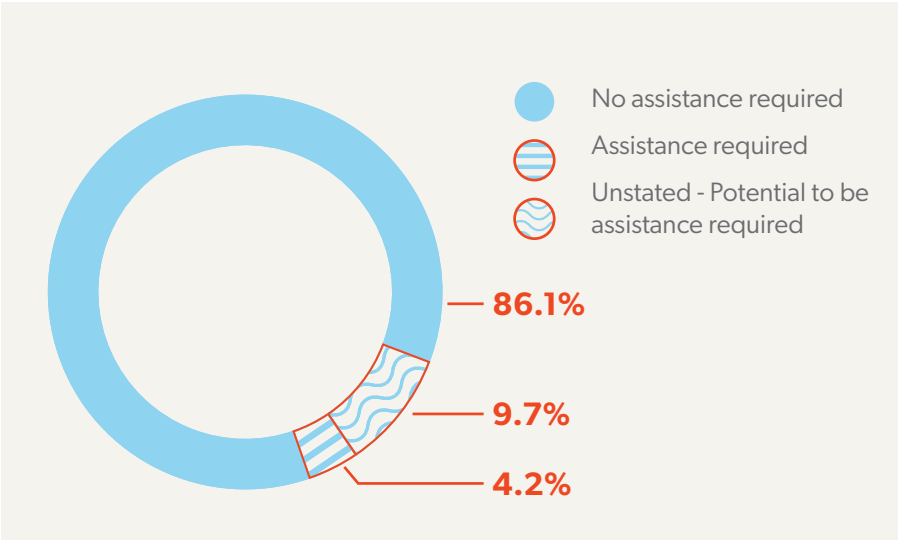
28.3% of households have atleast one child.

More than **1 in 7** residents are children aged **0-11** years.

Population Chart



Disability Status



In 2019, the Bega LGA served:

298K interstate visitors

235K intrastate visitors

(www.tra.gov.au)

In 2019, the tourism sector accounted for **$423 Million** being spent by visitors in day and overnight trips to Bega Valley region.
(www.tra.gov.au)

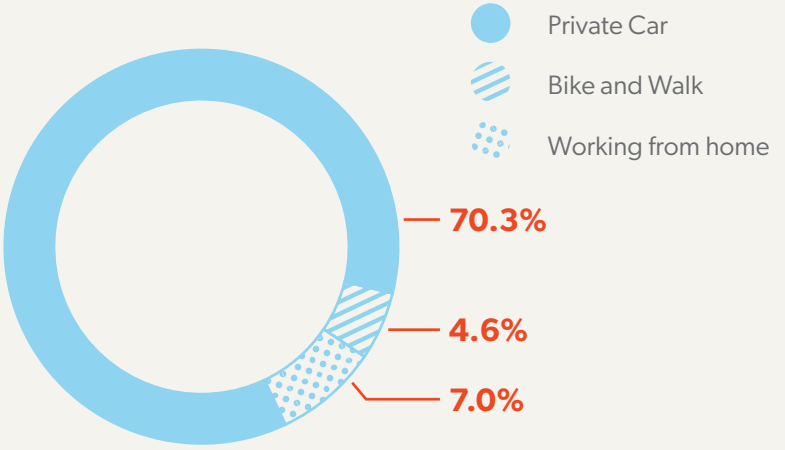
2.0% residents within Tathra-Kalaru are Aboriginal and Torres Strait Islander people.

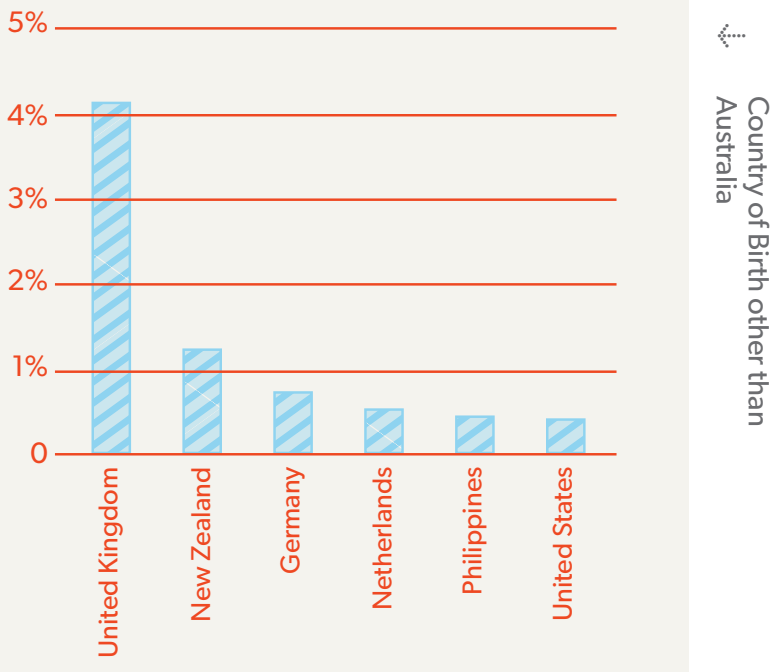
4.2% of residents declared they require assistance, with potential for 9.5% more unstated.

1 in 10 (10.7%) residents were born outside Australia from 6 different countries.

Tathra - Kalaru is a diverse precinct made of people from many backgrounds with a significant portion requiring assistance. Equal access and equity should be a priority.

Transport to work

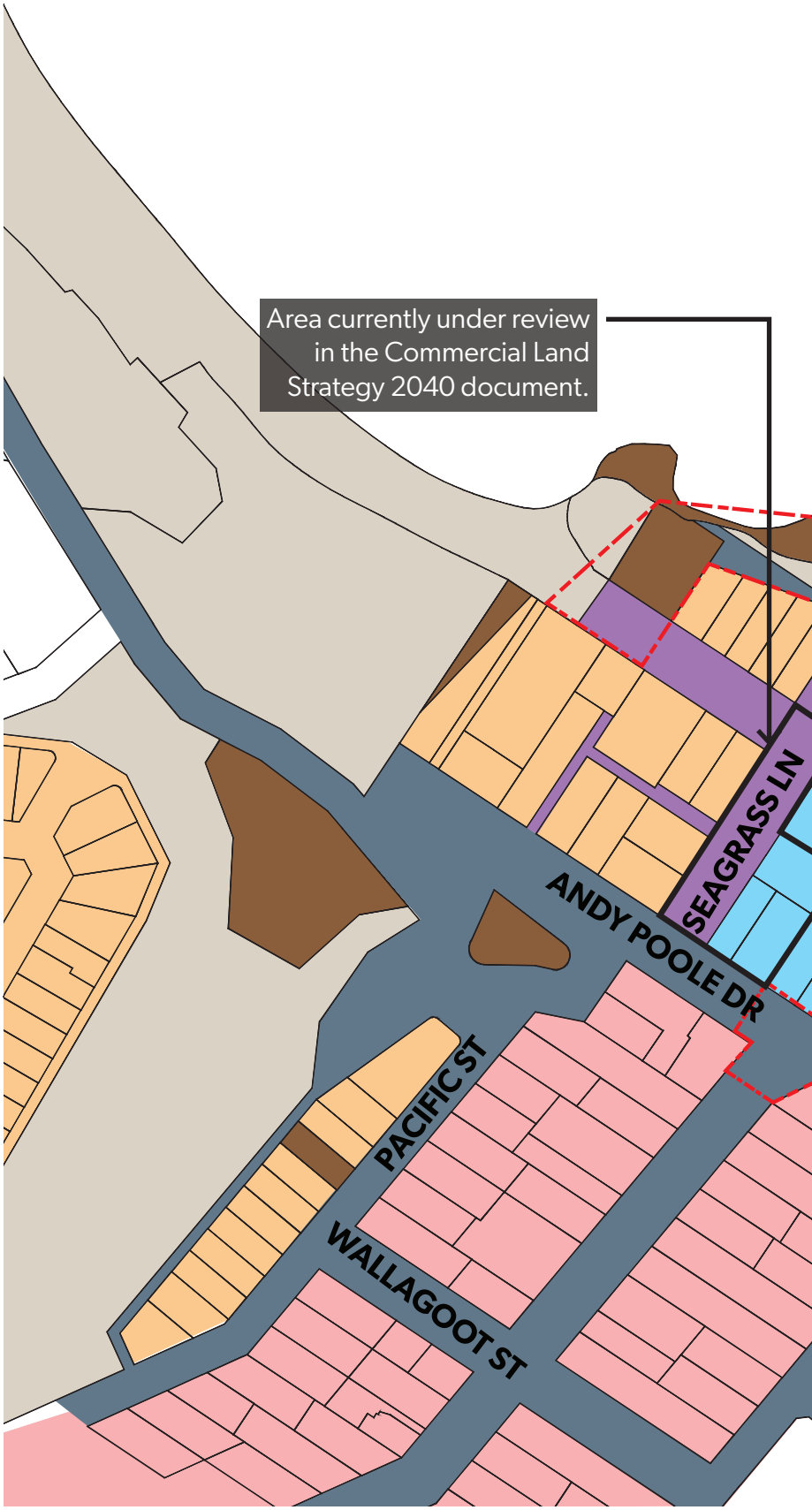




Source:

- https://profile.id.com.au/
- Local Strategic Planning Statement 2040 - Bega Valley Shire
- 2019 Tourism profile, Tourism Research Australia, www.tra.gov.au

5. LAND TENURE



LEGEND

- Site boundary
- Crown Land
- Crown Land managed by Bega Valley Shire Council
- Bega Valley Shire Council Land
- Crown Land Road Reserve
- Bega Valley Shire Council Road Reserve
- R2 - Low Density Residential
- R3 - Medium Density Residential
- B2 - Local Centre

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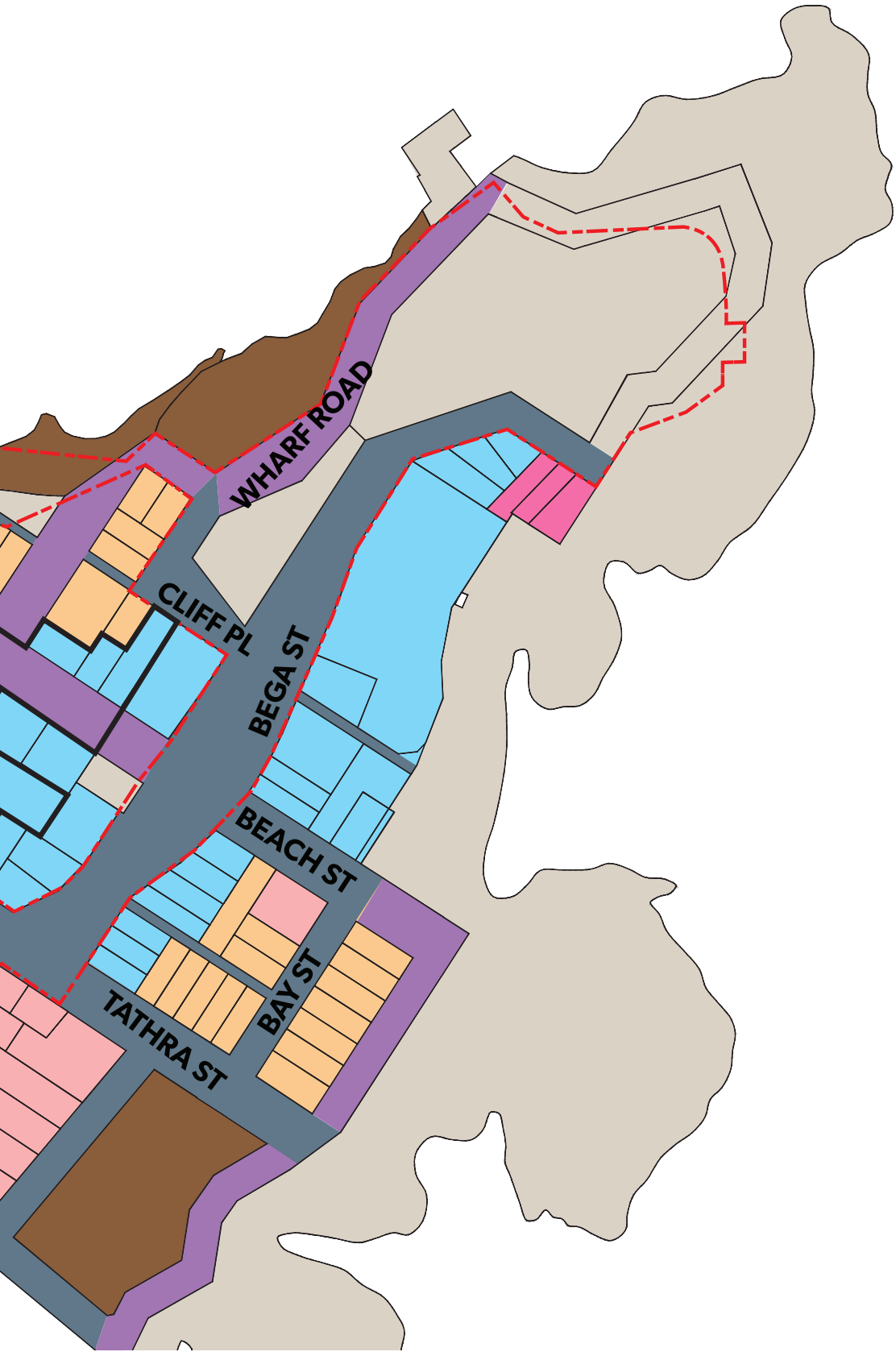
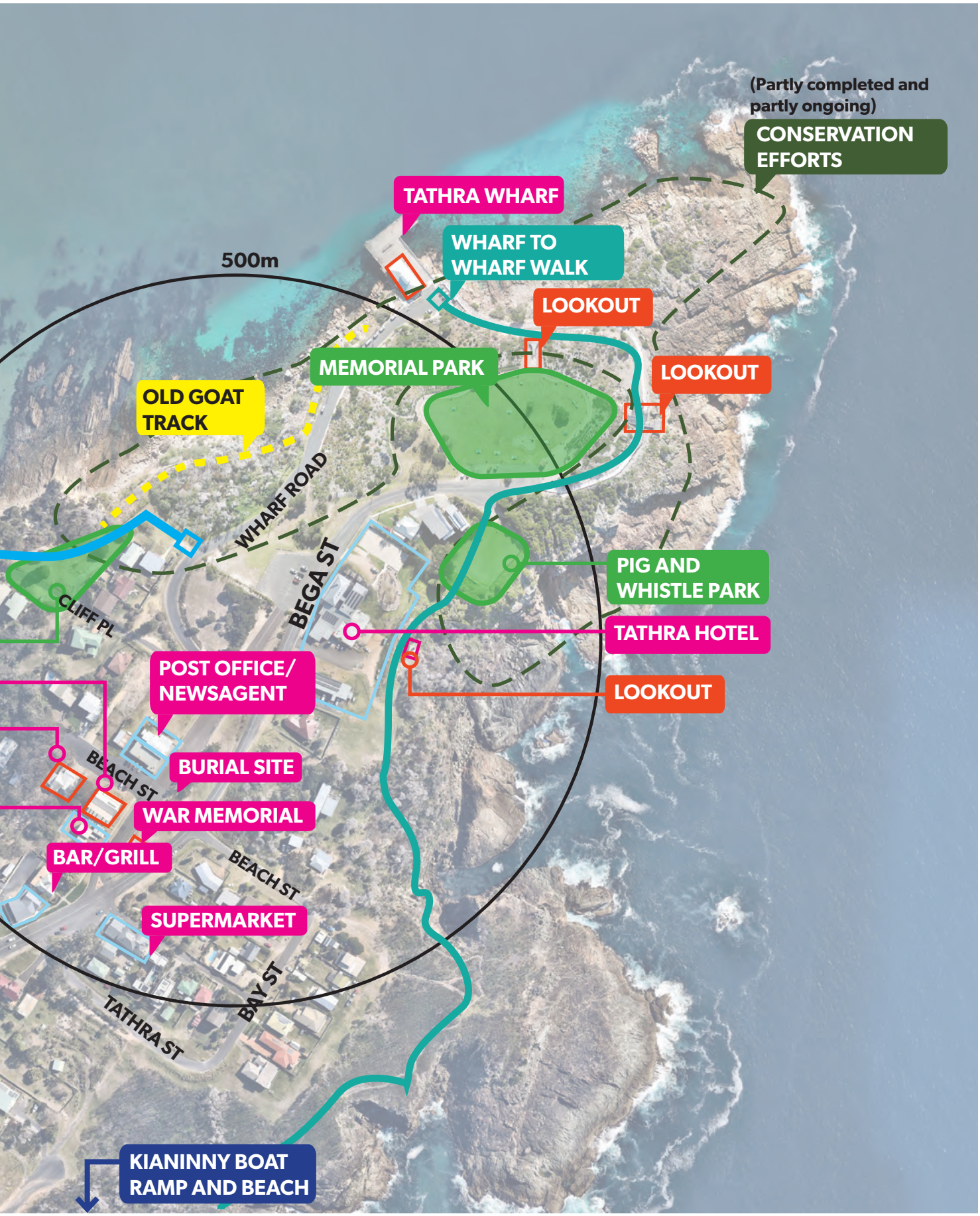

WHARF ROAD
CLIFF PL
BEGA ST
BEACH ST
BAY ST
TATHRA ST

6. DESTINATIONS AND ACTIVITIES


(Partly completed and partly ongoing)
CONSERVATION EFFORTS
TATHRA WHARF
WHARF TO WHARF WALK
500m
LOOKOUT
MEMORIAL PARK
LOOKOUT
OLD GOAT TRACK
WHARF ROAD
BEGA ST
PIG AND WHISTLE PARK
CLIFF PL
TATHRA HOTEL
LOOKOUT
POST OFFICE/ NEWSAGENT
BURIAL SITE
BEACH ST
WAR MEMORIAL
BAR/GRILL
BEACH ST
SUPERMARKET
BAY ST
TATHRA ST
KIANINNY BOAT RAMP AND BEACH

7. MOVEMENT NETWORK

PEDESTRIAN AND CYCLING

88% residents live and work in the Bega area

Public Transport	**0.3%**
Car	**71.2%**
Bike	**0.5%**
Walk	**4.0%**

Being a beautiful coastal destination, walking, running, swimming and cycling are popular recreational activities in this region, with community organised events and clubs, such Wharf to Waves Swim. In the surrounding area are great mountain bike tracks and within the site area is the start of the Wharf to Wharf Walk.

There is a very inconsistent coverage of footpaths and shared paths, with entire sections of the precinct being unserviced by accessible paths. There are no dedicated bike paths either on the road as separate lanes or as shared paths, which could benefit the visitors and residents greatly by both increasing wayfinding and safety.

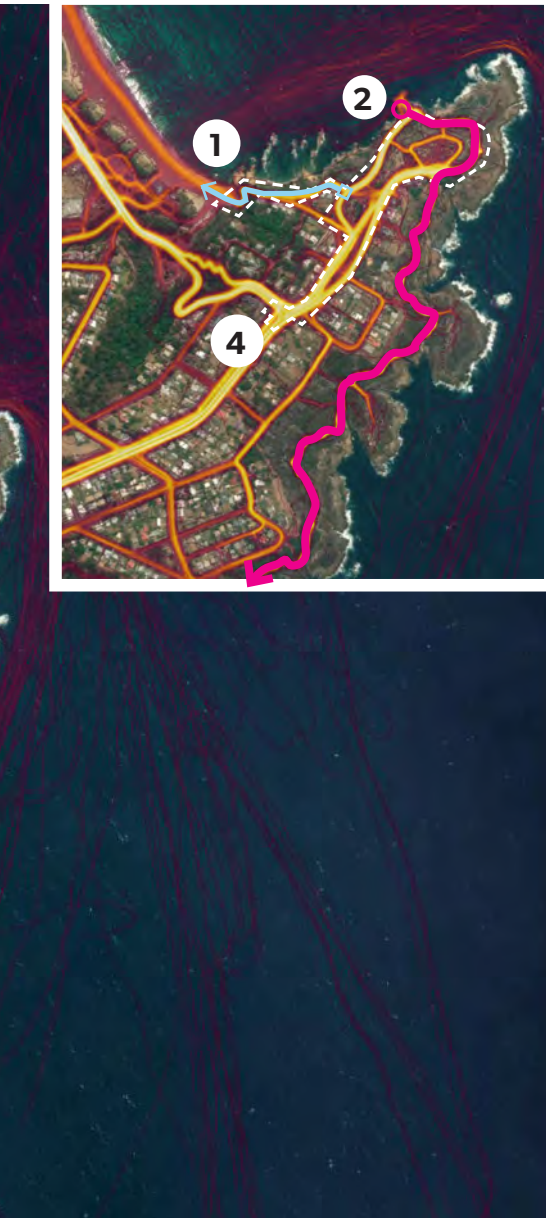
The Strava Heat Map illustrates intensive walking and cycling activities concentrated along Bega St and down Andy Poole Dr, irrespective of grading challenges.

Heat maps and trail locations

The Strava data also identifies traffic using the local bush tracks highlighting the assumption that these trails are popular assets to the town.

