

DEPARTMENT OF PLANNING AND
ENVIRONMENT

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TECHNICAL STUDY REPORT

ENGINEERING –
TRANSPORT

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Technical Study Report Engineering – Transport

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TABLE OF CONTENTS

GLOSSARY	XII
ABBREVIATIONS	XIII
EXECUTIVE SUMMARY	XIV
1 INTRODUCTION	1
1.1 MASTER PLANNING	2
1.2 SNOWY MOUNTAINS SAP	3
1.3 STUDY AREA	4
1.4 PURPOSE OF THIS REPORT	4
1.5 BACKGROUND INFORMATION	5
1.6 SNOWY MOUNTAINS SAP TRANSPORT ASPIRATIONS	6
1.7 THIS REPORT	7
2 STRATEGIC CONTEXT	8
2.1 FUTURE TRANSPORT 2056	8
2.2 GO JINDABYNE	10
2.3 SOUTH-EAST AND TABLELANDS REGIONAL PLAN 2036	11
2.4 SEPP PRECINCTS – REGIONAL (2021)	12
2.5 KOSCIUSZKO NATIONAL PARK PLAN OF MANAGEMENT	12
2.6 SNOWY MONARO LOCAL STRATEGIC PLANNING STATEMENT	12
3 EXISTING TRANSPORT	14
3.1 CONNECTIONS TO THE REGION	14
3.2 AIR TRAVEL	15
3.2.1 SNOWY MOUNTAINS AIRPORT	15
3.2.2 CANBERRA INTERNATIONAL AIRPORT	15
3.2.3 JINDABYNE AERODROME	16
3.3 ROAD NETWORK	17
3.3.1 TRAFFIC DATA	19
3.3.2 FREIGHT	25
3.3.3 EXISTING ROAD PERFORMANCE	26
3.3.4 ROAD SAFETY	28

3.3.5	OVERSNOW VEHICLES	31
3.3.6	SNOW CLEARING	31
3.3.7	CHAIN BAYS.....	32
3.4	PARKING	33
3.4.1	JINDABYNE TOWN CENTRE	33
3.4.2	ALPINE RESORTS.....	34
3.4.3	PERISHER	35
3.4.4	BULLOCKS FLAT (SKITUBE TERMINAL).....	35
3.4.5	CHARLOTTE PASS.....	36
3.4.6	THREDBO.....	36
3.4.7	SPONARS CHALET, SKI RIDER HOTEL AND KOSCIUSZKO MOUNTAIN RETREAT	36
3.4.8	SAWPIT CREEK NPWS VISITOR ENTRY STATION.....	36
3.5	PUBLIC TRANSPORT	36
3.5.1	REGIONAL COACHES	37
3.5.2	COMMUNITY BUSES.....	38
3.5.3	SCHOOL BUSES.....	38
3.5.4	SEASONAL SHUTTLE BUSES	39
3.5.5	SKITUBE	41
3.5.6	TAXIS AND RIDE SHARE.....	43
3.5.7	RAIL.....	43
3.6	WATER TRANSPORT	44
3.7	ACTIVE TRANSPORT	47
3.7.1	STRAVA DATA.....	47
3.7.2	PEDESTRIANS	49
3.7.3	CYCLISTS.....	51
3.7.4	ROAD CYCLING.....	54
3.7.5	MOUNTAIN BIKING	54
3.7.6	HIKING.....	56
3.7.7	SNOW SPORTS.....	60
4	BENCHMARKING	61
4.1	QUEENSTOWN NEW ZEALAND	61
4.2	LAKE TAUPO NEW ZEALAND.....	62
4.3	JACKSON HOLE USA	64
4.4	LAKE PLACID USA	66
4.5	WHISTLER CANADA.....	68
4.6	BANFF CANADA	70
4.7	ZERMATT SWITZERLAND	72
5	STAKEHOLDER LIAISON	74
5.1	TRANSPORT FOR NSW	74

5.2	NSW NATIONAL PARKS AND WILDLIFE SERVICE.....	75
5.3	SNOWY MONARO REGIONAL COUNCIL	76
5.4	ALPINE RESORTS	77
6	FUTURE TRANSPORT	79
6.1	FUTURE GROWTH	79
6.1.1	YEAR-ROUND POPULATION GROWTH	80
6.1.2	VISITORS.....	81
6.1.3	SEASONAL WORKERS.....	82
6.1.4	MODE OF TRAVEL	82
6.2	TRAVEL DEMAND MANAGEMENT.....	83
6.3	AVIATION	84
6.3.1	CANBERRA INTERNATIONAL AIRPORT	84
6.3.2	SNOWY MOUNTAINS AIRPORT UPGRADE	85
6.3.3	JINDABYNE AERODROME	85
6.3.4	HELICOPTERS	85
6.3.5	DRONES.....	86
6.4	SKITUBE.....	86
6.4.1	EXPANSION OF CURRENT OPERATIONS	86
6.4.2	EXTENSION TO JINDABYNE	87
6.4.3	ALTERNATIVES TO SKITUBE EXTENSION	88
6.4.4	MOUNTAIN SHUTTLE BUSES	90
6.4.5	GONDOLAS/CABLE PROPELLED TRANSIT	90
6.4.6	LOOP TECHNOLOGIES.....	95
6.5	ROAD NETWORK.....	95
6.5.1	FUTURE ROAD PERFORMANCE	97
6.5.2	SOUTHERN CONNECTOR ROAD.....	99
6.5.3	KOSCIUSZKO ROAD URBAN REALM.....	105
6.5.4	BARRY WAY	108
6.5.5	REST AREAS AND DRIVER REVIVER.....	108
6.5.6	TOURIST LOOKOUTS.....	108
6.5.7	FREIGHT	114
6.5.8	ROAD SAFETY	114
6.5.9	ROAD SALTING	114
6.5.10	SNOW CLEARING	115
6.5.11	CHAIN BAYS.....	115
6.5.12	CONNECTED AND AUTOMATED VEHICLES (CAVS)	115
6.6	FUTURE PARKING	115
6.6.1	JINDABYNE TOWN CENTRE	115
6.6.2	PROPOSED PARK-AND-RIDE	117
6.6.3	ALPINE RESORTS.....	118
6.6.4	SMARTER USE OF PARKING	119
6.6.5	ELECTRIC VEHICLE CHARGING STATIONS.....	119
6.6.6	PERISHER, SMIGGIN HOLES, GUTHEGA.....	120

6.6.7	BULLOCKS FLAT	121
6.6.8	CHARLOTTE PASS	121
6.6.9	THREDBO	122
6.7	BUS AND COACH SERVICES	123
6.7.1	GROWTH OF EXISTING SERVICES	123
6.7.2	PARK-AND-RIDE AND MOUNTAIN SHUTTLE	123
6.7.3	JINDABYNE SERVICES	128
6.7.4	SUPPORTING INFRASTRUCTURE	129
6.7.5	MOBILITY AS A SERVICE (MAAS)	129
6.7.6	RIDESHARE	130
6.8	WALKING	130
6.8.1	WALKING IN JINDABYNE	130
6.8.2	ALPINE RESORT PEDESTRIANS	134
6.8.3	HIKING	134
6.9	CYCLING	134
6.9.1	CYCLING WITHIN JINDABYNE	134
6.9.2	LAKE JINDABYNE SHARED TRAIL	135
6.9.3	MOUNTAIN BIKING	137
6.9.4	ROAD CYCLING	138
6.9.5	MONARO RAIL TRAIL	138
6.10	WATER TRANSPORT	140
6.10.1	RECREATIONAL USES	140
6.10.2	ROLE IN TRANSPORT NETWORK	140
6.10.3	VESSEL OPTIONS	141
7	ACCESSING THE SNOWY MOUNTAINS SAP	142
7.1	CONNECTIONS	142
7.2	PLACE	145
7.3	SUSTAINABILITY	147
7.4	SUMMARY OF KEY TRANSPORT ACTIONS	149
8	JINDABYNE ACCESS	151
8.1	CONNECTIONS	151
8.2	PLACE	155
8.3	SUSTAINABILITY	159
8.4	SUMMARY OF KEY TRANSPORT ACTIONS	162
9	KOSCIUSZKO NATIONAL PARK ACCESS STRATEGY	164
9.1	CUSTOMERS	164

9.2	CONNECTIONS	169
9.3	PLACE	179
9.4	SUSTAINABILITY	184
9.5	SUMMARY OF KEY TRANSPORT ACTIONS.....	188
10	IMPLEMENTATION.....	190
10.1	INTEGRATED TRANSPORT NETWORK.....	190
10.2	INFRASTRUCTURE TIMING.....	190
10.3	FUNDING AND DELIVERY	190
10.4	SHUTTLE BUS.....	193
10.5	PARK-AND-RIDE CAR PARK.....	193
10.6	SKITUBE.....	193
11	NEXT STEPS.....	194

LIST OF TABLES

TABLE 2.1	SNOWY MONARO LOCAL STRATEGIC PLANNING STATEMENT 2040	13
TABLE 3.1	ASSUMED ROAD LANE TRAFFIC CAPACITIES BY ROAD TYPE AND ASSOCIATED LOS (AS DETERMINED BY V/C RATIO)	26
TABLE 3.2	MID-BLOCK ROAD CAPACITY ASSESSMENT – EXISTING VOLUMES	27
TABLE 3.3	CRASH SUMMARY ALONG FOUR MAJOR ROUTES IN THE STUDY AREA WITHIN THE SNOWY MONARO REGIONAL COUNCIL AREA.....	30
TABLE 3.4	EXISTING PARKING AT ALPINE RESORTS.....	34
TABLE 3.5	SUMMARY OF PUBLIC TRANSPORT/SHUTTLE SERVICES IN THE STUDY AREA.....	37
TABLE 3.6	SCHOOL BUS ROUTES OPERATED BY COOMA COACHES.....	38
TABLE 3.7	FREQUENCY OF THE SKITUBE BETWEEN BULLOCKS FLAT TERMINAL AND PERISHER VALLEY.....	42
TABLE 6.1	YEAR-ROUND POPULATION GROWTH FORECASTS.....	80
TABLE 6.2	OVERNIGHT VISITOR GROWTH FORECASTS – PEAK DAILY VISITORS IN AUGUST	81
TABLE 6.3	SEASONAL WORKER GROWTH FORECASTS.....	82
TABLE 6.4	TRAVEL DEMAND MANAGEMENT MEASURES	83
TABLE 6.5	OPERATIONAL ASPECTS OF ALTERNATIVE MODES	89
TABLE 6.6	GONDOLA BENCHMARKING	91
TABLE 6.7	MID-BLOCK ROAD CAPACITY ASSESSMENT – MORNING PEAK WINTER WEEKEND VOLUMES – NO CHANGE TO CURRENT BEHAVIOUR.....	97
TABLE 6.8	MID-BLOCK ROAD CAPACITY ASSESSMENT – MORNING PEAK WINTER WEEKEND VOLUMES – WITH CAPACITY CONSTRAINT AT RESORTS AND SOUTHERN CONNECTOR ROAD.....	104
TABLE 6.9	CLASSIFICATION OF STREETS (AND STREETSCAPE)	107
TABLE 6.10	EXISTING AND PROPOSED PARKING SPACE NUMBERS AT ALPINE RESORTS - WINTER	119
TABLE 6.11	EXISTING AND PROPOSED PARKING SPACE NUMBERS AT PERISHER GROUP OF RESORTS - WINTER	120
TABLE 6.12	SHUTTLE BUS SERVICE SUMMARY.....	127
TABLE 7.1	CONNECTIONS – THROUGHPUT.....	143
TABLE 7.2	CONNECTIONS – DIRECTNESS.....	143
TABLE 7.3	CONNECTIONS – WEATHER.....	144

LIST OF TABLES (CONTINUED)

TABLE 7.4	CONNECTIONS – TECHNOLOGY	144
TABLE 7.5	CONNECTIONS – PARKING	144
TABLE 7.6	CONNECTIONS – INTERNAL MOVEMENT	144
TABLE 7.7	PLACE – ANCHORS/DESTINATIONS	145
TABLE 7.8	PLACE – HUBS	145
TABLE 7.9	PLACE – AMENITY.....	145
TABLE 7.10	PLACE – CORRIDORS.....	146
TABLE 7.11	PLACE – ENVIRONMENT	146
TABLE 7.12	PLACE – SEASONALITY	146
TABLE 7.13	SUSTAINABILITY – TRIP GENERATION	147
TABLE 7.14	SUSTAINABILITY – SAFETY	147
TABLE 7.15	SUSTAINABILITY – SOCIAL.....	148
TABLE 7.16	SUSTAINABILITY – VEHICLES.....	148
TABLE 7.17	SUSTAINABILITY – ECONOMIC DEVELOPMENT	148
TABLE 7.18	SNOWY MOUNTAINS SAP OTHER AREAS – KEY TRANSPORT INITIATIVES	149
TABLE 8.1	CONNECTIONS – THROUGHPUT.....	152
TABLE 8.2	CONNECTIONS – DIRECTNESS.....	153
TABLE 8.3	CONNECTIONS – WEATHER.....	153
TABLE 8.4	CONNECTIONS – TECHNOLOGY	154
TABLE 8.5	CONNECTIONS – PARKING	154
TABLE 8.6	CONNECTIONS – INTERNAL MOVEMENT	155
TABLE 8.7	PLACE – ANCHORS/DESTINATIONS	156
TABLE 8.8	PLACE – HUBS	156
TABLE 8.9	PLACE – AMENITY.....	157
TABLE 8.10	PLACE – CORRIDORS.....	157
TABLE 8.11	PLACE – ENVIRONMENT	157
TABLE 8.12	PLACE – SEASONALITY	158
TABLE 8.13	SUSTAINABILITY – TRIP GENERATION	159
TABLE 8.14	SUSTAINABILITY – SAFETY	160
TABLE 8.15	SUSTAINABILITY – SOCIAL.....	160
TABLE 8.16	SUSTAINABILITY – VEHICLES.....	161
TABLE 8.17	SUSTAINABILITY – ECONOMIC DEVELOPMENT	161
TABLE 8.18	JINDABYNE – KEY TRANSPORT INITIATIVES	162
TABLE 9.1	CUSTOMER GROUPS	166
TABLE 9.2	CONNECTIONS – THROUGHPUT.....	170
TABLE 9.3	CONNECTIONS – DIRECTNESS.....	172
TABLE 9.4	CONNECTIONS – WEATHER.....	173
TABLE 9.5	CONNECTIONS – TECHNOLOGY	174
TABLE 9.6	CONNECTIONS – PARKING	175

LIST OF TABLES (CONTINUED)

TABLE 9.7	CONNECTIONS – INTERNAL PARK MOVEMENT	178
TABLE 9.8	PLACE – ANCHORS/DESTINATIONS	180
TABLE 9.9	PLACE – HUBS	181
TABLE 9.10	PLACE – AMENITY.....	182
TABLE 9.11	PLACE – CORRIDORS.....	182
TABLE 9.12	PLACE – ENVIRONMENT	183
TABLE 9.13	PLACE – SEASONALITY	183
TABLE 9.14	SUSTAINABILITY – TRIP GENERATION	184
TABLE 9.15	SUSTAINABILITY – SAFETY	185
TABLE 9.16	SUSTAINABILITY – SOCIAL.....	185
TABLE 9.17	SUSTAINABILITY – VEHICLES.....	186
TABLE 9.18	SUSTAINABILITY – ECONOMIC DEVELOPMENT	187
TABLE 9.19	KOSCIUSZKO NATIONAL PARK ACCESS PLAN – KEY INITIATIVES	188
TABLE 10.1	PROPOSED INFRASTRUCTURE AND SERVICE IMPROVEMENT	191

LIST OF FIGURES

FIGURE 1.1	STUDY AREA.....	4
FIGURE 2.1	TECHNOLOGY AND POTENTIAL IMPACT ON THE FUTURE OF MOBILITY	9
FIGURE 3.1	CONNECTIONS TO THE SNOWY MOUNTAINS SAP	14
FIGURE 3.2	KEY ATTRACTIONS FROM SNOWY MOUNTAINS AIRPORT	15
FIGURE 3.3	ROAD NETWORK	18
FIGURE 3.4	MONTHLY PATTERN OF CAR VISITORS TO KOSCIUSZKO NATIONAL PARK.....	19
FIGURE 3.5	EXISTING TRAFFIC DEMAND ON KEY ROADS WITHIN THE SNOWY MOUNTAINS SAP.....	20
FIGURE 3.6	DAILY VEHICLE COUNTS ENTERING AND LEAVING KOSCIUSZKO NATIONAL PARK ON KOSCIUSZKO ROAD AND ALPINE WAY.....	23
FIGURE 3.7	COMPARISON OF HIGH SEASON (JULY TO AUGUST) AND LOW SEASON (MAY) HOURLY TRAFFIC VOLUMES ON KOSCIUSZKO ROAD	24
FIGURE 3.8	COMPARISON OF HIGH SEASON (JULY TO AUGUST) AND LOW SEASON (MAY) HOURLY TRAFFIC VOLUMES ON ALPINE WAY.....	24
FIGURE 3.9	RESTRICTED TRUCK ROUTES.....	25
FIGURE 3.10	LOCATION OF CRASHES ALONG THE FOUR MAJOR ROUTES – 2014 TO 2018.....	29

LIST OF FIGURES (CONTINUED)

FIGURE 3.11 CHARLOTTE PASS OVERSNOW VEHICLE	31
FIGURE 3.12 CURRENT PARKING RESTRICTIONS IN JINDABYNE	33
FIGURE 3.13 BUS ROUTES BETWEEN COOMA AIRPORT, JINDABYNE AND THE ALPINE RESORTS	40
FIGURE 3.14 SKITUBE FROM BULLOCKS FLAT TO PERISHER.....	42
FIGURE 3.15 LAKE JINDABYNE BOATING FACILITIES	45
FIGURE 3.16 SNOWLINE CARAVAN PARK BOAT RAMP – LAKE JINDABYNE.....	46
FIGURE 3.17 SNOWY MOUNTAINS REGION – ALL ACTIVITIES.....	47
FIGURE 3.18 JINDABYNE – CYCLING.....	48
FIGURE 3.19 JINDABYNE – RUNNING.....	48
FIGURE 3.20 EXISTING FORMALISED PEDESTRIAN NETWORK.....	50
FIGURE 3.21 OFF-ROAD CYCLE INFRASTRUCTURE	52
FIGURE 3.22 RECOMMENDED CYCLE NETWORK – JINDABYNE, EAST JINDABYNE.....	53
FIGURE 3.23 MOUNTAIN BIKE ROUTES WITHIN THE SNOWY MOUNTAINS SAP AREA	55
FIGURE 3.24 KOSCIUSZKO NATIONAL PARK MAP.....	57
FIGURE 3.25 SNOWIES ICONIC WALK ROUTE	58
FIGURE 3.26 AUSTRALIAN ALPS WALKING TRACK	59
FIGURE 3.27 CROSS COUNTRY SKI TRAILS	60
FIGURE 4.1 QUEENSTOWN AREA ATTRACTIONS AND TRANSPORT.....	61
FIGURE 4.2 LAKE TAUPO AND SURROUNDS	63
FIGURE 4.3 JACKSON HOLE	65
FIGURE 4.4 JACKSON HOLE AIRPORT	66
FIGURE 4.5 LAKE PLACID.....	67
FIGURE 4.6 LAKE PLACID MAIN STREET.....	67
FIGURE 4.7 WHISTLER.....	68
FIGURE 4.8 MOUNTAIN BIKING IN WHISTLER.....	69
FIGURE 4.9 BANFF	71
FIGURE 4.10 ZERMATT.....	72
FIGURE 6.1 ESTIMATED EXISTING FUTURE ARRIVAL MODE FOR VISITORS.....	83
FIGURE 6.2 OPERATING SPEED AND PASSENGER CAPACITY OF PUBLIC TRANSPORT MODES	89
FIGURE 6.3 EXAMPLE OF BUS FOR SKI PASSENGERS.....	90

LIST OF FIGURES (CONTINUED)

FIGURE 6.4	FORECAST TRAFFIC DEMAND ON KEY ROADS WITHIN THE SNOWY MOUNTAINS SAP DURING A WINTER WEEKEND VISITOR PEAK – NO CAPACITY CONSTRAINT AT RESORTS AND NO SOUTHERN CONNECTOR ROAD	96
FIGURE 6.5	POTENTIAL ALIGNMENT OF FUTURE SOUTHERN CONNECTOR ROAD	100
FIGURE 6.6	FORECAST TRAFFIC DEMAND ON KEY ROADS WITHIN THE SNOWY MOUNTAINS SAP DURING A WINTER WEEKEND VISITOR PEAK – WITH CAPACITY CONSTRAINT AT RESORTS AND SOUTHERN CONNECTOR ROAD	101
FIGURE 6.7	FORECAST TRAFFIC DEMAND ON KEY ROADS WITHIN THE SNOWY MOUNTAINS SAP DURING A TYPICAL WINTER WEEKDAY PEAK – WITH THE SOUTHERN CONNECTOR ROAD	102
FIGURE 6.8	FORECAST TRAFFIC DEMAND ON KEY ROADS WITHIN THE SNOWY MOUNTAINS SAP DURING AN OFF-SEASON WEEKEND VISITOR PEAK – WITH SOUTHERN CONNECTOR ROAD	103
FIGURE 6.9	SOUTHERN CONNECTOR ROAD INDICATIVE CROSS-SECTION	105
FIGURE 6.10	PROPOSED MOVEMENT AND PLACE CATEGORISATION – JINDABYNE, EAST JINDABYNE AND TYROLEAN VILLAGE	107
FIGURE 6.11	TOURIST LOOKOUT OPTION 1 - KOSCIUSZKO ROAD, APPROACHING EAST JINDABYNE 2 KM NORTH OF JERRARA DRIVE	110
FIGURE 6.12	TOURIST LOOKOUT OPTION 2 – KOSCIUSZKO ROAD, TYROLEAN VILLAGE, 1 KM SOUTH OF JERRARA DRIVE	111
FIGURE 6.13	TOURIST LOOKOUT OPTION 3 – ALPINE WAY, 1.6 KM WEST OF KOSCIUSZKO ROAD	112
FIGURE 6.14	TOURIST LOOKOUT OPTION 4 – HYDRO SURGE TOWER, KOSCIUSZKO ROAD	113
FIGURE 6.15	JINDABYNE PARK AND RIDE CONCEPT DESIGN (CONCEPT DESIGN REPORT, 2021)	118
FIGURE 6.16	KOSCIUSZKO ROAD/SUMMIT ROAD PARKING	122
FIGURE 6.17	MOUNTAIN SHUTTLE SERVICE – WINTER	125
FIGURE 6.18	MOUNTAIN SHUTTLE SERVICE - SUMMER	126
FIGURE 6.19	MOUNTAIN SHUTTLE SERVICE – SUMMER ROUTE TO KOSCIUSKO SUMMIT WALK	127
FIGURE 6.20	MOUNTAIN SHUTTLE SERVICE – JINDABYNE	128
FIGURE 6.21	ADVERTISEMENT FOR ELECTRIC BUS IN PARK CITY UTAH, UNITED STATES	129

LIST OF FIGURES (CONTINUED)

FIGURE 6.22 IMPROVEMENT OPPORTUNITIES FOR THE PEDESTRIAN NETWORK	132
FIGURE 6.23 EXISTING AND PROPOSED FOOTPATH AND CROSSING FACILITIES	133
FIGURE 6.24 LAKE JINDABYNE BICYCLE AND SHARED PATH ROUTE.....	136
FIGURE 6.25 PROPOSED MONARO RAIL TRAIL.....	139
FIGURE 6.26 EXAMPLE OF A PASSENGER HOVERCRAFT THAT CAN TAKE 10 TO 30 PASSENGERS.....	141
FIGURE 7.1 MAP OF SNOWY MOUNTAINS SAP OTHER AREAS (OUTSIDE JINDABYNE AND KOSCIUSZKO NATIONAL PARK KEY TRANSPORT INITIATIVES	150
FIGURE 8.1 MAP OF JINDABYNE KEY TRANSPORT INITIATIVES	163
FIGURE 9.1 KOSCIUSZKO NATIONAL PARK INTERNAL POPULATION.....	168
FIGURE 9.2 KEY ROAD CAPACITY	171
FIGURE 9.3 WINTER CAR PARKING CAPACITY.....	176
FIGURE 9.4 PUBLIC TRANSPORT CAPACITY	177
FIGURE 9.5 MAP OF KOSCIUSZKO NATIONAL PARK KEY TRANSPORT INITIATIVES	189

LIST OF APPENDICES

APPENDIX A TRAFFIC VOLUME DATA
APPENDIX B FREIGHT DATA
APPENDIX C STRUCTURE PLAN AREA DETAILS
APPENDIX D WEEKDAY ROAD NETWORK PERFORMANCE
APPENDIX E JINDABYNE TOWN CENTRE PARKING PLAN

GLOSSARY

B-double	A heavy vehicle that consists of a prime mover towing two semitrailers, with the first semitrailer being attached directly to the prime mover by turntable and the second semitrailer being mounted on the rear of the first semitrailer by another turntable.
COVID-19	A respiratory illness caused by a new virus first reported in 2019.
high season	The period when most of the visitation to the region occurs. For the Snowy Mountains SAP it is usually 16 to 18 weeks from late June to early October each year depending on weather conditions.
hop-on-hop-off	A transport service where a ticket is valid for a length of time and multiple boardings and alightings are permitted within the specified time.
Investigation Area	The investigation area for the Snowy Mountains SAP, encompassing an area of 72,211 ha including Jindabyne and the Alpine Resorts of Kosciuszko National Park.
low season	Typically, October through to May
Monero Ngarigo	Aboriginal linguistic group who traditionally occupied the eastern side of the Kosciuszko plateau and further north towards the Murrumbidgee River.
rideshare	A service that arranges one-way transportation on short notice for a fee.
Short combination	A truck nominated to haul one trailer where the combination has six axles or fewer, and the maximum total mass that is legally allowable for the combination is 42.5 tonnes or less.
Skitube	A rack-rail train that takes passengers from Bullocks Flat on the Alpine Way through to the Perisher Resort and then continues to Blue Cow.
Snowy Mountains	The highest mountain range on the continent of mainland Australia, located in southern New South Wales and part of the larger Australian Alps and Great Dividing Range. The mountain range experiences large natural snowfalls every winter.
Special Activation Precinct	A Special Activation Precinct is a dedicated area in a regional location identified by the NSW Government to become a thriving business hub to create jobs, attract business and investors, support local industries and fuel economic development.
Strava data	Strava is an internet service for tracking human exercise (mostly cycling and running) using GPS data.

ABBREVIATIONS

CBD	Central Business District
CML	Concessional Mass Limits
DPE	Department of Planning and Environment
DRNSW	Department of Regional New South Wales
EbD	enquiry by design
GML	General Mass Limits
HML	Higher Mass Limit
HNSW	Heritage New South Wales
KNP	Kosciuszko National Park
KNP POM	Kosciuszko National Park Plan of Management
LGA	Local Government Area
MaaS	Mobility as a Service
NPWS	National Parks and Wildlife Service
NSW	New South Wales
RAP	Registered Aboriginal Party
RGDC	Regional Growth NSW Development Corporation
SAP	Special Activation Precinct
SEPP	State Environmental Planning Policy
SMRC	Snowy Monaro Regional Council
TfNSW	Transport for NSW
VES	Visitor Entry Station
vpd	vehicles per day
vph	vehicles per hour
ZEV	Zero emission vehicles

EXECUTIVE SUMMARY

The Snowy Mountains are a unique destination for visitors from across Australia which are attracted by its pristine alpine environment, facilities for snow sports and outdoor activities such as mountain biking and hiking. The Snowy Mountains Special Activation Precinct (SAP) master plan, outlines the plan to enable future visitor and population growth for this established regional economy.

Even without the projected growth in visitation, the transport network in the Snowy Mountains, elements of the road network and car parking, operates at capacity during the 14-week peak high season visitation period in the winter months and during public holiday periods in the remaining “green seasons”. The dramatic climatic conditions of the region are a key influence on the capacity and safety of the transport network, particularly when accessing the alpine resorts in the Kosciuszko National Park during winter. Summer visitation to the Snowy Mountains is also growing in popularity with year on year growth associated with mountain biking and hiking.

Jindabyne and the surrounding villages are also experiencing growth and are seen as a healthy, accessible, adventurous and sustainable place to live, work and play. A key aspect of the Snowy Mountains SAP is the expansion of education and high-performance sporting facilities. Whilst Jindabyne is an established regional centre, its urban realm and accommodation offering are becoming tired and reflect the car dominated nature of development from times past. Pockets of investment demonstrate that with government support through enabling infrastructure and targeted investment, a more sustainable and attractive township (place) can emerge and become a successful destination like other alpine towns across the globe.

TRANSPORT ASPIRATIONS

The aspirations for transport for the Snowy Mountains SAP focus on infrastructure and connections. They also address several aspirations for sustainability and wellness and also consider design and culture. The key aspirations include:

INFRASTRUCTURE AND CONNECTIONS

- Improved air access to Jindabyne from key markets
- Public transport between Jindabyne and Kosciuszko National Park
- More transport technologies and less congestion
- A pedestrian and cycle friendly town centre
- Unlocked with a quality visitor experience to keep visitors coming back.

SUSTAINABILITY AND WELLNESS

- As a region be a national leader in environmental resilience and sustainability
- Investment in renewable energies and green infrastructure
- Aspirations for a climate positive and carbon-negative future
- Opportunities to connect with nature
- Continued protection of the vulnerable alpine environment of Kosciuszko National Park.

DESIGN AND CULTURE

- Strengthened alpine character
- Heightened attention to design
- Enhancement of Lake Jindabyne’s foreshore
- Improved social equity.

STRATEGIC CONTEXT

Both state and local government have developed various policies for the state and region which influence transport and population growth in the Snowy Mountains SAP study area. Transport for NSW's (TfNSW) key policy document Future Transport 2056, outlines the plans for a future transport network that is customer focussed, leverages new technologies and fosters successful places. Future Transport 2056 identified Canberra as a global gateway city which in turn opens the Snowy Mountains SAP to new international markets. It also outlines the road map to introducing new technologies associated with mobility including automated vehicles and alternative fuels. The plan also shifted the focus of planning for transport to consider a place-based approach to balance the traditional focus on movement.

The South East and Tablelands Regional Plan 2036 issued by the Department of Planning and Environment (DPE) was the initial planning document which identified the key direction to develop the Snowy Mountains into Australia's premier year-round alpine destination.

The SEPP Precincts – Regional 2021 (Chapter 4 Kosciuszko National Park and alpine resorts) encourages environmentally sustainable development whilst protecting the environmental and cultural heritage of the land. The associated Kosciuszko National Park Plan of Management provides a framework to guide the long-term management of the National Park. This includes the control of bed limits associated with tourist resorts within the National Park. These bed limits directly influence the scale of the daily transport task within the Snowy Mountains SAP, particularly in the peak winter season. The more visitors who stay within the alpine resorts reduces the load on the transport system and the provision for day parking and public transport shuttles.

The Snowy Monaro Local Strategic Planning Statement (LSPS) provides a detailed investigation into the plans for the local Snowy Monaro community over the next 20 years. The relevant planning priorities include supporting development of the Snowy Mountains as Australia's premier year-round alpine destination, identify and integrate transport corridors and connections with the right types and levels of development, protect and enhance the scenic landscape of the region and move towards a carbon neutral future.

EXISTING TRANSPORT

Existing connections to the Snowy Mountains SAP are predominantly road based which reflects the fact that 75% of visitors come from NSW and a further 12% from the ACT. Jindabyne is five hours driving time from Sydney and two hours from Canberra. Limited flights operate to the Snowy Mountains Airport located outside of Cooma which is a 65-minute flight from Sydney and a 35-minute drive to Jindabyne.

With road-based transport the dominant access mode to the Snowy Mountains SAP, the road network regularly operates at capacity (Traffic Level of Service (LoS) E; approximately 1,100 vehicles per hour) on the roads to Perisher and Thredbo alpine resorts during the peak winter season. Journey time reliability becomes an issue in the winter months with travel times between the alpine resorts and Jindabyne varying between 35 minutes to three hours depending on weather and road conditions. The general lack of experience of Australian drivers in navigating alpine conditions means that road safety becomes an issue several times a year during extreme weather events. Currently there are limited alternate transport options to the private vehicle to access the alpine resorts. Currently park entry fees for the Kosciuszko National Park are \$29 per vehicle per day for winter season and \$17 per vehicle per day for the remaining period which are considered modest when compared with other alpine jurisdictions such as Victoria. Comparatively, bus passengers pay \$11.45 per adult per day in peak season which is higher than a car with several occupants.

The demands on car parking within Jindabyne town centre continue to be high during the peak winter season. This is due to both the swelling seasonal tourist population and the car dominated design of the township with limited footpaths and cycle facilities and alternative travel choices e.g. public transport.

The demand for car parking at the alpine resorts continues to grow in line with year on year growth in visitation. There has also been a limit put on the number of coach parking spaces in some alpine resorts in recent years. The capacity for increased supply in car parking at the resorts is restricted due to both road access capacity and the available locations for new car parking. Overflow parking on the sides of alpine roads and within chain bays currently occurs on peak snow days under existing transport management plans. This approach is acknowledged as not desirable in terms of safety, operational management and visitor experience and is considered a short-term solution. The winter peak season has the unique and complex challenge of trying to satisfy increases in demand for car parking on high ski days (after or during a significant snowfall event) with reduced parking supply created by the requirements for snow removal and road safety. Charlotte Pass also experiences car parking demand and supply issues during summer months whereby in excess of 200 vehicles park informally on the sides of roads where topological constraints restrict the number of signposted spaces to six vehicles.

Public transport to, from and within the Snowy Mountains SAP is currently limited and reflects the status of Jindabyne as a regional town rather than a year-round tourism hub. It is served by existing regional coach connections, community and school buses and seasonal shuttles operated by local businesses focussing on transfers for snow sports in winter and mountain biking in summer. This disparate approach to transport provision does not offer the customer an easily understood transport selection or surety in terms of frequency, journey time and cost.

The Skitube is a privately operated (by Vail Resorts, lift operator for Perisher Ski Resort) rack railway that operates within a tunnel between Bullocks Flat (off the Alpine Way), Perisher and Blue Cow during the peak winter season only. It has a current capacity of approximately 1,620 passengers per hour. However, it is understood that there is capacity to increase this to a future capacity of 2,250 passengers per hour. Previously submitted development application reports (2011) that are publicly available state that its daily capacity sits at 6,500 passengers with 2,300 passengers travelling in the 90-minute AM peak period. This represents approximately 32% of the daily transport task to Perisher. The return-journey fare for the Skitube in 2020 was \$95 for adults and \$51 for children. Vail Resorts current operating lease for the Skitube expires in July 2030.

Water transport on Lake Jindabyne is limited to recreational activities utilising both motorised and non-motorised vessels. The water levels of the lake are controlled by Snowy Hydro as part of their hydro-electric power generation operations. This means the shoreline can change significantly by up to 100 metres. This make the establishment of commercial maritime operations problematic as wharf infrastructure needs to respond to such conditions. The lack of population in the catchment of the lakeside communities and the seasonality in visitation is also an influencing factor to the passenger demand and viability for commercial success. Water transport services are commonly known as being expensive to operate in comparison to other forms of transport.

The community of Jindabyne and the surrounding areas are considered active people who choose to live in the region to take advantage of its outdoor lifestyle opportunities. This is reflected in the revealed data of walking and cycling patterns. This extensive network incorporates shared paths around the foreshore, Mountain Bike paths, running and hiking trails and road cycling. Unfortunately, the pedestrian and cycling network within the town centre and surrounding residential areas are not extensive or scaled to accommodate the influx of visitors during peak periods. The existing urban realm character associated with Kosciuszko Road through the town centre also reflects the car dominated design which has prevailed from the late 1960s when the new township was established. The level of pedestrian amenity and safety within the major alpine resorts is also low with Perisher dominated by surface car parking and lack of shelter, whereas Thredbo shares its pedestrian space with cars and buses and experiences significant level differences within its village street network.

GLOBAL BENCHMARKING

Global benchmarking of alpine townships (most being lakeside) were studied to understand common themes which could be applicable to planning for the Snowy Mountains SAP. Queenstown New Zealand was considered an exemplar in terms of alternative activities for visitors, besides snow sports, and also the positive effects that an appropriately scaled airport facility can bring to a region. It was also referenced in terms of more negative impacts such as the management of the capacity transport networks, urban infrastructure, accommodation and exponential population and tourism growth in a regional setting. Lake Taupo in New Zealand provided a case study which outlined the benefits of year-round tourist opportunities and event programming. Jackson Hole in Wyoming USA provided an example of how to establish an airport in a National Park setting as well as successfully implementing a rapid transit system for skiers with an associated park-and-ride facility. Lake Placid USA provided an example of how not to address a waterfront public realm through the main street turning its back on the adjacent lake. Whistler Canada provided an example how to incorporate mountain biking into the list of attractions and manage parking in a significantly scaled resort setting. Banff Canada provide insights into how a major highway bypassing the township would not negative influence on its economic viability. The sustainable transport measures such as electric vehicles are a key feature and other sustainability measures restrict the level of development in Banff. Lastly Zermatt Switzerland was referenced to understand the requirements of a car-free village, the use of remote parking and extensive use of electric vehicles.

FUTURE DEMAND

The Snowy Mountains SAP planning process is seeking to plan for sustainable long-term growth (2020–2061) with a strong year-round economy. Beyond 2031, as the of emerging transport technologies develop rapidly, particularly in the area of automated and electric vehicles come online the role of traditional modes of transport becomes less certain. The future operation of transport for the Snowy Mountains SAP master plan could change from today's assumptions and perceptions. The flexibility of the transport strategy to adapt as new transport opportunities become available is critical.

To assess the potential transport needs of the Snowy Mountains SAP, a high growth scenario has been assessed to test the possible size of transport system needed to cater for this upper limit of growth. The scenario selected for the assessment is the Visitation linked (high) scenario – that links population growth to visitation and tourism expenditure with an upper bound (The CIE, 15 December 2020). This would see the local population grow from 7,300 in 2020 to peak at 12,000 in 2051 (2% growth per annum). Winter peak overnight visitors would increase from 18,300 in 2020 to 29,400 in 2039 (3.2% growth per annum). Seasonal workers would increase from 3,300 in 2020 to peak at 4,600 in 2039 (2.1% growth per annum).

A key pillar of the vision for the Snowy Mountains SAP is sustainability. Transport is a key contributor to emissions through the direct combustion of fuels in transport by road, rail, domestic aviation and domestic shipping. In the year to June 2020, transport accounted for 18.3% of Australia's national inventory of greenhouse gas emissions (*Source: Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2020, Commonwealth Department of Industry, science, energy and Resources*). Therefore, investing in future transport infrastructure and services that leverage alternative fuels and reduce unsustainable individual trip generation e.g. low occupancy private cars, will support the growth of the Snowy Mountains SAP and contribute positively to reducing emissions.

TRAVEL DEMAND MANAGEMENT

Increasing travel choices for both residents and visitors is a key objective of the transport plans for the Snowy Mountains SAP. Other alpine areas overseas such as Utah in the USA and Zermatt in Switzerland have introduced progressive measures to encourage winter visitors to use alternative methods of transport than private car to visit sensitive alpine environments from nearby towns. It is important that funding to support new sustainable transport initiatives and the associated marketing messages link the changes in travel behaviour required to the benefits that they experience from the pristine alpine environments within the Snowy Mountains. It is also important that the likely long-term impacts on climatic conditions in the Snowy Mountains SAP (e.g. lower snowfall levels and more frequent bushfire events) are as a direct result of maintaining the status quo in terms of travel behaviour.

AVIATION

Investigations for future air travel for this study have identified that Canberra International Airport maintain its role as the Global Gateway to the Snowy Mountains SAP. This supports TfNSW's planning, as outlined in Future Transport 2056, and reinforces current operations whereby private transport operators provide shuttles to Jindabyne via the airport during the peak winter season. It is noted that international services have ceased during the global pandemic however it is expected that services will be reinstated in the next few years as health and economic conditions improve. Snowy Mountains Airport at Cooma remains an option for increased passenger services from the eastern states of Australia with potential for future growth at the existing facility located within 35 minutes driving time of Jindabyne. The existing Jindabyne Aerodrome has been identified for future aviation uses such as Advanced Air Mobility (new technologies), helicopters and light aircraft.

SKITUBE AND ALTERNATIVE TRANSPORT MODES

The Skitube is a vital and strategic asset in the Snowy Mountains SAP transport network. Through past strategic planning by DPIE, NPWS, TfNSW and Vail Resorts, its important role in the region's transport task of efficiently moving significant volumes of people through challenging alpine conditions has always been recognised. The Skitube comes into its own in times of poor weather through its advantage of being an underground transit system. Its Bullocks Flat location, conveniently located on the edge but within the National Park boundary, reduces the amount of car movements within the park which is also seen as a positive attribute. It is important that as the infrastructure ages, it is not only maintained but also optimised in terms of its ability to move people and maintain customer amenity at an affordable price when compared to travel by private vehicle. As car-based transport solutions such as expanding road capacity and increasing the footprint of car parking at alpine resorts diminish in terms of spatial requirements, environmental impact and community perceptions, the alternative investment strategy in providing increased transport capacity via the Skitube to 2,200 passengers per hour should be explored. Strategies whereby passenger throughput can be increased, and fares lowered and incorporated with the government's opal card fare payment system should also be explored. Investigations from the operator indicate that the design life of the asset based on existing usage for only 14 weeks per year and maintenance regimes mean that the Skitube can continue to operate for the life of the Snowy Mountains SAP Master Plan, i.e. beyond the current operating lease which expires in July 2030.

There have been suggestions over the years to extend the Skitube to Jindabyne. The operational costs of this privately owned and operated transport system restrict its use to around 14 weeks per year. There is a risk of substantial additional cost and environmental impact of upgrading the existing Skitube to meet today's standards, before commencing the extension to Jindabyne. Any proposed extension would then also face substantial environmental, technological and economical challenges after the existing system has been upgraded. An extended Skitube's (to Jindabyne) ability to operate as a commercially viable mass transit system year round in regional area of limited population is unlikely. It is not recommended to upgrade or extend the existing Skitube, however the current operations should continue as a key piece of infrastructure in providing access to the alpine areas.

Alternative forms of transport to supplement or replace the Skitube or improve access to the alpine resorts from Jindabyne were considered. Gondolas have been identified as an alternative mode common to alpine environments and tourist destinations. Whilst gondolas are considered positive in terms of passenger safety, lower power consumption, passenger experience, amenity and traversing difficult terrain or steep inclines, they are highly susceptible to wind, offer lack of flexibility in terms of route to match shifts in location and time of demand, have lower speeds (longer journey times) and carrying capacity than other forms of transit, and suffer from a high degree of scrutiny and cynicism from local communities due to their novelty value as a transport mode and visual impact in sensitive environmental areas. The high variability in capital costs and long-term patronage levels after initial opening (e.g. ability to attract repeat visitors) is also key criticism of this form of transport. Gondolas can be successful as part of specific tourism attraction which involves navigating terrain not easily achieved by another forms of transport and without the large seasonal differences in demand. Gondola systems such as those in the New Zealand towns of Queenstown and Rotorua are considered exemplar facilities.