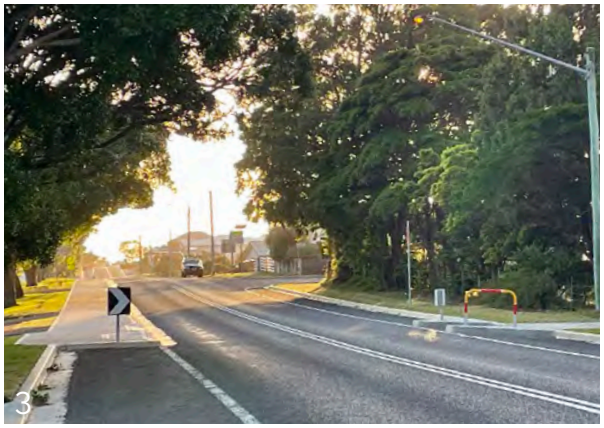
Poor path conditions, unsafe path unloading and unconnected paths are a priority for upgrading the town.

Wharf to Wharf trail - 27km
Trail to Tathra Beach
Mountain bike trail areas



Trail to Tathra Beach

Stairs to the Wharf with appropriate safety elements while retaining landscape character



Formal bike path outside Tathra that can be carried into the headland

Principle path crossing can be improved for safety

OPPORTUNITIES AND CONSTRAINTS

To achieve Objective 1 – "Improve active travel links to create a cycle friendly, walkable, and safe precinct", formalised pedestrian and cyclist infrastructure is required. The missing links identified in the plan below are potential opportunities to provide formal pedestrian and cyclist infrastructure.

A proposed change to Wharf Road's current use (for vehicle access) could be expanded or redefined to provide pedestrian and cycle movement.

Site wide treatments could include either independently or in combination:

- A separated shared path along and connecting Wharf Road, Bega Street, Service Lane, and Tathra Street. This could be on or off road.
- Separated cycle and walking paths (at similar locations to previous but provide separation between these modes).
- Handrails/guiderails for mobility impaired persons at key locations.
- Formalised cliffside walk and heightened awareness around Cliff Place through amended wayfinding.
- Improved stair facilities between the Tathra Memorial Park and Wharf Road better integration with Wharf Road
- Formal infrastructure along eastern cliffs to facilitate Wharf to Wharf between Tathra and Merimbula.
- Further pedestrian amenity including paths along Bega Street and Service Lane between the Beach Street shops and the headland.
- Providing crossing opportunities (zebra crossing, refuge islands) would improve connectivity and promote active travel by ensuring safe connectivity amongst vehicle traffic.
- Create a pedestrian friendly environment by converting Service Lane to a shared, low speed zone and direct the majority of through traffic along Bega Street.
- For the most part, the upper Tathra region has wide road reserves so there is room to allocate provisions for active travel.

Existing pedestrian and cycling facilities and infrastructure are limited across the precinct. Pedestrians are observed walking along grassed areas adjacent to most roads; using this area as proxy footpaths.

Formal walking infrastructure is limited to a section of Bega Street and through the local attractions including Tathra Memorial Gardens and the Tathra Headland Walk. While providing scenic connectivity, these locations do not provide suitable connectivity for the observed and anecdotal demand along locations such as Wharf Road and Bega Street fronting the Tathra Hotel and Beach Street shops along Service Lane.

There are no formal pedestrian crossings in the upper Tathra region which restricts active travel as it is unsafe with no priority given to pedestrians or cyclist on roads.

The bushland walkway along the western shore/cliffs is also hard to spot and is not entirely accessible, as well as not being an attractive option for most with it hidden behind private property. This is seen in the images below

Hard to spot trail to Tathra Beach as the private property imposes a feeling of trespassing.

The path is not connected back to the network, and conditions are failing.

PARKING

Parking within the study area is generally unrestricted along both sides of most roads. Parking along Wharf Road takes advantage of this and parked vehicles restrict the roads ability to accommodate two-way traffic.

Wharf Road has nine formalized parking bays including one DDA compliant bay.

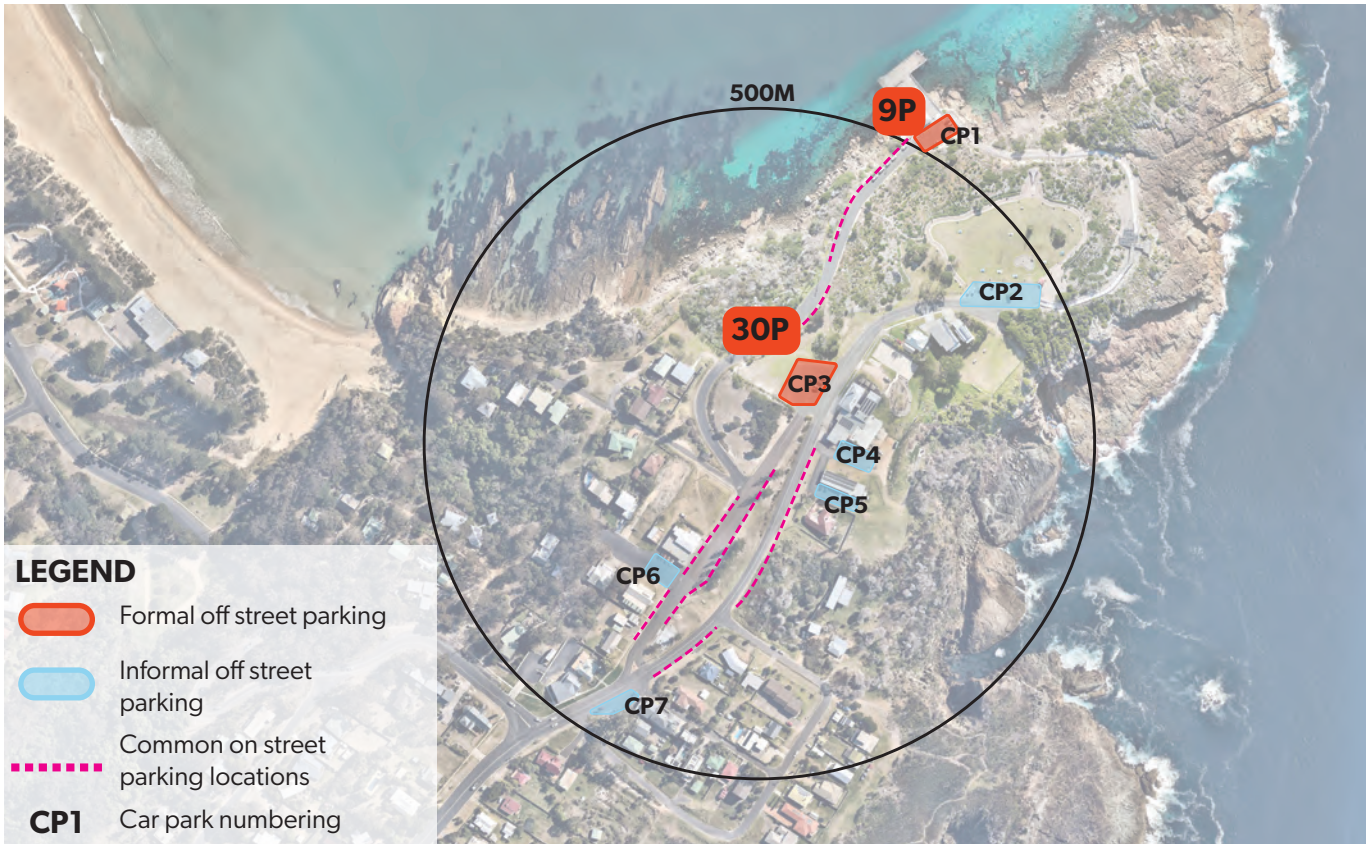
Multiple off-street parking areas have been identified through surveying Nearmap, attending a site visit and consulting with the

Bega Valley Shire Council. These locations are highlighted below. Most of these do not have formalised bays and vehicles park in any available area either on pavement or along grassed areas.

Off-street informal parking areas are seen with vehicles potentially blocking access for other users.

CP2 - The memorial carpark is not formalised with linemarking, allowing people to park wherever possible. This can be inefficient.

Carpark typologies and formal parking capacity (formal parking capacity)



OPPORTUNITIES AND CONSTRAINTS

Providing formalised parking would be a key opportunity for the entire precinct, and achieve Objective 3 is to *"Improve functionality of traffic circulation and carparking to create more efficient use of space"*. There is limited formal parking and vehicles are prone to blocking road and path access.

Providing formal parking at key areas (such as the off-street car parks and kerbsides outside of key commercial areas) as well as DDA compliant spaces, will limite the potential for obstructed access.

Formalised parking may include angled parking and will be in line with any road network reorientation.

Formalised parking uses space more efficiently and effectively redistributes space within the existing off-street parking areas.

Wharf Road would benefit significantly if parking were either restricted or removed entirely and consolidated at an alternate location. In line with the General Traffic Access opportunities, expanding CP3 may enhance one-way circulation and facilitate the closure of Wharf Road to general vehicles.

Most areas have informal parking with largely unrestricted access available. For example, non- formalised car parking is on site along the grass verges. This can create difficulties for internal circulation and turnaround.

At the Beach Street shops, vehicles generally park along kerbsides when the off-street parking is full. There are limited formal parking opportunities with vehicles parking at will.

PUBLIC TRANSPORT ACCESS

Public transport in the Tathra region is limited to bus facilities. Two bus routes service the area:

- 785/885 Bega to Tathra via Auckland St & SE Regional Hospital (Loop Service)
- 786/886 Tathra to Merimbula via Kalaru (this is a school services that services lower Tathra only)

The 785/885 services the Davidson Street stop enabling connection to the topside Tathra region. This route can also stop at the Post Office on request to driver, providing further connection if required.

OPPORTUNITIES AND CONSTRAINTS

Public transport demand is not expected to increase significantly with current services accommodate existing demand. Nevertheless, any reorganised circulation or upgrades at CP2 may assist in bus turnaround for buses accessing the Beach Street shops.

The area in general is constrained by its geometry without formal turnaround areas. Bus access to the wharf via Wharf Road would currently be impractical and nearly impossible with the existing parking arrangement and narrow width.

ROAD NETWORK

LOADING AND SERVICING ACCESS

Due to the general lack of traffic observed, low parking demand, and available parking

supply, it is likely that loading vehicles do not experience significant delays or difficulties parking and loading where and when required. The off-street parking areas located around commercial outlets provide suitable space for loading vehicles to operate. However, due to the lack of formalised parking in these areas, there may be times where a general vehicle parks in a spot that obstructs access for loading and service vehicles.

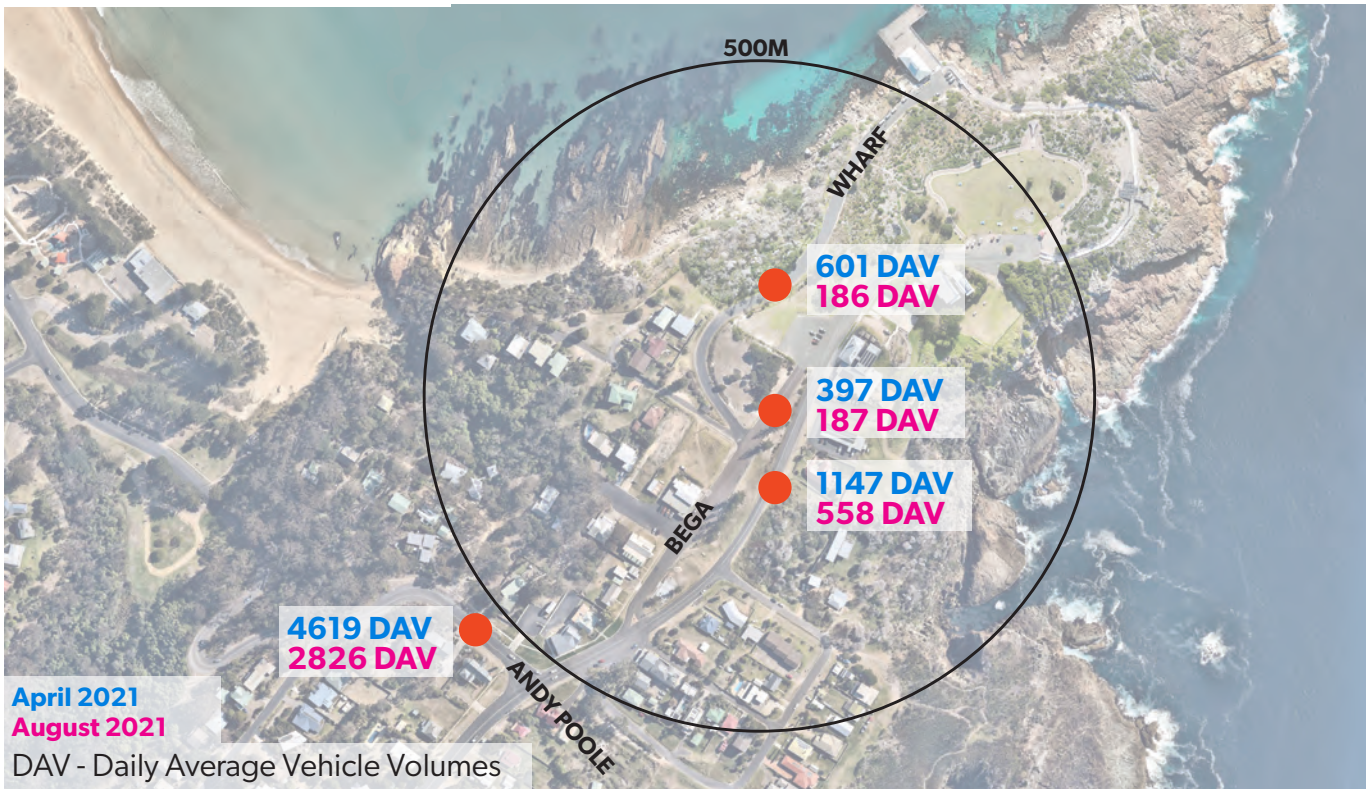
OPPORTUNITIES AND CONSTRAINTS

No formalised loading areas were evident across the site, with the exception of the Wharf. This is problematic as general vehicles are able to park in an area that obstructs access for loading and service vehicles. Therefore, in conjunction with formalising parking, there is an opportunity to provide formalised loading spaces and signage for delivery service vehicles. This would reduce the risk of general vehicles obstructing required loading access to commercial outlets.

GENERAL TRAFFIC ACCESS

Site observations show that the study area has low traffic volumes, comparatively. Considering the low traffic volumes, the operation and circulation in the study area is considered acceptable. Traffic counts from two separate dates were used to inform the study. They provided daily average traffic volumes during April, across a 15-day period, and August, across an 11-day period, 2021. It should be noted that the April counts were conducted over the Easter long weekend and were considered to reflect a typical holiday peak for the area. Additionally, August 2021 saw regional New South Wales in lockdown due to the COVID-19 pandemic which may have impacted the 11-day average with less residents out and about, and likely very few visitors in the area.

Traffic count locations and volumes - Shire Council Data



OPPORTUNITIES AND CONSTRAINTS

In order to achieve Objective 3 *"Improve functionality of traffic circulation and carparking to create more efficient use of space"*, opportunities to alter the current circulation were explored and are suggested below. These could be implemented individually or in combination.

1. Closure of Wharf Road to general vehicles, maintaining controlled access for mobility impaired persons and other authorised vehicles including but not limited to maintenance, emergency vehicles, delivery trucks, permit holders, and special events vehicles.

2. Creating a one-way loop in either direction integrating Bega Street and Wharf Road, looping around the existing car park opposite the Tathra Hotel. This scenario has the potential to both use and discount Service Lane.

3. Changing the function of Bega Street to local use only at the intersection with Service Lane and directing vehicles to travel along Service Lane and more directly align to the Wharf Road.

4. Creating a destination car park at CP3 by expanding this to provide more spaces, promoting 'park and walk' to the wharf down Wharf Road. This is in line with Wharf Road closure and one-way loop opportunities.

5. Traffic is currently able to access almost all of the headland. This is problematic particularly along Wharf Road which is narrow and has cars parked on either side. Vehicles and pedestrians interact in an informal setting causing undesired congestion which may result in significant injury. Turnaround facilities at Wharf Road (CP1) and the Tathra Memorial Garden (CP2) are also limited particularly when vehicles are parked at these locations.

SAFETY

Within the study area, there have been two crashes reported (based on data provided by Bega Valley Shire Council) capturing statistics across a 10-year period between 2010 and 2020. One involved a vehicle crashing off to the side of the road along Bega Street and the other a vehicle turning right in front of an oncoming vehicle which lead to collision.

Neither involved pedestrians, cyclists or significant casualty. Nevertheless, limitations to pedestrian and cyclist connectivity including crossings could potentially result in casualty crashes with more vulnerable modes of travel.

OPPORTUNITIES AND CONSTRAINTS

Even with minimal crash statistics across a significant period of time, there are still risks of incidents. The poor formal pedestrian and cyclist facilities including crossing opportunities result in a large majority of users traveling along the road. Integration with road traffic and a lack of formal separation between traffic and active travel is unsafe.

Similarly, vehicle and pedestrian interaction along Wharf Road can be concerning particularly during busy times due to its narrow nature, geotechnical instability and lack of formal pedestrian infrastructure. Limited formal parking and loading space at commercial areas can result in general vehicles obstructing key access.

With only two recorded crashes in the data provided between 2010 and 2020, significant works are unlikely to be required. Nevertheless, formalising parking, providing upgraded pedestrian and cyclist infrastructure including crossing facilities and potentially reorganising the road network and circulation would help prevent any significant crashes or incidents in the future.

Re-prioritising active travel along Wharf Road will likely have the biggest impact where a reduction in general traffic access and parking at this location will promote a calmer environment for safe pedestrian access.

INTERSECTION CHARACTERISTICS

An assessment of the existing intersections was undertaken. The intersection of Cliff Place, Wharf Street and Service Lane has poor sight distance, insufficient traffic lane width and insufficient signage and line marking. The elevation difference between the three subject roads pose difficulties to achieve compliance within their current state. There is an opportunity to improve this intersection.

The intersection at both the northern and southern junction of Bega Street and Service Lane has poor sight distance and vehicular storage for overtaking vehicles. Further analysis of the intersection is required upon formalisation of the subject road network. There is opportunity to improve this intersection.

PHYSICAL ROAD CHARACTERISTICS

An assessment of the existing road network has been undertaken throughout the study area and has been listed within the Existing Road Characteristics table.

The general existing road network has a 50 kilometre per hour speed limit. Bega Street, Tathra Street (towards lower Tathra) and Andy Poole Drive are classified as Local Access Roads with all other streets in the study are classed as Access Streets (using the road classification information provided from Bega Valley Shire Council).

The existing carriageway widths for Bega Street range between 6 to 10m. The most-part, Bega Street from the War Memorial park to the headland carpark is only 6m wide with no provision of a shoulder or kerb in parts.

The roadside swales in parts are contributing to pavement degradation issues where inadequate drainage provision is present.

BEGA STREET

Bega Street is currently listed as a Local Access road, with a 50 kilometre per hour speed limit, which should be retained.

The existing carriageway could be widened from 6m to 9m from the intersection of East Lane through to the carpark located at the headland.

Shoulder widenings could be provided and formalised on the eastern side of the road where barrier kerb and channel has not has been provided.

These shoulder widenings allow for informal/formal parallel parking opportunities, with signage and line marking to be upgraded to improve visibility to oncoming traffic to make them aware of the parking conditions. Footpaths could be upgraded and provided to sections of the verge where possible.
The verge on the western side adjoins the War Memorial park, which has a roadside grass-lined swale (informal and not suitably sized) leading to a steep vertical embankment approximately 1m from the edge of bitumen. This swale could be widened and additional culvert crossings provided to increase stormwater capacity.

Between Service Lane junction (hotel carpark) and the headland carpark, the grassed verge is also without kerb which dissipates down the headland embankment towards Wharf Road. The existing pavement condition is poor. A lack of on-street drainage is likely contributing to the deterioration of pavement condition and upgrades to this infrastructure would improve pavement service-life.

SERVICE LANE

The Service Lane is currently listed as a Local Access road, with a 50 kilometre per hour speed limit. There is opportunity to reduce the existing speed limit to 40 kilometers per hour. The existing carriageway width is constrained slightly at the south of the study area (War Memorial staircase at Bega Street intersection), although there is currently up to 9m width of existing pavement (in additional to the 8m wide required carriageway) at the shop frontages between Beach Street and Cliff Place in which can be readily converted into formalised carparking without the need to upgrade and widen pavements on the eastern side.

The large shoulder widenings (informal) can be formalised with kerb and channel or by landscaped swale treatments. Parking can be formalised and barriers installed on the eastern shoulder to limit vehicular access across the park from Service Lane into Bega Street.

Footpaths can be upgraded and installed. The existing pavement condition is poor and a lack of on-street drainage is contributing to the deterioration of pavement condition.