The potential for repurposing the Skitube tunnel into the future was explored incorporating the adoption of emerging “Loop Technologies”. This involves using automated electric vehicles (AEVs) carrying around 16 people traveling up to 250 km/h within the existing tunnel. The first of several projects utilising this emerging technology commenced operation in April 2021 in Las Vegas USA. The target for the Las Vegas project is to achieve a capacity of 4,500 vehicles per hour through the tunnels.

ROAD NETWORK

The constraints on the road network in the Snowy Mountains SAP continue to place pressures on both transport operations and the amenity of the township of Jindabyne and the resorts within the Kosciuszko National Park. To meet the growth projections at the same time as increasing the sustainable outcomes for the Snowy Mountains SAP, targeted investments in road improvements that increase safety (i.e. passing and turning lanes and lower speed limits), maximise existing capacity, improve amenity, support driver guidance (intelligent transport systems), support access for pedestrians and cyclists and facilitate the higher use of public transport are all supported.

The establishment of the Southern Connector Road to the south of the Jindabyne township provides an opportunity to improve the urban realm within the town centre and better connect the town to the lake foreshore. It will also facilitate pedestrian and cycling improvements and remove the unnecessary through traffic which occurs at peak periods during winter. Like many other successful regional townships, the economic and community benefits that such a road network improvement can bring can be substantial, particularly with a growing demand for visitation and the fact that the passing traffic is entering a National Park and needs to return at some stage. The Southern Connector Road will not be a traditional town bypass that severs a community but rather an alternative route with connections to it from adjacent precincts. It will be lower in speed and safely navigable across it via proposed grade separations at key locations for pedestrians and cyclists.

The use of Intelligent Transport Systems (ITS) will be crucial in improving the management of the Snowy Mountains SAP road network which is subject to regular variations in terms of weather and access restrictions e.g. snow and bushfires. The recent installation of vehicle monitoring technology in the Kosciuszko National Park by NPWS demonstrates the value of deeper insights into visitor travel behaviour which shape management responses and coordination with resort and transport operators as well as future planning. Any extension of this system with a focus on driver guidance, early warning messages and potential more detailed monitoring of vehicles that can support smarter demand management such as road user charging by vehicle occupancy or time of day or season so that a more equitable user pays approach to accessing a road network with finite capacity can be achieved.

PARKING

The upgrades to the urban realm and changes to Kosciuszko Road within the Jindabyne town centre present opportunities to rethink the planning and operation of car parking. It is acknowledged that convenient parking supports a thriving town centre however this cannot be at the expense of achieving a walkable and cycle friendly retail and community hub. A separate Jindabyne Town Centre Parking Plan has been completed as part of this study and is included in Appendix E.

Parking which is incorporated into major retail developments and removed from street level (off-street) is preferred. Parking on the edge of the retail core integrated with active frontages is also supported along with appropriately located and timed on-street parking in the new streets created by the master plan and along a redesigned Kosciuszko Road. Opportunities for adaptable multi-deck council operated car parks have also been recommended.

The establishment of a Park-and-Ride facility on the edge of town adjacent to the proposed Southern Connector Road is key priority project which will provide relief for the constrained parking within the National Park, particularly at the alpine resorts. It will also provide an alternative travel option for those visitors who are not comfortable driving during in variable weather conditions. The park-and-ride facility would be supported through a new dedicated transit service (mountain shuttles) operating to the major alpine resorts from the facility.

Resorts have worked closely in the past with NPWS, TfNSW and DPE to meet the growing demand for car parking within the National Park during the peak winter season. The sustainable objectives of the Snowy Mountains SAP vision mean that a social license from the local community for continual increases in the supply of car parking within the National Park will be difficult to achieve without the implementation of alternative sustainable transport measures to meet the growth in proposed visitation. This study recommends a cap on existing quantities of parking for day visitors at each of the major alpine resorts which is based upon existing and proposed locations including those previously submitted to government through development applications and agreements between government stakeholders and alpine resort operators. Any perceived shortfall in capacity after realising these identified sites, should be staged and aligned with new public transport services linked with a park-and-ride facility in Jindabyne or increases to on site accommodation capacity e.g. more overnight accommodation. Existing day parking located on-street or in chain bays should be reduced and removed as replacement off-street facilities come online. A new at-grade car park is proposed at Pipers Gap, however this only replaces existing spaces from the Perisher car park and roadside parking which will be reallocated for development or removed / upgraded to improve road safety and operational outcomes.

The implementation of additional ITS infrastructure and potential online booking systems for car parking should also be considered so that visitors can make their travel choice decisions based on capacity information before leaving their accommodation.

Demand for parking at Charlotte Pass outside of winter is increasing year on year. With limited capacity at the turning circle and the establishment of the Iconic Snowies Walk supporting increased visitation to the resort, a new parking solution is required in the short term. Through the master plan process, a parking management scheme whereby limited additional parking is established within Charlotte Pass village (Parking Area P2) is established supported by a summer shuttle system operating on a loop between the turning circle, new village car park and the high capacity and underutilised car park at Perisher Valley is proposed. This would require formalising short-stay parking on the northern side of Kosciuszko Road (Parking Area P1) to allow pedestrians and cyclists to use the uphill road shoulder. Operating a shuttle bus to the Summit Road turn around and incorporated with the shuttle to Perisher Car Park (Parking Area P3) as well as a chairlift and walking trail would provide several choices for visitors. Only limited disabled parking and short-term parking (drop off) would be available at the turning circle. Driver guidance signage would indicate the availability of parking at each location.

Limited overnight parking in winter for access to the backcountry will continue to be provided at Thredbo and Guthega. The proposed mountain shuttle service will provide additional parking at the proposed Jindabyne park and ride facility and the shuttle can be used to access the backcountry from the alpine resorts of Thredbo or Perisher.

BUS AND COACH SERVICES

Besides the Skitube and internal resort shuttles, public transport does not have a significant profile with visitors as a reliable and convenient form of transport within the Snowy Mountains SAP. Information for regular coach services and private shuttles from Canberra and its airport should be marketed and presented to visitors in a coordinated way.

Local bus services supporting the township and surrounding villages should follow TfNSW's approach to regional bus service contract reviews and future operating models (e.g. potential for on-demand services) and be coordinated with local government provided community shuttles as the township grows over time. School bus services will need to be adjusted to service its new location within the Sports and Education precinct.

Taking a lead from progressive world leading alpine resorts in Utah and Wyoming as well as the Grand Canyon in the USA, a dedicated mountain shuttle service would be established and operate from the Jindabyne Town Centre and a Park-and-Ride facility (adjacent to the proposed Southern Connector Road) to the resorts in the National Park, potentially utilising zero emission vehicles in line with Transport for NSW's Future Transport Technology Roadmap 2021–2024. Associated hubs would be established in the alpine resorts which provide convenient and comfortable waiting areas near on mountain facilities. This service would provide a viable alternative to the private vehicle and be competitive in terms of travel time and costs for park access fees for private vehicles.

This service would also operate in the green seasons and be extended to trailheads for the Snowies Iconic Walk at Charlotte Pass. The mountain shuttle system also should be fitted with trailers during summer to allow for the bulk transportation of mountain bikes and hikers for journeys throughout the Snowy Mountains SAP area and within the National Park. A common route mountain shuttle system incorporating park-and-ride and a limited number of local stops in Jindabyne that operates during all year round with summer route extensions to Charlotte Pass is desired to grow familiarity and trust with the service and provide better access to key attractions within the National Park. There are also an opportunity to operate the Mountain shuttle as a loop system within Jindabyne in the late afternoon and evening during the winter season to link the town centre with accommodation located throughout Jindabyne utilising the same limited local bus stops. This approach should be further explored with TfNSW in conjunction with planning for the mountain shuttle and regular contracted bus services in the region. Such a service would reduce the peak demand for car parking in the town centre and provide a comfortable service in the cooler months of winter.

WALKING

The urban realm improvements identified for the Jindabyne town centre, Kosciuszko Road and within the alpine resorts as outlined in the structure plans will significantly improve the safety and amenity of the Snowy Mountains SAP. The targeted relocation of some car parking and lowering of speed limits within the town centre will also support more pedestrian movements and increased retail activity creating a destination within its own right like other globally recognised alpine villages.

With the relocation of the central school to the sport and recreation site, a proposed pedestrian/cycling bridge and path network across and adjacent to the proposed Southern Connector Road will ensure the school remains well connected to its community.

The continued development of the Snowies Iconic Walk and improvements proposed in the master plan at the key trailheads of Charlotte Pass and Guthega will significantly improve the visitor and National Park experience for hikers. The proposed foreshore lake trail will also provide further opportunities for hikers, trail runners and mountain bikers to use for day trips out of Jindabyne.

CYCLING

The establishment of the Lake Jindabyne shared trail will be a region shaping transport infrastructure project. It will link the local lakeside settlements within the Snowy Mountains SAP, provide direct access to the comprehensive network of mountain bike facilities directly from the town centre and provide a recreational path for runners and cyclists to support an established healthy community. Jindabyne and the national park will remain a popular destination for road cyclists wanting to undertake high altitude training or challenge themselves during the summer months in a cooler climate.

Another significant priority project is the establishment of a Mountain Bike Park focussed on Round Hill to the west of the township off the Alpine Way. Key shared path connections from Jindabyne town centre to other mountain bike facilities at Mill Creek and Bungarra will make the Snowy Mountains SAP a unique destination in terms of mountain bike tourism when considering the variety of cycling experiences that will be on offer.

The Monaro Rail trail is a new 213 km cycle touring facility proposed between Queanbeyan and Bombala utilising the former freight and passenger rail line and corridor. There is broad support for such a facility from Council and the local community and it represents a piece of transport and tourism infrastructure that has been successful in other alpine areas such as Bright in Victoria (Murray to Mountains Rail Trail) and Southern Otago in New Zealand. A link to Jindabyne from the closet point on the alignment at Cooma would be 54 km. The challenge would be acquiring the land for this section as the disused rail corridor is already in TfNSW ownership. Ideally this additional link would connect into the Lake Jindabyne shared trail.

WATER TRANSPORT

The opportunities for infrastructure associated with water transport will be considered in the next stage of the Lake Jindabyne urban realm improvements. It is recommended that a wharf/pontoon structure be considered for the town centre which can appropriately address the variable water levels within Lake Jindabyne and be a focal point for active interactions with the Lake. An additional boat ramp should also be considered as part of the western foreshore precinct redevelopment.

Lake based water transport would need to be delivered by a private transport operator as there is no clear business case for such operations funded by government. The SMRC feasibility study for an ‘around the lake’ trail experience supports the opportunity for a private operator to run a service connecting the trail. It should be noted that similar services have also been difficult to establish and maintain as commercially viable operations in other larger alpine towns such as Queenstown New Zealand.

The focus for marine based infrastructure should be for public access to the lake for sailing, paddling, kayaking and other forms of recreational boating and fishing.

1 INTRODUCTION

Special Activation Precincts (SAPs) are dedicated areas in regional NSW identified by the NSW Government to become thriving hubs. The SAP program facilitates job creation and economic development in these areas through infrastructure investment, streamlining planning approvals and investor attraction.

The SAP program adopts a collaborative and integrated whole-of-government approach, bringing together the local Council and a range of other relevant State and local agencies.

SAPs are unique to regional NSW. By focusing on planning and investment, their goal is to stimulate economic development and create jobs in line with the competitive advantages and economic strengths of a region.

On 15 November 2019, the NSW Government announced its commitment to investigating the Snowy Mountains SAP, to revitalise the Snowy Mountains into a year-round destination and Australia's Alpine Capital, with Jindabyne at its heart. The Snowy Mountains SAP is being delivered through the \$4.2-billion Snowy Hydro Legacy Fund.

Different components of each SAP are led by different teams within the NSW Government:

- The **Department of Regional NSW** assesses potential locations for inclusion in the program and considers government investment for essential infrastructure to service the SAPs.
- The **NSW Department of Planning and Environment** (the Department) is responsible for the planning of SAPs. The Department leads the master planning process, including community and stakeholder engagement, the technical studies required to inform the preparation of a master plan and development of the simplified planning framework for each Precinct.
- The **Regional Growth NSW Development Corporation** (Regional Growth NSW) is responsible for delivering and implementing Special Activation Precincts. This includes attracting investment, providing support to businesses, developing enabling infrastructure, and creating strategic partnerships to foster education, training and collaboration opportunities.

The five core pillars of the Special Activation Precincts are:



The planning framework for each Special Activation Precinct includes three key parts:



STATE ENVIRONMENTAL PLANNING POLICY (ACTIVATION PRECINCTS) 2020	SPECIAL ACTIVATION PRECINCT MASTER PLANS	SPECIAL ACTIVATION PRECINCT DELIVERY PLANS
<ul style="list-style-type: none"> — Identifies each Special Activation Precinct. — Requires that an Activation Precinct Certificate be sought prior to a development application or complying development certificate being issued, to ensure the development is consistent with the Master Plan and Delivery Plan. — Provides zoning and land use controls for each Precinct. — Identifies Exempt and Complying Development pathways for certain development. 	<ul style="list-style-type: none"> — Made by the NSW Department of Planning, Industry and Environment and approved by the Minister. — Identifies the Vision, Aspirations and Principles for the Precinct. — Provides more detailed land use controls where required. — Identifies Performance Criteria at a Precinct-scale for amenity, environmental performance and infrastructure provision. — Identifies the matters to be addressed as part of the Delivery Plan. 	<ul style="list-style-type: none"> — Prepared by Regional Growth NSW and approved by the Planning Secretary. — Identifies site-level development controls. — Provides detailed strategies and plans for: <ul style="list-style-type: none"> — Aboriginal cultural heritage — environmental protection and management — protection of amenity — infrastructure and services — staging — provides procedures for ongoing monitoring and reporting.

1.1 MASTER PLANNING

The master planning process for the SAPs adopts an evidenced based approach to determining the best outcome for the precincts. It is designed to ultimately provide a clear pathway for the right types of future development, in the right locations.

The process involves the engagement of a range of technical experts to investigate the study area and prepare technical studies (such as this report) to demonstrate their findings. Each of the technical studies are specifically designed and scoped for each SAP and tailored to the needs of the study area.

Importantly, the master planning process for the Snowy Mountains SAP will build on work already undertaken for portions of the study area as part of the Go Jindabyne master plan.

To achieve integrated and balanced planning outcomes, technical experts and other stakeholders work together at a series of enquiry by design workshops throughout the master planning process. At these workshops, opportunities and constraints are discussed and assessed to inform how the precinct should be shaped. This includes the evaluation of matters such as environmental impacts and benefits, transport opportunities, infrastructure capabilities, stormwater, economic viability and many others. These workshops are designed to give technical experts and decision makers a chance to ensure the identified vision, aspirations and principals for the precinct are guiding the outcomes.

The technical reports will ultimately inform the development of planning controls for the Snowy Mountains SAP to guide the precincts development. These controls will be contained in the master plan, SEPP Precincts – Regional 2021 (Chapter 3 Activation Precincts) and delivery plan and will relate to important matters such as amenity, environmental performance and infrastructure provision.

Throughout the planning process, community, stakeholder and industry consultation takes place. Ongoing consultation provides an opportunity for community members and landowners to contribute and help shape the vision for the project.

1.2 SNOWY MOUNTAINS SAP

The Snowy Mountains region is one of Australia's most iconic natural environments. In addition to hosting some of Australia's premier alpine destinations, the Snowy Mountains is home to over 35,000 people and Australia's highest peak, Mount Kosciuszko. The traditional custodians of the Snowy Mountains are the Monero Ngarigo people, in connection with the Walgalu, Ngunnawal and Bidjawal people.

The Snowy Mountains are located in the south east of NSW. This region forms the northern part of the Australian Alps which extends south into Victoria. Predominantly the region is accessed from Canberra which is located approximately 150 kilometres to the north. To the south and west of this region is the sparsely populated high country. The township of Jindabyne situated on Lake Jindabyne provides a hub for the region, with opportunities for tourism and facilities supporting the regional catchment.

Jindabyne is located 175 km south of Canberra and 60 km south-west of Cooma. Jindabyne has evolved into the gateway to the Snowy Mountains and currently services 1.4 million visitors each year who travel to the region to enjoy its unique tourism and recreational offerings (Destination NSW, June 2020 report). There are approximately 35,500 residents of the Snowy Mountains, of which 3,500 residents live in Jindabyne (including Kalkite, East Jindabyne and Tyrolean Village).

Portions of the Snowy Mountains are within Kosciuszko National Park. Kosciuszko National Park is the central segment of the Australian Alps Bioregion containing the highest mountains in Australia and is the largest National Park in NSW (NSW National Parks and Wildlife Service, 2006). The park possesses exceptional diversity of alpine plant communities, containing threatened ecological communities (TECs) and providing habitat for a number of rare and threatened species (National Parks and Wildlife Service, 2006). The park contains most of the alpine endemic species found on the Australian mainland (National Parks and Wildlife Service, 2006).

The Snowy Mountains region is home to the Monero Ngarigo people, the tribal homeland stretches from the western slopes of the coastal ranges to the eastern side of the Kosciuszko plateau and further north. Included in the Ngarigo land is the peak of Mount Kosciuszko and the Snowy Ranges. European settlers accessed the region in 1823, and between the late 1830s to 1957 the Monaro highland region was grazing by cattle and sheep. The original town of Jindabyne was settled in the 1840s on the banks of the Snowy River where the main river crossing took place. A bridge was constructed over the river in 1893, contributing to the success of the town. In 1949 the Snowy Mountains Scheme was introduced which consisted of plans to dam and divert water from the Snowy River. By 1964 the dam had created Lake Jindabyne and the township relocated to where it is today. The old town disappeared under Lake Jindabyne in 1967. Although losing much of its built heritage, Jindabyne, as we know it today, was rebuilt and has continued to steadily grow leveraging its tourist and agricultural offerings (Ozark Environment and Heritage, 2020).

Today, the Snowy Mountains region plays a crucial role within the regional and state economy, with its local population swelling with an additional 1.4 million international and domestic visitors each year (Destination NSW, June 2020 report). The region's unique natural environment allows locals and visitors to participate in a diverse array of recreational activities year-round, with many visitors still experiencing the region through the peak winter season.

Priorities for the Snowy Mountains SAP are to capitalise on the unique cultural and environmental attributes which attract 1.4 million visitors annually to the region, revitalise the Snowy Mountains into a year-round destination, and reaffirm Australia's Alpine Capital (Destination NSW, June 2020 report). The revitalisation is to focus on year-round adventure and eco-tourism, improving regional transport connectivity, shifting towards a carbon neutral region, increasing the lifestyle and wellbeing activities on offer, and supporting Jindabyne's growth as Australia's national winter sports training base.

1.3 STUDY AREA

The Snowy Mountains SAP Investigation Area, shown in Figure 1.1, encompasses 72,211 hectare (ha) of land and within this study area are several key areas called “development opportunity areas”:

- Jindabyne growth opportunity areas: parcels of land located primarily to the south and west of the existing Jindabyne township, but also at East Jindabyne.
- Jindabyne centre opportunity areas: areas within the existing town of Jindabyne.
- Tourism opportunity areas: areas both near the town of Jindabyne and in the Kosciuszko National Park.

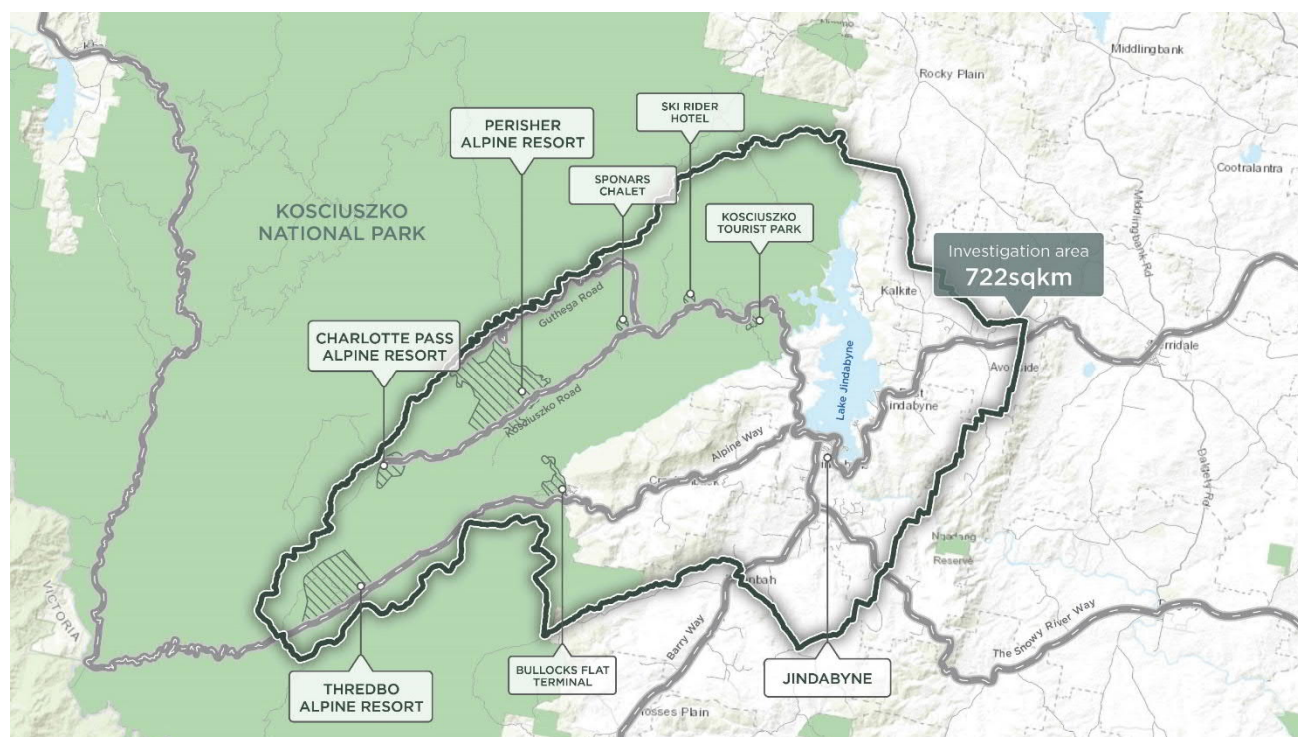


Figure 1.1 Study area

1.4 PURPOSE OF THIS REPORT

This Technical Study forms part of the Engineering Package for the Snowy Mountains SAP. This report builds on the context analysis reporting to provide a holistic view of the issues, opportunities and constraints within the Snowy Mountains SAP study area. It explores stakeholder issues and current and future constraints to investigate strategic projects for the Snowy Mountains area. This Technical Study has been prepared through collaboration with the NSW Government, Snowy Monaro Regional Council and other stakeholders including representatives from the Alpine Resorts.

The recommendations from this report will combine with other technical studies in the disciplines of engineering, planning, environment, economics and legislation to inform the Master Planning for the Snowy Mountains SAP.

1.5 BACKGROUND INFORMATION

The following background information has been reviewed and summarised in this report:

POLICY AND PLANNING CONTEXT	Future Transport 2056 Strategy, Transport for NSW
	Future Transport 2056 – Tourism and Transport Plan
	Jindabyne Community Statement (from the Go Jindabyne study), April 2019, Planning, DPIE
	State and Regional Classified Roads in Snowy Monaro Region
	State Environmental Planning Policy Precincts – Regional 2021 (Chapter 3 Activation Precincts) (Chapter 4 Kosciuszko National Park-and alpine resorts) and State Environmental Planning Policy Transport and Infrastructure 2021
	South-East and Tablelands Regional Plan 2036 – Department of Planning and Environment
	Kosciuszko National Park Plan of Management, 2006 (updated in 2014)
	Snowy River Development Control Plan 2013
	Kosciuszko National Park Cycling Strategy
	Snowy Monaro Destination Management Plan 2019
	Snowy Monaro Local Strategic Planning Statement, 2020
WEBSITES	https://charlottepass.com.au/ (Accessed 3/06/2020)
	https://www.perisher.com.au/ (Accessed 3/06/2020)
	https://www.sponars.com.au/ (Accessed 3/06/2020)
	https://www.skirider.com.au/ (Accessed 3/06/2020)
	https://www.kosipark.com.au/ (Accessed 3/06/2020)
	https://www.thredbo.com.au/ (Accessed 3/06/2020)
	Roads and Maritime Services Cycleway Finder
	nationalparks.nsw.gov.au
	Snowymountainsfishing.com.au
	trailforks.com
	Skicheap.com.au
	Snowymountainsairport.com.au
EXISTING STUDIES	Go Jindabyne Mobility and Connectivity Study, GTA Consultants, 2019
	Waste Point Kosciuszko National Park, Preliminary Master Plan, Tract, September 2016
	Monaro Rail Trail Draft Feasibility Report, Transplan, October 2019
	Canberra to Eden rail line feasibility study, DPIE, May 2020
DATA	Traffic surveys undertaken for the <i>Go Jindabyne Mobility and Connectivity Study</i> (GTA Consultants, 2019)
	Transport for NSW – Traffic Volume Viewer
	Transport for NSW – classified tube counts
	NSW Centre for Road Safety road crash data
	Transport for NSW – Freight Forecast from the Strategic Freight Model
STANDARDS AND GUIDELINES	Austroroads Guide to Traffic Management Part 3 – Transport Study and Analysis Methods

In some instances, data on transport services was unavailable due to the COVID-19 environment, including restrictions on services and a reduced demand. Examples include reduced flights to the region, affected bus timetables and the delayed start to the 2020 ski season.

1.6 SNOWY MOUNTAINS SAP TRANSPORT ASPIRATIONS

Improved air connections – Investigations for future air travel for this study have identified that Canberra International Airport maintain its role as the Global Gateway to the Snowy Mountains SAP. Snowy Mountains Airport at Cooma remains an option for increased passenger services from the eastern states of Australia with potential for future growth at an existing facility. The existing Jindabyne Aerodrome has been identified for future aviation uses such as Advanced Air Mobility (new technologies), helicopters and light aircraft for further tourism opportunities such as scenic flights over the rooftop of Australia.

Public transport – Improving access to and from the Snowy Mountains is one priority, as is improving access within the region itself. A regional public transport service will mean better connections between Jindabyne, the alpine resorts in Kosciuszko National Park, and other population centres, resulting in reduced congestion and emissions, safer streets, and a better visitor experience. Lake-based transport is also an opportunity, with a hop-on-hop-off ferry or water taxi connecting points of interest around Lake Jindabyne.

Accessibility, walkability and cyclability – The future of Jindabyne will be accessible to all ages and abilities, pedestrian – and cycle-friendly with safe, convenient, and enjoyable alternatives for moving around town, and include more direct routes to access the town centre, waterfront, and Jindabyne Sport and Recreation Centre from other areas around town. Sustainability-powered electric scooters and bikes might also assist with overcoming the challenges of moving around a mountain town.

Getting around – Although we'll foster feasible alternatives to driving improvements to roads and parking in Jindabyne and Kosciuszko National Park are needed to alleviate congestion, improve safety, increase access to the alpine resorts, and enhance the overall visitor experience to keep people coming back to the Snowy Mountains. Likewise, an alternative route for through traffic around Jindabyne would enable Kosciuszko Road to be transformed into a walkable main street, and scenic lookouts at key vantage points throughout the region would add to the visitor experience.

Digital connectivity – The Snowy Mountains will be an innovation region that embraces technology as a means to providing a quality visitor experience, growing our regional economy, protecting our sensitive environment, and improving social cohesion. Improved digital connectivity will be key to unlocking the snow service challenges experienced in peak season and meeting the growing expectations of visitors. We'll also embrace new technologies in areas such as transport, infrastructure and energy.

These transport aspirations are connected to the aspirations for place including:

- transformation to a year-round destination
- increased interaction with Lake Jindabyne
- support more sports activity, vibrant nightlife and new and improved tourist attractions
- sport/athlete and education centre
- improved sustainability to support the National Park environment.

1.7 THIS REPORT

The remainder of this report is structured as follows:

- Section 2 gives an overview of the strategic transport context
- Section 3 outlines the existing transport context within the study area
- Section 4 gives an overview of the case studies used for benchmarking
- Section 5 lists the stakeholder liaison undertaken
- Section 6 gives an overview of the future transport opportunities
- Section 7 summarises the transport solutions for accessing the Snowy Mountains SAP (not including Jindabyne or the Kosciuszko National Park)
- Section 8 summarises the transport solutions for Jindabyne
- Section 9 details the Kosciuszko National Park Access Strategy
- Section 10 proposes a strategy for implementation of the transport recommendations including the priorities and timings of the infrastructure and service improvements
- Section 11 lists the next steps for the transport context in the Snowy Mountains SAP.

2 STRATEGIC CONTEXT

This section provides a brief assessment of the relevant State and Local Government policies, planned infrastructure and transport initiatives that will affect the Snowy Mountains SAP development.

2.1 FUTURE TRANSPORT 2056

Future Transport 2056 (Transport for NSW, March 2018) plans for a future transport network that is customer focussed, fosters successful places and strong economy, operates with safety and suitable performance, provides accessible services and is sustainable.

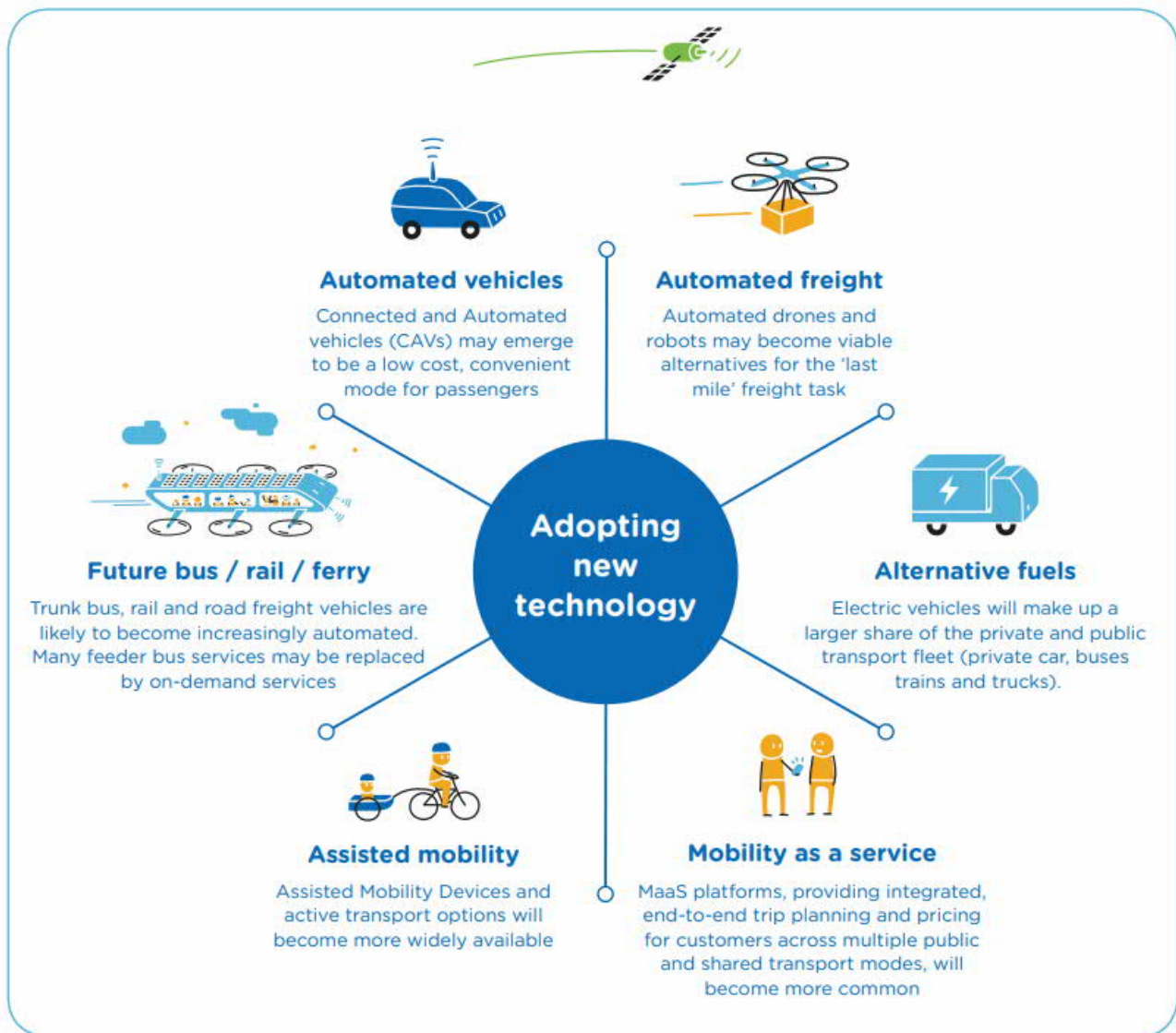
The range of transport options available to regular users through the region should provide them with greater choice. This will be achieved through initiatives such as:

- leveraging from the designation of Canberra as a “Global Gateway City” with international links to other markets, particularly through its International airport
- the regional NSW network – a “hub and spoke” model connecting Jindabyne to Cooma and Cooma to Canberra and on to wider NSW
- integrated timetables enabling better connections and day return services
- increased frequencies and operating hours
- flexible/demand-responsive public transport offering a mix of services
- accessible services for mobility impaired and disadvantaged customers
- real-time information making public transport more user friendly and accessible
- introducing the concept of Mobility as a Service
- improved walking and cycling infrastructure within towns and connecting residential areas to the town centre to accommodate shorter trips.

Opportunities for possible application of future transport technologies include those shown in Figure 2.1. Potential technologies that could assist the Snowy Mountains SAP include:

- Mobility as a Service (MaaS) and associated technology platforms enable dynamic, personalised services, for example in situations where traditional fixed-route bus services are unable to feasibly offer the flexibility required
- electric vehicles and automated vehicles that could provide regular shuttles or residents and tourists with more sustainable mode choices
- improving productivity through exploring benefits of freight technology advances, for example supply chain efficiencies of vehicle platooning
- smart vehicle technology features such as automatic braking and lane keep assist are increasingly available in new vehicles to improve road safety
- telecommunication improvements to enable people to travel less and undertake some work at home, or at locations close to home.

While the application of new technology offer opportunities to improve transport to and within the Snowy Mountains SAP, the application of these technologies has challenges to respond to the particular demands of the alpine setting. Some autonomous vehicles rely on optic guidance, which may be affected by snow clearing activities. The autonomous technology also needs to be able to control the vehicle in dry, wet, snow-covered and icy road conditions, while still maintaining an efficient service. Vertical take-off and drone technology need to be able to maintain safety in highly variable weather conditions, including snow and high-winds. The impact of their noise on the sensitive fauna within Kosciuszko National Park needs consideration, along with their management when emergency helicopters require urgent flight paths.



Source: *Future Transport 2056 Regional NSW Services and Infrastructure Plan, Transport for NSW, March 2018*

Figure 2.1 Technology and potential impact on the future of mobility

Future Transport 2056 also considers the application of movement and place principles into road network planning. For the Snowy Mountains SAP, this could mean:

- separation of through movement (Movement Corridors) and reinforced place-based activity (Places for People) through the Jindabyne Town Centre. This includes introducing a separate road for the movement of tourism to and from the area, and a distinct area for a “place” within the township to serve both the residents and tourists
- linking the town centre “place” to the surrounding land use and public transport and active transport network
- improving the urban realm to maximise use of active and public transport modes
- integrating safety features with road function, accounting for needs of different road users in each environment
- consideration of public transport services at different times of the day and over different seasons in the Snowy Mountains.

The Tourism and Transport Plan is a key Supporting Plan in the Future Transport 2056 strategy documents. It aligns with other Future Transport 2056 initiatives and focuses on how the transport cluster can contribute to NSW Government’s state-wide targets for the visitor economy.

The plan acknowledges the importance of the Snowy Mountains region for attracting tourism and notes that private vehicles are the main source of transportation to the region. The plan commits to investigating new options for transport to safely accommodate growing visitor numbers within the region throughout the year.

Regional NSW initiatives for investigation (0–10 years) included in Future Transport 2056 are identified to improve the highway access to Cooma include Monaro Highway improvements and Snowy Mountains Highway improvements (including Brown Mountain). No other initiatives are specifically mentioned affecting the Snowy Mountains SAP study area.

2.2 GO JINDABYNE

In November 2019, the Deputy Premier and Minister for Regional NSW announced the Go Jindabyne project (DPIE, 2019). Go Jindabyne was a visionary project focussed on the township aimed at supporting a more sustainable region; balancing recreational, economic, social and cultural values. The holistic nature of the project called for a comprehensive engagement approach that took in community and business values as well as government agencies' management perspectives.

ECONOMY

- The Snowy Mountains delivers a strong recreation-based tourist economy due to being home to some of Australia's leading skiing destinations, including Perisher and Thredbo.
- Jindabyne has evolved to be relatively dependent on the tourism sector, with the impacts of the seasonal economy felt by residents and businesses. Residents deal with the incapacity of infrastructure and services, road congestion and accommodation pressures during the winter months, as the town's population increases by 16,000 people compared to its year-round population of 3,500¹ permanent residents.

LANDSCAPE

- Locals possess a strong sense of pride in their natural landscape and are passionate and protective of the environment's preservation and utilisation.
- Natural assets such as Lake Jindabyne and Kosciuszko National Park are considered important and defining features of the region, with locals calling for increased activation and connectivity in hopes to increase year-round use and attraction.

BUILT FORM

- Although becoming a town teeming with tourists during winter, Jindabyne has strived to maintain its small-town country charm. Locals view Jindabyne as an alpine town and envision a town whereby its urban design and town character more accurately reflect this.
- Through centralizing development within proximity to the town centre, implementing planning and urban design guidelines and improving public amenity, locals envision Jindabyne as a walkable and vibrant town, teeming with affordable and diverse housing options.

PEOPLE

- For locals, Jindabyne isn't only a place to live, it provides a lifestyle offering like no other – one that is truly unique to the region. As an outdoor community, young and old enjoy their natural environment and envision Jindabyne to be walkable and cyclable so they can move from place-to-place whilst enjoying the natural environment.

¹ Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019).

- As Jindabyne has grown from a small country town, to what it is today, the community understands the gaps in which are needed to ensure their town can further grow, sustainably. Such gaps include accessibility within the town centre to support aging in place, and access to healthcare and aged care facilities to meet the needs of people of all ages and abilities.

The Go Jindabyne study examined the opportunities and constraints for the Jindabyne township. It involved extensive community engagement to visualise the opportunities for Jindabyne in the future, for locals and tourists alike. This transport context report for the Special Activation Precinct builds upon this study and looks to Jindabyne's connections across the region with less of a focus on Jindabyne itself.

2.3 SOUTH-EAST AND TABLELANDS REGIONAL PLAN 2036

The South-East and Tablelands Regional Plan 2036 (Department of Planning and Environment, July 2017) sets out a blueprint for changes in the region that balance the needs of the anticipated growth over the next two decades with the need to protect that area's natural environment. Many of the objectives of this study are compatible with those guiding the Snowy Mountains SAP and this Transport Study, including:

- Direction 3: Develop the Snowy Mountains into Australia's premier year-round alpine destination.
- Direction 11: Enhance strategic transport links to support economic growth.
- Direction 20: Enhance access to goods and services by improving transport connections.

The area is seen as already being rich in recreational experiences, with potential to capitalise on this with increases in international tourism to assist in growing the visitor economy. The plan presents statistics from 2016 indicating that the Snowy Mountains attracted 1.35 million visitors that contributed \$500 million to the local economy.

The high season in the Kosciuszko National Park and alpine resorts and lasts between 16 and 18 weeks from July to September, which is driven by a strong tourism economy, driven mainly by skiing and related winter sport experiences. However, there is a challenge to the sustainability of this strength due to changing climate conditions. One of the proposed measures is to boost the area's credentials as a year-round destination for mountain biking, bushwalking, horse riding, kayaking, cultural and educational tourism, and recreational fishing.

This increase in visitor numbers will need to be matched with better access, public facilities, signage, parking and boat launching facilities. It will also require improved access through flexible transport options, improved connections through existing transport modes, and air travel. Options to address the seasonal transport capacity shortages include initiatives such as:

- better marketing and branding of public transport services
- raising awareness of all travel options available through a single source of information
- supporting seasonal transport options such as holiday bus services and/or park-and-ride services
- introduce flexible and on-demand transport options, potentially bundled with accommodation or air travel.

Improvements to strategic transport links to support economic growth are planned. For the movement of freight, this includes improving the regional connections to Cooma to support higher productivity vehicles. Other potential changes could include improved inter and intra-state connections from a potential high-speed rail network and maximising the advantage of direct international flights to Canberra Airport and cruise ships at the Port of Eden.

For permanent residents, the plan seeks to enhance access to goods and services by improving transport connections. The population of Snowy Monaro is ageing, with 27% of the population predicted to be over 65 by 2036. This will require more trips for health, medical and recreation purposes within Jindabyne and between Jindabyne and Cooma – the strategic centre providing business, retail and entertainment. Integrating community transport services into an enhanced public transport system will improve connections between centres and communities.

2.4 SEPP PRECINCTS – REGIONAL (2021)

Alpine Resort development assessments are governed by the State Environmental Planning Policy Precincts – Regional 2021 (Chapter 4 Kosciuszko National Park and alpine resorts). The SEPP Precincts – Regional 2021 encourages environmentally sustainable development whilst protecting the environmental and cultural heritage of the land. The land in which the SEPP Precincts – Regional 2021 (Chapter 4 Kosciuszko National Park and alpine resorts) applies includes:

- Thredbo Alpine Resort
- Perisher Range Alpine Resort
- Charlotte Pass Alpine Resort.
- Mount Selwyn Alpine Resort
- Sponars Chalet Alpine Resort
- Kosciuszko Mountain Retreat Alpine Resort
- Ski Rider Alpine Resort
- Bullocks Flat Terminal.

2.5 KOSCIUSZKO NATIONAL PARK PLAN OF MANAGEMENT

The Kosciuszko National Park is the largest National Park in NSW and encompasses one of the most complex conservation reserves in Australia. The Kosciuszko National Park Plan of Management provides a framework to guide the long-term management of the National Park. It details actions for the NSW National Parks and Wildlife Service (NPWS) as well as other organisations to not only maintain the park but protect and conserve it whilst promoting its values.

The Plan of Management is also the primary mechanism for controlling development within the park. It also controls the number of beds allowed within the management areas.

2.6 SNOWY MONARO LOCAL STRATEGIC PLANNING STATEMENT

The Local Strategic Planning Statement (LSPS) released by the Snowy Monaro Regional Council in 2020 provides a detailed investigation into the plans for the Snowy Monaro community over the next 20 years. It looks at the environmental, social and economic land use needs of the area and details the future vision for the region and outlines 12 planning priorities. It also includes town plans with specific objectives and actions for Jindabyne and other surrounding towns in the region. The key defining theme of Jindabyne in the LSPS is “Tourism Hub”.