WHARF ROAD

Wharf Road is currently listed as a Local Access road, with a 50 kilometre per hour speed limit. There is opportunity to reduce the existing speed limit to 25 kilometers per hour or less depending on if the road is converted to a shared space. The existing carriageway width is approximately 6m wide and there is currently inadequate shoulder space for two-way traffic and parallel parking along the entirety of Wharf Street.

The guard rail to the east needs to be assessed and extended or treated within a structural landscape element to improve pedestrian and vehicular interaction. There is an opportunity for improved pedestrian access for the most-part of the road.

The verge on the eastern side has a roadside grass-lined swale (informal and not suitably sized) leading to a steep embankment approximately 1 to 3m from the edge of bitumen. It could be formalised with scour protection.

The eastern verge then transitions into layback kerb and channel with a concrete apron to the base of the cliff face separating Bega Street from Wharf Road. There should be a treatment adjoining the kerb and apron to reduce the likelihood of rock interaction with vehicles and pedestrians. Carparking along Wharf Road is a constraint and should be reduced or removed entirely with the exception of service vehicles and permit holders.

The existing pavement condition is poor and a lack of on-street drainage is contributing to the deterioration of pavement condition. Pavement upgrades should be included within any potential upgrades.

CLIFF PLACE

Cliff Street is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted. There is opportunity to reduce the existing speed limit to 25 kilometers per hour.

The existing carriageway width is approximately 3m and is constrained throughout be inadequate road reserve widths.

An unsealed informal carpark is located on the northern side near the Service Lane intersection, from a demolished hotel. This carpark has opportunity to be formalised under its existing condition but providing signage and marking bays with gravel line marking treatments.

No kerb and channel is located within the extent road reserve on Cliff Street, the width constraints would make it difficult to provide full layback kerb and channel, although a combination of roadside swales and layback kerb and channel could be introduced to enhance the functionality of the road and reduce overland stormwater flow issues.

The pedestrian access to Tathra beach is located at the western end of the road via a concrete footpath, no provision of footpath adjoining the road and there is a disconnect between the connections. Upgrades and linkages between the network and lighting shall provide increased functionality to the area.

Driveway crossings are to be upgraded to formalise local traffic within this area and to eliminate confusion between pedestrian activity. The existing pavement condition is poor and a lack of on-street drainage contributes to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

BEACH STREET

Beach Street is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted.

There is opportunity to reduce the existing speed limit to 25 kilometers per hour.

The existing carriageway width is currently up to 9m wider than required (in additional to the 6m wide required carriageway) in which it can be readily converted into formalised carparking without the need to upgrade and widen pavements on the eastern side.

The large shoulder widenings (informal) can be formalised with kerb and channel or by landscaped swale treatments. Footpaths can be upgraded and installed.

The existing pavement condition is poor and a lack of on-street drainage would contribute to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

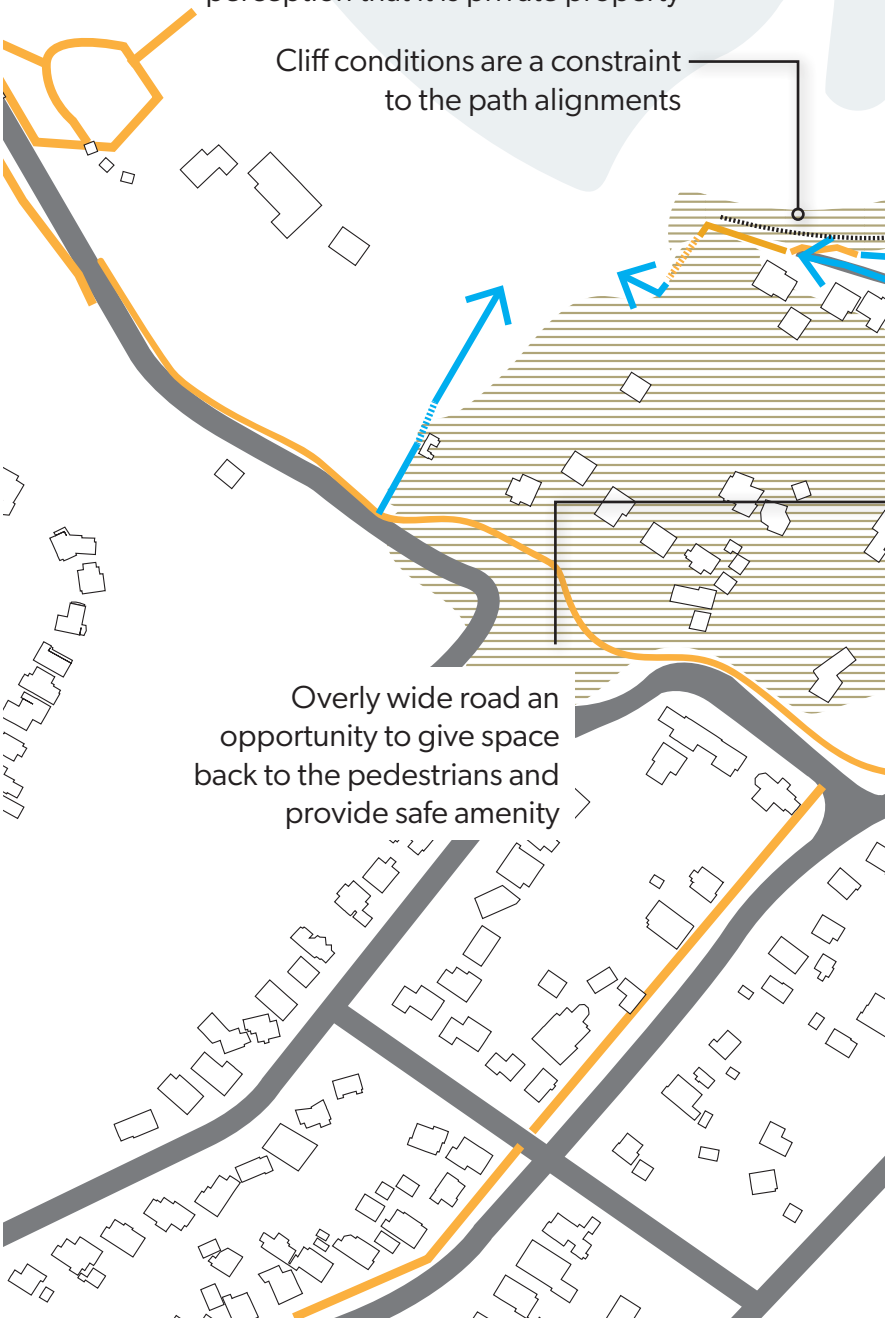
EXISTING ROAD CHARACTERISTICS

ROAD NAME	EXISTING ROAD TYPE	EXISTING TRAFFIC VOLUME (VPD)	EXISTING SPEED (KM/HR)	EXISTING ROAD WIDTH (M)	EXISTING PARKING PROVISIONS	EXISTING KERB	EXISTING FOOTPATH	EX. VERGE WIDTH (M)
BEGA ST	Local access	1147	50	6	NIL.	50% of western side Barrier K&C. No kerb east	25% of eastern side.	4.5-7
SERVICE LANE	Local access	397	50	7.5-17	Informal roadside	100% of eastern side Barrier K&C. No kerb west	50% of western side.	3.5-4.5
WHARF ROAD	Local access	601	50	6	Informal roadside	50% of eastern side Layback K&C. No kerb west	Nil	Nil
CLIFF PLACE	Local access	N/A	50	3.5	Informal roadside	Nil	25% of southern side.	4.5
BEACH STREET	Local access	N/A	50	15	Informal roadside	Nil	Nil.	6

OPTIMAL ROAD CHARACTERISTICS

ROAD NAME	ROAD TYPE	TRAFFIC VOLUME (VPD)	SPEED (KM/HR)	ROAD WIDTH (M)	PARKING PROVISIONS	KERB	FOOTPATH	VERGE WIDTH (M)
BEGA ST	Collector Street	3000	50	9	Carriageway Parking	Layback or barrier	1.2m on one side	3.5
SERVICE LANE	Local access	1000	40	8	Carriageway Parking	Layback or flush with grassed swale	1.2m on one side	3.5
WHARF ROAD	Access Street	150	25	6	Carriageway Parking	Layback or flush with grassed swale	1.2m on one side	4.5
CLIFF PLACE	Access Street	150	25	6	Carriageway Parking	Layback or flush with grassed swale	1.2m on one side	4.5
BEACH STREET	Access Street	150	25	6	Carriageway Parking	Layback or flush with grassed swale	1.2m on one side	4.5

MOVEMENT NETWORK PLAN



LEGEND

- Paved footpath
- Unpaved informal path
- Crossing / stair
- Unresolved path termination
- Over wide road
- Formal off-street Parking
- Informal off-street Parking
- Common on-street parking locations

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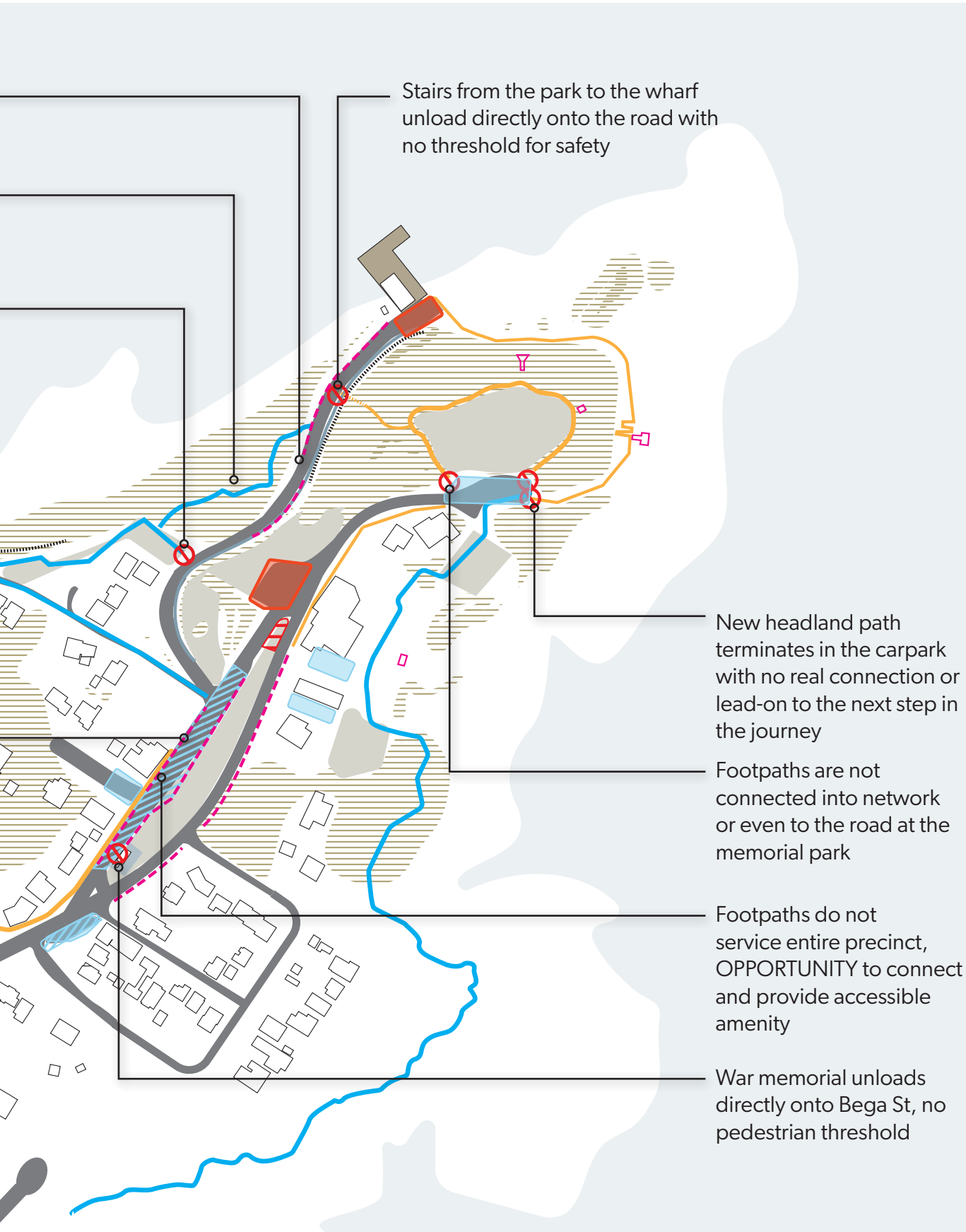

Stairs from the park to the wharf unload directly onto the road with no threshold for safety
New headland path terminates in the carpark with no real connection or lead-on to the next step in the journey
Footpaths are not connected into network or even to the road at the memorial park
Footpaths do not service entire precinct, OPPORTUNITY to connect and provide accessible amenity
War memorial unloads directly onto Bega St, no pedestrian threshold

8. LANDSCAPE ASSESSMENT

VEGETATION

The coastline and surrounding Tathra area contains a variety of vegetation as well as some important remnant vegetation. During the 2018 Bushfires, a major portion of this was lost, however, new vegetation is already quickly regrowing.

The Tathra foreshore management plan has identified and logged the core vegetation types in succinct areas:

- **Southern boundary of the Tathra Tourist Park to Tathra Headland:** The vegetation in this section has been highly modified and is characterised by large areas of open grass and plantings of largely non-indigenous shrubs and trees. Stands of Norfolk Pine at the landward edge of the dunes are significant visually to the town.
- **Tathra Headland to Kianinny Bay:** The vegetation occurring on the cliffs from the beach stairs around to Kianinny Bay generally comprises a narrow strip of Melaleuca armillaris (Giant Honey Myrtle). Acacia longifolia var sophore (Coastal Wattle), Westringia fruticosa (Coast Rosemary) and Casuarina stricta (Drooping She-oak). Other species including Acacia mearnsii (Late Black Wattle), Pittosporum undulatum (Sweet Pittosporum), A. implexa (Lightwood), Allocasuarina littoralis (Black She-oak) and various eucalypt species are present with increasing distance from the cliff edge.

FAUNA

A principle survey of the Tathra area identified the species that are likely to be found in the reserves. Included in the survey were several species that are listed as endangered or vulnerable on the Threatened Species Conservation Act 1995.

These include:

- Yellow-bellied Glider (Petaurus australis);
- Pied Oyster Catcher (Haematopus longirosrtis);
- Glossy Black Cockatoo (Calyptorhynchus lathami);
- Swift Parrot (Lathamus discolor);
- Hooded Plover (Charadrius rubicollis); and,
- Little Tern (Sterna albifrons).

It's important to maintain and construct areas of continuous bushland that can create the important wildlife corridors.

NORFOLK PINES

Norfolk Island Pine trees are a an staple to the landscape character of Tathra. Honey Suckle trees used to be the dominant tree along the beach front, however many died and were washed away. Willy Russel and Reg Taylor replaced the honey suckles with Norfolk pines in the 1940s.

THE LONE PINE

Next to the ANZAC memorial stands an Aleppo Pine Tree, ***Pinus brutia.*** This tree is grafted from the Original Lone Pine tree from Gallipoli. The tree in Tathra was planted in 1965 and is surrounded by a picket fence.

⚓ Endangered species included in the fauna survey

Yellow-bellied Glider

Pied Oyster Catcher

Glossy Black Cockatoo

Swift Parrot

The Norfolk Island pines are a strong characteristic for the place, but the overhead services detract from the quality

Sources:

- *Flora and Fauna Impact Assessment of the Tathra River Estate Stage 2, Prepared for Cuthbertson and Richards Sawmills Pty Ltd. (1993)*
- *Tathra Foreshore Reserves Plan on Management, 2002*
- *'Throwback to life at Tathra Beach', Bega District News, 2016*

The Lone Pine is a culturally important tree for Tathra and Bega, however the treatment of the tree is unattractive and could be improved.

Bushfire extents and significant trees

MICRO CLIMATE

Land temperatures may exceed

44 °C

in extreme heat conditions

As usual for headlands and highlands, the Tathra highland plain is dominated by coastal winds and climate. Being coastal, the average heat hovers around 15 degrees. However being the headland, where you are can completely change how much wind you're exposed to and whether you need a jumper. The cold snaps can get as low as -4.7 degrees.

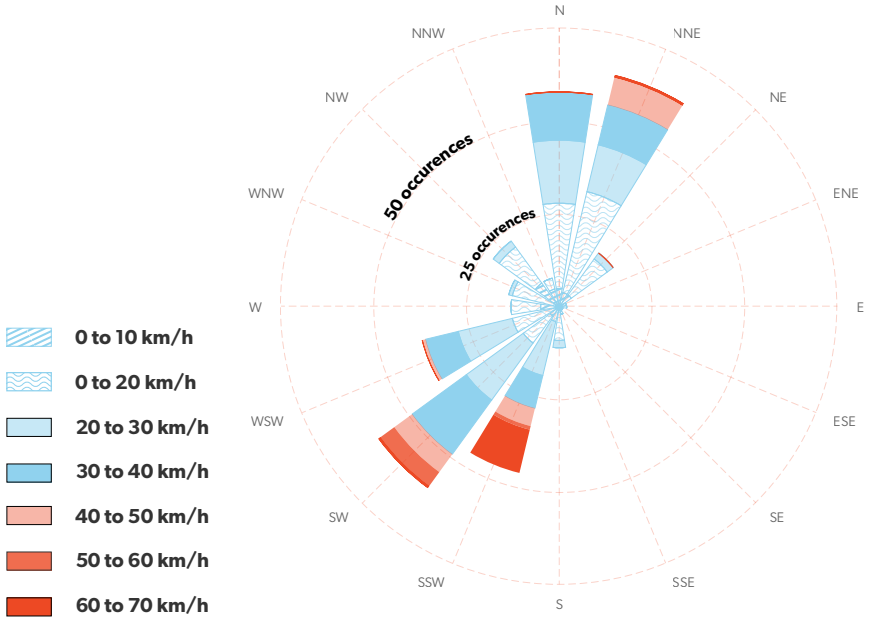
The entire reason why Tathra became a shipping destination and that the Wharf was built in that location was because of the shelter that the headland provides from the Eastern winds.

In recently years, the region has seen an increasing number of hot days and record-breaking high temperature.

Unfortunately the lost vegetation due to the bushfires would be contributing to the experienced heat on the hot days. Improving canopy coverage would be a great advantage to add shelter from the sun and the wind.

Source:

- https://www.willyweather.com.au/
- https://en.climate-data.org/oceania/australia/new-south-wales/tathra-12733/



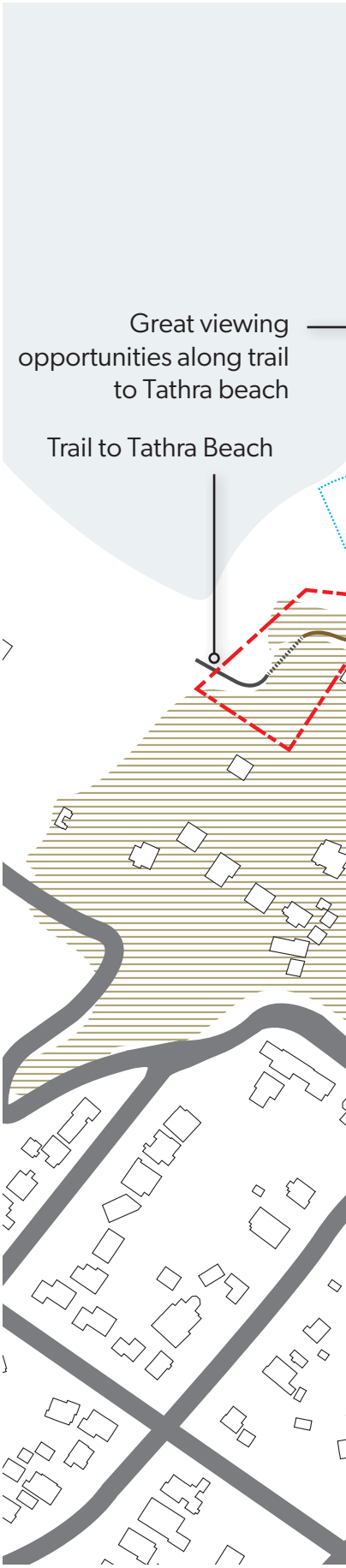
Average wind speed and direction for Tathra over 10 Years

Tathra can get swells that can reach the height of the wharf itself

VIEWPOINTS AND VIEWLINES

LEGEND

- View opportunities
- Viewing platforms
- Long site lines
- Obstructed views



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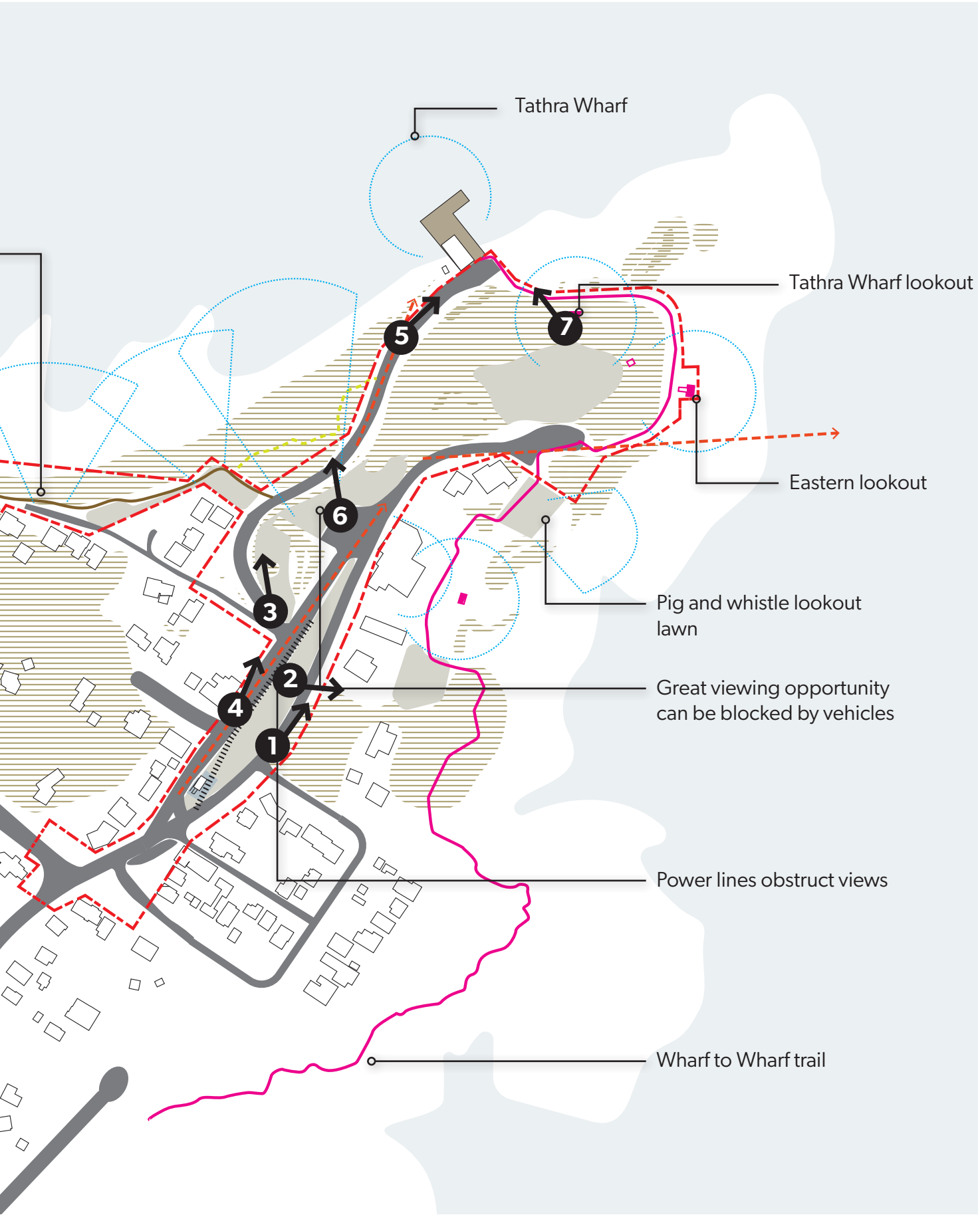

Tathra Wharf
Tathra Wharf lookout
Eastern lookout
Pig and whistle lookout lawn
Great viewing opportunity can be blocked by vehicles
Power lines obstruct views
Wharf to Wharf trail
1
2
3
4
5
6
7

LANDSCAPE CHARACTER

The landscape character of a coastal town like Tathra is unique and a valuable asset. A successful precinct plan will ascertain what these characters are and build on them, the objective is not to change the core values of the town.

Tathra is characterised by its wide roads, informal tracks and trails, the Norfolk Island Pines and classic coastal vegetation. The Victorian style architecture also has a strong effect on the experience of the place.

Suitable materials that tie into these elements are visibly more successful, they feel in place.

Whereas certain materials feel unnatural in the town, and make a person feel odd and out of place.

To call upon and improve these characteristics will create a cohesive space that's comfortable and wills the person to linger longer in places.

WILD

There is a wildness and rawness to this town and its surrounds. The ocean, bush and beach enable this place to be natural playground, a place of respite and multi-sensory indulgence.

Weaving through Tathra's coastal bush setting is a rugged bush aesthetic. Materials are aged and muted in colour and are of this place, just like the worn-down escarpments and cliff face.

Differences in micro climate and major changes in gradient mean that there is a diverse range of habitats to be understood and enjoyed.

THE VILLAGE FEELING

This seaside town has a layering of stories reflected within its built form that reflects its relaxed pace of life. Materials are weathered by the sea spray, wind and rain.

Locals gather daily on the footpath outside the shops to catch up on the daily news. This generates a community spirit.

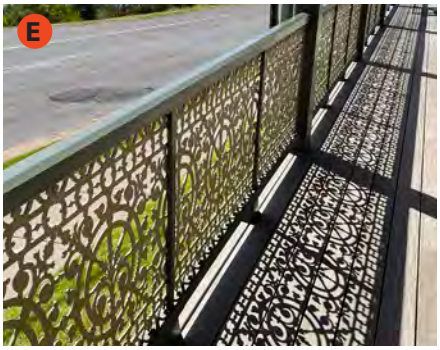
Memorials are well-kept as a sign of reverence to past stories. As are the broad swathes of lawn and parks. The roads and footpaths have a quick fix quality and are falling apart.

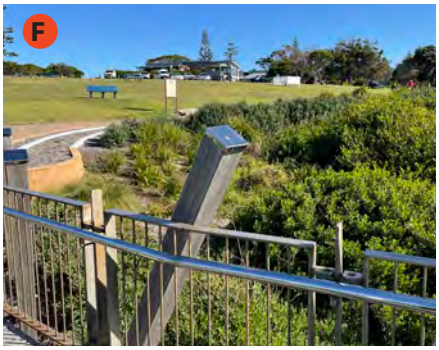
MATERIALITY

Being a historic coastal town, the natural landscape shines through with a palette of sandstone, coastal vegetation and naturally weathered timber.

The combination of these materials has been successful in a couple of places, in particular the newly renovated Tathra Hotel and Police Station.

Some materiality such as stainless steel and brick feel out of character with the coastal heritage.





OPENNESS

The sense of openness of the streets and parklands is characteristic of a typical coastal town. It speaks about the expansive ocean, and the harsh environment.

This is reflected in the wide roads of Bega Street as well as open space in front of the shops, enabling vast vistas to the ocean.

Future streetscapes will need to recognise and respond to open character while providing a safe and comfortable place for locals and visitors. Sizable grass verges promote comfortable walking along the roadside, however, it's not entirely accessible to everyone.

9. EXISTING TOPOGRAPHY AND STORMWATER

EXISTING TOPOGRAPHY

The full extent of the study area is comprised of road reserve and open space which has a combined area of approximately 65,325m2 (6.6 Ha). The existing topography of the study area varies significantly, partly due to the headland and associated cliff faces with considerable elevation changes across the site.

Bega Street slopes from approximately RL 49m to RL 28m, falling at approximately 4% from the highest point of the study area, the intersection of Andy Poole Drive and Bega Street, to the headland carpark.

The headland is the lowest part of the study area, with the headland carpark being approximately RL 28m and then elevation drop to the end of Wharf Road being RL7m.

EXISTING STORMWATER INFRASTRUCTURE

The existing stormwater strategy within the study area relies mainly on open swale drainage, culvert crossings to transverse under roads and eventually discharges directly to the ocean.

There is limited piped stormwater infrastructure and kerb and channel within the study area, utilising natural gullies to discharge stormwater runoff down the headlands. Due to the elevation, the study area is not impacted by flooding. The occurrence of localised kerbside buildup may occur during rainfall events and further investigations are required for isolated sections of stormwater infrastructure.

The study area can be divided into seven (7) main existing catchments that affect the main commercial area of Bega Street and Service Lane, with the other five of the seven discharging down along various points on Wharf Road and the headland at the end of Cliff Street near the beach track access. There are several smaller catchments on the fringe of the study area that fall away from the study area and flow is conveyed by external stormwater systems outside the scope of the study.

Adjacent the Wharf, flush kerb discharges a sag on the northern side of Wharf Road down the retaining structure, as per the staining evident in the left image below.

A stormwater pit and pipe network can also be found in the new Headland Shared Path, which discharges directly to the weathered rock natural surface, as per the right image below.

Typical stormwater treatment within the study area

Requirements for water quality treatment are limited due to the low amount of impervious area and appears to be handled primarily by utilising natural open channel flows.

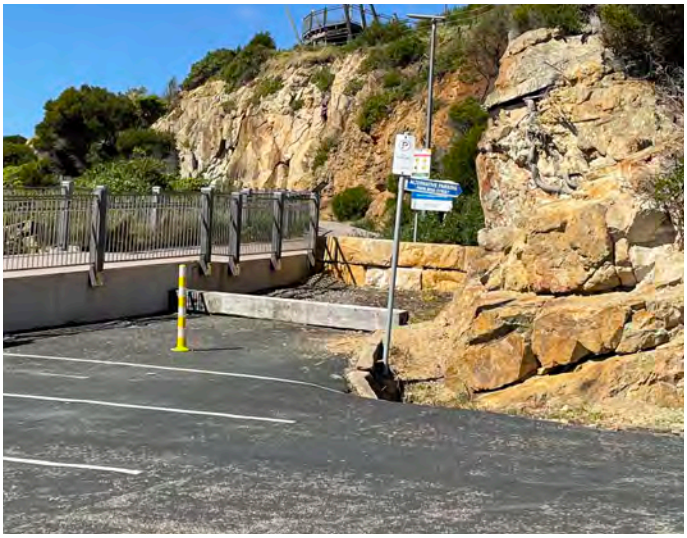
Throughout the study area there appears to be a lack of overall stormwater strategy, many of the existing drainage structures are in poor condition, with evidence of significant scour around inlets and cleaning of structures limited which can cause localised build-up in a large stormwater event or localised ponding post rainfall event.

PROPOSED STORMWATER IMPACTS

The proposed strategy for the Tathra Wharf and Headland Precinct Plan incorporates the following items that will impact the stormwater on the proposed site:

- Adjoining public road infrastructure (Bega Street, Service Lane, Wharf Road, Cliff Place);
- Sealed (impervious) car parks & associated pedestrian footpaths;
- Minor buildings and/or structures;
- Overland stormwater elements (Swales and spoon drains, etc);
- Underground stormwater infrastructure network; and
- Overland flow generated by the potential regrading of the surrounding areas.

Additional impervious area could potentially increase the stormwater runoff during rainfall events and may cause stormwater issues downstream of any upgrades. Typical increases in impervious area, such as buildings, car parks and roads are usually mitigated by capture in stormwater infrastructure and controlled via a pipe network to detention devices.



900x900 Box culvert draining the southern swale adjacent Wharf Road

Drainage pit and discharge to natural surface under path

PROPOSED STORMWATER CONTROLS

The Bega Valley Shire Council Development Engineering Standards – Development Design Specification D5 Stormwater Drainage Design is the primary document for regulating stormwater design in Tathra. In accordance with the Development Design Specification outlined, the additional stormwater runoff generated by the proposed works will need to be attenuated to prevent any downstream actionable nuisance.

Furthermore, the proposed road network requires stormwater overland flow controls to minimise runoff flowing across roads and reducing potential danger to vehicles and pedestrians. The overland flow paths, where impacted by the road network, will be appropriately redirected and controlled by swales, spoon drains, pit and pipe infrastructure and engineered retention/detention structures.

A stormwater network in line with the existing strategy is recommended but will need to be constructed in accordance with BVSC requirements and WSUD principles implemented where possible. It is recommended that all proposed culverts are sized to allow for 1% AEP storm events, to prevent inundation of local access roads. Appropriate culvert sizing shall assist with preventing damage to the road surface and open space areas. Culvert sizing should be reviewed at the detailed design stage as grades and layouts are refined.

The masterplan shall utilise grassed swales where possible, primarily adjacent to the proposed access roads, as naturally vegetated engineered controls to the stormwater overland flow. These swales will guide the stormwater runoff to appropriate culverts crossings under the road network. Grassed swales also provide water quality treatment contributions to the stormwater runoff.

Piped infrastructure may need to be utilised where pedestrian movements are prioritized adjacent roadways, limiting the use of grassed swales in these areas. Kerb and channel will be introduced to control runoff.

GEOTECHNICAL REVIEW

The study undertaken by ACT Geotechnical Engineers Pty Ltd, dated 25 June 2019, raises several risks regarding the slope stability of Wharf Road. There are three main hazards identified, which are as follows:

- Rock boulder dislodgement;
- Cave collapse under Wharf Road; and
- Erosion of drainage path.

Each of these items has an associated risk assessment on the likelihood and consequences of failures. Rock boulder dislodgement resulting in slope instability beneath Wharf Road is assessed as "Unlikely". The rocks are noted as strong with widely spaced joints, reducing the likelihood of failure.

Cave collapse under Wharf Road is noted as "Possible" and has a higher classification of consequences with "Moderate to High" risk level assigned. As a potentially high risk, a treatment has been suggested which would involve mortar application to the cave induced by wave action over long periods of time. This treatment has been noted to have negative visual and cultural heritage impacts.

Lastly, the report notes that stormwater drainage is discharged via culvert crossings below Wharf Road and onto the rockface and has caused notable erosion. A specific location, approximately 43m from the Wharf, has been noted, but there are multiple discharge locations along Wharf Road (Four in total). The report notes, in section 5.2 Site Drainage, it is possible that during periods of rainfall, surface water could enter the rock mass along the slightly open joints and exit along the face. Over time, this could assist in the dislodgement of rock. The treatment recommendations also refer to construction of an appropriately sized open concrete drain to discharge the flow and reduce erosion impacts. However, this treatment will also result in visual and heritage impacts to the Headland.

10. UTILITIES

EXISTING WATER

Water services are available throughout the study area, including to the wharf. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed in the most-part in 1954, with isolated sections being installed more recently to service isolated developments. The majority of the water mains are Asbestos Cement (AC).

OPPORTUNITIES AND CONSTRAINTS

Constraints relating to any proposed works within the study area would include locating, potholing and identifying the adequacy of the existing water mains.

Fire hydrants

Upon investigation of the water reticulation network, if water mains are relocated within the existing locations then hydrants shall be reinstated to suit. If alignments are altered then hydrant provision is to be assigned as per required of Bega Valley Shire Council and Water Services Association Australia.

Open space water supply

Currently there is internal water supply lines servicing the open space areas within the headland and the park at the War Memorial. If additional amenities are required to be serviced an extension from existing or new individually metered domestic lines can be provided to service where required. The supply will be installed in accordance with Bega Valley Shire Council Water, Water Services Association Australia and AS3500 requirements with water meter and boundary backflow prevention provided at the point of connection (If required).

EXISTING SEWER

Sewer services are available throughout the study area. It is assumed that the existing sewer network is currently meeting servicing requirements. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed within 1976, with isolated sections being installed more recently to service isolated developments. The sewer reticulation network is arranged in two (2) notable portions, being east and west of Bega Street.

The Wharf is currently serviced by a pressure main due to the elevation change. The pressure main is positioned in the western verge of Wharf Road and connects to the western portion of the reticulation network at the pedestrian access track.

OPPORTUNITIES AND CONSTRAINTS

Sewer services are available throughout the study area. It is assumed that the existing sewer network is currently meeting servicing requirements. Due to its age, any upgrades would require further network assessment with infrastructure approaching the end of its service-life.

Constraints relating to any proposed works within the study area would include the following locating, potholing and identifying the adequacy of the existing sewer system in the event of any pavement upgrades or general works requirements compaction or excavation.

If there is needs for additional amenities buildings to be provided with open space areas north of Cliff Place there would need to be provision of a localised onsite treatment to treat and dispose of waste locally, discussions with the local authorities will be required to determine the extent of treatment required to satisfy local conditions. There is possible opportunity to connect to existing sewer reticulation network with a road crossing of Bega Street and further investigation.

ELECTRICITY

Existing overhead Low Voltage (LV) power lines have been sighted within the subject study area during the desktop review. Based on the DBYD information there are existing overhead power lines present throughout the study area. LV underground power lines are currently present on site in isolated locations on the western side of Bega Street. No HV underground/ aboveground power is currently present within the study area that have been identified.

Overhead lines cross sporadically across the traffic lanes of Bega Street and the Service Lane within the study area and will need to be addressed accordingly if works are to be undertaken beneath or around. Public street lighting,is limited throughout the study area, with most paths and streets identified with little to no provision. Bega Street and the Service Lane have isolated locations with pole mounted lamps and sporadic pole mounted lamp is present at the start of Wharf Road.

It is assumed that none of the lamps are LED (To be confirmed upon further assessment).

Existing power/light poles locations within the road reserve appear to be within clear zones of vehicular traffic and will need to be addressed with any proposed pavement upgrades.

OPPORTUNITIES AND CONSTRAINTS

Relocation of existing services

It has been established by Bega Valley Shire Council that the above ground electrical infrastructure is a visual obstruction to the landscape. There is opportunity to look at upgrading the existing electrical infrastructure in its entirety to achieve an underground network if desired. If the proposed extent of works impacts any isolated locations of the existing power/light poles there would be opportunity to underground the impacted part of the electrical overhead infrastructure as part of the works.

Assess maximum demand

It is assumed that the existing electrical infrastructure demands are being serviced within the study area and any upgrades to individual properties are outside of the scope of this study.

Low Voltage Supply

The extension of lighting to the full extent of the study area, including feature lighting and various smart technology initiatives such as electric vehicle/bicycle charging stations may requires upgrades to existing LV infrastructure in the current servicing area.

Obtrusive Lighting

Obtrusive lighting to neighboring properties and light spill into the night sky and the surrounding environment will be controlled through careful selection of luminaire fitting

GAS

There is no current gas supply to the study area. Any proposed gas services would be out of scope at this time.

COMMUNICATIONS

Based on the DBYD plans it appears that underground telecommunication cabling is located throughout the study area. Connections will be available to support the proposed upgrades and smart infrastructure. A network of conduits and pits are located along the road and pathway verge.

OPPORTUNITIES AND CONSTRAINTS

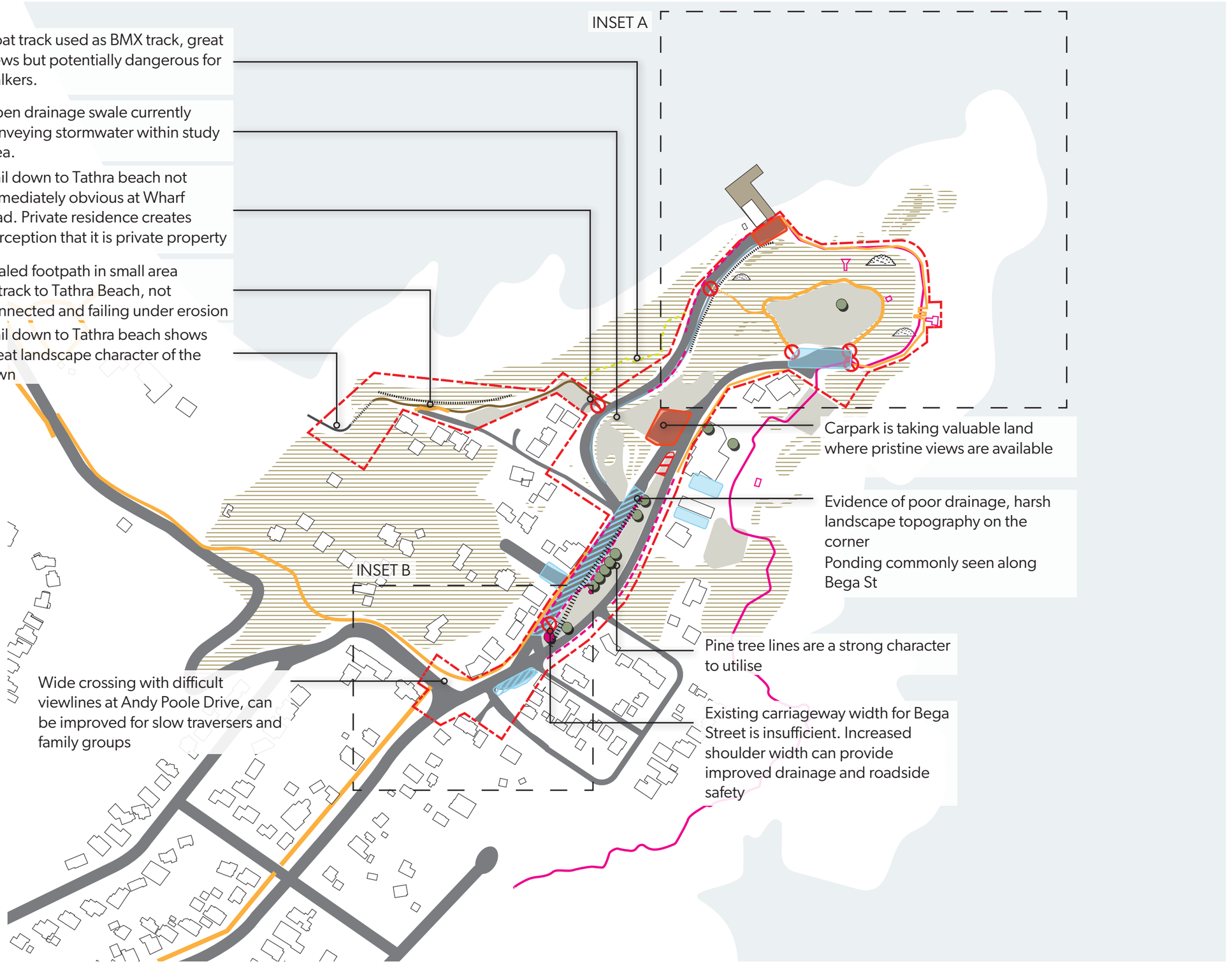
Relocation of existing services

Relocation of existing services to make way for proposed works may be required as underground telecommunications services are present within the study area based on the DBYD plans. It is assumed the existing cover requirements for existing conduits and any new pavement works will be assessed by a case by case scenario.