The planning priorities are listed in Table 2.1.

Table 2.1 Snowy Monaro Local Strategic Planning Statement 2040

THEME	PLANNING PRIORITY
Our Thriving Economy	1 – Promote, grow and protect agricultural production and industry
	2 – Maximise potential for business growth and efficiency
	3 – Support development of the Snowy Mountains as Australia's premier year-round alpine destination
Vibrant Places to Live, Work and Play	4 – Use appropriate evidence-based planning controls to respond to a diverse region
	5 – Provide a variety of housing options throughout the Snowy Monaro
Infrastructure to Support Growth and Change	6 – Identify and integrate transport corridors and connections with the right types and levels of development
	7 – Foster resilient, enduring and safe local communities using land use planning controls which address local and regional natural hazards
	8 – Capitalise on Growth and Change by Preparing for New Business and Population
A Sustainable Environment with a Vibrant Connection to Heritage and Culture	9 – Protect and enhance the cultural and built heritage of the Snowy Monaro
	10 – Protect and enhance the scenic landscape of the region
	11 – Identify protect and encourage restoration of specific areas of environmental values of the Snowy Monaro Region
	12 – Move towards a carbon neutral future

3 EXISTING TRANSPORT

3.1 CONNECTIONS TO THE REGION

The Snowy Mountains are located in the south east and tablelands region of NSW, approximately 490 km south of Sydney and 175 km south of Canberra. Jindabyne is the main hub in the region with the alpine resorts of Perisher, Thredbo and Charlotte Pass all accessed via routes through Jindabyne.

The region is predominantly accessed via private car from the north, along the Monaro Highway (B23) to Cooma and then the Kosciuszko Road to Jindabyne. The region can also be accessed from the Snowy Valleys via the Alpine Way. Another important connection to the region is via the Snowy Mountains Highway which connects with the Princes Highway north of Bega in the south-east of NSW.

The Snowy Mountains Airport at Cooma accommodates domestic flights with private shuttles available to Jindabyne and the alpine resorts. There are limited regular public transport services in the region, however during winter there are many private coaches and shuttles operating to Jindabyne and the alpine resorts.

From Jindabyne, the alpine resorts are accessed either via the Alpine Way (MR677) (Thredbo) or Kosciuszko Road (MR286) (Perisher and Charlotte Pass). Due to snow conditions, the Kosciuszko Road from Perisher to Charlotte Pass is closed during winter with over snow transport options providing access to the resort at Charlotte Pass.

The proximity of the Snowy Mountains to these areas are shown in Figure 3.1.

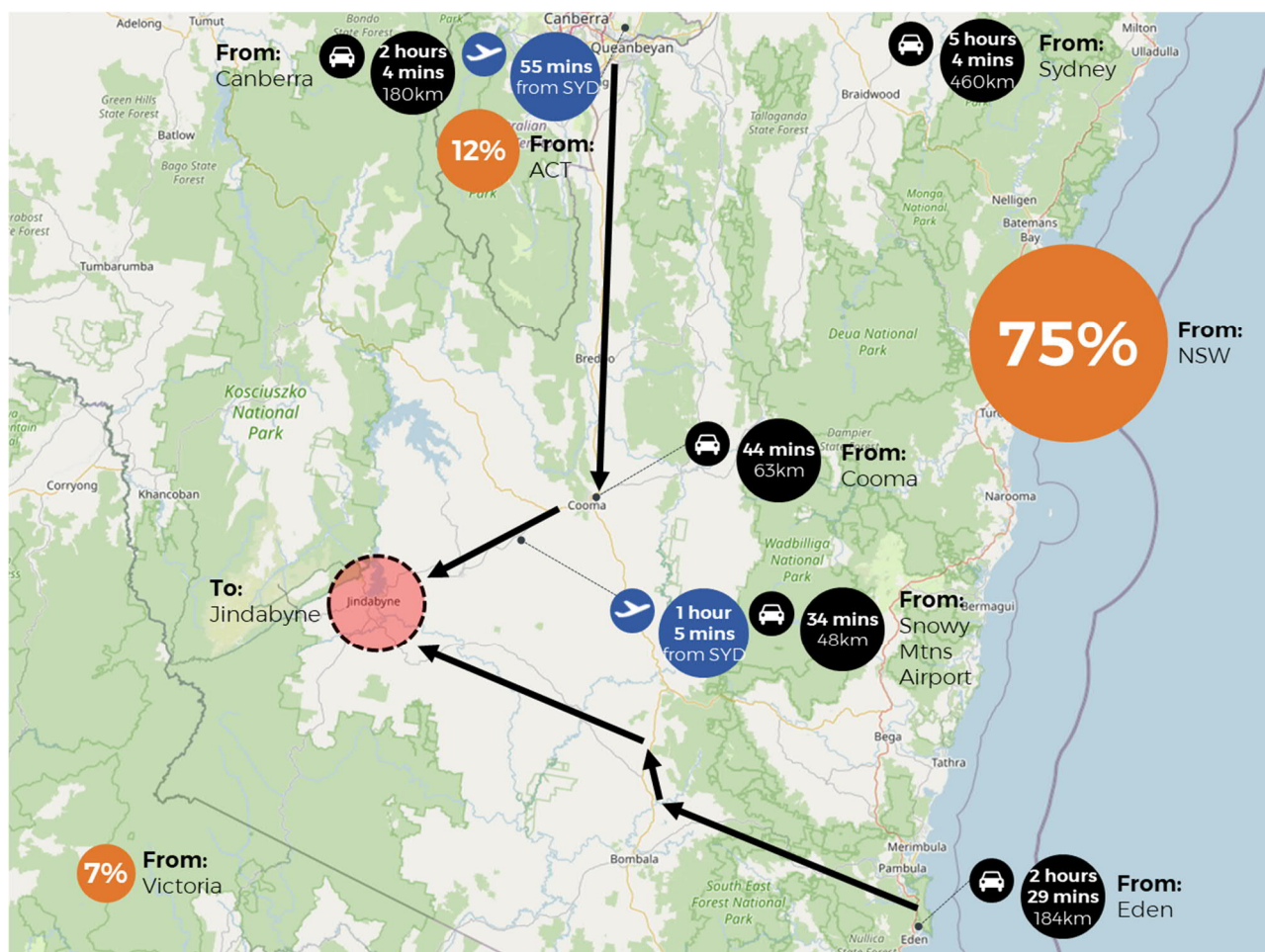


Figure 3.1 Connections to the Snowy Mountains SAP

3.2 AIR TRAVEL

3.2.1 SNOWY MOUNTAINS AIRPORT

The Snowy Mountains Airport is located 16 km south-west of Cooma, which is a 35-minute drive to Jindabyne. Its location in relation to the surrounding towns and alpine resorts is shown in Figure 3.2. It facilitates services to and from Sydney by Regional Express Airlines (Rex) and Qantas. Passengers could then make onwards domestic or international connections from Sydney.

Privately-operated airport shuttle minibuses connect the airport to Jindabyne, Bullocks Flat and Thredbo. Similarly, there are a range of private and taxis options. The Hertz rental car company operates from Snowy Mountains Airport. However, there is uncertainty about this arrangement given their recent financial difficulties brought on by the COVID-19 travel restrictions.



Source: Snowymountainsairport.com.au

Figure 3.2 Key attractions from Snowy Mountains Airport

Access to the current Airport requires use of Kosciuszko Road east of Jindabyne. This route is busy during high (snow) season with large volumes of visitors arriving by car.

Currently, the airport offers flights to and from Sydney. Qantas has recently announced a new winter service from Brisbane commencing for the 2021 ski season.

3.2.2 CANBERRA INTERNATIONAL AIRPORT

Canberra Airport is located about 10 minutes' drive (7 km) east of Canberra. It is approximately 2 hours' (207 km) drive from Jindabyne. A shuttle bus is operated by Snow Connect from Canberra Airport to Thredbo, Jindabyne, and Perisher.

Daily domestic services are available from Canberra Airport to Brisbane, Sydney and Melbourne. Other flights travel direct from Canberra to Cairns, Sunshine Coast, Gold Coast, Ballina/Byron Bay, Port Macquarie, Newcastle, Hobart, Adelaide and Perth. Canberra Airport is currently serviced by Qantas, Virgin Australia, Alliance Airlines, Link Airways, REX and FlyPelican.

International flights are currently suspended due to COVID-19 travel restrictions. However, previous destinations included Pacific countries such as New Zealand, South East Asian countries such as Singapore and Middle East countries such as Qatar.

3.2.3 JINDABYNE AERODROME

An aerodrome is located off Tinworth Drive, about 5 km south-west of the town centre. Small fixed-wing aircraft and helicopters operate from the air strip for charter flights and private rentals.

Airport key points:

- The Snowy Mountains Airport facilitates domestic travel. However, its distance from the alpine resorts, limited flight destinations and number of flights are considered a disadvantage.
- Canberra Airport offers a wider selection of domestic destinations and, international travel when COVID-19 restrictions cease. However, it is located 2 hours' drive from Jindabyne.
- The shake-up of the airline industry from the COVID-19 travel restrictions provides an opportunity to re-evaluate the role of the Snowy Mountains Airport, how it relates to the Snowy Mountains, Jindabyne and Cooma, and the transport options to connect it better to the visitor accommodation.
- Qantas has started serving Cooma during the 2021 winter ski season.

3.3 ROAD NETWORK

The existing road network is shown in Figure 3.3. The following State Roads run through the Snowy Mountains SAP:

- **Alpine Way:** MR677 is a sealed road connecting to Kosciuszko Road, west of Jindabyne. It has a posted speed limit of 100 km/h with one lane in each direction and occasional overtaking lanes and chain bays. This road provides access to Bullocks Flat Skitube Station, Crackenback Resort and Thredbo Village and continues through the Snowy Mountains to Khancoban in the west of the Snowy Mountains region.
- **Kosciuszko Road:** MR286 is a sealed road connected to the Snowy Mountains Highway (HW4/B72) immediately west of Cooma, passing through Jindabyne to Charlotte Pass and the start of the Mount Kosciuszko Summit Walk. It is mostly posted with a 100 km/h speed limit, with stretches of reduced speeds through town centres such as Jindabyne and Berridale. This road provides access to Guthega, Smiggin Holes, Perisher and Charlotte Pass alpine resorts. Speed limit reductions are implemented in snow affected sections during the ski season.
- **Link Road:** MR4016 is a sealed road from Kosciuszko Road at Smiggin Holes to the Island Bend-Guthega Road near Perisher Creek.

The following Regional Roads also run through the Snowy Mountains study area:

- **Barry Way:** MR4056 is a sealed two-lane rural road connecting Kosciuszko Road to Snowy River Way (as a regional road) and then continuing south to Moonbah (as a local road). Within Jindabyne it has a speed limit of 60 km/h, while south of Jindabyne it has a speed limit of 100 km/h.
- **The Snowy River Way:** MR4056 is a sealed two-lane rural road connecting with Barry Way south of Jindabyne. Near Jindabyne it is a posted 80 km/h road increasing to 100 km/h road outside of the urban area. The Snowy River way continues through Dalgety before connecting with the Monaro Highway to the south east of the study area.

Visitors travelling up to Guthega, Smiggin Holes, Perisher Valley and Charlotte Pass pay a National Parks entry fee at the Kosciuszko Road gateway at Sawpit Creek, while visitors to Thredbo pay the National Park entry fee on Alpine Way, west of Bullocks Flat. This fee is either charged by vehicle at the entrance gates or passes can be purchased prior for multi-day access or a one- or two-year pass. Public transport vehicles are charged by individual passengers which is captured through their transport ticket price.

- **Winter peak** (Alpine Way, Kosciuszko Road from start of June long weekend to end of October long weekend:
 - Vehicles \$29 per day
 - Motorcycles \$12 per day
 - Bus passengers \$11.45 per adult, \$3.60 per child per day.
- **Rest of the year**
 - Vehicles \$17 per day
 - Motorcycles \$7 per day
 - Bus passengers \$6.60 per adult, \$2.20 per child per day.

Winter road closures are enacted each year from the June long weekend to the October long weekend (subject to snow conditions) at the following locations:

- Kosciuszko Road – between Perisher Valley and Charlotte Pass
- Link Road – between Smiggin Holes and the Guthega Road
- Kings Cross Road – between Mt Selwyn and Cabramurra
- Cabramurra Road (KNP 5) – between Cabramurra and Khancoban turn-off.

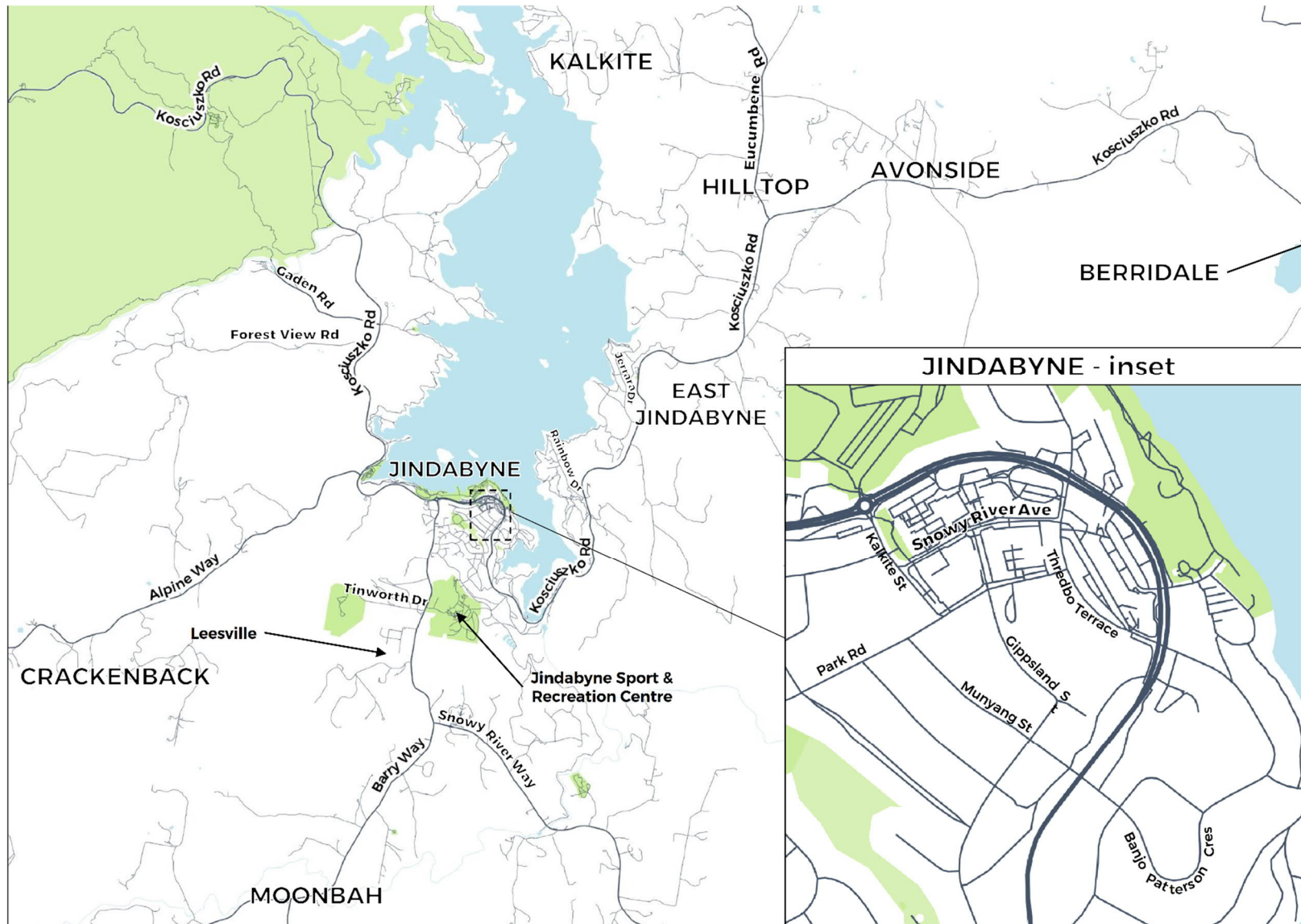


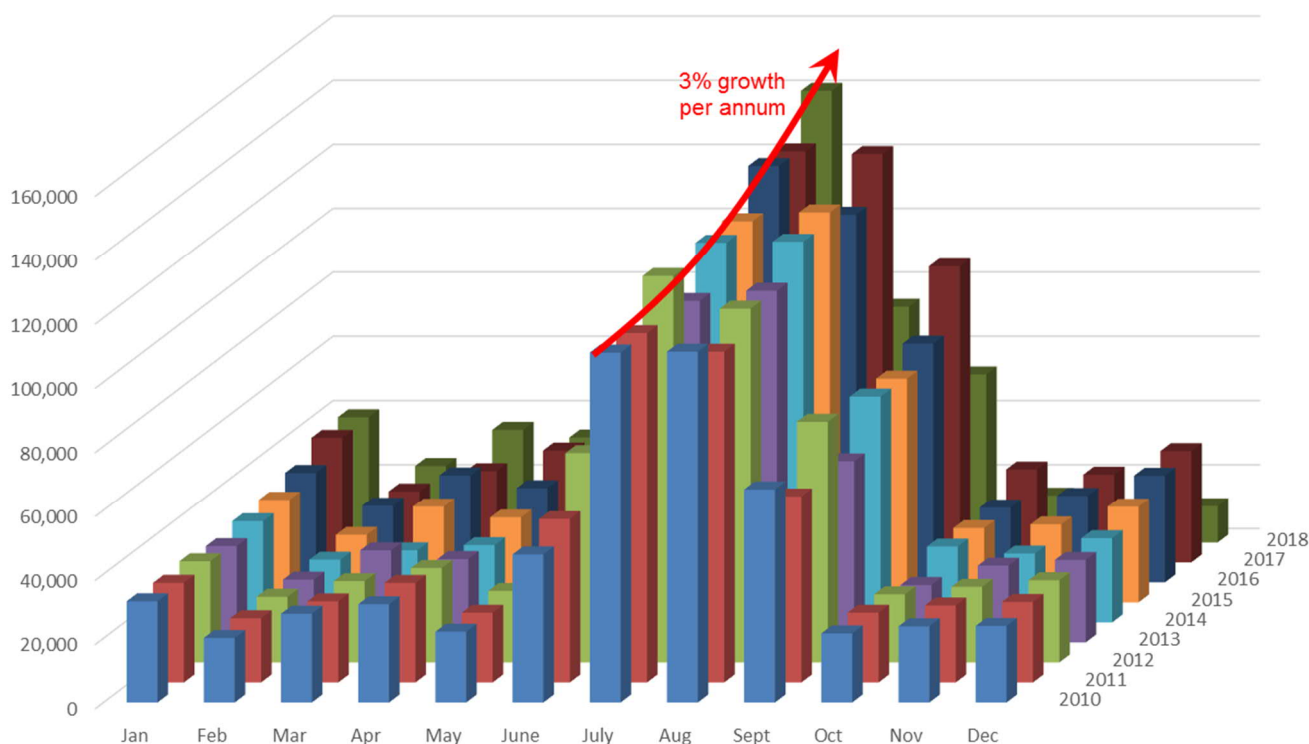
Figure 3.3 Road network

3.3.1 TRAFFIC DATA

Traffic data has been made available for this analysis from various sources including:

- Traffic surveys undertaken for the *Go Jindabyne Mobility and Connectivity Study* (GTA Consultants, 2019). These intersection counts were undertaken in high and low seasons (July and May respectively) in 2019, within and around Jindabyne. They represent a good source of recent data before the impact of bushfires and the COVID-19 travel restrictions.
- Transport for NSW Traffic Volume Viewer – with traffic counts from 2006. Some continuously counting sites have been used to factor older counts to match the more recent 2019 data, or to factor counts taken at different times of the year.
- Transport for NSW classified tube counts at various points along Kosciuszko Road and Alpine Way undertaken in August and November 2019.
- Daily traffic data from National Park cameras from 2019 and monthly data from 2010 to 2018 at the Kosciuszko Road and Alpine Way Visitor Entry Station (VES).

National Parks and Wildlife Service data for the Kosciuszko Road and Alpine Way visitor entry station (VES) indicates that the month of May represents a consistently low number of park car entries, while the peak number of entries occur in July and August, as shown in Figure 3.4. To provide a consistent way of comparing traffic volumes around the study area and between high season and low season, we have chosen the month of May 2019 to represent the recent low season and the months of July and August 2019 to represent the high season. Traffic volumes in other months were not used as they included the impacts of school holidays, public holidays, or the uncertainty of the start and finish of snow conditions.

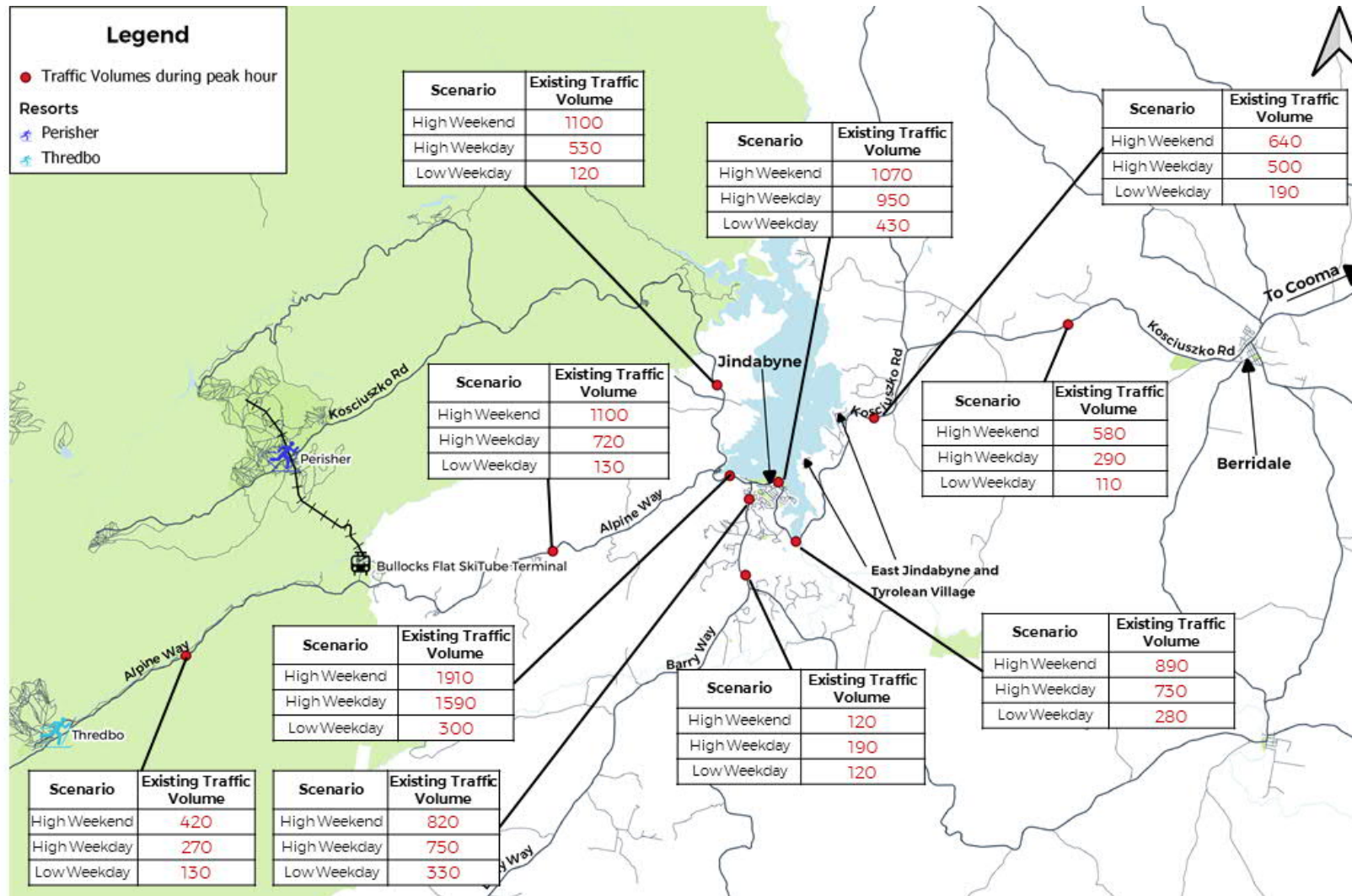


Source: National Parks and Wildlife Service Kosciuszko Road and Alpine Way car counts, 2010 to 2018

Figure 3.4 Monthly pattern of car visitors to Kosciuszko National Park

This data also indicates that year-to-year visitation is increasing by 3% per annum.

Existing traffic volumes within the Snowy Mountains SAP are shown in Figure 3.5. More detailed information is available in Appendix A.



Notes Limited data for low season weekend, typically 60% to 80% of high season weekend volumes

Figure 3.5 Existing traffic demand on key roads within the Snowy Mountains SAP

3.3.1.1 TRAFFIC VOLUMES BETWEEN JINDABYNE AND BERRIDALE

The eastern approach to Jindabyne performs multiple roles, including:

- providing the main road access to Jindabyne from Cooma, Canberra and the rest of New South Wales
- connecting Jindabyne to the eastern foreshore villages of East Jindabyne, Tyrolean Village and Kalkite
- the road between the current Snowy Mountains Airport and Jindabyne
- the main road access route to the alpine resorts
- heavy vehicle route.

These important roles create demand for the available road capacity, especially during the high season. Anecdotally, the section of Kosciuszko Road that travels over Jindabyne Dam experiences higher congestion than other sections, possibly due to the narrower road carriageway width, approach geometry (curves on both ends) and as people slow down to look at the scenery. This may also result from upstream congestion on Kosciuszko Road through the Jindabyne Town Centre banking up.

The increased cost of accommodation within Jindabyne and surrounds causes some snow visitors to seek accommodation outside the area, including at Berridale and Cooma. This extends their daily journey to the snow and increases the amount of travel on Kosciuszko Road east of and through Jindabyne.

3.3.1.2 TRAFFIC VOLUMES WITHIN JINDABYNE

Traffic volumes and congestion jumps substantially within the Jindabyne township during the high season, with the large volumes of visitors moving through and around the town. This results in:

- longer delays at intersections, especially on Kosciuszko Road
- increased friction from parking manoeuvres and vehicles circulating looking for a parking space
- increased difficulty for pedestrians to cross the road
- division of the town into the main part of the town south of Kosciuszko Road and the section between Kosciuszko Road and the lake foreshore.

As the streets within Jindabyne are urban roads, they would have a lower capacity (900 vph), due to the various interruptions to flow. The surveys indicate that there are heavy volumes on Kosciuszko Road at Kalkite Street and Munyang Street, and that it is operating close to capacity at both ends within Jindabyne.

The performance of intersections along Kosciuszko Road has not been assessed for this stage of the study. However, the high traffic volumes on Kosciuszko Road and Barry Way indicate that vehicles on Barry Way are likely to experience higher-than-usual delays in the weekend AM peak. Queue length surveys undertaken for the Go Jindabyne Study confirm queuing on Barry Way in the Saturday AM peak as it approaches Kosciuszko Road.

The road network within Jindabyne is divided by those streets accessed from Kosciuszko Road and those accessed via Barry Way. Currently, only Gippsland Street connects the two areas for vehicles other than using Kosciuszko Road and Barry Way themselves. Because of this, Gippsland Street performs a collector street role. However, its alignment is not direct.

Park Road performs a collector role because of the types of land use along it – including the town centre, Jindabyne Central School and JJ Connors Oval. For pedestrians and cycles, it is connected to Barry Way via Reedys Cutting Road.

3.3.1.3 TRAFFIC VOLUMES BETWEEN JINDABYNE AND THE ALPINE RESORTS

Kosciuszko Road and Alpine Way connect the alpine resorts to Jindabyne and the wider regional road network. These roads are heavily influenced by the movement of visitors and goods from the township to the ski fields. While visitors may use Kosciuszko Road between Jindabyne and Cooma once each way per visit, they will travel from Jindabyne and the ski fields multiple times during their visit.

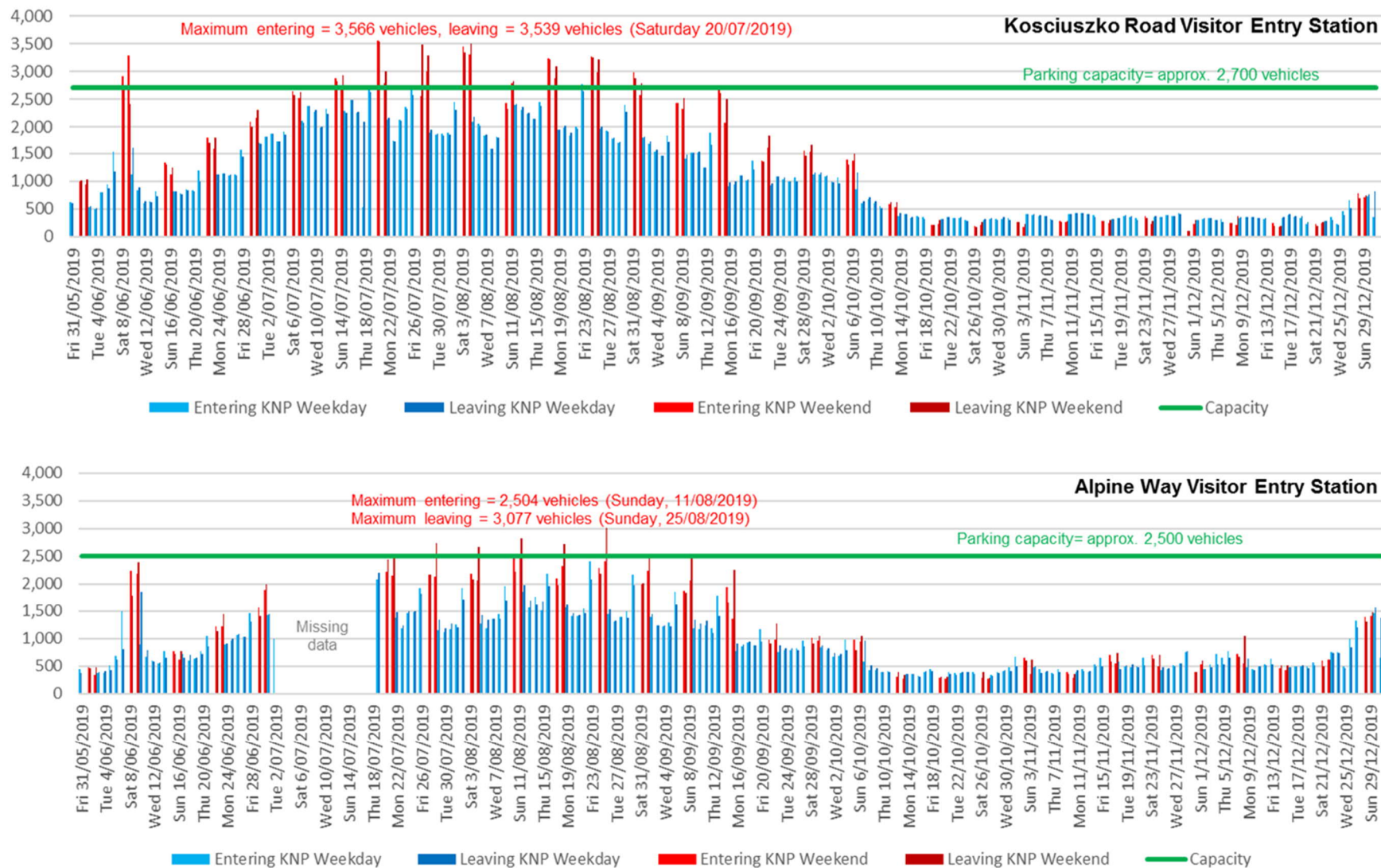
These roads are frequently affected by poor weather conditions due to their altitude, with snow chains required to be carried and fitted when roads become icy.

The daily traffic volumes entering and leaving Kosciuszko National Park is shown on Figure 3.6 on Kosciuszko Road and Alpine Way. The capacity of parking is also shown to show days when the number of vehicles entering the park exceeds the number of parking spaces. The Alpine Way counts includes vehicles travelling beyond Thredbo, heading toward Tom Groggin and Khancoban. The Kosciuszko Road counts indicate more vehicles entering the area than there are parking spaces. This indicates that people may be dropping passengers and ski gear at the resort, driving back down the mountain, then returning to pick up them up at the end of the day.

The counts for Kosciuszko Road between Jindabyne and the Alpine Way show high volumes, but within the capacity. These high volumes were recorded at 7.00 am as visitors leave early to get a full day in the snow and 4.00 pm for the return to their accommodation. The relatively early morning start is also influenced by the capacity of the car parks and the desire to park within comfortable walking distance of the base stations at the resorts.

Both Kosciuszko Road and Alpine Way north and west of their intersection are operating close to their capacity. At these flow rates, any interruptions such as a breakdown, collision, bad weather or even the shockwave from unexpected braking could cause the traffic flow to deteriorate.

Queue length surveys undertaken for the Go Jindabyne Study indicate queuing on Alpine Way in the weekday PM peak and Saturday AM peak as it approaches Kosciuszko Road.



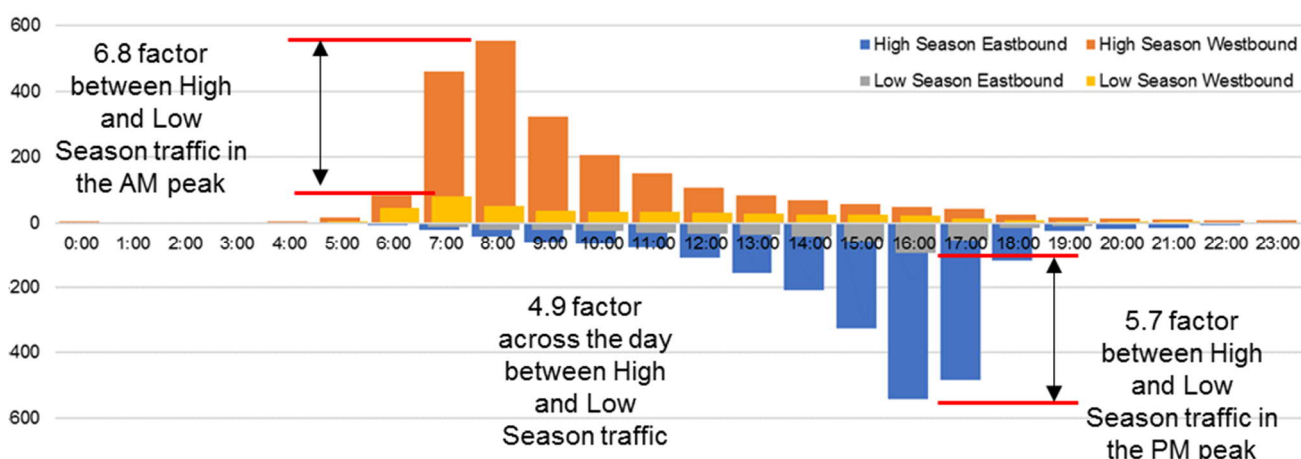
Source: National Parks and Wildlife Service Kosciuszko Road and Alpine Way vehicle camera counts, 31 May 2019 to 31 December 2019

Figure 3.6 Daily vehicle counts entering and leaving Kosciuszko National Park on Kosciuszko Road and Alpine Way

DIFFERENCE BETWEEN HIGH SEASON AND LOW SEASON

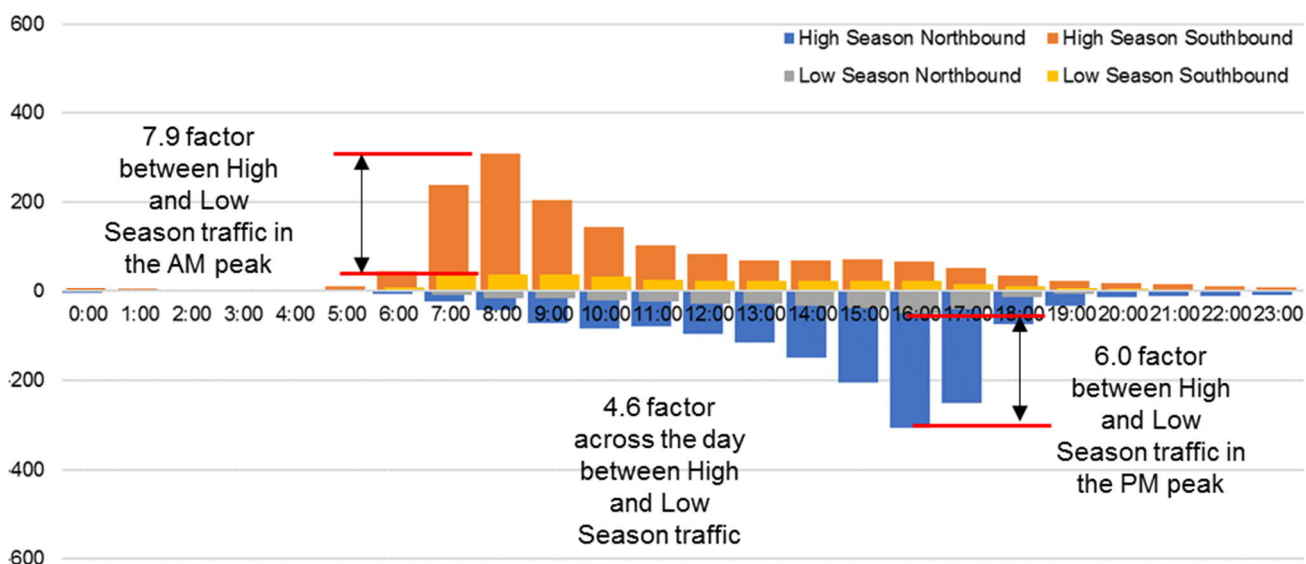
The difference between high season (July and August) and low season (taken as May) activity in the area is illustrated in Figure 3.7 and Figure 3.8 for Alpine Way and Kosciuszko Road respectively. The data from 2014 provided a continuous count across the year, enabling a comparison of volumes in that year (continuous counts were not available for later years).

The difference between high season and low season is approximately a factor of 4.5 to 5, i.e. there is about five times the traffic during peak season than low season. The difference is larger during the AM peak when people are travelling up to the ski fields and the PM peak when they are returning to their accommodation.



Source: Transport for NSW Traffic Volume Viewer, Kosciuszko Road 08.098, 2.6 km north of Hatchery Bay Road, Kosciuszko National Park – 2014 data

Figure 3.7 Comparison of high season (July to August) and low season (May) hourly traffic volumes on Kosciuszko Road



Source: Transport for NSW Traffic Volume Viewer, Alpine Way Site 08.839, 910 m north of Post Office Lane, Crackenback – 2014 data

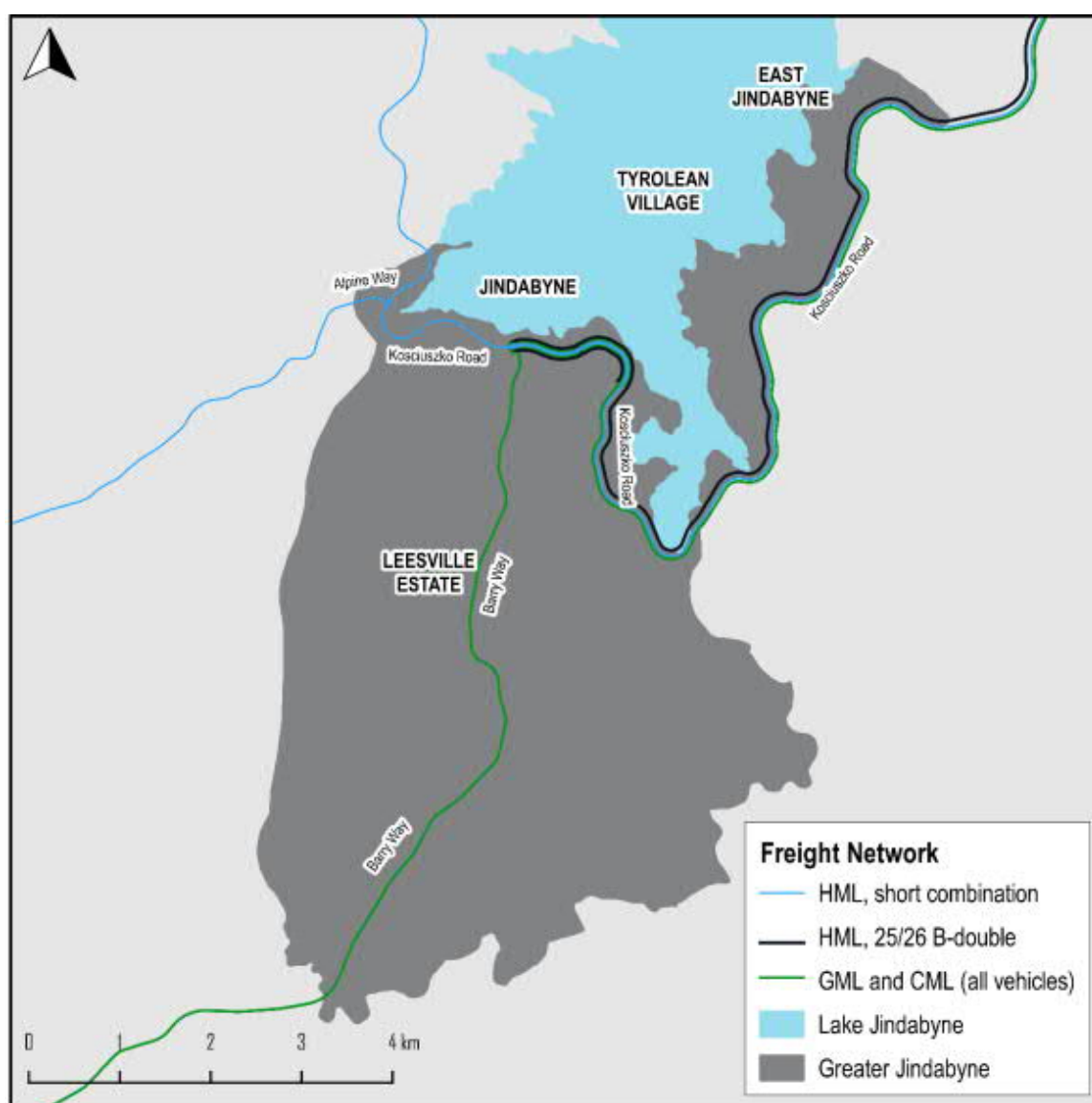
Figure 3.8 Comparison of high season (July to August) and low season (May) hourly traffic volumes on Alpine Way

This high factor indicates that the roads are approaching their capacity more during the high season, and even more during the peak travel times. Should the roads reach their capacity, peak spreading could allow a greater use of the road across the day, provided the visitors are willing to adjust their start and/or finish times.

3.3.2 FREIGHT

General Mass Limits (GML) and Concessional Mass Limits (CML) B-double vehicles travelling in the region are restricted to Barry Way and Kosciuszko Road east of the Barry Way intersection. B-doubles can also access the Leesville industrial estate located 2 km south of Jindabyne. Approved routes are shown below in Figure 3.9. Higher Mass Limit (HML) vehicles are allowed on Kosciuszko Road, Barry Way and Alpine Way. However, only short-combination HML vehicles are allowed between Jindabyne and the Kosciuszko National Park. Count data from June 2018 indicates that, on average, heavy vehicle volumes make up approximately 7% to 14% of the daily traffic on Kosciuszko Road and Barry Way².

There are currently no railway lines within the Snowy Mountains SAP, for either passenger or freight services. A disused railway exists from Canberra to Bombala which passes to the east of the region, through Cooma south to Bombala. In 1986 the line south of Cooma was closed, and passenger services south of Queanbeyan ceased in 1988.



Source: <https://www.tms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html>

Source: Go Jindabyne Mobility and Connectivity Study Stage 1 Report (GTA Consultants (NSW) Pty Ltd 23/07/19)

Figure 3.9 Restricted truck routes

² Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019)

Transport for NSW freight model data provides information on the types, amounts, origins and destinations and mode of transport of freight in NSW. This data shows that all freight is moved by road and that forestry materials are the largest commodity for both imports and exports. Overall, exports outweigh imports by more than a factor of two to one. Further details can be found in Appendix B.

Considering the origins and destinations of freight outside Snowy Monaro Regional Council area:

- Imports mainly arrived from Victoria (51%), Western Sydney (36%), Goulburn–Yass (4%), Dapto–Port Kembla (2%) and Albury (2%).
- The main destination for exports was the South Coast (38%), Tumut–Tumbarumba (30%), Sydney Inner City (12%) and Victoria (12%).

Transport for NSW forecasts indicate that total exports and imports are expected to fluctuate and are largely governed by the prospects for the forestry products. However, exports quantities of livestock, meat, wine and wine grapes are expected to grow. For imports, horticulture, livestock, meat, wine grape, consumer goods, fuel and motor vehicles are all expected to grow, while timber imports are expected to drop slightly.

3.3.3 EXISTING ROAD PERFORMANCE

Austrroads Guide to Traffic Management Part 3 – Transport Study and Analysis Methods, Section 5.1.1 indicates that on single lane traffic lane on a one lane in each direction road, travelling at high speeds without overtaking, the operational capacity can be taken as 1,800 passenger cars per hour. However, this is under ideal conditions, operating at capacity. In the case of the roads within the Snowy Mountains SAP area, terrain, road geometry and weather conditions mean that conditions are usually not ideal.

Road (lane) capacities vary greatly between locations based on many factors including the type of road (urban/rural, free-flowing or interrupted flow), road category (freeway, rural highway, arterial road, collector street, local street), speed limit, gradient, curvature, shoulder width, overtaking arrangements, opposing traffic volume, gradient, percentage of heavy vehicles, weather conditions, etc.

To assess how well a road section will perform for a particular traffic volume, the theoretical lane traffic capacity has been assigned based on Austrroads and Roads and Maritime Services guidance depending on the type of road. Table 3.1 shows the assumed traffic volumes (measured in passenger car units per hour (pcuph)) and the Level of Service (LoS) from A to F (equated to a volume to capacity ratio (V/C Ratio)).

Table 3.1 Assumed road lane traffic capacities by road type and associated LoS (as determined by V/C ratio)

LEVEL OF SERVICE	RURAL HIGHWAY UNDIVIDED		URBAN DIVIDED/UNDIVIDED HIGHWAYS OR ROADS, WITH CLEARWAYS		URBAN DIVIDED/UNDIVIDED HIGHWAYS OR ROADS WITH INTERRUPTIONS	
	V/C RATIO	MSF (PCUPH)	V/C RATIO	MSF (PCUPH)	V/C RATIO	MSF (PCUPH)
A	0.15	210	0.35	560	0.35	420
B	0.27	380	0.5	800	0.5	600
C	0.43	600	0.75	1,200	0.75	900
D	0.64	900	0.9	1,440	0.9	1,080
E	1	1,400	1	1,600	1	1,200
F	10	> 1,400	10	> 1,600	10	> 1,200

Notes Based on Austrroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (2017) and TfNSW Guide to Traffic Generating Developments (October 2002)

V/C: ratio of traffic demand to nominal capacity on a road network

LoS: Level of Service from A (best) to E (at capacity) and F (over capacity)

MSF: Maximum Service Flow, measured in passenger car units per hour (pcuph).

For these calculations, trucks are converted to passenger car units using a factor based on their length. Roads were classified as either a rural highway, urban highways with clearways, urban highways with interruptions or an industrial street.

For typical rural road assessments, the threshold for upgrading is taken as the transition between LoS C and LoS D. This is considered appropriate for the day-to-day operation of the roads in the off-peak and summer peak seasons.

Some rural highways that experience heavy holiday demands are sometimes designed based on the 100th or 50th busiest hour, so that it can cope with the sharp peaks at the start and end of the holiday period.

However, the situation on Kosciuszko Road and Alpine Way, shown in Table 3.2, is in-between these two situations. The peak traffic events occur daily on snow season weekends and winter school holidays (for several months). They are more frequent than isolated holiday peaks but are less frequent than a typical weekday commuter peak. For sustained but temporary spikes in demand, such as in the weekend morning travel to the ski fields and afternoon travel back down to Jindabyne, to obtain effective use of current road assets, the threshold for upgrading a road has been assumed as the transition **between LoS D and LoS E**, i.e. 900 pcuph for a rural highway, 1,440 pcuph for urban highways with clearways, 1,080 pcuph for urban highways with interruptions and 810 pcuph for industrial streets.

The transition from LoS D to E is used as the threshold for upgrade as daily fluctuations in traffic volumes and conditions may mean above-capacity operation on some days. It also plans for upgrades before LoS E operation which has unstable flow where minor disruptions can cause delays. The transition from LoS E to F is assumed to be the theoretical capacity of the lane. LoS F represents above-capacity operation, with extensive delays.

Snow conditions affect road capacity by requiring slower speeds and greater headways between vehicles. Studies of the impact of snow conditions on road capacity have indicated that it can reduce the capacity by approximately 33%³. For the rural alpine roads, this means that volumes over **1,000 vehicles per hour** are likely to be over capacity on days when snow is a factor, even though they would be within capacity on a clear-weather day.

Table 3.2 Mid-block road capacity assessment – Existing volumes

ROAD LOCATION	WINTER WEEKEND MORNING PEAK HOUR – 2019	WINTER WEEKDAY PEAK HOUR – 2019	OFF-PEAK SEASON WEEKDAY PEAK HOUR – 2019
Kosciuszko Road (Alpine Way to Sawpit Creek)	E	C	A
Kosciuszko Road (Barry Way to Alpine Way)	C	C	A
Kosciuszko Road (East of Barry Way)	C	B	A
Kosciuszko Road (Jindabyne Dam)	D	B	A
Kosciuszko Road (Eucumbene Road to East Jindabyne)	D	D	B
Kosciuszko Road (Berridale to Eucumbene Road)	C	C	A
Alpine Way (Bullocks Flat to Thredbo)	C	B	A
Alpine Way (Kosciuszko Road to Bullocks Flat)	E	D	A
Barry Way (South of Kosciuszko Road)	B	B	A
Barry Way (North of Snowy Mountains Way)	A	A	A

³ Impacts of Snowy Weather Conditions on Expressway Traffic Flow Characteristics, research article (Jiancheng Weng, Lili Liu, and Jian Rong, 05 Mar 2013)

The results show:

- Alpine Way (Kosciuszko Road to Bullocks Flat) and Kosciuszko Road (Alpine Way to Sawpit Creek) are already operating close to their theoretical capacity in the winter weekend peak and above the Level of Service E threshold. However, it is noted that this is a short peak
- Kosciuszko Road through Jindabyne are currently operating within their capacity
- Kosciuszko Road from east of Jindabyne to Eucumbene Road is experiencing increasing pressure during peak times, operating at Level of Service D in the winter weekend and weekday peaks
- all roads have good performance in the off-season.

3.3.4 ROAD SAFETY

Road crash data was obtained for the 2014–2018 period from the NSW Centre for Road Safety. Between 2014 and 2018, from a total of 181 crashes in the Study Area within the Snowy Monaro Regional Council area, 145 crashes occurred along four major routes. These major routes are Alpine Way (57 crashes between 2014–2018), Barry Way (12 crashes between 2014–2018), Kosciuszko Road between Charlotte Pass and Jindabyne (28 crashes between 2014–2018) and Kosciuszko Road between Jindabyne and Berridale (48 crashes between 2014–2018). This is illustrated in Figure 3.10.

In addition to these reported crashes, it is understood that there are unreported crashes and near misses during the winter season caused by the wet and icy conditions.

The details of crashes along these routes are summarised in Table 3.3. There were two fatal crashes along Alpine Way (a collision with a pedestrian at the NPWS Alpine Way VES near Thredbo and an off-carriage way collision occurred approximately 1.5 km west of the intersection with Kosciuszko Road) and one fatal crash along Barry Way (a head on collision about 5 km south of the roundabout with Kosciuszko Road). There is a high proportion of off-road crashes (between 29% and 32%), which may be contributed by the difficult driving environment such as icy road conditions caused by low temperature and high altitudes.

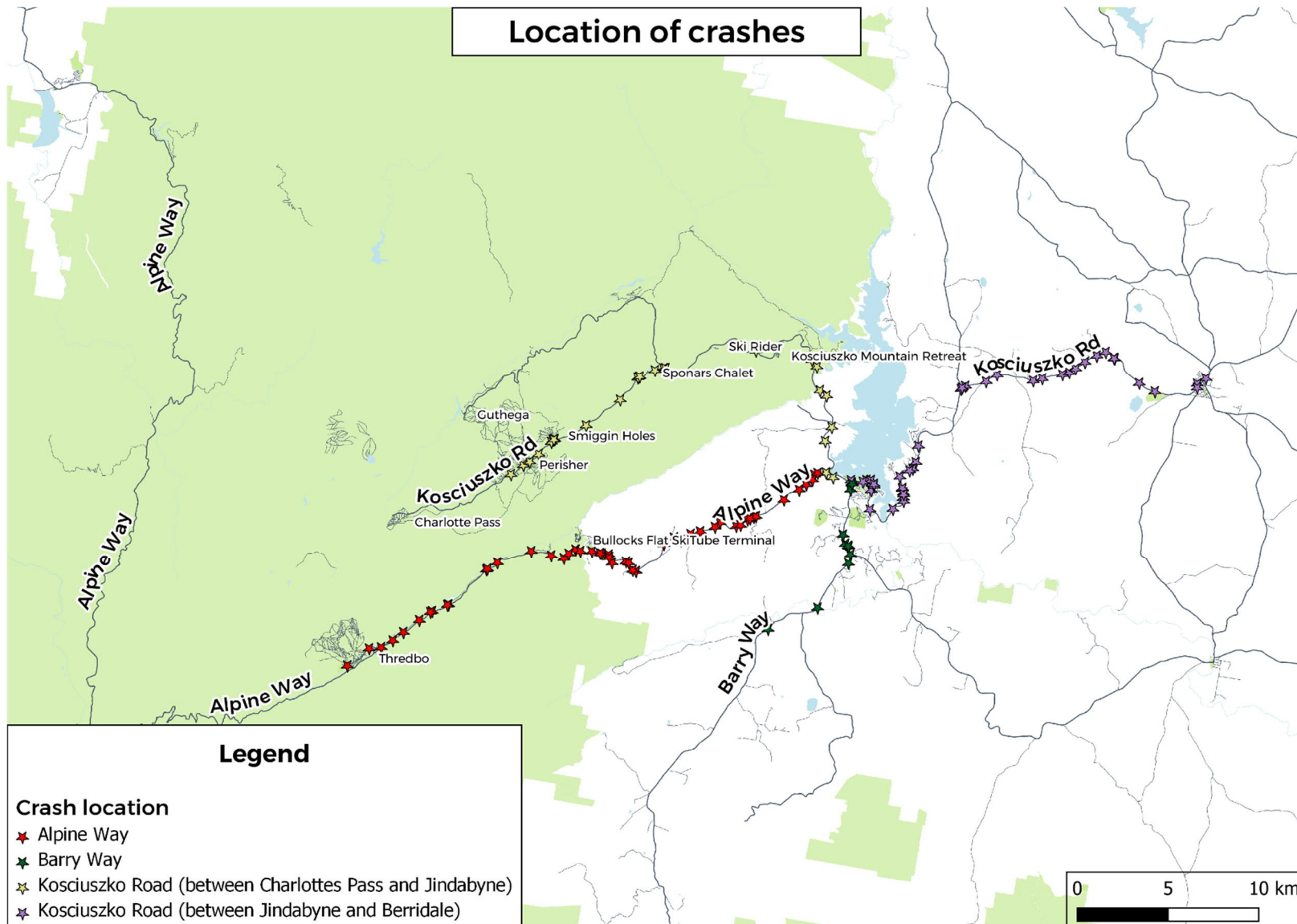


Figure 3.10 Location of crashes along the four major routes – 2014 to 2018

Table 3.3 Crash summary along four major routes in the study area within the Snowy Monaro Regional Council area

	KOSCIUSZKO ROAD (BETWEEN CHARLOTTE PASS AND JINDABYNE)		KOSCIUSZKO ROAD (BETWEEN JINDABYNE AND BERRIDALE)		ALPINE WAY		BARRY WAY	
	No. Crashes	Proportion	No. Crashes	Proportion	No. Crashes	Proportion	No. Crashes	Proportion
Degree of crash								
Fatal	0	0%	0	0%	2	4%	1	8%
Serious injury	4	14%	7	15%	7	12%	1	8%
Moderate injury	6	21%	5	10%	9	16%	1	8%
Minor injury/ other injury	3	11%	7	15%	9	16%	5	42%
No casualty	15	54%	29	60%	30	53%	4	33%
Type of crash								
Off-road crash	8	29%	14	29%	18	32%	4	33%
Rear-end crash	2	7%	2	4%	5	9%	3	25%
Animal crash	2	7%	7	15%	4	7%	0	0%
Head on crash	2	7%	4	8%	3	5%	1	8%
Miscellaneous	14	50%	21	44%	27	47%	4	33%

Source: NSW Centre for Road Safety, crash records between 2014 and 2018

3.3.5 OVERSNOW VEHICLES

Many roads within the alpine resorts themselves are also closed to all traffic other than oversnow vehicles during the snow season. When this occurs, oversnow vehicles, including snowmobiles, snowcats, all-terrain vehicles (Argos, quad bikes, vehicles fitted with rubber track system) and snow grooming machinery are used. 4WD vehicles are not classed as oversnow vehicles and are not permitted on oversnow routes without special permit. Oversnow vehicles require special registration and the operator requires an oversnow licence.

Charlotte Pass resort is closed to all vehicles except over-snow vehicles during the snow season. An oversnow bus links Charlotte Pass to Perisher and the Skitube. Daytripper's can park at Perisher and overnight parking is available at Bullocks Flat. The service requires a ticket and it is available to pre-book.



Source: <https://charlottepass.com.au/oversnow/>

Figure 3.11 Charlotte Pass oversnow vehicle

Private oversnow transport services are available (e.g. Hans Over Snow) for snow taxi services within Perisher Valley.

3.3.6 SNOW CLEARING

Roads at Perisher and Thredbo are cleared of snow if required for safe access. Parking is not permitted at Perisher Valley and Smiggin Holes in daytime public car parks during the winter period between 12.00 am and 7.00 am. This is to allow snow clearing operations in the car parks and on roads.

Transport for NSW undertake snow clearing on Kosciuszko Road. A wet salt mix is used, although dry salt is sometimes applied in colder conditions. The amount of salt applied is calculated based on the temperatures anticipated for the day.

The effect of salts on salinity levels in nearby streams has largely not been studied. Some aquatic fauna may be sensitive to increased water salinity from road run-off containing salt from the road. The University of Canberra is undertaking research into the effect of salts on the ecological health of alpine streams.⁴

⁴ Roads and Maritime Services Snow and Ice Clearing update PREMS November 2016

3.3.7 CHAIN BAYS

In the Kosciuszko National Park, it is a requirement for two-wheel drive vehicles to carry snow chains in winter. Snow chains must be carried on the following roads:

- Kosciuszko Road from the Kosciuszko National Park boundary at Thredbo River to Perisher Valley
- Alpine Way beyond Thredbo
- Island Bend/Guthega Road for its full length.

Snow chains are also recommended to be carried on the Alpine Way between Jindabyne and Thredbo.

Four-wheel drive and all-wheel drive vehicles are not required to carry snow chains in winter. However, it is strongly encouraged and there are certain extreme weather conditions in which it would be beneficial for four-wheel drive and all-wheel drive vehicles to fit snow chains.

There are chain bays along the Kosciuszko Road and Alpine Way, and it is mandatory to fit chains at these chain bays if directed by roadside signage or authorised NPWS, Roads and Maritime Services and Police officers. Chain bays allow for a safe fitting of chains with a clear division between vehicles and pedestrians fitting chains. In some circumstance's vehicles will be required to fit chains outside of chain bays.

Chain bays are located on Kosciuszko Road at:

- Sawpit Creek
- Wilsons Valley
- Dainers Gap
- Prussian Creek.

Chain bays are located on the Alpine Way at:

- Penderlea
- Thredbo Diggings
- Thredbo Ranger Station.

Road network key points:

- Kosciuszko Road entering and leaving Jindabyne is also close to capacity at peak times. The high level of traffic on Kosciuszko Road contributes to intersection delays in town.
- Kosciuszko Road to the east of Jindabyne is busy, but still operating within its capacity.
- Some of the key roads within the Snowy Mountains SAP have experienced high numbers of crashes, with many single-vehicle crashes where the vehicle has left the roadway after losing control.
- Freight is moved into and out of the Snowy Mountains area by truck, with forestry products being the main export.

3.4 PARKING

3.4.1 JINDABYNE TOWN CENTRE

Demand for parking in the Jindabyne town centre varies greatly between peak season and off-season. For the majority of the year parking is more than adequate for the permanent residents. However, during the peak snow season demand swells and the unrestricted on-street parking needs to cater for the influx of seasonal workers and visitors. The increase in parked vehicles during the high season can make it difficult for other vehicles, especially larger vehicles (including waste collection vehicles), to manoeuvre through Jindabyne's residential streets.

Current parking restrictions are shown in Figure 3.12. Most on-street and the majority of off-street parking is unrestricted. Time-restricted parking is located within the retail and commercial core to provide parking turnover for businesses. There is currently no paid parking in Jindabyne. There is a mix of parallel kerbside parking and 45-degree parking on town centre streets within Jindabyne.



Source: GTA analysis

Source: Go Jindabyne Mobility and Connectivity Study Stage 1 Report (GTA Consultants (NSW) Pty Ltd, 23/07/19)

Figure 3.12 Current parking restrictions in Jindabyne

Overnight parking by campers is discouraged with No Stopping zones. However, anecdotally evidence suggests that this still occurs despite the control efforts.

3.4.2 ALPINE RESORTS

Parking within the alpine resorts is in high demand, from both day visitors and overnight guests. Day visitors travel to the resorts each day from Jindabyne or other surrounding accommodation areas, potentially from destinations even further away such as Canberra. These day trippers typically arrive from 8.00 am and depart by 5.00 pm. Overnight guests staying in the resorts typically have car parking associated with their accommodation in Thredbo. Some accommodation in Perisher has limited overnight car parking and guests typically park their vehicles in overnight parking at Bullocks Flat and access the resort via the Skitube.

Parking within the alpine resorts is increasingly becoming an issue, especially as parking extends away from the resort to the side of the road as formal car parks reach capacity. There are also occurrences of chain bays being utilised for car parking. Parking outside of these formalised areas presents a road safety risk within the National Park.

An overview of the existing parking availability within the alpine resorts is included in Table 3.4. Further detail of the parking context of the individual resorts is explained in the following sections.

Table 3.4 Existing parking at alpine resorts

LOCATION	DAY PARKING	OVERNIGHT PARKING	TOTAL
Perisher Group	2,576 including: 1,185 at Perisher Village 820 informal overflow (alongside Kosciuszko Road to Pipers Gap, Prussian Creek chain bay and Dainers Gap chain bay), 471 at Smiggin Holes, 100 at Guthega	119 including: 65 at Perisher Village, 29 at Smiggin Holes 25 at Guthega	2,695 including: 1,250 at Perisher Village 820 informal overflow (alongside Kosciuszko Road to Pipers Gap, Prussian Creek chain bay and Dainers Gap chain bay), 500 at Smiggin Holes, 125 at Guthega
Bullocks Flat	1,973	1,727	3,700
Thredbo	1,136	506 plus 858 private	2,500
Total	5,685	2,352 plus 858 private	8,037 plus 858 private

Note: The overnight car parking spaces at Perisher and Smiggin Holes is predominantly for lodge managers and employees only

Source: National Parks and Wildlife Service, aerial photography, reports

An assessment of current parking and visitor numbers indicated that there are approximately **2.8 visitors per car parking space**.

There are currently approximately 8,000 parking spaces in the Kosciuszko National Park and nearby area, including approximately 2,700 spaces within Perisher ski resort area (of which ~820 is informal overflow parking along Kosciuszko Road), 3,700 spaces at Bullocks Flat (Skitube access) and 2,500 at Thredbo (including private off-street parking). On good snow days, the overflow parking on the side of Kosciuszko Road at Perisher is not always available due to safety concerns and snow clearing. If car parking is full at the resort, TfNSW implements its Traffic Management Plan to close the road and redirect traffic to Bullocks Flat. There is evidence that also on these peak snow days that parking at Bullocks Flat is filling up and that some overflow parking is occurring along the Alpine Way before entry into Thredbo.

With increasing demand for car parking at the alpine resorts and limited supply, alternative options such as remote park-and-ride sites with a connecting bus service become more viable. If this option could avoid the need to construct additional parking within the environmentally sensitive Kosciuszko National Park and reduce the volume of traffic on Kosciuszko Road, this could have multiple benefits.

There have been various proposals for multi-deck and/or basement parking at Perisher and Thredbo, with Perisher's basement parking having since been abandoned due to cost. If these projects are going to proceed, the design of these facilities will need to provide parking space sizes that take into consideration people moving around their vehicles to get their ski gear and associated height clearances of 4WD vehicles. This is accommodated by surface parking areas by providing increased space. However, this is more difficult in multi-deck and basement facilities due to the position of columns and walls and adds to the already high cost of the structure.

3.4.3 *PERISHER*

Difficult private vehicle access due to the elevation and limited parking throughout the Perisher Alpine Resort encourage drivers to park the Skitube Terminal in Bullocks Flat. At Perisher Valley and the village of Smiggin Holes, there is limited parking throughout the day, but no overnight parking is allowed. There are approximately 1,250 spaces at Perisher Valley and 380 marked spaces at Smiggin Holes (plus another 120 car and 30 coach spaces unmarked). The village of Guthega has 100 parking spaces available during the day only and 25 overnight spaces, however snow conditions may affect this capacity. Overnight parking isn't currently provided in Perisher due to its position above the snowline. However, overnight spaces are available at Bullocks Flat allowing travel back to Perisher on the Skitube.

In addition to the above, there are approximately 820 overflow parking spaces available along the shoulder of Kosciuszko Road including 360 at Perisher, 160 at Smiggin Holes Workshop, 150 at Prussian Creeks Chain Bay and 150 at Dainers Gap Chain Bay. This parking is managed through a Road Occupancy Licence between Perisher and TfNSW. This parking is generally not available on bad weather days. However, the demand for parking is typically lower on these days as well.

While the number of parking spaces (approximately 2,700) is large, anecdotal information indicates that the majority of parking is taken up by ski lift pass holders. This creates an equity issue for snow play visitors, who are seeking a snow experience without needing to purchase ski lift passes or accommodation.

There have been a number of investigations into the potential for additional development within Perisher Village and Smiggin Holes. A Development Application for Stage 1 of the plan was prepared in 2004 that incorporated new basement parking (for 271 vehicles) in buildings on land currently occupied by car parking. The net deficit in parking (112 spaces) would be accommodated by new parking areas alongside Kosciuszko Road between Perisher Valley and Pipers Gap (within the 40 m road reservation. Subsequent stages would relocate more parking, such that the total of 1,200 spaces was maintained throughout.

A total of 356 spaces were proposed alongside Kosciuszko Road, 152 on disturbed ground at Pipers Gap, and a further 391 spaces in new and extended parking areas at Smiggin Holes. The design for the parking alongside Kosciuszko Road incorporates wider pedestrian areas for improved safety for people moving between their vehicle and the resort. The plan has not yet been implemented. However, concept and detailed designs have been prepared for some elements of the plan. The increased development at Perisher would increase demand for other transport options (including Park-and-Ride) if parking is capped at current numbers.

3.4.4 *BULLOCKS FLAT (SKITUBE TERMINAL)*

There is free, security-patrolled overnight parking available at the Skitube Terminal station at Bullocks Flat which experiences high demand during the peak winter season. Further information on the Skitube service is contained in Section 3.5.5.

The high demand for this parking is due to the station being located at a lower elevation compared to most of the alpine resorts, making it more accessible by private vehicle, and there are frequent Skitube trains to the Perisher Valley and Blue Cow resorts. Bullocks Flat has free day parking for 2,208 vehicles and overnight parking for 822 vehicles⁵. However, other vacant space increases the total to approximately 3,700 spaces. While the parking is free, it is noted that the cost of the Skitube (approximately \$95 per adult) is a consideration for those visitors considering parking their vehicle at Bullocks Flat.

⁵ <http://www.absolutealpine.com.au/perisher/getting-there/>

3.4.5 CHARLOTTE PASS

During the snow season (June long weekend to October long weekend, weather permitting) vehicle access to Charlotte Pass is not possible. Charlotte Pass Resort has raised the issue of access to dedicated parking at Perisher during the winter. However, no arrangement has been achieved to date. An alternative that has been considered includes parking at Sawpit Creek with a shuttle service to connect to the oversnow vehicle.

In the green seasons, Charlotte Pass is a popular hiking destination with the Mount Kosciuszko and Lakes walks commencing from here. There is limited (6 spaces) formal parking at the turn around at the end of Kosciuszko Road which is often at capacity. Aerial photography suggests that during the summer and Easter peaks demand for car parking is approximately 200 spaces or more at any one time. There is currently no parking within the village which is utilised for visiting the lookout area or accessing the hiking trailhead.

3.4.6 THREDBO

Thredbo has over 2,500 parking spaces with a combination of day and overnight spaces. This includes 506 night spaces, 1,136 day spaces and the remainder being private parking attached to chalets. Parking areas are located at different locations in Thredbo village, but mostly concentrated in the east along Friday Drive and in Friday Flat. Four internal shuttle bus routes transfer people from parking areas to the rest of Thredbo.

There are four current development applications for parking improvements in Thredbo. They include⁶:

- 161 space net parking increase from elevated platform parking spaces at Friday Flat Terminal (approved but not constructed)
- 95 spaces at-grade at Friday Flat (being built for winter 2020)
- 171 spaces at Friday Flat near the Thredbo River (currently being assessed)
- a pre-DA application for parking near the old tip (detail not available).

3.4.7 SPONARS CHALET, SKI RIDER HOTEL AND KOSCIUSZKO MOUNTAIN RETREAT

The individual resorts/accommodation leases have free parking for guests around their grounds to suit their needs. Space is generally limited, and parking is not provided for visitors. However, parking is not considered a constraint at these locations.

3.4.8 SAWPIT CREEK NPWS VISITOR ENTRY STATION

Parking is available for vehicles and buses after they have proceeded through the NPWS Kosciuszko Road VES. This area can be used as a parking overflow area. However, visitors are required to get back to the resorts after parking here. A shuttle bus with a heated waiting lounge could make use of this parking area more attractive, taking pressure of overflow parking on the shoulder of Kosciuszko Road.

3.5 PUBLIC TRANSPORT

Buses provide the primary public transport service between regions within the study area, including Jindabyne town centre and various residential land-uses in the Snowy Mountains. Coaches provide inter-regional connection between the study area to regions outside the study area such as major towns like Cooma and Bombala as well as major cities like Canberra and Sydney. However, there are no intra-town bus routes that specifically service the public transport needs of Jindabyne town. The bus routes and the frequency of services available in the study area are summarised in Table 3.5 with further detail following the table.

⁶ Information from National Parks and Wildlife Services based on Department of Planning Major Projects website.

Table 3.5 Summary of public transport/shuttle services in the study area

SERVICE TYPE	OPERATOR	DAILY SERVICES	AM PEAK SERVICES (7.00 am–9.00 am)	PM PEAK SERVICES (3.00 pm–5.00 pm)
Public buses (Coaches)	Transport for NSW (operated by NSW TrainLink)	2 (Monday, Wednesday and Friday)	1	1
School buses	Snowliner Coach	2	1	1
	Alpine Charters	2	1	1
	Cooma Coaches	19	9	10
Seasonal shuttle buses	Snowy Mountains Shuttles	2	1	1
	Snowlink	2	1	1
	Murrays	2 (from Canberra) 2 (from Sydney on Friday and Saturday)	1	1
	Snowexpress	4 (peak season) 2 (off peak season)	2 (peak season) 1 (off peak season)	2 (peak season) 1 (off peak season)
	Mountain Group Australia	Up to 10 services (Friday-Monday in peak season)	Depends on flights	Depends on flights
	Thredbo shuttles (operating within Thredbo Village)	4 separate routes within Thredbo Village	No information available	No information available
	Perisher resort shuttle to Smiggin Holes	Operates 7.30 am to 5.30 pm	Every 15 minutes	Every 15 minutes
	Ski Rider Hotel shuttles (shuttle to Perisher)	Up to 8	No information available	No information available
	Sponars Chalet shuttle	By arrangement	By arrangement	By arrangement

3.5.1 REGIONAL COACHES

There are two public coach services on the Regional Bus and Coaches Network which operate via Jindabyne town centre at the Jindabyne Coach bus interchange. These include routes:

- 775 service which travels from Canberra Civic to Bombala, arriving at Jindabyne at 2.26 pm every Monday/Wednesday and Friday
- 776 service which travels from Bombala to Canberra Civic, arriving at Jindabyne at 8.20 am every Monday/Wednesday and Friday.

The town of Jindabyne and the surrounding residential areas within the study area do not have existing local public bus services.

3.5.2 COMMUNITY BUSES

The Snowy-Monaro Regional Council provides communal bus services for passengers with restricted access to means of transport. These include on-demand services to get passengers to local appointments (medical, social and community) as well as a fortnightly shopping bus service from Jindabyne to Cooma.

3.5.3 SCHOOL BUSES

Cooma Coaches operates the bulk of the daily school bus services, for the two schools in Jindabyne (Snowy Mountains Grammar School and Jindabyne Central School) and the five schools in Cooma (Monaro High School, Cooma Public School, Cooma North Public School, St Patrick's Parish School and Snowy Mountains Christian School). These services bring students within and outside the study area to the schools in the town of Jindabyne as well students from the study area to the schools in the town of Cooma.

Table 3.6 School bus routes operated by Cooma Coaches

ROUTE	DESCRIPTION	MORNING SERVICE	AFTERNOON SERVICE
S500	Cooma to Jindabyne	1	0
S501	Jindabyne To Berridale	0	1
S502	Berridale To Jindabyne (Primary School)	1	0
S502	Berridale To Jindabyne (Secondary School)	0	1
S503	Jindabyne to Kalkite via Tyrolean village (Primary school only)	1	1
S504	Jindabyne to Kalkite via Tyrolean village (Secondary school only)	1	1
S505	Jindabyne to Lakewood estate via Old Settlers Road	1	1
S506	Jindabyne to Moonbah Mowamba Way	1	1
S507	East Jindabyne to Cooma	1	0
S507	Jindabyne to East Jindabyne	0	1
S508	Jindabyne to Ingebirah	1	1
S509	Jindabyne to Cooma	0	1
S527	Jindabyne to Thredbo	1	1
	TOTAL	9	10

Snowliner Coaches provides a daily school bus services for outlying towns to/from up to five schools in Cooma, with a morning service leaving Jindabyne Central School on Park Road at 7.45 am for Cooma and an afternoon service leaving Cooma to arrive at Jindabyne at 4.45 pm.

Alpine Charters operates a daily school bus service to/from outlying areas in the Snowy Mountains region directly to the schools in Jindabyne (Snowy Mountains Grammar School and Jindabyne Central School). These daily services operate twice a day, collecting passengers in the Snowy Mountains region between 8.00 am to 9.00 am and returning passengers to the Snowy Mountains region between 3.30 pm to 4.30 pm. These outlying areas include:

- Perisher
- Smiggin Holes
- Ski Rider
- Waste Point
- Gaden Hatchery Road
- Forest View Road.

3.5.4 SEASONAL SHUTTLE BUSES

During the winter peak many additional private bus services operate. These services connect tourists to the Snowy Mountains from Canberra and Sydney, as well as connecting them within the region. Figure 3.13 indicates all the bus routes operating within the peak winter season with further detail provided below.

The various private bus services operating within the Snowy Mountains SAP, or to/from the region are:

- Murrays Sydney Snow express offers shuttle bus services from Sydney to the Snowy Mountains resorts (Perisher and Thredbo) departing every Friday and Saturday in July and August., whilst the Murrays Canberra Snow Express provides a daily coach service to/from Canberra.
- Snoexpress is an online booking platform for transport services to the Snowy Mountains, such as Snow Alliance. These services run only on Sunday and Friday, offering transport to/from Canberra, Canberra Airport and the major alpine resorts such as Perisher and Thredbo, travelling via Jindabyne and the Ski Rider station at Bullocks Flat. During late June and October, there is one morning service leaving Canberra at 8.00 am before arriving at the Perisher Valley/Thredbo Info Centre at 11.30 am and one afternoon service leaving the Perisher Valley/Thredbo Info Centre at 12.30 pm and arriving at Canberra at 4.00 pm. During the busier months of July and August, there is an additional morning service leaving Canberra at 11.00 am before arriving at the Perisher Valley/Thredbo Info Centre at 2.30 pm and one afternoon service leaving the Perisher Valley/Thredbo Info Centre at 3.30 pm and arriving at Canberra at 7.00 pm.
- Mountain Group Australia provides airport shuttle services between the Snowy Mountains Cooma Airport and to Jindabyne, Thredbo and the Skitube terminal at Bullocks Flat. The airport shuttle services are lined up with the arrival and departure flights from Snowy Mountain Cooma Airport. During the busier period between July and late August, there are four daily services corresponding to departure flights on Saturday–Monday and six daily services corresponding to arrival flights on Friday–Sunday. They also offer mountain bike shuttles to a variety of nearby trails.
- Greyhound Australia is a coach operator that offers bus transportation between Sydney/Canberra and Thredbo Village/Skitube Terminal at Bullocks Flat, including a stop in Jindabyne.
- Transborder express is a bus operator that offers on demand charter bus services from Canberra to Jindabyne.
- Snowy Mountains Shuttles are a family operated business operating a 25-seater bus and three 4WD vehicles. They run shuttles daily from Berridale via Jindabyne to Perisher, Thredbo and the Skitube at Bullocks Flat, arriving at Jindabyne between 7.45 am and 8.00 am and returning to Jindabyne at around 4.15 pm. They also run private transfer services with seven and eight seat 4WD vehicles, from Snowy Mountains Cooma Airport and Canberra Airport to the Snowy Mountains all year around. They also use their fleet to provide mountain bike shuttles all year round.
- Snowlink offers private transfers with a fleet of 11-seater minibuses and 4WD vehicles operating between the alpine resorts and Jindabyne as well as facilitating longer transfers to Cooma airport, Canberra and Sydney. During the peak winter season (between June and September), the Snowlink usually operates a shuttle service every day of the week. These shuttle services pick up passengers from Jindabyne and East Jindabyne in the morning between 7.30 am and 8.00 am and the alpine resorts (Perisher, Thredbo and Skitube) in the afternoon between 3.30 pm and 4.00 pm. Since services are dependent on the volume of bookings, there needs to be a minimal number of bookings for the minibuses to operate and passengers outside these times require a private transfer service, which include pick-ups from Canberra and Snowy Mountains Airport Cooma. During the off-peak season Snowlink operate regular mountain bike lift shuttles providing transport for individuals and private groups with their vehicles fitted with purpose-built bike carriers.
- A free internal resort shuttle service operates between Perisher Valley and Smiggin Holes. The shuttle service runs approximately every 15 minutes from 7.30 am to 5.30 pm.

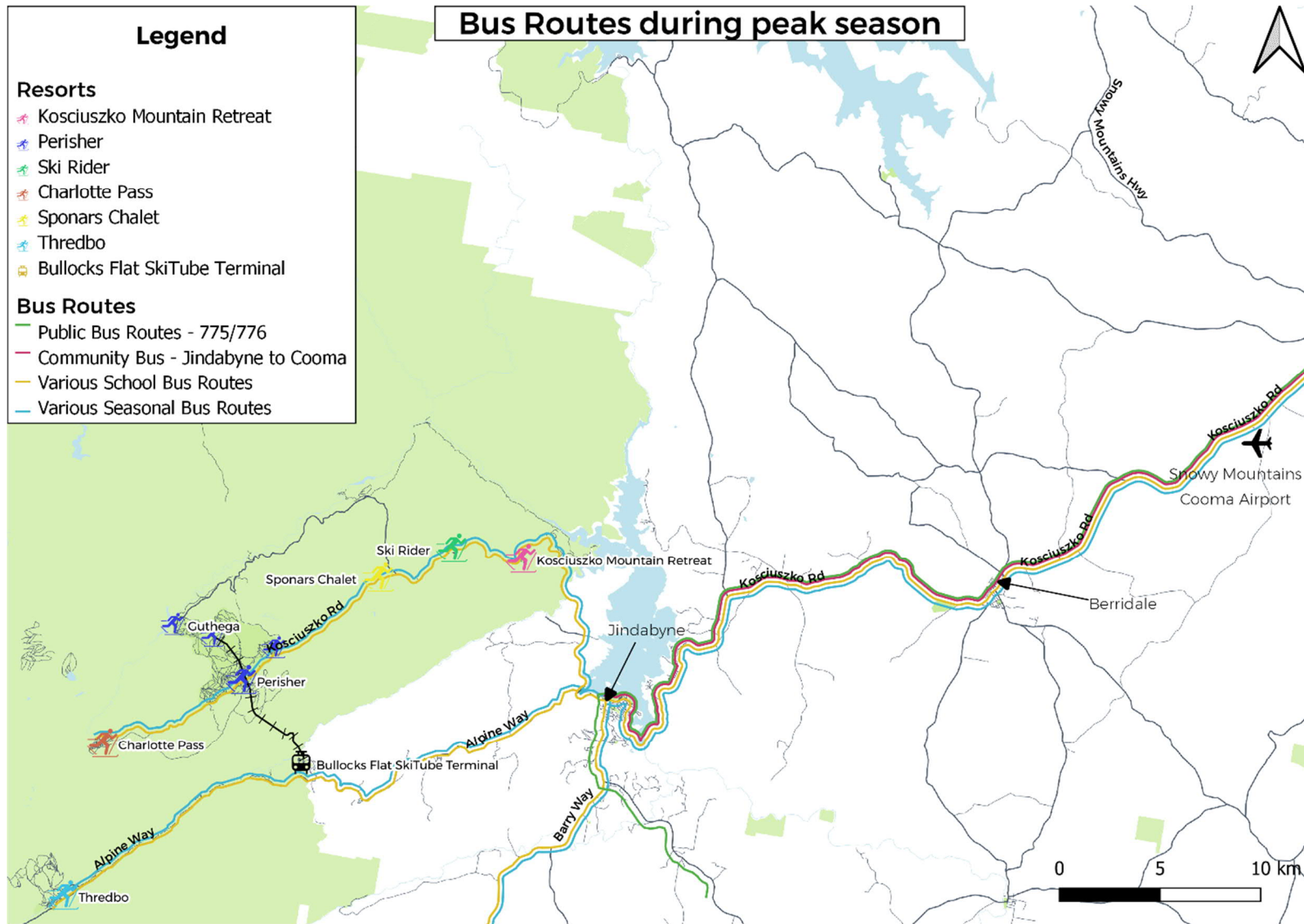


Figure 3.13 Bus routes between Cooma Airport, Jindabyne and the alpine resorts

- Thredbo offers four shuttle bus routes to assist its guests and visitors move around the village. These includes routes that service the accommodation, ski lifts and parking areas, as well as a service that completes a loop of the village. All three routes stay within local streets within Thredbo (none use Alpine Way). Friday Drive provides a main shuttle bus spine route through the village. Service starts at 7.30 am and runs until 6.00 pm during the winter season. Operation hours are extended until 7.30 pm on Thursday and Saturday nights.
- For Charlotte Pass, the passage of Kosciuszko Road between Charlotte Pass and Perisher is closed during the winter season due to heavy snowfall, meaning the Charlotte Pass Oversnow Transport is the only transport service operating between the two resorts. It is an on-demand service that departs from the Perisher Valley Skitube terminal and travels via Kosciuszko Road to Charlotte Pass.
- Sponars Chalet shuttle operates between the chalet and Melbourne Airport for private bookings.
- The Ski Rider hotel offers free shuttle bus services to the Perisher ski resort for up to eight times per day, however there is no available timetabled information to indicate frequency.
- Lake Crackenback offer a specific Thredbo Valley Track mountain bike shuttle service, with a daily shuttle from the resort to the start of the track at Thredbo.

3.5.5 SKITUBE

The Skitube, shown in Figure 3.14, was developed from 1984 and commissioned on 26 July 1987 to address the emerging problem of road access to resorts becoming inadequate for the steadily increasing demand. The Skitube route was to provide a short connection from Bullocks Flat under Rams Head Range to Perisher then across to Blue Cow.

Common operation is a two or three car shuttle between Perisher and Blue Cow and a three or four car service between Bullocks Flat and Perisher. A passing loop just outside the first tunnel allows additional capacity on the Bullocks Flat to Perisher section. At Perisher, there is a loop around the island platform that allows trains to pass. However, current common operation is to run separate services (no passing required).

Travel times are approximately 10 minutes from Bullocks Flat to Perisher and approximately 5 minutes from Perisher to Blue Cow⁷. The platforms have been constructed with sufficient length to accommodate four carriages. With a maximum capacity of 225 people per carriage, it has a claimed maximum capacity of 4,500 people per hour. However, current operational capacity is well below this level at 1,620 people per hour. In the summer of 2016/2017 upgrading works were scheduled to upgrade train control and communications, train braking, for the 11 Comeng carriages that service the Skitube.

With the Skitube operations limited to the ski season and the use of the rack railway technology, the current operators Vail Resorts have indicated that the design life of the Skitube rolling stock and associated infrastructure will last the entire length of the Snowy Mountains SAP Masterplan (i.e. beyond their current operating lease which expires in July 2030).

⁷ Perisher Web Site: <https://www.perisher.com.au/plan-your-trip/new-to-perisher/skitube>



Source: *Perisher.com.au*

Figure 3.14 Skitube from Bullocks flat to Perisher

Table 3.7 shows the frequency of services, where the peak season operates during the months of July and August. During the peak time periods of 8.00 am and 10.00 am in the morning and 3.00 pm to 5.00 pm in the afternoon, there are luggage restrictions in place on the Skitube to maximise space during busier times.