Public Wi-fi

Where required external grade WIFI modules can be mounted onto fixed buildings and onto the road and pathway lighting poles. This will require separate communications conduits to be installed to the relevant lighting poles within public spaces.

11. SITE ANALYSIS PLAN

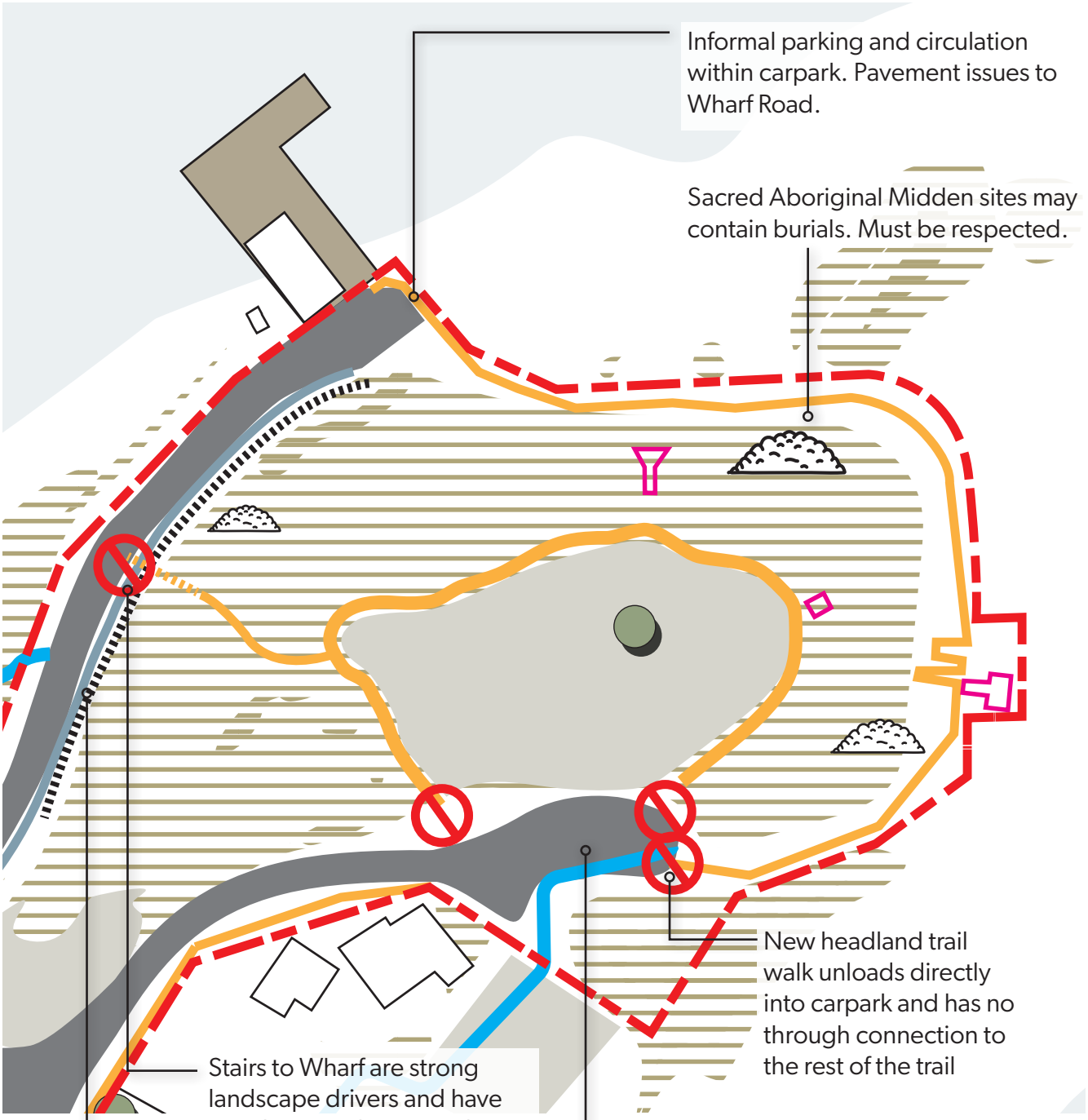


LEGEND

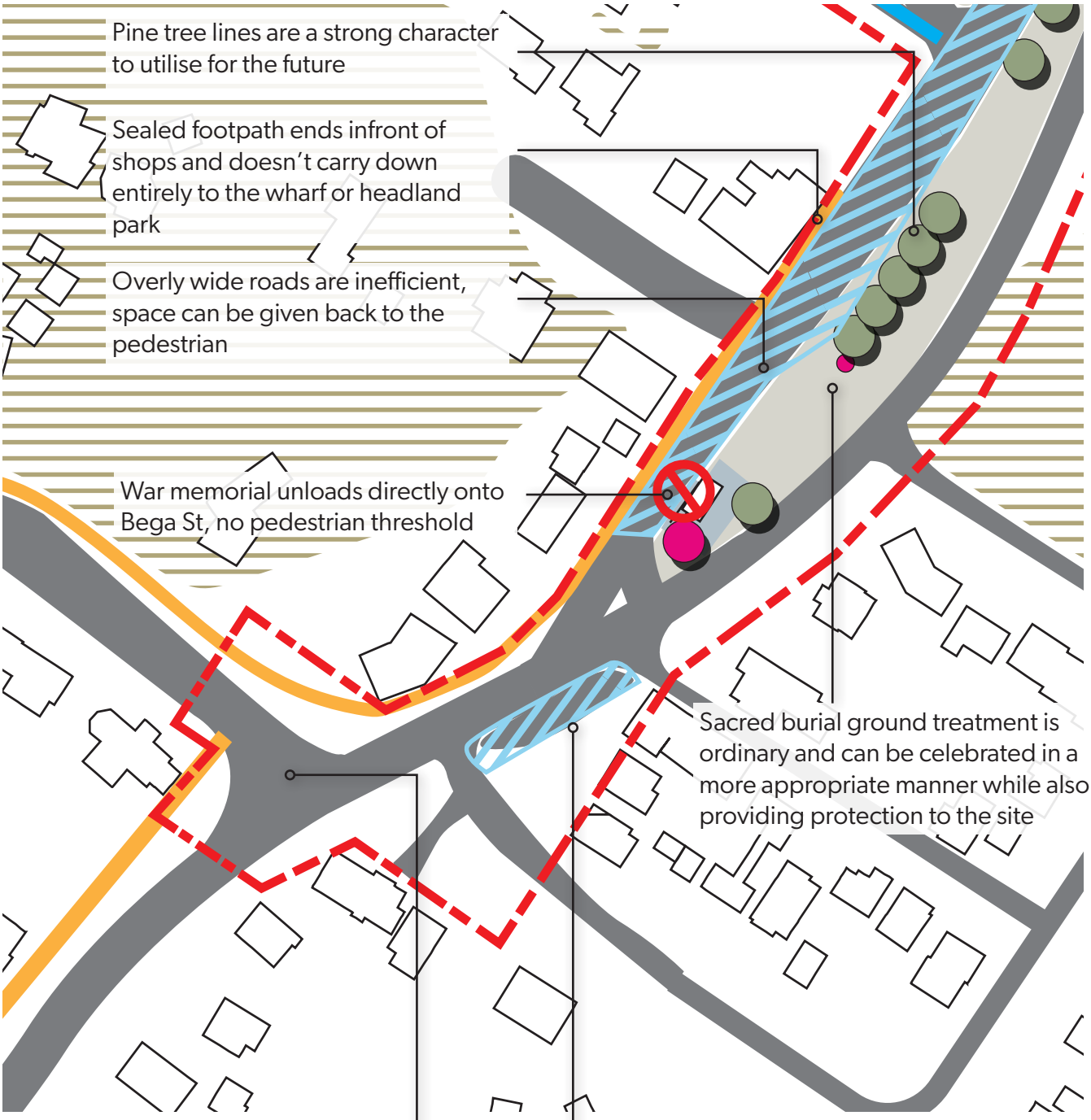
- Paved footpath
- Unpaved informal path
- Crossing / stair
- Unresolved path termination
- Over wide road
- Formal off-street Parking
- Informal off-street Parking
- Common on-street parking locations
- Powerlines obstructing views

N 0 50 100 150 200

INSET A


Informal parking and circulation within carpark. Pavement issues to Wharf Road.
Sacred Aboriginal Midden sites may contain burials. Must be respected.
New headland trail walk unloads directly into carpark and has no through connection to the rest of the trail
Informal parking and circulation within carpark. Pavement issues at Headland
Stairs to Wharf are strong landscape drivers and have good access, however they unload directly onto Wharf Road with no threshold for safety.
Swale drainage and weather events are causing erosion to the cliff-face. Opportunity to pull road away from the face and gain more space for the pedestrian.
N
0
50
100

INSET B



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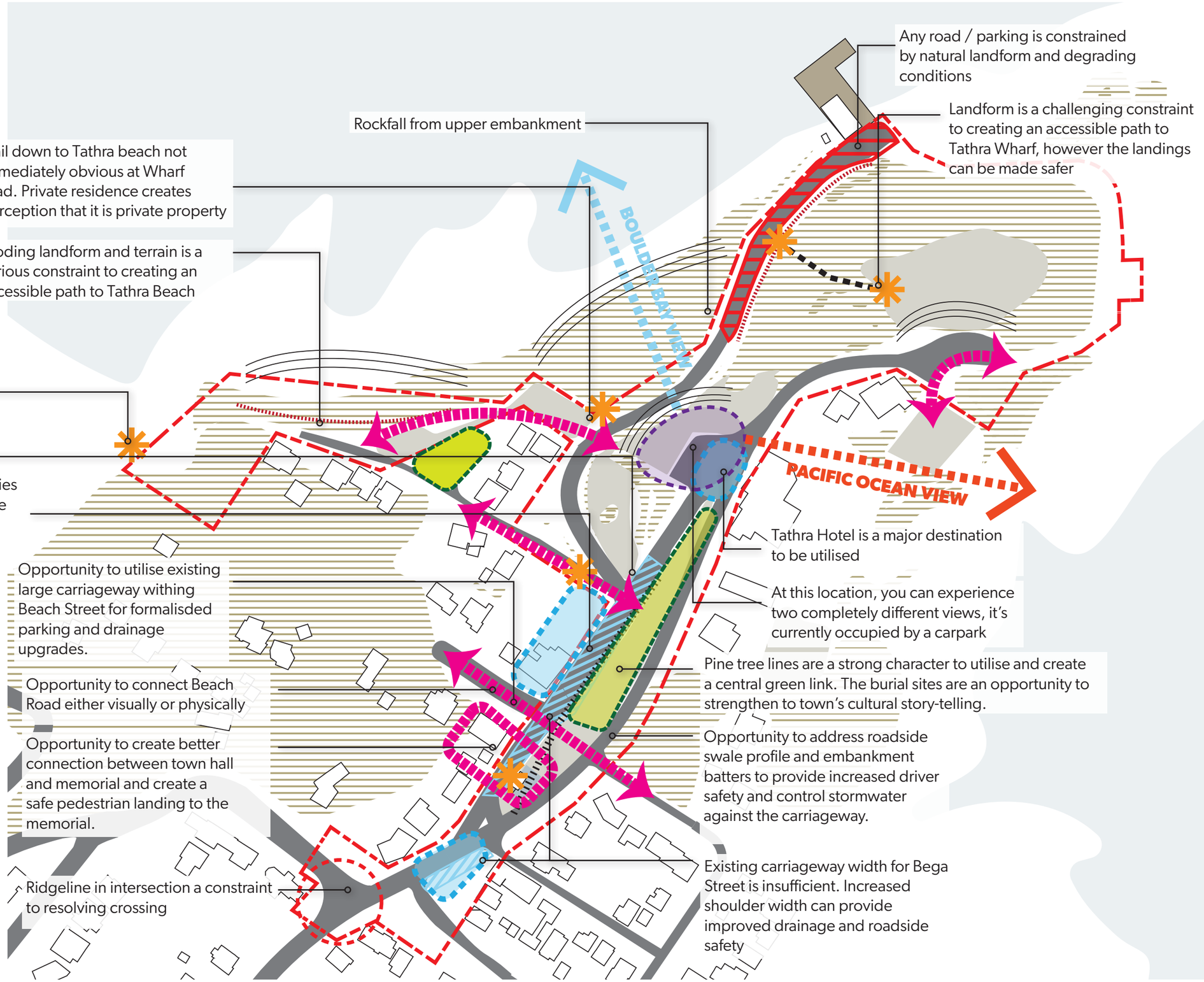
12. OPPORTUNITIES AND CONSTRAINTS PLAN



Any road / parking is constrained by natural landform and degrading conditions

Landform is a challenging constraint to creating an accessible path to Tathra Wharf, however the landings can be made safer

Rockfall from upper embankment

Trail down to Tathra beach not immediately obvious at Wharf road. Private residence creates perception that it is private property

Eroding landform and terrain is a serious constraint to creating an accessible path to Tathra Beach

Wayfinding opportunity to introduce the Headland better from the Tathra Beach

Cliff Place intersection has access and sight constraints

Formalisation for parking and pedestrian facilities within the existing wide carriageway on Service Lane allows for increase driver and pedestrian safety.

Tathra Hotel is a major destination to be utilised

At this location, you can experience two completely different views, it's currently occupied by a carpark

Opportunity to utilise existing large carriageway withing Beach Street for formalisded parking and drainage upgrades.

Pine tree lines are a strong character to utilise and create a central green link. The burial sites are an opportunity to strengthen to town's cultural story-telling.

Opportunity to connect Beach Road either visually or physically

Opportunity to create better connection between town hall and memorial and create a safe pedestrian landing to the memorial.

Opportunity to address roadside swale profile and embankment batters to provide increased driver safety and control stormwater against the carriageway.

Existing carriageway width for Bega Street is insufficient. Increased shoulder width can provide improved drainage and roadside safety

Ridgeline in intersection a constraint to resolving crossing

LEGEND

- Connection opportunity
- Greenlink opportunity
- Business frontage activations
- Degraded landform constraint
- Over wide road
- Vertical viewpoints
- Powerlines obstructing views
- Wayfinding opportunity

N 0 50 100 150 200

5. LAND TENURE

LEGEND

- Site boundary
- Crown Land
- Crown Land managed by Bega Valley Shire Council
- Bega Valley Shire Council Land
- Crown Land Road Reserve
- Bega Valley Shire Council Road Reserve
- R2 - Low Density Residential
- R3 - Medium Density Residential
- B2 - Local Centre

N 0 50 100 150 200

TATHRA HEADLAND
PRECINCT PLAN

APPENDIX A - TECHNICAL SITE ANALYSIS

DECEMBER 2021

PLACE LABORATORY

WSP

Bega Valley Shire Council

OCTOBER 2021

PUBLIC

Tathra Headland Precinct Plan

Site Analysis

Question today
Imagine tomorrow
Create for the future

Tathra Headland Precinct Plan
Site Analysis

Bega Valley Shire Council

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REV	DATE	DETAILS
A	24/09/2021	Draft Issue
B	15/10/2021	Updated Draft with Information

	NAME	DATE	SIGNATURE
Prepared by:	Joshua Affleck Jared Falkenhagen Sam McCormick	15/10/2021	
Reviewed by:	Adrian Thuell	15/10/2021	
Approved by:	Adrian Thuell	15/10/2021	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of contents

1 SITE ANALYSIS OVERVIEW

WSP has partnered with Place Laboratory to review the existing infrastructure and prepare an assessment of the infrastructure to support the Tathra Wharf and Headland Precinct Plan.

Preliminary investigations have been undertaken reviewing GIS, public mapping, existing masterplan reports and Dial Before You Dig (DBYD) data. The gap analysis outlines information currently not publicly available online or in the Bega Valley Shire Council (BVSC) supplied documentation, leading to some comments and recommendations regarding acquiring or supplying the information. The recommendation on initial infrastructure investigations would be to design the precinct to utilise the proximity to existing services infrastructure and incorporate the natural topography where possible.

Road infrastructure, stormwater, water supply, sewer, communications, lighting and electrical services have been the focus of investigations and our findings to date are outlined below.

2 TOPOGRAPHY AND STORMWATER INFRASTRUCTURE

2.1 EXISTING TOPOGRAPHY WITHIN STUDY AREA

The full extent of the study area is comprised of road reserve and open space which has a combined area of approximately 65,325m2 (6.6 Ha). The existing topography of the subject study area varies significantly, partly due to the headland and associated cliff faces with considerable elevation changes across the site. Bega Street slopes from approximately RL 49m to RL 28m, falling at approximately 4% from the highest point of the study area, the intersection of Andy Poole Drive and Bega Street, to the headland carpark. The headland is the lowest part of the study area, with the headland carpark being approximately RL 28m and then elevation drop to the end of Wharf Road being RL7m.

The study area has minimal to no impact from adjoining properties or broader catchments due to the high point of the headland being located at the intersection of Andy Poole Drive and Bega Street, with underground stormwater infrastructure capturing upstream flows and distributing them south-west along Tathra Street. The remainder of the study area is located on the ridge of the headland with all streets perpendicular to Bega and the Service Lane falling west by Beach Street, Cliff Place and Wharf Road, then east along Tathra Street, East Lane and Beach Street and towards the ocean on each side of the headland.

At present the subject site is not affected by any 1% AEP (100-year ARI) flood event overlays following a review from of NSW Planning portal.

2.2 EXISTING STORMWATER INFRASTRUCTURE

The existing stormwater strategy within the study area relies mainly on open swale drainage, culvert crossings to transverse under roads and eventually discharges directly to the ocean.

The current stormwater strategy results in limited kerb and channel and underground piped stormwater infrastructure within the study area, utilising natural gullies to discharge stormwater runoff down the headlands. Due to the elevation changes throughout the site, the study area is not impacted by flooding. The occurrence of localised kerbside build-up may occur during rainfall events and further investigations are required for isolated sections of stormwater infrastructure locally within the study area.

The study area can be divided into seven (7) main existing catchments that affect the main commercial area of Bega Street and Service Lane, with the other five of the seven discharging down along various points on Wharf Road and the headland at the end of Cliff Street near the beach track access. There are several smaller catchments on the fringe of the study area that fall away from the study area and flow is conveyed by external stormwater systems outside the scope of the study. These seven main catchments can be defined as:

- Catchment A: Wharf Road A (1.6 Ha)
- Catchment B: Wharf Road B (0.5 Ha)
- Catchment C: Wharf Road C (0.8 Ha)
- Catchment D: Wharf Road D (0.5 Ha)
- Catchment E: Beach Street West (0.6 Ha)
- Catchment F: Beach Street East (0.3 Ha)
- Catchment G: Cliff Street (0.7 Ha)

In addition to the seven notable catchments above, there is an additional 1.73 Ha at the end of the headland that is conveyed directly into the ocean via overland flow with an additional 0.8 Ha discharging over the headland at the beach access track. Refer to attached Existing Stormwater Catchment Plan for further catchment information.

The existing underground piped drainage is primarily a network of 375mm RCP culverts transferring runoff underneath the roads located at the intersection of Wharf Road and Service Lane (Part of Catchment A), Bega Street and Service Lane junction (carpark at hotel) (Part of Catchment A), a culvert crossing on the approach to the headland carpark which discharges down the cliff towards Wharf Road (Part of Catchment C). All of these culvert outlets discharged into open swales to continue flowing downstream towards Wharf Road. Wharf Road is a key constraint to this strategy, requiring multiple culvert crossings to support the runoff from the Memorial Gardens and the catchment north-west of Bega Street at the top of the headland. Wharf Road has three 375mm RCP culvert crossings (Catchment A, B and C) conveying stormwater from a swale on the eastern side of the road to the western side and directly down the headland toward the ocean. At the downstream end of Wharf Road on the eastern side, directly across from the wharf itself, is a 900x900mm reinforced concrete box culvert (Catchment D) that conveys the remainder of the runoff within the swale out onto the rock surface of the headland toward the ocean.