Table 3.7 Frequency of the Skitube between Bullocks Flat terminal and Perisher Valley

DIRECTION	DAILY SERVICES	AM PEAK SERVICES (8.00–10.00 am)	AM PEAK FREQUENCY	PM PEAK SERVICES (3.00–5.00 pm)	PM PEAK FREQUENCY
Bullocks Flat to Perisher Valley (uphill) during peak season between Monday and Friday	40	7	Every 20 minutes	–	–
Perisher Valley to Bullocks Flat (downhill) during peak season between Monday and Friday	40	–	–	6	Every 20 minutes
Bullocks Flat to Perisher Valley (uphill) during peak season between Saturday and Sunday	44	7	Every 20 minutes	–	–
Perisher Valley to Bullocks Flat (downhill) during peak season between Saturday and Sunday	44	–	–	6	Every 20 minutes
Bullocks Flat to Perisher Valley (uphill) during off-peak season	33	4	Every 30 minutes	–	–
Perisher Valley to Bullocks Flat (downhill) during off-peak season	33	–	–	4	Every 30 minutes

The ticket price for the Skitube is \$95 for adults, \$51 for children and \$77 for seniors return⁸, open times. However, discounted rates are offered as an add on to multiple day lift passes and season passes.

Anecdotal evidence suggests that some visitors find these ticket prices too high, and instead try to hitch-hike up to the alpine resorts along Kosciuszko Road. In addition, for family and friend groups, the relative economy of driving and paying the NPWS entry charges soon outweighs the cost of buying individual Skitube tickets.

⁸ Skicheap.com.au (2018 prices) – ticket prices on Perisher web site not available due to COVID-19 travel restrictions.

3.5.6 TAXIS AND RIDE SHARE

Taxi services operate within Jindabyne and to surrounding areas. Standard taxis and maxi taxis are operated. Ride share services are not known to operate in Jindabyne currently. However, the Uber website indicates that their booking service will be available in regional NSW areas (including Jindabyne) from April 2020.

3.5.7 RAIL

A concept plan has been developed for a railway between Canberra and Eden utilising the disused railway corridor between Queanbeyan and Bombala which ceased operation in 1988. The key objective is to create an alternative freight corridor to road between the Port of Eden and Canberra International airport. It is envisaged the proposal would also accommodate passenger services.

A 2020 report into the Canberra to Eden railway feasibility found the project is not viable due to high costs and low benefits. The proposed 300 km railway would pass through challenging terrain and areas of significant environmental value, including National Parks. These constraints would contribute significantly to costs resulting in the report estimating \$6.3 billion for the overall project cost.

The current corridor is only in the ownership of Transport for NSW from Queanbeyan to Bombala (207 km). The land to accommodate the spur to Canberra Airport and additional 105 km from Bombala to Eden would need to be purchased.

In terms of the Snowy Mountains SAP, the benefits of this proposal would have been for passengers seeking aside excursion from the rail journey. If a coach service were provided to connect Cooma to Jindabyne, it would assist this experience.

To match or better the car travel times (76 minutes) from Canberra to Cooma (114 km) it would need to achieve speeds of 160 km/h (52 minutes) or 200 km/h (44 minutes). The 200 km/h would be in line with the NSW government investigations into Fast Rail.

The benefits of a Canberra to Cooma rail link would have needed to leverage off other Fast Rail initiatives being explored by Commonwealth and NSW Government such as Sydney to Canberra Fast rail corridor. Based on a strategic level average global price for Faster Rail being approximately \$75M/km, the minimum price of making the entire corridor capable of accommodating 200 km/h trains would start from approximately \$23B for 312 km from Canberra to Eden and \$8.5B for 114 km Canberra to Cooma.

The proposal to reactivate the line was in direct conflict with the alternate proposal to create Monaro Rail Trail, a cycle tourism project which would require the entire rail corridor to operate within.

Public Transport key points:

- There are a plethora of bus and coach services within the Jindabyne and Snowy Mountains SAP during the high season. However, each is performing its own task for a specific clientele. Despite this, there are few services for the general public to move around town or to travel between Jindabyne and the ski fields.
- Coaches link Jindabyne to major cities and regional centres. However, frequency of service is low.
- The Skitube has the potential to move larger numbers of visitors. However, there needs to be a review of its fare versus other options to encourage its use versus increased parking and traffic congestion. Its design life matches the length of the Snowy Mountains SAP Master Plan.

3.6 WATER TRANSPORT

A range of water sports occur on Lake Jindabyne, however no formal public transport options on the lake exist. Lake facilities include:

- A formal launching ramp with parking facilities is located to the west of Jindabyne, immediately north of the holiday park. There are also several unformed, informal boat ramps around the lake edge (Kalkite, East Jindabyne, Claypits, Waste Point).
- The boat ramp at Widows Inlet has recently been upgraded and is well-used. Other ramps at Claypits, the bowling club, Rainbow, Rusher Bay and East Jindabyne are also popular.
- A sailing club is located to the west of Jindabyne at Widows Inlet with sailing courses located west of Lion Island (Moreas Island).
- Diving is known to occur in Lake Jindabyne with dive sites at the Old Town and the Kalkite homestead at the end of Lake Jindabyne.
- Water sports both motorised and non-motorised, are popular on the lake particularly in summer. Examples include; water skiing, canoeing, kayaking, windsurfing, stand-up paddle boarding etc.
- The lake is used for fishing all year round.
- Triathlons and other adventure races are frequently held on Lake Jindabyne.

A map showing the location of boating facilities is shown in Figure 3.15. A photo of the paved boat ramp at the boat ramp near Snowline Caravan Park boat is shown in Figure 3.16.

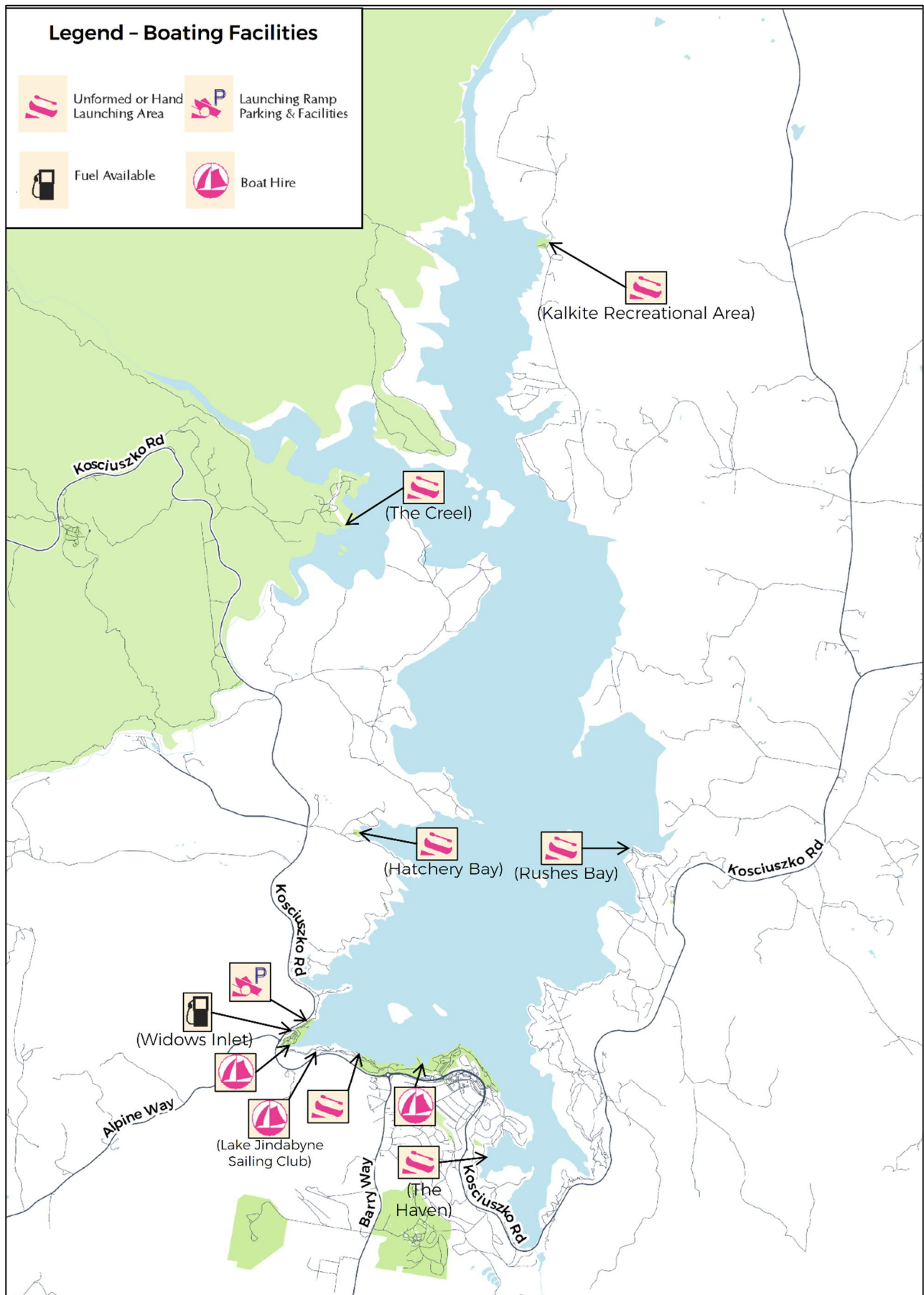


Figure 3.15 Lake Jindabyne boating facilities



Source: Snowymountainsfishing.com.au, Accessed 4 June 2020

Figure 3.16 Snowline Caravan Park boat ramp – Lake Jindabyne

A study into the potential for a lake-based transport service was undertaken for the Go Jindabyne study. Through a comparison to other alpine lakes around the world found that:

- most lakes have private operators
- many services are tourist based with a range of different destinations and durations
- using water-based services for both public transport and tourist services could be beneficial for Jindabyne
- most services operate year-round, however a precedent for Lake Jindabyne would be Lake St Clair in Tasmania which has scheduled summer services and operates winter services on demand.

It concluded that further investigation would need to be undertaken regarding costs associated with a tourist service including the fleet, infrastructure, operations or maintenance, as well as demand estimation and patronage.

The Snowy Mountains SAP Tourism Development Study (Stafford Strategy, March 2021) identified a potential for greater use of Lake Jindabyne as one of the tourism draw-cards for the Snowy Mountains SAP area. Two projects were identified and costed, including:

- A water taxi/ferry service would require approximately \$2.0 million of capital expenditure, with another \$1.3 million for supporting infrastructure (lake boardwalk, pontoons, access roads, utilities into site).
- Lake Jindabyne Water Activities and Experiences would require \$500,000 of capital expenditure with another \$250,000 for supporting infrastructure (access roads, utilities into site).

The water taxi/ferry could be a seasonal service. However, the impact of changing lake levels on the service and the infrastructure required to support it could affect its viability.

Water-activities to be encouraged on the lake include:

- | | | |
|-------------------|---------------------------|-----------------|
| — Fishing | — Yachting | — Scuba diving. |
| — Kayaking | — Water skiing | |
| — Paddle boarding | — Seasonal ferry services | |

Water Transport key points:

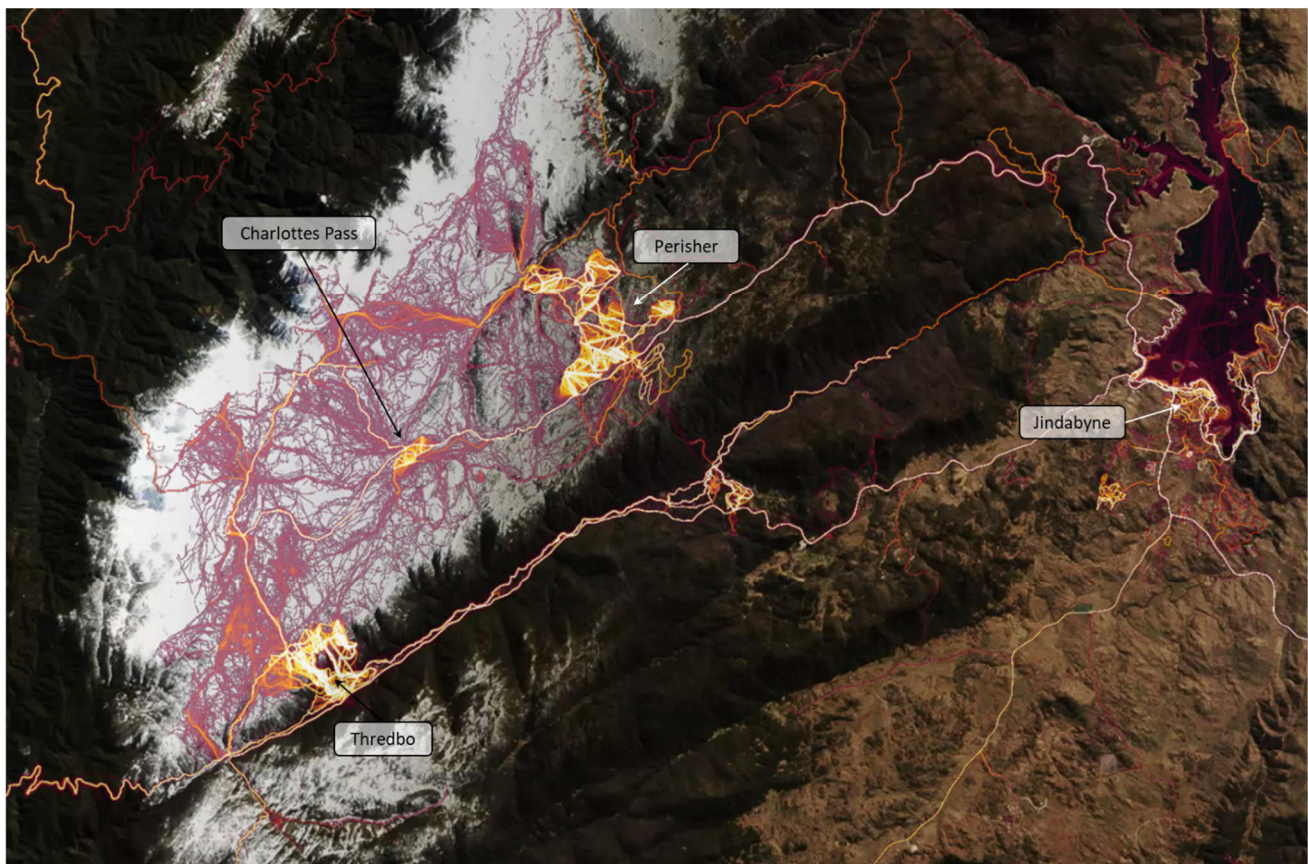
- Lake Jindabyne is used for a wide variety of recreational uses.
- The variable water levels make the provision of dedicated infrastructure more difficult.

3.7 ACTIVE TRANSPORT

3.7.1 STRAVA DATA

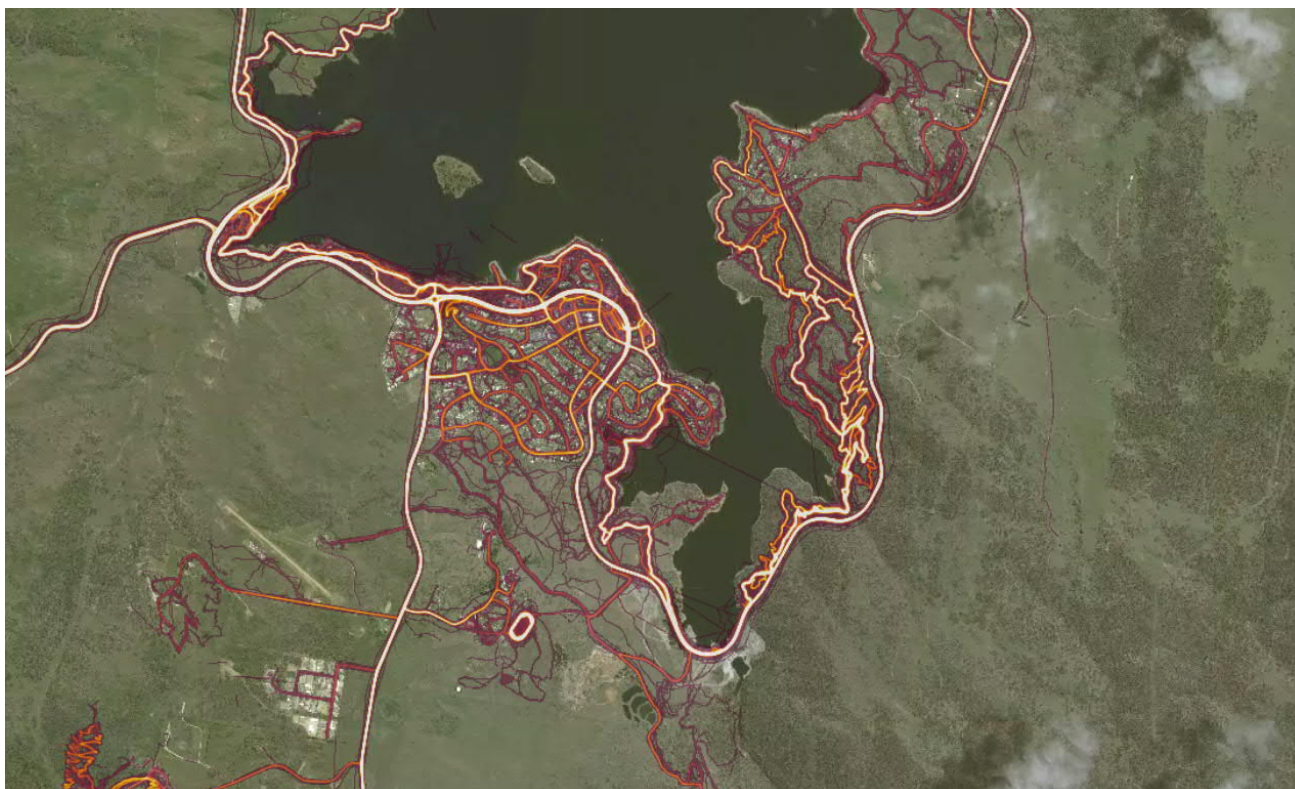
Strava data can be used to visualise the key active transport routes across the region. This data should be used with the understanding that Strava data captures only a subset of active transport users that chose to use the Strava app to record their travel. Hence it is often used more by “athletes” and does not capture all the active travel routes around Jindabyne and the surrounding areas. Similarly, routes will be shown strongly that are used for training or recreational purposes by these app users. Whilst routes used to facilitate access around Jindabyne or for more leisurely recreational users will not be shown strongly as these users will unlikely be using the app. An example of this would be in Figure 3.17 where the alpine resorts are shown as being very strongly recorded in the Strava app. The more users recorded along a route, the brighter or more intensity is shown on the figures.

Figure 3.17 shows the Snowy Mountains SAP, the Strava data highlights the alpine resorts and the mountain biking trails around Lake Crackenback. Figure 3.18 and Figure 3.19 show Jindabyne and the different routes taken for cyclists or runners. The most obvious of which is the high use of the lake foreshore for running.



Source: Strava data, 2018

Figure 3.17 Snowy Mountains region – all activities



Source: Strava data, 2018

Figure 3.18 Jindabyne – cycling



Source: Strava data, 2018

Figure 3.19 Jindabyne – running

Based on the Strava data for running and relating it to walking, it appears that there are significant jogging/walking routes along:

- Lake Jindabyne foreshore
- Kalkite Street
- Snowy River Avenue
- Thredbo Terrace
- Kosciuszko Road
- Reedys Cutting Road and Park Road, with a path between
- Gippsland Street
- Clyde Street
- Banjo Patterson Crescent
- Munyang Street
- Barry Way.

Improving pedestrian facilities on these roads would broaden the pedestrian network within Jindabyne and improve connections to key land uses including schools, shops and services.

3.7.2 PEDESTRIANS

Within Jindabyne there is a limited local footpath network with limited to no connectivity across Kosciuszko Road to reach the Lake Jindabyne foreshore. There are minimal footpath facilities through the outer edges of Jindabyne and the communities of East Jindabyne and Tyrolean village. The existing pedestrian network of Jindabyne is shown in Figure 3.20.

Throughout the alpine resorts there is limited or no formalised pedestrian facilities. Recreational hiking facilities throughout the region are discussed in Section 3.7.6.



Base map Source: Six maps

Figure 3.20 Existing formalised pedestrian network

3.7.3 CYCLISTS

A formalised off-road cycle facility runs along the foreshore of Lake Jindabyne from the skate park in the east to the caravan park in the west. This path also connects from the foreshore to the back of Jindabyne Central School. These paths can be seen in Figure 3.21. A small section of off-road paths also runs along the Tyrolean Village foreshore.

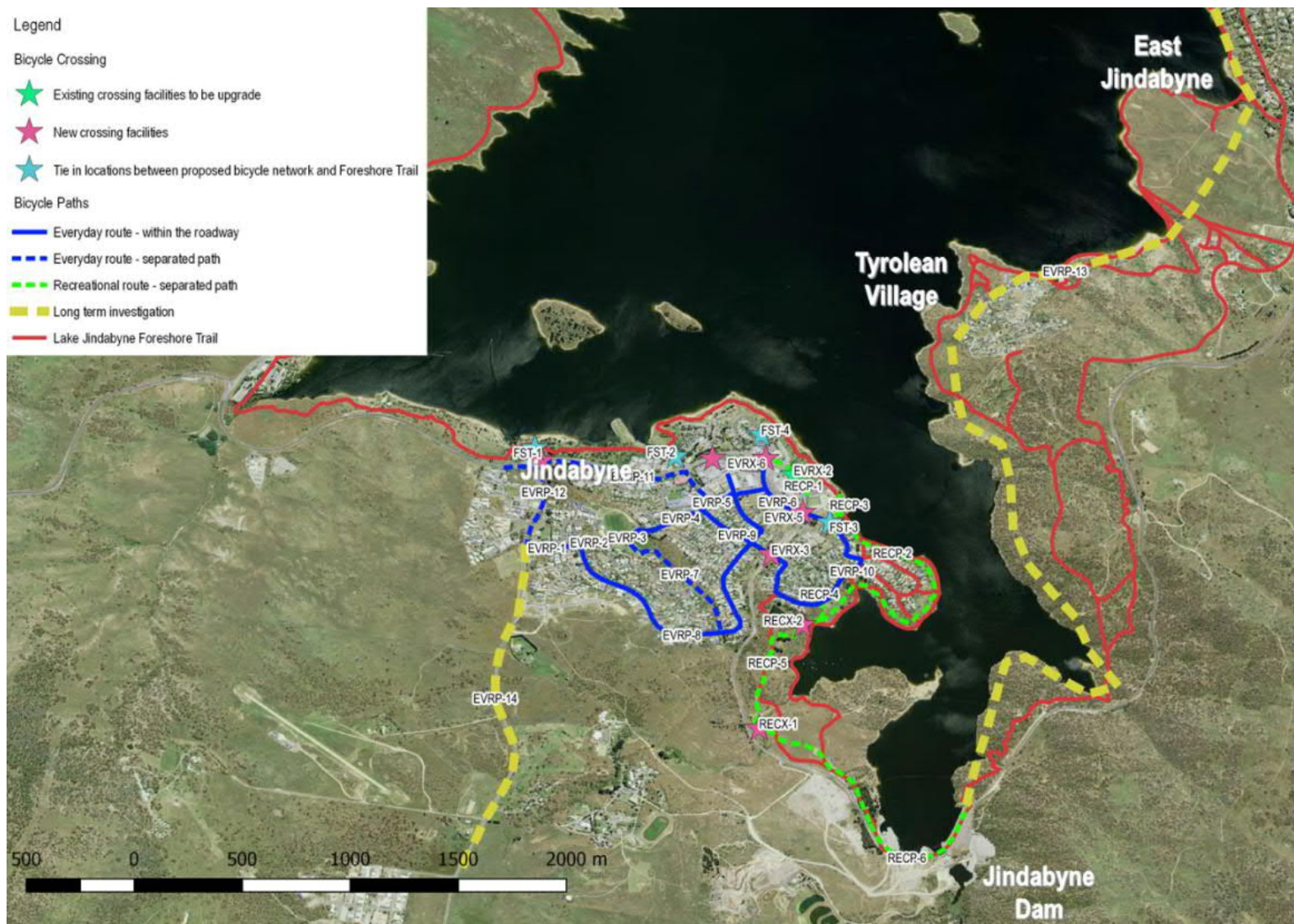
There are no formal on road cycle paths or marked recreational road cycling routes within the Snowy Mountains SAP. Recreational road cycling and mountain biking facilities throughout the region are discussed in Section 3.7.5.

The Go Jindabyne Study recommended improvements to the cycle network in Jindabyne and surrounding areas. The proposed cycle network is shown in Figure 3.22.



Base map Source: Roads and Maritime Services Cycleway Finder, 2020

Figure 3.21 Off-road cycle infrastructure



Source: Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019)

Figure 3.22 Recommended cycle network – Jindabyne, East Jindabyne

3.7.4 ROAD CYCLING

The Snowy Mountains is a popular region for recreational cyclists with several scenic routes for a variety of fitness levels. Examples of recreational cycling routes include:

- Jindabyne to Charlotte Pass
- Jindabyne to Dead Horse Gap
- Barry Way
- The Berridale Loop
- The Dalgety Loop.

It is understood that there is a growing demand for recreational cycling opportunities within the region. The routes listed above are popular although require cyclists to share the road with vehicles, often travelling at high speeds. An objective of the Snowy Monaro Destination Management Plan is to develop a trails master plan for the region which would include strategies to improve road cycling infrastructure (and mountain biking infrastructure).

Kosciuszko National Park released a cycling strategy in 2017 to guide the management of both on-road and off-road cycling opportunities. It aims to maintain and develop both cycling and mountain biking opportunities to meet demand whilst retaining Kosciuszko National Park's natural and cultural values.

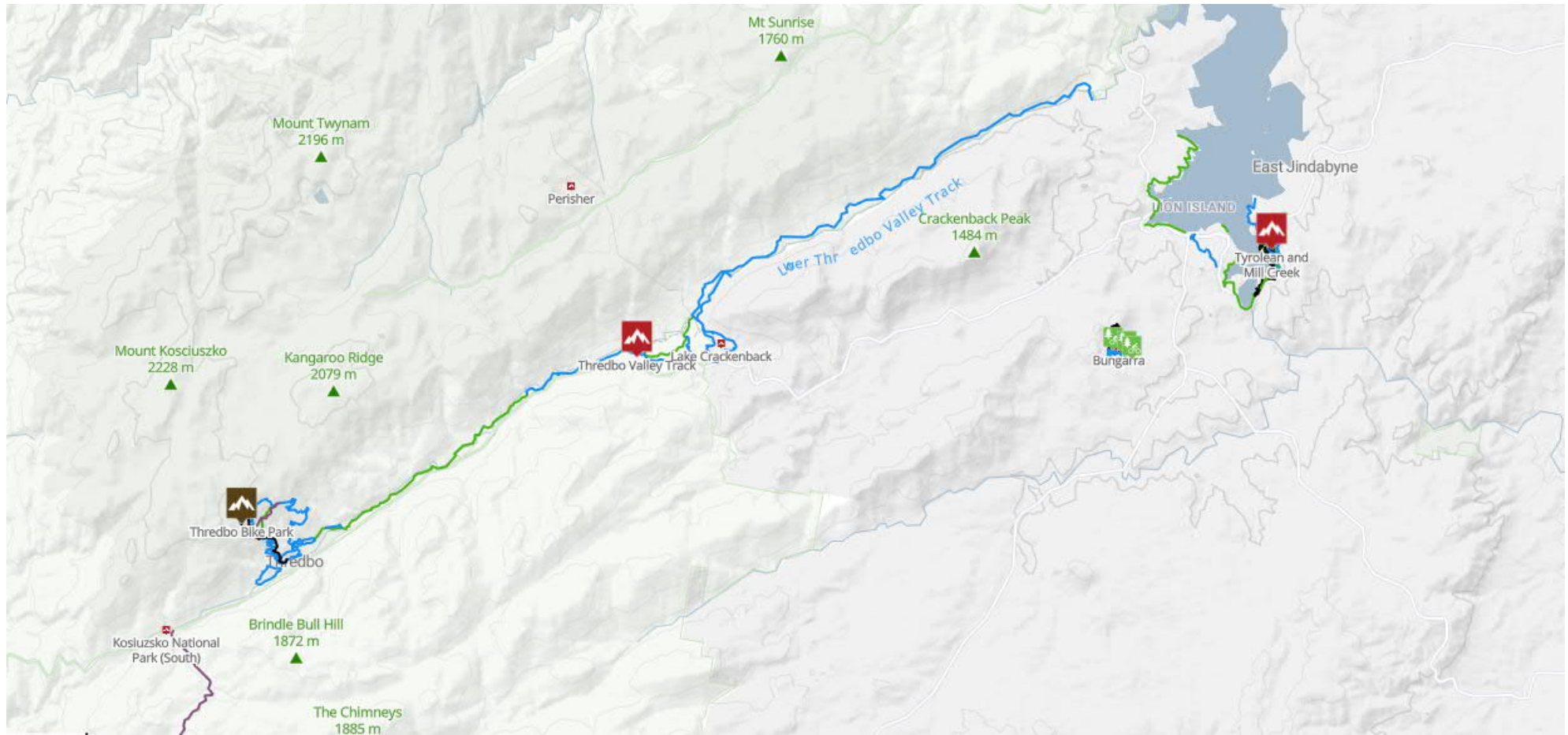
3.7.5 MOUNTAIN BIKING

Mountain biking is becoming increasingly popular in the Snowy Mountains region with several trails being developed:

- Jindabyne connects with the Tyrolean Village via the Lake Jindabyne Community Trail.
- Thredbo has developed a range of cross-country trails, a skills park and downhill trails. Thredbo also runs a chairlift from November through May to facilitate access to the downhill trails.
- The Thredbo Valley Track runs from Thredbo, past Crackenback to the Gaden Trout Hatchery near lake Jindabyne. Between 1 November 2017 and 30 April 2018, 21,000 mountain bike riders used the Thredbo Valley Track.
- The Bungarra Alpine Centre located south of Jindabyne has 20 km of mountain bike trails with a small fee required to access these trails.
- The Cascade to Pinch trail is over 50 km long and utilises service tracks to provide a scenic route through the southern portion of Kosciuszko National Park.
- There are also several advertised mountain bike trails that are predominantly service roads around Perisher.
- Lake Crackenback has a range of mountain bike tracks, a pump track and surrounding service roads for mountain bike access.

A map of these mountain bike routes is shown in Figure 3.23.

The uptake of e-biking is contributing to the increasing popularity of these trails. As it assists with the mountainous terrain, making these trails more accessible for a wider range of abilities.



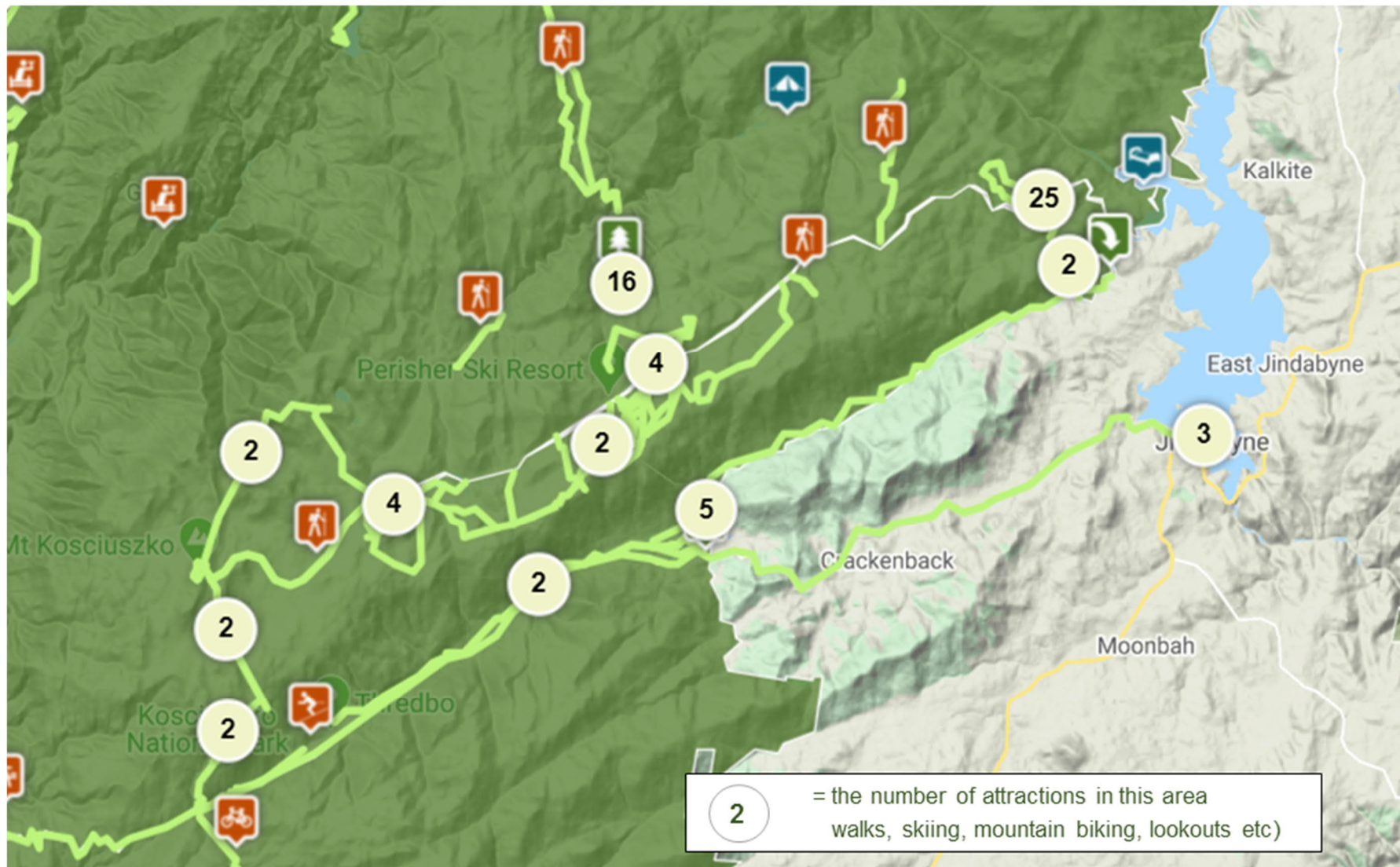
Source: www.trailforks.com

Figure 3.23 Mountain bike routes within the Snowy Mountains SAP area

3.7.6 *HIKING*

The Snowy Mountains are a popular hiking destination with opportunities for hiking all year-round. However, many of the hiking trails within the Kosciuszko National Park and the higher alpine areas are snowbound over winter with alternative opportunities for back country ski touring. The hiking trails within the region vary in difficulty and level of formality:

- Kosciuszko National Park has numerous walks within the study area including along the main range, around Perisher cross country ski trails and around Bullocks Flat. Hiking trails to reach Australia's highest peak Mount Kosciuszko starts at either Charlotte Pass or Thredbo. An overview of walks available through the park is shown in Figure 3.24.
- The Main Range walk is a very popular 22 km loop to the summit of Mount Kosciuszko from Charlotte Pass.
- The Snowies Iconic Walk is being developed to link existing tracks to provide a 44 kilometre walk linking the resorts of Thredbo, Charlotte Pass, Guthega, Perisher and Lake Crackenback, shown below in Figure 3.25. This walk is proposed to be completed in 2022 with the first stage of construction currently underway.
- The Australian Alps Walking Track, shown in Figure 3.26 which extends 650 km from Walhalla to Canberra passes through the Snowy Mountains region past Charlotte Pass, Perisher and Guthega.



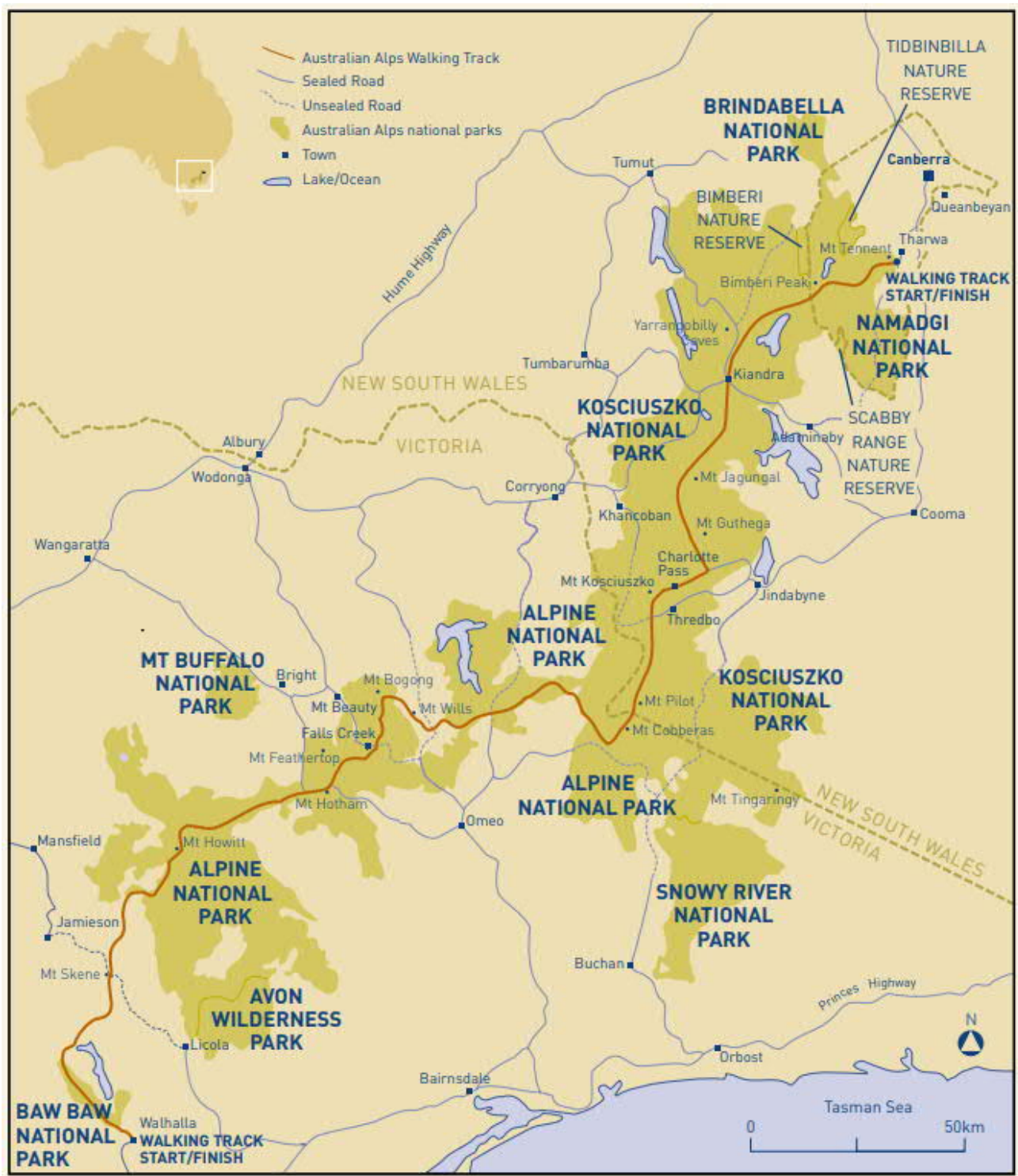
Source: nationalparks.nsw.gov.au

Figure 3.24 Kosciuszko National Park map



Source: environment.nsw.gov.au

Figure 3.25 Snowies Iconic Walk route



Source: Australian Alps walking track brochure – Canberra to Walhalla

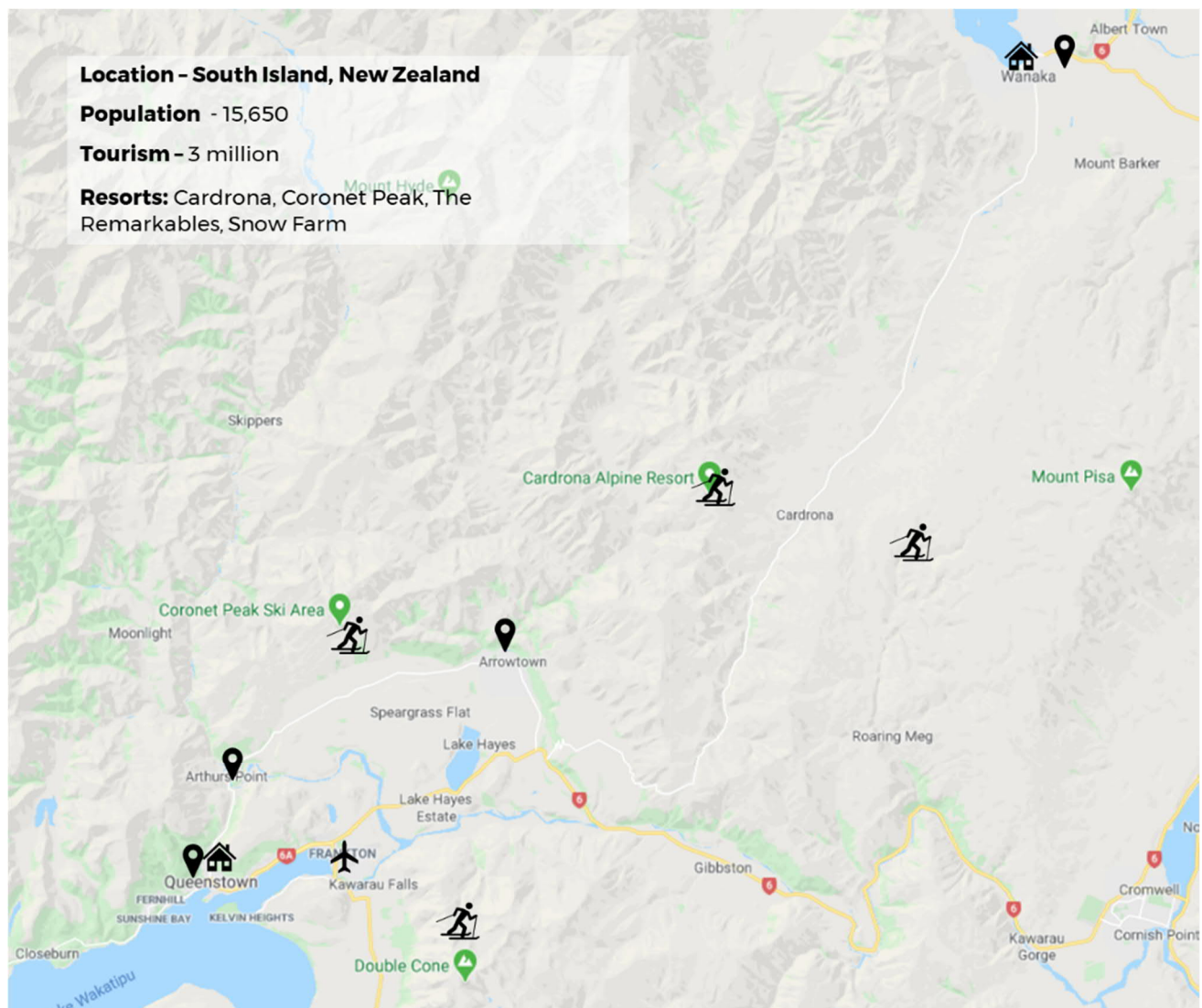
Figure 3.26 Australian Alps walking track

4 BENCHMARKING

A benchmarking exercise was conducted using seven comparable alpine towns to Jindabyne and the Snowy Mountains SAP. The transport context in these alpine tourism towns has been investigated to draw examples of best practice of their respective transport infrastructure and systems. Lessons learned for where transport infrastructure and policies may not have been implemented successfully have also been considered in this exercise. The following alpine towns were used for the benchmarking exercise with ideas and examples of their transport context included throughout Section 4.