Catchment A conveys flows from the upper portion of Wharf Road and the lower portion of Service Lane, Bega Street and Service Lane junction (carpark at hotel), through a series of underground 375mm RCP pipes and letter box pits. This underground system then discharges to the rock/grass-lined (over-grown) swale falling east-west from the Service Lane junction (carpark at hotel) to the upper portion of Wharf Road, further conveyed by a culvert crossing to discharge at the outlet on the headland.

Catchments B, C and D conveys flows from the headland directly and function partly through the existing vegetation through a series of swales which are difficult to assess, although largely could contribute to rockfalls occurring on the uphill (eastern) side of Wharf Road.

Figure 2.1 – Swale drain linking Service Road junction (hotel carpark) to Wharf Road.

Catchment E conveys stormwater from a portion of the Service Lane west of the shops. This flow is then conveyed west down Beach Street (west) and discharged towards the vegetated gully through isolated culvert crossings. This catchment is largely under-serviced with roadside kerb and channel or formalised swales not provided to convey water. Overland flow will interact with vehicles and pedestrians.

Catchment F conveys stormwater from the southern intersection of Service Lane and Bega Street including a portion of open space at the War Memorial. This flow is then conveyed east down Beach Street (east) and discharged towards the ocean via an underground system. Part of this catchment is serviced by kerb and channel to the west of Bega Street.

At the intersections of Andy Poole Drive and Bega Street the existing underground piped drainage is primarily a network of 375mm RCP culverts transferring runoff underneath the roads which is conveyed east down Tathra Street and discharged towards the ocean via an underground system. This catchment has minimal impact on the broader study area.

Figure 2.2 – 900x900mm Box culvert draining the southern swale adjacent Wharf Road (Image supplied by Google Maps [2010]).

Adjacent to the Wharf, flush kerb conveys overland flow (Catchment D) to a sag inlet pit on the northern side of Wharf Road down the existing retaining structure, as per the staining evident in the image below.

Figure 2.3 – Staining on retaining structure suggest stormwater runoff.

Figure 2.4 – Flush kerb at Wharf crossover directs stormwater down to retaining structure discharge as per Figure 2.3

A stormwater pit and pipe network can also be found under the Headland Shared Path, which discharges directly to the weathered rock natural surface (Catchment D), as per the image below.

Figure 2.5 - Drainage pit and discharge to natural surface under path

Requirements for water quality treatment are limited due to the low amount of impervious area and appears to be handled primarily by utilising natural open channel flows.

Throughout the study area there appears to be a lack of overall stormwater strategy, many of the existing drainage structures are in poor condition, with evidence of significant scour around inlets and cleaning of structures limited which can cause localised build-up in a large stormwater event or localised ponding post rainfall event.

Figure 2.6 – Typical stormwater treatment within study area.

Figure 2.7 – Typical stormwater treatment within study area.

3 ROAD INFRASTRUCTURE

3.1 EXISTING PHYSICAL ROAD CHARACTERISTICS

An assessment of the existing road network has been undertaken throughout the study area and has been summarized within the Road Characteristics Table 3.1.below. The following characteristics have been assessed against the desirable characteristics listed within Table D.1.5 within Bega Valley Shire Council Development Guidelines D1 ‘Geometric Road Design’:

- Road classification.
- Traffic volume (VPD).
- Speed (km/h).
- Carriageway Width.
- Parking provisions within road reserve.
- Kerbing.
- Footpath requirements.
- Verge Width.

EXISTING ROAD CHARACTERISTICS					
	BEGA STREET	**SERVICE LANE**	**WHARF ROAD**	**CLIFF PLACE**	**BEACH STREET**
EXISTING ROAD CLASSIFICATION	Local Access	Local Access	Local Access	Local Access	Local Access
EXISTING TRAFFIC VOLUME (VPD)	1147	397	601	N/a	N/a
EXISTING SPEED (KM/H)	50	50	50	50	50
EXISTING CARRIAGEWAY WIDTH (M)	6 to 10	7.5 to 17	6	3.5	15
EXISTING PARKING PROVISIONS	Nil.	Informal Roadside	Informal Roadside	Informal Roadside	Informal Roadside
EXISTING KERB	50% of western side Barrier K&C. No kerb east	100% of eastern side Barrier K&C. No kerb west	50% of eastern side Layback K&C. No kerb west	Nil.	Nil.
EXISTING FOOTPATH	25% of eastern side.	50% of western side.	Nil.	25% of southern side.	Nil.
EX. VERGE WIDTH	4.5 to 7	3.5 to 4.5	Nil.	4.5	3 to 9m

Table 3.1– Existing Road Characteristics.

3.1.1 BEGA STREET

Bega Street is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted. The existing carriageway width varies from 10m at the south of the study area (adjoining Andy Poole Drive), reducing to 6m from the intersection of East Lane through to the carpark located at the headland. Sporadic shoulder widenings (informal) occur on the eastern side of the road, where barrier kerb and channel has been provided. These shoulder widenings allow for informal parallel parking, although parking is poorly signed and in several locations there is poor visibility to oncoming traffic that are not aware of the parking conditions. Existing concrete footpath is provided in limited sections of the road, with a small portion located within the vicinity of the existing hotel. The verge on the eastern side varies between 4.5 to 7m throughout various sections. The verge on the western side adjoins the War Memorial Park, which has a roadside grass-lined swale (informal and not suitably sized) leading to a steep vertical embankment approximately 1m from the edge of bitumen. Between the carpark located outside the hotel and the headland carpark, the grassed verge is also without kerb which dissipates down the headland embankment towards Wharf Road. The existing pavement condition visually appears poor from desktop assessment and a lack of on-street drainage would contribute to the deterioration of pavement condition.

3.1.2 SERVICE LANE

The Service Lane is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted. The existing carriageway width varies from 7.5m at the south of the study area (War Memorial staircase at Bega Street intersection), widening to 17m at the shop frontages between Beach Street and Cliff Place. Excessively large shoulder widenings (informal) are present on the eastern side of the road, where no kerb and channel has been provided. With no formal parking options and limited barriers to the adjoining park, vehicles are able to traverse across the park from Service Lane

into Bega Street creating a safety issue around the shops concerning pedestrians and drivers. Existing concrete footpath is provided in limited sections of the road, with a small portion located within the vicinity of the existing shops. The verge on the western side varies between 3.5 to 4.5m throughout various sections. The verge on the eastern side adjoins the War Memorial Park, which falls away to Bega Street. The existing pavement condition visually appears poor from desktop assessment and a lack of on-street drainage would contribute to the deterioration of pavement condition.

3.1.3 WHARF ROAD

Wharf Road is currently listed as a Local Access road, with a 50 kilometer per hour speed limit posted. The existing carriageway width is approximately 6m wide. Sporadic shoulder widenings (informal) occur on the eastern side of the road. These should widenings allow for informal parallel parking, although parking is poorly signed and in several locations there is poor visibility to oncoming traffic that are not aware of the parking conditions. In addition, for the most-part the carriageway is serviced to the east by a guardrail, and in some locations none, which prevents pedestrian and vehicular interaction to the top of embankment leading towards the ocean. There is inadequate pedestrian access for the most-part of the road. The verge on the eastern side has a roadside grass-lined swale (informal and not suitably sized) leading to a steep embankment approximately 1 to 3m from the edge of bitumen. The eastern verge then transitions into layback kerb and channel with a concrete apron to the base of the cliff face separating Bega Street from Wharf Road. Evidence of rock fall activity is present within the lower half of Wharf Road. Carparking located throughout Wharf Road is informal and restrictive, with limited ability to manoeuvre vehicles greater than a passenger vehicle at peak periods. The northern end of Wharf Road has formalized parking spaces to service the wharf. The existing pavement condition visually appears poor from desktop assessment and a lack of on-street drainage would contribute to the deterioration of pavement condition.

Figure 3.1 – Wharf Road (Looking South).

3.1.4 CLIFF PLACE

Cliff Street is currently listed as a Local Access road, with a 50 kilometer per hour speed limit posted. The existing carriageway width is approximately 3m. An unsealed informal carpark is located on the northern side near the Service Lane intersection, from a demolished hotel. No kerb and channel is located within the extent of the road reserve on Cliff Street. The pedestrian access to Tathra beach is located at the western end of the road via a concrete footpath, no provision of footpath adjoining the road. Limited provision of driveway crossings are located within the road reserve. The verge on the northern side varies although is narrow in numerous sections with the road reserve width preventing full compliance with typical formations. Existing roadside drainage is poor and visibility and manoeuvre space within the

street extent is poor. The existing pavement condition visually appears poor from desktop assessment and a lack of on-street drainage would contribute to the deterioration of pavement condition.

3.1.5 BEACH STREET

Beach Street is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted. The existing carriageway width is 15m. Sporadic shoulder widenings (informal) occur on the north and south side of the road, at locations of commercial buildings. These should widenings allow for informal parallel parking, although is poorly signed and in several locations have poor visibility to oncoming traffic (reversing into oncoming traffic) that are not aware of the parking conditions. Concrete footpath is not provided within the road reserve. The verge on the western end varies between 3 to 9m throughout various sections and on the eastern end varies between 6 and 9m. Limited provision of driveway crossings are located within the road reserve. The on-street drainage is poor with the majority of Beach Street falling towards the vegetation to the west. The existing pavement condition visually appears poor from desktop assessment and a lack of on-street drainage would contribute to the deterioration of pavement condition.

3.2 EXISTING INTERSECTION CHARACTERISTICS

An assessment of the existing intersections was undertaken. The formalisation through signage and line marking requires further assessment upon formalising the roadside environment. The intersection of Cliff Place, Wharf Road and Service Lane has poor sight distance, insufficient traffic lane width and insufficient signage and line marking. The elevation difference between the three subject roads pose difficulties to achieve compliance within its current state.

The intersection at both the northern and southern junction of Bega Street and Service Lane has poor sight distance and vehicular storage for overtaking vehicles. Further analysis of the intersection is required upon formalisation of the subject road network.

4 TRAFFIC, TRANSPORT AND ACCESS

4.1 EXISTING CONDITION

4.1.1 PEDESTRIAN AND CYCLIST ACCESS

The Tathra Headland Precinct Upgrade's first project objective is to "Improve active travel links to create a cycle friendly, walkable and safe precinct". Existing pedestrian and cycling facilities and infrastructure are limited across the precinct with minimal formalised footpaths along key roads. Pedestrians are observed walking along grassed areas adjacent to most roads, using these areas as proxy footpaths.

There are some established footpaths along Bega Street as well as through local attractions including Tathra Memorial Gardens and the Tathra Headland Walk to the north of the study area. While these may attract attention and tourism, broader connectivity throughout the precinct is limited and largely involves walking either on grass or directly on road as is observed down Wharf Road.

The only recognised cycle path is that along the Tathra Headland Walk with a section of Bega Street nominated as "bike-friendly" as part of future works. The future works is proposed as an off road, shared path along Andy Poole Drive connecting the upper and lower Tathra regions and, while outside of this study area, is noted to be too steep for the casual rider with these users utilizing Dilkera Road, Davidson Street and Bega Street as a more relaxed connection. This shall be investigated within future works outside of this project.

Figure 4.1 highlights the identified mix of pedestrian and cycling routes in the upper Tathra region including paved areas, bushland/gravel walking track, town cycle route, identified Council bike way and a missing cycle link. It is clear that the existing bike way and missing links align with the identified town route with an opportunity to connect these further.

The bushland walkway along the western shore/cliffs is also hard to spot and is not entirely accessible, as well as not being an attractive option for most with it hidden behind private property. This cliffside track is seen in Figure 4.2.

There are also no formal crossing opportunities in the upper Tathra region.

Source: Bega Valley Bike Plan (Tathra Cycling Network), nearmap (basemap)

Figure 4.1 Active travel links

Figure 4.2 Cliffside track

4.1.2 PUBLIC TRANSPORT ACCESS

Public transport in the Tathra region is limited to bus facilities. Two bus routes service the area:

- 785/885 Bega to Tathra via Auckland St & SE Regional Hospital (Loop Service)
- 786/886 Tathra to Merimbula via Kalaru (this is a school services that services lower Tathra only)

The 785/885 services the Davidson Street stop enabling connection to the upper Tathra region. This route can also stop at the Post Office on request to driver providing further connection if required. The 785/858 frequency is detailed in Table 4.1.

Table 4.1 785/885 service frequency

SERVICE	DIRECTION	FREQUENCY
785/885 Bega to Tathra via Auckland St & SE Regional Hospital (Loop Service) – Davidson Street stop	Inbound to Tathra	8:16 am (a) 10:36 am (a) 2:41 pm (a)
	Outbound to Tathra	10:20 am (a) 2:30 pm (a) 3:49 pm (a)

Source: (a) denotes wheelchair accessible service

4.1.3 LOADING AND SERVICING ACCESS

Due to the general lack of traffic, observed low parking demand and resultant available parking supply in the area, it would be expected that loading vehicles do not experience significant delays or difficulties parking and loading where and when required. The off-street parking areas located around business areas including the shops and motel provide suitable space for loading vehicles to operate.

Due to the lack of formalised parking in most of the off-street parking areas surrounding shops and other businesses, there may be times where a general vehicle parks in an area that obstructs access for loading and service vehicles.

4.1.4 GENERAL TRAFFIC ACCESS

Considering the low traffic volumes at most times based on site observations, operation and circulation in the study area of the upper Tathra region is acceptable. Traffic counts from two separate dates have been received to inform the study. These provide daily average traffic volumes during April, across a 15-day period, and August, across an 11-day period, 2021. It should be noted that the April counts were conducted during the Easter long weekend and would reflect a typical holiday peak for the area. Additionally, parts of August 2021 saw regional New South Wales in lockdown due to the COVID-19 pandemic which may have impacted the 11-day average with less residents out and about, and likely very few travellers in the area.

Daily average traffic volumes are displayed in Figure 4.4, using data provided by Bega Valley Shire Council.

Source: *Bega Valley Shire Council data (volumes), nearmap (basemap)*

Notes DAV represents Daily Average Vehicle volumes

Figure 4.3 Traffic count locations and volumes

4.1.5 PARKING

Parking within the upper Tathra study area is generally unrestricted and possible along both sides of most roads. Parking observed along Wharf Road takes advantage of the lack of formalized parking in the area where, beyond signage and line marking, parked vehicles restrict the roads ability to accommodate two-way traffic. Seen at this location are nine formalized parking bays including one DDA compliant bay. Beyond these, vehicles are observed to park along both sides of the road creating a very narrow road width that is limited to allowing one vehicle to pass at a time.

Multiple off-street parking areas have been identified through surveying nearmap, attending a site visit and consulting with the Bega Valley Shire Council. These locations are highlighted in Figure 4.4. Most of these do not have formalised bays with vehicles parking in any available area either on pavement or along grassed areas. This is seen in Figure 4.5 showing Car Park 2 at the south of the Tathra Memorial Gardens.

Off-street informal parking areas are seen in Figure 4.6 with vehicles potentially blocking access for other users.

Source: *nearmap (basemap)*

Figure 4.4 Off-street parking areas

Figure 4.5 Car Park 2 (CP2)

Figure 4.6 Informal parking blocking pedestrian access at CP6

4.1.6 SAFETY

Within the upper Tathra region and study area, there have been two crashes reported based on data provided by Bega Valley Shire Council capturing statistics across a 10-year period between 2010 and 2020. One involves a vehicle crashing off to the side of the road along Bega Street and the other a vehicle turning right in front of an oncoming vehicle which lead to collision. Neither involved pedestrians, cyclists or significant casualty. Nevertheless, limitations to pedestrian and cyclist connectivity including crossings and protected facilities and observations showing pedestrians on road in the area could potentially result in casualty crashes with more vulnerable modes.

5 WATER, SEWER AND GAS RETICULATION

5.1 EXISTING SERVICES

5.1.1 WATER RETICULATION

Water services are available throughout the study area, including to the wharf. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed in the most-part in 1954, with isolated sections being installed more recently to service isolated developments. The majority of the water mains are Asbestos Cement (AC). Further investigation required to confirm serviceability requirements are met.

- An existing 100 diameter uPVC water main (1992 install – From records) is located within the western verge of Wharf Road similarly to the sewer pressure man.
- An existing 100 diameter AC water main (1957 install – From records) is traversing east-west across Bega Street and Service Lane and adjacent to Cliff Place.
- An existing 100 diameter water main (1957 install – From records) is located in the southern verge of Cliff Place.
- An existing 100 diameter AC water main (1957 install – From records) is located in the northern verge of Beach Street.
- An existing 100 diameter water main is located in the eastern verge of Bega Street. The ages vary from 1956 to 1984 and materials vary, although primarily AC. The last length of water main servicing the property adjoining the headland carpark is a 200 diameter DICL water main.
- An existing 100 diameter water main is located in the western verge of Service Lane (beneath existing footpath). The ages vary from 1956 to 1984 and materials vary, although primarily AC.
- A domestic water supply is servicing the open space area at the headland with the existing 200 diameter water main terminating at the carpark of Bega Street.

Figure 5.1 – Water tap located within Memorial Gardens

5.1.2 SEWER RETICULATION

Sewer services are available throughout the study area. It is assumed that the existing sewer network is currently meeting servicing requirements. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed within 1976, with isolated sections being installed more recently to service isolated developments. The sewer reticulation network is arranged in two (2) notable portions, being east and west of Bega Street. The existing sewer arrangement includes the following notable features:

- Existing 150 diameter sewer pipes service the eastern portion of Bega Street, through a mix of easements internal of the allotments, street frontages and along the top of the headland to the east. The eastern portion falls to an existing sewer rising main sump pit located at the rear of the existing hotel at the headland.
- A 150 rising main is fed across Bega street to Cliff Place from the rising main sump pit located at the rear of the existing hotel eastern portion, which then connects into an existing sewer manhole located at the junction of Cliff Place and Wharf Road.
- Existing 150 diameter sewer pipes service the western portion of Bega Street, through a mix of easements internal of the allotments and street frontages. The western portion located north of Beach Street falls south to an existing sewer manhole located behind of properties and the end of Beach Street. An existing 225 diameter sewer pipes then falls towards Andy Poole Drive via Seagrass Lane to the west.
- The Wharf is currently serviced by a 150 sewer pressure main due to the elevation change. The pressure main is positioned in the western verge of Wharf Road and connects to the western portion of the reticulation network at the pedestrian access track.

5.1.3 GAS RETICULATION

There is no current gas supply to the study area.

6 ELECTRICITY

6.1 EXISTING SERVICES

Existing overhead Low Voltage (LV) power lines have been sighted within the subject study area during the desktop review. Based on the DBYD information there are existing overhead power lines present throughout the study area. LV underground power lines are currently present on site in isolated locations on the western side of Bega Street. No High Voltage (HV) underground/aboveground power is currently present within the study area that have been identified.

Overhead lines cross sporadically across the traffic lanes of Bega Street and the Service Lane within the study area and will need to be addressed accordingly if works are to be undertaken beneath or around. Public street lighting,is limited throughout the study area, with most paths and streets identified with little to no provision. Bega Street and the Service Lane have isolated locations with pole mounted lamps and sporadic pole mounted lamp is present at the start of Wharf Road.

It is assumed that none of the lamps are LED (To be confirmed upon further assessment). Further advice and discussions with local Utility company (Essential Energy) and/or a suitably qualified Accredited Service Provider (ASP) would be required to establish exact LV power supply configuration to the street lighting for the study area.

A further assessment of the existing public lighting will be required to ensure it is in accordance with ‘in-service’ values specified for ‘Category V’ and ‘Category P’ lighting in AS/NZS 1158 series of standards pertaining to the lighting of roads and public spaces as outlined within the NSW Public Lighting Code.

Existing power/light poles locations within the road reserve appear to be within clear zones of vehicular traffic and will need to be addressed with any proposed pavement upgrades.

7 COMMUNICATIONS

7.1 EXISTING SERVICES

Based on the DBYD plans it appears that underground telecommunication cabling is located throughout the study area. Connections will be available to support the proposed upgrades and smart infrastructure. A network of conduits and pits are located along the road and pathway verge.

8 GEOTECHNICAL STUDY PRELIMINARY REVIEW

8.1 GEOTECHNICAL STABILITY CONDITIONS

The study undertaken by ACT Geotechnical Engineers Pty Ltd, dated 25 June 2019, raises several risks regarding the slope stability of Wharf Road. There are three main hazards identified, which are as follows:

- Rock boulder dislodgement;
- Cave collapse under Wharf Road; and
- Erosion of drainage path.

Each of these items has an associated risk assessment on the likelihood and consequences of failures. Rock boulder dislodgement resulting in slope instability beneath Wharf Road is assessed as “Unlikely”. The rocks are noted as strong with widely spaced joints, reducing the likelihood of failure.

Cave collapse under Wharf Road is noted as “Possible” and has a higher classification of consequences with “Moderate to High” risk level assigned. As a potentially high risk, a treatment has been suggested which would involve mortar application to the cave induced by wave action over long periods of time. This treatment has been noted to have negative visual and cultural heritage impacts.

Lastly, the report notes that stormwater drainage is discharged via culvert crossings below Wharf Road and onto the rockface and has caused notable erosion. A specific location, approximately 43m from the Wharf, has been noted, but there are multiple discharge locations along Wharf Road (Four in total). The report notes, in section 5.2 Site Drainage, it is possible that during periods of rainfall, surface water could enter the rock mass along the slightly open joints and exit along the face. Over time, this could assist in the dislodgement of rock. The treatment recommendations also refer to construction of an appropriately sized open concrete drain to discharge the flow and reduce erosion impacts. However, this treatment will also result in visual and heritage impacts to the Headland.

TATHRA HEADLAND PRECINCT PLAN

APPENDIX B - SITE OPPORTUNITIES AND CONSTRAINTS ANALYSIS

DECEMBER 2021

PLACE LABORATORY

WSP

Bega Valley Shire Council

OCTOBER 2021

PUBLIC

Tathra Headland Precinct Plan

OPPORTUNITIES AND CONSTRAINTS ANALYSIS

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Tathra Headland Precinct Plan
Site Analysis

Bega Valley Shire Council

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REV	DATE	DETAILS
A	24/09/2021	Draft Issue
B	15/10/2021	Updated Draft with Information

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Reviewed by:	Adrian Thuell	15/10/2021	
Approved by:	Adrian Thuell	15/10/2021	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of contents

1 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

WSP has partnered with Place Laboratory to review the existing infrastructure and prepare an assessment of the opportunities and constraints for the infrastructure to support the Tathra Wharf and Headland Precinct Plan.

Preliminary investigations have been undertaken reviewing GIS, public mapping, existing masterplan reports and Dial Before You Dig (DBYD) data. The gap analysis outlines information currently not publicly available online or in the Bega Valley Shire Council (BVSC) supplied documentation, leading to some comments and recommendations regarding acquiring or supplying the information. The recommendation on initial infrastructure investigations would be to design the precinct to utilise the proximity to existing services infrastructure and incorporate the natural topography where possible.

Road infrastructure, stormwater, water supply, sewer, communications, lighting and electrical services have been the focus of investigations and our findings to date are outlined below.

2 STORMWATER INFRASTRUCTURE

2.1 STORMWATER OPPORTUNITIES AND CONSTRAINTS

The proposed strategy for the Tathra Wharf and Headlands Precinct Plan incorporates the following items that will impact the stormwater on the proposed study area:

- Adjoining public road infrastructure (Bega Street, Service Lane, Wharf Road, Cliff Place);
- Sealed (impervious) car parks & associated pedestrian footpaths;
- Minor buildings and/or structures;
- Overland stormwater elements (Swales and spoon drains, etc);
- Underground stormwater infrastructure network; and
- Overland flow generated by the potential regrading of the surrounding areas and contributions from open space areas.

The items listed above can create additional impervious areas, although following an initial review, the potential of increased impacts has been considered minimal within the existing road reserve. This additional impervious area could potentially increase the stormwater runoff during rainfall events and may cause stormwater issues downstream of any upgrades. Typical increases in impervious area, such as buildings, car parks and roads are usually mitigated by capture in stormwater infrastructure and controlled via a pipe network to detention/retention devices prior to discharging into an open water source such as the ocean.

The Bega Valley Shire Council Development Engineering Standards – Development Design Specification D5 Stormwater Drainage Design is the primary document for regulating stormwater design in Tathra. In accordance with the Development Design Specification outlined, the additional stormwater runoff generated by the proposed works will need to be attenuated to prevent any downstream actionable nuisance. Furthermore, the proposed road network requires stormwater overland flow controls to minimise runoff flowing across roads and reducing potential dangers to vehicles and pedestrians. The overland flow paths, where impacted by the road network, will be appropriately redirected and controlled by swales, spoon drains, pit and pipe infrastructure and engineered retention/detention structures.

A stormwater network in line with the existing strategy is recommended but will need to be constructed in accordance with BVSC requirements and WSUD principles implemented where possible. It is recommended that all proposed culverts are sized to allow for 1% AEP storm events, to prevent inundation of local access roads. Appropriate culvert sizing shall assist with preventing damage to the road surface and open space areas. Culvert sizing should be reviewed at the detailed design stage as grades and layouts are refined.

The masterplan shall utilise grassed swales where possible, primarily adjacent to the proposed access roads, as naturally vegetated engineered controls to the stormwater overland flow. These swales will guide the stormwater runoff to appropriate culverts crossings under the road network. Grassed swales also provide water quality treatment contributions to the stormwater runoff.

Piped infrastructure may need to be utilised where pedestrian movements are prioritized adjacent roadways, limiting the use of grassed swales in these areas. Kerb and channel will be introduced to control runoff.

At present there is opportunity to improve the local stormwater network through the upgraded or conversation of the roadside environment of Bega Street, Service Lane, Beach Street and Cliff Street with formalised kerb and channel being conveyed underground and/or open swales. The existing swale on the western verge of Bega Street between Cliff Place and East Lane is to be upgraded. There is significant scour along sections of all roads where kerb and channel transitions to existing stormwater structures. The swale linking the Service Lane junction (hotel carpark) to Wharf Road is to be upgraded to accommodate and delay flows.

3 ROAD INFRASTRUCTURE

3.1 PHYSICAL ROAD CHARACTERISTICS OPPORTUNITIES AND CONSTRAINTS

An assessment of the existing road network against the minimum requirements has been undertaken throughout the study area and has been summarized within the Road Characteristics table below (Table 3-1). The following characteristics have been assessed against the desirable characteristics listed within Table D.1.5 within Bega Valley Shire Council Development Guidelines D1 'Geometric Road Design':

- Road classification.
- Traffic volume (vpd).
- Speed (km/h).
- Carriageway Width.
- Parking provisions within road reserve.
- Kerbing.
- Footpath requirements.
- Verge Width.

Table 3-1 Road Characteristics

REQUIRED ROAD CHARACTERISTICS					
	BEGA STREET	**SERVICE LANE**	**WHARF ROAD**	**CLIFF PLACE**	**BEACH STREET**
ROAD CLASSIFICATION	Collector Street	Local Street	Access Street	Access Street	Access Street
TRAFFIC VOLUME (VPD)	3000	1000	150	150	150
SPEED (KM/H)	50	40	25	25	25
CARRIAGEWAY WIDTH (M)	9	8	6	6	6
PARKING PROVISIONS	Carriageway Parking	Carriageway Parking	Carriageway Parking	Carriageway Parking	Carriageway Parking
KERB	Layback or barrier	Layback or flush with grassed swale	Layback or flush with grassed swale	Layback or flush with grassed swale	Layback or flush with grassed swale
FOOTPATH	1.2m on one side	1.2m on one side	1.2m on one side	1.2m on one side	1.2m on one side
VERGE WIDTH	3.5	3.5	4.5	4.5	4.5

Table 3-2– Required Road Characteristics.

3.1.1 BEGA STREET

Bega Street is currently listed as a Local Access road with a 50 kilometre per hour speed limit posted, which it shall remain. The existing carriageway is to be widened from 6m to 9m from the intersection of East Lane through to the carpark located at the headland. Shoulder widenings are to be provided and formalised on the eastern side of the road where barrier kerb and channel has not been provided. These shoulder widenings allow for informal/formal parallel parking opportunities, with signage and line marking to be upgraded to improve visibility to oncoming traffic that are not aware of the parking conditions. Footpaths are to be upgraded and provided to sections of the road where possible. The verge on the western side adjoins the War Memorial park, which has a roadside grass-lined swale (informal and not suitably sized) leading to a steep vertical embankment approximately 1m from the edge of bitumen. This swale is to be widened to provide increased stormwater capacity with the need to provide additional culvert crossings throughout with water currently trapped. Between the Service Lane junction (hotel carpark) and the headland carpark, the grassed verge is also without kerb which dissipates down the headland embankment towards Wharf Road. The existing pavement condition visually appears poor from desktop review. A lack of on-street drainage would contribute to the deterioration of pavement condition so upgrading this infrastructure is required to improve pavement service-life.

3.1.2 SERVICE LANE

The Service Lane is currently listed as a Local Access road, with a 50 kilometre per hour speed limit posted. There is opportunity to reduce the existing speed limit to 40 kilometers per hour. The existing carriageway width is constrained slightly at the south of the study area (War Memorial staircase at Bega Street intersection), although there is currently up to 9m width of existing pavement (in additional to the 8m wide required carriageway) at the shop frontages between Beach Street and Cliff Place in which can be readily converted into formalised carparking without the need to upgrade and widen pavements on the eastern side. The large shoulder widenings (informal) can be formalised with kerb and channel or by landscaped swale treatments. Parking can be formalised, and barriers installed on the eastern shoulder to limited vehicular access across the park from Service Lane into Bega Street and further improve safety surrounding pedestrian and drivers around the shops. Footpaths can be upgraded and installed. The existing pavement condition visually appears poor from desktop review and a lack of on-street drainage would contribute to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

3.1.3 WHARF ROAD

Wharf Road is currently listed as a Local Access road, with a 50 kilometer per hour speed limit posted. There is an opportunity to reduce the existing speed limit to 25 kilometers per hour or less if the road is reduced to a shared space. The existing carriageway width is approximately 6m wide and is currently adequate assuming there is larger verge width which at present is non-existent and is a constraint. There is currently inadequate shoulder space for two-way traffic and parallel parking along the entirety of Wharf Street. The guard rail to the east needs to be assessed and extended or treated with a structural landscape element to improve pedestrian and vehicular interaction. There’s an opportunity for improved pedestrian access for most of the road to be achieved. The verge on the eastern side has a roadside grass-lined swale (informal and not suitably sized) leading to a steep embankment approximately 1 to 3m from the edge of bitumen is to be formalised with scour protection. The eastern verge then transitions into layback kerb and channel with a concrete apron to the base of the cliff face separating Bega Street from Wharf Road. There should be a treatment adjoining the kerb and apron to reduce the likelihood of rock for interaction with vehicles and pedestrians. Carparking along Wharf Road is a constrain and should be reduced or removed entirely with the exception of the formalized parking spaces to service the wharf at the northern end. The existing pavement condition visually appears poor from desktop review and a lack of on-street drainage would contribute to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

3.1.4 CLIFF PLACE

Cliff Street is currently listed as a Local Access road with a 50 kilometer per hour speed limit posted. There is opportunity to reduce the existing speed limit to 25 kilometers per hour. The existing carriageway width is approximately 3m and is constrained throughout be inadequate road reserve widths. An unsealed informal carpark is located on the northern side near the Service Lane intersection, from a demolished hotel. This carpark has opportunity to be formalised under its existing condition but providing signage and marking bays with gravel line marking treatments. No kerb and channel is located within the extent road reserve on Cliff Street, there width constraints would provide difficult to provide full layback kerb and channel, although a combination of roadside swales and layback kerb and channel could be introduced to enhance the functionality of the road and reduce overland stormwater flow issues. The pedestrian access to Tathra Beach is located at the western end of the road via a concrete footpath, no provision of footpath adjoining the road and there is a disconnect between the connections. Upgrades and linkages between the network and lighting shall provide increased functionality to the area. Driveway crossing are to be upgraded to formalise local traffic within this area and to eliminate confusion between pedestrian activity. The existing pavement condition visually appears poor from desktop review and a lack of on-street drainage would contribute to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

3.1.5 BEACH STREET

Beach Street is currently listed as a Local Access road with a 50 kilometer per hour speed limit posted. There is opportunity to reduce the existing speed limit to 25 kilometers per hour. The existing carriageway width is currently up to 9m wider than required (in additional to the 6m wide required carriageway) in which can be readily converted into formalised carparking without the need to upgrade and widen pavements on the eastern side. The large shoulder widenings (informal) can be formalised with kerb and channel or by landscaped swale treatments. Footpaths can be upgraded and installed. The existing pavement condition visually appears poor from desktop review and a lack of on-street drainage would contribute to the deterioration of pavement condition. Pavement upgrades can be included within any potential upgrades.

3.2 INTERSECTION CHARACTERISTICS OPPORTUNITIES AND CONSTRAINTS

An assessment of the existing intersections were undertaken. The intersection of Cliff Place, Wharf Street and Service Lane has poor sight distance, insufficient traffic lane width and insufficient signage and line marking. The elevation difference between the three subject roads pose difficulties to achieve compliance within its current state. There is opportunity to improve this intersection within the study area.

The intersection at both the northern and southern junction of Bega Street and Service Lane has poor sight distance and vehicular storage for overtaking vehicles. Further analysis of the intersection is required upon formalisation of the subject road network. There is opportunity to improve this intersection within the study area.

4 TRAFFIC, TRANSPORT AND ACCESS

4.1 CONSTRAINTS

4.1.1 PEDESTRIAN AND CYCLIST ACCESS

The Tathra Headland Precinct Upgrade's first project objective is to "Improve active travel links to create a cycle friendly, walkable and safe precinct". Existing pedestrian and cycling facilities and infrastructure are limited across the precinct with minimal formalised footpaths along key roads. Pedestrians are observed walking along grassed areas adjacent to most roads with using this area as proxy footpaths.

Formal walking infrastructure is limited to the western side of Bega Street between Andy Poole Drive and Beach Street, in front of the Tathra Hotel and through the local attractions including Tathra Memorial Gardens and the Tathra Headland Walk. While providing scenic connectivity and some infrastructure in front of retail and commercial areas, these locations do not provide suitable connectivity for the observed and anecdotal demand and between key destinations including the Tathra Hotel, Beach Street shops and Wharf Road. These are also not suitable for mobility impaired persons with steep grades and no existing footpaths adjacent to the road. Users are observed walking along roads in the area which could result in safety issues with vehicles.

There are no formal pedestrian crossings in the upper Tathra region which restricts active travel as it is unsafe with no priority given to pedestrians or cyclist on roads.

The bushland walkway along the western shore/cliffs is also hard to spot and is not entirely accessible, as well as not being an attractive option for most with it hidden behind private property. This is seen in Figure 4.1.

Figure 4.2 displays the existing infrastructure and identifies missing pedestrian and cyclist links in the area.

Figure 4.1 Cliffside walking track

Source: Bega Valley Bike Plan (Tathra Cycling Network), nearmap (basemap)

Figure 4.2 Active travel infrastructure

4.1.2 PUBLIC TRANSPORT ACCESS

Public transport demand expected in the area is low with the existing services satisfying connectivity needs. Nevertheless, bus connectivity can be limited with direct access to the businesses in upper Tathra (i.e. Post Office Stop) available by request only during certain times. Buses then make a right turn from the service lane onto Bega Street towards Davidson Street and onward to lower Tathra. This right turn appears tight and buses may experience difficulties making the turn without an alternative formal arrangement.

The area in general is constrained by its geometry without formal turnaround areas but demand expected is low. Bus access to the wharf via Wharf Road would currently be impractical and nearly impossible with the existing parking arrangement and resulting narrow width.

4.1.3 LOADING AND SERVICING ACCESS

No formalised loading areas are evident through a desktop analysis or site visit observations. This can be problematic with general vehicles parking in areas that may obstruct loading vehicles completing their duties. An example is seen in Figure 1.5 where a general vehicle has blocked the pram ramp to footpath. This could prevent access for any trolley loading needed to the front of the Beach Street shops.

4.1.4 GENERAL TRAFFIC ACCESS

Traffic is currently able to access almost all of the upper Tathra region. This can become problematic particularly along Wharf Road which is narrow and with cars parked on either side, can become even tighter. Additionally, vehicles and pedestrians interact significantly without the provision for formal pedestrian facilities along Wharf Road which causes undesired congestion and may result in significant injury. Turnaround facilities at Wharf Road (CP1) and the Tathra Memorial Garden (CP2) are also limited particularly when vehicles are parked at these locations.

4.1.5 PARKING

Most areas in the upper Tathra region have informal parking with largely unrestricted access available. Figure 4.3 highlights the key off-street car parks and includes spaces if formalised. An example of a non-formalised car park is seen in Figure 4.4 where vehicles park in available space, or along the grass verge. This can create difficulties for internal circulation and turnaround. At the Beach Street shops, vehicles generally park along kerbsides where the off-street parking is full. There are limited formal parking opportunities with vehicles parking at will which can cause potential blockage for key pedestrian or loading access. This is seen in Figure 4.5.

Wharf Road is a key area of concern with vehicles parking along either side of the road beyond the formal bays at the wharf entry (CP1). As seen in Figure 4.6, vehicles park along both sides of the road limiting its width to accommodate one vehicle at a time. This can become problematic with two-way flows and the limited turnaround space available within CP1 at the wharf entry.

Source: nearmap (basemap)

Figure 4.3 Off-street parking locations

Figure 4.4 Car park 1 (CP1) showing informal parking and parking on grass (right side)

Figure 4.5 Informal parking blocking pedestrian access at CP6

Source: Google Maps Streetview

Figure 4.6 Wharf Road parking

4.1.6 SAFETY

Crash data provided by Bega Valley Shire Council between 2010 and 2020 shows that there have only been two incidents during this period within the study area. One involves a vehicle crashing off to the side of the road along Bega Street and the other a vehicle turning right in front an oncoming vehicle which lead to collision. Even with minimal crashes statistics across a significant period of time, there are still risks of incidents. The limited formal pedestrian and cyclist facilities including crossing opportunities result in a large majority of such users travelling along the road. Integration with road traffic and a lack of formal separation between traffic and active travel can be dangerous. Similarly, vehicle and pedestrian interaction along Wharf Road can be concerning particularly during busy times due to its narrow nature, geotechnical instability and lack of formal pedestrian infrastructure. Limited formal parking and loading space at commercial areas can result in general vehicles obstructing key access whereby other vehicles and pedestrians may be required to travel along dangers routes i.e. on road.

4.2 OPPORTUNITIES

4.2.1 PEDESTRIAN AND CYCLIST ACCESS

In addressing Objective 1 – “Improve active travel links to create a cycle friendly, walkable, and safe precinct” providing formalised pedestrian and cyclist infrastructure is the key opportunity. The missing links identified in Figure 4.2 are potential areas to provide formal pedestrian and cyclist infrastructure including paved pathways and stairs with guiderails along steeper grades. Any proposed changes to Wharf Road’s intended use (eg limiting general vehicle access)

would require pedestrian and cycle facilities to support movement along here with is steep grade. Site wide treatments could include either independently or in combination:

- A separated shared path along and connecting Wharf Road, Bega Street, Service Lane, Tathra Street, Davidson Street (outside of study area but is preferred to Tathra Street/Andy Pool Drive to access the lower Tathra region as it is too steep). This could be on or off road.
- Separated cycle and walking paths (at similar locations to previous but provide separation between these modes).
- Handrails/guiderails for mobility impaired persons at key locations.
- Formalised cliffside walk and heightened awareness around this facility through amended wayfinding.
- Improved stair facilities between the Tathra Memorial Park and Wharf Road including enhanced handrails and integration with road level at Wharf Road
- Formal infrastructure along eastern cliffs to accommodate events like the "Wharf to Wharf" between Tathra and Merimbula.
- Further pedestrian amenity including paths along Bega Street and Service Lane between the Beach Street shops and the Tathra Hotel.
- Providing crossing opportunities (zebra crossing, refuge islands) would improve connectivity in the area promoting more active travel by ensuring safe connectivity of users amongst vehicle traffic.
- Create a more pedestrian friendly environment by converting the service lane to a shared, low speed zone and directing the majority of through traffic along Bega Street.
- For the most part, the upper Tathra region has wide road reserves so treatments would not be extensive as the existing width could be better allocated to achieve Objective 1 and provide additional facilities for active travel.

4.2.2 PUBLIC TRANSPORT ACCESS

Public transport demand is not expected to increase significantly with current services accommodate existing demand. Nevertheless, any reorganised circulation or upgrades at CP2 may assist in bus turnaround for buses accessing the Beach Street shops.

4.2.3 LOADING AND SERVICING ACCESS

In parallel to formalising parking across the region, loading area signage and spaces could be incorporated to provide areas for freight and service vehicles. This would likely reduce the risk of general vehicles obstructing any key loading access to commercial areas such as the Beach Street shops and Tathra Hotel.

4.2.4 GENERAL TRAFFIC ACCESS

In order to achieve Objective 3 *"Improve functionality of traffic circulation and carparking to create more efficient use of space"*, opportunities to alter the current circulation have been explored and are suggested below. These could be made individually or in some combination.

- Wharf road closure to general vehicles, maintaining controlled access for mobility impaired persons and other authorised vehicles including but not limited to maintenance, emergency vehicles, delivery trucks for the Wharf Café and special events vehicles.
- Creating a one-way loop in either direction integrating the service lane and Wharf Road looping around the existing and possible expanded car park opposite the Tathra Hotel (CP3 in Figure 1.3). This scenario has the potential to both use and discount Bega Street.
- Changing Bega Streets function to local use only from its intersection with the service lane promoting vehicles to travel along the Beach Street shops frontage and more directly aligned to the wharf.