4.1 QUEENSTOWN NEW ZEALAND

Queenstown, in the South Island of New Zealand is known for its adventure tourism which includes multiple alpine resorts, rafting, jet boating, bungy jumping, sky diving and mountain biking, to name a few. The location of Queenstown, its attractions, the lake and the airport are shown in Figure 4.1. The nearby town of Wanaka one-hour drive north is also a popular accommodation option to access similar attractions.



Base map Source: Google maps

Figure 4.1 Queenstown area attractions and transport

The region also has an international airport to the east of Queenstown in Frankton (8 km from town) which facilitates tourism from major cities in Australia and New Zealand. Due to the number of international tourists, frequent shuttle buses are offered between the airport, town and directly to the ski fields. A “super shuttle” is also offered to cater to individual that wish to travel to specific destinations.

To encourage public transport usage, Otago Regional Council offer \$2 public bus rides, linking Queenstown’s main suburbs. Daily buses run from Wanaka, Dunedin and Christchurch run to Queenstown. Furthermore, many of the activity operators offer free transportation from the town centre and hotels to encourage ride sharing. Dedicated ski buses run from the town centre to the ski fields. To encourage users to utilise the ski buses, discounted bundles combining ski bus and lift passes are offered to reduce congestion and alleviate parking shortages.

The lake is a tourist attraction in its own right. A historic ferry operates sightseeing journeys around the lake operating to accommodation/farm-stay on the opposite side of the lake. Passenger ferry services also operate to the Frankton, near the Airport, connecting to a hotel close to the shore.

The township’s road network is constrained by topography with hills on one side and the lake on the other on the key corridors between the airport and town centre. The road network is similar to Jindabyne where the roads all converge in the town centre. Traffic becomes congested during the AM and PM peaks and solutions for a town centre bypass are problematic due to the combination of the steep nearby mountains and the established built up nature of the surrounding suburbs.

The traffic congestion issues have become heightened by the success of Queenstown as a year-round tourist destination. The constant mix of tourists and residents is both an advantage in terms of employment and a hinderance in terms of competition for road space.

Understandings for Snowy Mountains SAP:

All of these public transport concepts add to the convenience for tourists and can be considered for Jindabyne and the Snowy Mountains SAP. The bus services to the snow resorts take the pressure off the roads that connect Queenstown to the ski resorts.

The vision for Snowy Mountains SAP as a year-round destination needs to seek long-term solutions to the current congestion issues to avoid their period of influence expanding to other times of the year.

4.2 LAKE TAUPO NEW ZEALAND

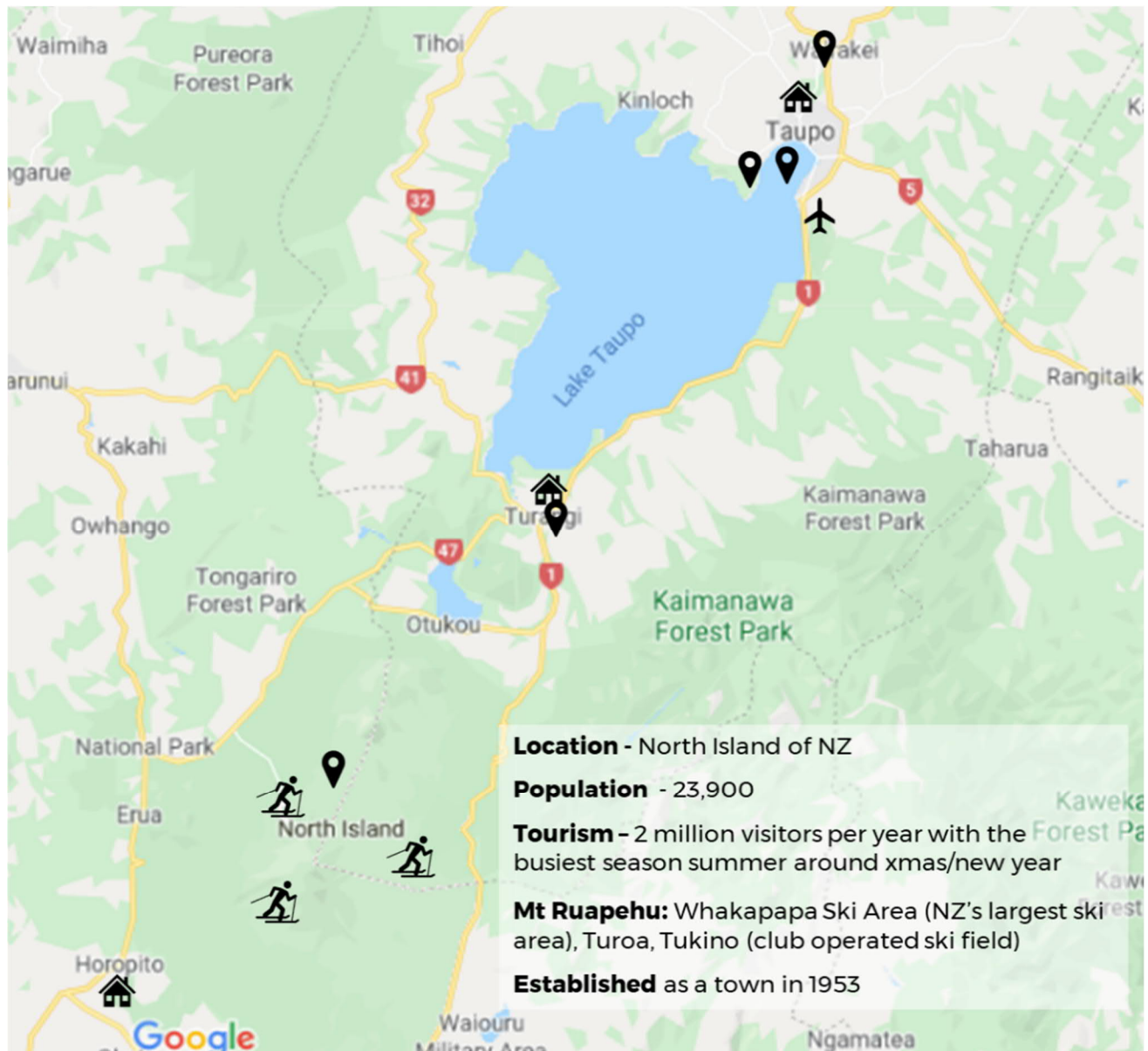
Lake Taupo, shown in Figure 4.2 is located on the North Island of New Zealand. It facilitates two million visitors a year, primarily in summer with visitors coming to experience activities on and around the lake. The active volcano of Mount Ruapehu supports a range of winter activities with three alpine resorts established on the mountain.

Accommodation is mainly in Taupo or Turangi, however some visitors may choose to stay at some closer towns to the alpine resorts. It is a 90-minute drive from Taupo to Whakapapa ski area (Mount Ruapehu). Park-and-ride shuttle services are offered for mountain access. Furthermore, private shuttles are offered from Taupo and Turangi.

Taupo is supported by a regional airport located 8 km from town which has flights to key domestic locations such as Auckland and Wellington. Taupo is also a 3½ hour drive from Auckland and 4½ hours from Wellington.

The East Taupo Arterial acts as a ring road around the township of Taupo. It is part of national Highway 1 which becomes and narrow two-lane undivided road which experiences regular land slips along the eastern side of the Lake. Despite this bypass, local town centre traffic still suffers congestion in the summer months which is the busiest holiday period in the region.

Access to certain activities experience significant congestion. For instance, the Tongariro Alpine Crossing has a severe shortage of parking. Hence, the Department of Conservation are attempting to alleviate the shortage of parking by limiting car parks to only designated car parks in the future. Visitors are also being encouraged to utilise shuttle transport from neighbouring suburbs such as Taupo, Turangi Whakapapa Village and the National Park Village. Transport hubs have also been proposed to alleviate car parking pressure.



Base map Source: Google maps

Figure 4.2 Lake Taupo and surrounds

The Taupo region has developed some of the best mountain biking in New Zealand with a particular focus on catering for every type of rider; family and e-bike tracks, cross-country trails, mountain bike parks, BMX jump parks and downhill tracks. The region has been accredited by the International Mountain Biking Association (IMBA) as a Silver Level Ride Centre. The Ride Centre designation recognises the pinnacle of mountain biking communities. To access the mountain bike facilities in Wairakei Forest, where the main bike park is, a permit is required which costs \$10 a week.

Understandings for Snowy Mountains SAP:

Lake Taupo is well serviced with a shared path surrounding the lake. This enables visitors and residents to access activities surrounding the lake quite easily. The concept of the shoreline ride/walk is worthwhile considering for Lake Jindabyne. While both lake shorelines are too long to cycle in a day, it is noted that Lake Taupo has developed areas at various points around the lake, enabling the circumnavigation to be split into multiple sections, whereas development around Lake Jindabyne is concentrated at the southern end. The road network follows close to the shoreline, allowing shorter walks joined by the local bus service.

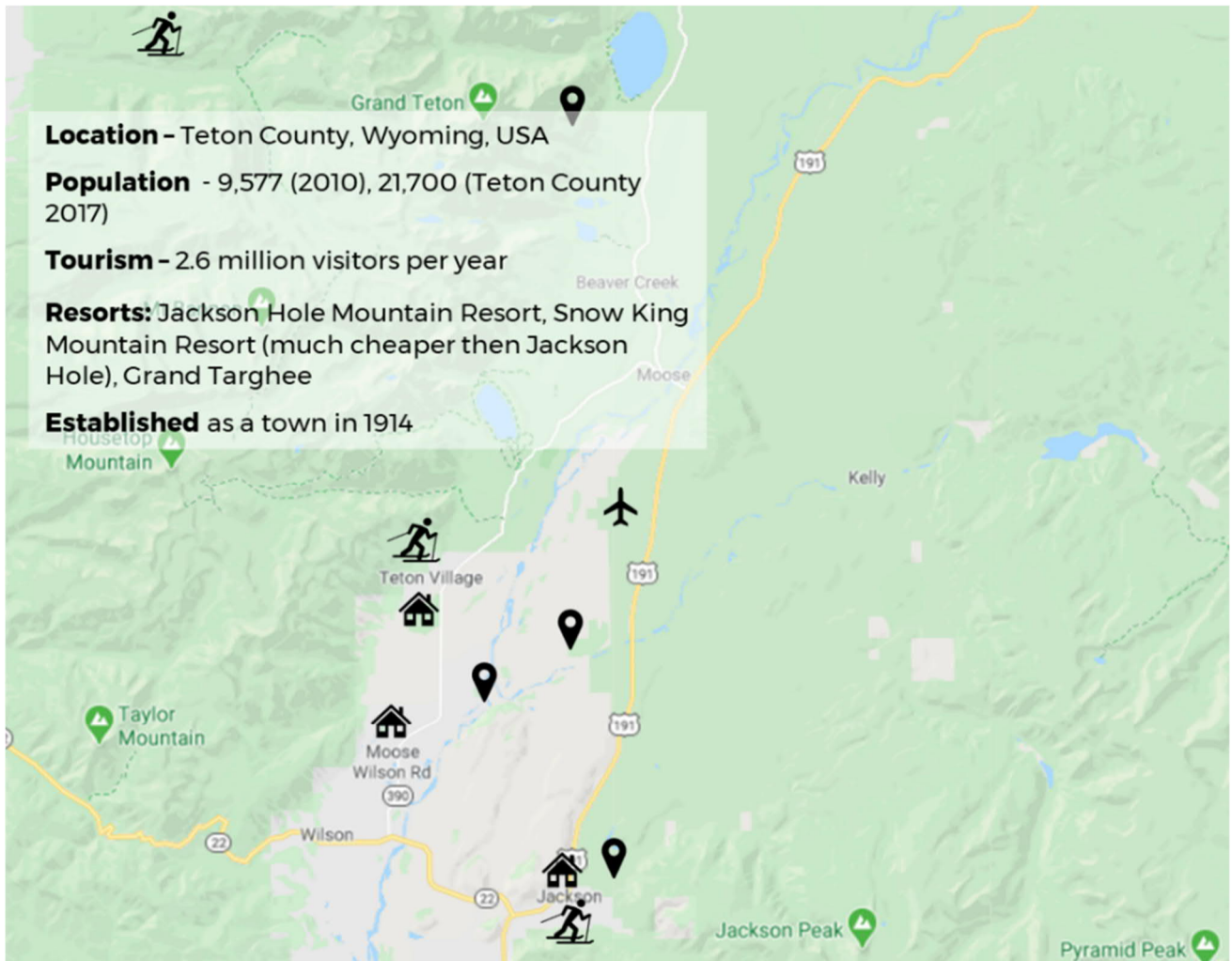
4.3 JACKSON HOLE USA

Jackson is the main township in the valley known as Jackson Hole in Wyoming, USA. 20 minutes from Jackson is Teton Village which accommodates the world-famous Jackson Hole Mountain Resort. The two townships share facilities with accommodation options across the two, and the main shopping and dining precinct in Jackson. A county run shuttle bus helps facilitate transport between the two.

Jackson Hole is supported by a domestic airport 15 km from town which accommodates jet aircraft from key domestic destinations such as Denver and Salt Lake City. The airport is located within the National Park boundary. However, restrictions are enforced on the airplanes size due to noise restrictions.

Because the airport operates within a National Park, it encourages carpooling and shuttle use to minimize the environmental footprint of transportation. The Airport provides links to cameras for customers to view parking lot availability in real-time. In addition, taxi companies, Uber, Lyft, shuttles, and executive drivers provide services to the airport, with some requiring reservations in advance. Rental cars are also available.

Jackson Hole has a rapid bus system that serves the residents and visitors of Teton County, Wyoming. Buses run within the town of Jackson, between Jackson and Teton Village as well as commuter routes from Star Valley and Teton County. Buses run frequently in both summer and winter. Hybrid buses are used to reduce fuel consumption, with a commitment to convert the fleet to be 40% electric fleet by 2022. Rides are reasonable priced, varying from \$1–\$3 one way, depending on pick-up and drop-off locations. A loading tax on tourism helps support this service and keep the ticket prices low.



Base map Source: Google maps

Figure 4.3 Jackson Hole



Figure 4.4 Jackson Hole Airport

Understandings for Snowy Mountains SAP:

The rapid bus system concept could be implemented for the rapid transit system between Jindabyne/the park-and-ride facility and the ski resorts is a bus-based system. This is discussed in section 6.7. This new service could address the transport needs of visitors and seasonal staff of the resorts in the Snowy Mountains.

The National Museum of Wildlife Art in Jackson, Wyoming has created a sculpture trail which sits alongside the National Elk Refuge. It is a short walk that is continually being developed to cater for a wide variety of visitors. It capitalises on the surrounding scenery and ties in with the museum located in town to provide a unique tourism offering. A similar concept could attract more visitors to a sculpture hike.

4.4 LAKE PLACID USA

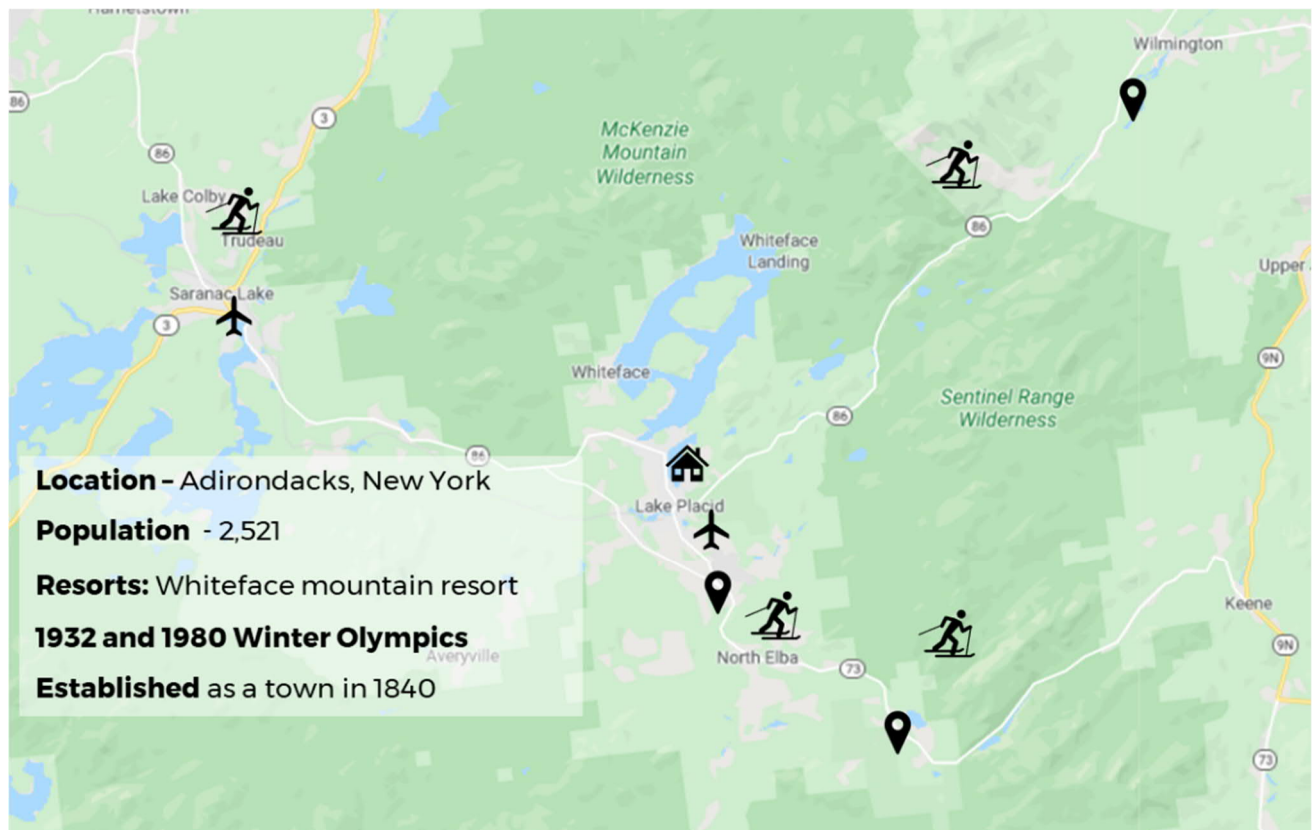
Lake Placid in the state of New York, USA, was the home of the 1932 and 1980 Winter Olympic Games. It therefore has considerable legacy of Olympic training infrastructure that supports not only tourism but a large athlete population. Although a popular winter destination, Lake Placid is also well visited in summer. The region has many lake houses and campgrounds with mountain biking, canoeing and fishing all popular activities. It is served by Adirondack Regional Airport 26 km from town with connections to Boston and a local airfield for charter flights.

It has limited public transport with private vehicles the most used mode of transport. A free park-and-ride trolley service, Lake Placid XPRESS, is offered. The trolley service offers limited coverage in the town centre and operates infrequently until 9.15 pm. However, the trolley service is flexible where it enables riders to flag stops on certain routes. Majority of the shuttle buses are only offered during the daytime.

A free mountain valley shuttle bus is also offered that provides access to the Whiteface Mountain Ski Centre in Wilmington and Lake Placid. Limited information is provided regarding the services times and visitors. Hence, people mostly walk around town and travel to further destinations outside of Lake Placid via private vehicles.

As driving is a necessity to reach the major attractions, there is limited a parking supply available to visitors. A recent proposal could see the potential installation of a parking deck, providing 100 spaces as a result of the potential removal of on-street parking along Main street.

The town's main street turns its back on the Lake and consists of one lane each way with parking allowed on certain sections of the road. All the roads converge in the township.



Base map Source: Google maps

Figure 4.5 Lake Placid

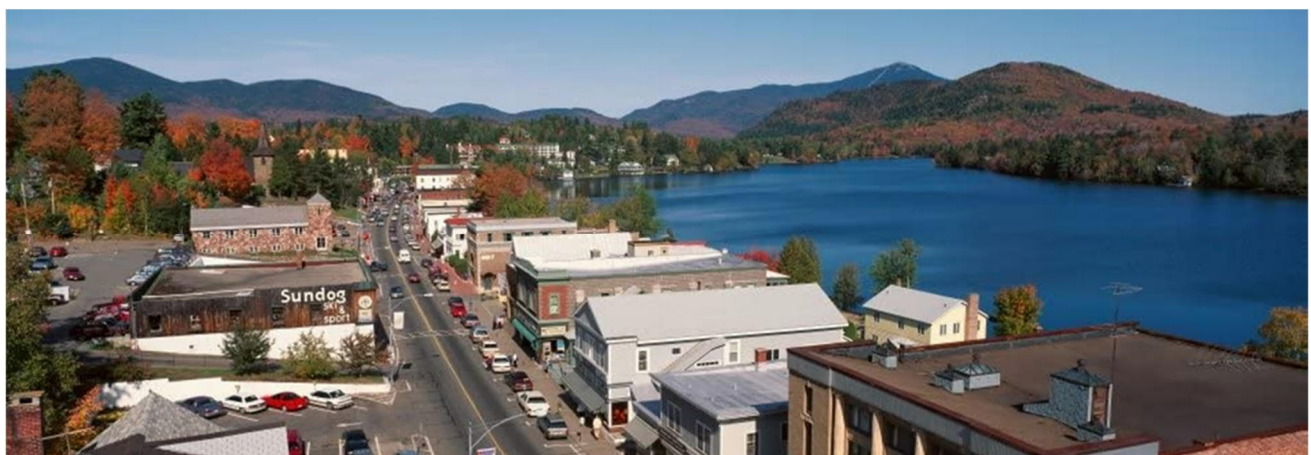


Figure 4.6 Lake Placid Main Street

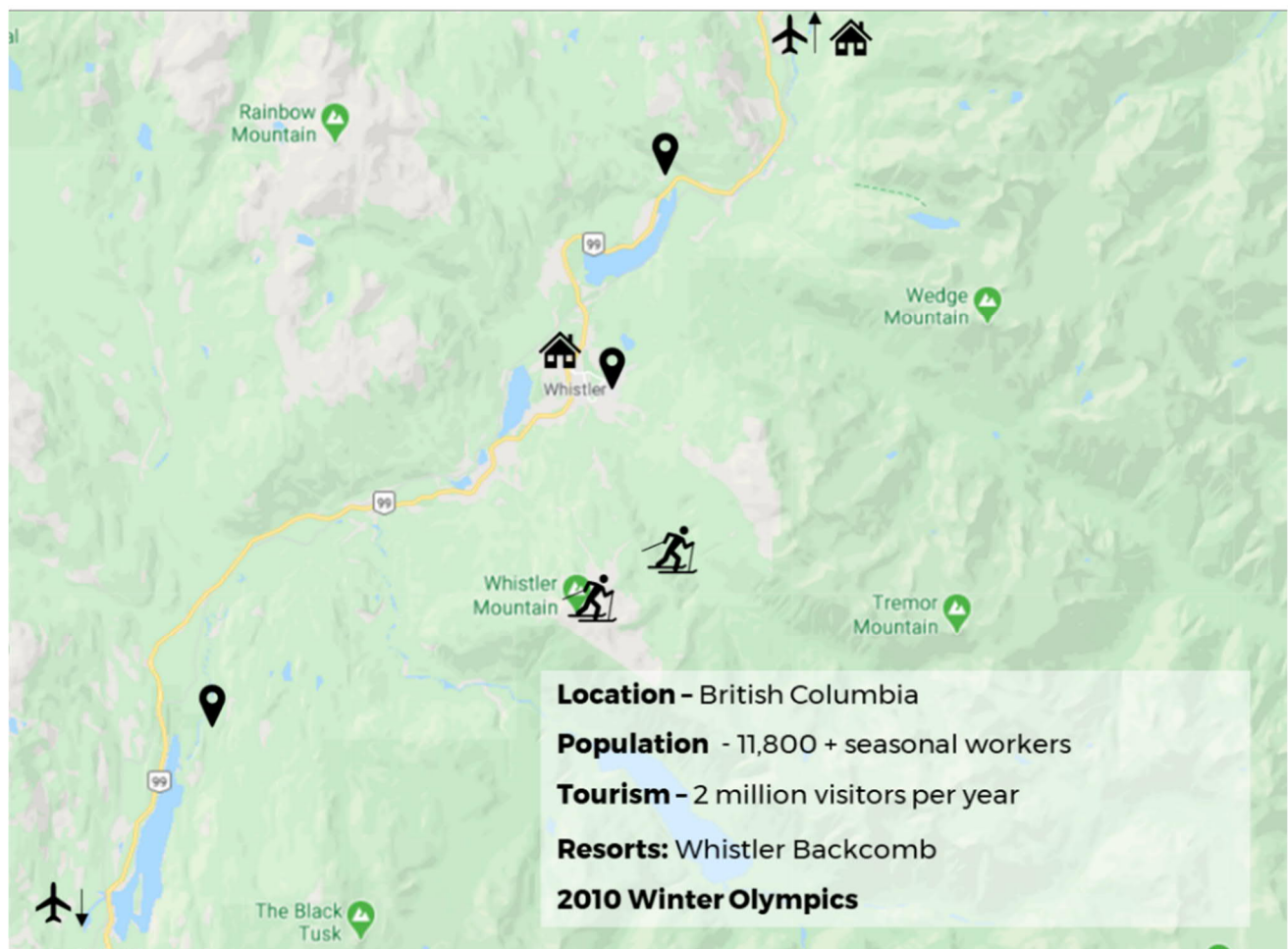
Understandings for Snowy Mountains SAP:

The requirement to drive to tourist attractions within the Snowy Mountains SAP should be avoided if possible, by clustering attractions within walking distance of each other, locating them close to popular walking trails or operating public buses to enable people staying in Jindabyne to sightsee without the need to drive.

4.5 WHISTLER CANADA

Whistler is 90 minutes from Vancouver on Canada's west coast. Tourism in Whistler is primarily for its alpine resorts which can be accessed directly from the town. Whistler has also taken steps to develop its mountain biking facilities which have become a destination for both domestic and international travellers in the summer season. It hosted the 2010 Winter Olympic Games.

With its international reach, many shuttle buses operate between Vancouver International Airport and Whistler – a distance of 125 km. Free shuttle services are offered and provide connections through the village and access to ski lifts and parks such as the Gondola Transit Exchange.



Base map Source: Google maps

Figure 4.7 Whistler

Bus services are offered and provide connections to the village and surrounding neighbourhoods. These bus services also enable visitors to load their ski and snowboard gear onto the bus to encourage public transport usage. Furthermore, visitors can load their bikes onto the bike racks attached to the front of the bus, with a maximum of two bikes per bus. This allocation of space would make cycling and skiing easier within the Snowy Mountains SAP.

Whistler is a pedestrian only village, with all attractions within walking distance. Walking and cycling has been further encouraged through the provision of a 40 km paved trail network that connects Whistler's neighbourhoods. The trail is open year-round, with regular maintenance in winter for walking. It has a vibrant nightlife and after ski scene. The township of Whistler is expanding with unique neighbourhoods, not just expanding outwards.

Whistler is consistently rated as one of the best mountain bike parks in the world. It was one of the first mountain bike parks and its commitment to expanding, maintaining tracks and building infrastructure enables it to lead the way. Mountain biking in Whistler includes over 350 kilometres of cross-country trails and 200 kilometres of lift-serviced trails.

The Whistler Mountain Bike Park has over 125,000 visits annually which creates an impressive summer demand for the resort. The atmosphere of Whistler in summer is also a major draw card for tourists with the restaurants and nightlife full of mountain bikers.



Figure 4.8 Mountain biking in Whistler

Parking is available at certain locations such as Blackcomb Way which is a five to ten-minute walk to the village and Upper Village. Parking fees apply and overnight parking is not permitted during certain months. Some parking areas are only available during winter and is free for skiers and people accessing the Tube Park. Furthermore, Whistler implements winter parking regulations from November 1 to March 31 to keep roads clear. Certain rules include:

- no even side street parking Monday to Friday from 9.00 am to 5.00 pm (excluding holidays)
- no odd side street parking any time of the year
- daytime parking is permitted on the weekends on even side street due to the increase in parking demand by visitors and second homeowners on the weekend.

Understandings for Snowy Mountains SAP:

The resort Municipality of Whistler have developed in partnership with the Ministry of Forests an educational interactive forest walk. The forest walk balances the need for commercial interests, recreational activities and promoting sustainable forest management. The Forest Service manages this area of hiking trails to provide benefits to locals and tourists with diverse interests. Planning for human needs in the forest requires consideration of scenic vistas, hiking, cross-country skiing, snowmobiling, snowshoeing, nature appreciation – plus ongoing logging operations.

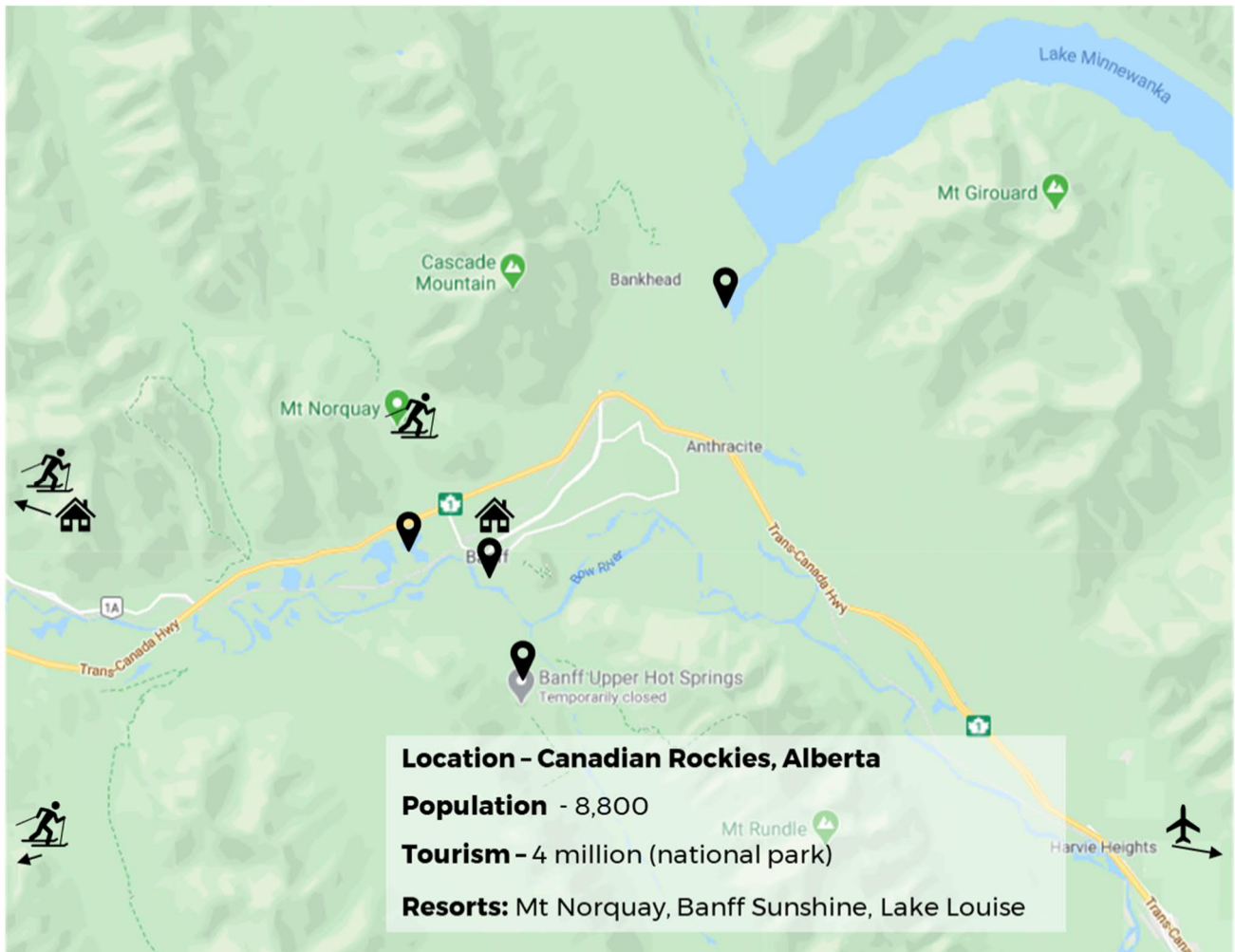
4.6 BANFF CANADA

Banff is a resort town located within the Banff National Park in the Canadian Rockies. Due to its location in a National Park, the city is highly regulated. Banff and the surrounding area (including Lake Louise) is highly focussed on the natural environment. The tourism attractions are less developed with activities focussed on hiking, canoeing and scenic picnics, to name a few.

Banff is situated off the Trans-Canada Highway which bypasses the town and the train line used by the Rocky Mountaineer and Royal Canadian Pacific train tours which pass immediately to the north of the town.

Driving through the region is still the most convenient way to access the attractions in summer, however in winter a free shuttle service from Banff is provided with the lift ticket to nearby resorts. However, Banff does encourage private vehicle usage, in particular RVs, with an RV parking area offered near the edge of the township.

The community bus service operates all hybrid electric vehicles. Banff is a National Park town and sustainability is the main priority for development. Nature preservation is paramount which highly restricts the growth of Banff.



Base map Source: Google maps

Figure 4.9 Banff

Understandings for Snowy Mountains SAP:

This bypass leaves streets in Banff to local trips, assisting in the walkability of the town. While Jindabyne experiences through traffic between Cooma and the Kosciuszko National Park, it does not have the same year-round regional traffic between two major cities that Banff has. A pure bypass may remain unused for large parts of the off-season and during the week. The Banff example is also sufficiently out of town that it does not become a barrier to its growth. The Southern Connector Road is proposed as an addition to the road network of Jindabyne rather than a pure bypass. It would provide an alternative route during peak times (relieving Kosciuszko Road) and could also serve other purposes/land uses during the week and in low season.

The concept of a bus service powered by a sustainable energy source is compatible with the Vision of the Snowy Mountains SAP and the region. With the electricity from the Snowy Hydro scheme, this can add to the sustainability credentials of the area.

4.7 ZERMATT SWITZERLAND

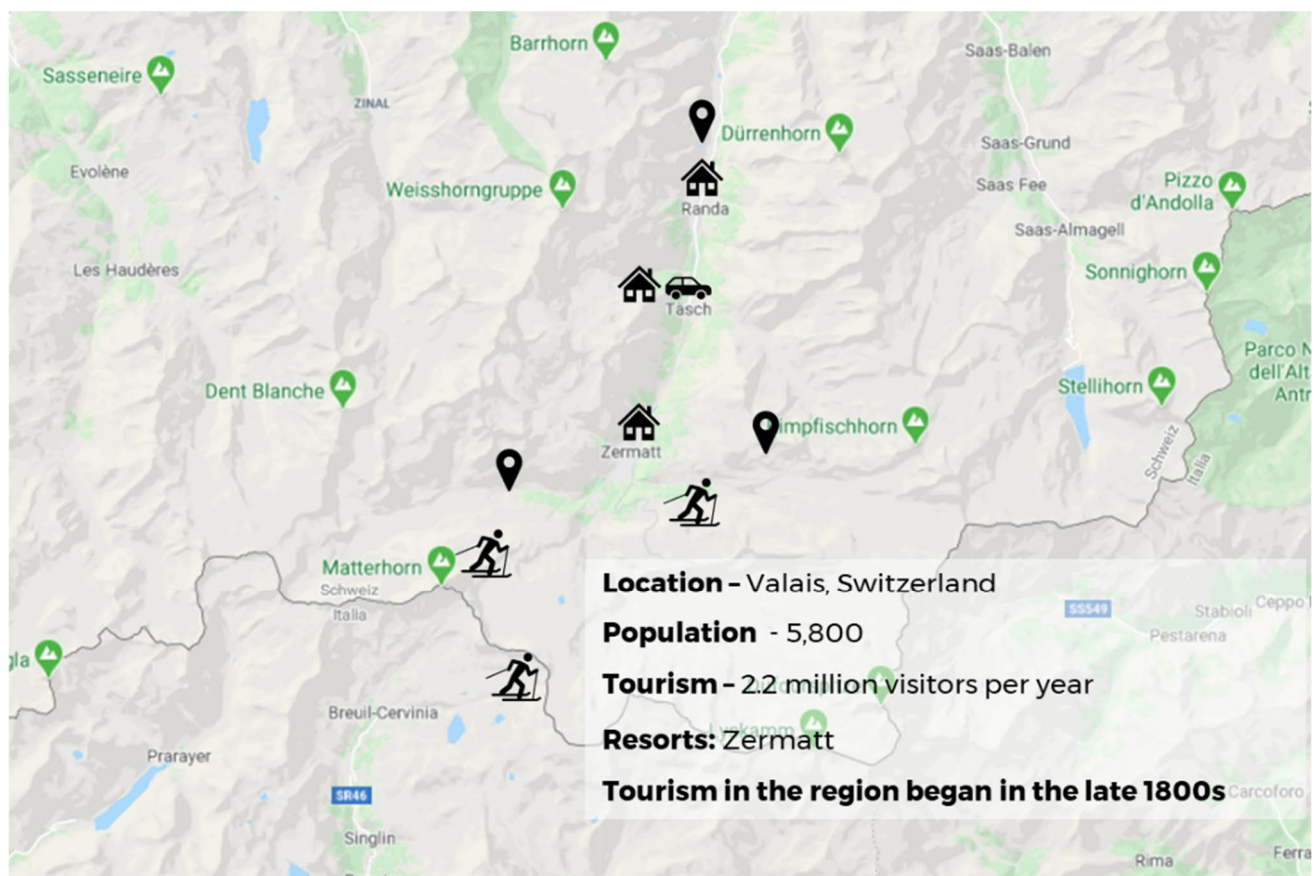
Zermatt is a car free mountain village in the south of Switzerland near the Italian border. The rack-rail train line stops in the village, making it a common mode to access the town. For tourists driving to Zermatt, the nearby town of Täsch (5 km from Zermatt) has large parking facilities where visitors must leave their car before catching a train the final five kilometres to Zermatt.

By coercing visitors to transfer to electric vehicles instead of utilising their cars, this facilitates a car free village, by creating places for visitors to park their car and. The electric vehicles also have speeds more compatible with streets created for walking. The town centre is therefore the destination. without through traffic.

Skiing is the main tourism drawcard to Zermatt. Visitors are also attracted by the famous after ski scene in winter and the scenic landscape in both winter and summer. The Matterhorn the iconic peak of Switzerland and Europe and can be seen from the village.

The township is supported by a regional airport in the city of Sion, 70 minutes from Täsch which has limited international connections to London and domestic connections to other cities in Switzerland.

Zermatt is constricted by growth due to its location, with accommodation spreading to other villages rather than in the town itself. There are concerns over daytime tourism restricting the amount of money spent in the village.



Base map Source: Google maps

Figure 4.10 Zermatt

Understandings for Snowy Mountains SAP:

While not appropriate for Jindabyne, it is similar to the arrangements at Perisher, where visitors park their vehicle just outside the village and then walk to their destination. Connecting people from their parking space to Perisher Village could be completed using innovative transport arrangements. The automotive industry is already moving towards a greater representation of electric, hybrid electric/combustion and hydrogen-powered vehicles. Many countries are implanting policies requiring the ceasing of sales of combustion engines by a certain time in the future. The need to force people out of one vehicle and into another to achieve air-quality benefits will become unnecessary in the future.

5 STAKEHOLDER LIAISON

This section outlines the outcomes of transport-focussed stakeholder liaison undertaken for the Snowy Mountains SAP Transport Assessment. Stakeholders were canvassed to identify any critical issues to be considered as part of the Plan, and to obtain data and information to assist in the assessment of the Snowy Mountains SAP master plan options and their subsequent impact on the transport network.

5.1 TRANSPORT FOR NSW

The purpose of the consultation with Transport for NSW was to understand the key issues to be considered as part of the Snowy Mountains SAP assessment process and to obtain useful information for the transport study. The outcomes of these discussions are summarised below:

- Transport for NSW has road upgrades planned in the Cooma area and the Snowy Mountains Highway funded by the Snowy 2.0 project.
- Kosciuszko Road was expanded to two lanes in both directions on its approaches to the Alpine Way in 2018, addressing one of the major road constraints in the area. However, despite this upgrade, the parking capacity within Kosciuszko National Park remains a key constraint for the ski fields in winter.
- If a southern connector road was constructed, taking through traffic off Kosciuszko Road through Jindabyne, the design of Kosciuszko Road could be reviewed with a view to making it more pedestrian friendly. A Movement and Place assessment could assist when considering facilities that are not aligned with the typical warrants for these types of facilities.
- Transport for NSW would like to see an upgrading of pedestrian access to the town centre from local streets addressed as part of the Structure Plan for this SAP. It should make the road network more permeable for pedestrians.
- The safety of cyclists on Kosciuszko Road between East Jindabyne and the Jindabyne Dam and at the Barry Way roundabout should be considered.
- The transport situation within the Snowy Mountains SAP has changed since the 2008 study into shuttle bus services⁹, and its conclusions should be re-evaluated for this study. There are existing private shuttle buses that have spare capacity. However, the study should consider if coaches are the most effective way of transporting people up to the snow.
- The option of extending the Skitube should be considered. However, it is noted that the existing Skitube is privately owned.