- Creating a destination car parks at CP2 or CP3 by expanding these to provide more spaces, promoting walk from here to wharf down Wharf Road. Could support Wharf Road closure and one-way loop opportunities.
- One limitation of reorienting circulation and potential changes to promoting the service lane as the new main thoroughfare would be the potential for significant intersection upgrades required at the Bega Street, East Lane and service lane intersection as well as possible treatments at Cliff Place.

4.2.5 PARKING

Providing formalised parking areas would be a key parking opportunity for this entire area, particularly in achieving Objective 3 is to "Improve functionality of traffic circulation and carparking to create more efficient use of space". With little such parking currently identified and standardised, vehicles are prone to blocking key access. Providing formal parking at key areas such as the off-street car parks and kerbsides outside of key commercial areas (i.e. Beach Street shops and Tathra Hotel) as well as DDA compliant spaces, can limited the potential for obstructed access.

Formalised parking areas could include angled parking provision in line with any road network reorientation using new space more efficiently or effectively redistributing space within the existing off-street parking areas.

Wharf Road would benefit significantly if parking were either restricted or removed entirely and consolidated at an alternate location. In line with the General Traffic Access opportunities, expanding CP2 or CP3 could enhance the one-way circulation and Wharf Road closure (to general vehicles) scenarios.

4.2.6 SAFETY

With two recorded crashes in the data provided between 2010 and 2020, significant works are unlikely to be required. Nevertheless, formalising parking, providing upgraded pedestrian and cyclist infrastructure including crossing facilities and potentially reorganising the road network and circulation would help prevent any significant crashes or incidents in the area. Re-prioritising modes along Wharf Road would likely have the biggest impact where a reduction in general traffic access and parking at this location could promote a calmer environment for safe pedestrian access.

5 WATER AND SEWER RETICULATION

5.1 SERVICES OPPORTUNITIES AND CONSTRAINTS

5.1.1 WATER RETICULATION

Water services are available throughout the study area, including to the wharf. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed in the most-part in 1954, with isolated sections being installed more recently to service isolated developments. The majority of the water mains are Asbestos Cement (AC). Further investigation required to confirm serviceability requirements are met with infrastructure approaching the end of its service-life.

Constraints relating to any proposed works within the study area (Road Reserve/Open Space) would include the following:

- Locating, potholing and identifying the adequacy of the existing 100 diameter uPVC water main (1992 install – From records) is located within the western verge of Wharf Road similarly to the sewer pressure man.
- Replacement of existing 100 diameter AC water main (1957 install – From records) traversing east-west across Bega Street and Service Lane and adjacent to Cliff Place.
- Replacement of existing 100 diameter water main (1957 install – From records) located in the southern verge of Cliff Place.
- Replacement of existing 100 diameter AC water main (1957 install – From records) located in the northern verge of Beach Street.
- Replacement of existing 100 diameter water main located in the eastern verge of Bega Street. The ages vary from 1956 to 1984 and materials vary, although primarily AC.
- Replacement of existing 100 diameter water main located in the western verge of Service Lane (beneath existing footpath). The ages vary from 1956 to 1984 and materials vary, although primarily AC.

Upon further investigation easements will need to be established for future servicing requirements.

Figure 5.1 – Water tap located within Memorial Gardens

5.1.2 SEWER RETICULATION

Sewer services are available throughout the study area. It is assumed that the existing sewer network is currently meeting servicing requirements. It is to be noted that asset information provided for the study indicate that the infrastructure is aging and was installed in 1976, with isolated sections being installed more recently to service isolated developments. This would require further network assessment with infrastructure approaching the end of its service-life.

Constraints relating to any proposed works within the study area (Road Reserve/Open Space) would include the following:

- Locating, potholing and identifying the adequacy of the existing 150 sewer rising main traversing east-west across Bega Street and Service Lane and adjacent to Cliff Place in the event of any pavement upgrades or general works requirements compaction or excavation.
- Locating, potholing and identifying the adequacy of the existing 150 sewer rising main traversing north-west up Wharf Road located within the eastern verge in the event of any pavement upgrades or general works requirements compaction or excavation.

If there is needs for additional amenities buildings to be provided with open space areas north of Cliff Place there would need to be provision of a localised onsite treatment to treat and dispose of waste locally, discussions with the local authorities will be required to determine the extent of treatment required to satisfy local conditions. There is possible opportunity to connect to existing sewer reticulation network with a road crossing of Bega Street and further investigation.

Upon further investigation easements will need to be established for future servicing requirements.

5.1.3 FIRE HYDRANTS

Upon investigation of the water reticulation network, if water mains are relocated within the existing locations then hydrants shall be reinstated to suit. If alignments are altered then hydrant provision is to be assigned as per required of Bega Valley Shire Council and Water Services Association Australia.

5.1.4 OPEN SPACE WATER SUPPLY

Currently there is internal water supply lines servicing the open space areas within the headland and the park at the War Memorial. If additional amenities are required to be serviced an extension from existing or new individually metered domestic lines can be provided to service where required. The supply will be installed in accordance with Bega Valley Shire Council Water, Water Services Association Australia and AS3500 requirements with water meter and boundary backflow prevention provided at the point of connection (If required).

6 ELECTRICITY

6.1 SERVICES OPPORTUNITIES AND CONSTRAINTS

6.1.1 RELOCATION OF EXISTING SERVICES

Existing overhead Low Voltage (LV) power lines have been sighted within the subject study area during the desktop review. Based on the DBYD information there are existing overhead power lines present throughout the study area. LV underground power lines are currently present on site in isolated locations on the western side of Bega Street.

It has been established by Bega Valley Shire Council that the above ground electrical infrastructure is a visual obstruction to the landscape. There is opportunity to look at upgrading the existing electrical infrastructure in its entirety to achieve an underground network if desired. If the proposed extent of works impacts any isolated locations of the existing power/light poles there would be opportunity to underground the impacted part of the electrical overhead infrastructure as part of the works.

6.1.2 LOW VOLTAGE SUPPLY

The extension of lighting to the full extent of the study area, including feature lighting and various smart technology initiatives such as electric vehicle/bicycle charging stations may requires upgrades to existing LV infrastructure in the current servicing area.

6.1.3 ASSESS MAXIMUM DEMAND

It is assumed that the existing electrical infrastructure demands are being serviced within the study area and any upgrades to individual properties are outside of the scope of this study.

6.1.4 PUBLIC LIGHTING WITHIN OPEN SPACE AREAS

Public lighting would be designed to minimal required levels as per AS/NZS1158. Pole top mounted luminaires, typically 4 to 6m tall, will be located along the open space areas at the headland, at the War Memorial park between Service Lane and Bega Street and within the carpark located off Bega Street located adjacent to the Hotel. These will be designed to relevant, and lowest where appropriate, lighting categories as per AS/NZS1158. Additional lighting will be provided as required around landscaped areas.

Power to the luminaires will be distributed along underground conduits and pits and will be supplied from the general street lighting power supply system. Additional distribution pillars may be required depending on the staging of the works.

6.1.4.1 GENERAL RECOMMENDATIONS

Recommended luminaire types are full cut-off LED with appropriate choice of light distribution to suit the application.

6.1.4.2 OBTRUSIVE LIGHTING

Obtrusive lighting to neighboring properties and light spill into the night sky and the surrounding environment will be controlled through careful selection of luminaire fittings. As a minimum, all site lighting will be designed to meet obtrusive lighting requirements of AS/NZS4282 and the NSW Public Lighting Code.

Recommended design strategies to limit obtrusive lighting and light spill:

- Light sources should be shielded and concealed wherever possible, without direct view of light sources from off the site. Prioritize the use of luminaires with upward waste light ratios (UWLR) less than 3%

- Use luminaires with appropriate optics to provide light coverage where needed, minimizing spill light where not needed, and allowing efficient spacing of luminaires.
- Consider low pole heights where appropriate to limit spread of light and minimise visibility of light sources from a distance

1.1.1.1 LIGHTING CONTROL

External lighting will generally be controlled via local photoelectric sensors.

7 COMMUNICATIONS

7.1 SERVICES OPPORTUNITIES AND CONSTRAINTS

7.1.1 RELOCATION OF EXISTING SERVICES

Relocation of existing services to make way for proposed works may be required as underground telecommunications services are present within the study area based on the DBYD plans. It is assumed the existing cover requirements for existing conduits and any new pavement works will be assessed by a case by case scenario.

7.1.2 PUBLIC WI-FI

Where required external grade WIFI modules can be mounted onto fixed buildings and onto the road and pathway lighting poles. This will require separate communications conduits to be installed to the relevant lighting poles within public spaces.

8 REVIEW OF PREVIOUS HEADLAND GEOTECHNICAL STUDY

8.1 GEOTECHNICAL STABILITY OPPORTUNITIES AND CONSTRAINTS

The study undertaken by ACT Geotechnical Engineers Pty Ltd, dated 25 June 2019, raises several risks regarding the slope stability of Wharf Road. There are three main hazards identified, which are as follows:

- Rock boulder dislodgement;
- Cave collapse under Wharf Road; and
- Erosion of drainage path.

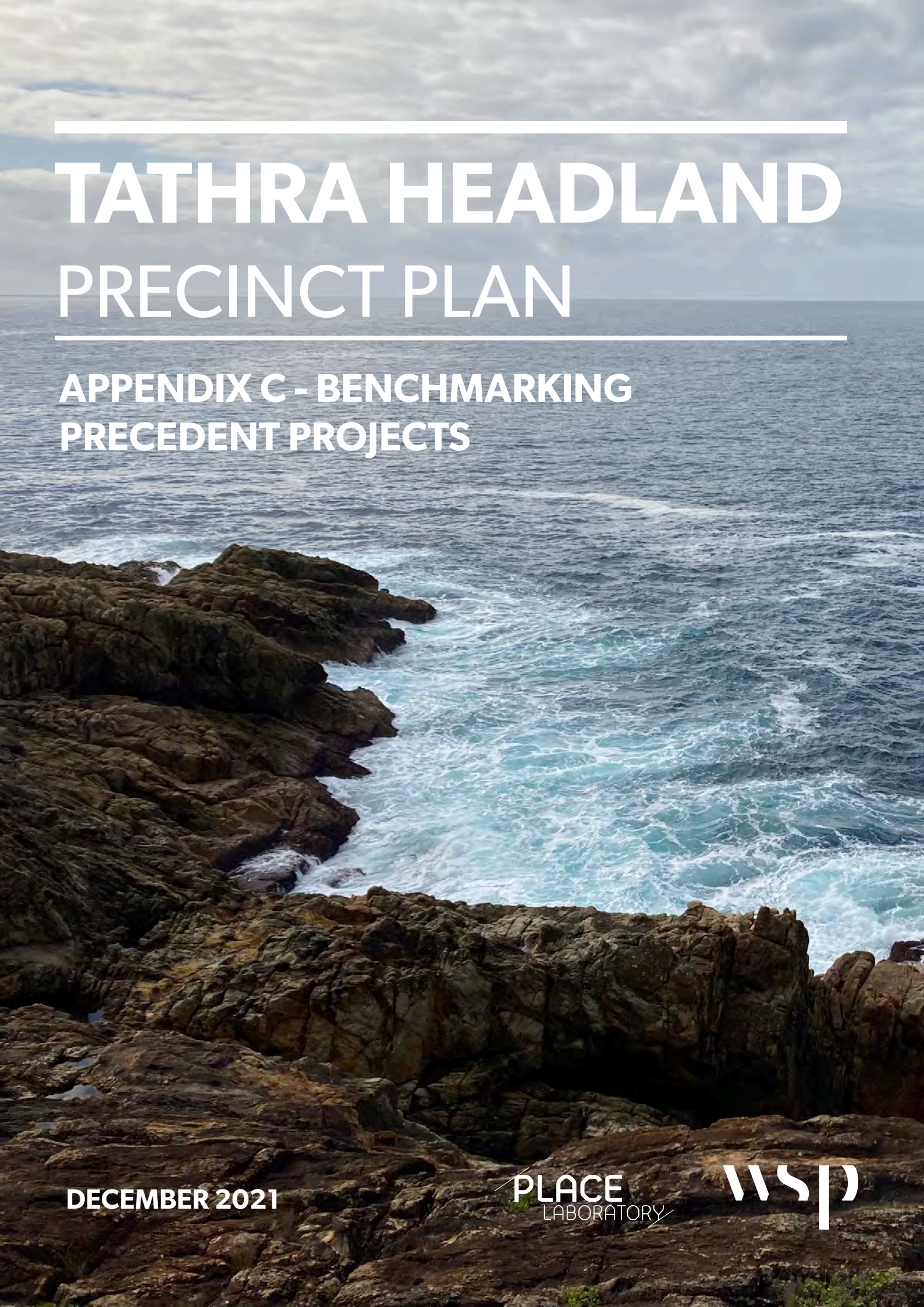
Each of these items has an associated risk assessment on the likelihood and consequences of failures. Remediation treatment has been suggested for each of the noted hazards. Each utilise concrete mortar application or concrete structures being constructed to resolve the issues. It has been noted that these treatments will have negative visual and cultural heritage impacts resulting in significant constraints to the Wharf Road area. Concrete remediation measure is unlikely to be an acceptable solution, which results in slopes adjacent Wharf Road remaining unstable.

Opportunities for alternate solutions that don't impact the visual or heritage aspects of the area include:

- Remove extensive loading from unstable areas, such as restricting vehicle access;
- Reduce vehicle loading by restricting Wharf road to single way access;
- Relocate stormwater outfalls to reduce impacts on already eroded areas;
- Increasing number of stormwater discharge locations to prevent large concentrated flows; and
- Implement a monitoring and maintenance plan that involves reviewing the slope stability of Wharf Road in a more regular manner, particularly after periods of rainfall.

TATHRA HEADLAND
PRECINCT PLAN

APPENDIX C - BENCHMARKING PRECEDENT PROJECTS

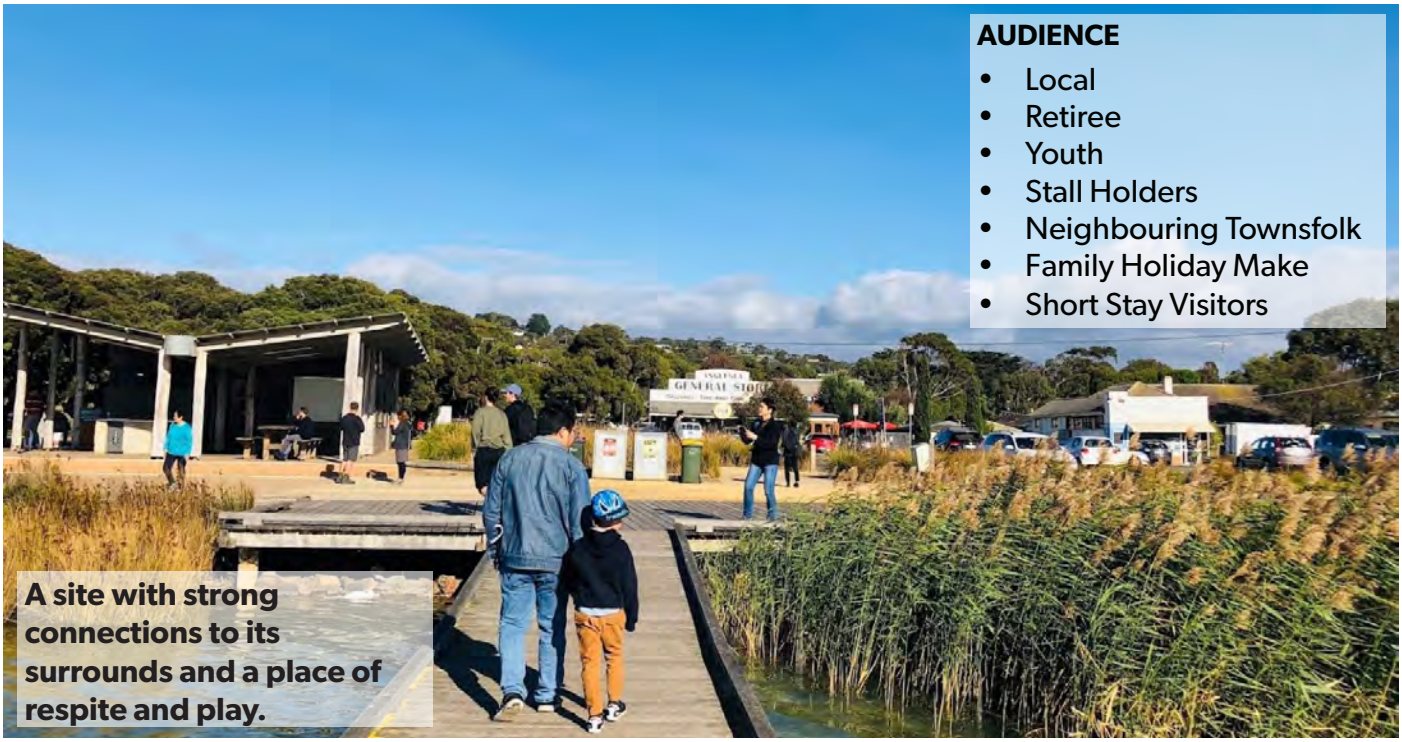


DECEMBER 2021

PLACE LABORATORY

WSP

ANGLESEA
VISITOR CENTRE UPGRADE



AUDIENCE

- Local
- Retiree
- Youth
- Stall Holders
- Neighbouring Townsfolk
- Family Holiday Make
- Short Stay Visitors

A site with strong connections to its surrounds and a place of respite and play.

The coastal connection defines the Great Ocean Road traveling experience

Stories are told in different ways that engage all people across the site

- Great Ocean Rd, Anglesea VIC
- Population: 2,545
- Project Area: 4,000m2

LESSONS LEARNED

Anglesea makes use of raw and hardy materials that reflect a familiar coastal aesthetic. Interpretive art is also embedded into the play structures that help informally tell the areas stories. The park and visitor centre provide clear way-finding strategies and multi use spaces for markets and events.

WHAT'S ON OFFER?

- Spaces for year-round community events and activities.
- Creates opportunities for local artists to exhibit and perform.
- Historical and cultural references along through interpretive signage and artworks

BERMAGUI FISHERMAN'S WHARF

AUDIENCE

- Locals
- Retirees
- Neighbouring Townsfolk
- Family Holiday Makers
- Short Stay Visitors
- Fisherman

A design approach that is reflective of the towns history and supports mixed use access for both tourism and industry.

The expanded pedestrian avenue facilitates hospitality and retail opportunities.

The rich history of the fisherman's co-op is reflected

- Lamont St, Bermagui NSW
- Population: 1,536
- Project Area: 6,500m2
- Budget: $5 million +

LESSONS LEARNED

Fisherman's Wharf provides an example of how to showcase the historical legacy of the town whilst maintaining and enhancing the operations of the of the fisherman's co-op and vendors. No through traffic promotes access to all users. The use of local materials in its construction reflects Bermagui's surrounds.

WHAT'S ON OFFER

- Diverse offer of pubs, cafe, and restaurants.
- Generous pedestrian walkways that become more informal paths which connect to the foreshore.
- Historical references along jetty through signage and materiality

BUSSELTON FORESHORE UPGRADE

AUDIENCE

- Locals
- Retirees
- Neighbouring Townsfolk
- Family Holiday Makers
- Young Adults
- Youth
- Short Stay Visitors

The gateway between the foreshore and the town centre has a clear landscape language which gently transitions visitors between the spaces.

The materials of the St were selected to balance pedestrian and vehicle priorities

The pedestrian avenues are wide, allowing life to spill onto the street

- Queen Street, Busselton WA
- Project Area: 10,000m2
- Budget: $1.2 million

LESSONS LEARNED

The spaces cater to a diverse range of visitors and local residents of all ages and abilities. Revitalisation efforts have maintained a distinctly 'Busselton' vibe which ensures new people are attracted and catered for without compromising the areas unique identity.

WHAT'S ON OFFER

- Coastal references along the main st with the old jetty recycled into seating; and seaside native plants and trees.
- Generous and shady pedestrian walkways that become more informal paths which connect to the foreshore.

MAITLAND LEVEE HIGH ST NSW

A site which shows how CBD and Foreshore Revitalisation go hand in hand to create a premier tourism destination

AUDIENCE

- Locals
- Retirees
- Neighbouring Townsfolk
- Family Holiday Makers
- Young Adults
- Youth
- Short Stay Visitors
- Performers
- Artists
- Market Vendors

The height and materiality of the 'gateway' is matched to the neighbouring heritage buildings to ensure they compliment each other.

Tree planting has been planted at the centre of the street increasing visibility.

LED street lighting allows the entire street mood to be changed instantly

- High St, Maitland NSW
- Project Area: 2000m2
- Budget: (approx) $20 million

LESSONS LEARNED

This project is planned with flexibility for future change in mind. LED street lighting allows the entire street mood to be instantly changed to support events. Large open pavilions are able to hold a diverse rage of programs throughout the year.

WHAT'S ON OFFER

- Modern design aesthetics paired with materials that compliment the existing towns heritage
- Artistic and interpretative wayfinding strategies
- Leisure based retail activity centre supported by a night-time produce and wine economy.