⁹ NSW Alpine Region Shuttle Bus Feasibility Study (Cardno Eppell Olsen, January 2008)

5.2 NSW NATIONAL PARKS AND WILDLIFE SERVICE

The NSW National Parks and Wildlife Service (NPWS) were consulted to obtain an understanding of current issues accessing the Kosciuszko National Park, parking issues within the alpine resorts, and plans for hiking and mountain biking within the National Park. Key points of the discussion included:

- NPWS provided additional data from Kosciuszko National Park Entry gates showing the peak movements into and out of the National Park. This data shows that on a winter peak weekend day, the peak time for entering the Park is between approximately 6.30 am and 9.00 am noting parking is restricted before 7.00 am. This is driven by the desire to get parking and to be on the ski slopes for lessons that start at 9.00 am. The peak movement out of the National Park starts around 1.00 pm, with the majority of vehicles leaving between 4.00 pm and 6.00 pm.
- While the Snowy Mountains SAP seeks to increase summer usage of the area, the Winter peak is expected to remain high, and will potentially grow as the season becomes more contracted (occurring over a shorter period of time).
- Overflow parking occurs along Kosciuszko Road and more recently on the Alpine Way, resulting in problems with impact on the environment, snow clearing, pedestrians and road safety.
- A paradox is that on the best snow days when the parking demand is highest, the parking capacity is reduced by the snow itself. This is due to the removal of on-road parking capacity due to snow clearing operations. On these days, some vehicles are turned away, having to find alternative parking at locations such as Bullocks Flat.
- Transport for NSW has had to close Kosciuszko Road and other roads on some days due to severe weather events.
- There is overnight parking at Bullocks Flat, plus some at Sawpit Creek. The latter is not well used as there is no shuttle to get back up to the Perisher Range resorts.
- Bullocks Flat typically has sufficient car parking capacity. However, it was full on one occasion on a good snow day on a weekend in August 2019.
- NPWS prefers that any changes to parking occur within the existing areas of disturbance from development.
- NPWS is aware of several development applications for new parking facilities. However, so far, only the at-grade proposals have been built. Multi-deck proposals are expensive and are affected by the cost of installing a roof that can shed snow.
- NPWS understands that there is an equity issue for the cost of parking a vehicle in the National Park in comparison with the Entry Fee and ticket price for public transport (coaches, shuttles) and the Skitube.
- Summit Road/Kosciuszko Road has summer parking issues. Consideration could be given to a shuttle and drop off (Perisher to Charlotte's Pass).
- The Iconic Walk is currently under construction. It was planned to connect to existing accommodation locations to avoid the need for extra parking and make it more useable. It is planned as the major drawcard for the Perisher Range group of resorts.
- Thredbo is expected to remain the focus of mountain biking activities during summer within the National Park.
- Emergency vehicle access is not as critical in some cases due to the Perisher Medical Centre that can treat a range of cases and the ability for air evacuations using the Perisher helipad. The helicopter pad is used on isolated occasions for emergency (approximately three times per year) and essential resort management only.
- NPWS does not allow private flights. Changing would require a change to the management plan. No drones are permitted in the National Park except with special permission.
- A strategy for snow-play visitors is required, as there have been issues with visitor coaches at Perisher in the past. Snow play could potentially be prioritised for Mt Selwyn as they utilise scarce resources in terms of space but offer very little commercial return for resorts.

- Road cyclists ride on Kosciuszko Road to Charlotte Pass and Summit Road. Issues sometimes occur between motorists and cyclists because of the speed differential on the long steep climb. Overflow parking at Charlotte Pass occupies the kerbside lane which could otherwise be used by slower cyclists.
- Charlotte Pass is starting to run a chairlift in summer on the weekend to accommodate hikers and there could potentially be an option for parking down at the resort for summer.
- Congestion on exit from the National Park – it generally flows well in the morning, however when it begins to snow then people slow down as they put snow chains on or slide off the road. It can take up to 3 hours to access the ski fields or Jindabyne during bad weather events (or full shut down in the event of a serious accident).
- Extending the Skitube is seen as preferable over a large number of coaches travelling to Perisher, which still relies on the same roads used by cars and requires turning and set down space within the resorts. However, the Skitube does not operate outside the ski season.

5.3 SNOWY MONARO REGIONAL COUNCIL

The Snowy Mountains Regional Council (SMRC) plays an important role in providing local infrastructure and facilities for residents, workers and visitors to Jindabyne and the surrounding towns of East Jindabyne, Tyrolean Village, Kalkite, Crackenback and surrounding towns and villages such as Moonbah, Dalgety, Berridale, etc. Snowy Mountains Regional Council was consulted to understand any issues affecting current residents and the challenges experienced with the seasonal influx of visitors and workers. The topics discussed included:

Footpaths:

- Jindabyne Action Plan 2030 has planned footpath works along with priorities for completion. Park Road to JJ Connors Oval is a key route. It provides pedestrian access to school from the west side of town. Gippsland Street is another key route.
- Cycle route from The Station into town would be popular.

Roads:

- SMRC would like a review of Kosciuszko Road:
 - in East Jindabyne to consider speed limits, connections to and from Jerrara Drive and Rainbow Drive and road safety
 - through Jindabyne (speed change, crossing locations and improved access) if the southern connector road is constructed.
- Access to the Highview Estate and along Barry Way needs to be reviewed as part of the planning for the Southern Connector Road.
- The road capacity of Kosciuszko Road at the Jindabyne Dam wall is an important issue. The alternative route via the Snowy River Way and Barry Way, is twice as long and utilises the old bridge at Dalgety, which cannot take B-double vehicles.
- The Leesville Industrial Estate has been successful and may need to expand in the future, which will increase the need for truck access. Modest growth is planned in Leesville in the Go Jindabyne study.

Parking:

- Some streets in Jindabyne (e.g. Twynam Street) are narrow and can become blocked to garbage trucks when visitors to Air BNB properties bring multiple vehicles.
- Illegal camping around the Lake (e.g. near the Clay Pits) has required the installation of No Stopping/No Parking and enforcement. Consider successful treatments from other locations to control illegal camper parking.
- There is a need to formalise parking in the Clay Pits.

Trails:

- \$11.8 million funding has been secured from the NSW Government for a shared trail from Kalkite to East Jindabyne, Hatchery Bay, Waste Point.
- There was a development application for a trail from East Jindabyne and Tyrolean Village to Cobham Crescent via Mill Creek and Rainbow Drive. Plan was to create a dedicated route from Banjo Patterson Park to the Dam wall and Mill Creek.
- Completing the loop around Lake would be costly at the north and west end due to topography and the need to cross two rivers (Eucumbene and Snowy). It would have a limited market as it is more than a day's ride (~120 km).

Lake-Based Transport:

- The major issue is the variable lake levels, which Snowy Hydro is keen on enforcing for any lake use proposals. This can mean the shoreline changes by a hundred metres.
- There was a plan for wharf as part of a marina on the west side of the Lake. However, the proposal has stalled.
- The current recreational activities (sailing, motor boating, stand-up paddle boarders, kayakers, water skiing and fishing) fit with the lake environment.
- Hovercraft is proposed as a potential vehicle type that could overcome level fluctuations. However, commercial viability of a regular service and noise are important considerations.

5.4 ALPINE RESORTS

DPIE has undertaken consultation with alpine resorts within the Kosciuszko National Park as part of the Snowy Mountains SAP to discuss their needs, their future plans, the desired outcomes from the Snowy Mountains SAP and any issues presenting a barrier to growth. The main points raised related to transport are:

SPONARS

- Currently open 9 weeks of the year, would like to be open all year.
- Vision for the precinct:
 - would love to see mountain bike track extended and more multi-day hikes
 - would like for tourists to be able to get around Jindabyne Lake.
- Constraints:
 - carparking is currently sufficient for anybody staying in the building
 - they would support a shuttle bus from the car park to mountain
 - winter-time road blockages are a big constraint, which can occur frequently.

KOSCIUSZKO TOURIST PARK

- Equidistant from Jindabyne and Perisher Valley.
- There are some walks that start at the park.
- 75% of business is winter (10–12-week period).
- Key challenges are attracting tourists in summer and the current bed limits.

PERISHER

- 30 to 120 minutes travel time from Jindabyne, depending on weather and the prevailing level of congestion.
- Car parking demand is increasing and at peak capacity (based on Transport for NSW data). The resort is working with Transport for NSW to come up with strategies for this.
- The Skitube is close to capacity and costly to operate:
 - it previously operated in summer. However, this was stopped due to very low yield/low passenger volume
 - there is potential to link parts of the iconic walk.
- Mass transportation with buses would be ideal for the area. However, it needs to be well coordinated and planned.

THREDBO

- Last winter (2019), peak capacity was reached in 18 days of the 100-day season. When this happened, they were turning cars away.
- Busy days in Christmas and Easter are also filling up the car parks.
- More mountain biking trails will entice more visitors and stay for longer.
- Thredbo can accommodate approximately 9,000 skiers per day. Currently, it has 7,000. They expect that they will reach capacity quickly.
- The limited bus services and the lack of an interchange hub is a constraint for transport between Jindabyne and Thredbo. This affects the mindset of visitors, with many preferring to drive.

6 FUTURE TRANSPORT

The transport network to and within the Snowy Mountains SAP will need to respond to forecast changes in the population of residents, visitors and seasonal workers. With some areas already under pressure, such as the links between Jindabyne and the alpine resorts, new transport solutions are required to provide an enjoyable experience that encourages visitors to return and caters for the seasonal changes in demand. This will help to create sustainable growth with a strong year-round economy.

The Snowy Mountains SAP planning process is seeking to plan for sustainable long-term growth (2020–2061) with a strong year-round economy. It should be recognised that there is a significant level of uncertainty about the operation of traditional modes of transport beyond 2031 as the rapid development of emerging transport technologies particularly in the area of automated and electric vehicles come online. It would be unwise to predict the future operation of transport for the Snowy Mountains SAP master plan based upon today's assumptions and perceptions.

6.1 FUTURE GROWTH

The three sources of population within the Snowy Mountains SAP – permanent residents, seasonal workers and visitors are all expected to change in the future. Future population forecasts were provided by The Centre for International Economics (The CIE) in their Context Report “Strategic economic context for the Snowy Special Activations Precinct” (The CIE, 12 June 2020) and revised forecasts of visitation and population (The CIE, 15 December 2020). In addition, the Structure Plan produced by Jensen Plus has estimates of residents, seasonal workers and visitors.

To assess the potential transport needs of the Snowy Mountains SAP, a high growth scenario has been assessed to test the possible size of transport system needed to cater for this higher growth. The scenario selected for the assessment is the Visitation linked (high) scenario – that links population growth to visitation and tourism expenditure with an upper bound:

- Residents within the Jindabyne/Berridale SA2 boundary will increase from 7,287 people in 2020 to a peak in 2051 of 11,854 people – a change of 2.0% per annum.
- Peak overnight visitors (in the month of August) will change from 18,275 in 2020 to 30,860 in 2039 and then a decline to 24,655 by 2061 – an increase of 3.2% per annum between 2020 and 2039.
- Seasonal workers will increase from 3,265 to 4,569 in 2039 followed by a decline to 2,839 in 2061 – an increase of 2.1% per annum between 2020 and 2039.

Future populations have been estimated for the 2031, 2041 and 2061 planning years using the information from the Structure Plan (23 March 2021) supplied by Jensen Plus and The CIE, using the following process:

- The Snowy Mountains SAP was divided into precincts. The Structure Plan estimates of dwellings and beds from Jensen Plus were used to divide up the future growth between these precincts for residents, tourists (visitors) and seasonal workers.
- Future growth from The CIE forecasts were added on top of existing 2020 numbers to obtain the final estimates.
- Where the peak population occurred at 2039, we have assumed this peak number for our 2041 planning.

The 14 December 2020 forecasts from The CIE included yearly and monthly estimates of day and overnight visitation of the SA2 area, yearly estimates of resident population and seasonal workers. as well as an estimate of the visitor numbers.

It was assumed that all the growth in residents, visitors and seasonal workers would be accommodated within the development areas identified in the Snowy Mountains SAP Strategic Master Plan. For the purposes of this stage of the project, the proposed development yields were not constrained by the bed limits to alpine resorts based on the Kosciuszko National Park Plan of Management. These bed limits would be revisited at a later stage in the project once a Carrying Capacity model and framework for the Kosciuszko National Park is established which also considers the expected increase in development within and around Jindabyne. The level of development within the Kosciuszko National Park is a key factor in determining the transport task for day visitors during the peak winter months as this reduces the demand for parking associated with the daily movements using private vehicles as well as shuttle systems from Jindabyne and surrounding areas.

6.1.1 YEAR-ROUND POPULATION GROWTH

The year-round population (resident) forecasts by location are shown in Table 6.1. They indicate that the largest growth is expected in Jindabyne, in East Jindabyne and Tyrolean Village, and the new development around the southern edge of the township.

Table 6.1 Year-round population growth forecasts

AREA	2020	2031	2041	2061
Jindabyne	2,275	3,483	4,988	5,145
East Jindabyne/Tyrolean Village	624	928	1,306	1,346
Hatchery Bay	50	50	50	50
Perisher Group of Resorts	156	156	156	156
Thredbo and along Alpine Way	640	640	640	640
Kalkite	224	253	291	294
Avonside	512	661	846	866
Snowy River Way	818	902	1,007	1,018
Moonbah	158	292	459	477
Outside SAP	1,832	1,844	1,859	1,861
Total	7,287	9,210	11,604	11,854

Source: Calculated from 15 December 2020 forecasts from the CIE, the Jensen Plus Structure Plan and Strategic economic context for the Snowy Special Activations Precinct" (The CIE, 12 June 2020)

Residents are moving around the area during all months and therefore have a larger impact on the off-season trip numbers. The growth to the east is likely to increase travel between the eastern shoreline villages and Jindabyne, adding pressure on Kosciuszko Road at the Jindabyne Dam, while the growth south of Jindabyne will generate trips to and from Jindabyne along Barry Way.

6.1.2 VISITORS

Because of their numbers and travel requirements, visitors generate the largest peak direction movement as they travel to the ski fields in the morning and return in the afternoon. The more visitors who stay in the alpine resorts, the smaller the amount of daily travel. However, there are limits to the amount of accommodation that can be located within the National Park.

Table 6.2 shows the forecast visitor numbers by location.

Table 6.2 Overnight visitor growth forecasts – peak daily visitors in August

AREA	2020	2031	2041 (using 2039 numbers)	2061
Jindabyne	6,379	8,674	10,871	8,673
East Jindabyne/Tyrolean Village	762	873	979	873
Hatchery Bay	0	1,324	2,591	1,323
Perisher Group of Resorts	4,756	5,872	6,939	5,871
Thredbo and along Alpine Way	5,670	7,112	8,493	7,112
Kalkite	0	0	0	0
Avonside	370	370	370	370
Snowy River Way	0	0	0	0
Moonbah	241	433	617	433
Total	18,178	24,658	30,860	24,655

Source: Calculated from 15 December 2020 forecasts from the CIE, the Jensen Plus Structure Plan and Strategic economic context for the Snowy Special Activations Precinct” (The CIE, 12 June 2020)

The current mechanism for managing visitor numbers within the Kosciuszko National Park is by limits set on overnight accommodation via bed limits in the Plan of Management. These have been used as a proxy for the limit of the number of visitors to each resort group. The current bed limits are:

— Perisher Range Management Unit	4,952
— Thredbo Management Unit	4,820
— Charlotte Pass Management Unit	611
— Selwyn Management Unit	50 (staff only)
— Total	10,433

The proposed visitor numbers for the alpine areas will necessitate a revision of the current bed limits. A separate assessment of the carrying capacity of the National Park to accommodate higher visitation numbers is also being undertaken within the Snowy Mountains SAP master plan process.

6.1.3 SEASONAL WORKERS

Seasonal workers are expected to increase in-line with visitors. Due to the nature of their work (they need to be at work ready to look after the visitors by the time they arrive), they are generally not travelling during the peak times for visitors.

Seasonal workers do not always stay at the location they work at. For example, workers at the Perisher resorts typically stay at The Station and travel to and work in specially organised staff transport. They are provided with free travel on the early services on the Skitube. Workers at other resorts are allowed discounted travel on the Skitube as well.

Resort staff can be encouraged to use shuttle buses from their accommodation to the resorts to preserve as much parking as possible for visitors. Their shifts can be arranged to allow shuttle buses operated by the resorts to provide these services. Alternatively, the hours of operation of the public service can be extended to get staff to the alpine resorts without the need to drive.

The forecast seasonal worker numbers are shown in Table 6.3.

Table 6.3 Seasonal worker growth forecasts

AREA	2020	2031	2041 (using 2039 numbers)	2061
Jindabyne	1,719	1,926	2,389	1,484
East Jindabyne/Tyrolean Village	128	128	128	80
Hatchery Bay	0	32	103	64
Perisher Group of Resorts	0	18	58	36
Thredbo and along Alpine Way	1,315	1,417	1,647	1,023
Kalkite	0	0	0	0
Avonside	62	62	62	39
Snowy River Way	0	0	0	0
Moonbah	41	84	182	113
Total	3,265	3,667	4,569	2,839

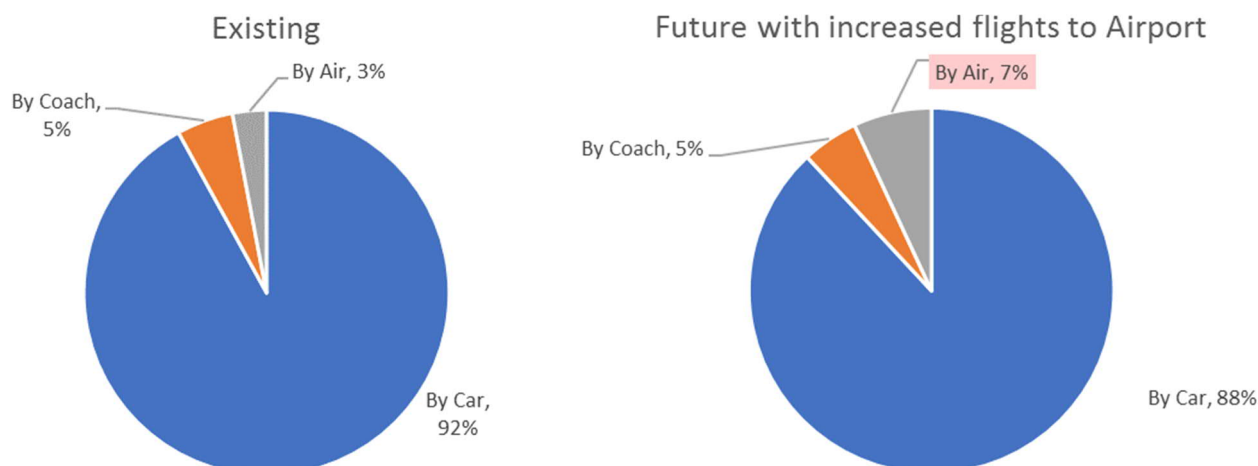
Source: Calculated from 15 December 2020 forecasts from the CIE, the Jensen Plus Structure Plan and Strategic economic context for the Snowy Special Activations Precinct" (The CIE, 12 June 2020)

6.1.4 MODE OF TRAVEL

The arrival mode influences the way that visitors move around the Snowy Mountains SAP during their stay.

- People arriving by car have the option of using their car to travel between their accommodation and the alpine resorts within the Snowy Mountains SAP or to switch to another mode such as the Skitube (however, must still use car to travel to the Skitube from Jindabyne).
- People arriving by coach are likely to travel straight to their accommodation if it is in a central location or meet up with friends with a car.
- People arriving by air have the option of using a private shuttle minibus, taking a taxi or ride share, or hiring a car between the airport and their accommodation. The first two options will mainly be used by those with accommodation in the alpine resorts, while those staying outside the National Park may select to hire a car to give them the option of using it for their daily travel between their accommodation and the ski fields.

The CIE provided information on the current mode of arrival for visitors to the Snowy Mountains SAP and the forecast increase with increased numbers and origins for flights to Snowy Mountains Airport. Both confirm the dominance of the car, with small components undertaken by air (via the Snowy Mountains Cooma Airport) and coach (from interstate), see Figure 6.1.



Source: The CIE, July 2020 and September 2020

Figure 6.1 Estimated existing future arrival mode for visitors

It has been assumed for this assessment that this arrival mode travel behaviour will largely continue in the future. The investment in the airport and the expected increase the number of flights is expected to increase the share of people arriving by air resulting in the airplane mode share more than doubling from 3% to 7%. As a result, the percentage arriving by car has been assumed to decline slightly from 92% to 88% in the future.

6.2 TRAVEL DEMAND MANAGEMENT

Due to the dominance of car travel to and from the area, the road capacity and parking capacity are the major constraints to growth in the future. The environmental impact within the National Park is a significant reason to consider modifying the travel demand rather than attempting to build more capacity to address these issues. Therefore, strategies are needed to move demand to other modes with spare capacity, to re-time travel or to avoid the need to travel in the first place. These strategies also benefit the customer, improving travel choices and adding flexibility to the journey options. Potential strategies are listed in Table 6.4.

Table 6.4 Travel demand management measures

STRATEGY	TRAVEL DEMAND ACTION
Promote sustainable transport options	Make the streets of Jindabyne and the alpine resorts more pedestrian and cycle friendly with improved infrastructure and connectivity.
	Planning a rapid transit system that can avoid the need to drive between Jindabyne and the alpine resorts.
	Provide a park-and-ride facility that can intercept visitors who choose to use their car so that they don't need to drive on the most congested links.
	Provide improved information on the relative performance and availability for each travel mode.
	Make riding bicycles safer in the area by reducing parking on road shoulders and promotion to warn drivers of the need to look out for cyclists.

STRATEGY	TRAVEL DEMAND ACTION
Encourage changes in travel behaviour	Revise the relative cost of Skitube, bus and car access to the Kosciuszko National Park to provide equitable fees and incentives not to drive and park.
	Consider subsidising the Skitube and buses to keep ticket costs down.
	Provide comfortable bus waiting facilities to reduce the weather impact of using public transport.
	Increase the supply and quality of bicycle end-of-trip facilities.
	Restrictions to expanding resort car parking may incentivise coach or shuttle access
Increase coordinated planning	Implement a Transport Management Association (or similar) to integrate transport demand and alternative transport options with nearby land-uses. Membership could include Council, NPWS, alpine resorts, business operators and transport operators.
	Work with resorts to investigate opportunities to bundle shuttle access into the cost of accommodation and/or lift passes
Reduce the amount of travel	Consider increasing overnight accommodation within the National Park (above current limited accommodation levels, within the carrying capacity of the National Park) to minimise the amount of daily travel required.
	Increase recreation options within Jindabyne, especially including hiking, cycling and recreational lake activities so that part of a visitor experience does not require travelling long distances.

6.3 AVIATION

The existing airport used to access the study area is the Snowy Mountains Airport located south-west of Cooma, a 35-minute drive from Jindabyne. Further details for this airport are included in Section 3.2.

To accommodate growing tourism in the region, opportunities to expand and improve the airport should be considered. Upgrades to accommodate either more services, or larger planes should be investigated by the airport. However, it is noted that this airport will still predominantly service the south-east of Australia. Larger planes from Australian destinations further away, or from international destinations will likely be facilitated by Canberra International Airport.

6.3.1 CANBERRA INTERNATIONAL AIRPORT

Canberra International Airport previously offered connections to international services operated by Singapore Airlines and Qatar Airlines. Although these services are no longer in regular operation, the airport remains an international airport with the possibility for international flights to be reintroduced in the future.

While the possibility of a connection to international air services is good, to be a well-used link, the Snowy Mountains needs to be seen as a destination by international travellers. At the moment, other destinations such as Queenstown in New Zealand and Nagano and other destinations in Japan have a higher international reputation with which to draw international visitors compared to the Snowy Mountains.

Currently there are public bus and coach services from Canberra however they operate infrequently. It will be difficult to increase this frequency or offer a connection to Canberra International Airport without a significant increase in international visitors to the Snowy Mountains.

6.3.2 SNOWY MOUNTAINS AIRPORT UPGRADE

The planned increase in the number of flights to the airport and the increased volume of passengers based on economic projections may justify improvements to the existing Snowy Mountains Airport, both in its capacity and facilities to customers. Increased flights, such as the new Qantas services proposed for ski season 2021 and customers to this airport may also warrant improved transport services between the existing airport and Jindabyne.

A new shuttle service operating between the airport at Cooma and Jindabyne and the alpine resorts would be beneficial to accommodate transport demands. The number of bus services per day would need to be tailored to the number of flights and passengers.

The range of transport services is consistent with those offered at other regional airports, e.g. Wagga Wagga. However, the number of passengers at those airport supports a wider variety of options – e.g. three car rental companies operating from the terminal instead of one.

6.3.3 JINDABYNE AERODROME

The Jindabyne Randall Community Aerodrome is located just south of Jindabyne township, off Barry Way. It is owned and operated by the Jindabyne Aero Club and is primarily used for private flights. It has previously been used as a base for the Rural Fire Service during bushfires.

The Aerodrome is well positioned to provide future aviation connectivity to the two neighbouring airports according to an evaluation of its future within the Snowy Mountains SAP¹⁰. In addition to the existing use by small, fixed wing aircraft and helicopters, safeguarding measures that may be required to preserve its potential for connectivity to the nearby Snowy Mountains Airport and Canberra Airport and for Advanced Air Mobility (AAM) operations, including:

- Extending the runway facilities to 1050 m to satisfy Code 2C operations serving mid-range fixed wing commercial aircraft (35–40 seats).
- Space for the potential growth in vehicle parking and storage of all aircraft types.
- Retaining simple and direct road access between the aerodrome and the village.
- Define air corridors between noise sensitive residential/natural areas of the master plan to minimise noise pollution exposure of residents.
- AAM operations using electric powered Vertical Take-Off and Landing (eVTOL) aircraft are expected to follow similar flight paths as helicopters, with the routes adjusted to minimise local noise exposure.
- Anticipated developments in the certification of new eVTOL aircraft and airspace management systems are expected suggesting that fleets of piloted and autonomous eVTOL aircraft may enter the market as the price drops and coverage expands to the broader population.
- An air shuttle service directly to the slopes could be operated from Jindabyne Aerodrome, providing faster access to the resorts. This would require a re-assessment of current policies regarding aviation above the National Park, and noise pollution and stakeholder engagement studies.

6.3.4 HELICOPTERS

Helicopters are restricted in their use within the Kosciuszko National Park to essential management, emergency and research purposes i.e. not for private use. Perisher has a dedicated helipad whilst a designated open space at Thredbo accommodates its infrequent usage requirements. Heliskiing is also not permitted anywhere in Australia but it is available in New Zealand. Future private helicopter use could be investigated using the Jindabyne Aerodrome as a base.

The Arup assessment concluded that the use helicopters with larger seated capacities could assist in transferring passengers from other airports to the Aerodrome. However, this would bring the potential for higher noise pollution impacts.

¹⁰ Snowy Special Activation Precinct (SAP) – Airport Planning: Suitability and adaption of Jindabyne Aerodrome as an aviation node (ARUP, 10 February 2021)

6.3.5 DRONES

The rapid development of drone technology for the movement of goods and the proposed movement of passengers warrants its consideration as alternative mode of transport within the Snowy Mountains SAP in the years ahead. It is important to understand that the Civil Aviation Safety Authority (CASA) classifies drones as aircraft and therefore, in accordance with the Kosciuszko National Park Plan of Management they can only be operated in the Park for commercial and management purposes (NPWS, 2019). Recreational drone use is restricted for reasons of safety, operational risk and to minimise disturbance to other visitors.

Anyone wanting to use a drone for commercial reasons in Kosciuszko National Park (KNP) must have:

- written consent from the local NPWS Area Manager
- a NPWS filming licence (fees apply) – If filming or taking photographs, unless the work is being conducted by or on behalf of the resort operator in a resort lease or licence area
- the resort operator's approval for use of a drone in a resort lease/licence area
- appropriate CASA certificates/licences and permits as a commercial user and/or exemptions if the applicant is proposing to fly above 120 metres, at night, over a populous area and within 5.5 kilometres of a landing strip or helicopter landing site (Thredbo and Perisher both have registered helicopter landing sites)
- \$20 million public liability insurance.

There is the potential for significant change in the certification of new eVTOL aircraft and airspace management systems are expected up to 2030. Initially, these aircraft could be piloted, but are likely to change to autonomous over time. The eVTOL aircraft are preferred due to their smaller landing sites and noise and air pollution.

The viability of utilising such light aircraft in such variable and severe weather conditions during the winter season means that stabilisation and noise suppression would have to be further developed to operate within such sensitive alpine environments.

6.4 SKITUBE

The Skitube is a vital and strategic asset in the Snowy Mountains SAP transport network. Through past strategic planning by Perisher, NPWS and TfNSW, its important role in the transport task has always been recognised and it comes into its own in times of poor weather being an underground system. Its Bullocks Flat location within the National Park (near the boundary) in terms of reducing the amount of car movements further into the National Park is also seen as a positive attribute. It is important that as the infrastructure ages, it is not only maintained at existing levels but also optimised in terms of its efficiency to move people and maintain customer amenity at an affordable price. Further details of the current ski tube operations are discussed in Section 3.5.5.

6.4.1 EXPANSION OF CURRENT OPERATIONS

Based on the 2020 Saturday timetable (for 25 July 2020), the Skitube is currently operating with a headway of 25 minutes between trains and three carriages per train, equating to a capacity of over 1,600 passengers (pax) per hour. However, in previous years, the Skitube has operated four car sets with a 20-minute headway. In this configuration, it could carry 2,700 pax per hour.

It is understood that there is scope to increase the capacity of the line from its current operations through future improvements to signalling and internal reconfiguration of existing rolling stock. If trains operated with a 20 minute headway, with two 3-car trains and one 4-car train, the capacity could increase to 2,250 pax per hour.

If peak hour Skitube passengers increase proportionally to daily passengers, a minimum capacity of 2,200 pax per hour would be required. However, if demand continues to spike for arrival before 9:00 am, then higher capacities may be required.

The change from the current operational capacity to the forecast future demand need of 2,200 pax per hour is required to be addressed by the operator. Strategies whereby passenger throughput can be increased, and fares lowered should also be explored. Any increase to the bed numbers in Perisher could be accommodated by available capacity on the Skitube in the non-peak periods (and direction of travel).

It is agreed that the Skitube and its tunnel and stations represent a piece of transport infrastructure of significant value which may not have been built without the bold private investment similar to that encouraged by the Snowy Mountains SAP process. Abandoning this key asset after its current operating lease expires despite having a design life that matches the duration of the Snowy Mountains SAP Master Plan (40 years) would put the success of the SAP project in doubt in terms of meeting the peak transport task and visitor and population growth targets. Conversely, further investment in the Skitube by the private sector or in partnership with government could offset both capital and ongoing operational costs for alternative transport operations such as road and parking management and shuttle bus operations to meet future visitation targets.

The key planning tasks required to maximise the future operation of the Skitube recognising its strategic value for the Snowy Mountains SAP Transport system includes:

Short-term:

- Government and Vail Resorts to make necessary arrangements to achieve an increased system capacity of 2,200 pax per hour (in the context of currently achieving 1,620 pax per hour) and investigate the operation of services outside the winter peak period.
- Government to work with Vail Resorts on potential solutions which could be implemented prior to the end of the operating lease in 2030.
- Undertake a review of fare structures and explore options to encourage higher use. Explore the possibility of integrating the Opal fare payment system.
- Government to consider the benefits of increasing the current capacity of the Skitube as opposed to building new surface car parks within the Kosciuszko National Park at the Perisher Range resorts as per the intent of the original Perisher Resorts Master Plan (NPWS, 2001).

Long term:

- Investigate replacing the current Skitube system with more modern rack rail technology and updating the system to the latest safety regulations. This may require a focus on rolling stock.
- Consider replacing the rack rail system with an emerging technology such as a Loop system (discussed further in the following section).

The current amount of car and coach parking at Bullocks Flat (3,700 and 200 respectively) has sufficient capacity to accommodate the typical daily volume of passengers moved by the Skitube.

As car-based transport solutions such as increasing road capacity and the footprint of car parking at the Perisher Range resorts diminish in terms of spatial requirements, environmental impact and social licence from the community, the alternative investment strategy in providing increased transport capacity via the Skitube should be explored.

6.4.2 *EXTENSION TO JINDABYNE*

Extending the Skitube to Jindabyne has been suggested as one method of providing a direct connection between the accommodation in Jindabyne to the alpine resorts, reducing reliance on the road network. However, the terrain and cost of the extension is a challenge.

The Skitube railway is by necessity different to most other railways in Australia.

- The rack and pinion system, although not unique, is needed for the gradient requirements of the Skitube. It is not appropriate to extend such a mechanically intensive system a further 20 to 23 km into Jindabyne.
- The Skitube system was designed to the requirements of the mid 1980's and does not meet the requirements that would be included in a current system.

Modifying the current operation is likely to trigger the upgrade of the existing system to current levels for issues like fire life and safety, evacuation routes etc. This would require costly actions in an environmentally sensitive area such as tunnelling new access tunnels alongside the current system.

The existing Skitube system faces challenges regarding the price competitiveness to driving directly to the alpine resorts and time penalties changing transport modes. This is counteracted by its strengths of not having to drive through snow and the competition for parking at Perisher.

The current private ownership of the Skitube, means that any extension to the current system would require the agreement of both Vail Resorts and the NSW Government. It would also be subject to the funding considerations of both parties.

There is a risk of substantial additional cost and environmental impact of upgrading the existing Skitube before commencing the extension to Jindabyne. Any proposed extension would then also face substantial environmental, technological and economical challenges after the existing system has been upgraded. It is not recommended to upgrade or extend the existing Skitube, however the current operations should continue as a key piece of infrastructure in providing access to the alpine areas. An extended Skitube's (to Jindabyne) ability to operate as a commercially viable mass transit system year round in regional area of limited population is unlikely.

Instead of a ski tube extension, consideration could be given to a new system built to modern standards which supplements this existing infrastructure.

6.4.3 ALTERNATIVES TO SKITUBE EXTENSION

The capacity of the road network to the alpine resorts is largely fixed, and therefore an alternative mass transport system is required to cater for the expected increase in visitors. Because of the changing demands across the year, from summer to winter and the low season in between, the system needs to be flexible to adapt to the fluctuations in demand.

Connecting Jindabyne to the existing Skitube at Bullocks Flat via a new service would get more people to the alpine resorts without adding congestion on the existing road network. However, introducing a forced interchange at Bullocks Flat would be a small disincentive. Possible solutions should canvass a range of rapid transit solutions including:

- dedicated Busways
- light rail connection
- metro style railways
- conventional style railways
- gondola
- emerging transport technology such as Loop Technologies.

As these would be a new system, there is flexibility about the route and the locations they could serve.

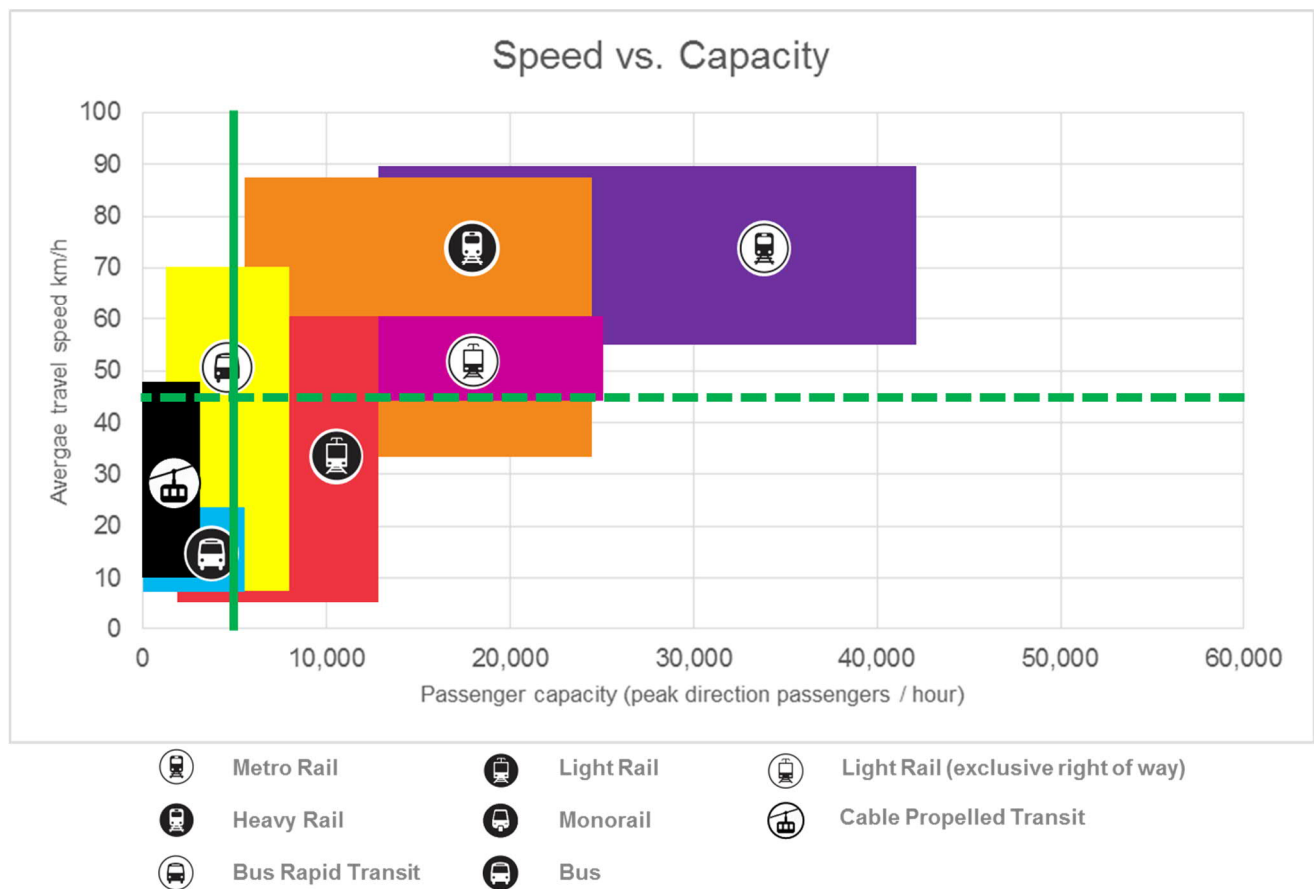
Of these solutions, the conventional style railways and light rail are unlikely to suit the topography of the region due to the grade requirements (typically around 3% for conventional rail and 7.5% for light rail). Metro style railways are considered too expensive to construct and operate based on the likely daily and annual passenger demands.

Bus Rapid Transit is considered the most appropriate transit mode based on its ability to provide the capacity, flexibility and cost effectiveness both in terms of capital and operating costs. It is also able to address the significant seasonal differences in demand across the year.

As mentioned in Section 6.6.2, based on the unconstrained population and visitor forecasts developed for the Snowy Mountains SAP, after the remaining car parking supply is used up by 2031, the rapid transit system is expected to move 3,400 passengers (pax) and equipment in 1.5 hours by 2031, 7,250 pax in 2041 and 2,750 pax by 2061 in a 1.5 hour peak. This equates to an hourly uplift of 4,850 passengers per hour (in 2041)¹¹. A comparison of the typical capacities of

¹¹ 3,400 passengers per hour in 2031, 6,500 passengers per hour in 2041 and 2,500 passengers per hour in 2061

different types of rapid transit are shown in Figure 6.2. The required capacity is shown by the solid green line. It shows that this volume of passengers is in the range of a bus rapid transit or light rail system and is in the lower limits of a metro/heavy rail.



Source: WSP, 2017 (adapted from TCRP Report 13, Transportation Planning Handbook)

Notes Solid green line shows 4,850 passengers per hour, dashed green line indicates approximate speed of 45 km/h between Jindabyne/Park-and-ride and alpine resorts

Figure 6.2 Operating speed and passenger capacity of public transport modes

The operational aspects of the relevant transport modes are summarised in Table 6.5. The operational impacts of the bus rapid transit and cable-propelled transit (gondola) systems are explained in the following sections.

Table 6.5 Operational aspects of alternative modes

MODE	VEHICLE CAPACITY	AVERAGE SPEED	SYSTEM CAPACITY	OPERATIONAL IMPACTS
Bus Rapid Transit	50–110	10–70 km/h	1,000–8,000 per hour	Speed reduction – Congestion, Weather conditions
Cable Propelled Transit	10–35	10–50 km/h	1,000–3,000 per hour	Operation – Wind speed above 70 km/h
Light Rail Transit	200–300	10–60 km/h	6,000+ per hour	Routes – Grades less than 7.5%
Skitube	225	-	2,250 per hour	None

Source: WSP, 2020 (adapted from TCRP Report 13, Transportation Planning Handbook); ETSAB, 2018: Urban Gondolas in Public Transit

6.4.4 MOUNTAIN SHUTTLE BUSES

Examples of buses for ski passengers, including the Ski Utah bus shown in Figure 6.3. It is a standard-length bus with a modified interior including storage space for ski gear. However, this comes at the expense of passenger space, with an expected capacity of 30 to 35 ski passengers instead of the typical 50 per bus.



Source: <https://www.skiutah.com/blog/authors/lexi/how-to-ride-the-uta-ski-bus-a>

Figure 6.3 Example of bus for ski passengers

Assuming 35 passengers per bus, the bus system for 2031 would need over 100 bus trips to move 3,400 people within a 90-minute window. Assuming an equal split of buses, this equates to a bus every 2 minutes to each of Thredbo and Perisher (a combined headway of one bus every minute).

To move the 2041 estimate of 4,850 passengers over 1.5 hours, it would require a bus every minute to each of Thredbo and Perisher. This is a high flow of buses and passengers, however, there are examples of corridors in Australia that achieve this rate of bus provision. It would, however, require a large amount of organisation and resources. Options to reduce the intensity of this movement would be to use larger capacity vehicles. Using articulated buses with a capacity of 50 passengers would reduce the headway of each of the four shuttles (Jindabyne to Thredbo, Jindabyne to Perisher, Park-and-Ride to Thredbo and Park-and-Ride to Perisher) to two buses every five minutes.

Park City Utah is also a global leader in providing zero emission bus services in an alpine resort environment. Park City Transit operate a high-quality fleet of battery powered electric buses which transfer visitors to the township and associated alpine resorts from a local transit hub adjacent to the region's main highway from the State capital Salt Lake City. This system is experiencing year on year growth in patronage and represents an exemplar in terms of sustainable transport options for the Snowy Mountains SAP. As outlined in our Global benchmarking, a similar system also operates in Jackson Hole Wyoming also in the USA.

A shuttle bus system is recommended for the Snowy Mountains region, further details of the proposed shuttle service is included in Section 6.7.

6.4.5 GONDOLAS/CABLE PROPELLED TRANSIT

Other forms of transport to supplement or replace the Skitube or improve access to the alpine resorts from Jindabyne were considered. Gondolas or Cable Propelled Transit have been identified as potential alternative transport modes commonly used in alpine environments and tourist destinations.

Many alpine resorts utilise gondolas to transport visitors within their resorts. Investigations by other well-known alpine towns such as Banff Canada have explored the opportunity to introduce Gondolas to transport people around their alpine regions. Table 6.6 outlines the key details of some well known gondola and cable propelled transit systems from around the world.

Table 6.6 Gondola benchmarking

SYSTEM	KM	YEAR BUILT	# OF STOPS	CAPACITY PPHPD	DAILY	ANNUAL	CAPEX	FARE ONE-WAY	OPEX
Telluride (Colorado)	5	1996	4	900	7,000	2,600,000	\$16M	Free	\$5.1M
Roosevelt Island tram (New York)	1	1976 (Rebuilt 2010)	2	1,000	6,400	2,400,000	\$25M	\$2.75	\$3.9M
Portland Aerial Tram (Oregon)	1	2007	2	980	3,800	1,350,000	\$57M	\$4.55	\$2.7M
Emirates Air Line (London)	1.1	2012	2	2,500	25,000	1,600,000	\$90M	\$8.00	\$9.4M
Medellin Line J (Columbia)	2.6	2008	4	3,000	15,000	5,000,000	\$50M	\$1.00	N/A
Caracas Metrocable (Venezuela)	1.8	2010	5	1,500	5,000	2,800,000	\$21M	\$1.00	N/A
Tlemcen (Algeria)	1.6	2009	3	1,500	6,000	5,000,000	\$14.7M	\$1.00	N/A

Source: Stantec, 2016: *Banff Long Term Transportation Study*, 2018: *Urban Gondolas in Public Transit*

The key benefits of utilising gondolas or cable propelled transit as outlined in the study *Urban Gondolas in Public Transit, ETSAB, 2018*) include:

- Urban gondolas have one of the lowest power consumption requirements of any transit mode – the energy required per person and per kilometre are much lower than electric buses or light rail due to the ratio of payload (passengers) to self-weight.
- Comparable capacity to light rail transit (LRT) or bus rapid transit (BRT).
- No point source emissions.
- System reliability is extremely high, ranging from 99.3% to 99.9% (this does not include stoppages for environmental conditions).
- Unlike buses, private vehicles or LRT, service cannot be impacted or slowed due to traffic congestion or physical obstacles such as a vehicle collision.
- Urban gondolas have virtually no impact on traffic flow due to their grade separation with street level traffic. They add capacity without contributing to road congestion.
- The longest monocabable detachable gondola is an 8.8 km long line in Turkey
- Urban gondolas are continuous movement transport systems which means there are no schedules or timetables - only the headway between cabins. This means minimal and predictable wait times since passengers can always see the next cabin coming.
- Ropeways are statistically the safest means of transport.
- Urban gondolas run continuously which means less electricity is used to overcome the rolling resistance of stop-and-go traffic that is typical to terrestrial systems.
- Cabin recovery technology allows cabins to always be safely returned to stations without the need for on-line evacuations.

- Several cabins could be designated only for female passengers during late night service if there are possible safety concerns from some potential passengers.
- Depending on the technology, towers can be spaced between 0.5 kms to 3 kms and have a very small footprint.
- Tower heights vary to suit the terrain; Singapore's systems have 80 m towers.
- Cabins can be luxurious and offers lots of passenger comforts. Exterior bike racks which can support up to 20 kg suspended (or bikes can be transported in a standing area in the cabin, depending on the configuration).
- Smart glass technology is available which allows windows to switch from clear to opaque when cabins travel over areas with privacy concerns like residential areas.
- Gondolas create minimal noise pollution since they require no on-board motor, which should be a key consideration in high-density urban areas.
- Based on the experience of other jurisdictions, successful implementation of gondola systems occurs when the gondola option provides an answer to a challenging situation (for example steep slopes or river or freeway crossings).

The same study also outlined the key disbenefits of utilising gondolas or cable propelled transit (*Urban Gondolas in Public Transit, ETSAB, 2018*):

- Limited stops for passengers to disembark. Similar to LRT, passengers can only disembark at stations, which cannot be placed exceedingly close to one another due to their high cost. Station location should be carefully thought out to maximise ridership.
- Costs vary significantly depending on the number of stations and their design, the type of gondola system, topographical challenges and amount of customization.
- Stations are the costliest part of projects, with the electro-mechanical equipment costing as little as 7% of total project costs in some cases.
- Capital costs per kilometre for a gondola project typically range from \$9 million to \$60 million (USD) per km, with the Emirates Air Line in London being an outlier at \$82 million per km.
- Residents of any neighbourhood the gondola passes over may have legitimate and serious concerns about an intrusion to their privacy. Depending on how problematic this may be, smart glass can be installed which can automatically turn opaque when passing over certain areas.
- Although average travel speeds are similar to other modes of transit, maximum speeds are significantly lower suggesting that urban gondola systems are only ideal for shorter distances in dense urban environments. This highlights that they are more complementary to a city's transit system rather than a substitute for other forms of rapid transit which are more appropriate for connecting distant nodes.
- Lack of flexibility in the route. Although capacity can be increased significantly through different means, the route is fixed similar to LRT systems and cannot be adjusted or modified. To contrast, bus routes can be completely re-routed to better meet demand and travel patterns while incurring minimal costs. This suggests the route should be carefully planned to take into consideration current and forecasted travel patterns and road traffic data.
- Although urban gondolas have many fail safes, backup motors, and an evacuation drive, if all of these systems experienced a complete failure, it would be difficult to rescue people from the cabins.
- Operating and maintenance costs. (Between \$3–\$9 million USD per year, typically ranging between 5–10% of total project implementation costs).
- Some individuals have fears of heights that may prevent them from being able to ride a gondola.

- People have different tastes and different opinions - some people will think that a gondola soaring above the neighbourhood will detract from the visual appeal of the area or may ruin the existing look and feel of the neighbourhood.
- Most gondola systems can operate only when wind speeds are less than 70–100 km/h depending on the design. A feasibility study should consider how frequently these conditions occur in the proposed route, and how much downtime is acceptable.
- Misinformation and public scepticism. Any such project is guaranteed to be subjected to a high degree of criticism and cynicism due to its novelty and lack of ubiquity in most transit systems.
- Project champions and political leaders should be clear about what transportation problem is being solved, be able to clearly communicate the objectives and expected benefits and have sound rationale for why a gondola makes the most sense compared to other alternatives.

The key lessons learned from cities that have adopted Cable Propelled Transit (*Urban Gondolas in Public Transit ETSAB, 2018*) include:

- Gondola design needs to respond to local climate conditions. The Emirates Air Line in London, which is a monocable, shuts down at winds up to 14 metres per second [31 mph]. That equates to about 30 days of downtime a year due to wind. Bi- or tri-cable systems provide for greatly enhanced stability allowing for operation during major winds (up to 100 km/h).
- Gondolas should be used to address a real problem. Where Gondolas are successfully implemented, they have responded to problems that could not be overcome by other options. Gondolas are successful in Medellín, Hong Kong, and Portland because of the challenging geographical conditions. Traditional Light Rail Transit and subways are not possible due to the elevation gain, and road infrastructure require switchbacks and inefficient access. Within Paris, gondolas are being implemented to address challenging access.
- Be clear about the project type, whether a rapid transit solution or tourist attraction. In communities where gondolas have been built as a tourist attraction, success after implementation is difficult to sustain. Using the London example, ridership was high during the Olympics, however six months after it opened ridership declined. While London has over 30 million tourist visits a year, annual ridership is approximately 1.5 million people. If London has a difficult time promoting this as a tourist attraction, there is a real concern for other jurisdictions over-investing in a project purely for tourism promotion.
- Do not underestimate ridership. Portland's Aerial Tram is already approaching maximum capacity ridership and cannot add capacity due to the system's design. Unlike gondolas, aerial trams are not scalable in that you cannot add more cabins; trams only have two cabins which travel back and forth between the two terminal stations. As a result, they have cut all marketing and promotions since the service is already well-subscribed and cannot accommodate much more growth.

The Snowy Mountains SAP area has a history of utilising Cable Propelled Transit through the Thredbo to Charlotte Pass Chairlift. The building of the lift commenced in 1963 and was completed in 1964. The chairlift was built by Transfield on behalf of Kosciuszko Chalet who at the time were owned by Broken Hill Holdings. The project reportedly cost 150,000 pounds. It ran during the 1964 and 1965 season before going into receivership.

The chair only operated for a year. High winds caused operational difficulties and the operators had great difficulty rescuing passengers if the chair broke down. Because the chairlift traversed remote thickly wooded areas on the Ramshead Range, passengers were at great risk of death by exposure.

It was essentially two separate lifts. The second lift, which terminated at Charlotte Pass, hardly ever ran due to the high wind problems. In addition, there were problems with snow banking up on some of the towers. The operators may have been a little unlucky in opening the project in one of the biggest winters (1964) in terms of snowfall (and possibly windiest) on record.

The stations/platforms were called in order: Alpine Way Terminal Station, Snowline Station, Bella Vista Station, Top Station – Ramshead Restaurant, Wrights Creek Station, Main Range View Station, Chalet Terminal Station. The lift had 50 towers, 8 stations and stretched over 5.5 kilometres. The skiing between the stations was a series of shallow bowls.

Establishing a gondola across the Ramshead Range, Crackenback range or on the perisher range between Charlotte Pass and perisher Valley would need to consider the impact of high winds and their prevailing direction on both the visitor experience and operational reliability. Weather data from the Bureau of Meteorology for Thredbo Top Station (the most relevant weather station in the Snowy Mountains SAP for the proposed resort focussed Gondola) for the month of August 2020 outlines maximum wind gusts of 137 km/h and wind speeds exceeding 70 km/h for 13 of 31 (42%) days of the month. This regularity in disruption to operations would require an alternative mode of transport when the gondola is not in operation. This demonstrates the comparative advantage of the Skitube in this location.

Establishing a gondola in a township or National Park should also consider the community's acceptance of such transport infrastructure. Gondolas represent one of the most a divisive mode of transport, typically due to their novelty value, visual impact on landscapes (both system infrastructure and the clearing of operating corridors they require) and the impacts on privacy of residents and businesses in urban areas. Many systems have been proposed and abandoned following feedback from local communities. Three recent examples are of community opposition to gondolas or projects which impact National Parks include the Wollongong Cableway, Banff to Mount Norquay gondola and the expansion of Snowy Hydro 2.0 transmission line network within the Kosciuszko National Park.

Both the proposed Wollongong and Banff gondola proposals were pitched by the private sector and connected adjacent elevated topography with nearby town centres. The Wollongong proposal travelled over significant areas of urban development which raised community opposition which ultimately led to its demise. The Banff project, despite the presence of several other gondola systems in its immediate area and had support from the local government, was rejected by Parks Canada stating *"It is Parks Canada's position that its policies on limits to development are fundamental to protecting the ecological integrity of Banff National Park and to ensure that this treasured place is preserved now and for future generations"*.

Lastly, the plan to install new high transmission power lines within the Kosciuszko National Park as part of Snowy Hydro 2.0 has raised opposition in the community (including 24 environmental groups) prior to the release of an Environmental Impact Statement. This opposition is based upon similar aspects to the construction of a gondola including the removal of vegetation for corridors and risks of bushfire. Pre-submissions identified *"incompatible uses with the obligations for the protection of Kosciuszko National Park, the Australian Alps National Heritage Place, the UNESCO Kosciuszko International Biosphere Reserve, Aboriginal cultural heritage, head-water catchments for south-east Australia's major rivers, unrivalled natural landscapes, and unique biodiversity"*. This community response should be considered when progressing any concepts for a gondola within the Kosciuszko National Park boundary.

Whilst gondolas are considered positive in terms of passenger safety, lower power consumption, passenger experience, amenity and traversing difficult terrain or steep inclines, they are highly susceptible to wind, offer lack of flexibility in terms of route to match shifts in location of demand, have lower speeds (longer travel times) and carrying capacity than other forms of transit, and suffer from a high degree of scrutiny and cynicism from local communities due to their novelty value as a transport mode and visual impact in sensitive environmental areas. The high variability in capital costs and long-term patronage levels after initial opening (e.g. attracting repeat visitors) is also key criticism of this form of transport.

Gondolas can be successful as part of specific tourism attraction where it considers:

- navigating terrain not easily achieved by another forms of transport
- avoiding areas which are sensitive to environmental impacts
- avoiding traversing built up urban areas
- being designed and located to withstand high winds
- operating in locations without large seasonal differences in demand such as those in the New Zealand towns of Queenstown and Rotorua
- a business plan that can attract repeat visitation.

6.4.6 LOOP TECHNOLOGIES

Loop technologies are tunnel based high-speed transport solutions developed by Elon Musk's The Boring Company, a future focussed tunnelling company reimagining the way tunnelling can be achieved more quickly and more cost effectively.

Loop is a high-speed underground public transportation system in which passengers are transported via compatible Automated Electric Vehicles (AEVs) at up to 250 kilometres per hour. Standard AEVs are Tesla Model X and Model 3 vehicles. High-occupancy AEVs use a modified Tesla Model 3 chassis to transport up to 16 passengers with both sitting and standing room. Loop is targeting 4,000 vehicles/hour at 250 km/h for each Main Artery Tunnel.

Loop is an "express" public transportation system and more resembles an underground highway than a subway system. Through the use of a Main Artery Tunnel with side tunnels for entry/exit, passengers travel directly to their final destination without stopping. A Loop vehicle's average speed is close to its maximum speed, while a train's average speed is much less than its maximum speed. Additionally, AEVs are generally faster than conventional subway cars (240 km/h vs. 105 km/h).

The risk of fire is very low in the Loop system, as the tunnel lining is non-flammable (concrete) and no other flammable materials are added. Additionally, there is no live electric third rail, minimizing potential fire sources and limiting the fire's main energy source to that of the vehicle's battery. In the unlikely case that a fire does occur, the tunnel's ventilation system will remove the smoke to allow passengers to safely evacuate.

The Las Vegas Convention and Visitors Authority (LVCA) Board of Directors approved a contract to design and construct a Loop system for the Las Vegas Convention Center. LVCC Loop will provide fast and convenient transportation for convention and trade show attendees across the LVCC campus. The LVCC Loop is currently under construction.

6.5 ROAD NETWORK

The road network within the Snowy Mountains SAP relies upon a few key roads (Kosciuszko Road, Barry Way, Alpine Way), with little choice between alternative routes. Sections of the road network are already operating close to capacity during the winter season at peak times.

The forecast change in traffic demand on key roads within the Snowy Mountains SAP during a winter weekend visitor peak with no constraint on the number of people driving to the National Park are shown in Figure 6.4. These forecasts are based on an increase in current behaviour and do not take into consideration the capacity of the road or the capacity of parking at the resorts. They illustrate that the demand for car travel to the alpine areas on Kosciuszko Road and Alpine Way will increase substantially based on the population projections.

To reduce the number of people driving to the resorts, a capacity constraint has been applied by capping numbers based on the day parking capacity at Thredbo, Bullock Flat and the Perisher group of resorts. To get everyone to the resorts to meet the future demand, a rapid transit system is recommended. Under this scheme, shuttle buses would operate between Jindabyne and a new park-and-ride site outside Jindabyne to Thredbo and Bullocks Flat and another shuttle to the Perisher group of resorts.

In addition, a Southern Connector Road is recommended within Jindabyne connecting from Kosciuszko Road west of the Jindabyne Dam Wall to Kosciuszko Road east of the Alpine Way intersection (via an intersection with Barry Way).

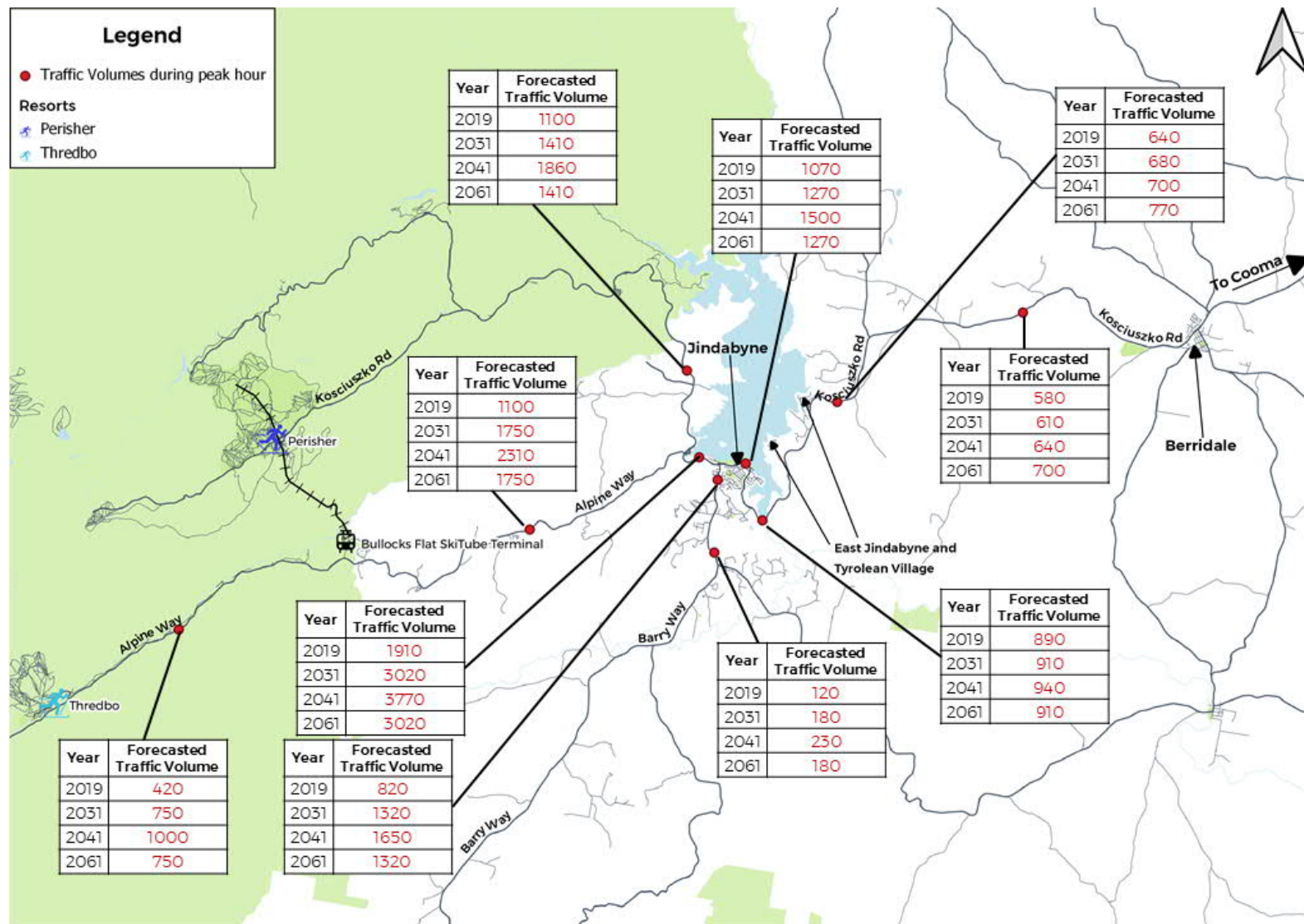


Figure 6.4 Forecast traffic demand on key roads within the Snowy Mountains SAP during a winter weekend visitor peak – No capacity constraint at resorts and no Southern Connector Road

6.5.1 FUTURE ROAD PERFORMANCE

The future people movements were assigned to the road network for the resident, peak visitor and seasonal worker movements.

- The 2019 count data was used to split how many people travelled to Thredbo, Bullocks Flat and the Perisher Range resorts along Kosciuszko Road.
- These were overlaid with resident trips travel between Jindabyne and Cooma and the areas to the south of Jindabyne.
- The relative change from 2019 to the future years (2031, 2041 and 2061) for resident, visitor and seasonal worker trips were applied to the 2019 surveyed volumes, to estimate the future traffic volumes.

From these, the level of service was estimated using the scales shown in Table 6.7, assuming that heavy vehicles make up 3% of the traffic flow during the peak.

The results for the winter weekend peaks are shown in Table 6.8. These projections are based on existing behaviour with future movement numbers, without any upgrade to the road network.

Table 6.7 Mid-block road capacity assessment – Morning peak winter weekend volumes – No change to current behaviour

ROAD LOCATION	2019 PEAK HOUR	2031 FORECAST	2041 FORECAST	2061 FORECAST
Alpine Way (Bullocks Flat to Thredbo)	C	D	E	D
Alpine Way (Kosciuszko Road to Bullocks Flat)	E	F	F	F
Kosciuszko Road (Alpine Way to Sawpit Creek)	E	F	F	F
Kosciuszko Road (Barry Way to Alpine Way)	C	E	F	E
Kosciuszko Road (East of Barry Way)	C	C	E	C
Kosciuszko Road (east of Kalkite Street)	B	C	C	C
Kosciuszko Road (Jindabyne Dam)	E	E	E	E
Kosciuszko Road (Eucumbene Road to East Jindabyne)	D	D	D	D
Kosciuszko Road (Berridale to Eucumbene Road)	C	D	D	D
Barry Way (South of Kosciuszko Road)	B	B	C	C
Barry Way (North of Snowy Mountains Way)	A	A	B	A

Notes Based on forecast increase in winter peak trips during weekend visitor movement to and from. Assumes that heavy vehicles make up 3% of the traffic flow during the peak

The winter peak results show:

- Kosciuszko Road (Alpine Way to Sawpit Creek) Alpine Way (Kosciuszko Road to Bullocks Flat) are already operating close to their theoretical capacity and above the Level of Service E threshold. This is forecast to become worse and expand in the future. This constraint combined with the constraint on parking at the resorts will require consideration of other ways of moving people between Jindabyne and the alpine areas. However, it is noted that this is a short peak.
- Kosciuszko Road through Jindabyne will become increasingly congested, and by 2041 sections would be operating at Level of Service E in places. This will mean increased disruption within Jindabyne, separation of Jindabyne town from the foreshore and delays at intersections. A new road, referred to as the Southern Connector Road, has been proposed as a way of removing through trips from this section of Kosciuszko Road.

- Kosciuszko Road from east of Jindabyne to Eucumbene Road is experiencing increasing pressure during peak times, operating at Level of Service E and D. This has implications for the future of the town, as this section of Kosciuszko Road provides local access to East Jindabyne and Tyrolean Village (which are expected to grow) and connects the airport to Jindabyne and the alpine resorts.

TRAVEL DEMAND MANAGEMENT

To reduce the number of people driving to the resorts, a capacity constraint has been applied by capping numbers based on the day parking capacity at Thredbo, Bullock Flat and the Perisher group of resorts. To get everyone to the alpine resorts to meet the future demand, a mass transport system is recommended. Under this scheme, shuttle buses would operate between Jindabyne and a new park-and-ride site outside Jindabyne to Thredbo and Bullocks Flat. another shuttle to the Perisher group of resorts, while a third would travel to Guthega. Further details are provided in section 6.6.2 (park-and-ride).

POTENTIAL ROAD UPGRADES

A Southern Connector Road is recommended within Jindabyne connecting from Kosciuszko Road west of the Jindabyne Dam Wall to Kosciuszko Road east of the Alpine Way intersection (via an intersection with Barry Way). Further details are provided in section 6.5.2.

The eastern approach to Jindabyne is expected to get increasingly congested during the peak winter season. However, the low-season traffic volumes are approximately half of the winter-peak. The mixture of types of trips makes it difficult to manage one type of road user to address the congestion issues. Residents of East Jindabyne and Tyrolean Village have raised issues with the speed of traffic and road safety. With increasing numbers of visitors and increasing numbers of people arriving via the Snowy Mountains Airport, the upgrade of this section of Kosciuszko Road should be considered to improve safety for turning movements and all vehicles in icy conditions.

With off-peak volumes within acceptable levels and the high cost of widening Kosciuszko Road at the Jindabyne Dam wall, the widening to two lanes in each direction may be difficult to justify economically. A potential upgrade could include localised treatments to manage local access and road safety issues and could be used to create a sense of arrival from the east. There are already climbing and overtaking lanes creating extra capacity, which may need to be lengthened.

ALTERNATIVE ROUTE VIA DALGETY

Presently there are two routes from Berridale to Jindabyne:

- via Kosciuszko Road: 30 km and approximately 23 minutes
- via Dalgety Road and The Snowy River Way through Dalgety and Beloka: 52 km and 40 minutes.

In addition to the 17-minute travel difference under typical conditions, the Dalgety route is of a different road standard to Kosciuszko Road. The Snowy River Way has a one-lane timber and steel truss bridge crossing of The Snowy River with a 10 km/h speed limit which is unsuitable for large trucks.

Upgrading bridge over the Snowy River at Dalgety would provide an alternative route into the Jindabyne area. This route could assist if there was a blockage of Kosciuszko Road and could be a heavy vehicle diversion route, i.e. it would increase the resilience of the network. It could also be promoted as a tourist drive from Jindabyne, opening up tourist options for Dalgety and properties south of Jindabyne.

6.5.2 SOUTHERN CONNECTOR ROAD

A Southern Connector Road has been proposed as a potential solution to the high traffic volumes on Kosciuszko Road and the severance impact that Kosciuszko Road creates within the town. This new road would divert a large portion of the through-traffic and heavy vehicles away from the town centre. By taking through trips off Kosciuszko Road, it is expected to encourage its use by more walking and cycling trips, and to improve its amenity.

It would serve journeys between Kosciuszko National Park the alpine resorts and accommodation in Cooma, Berridale, East Jindabyne, Tyrolean Village, Kalkite and the Snowy Mountains Airport. It would also support improved access to the Master Plan Growth Areas and the Sport and Education precinct. Connections to Barry Way and potentially other streets would increase its use to trips to/from the southern parts of Jindabyne as well. It would alleviate the congestion on Kosciuszko Road between Jindabyne and Alpine Way.

It is envisaged that the Southern Connector Road would become part of the State Road network, replacing the section of Kosciuszko Road through the Jindabyne township.

A concept sketch is shown in Figure 6.5. One of its advantages is that it could provide access to the new park-and-ride facility proposed as part of the travel demand management. The combination of the two new transport projects would allow visitors arriving by car to avoid impacting Kosciuszko Road through town, drive straight to the park-and-ride facility and then for the shuttle bus to travel directly up to the alpine resorts.

If the capacity constraints are applied to the number of vehicles travelling to the alpine resorts and the Southern Connector Road is opened, the potential traffic volumes are shown in Figure 6.6. The western section of the Southern Connector Road would be the busiest. However, it is expected that one lane in each direction will provide sufficient capacity.

Estimates of the peak hours volumes with the Southern Connector Road are shown in Figure 6.6 to Figure 6.8.

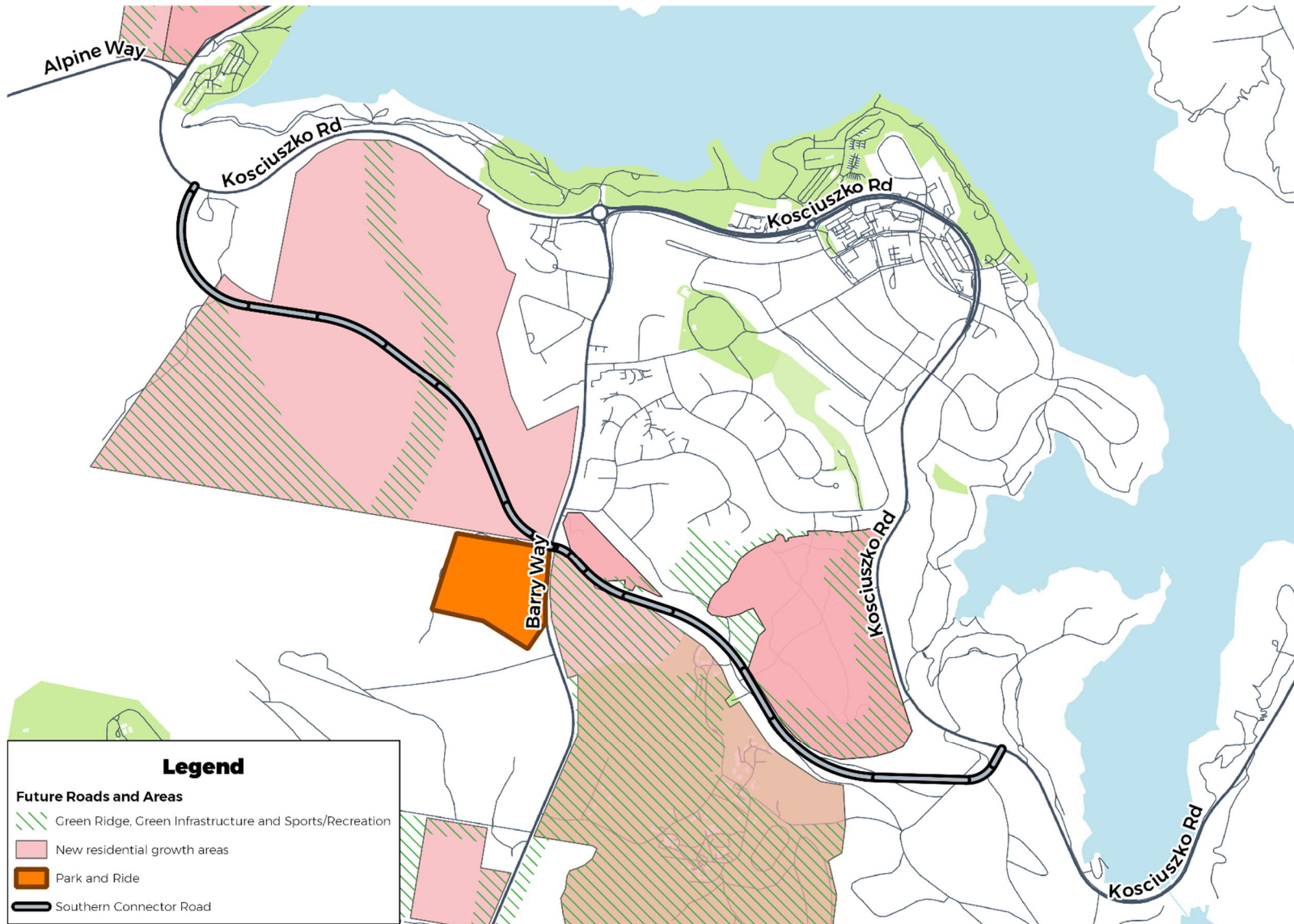


Figure 6.5 Potential alignment of future Southern Connector Road

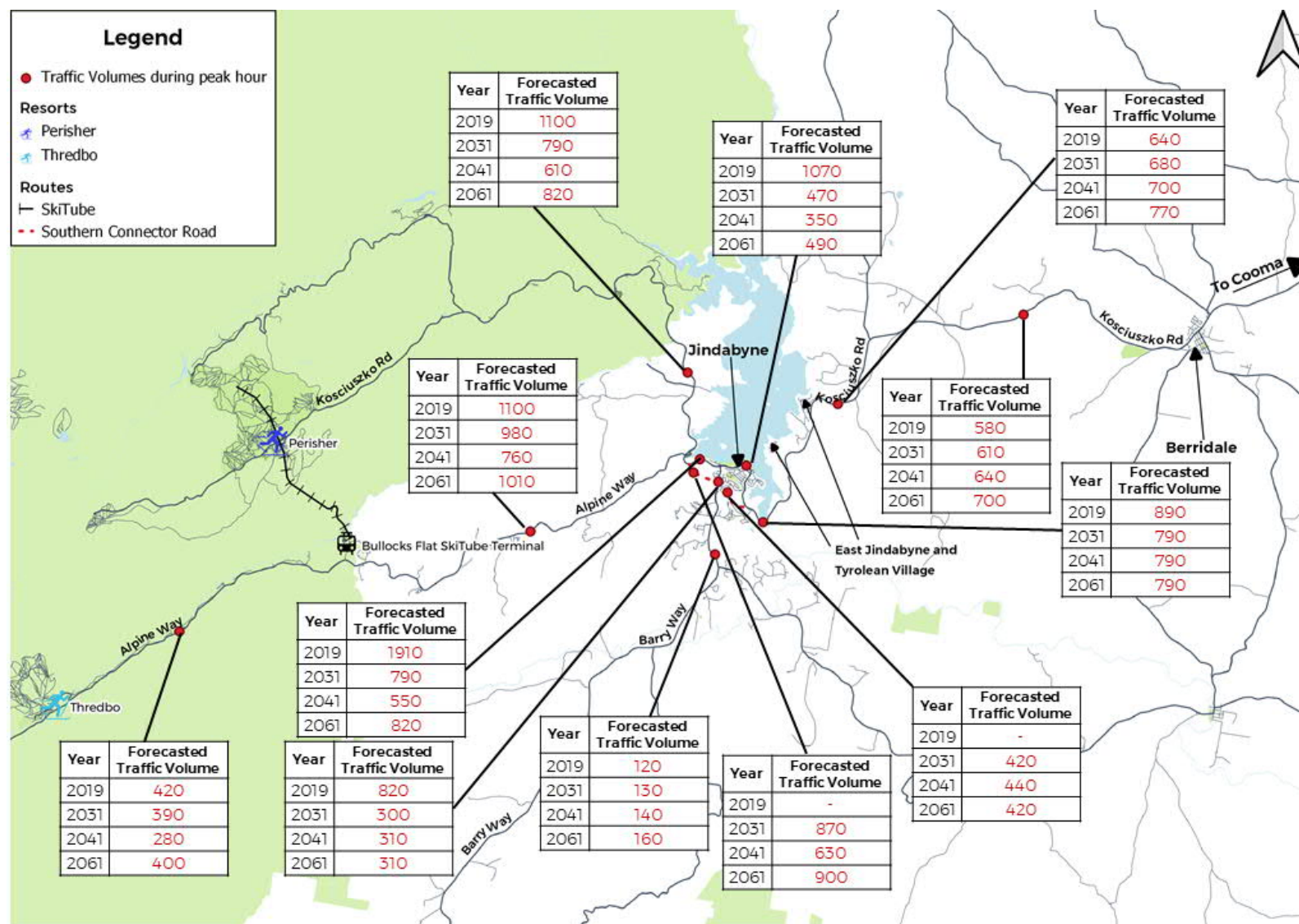


Figure 6.6 Forecast traffic demand on key roads within the Snowy Mountains SAP during a winter weekend visitor peak – With capacity constraint at resorts and Southern Connector Road

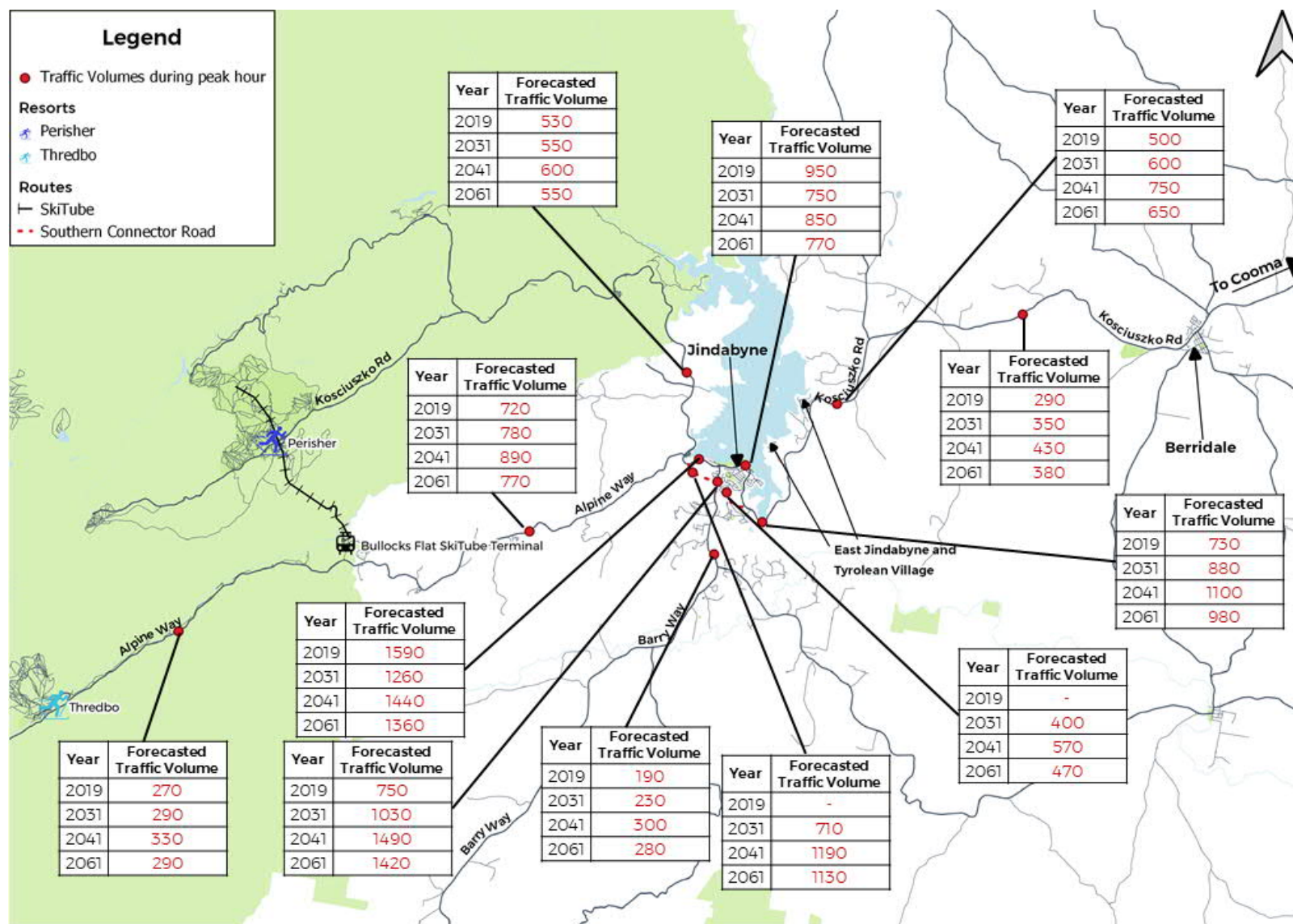


Figure 6.7 Forecast traffic demand on key roads within the Snowy Mountains SAP during a typical winter weekday peak – with the Southern Connector Road

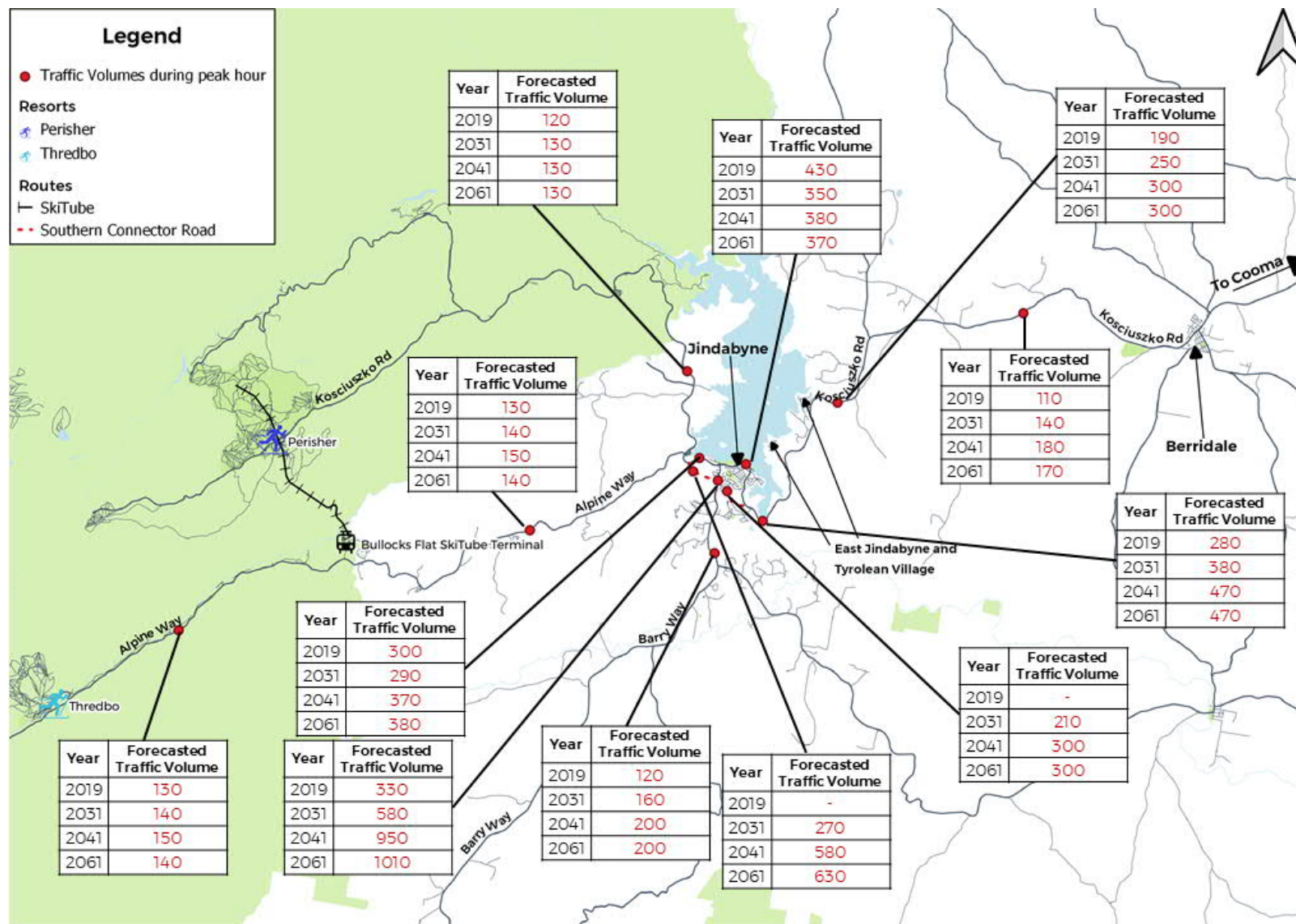


Figure 6.8 Forecast traffic demand on key roads within the Snowy Mountains SAP during an off-season weekend visitor peak – with Southern Connector Road

The results for the winter weekend peaks with the capacity constraint limiting the amount of car travel to the alpine resorts and the Southern Connector Road are shown in Table 6.8. Corresponding results for the winter and off-season weekday scenarios are included in Appendix D.

Table 6.8 Mid-block road capacity assessment – Morning peak winter weekend volumes – With capacity constraint at resorts and Southern Connector Road

ROAD LOCATION	2019 PEAK HOUR	2031 FORECAST	2041 FORECAST	2061 FORECAST
Alpine Way (Bullocks Flat to Thredbo)	C	C	B	C
Alpine Way (Kosciuszko Road to Bullocks Flat)	E	E	D	E
Kosciuszko Road (Alpine Way to Sawpit Creek)	E	D	D	D
Kosciuszko Road (Barry Way to Alpine Way)	C	A	A	A
Kosciuszko Road (East of Barry Way)	C	B	B	C
Kosciuszko Road (east of Kalkite Street)	B	B	A	B
Kosciuszko Road (Jindabyne Dam)	E	D	D	D
Kosciuszko Road (Eucumbene Road to East Jindabyne)	D	D	D	D
Kosciuszko Road (Berridale to Eucumbene Road)	C	D	D	D
Barry Way (South of Kosciuszko Road)	B	A	A	A
Barry Way (North of Snowy Mountains Way)	A	A	A	A
Southern Connector Road (east of Barry Way)	-	A	A	A
Southern Connector Road (west of Barry Way)	-	C	B	C

Notes Based on forecast increase in winter peak trips during weekend visitor movement to and from.

These results show:

- considerably improved performance when the number of cars driving to the snow is limited by capped parking at the resorts (see section 6.6.3 for details) and road capacity and a rapid transit system is implemented
- the only road which experiences performance issues is Alpine Way between Kosciuszko Road and Bullocks Flat. However, it is noted that the volumes forecast in the future are on-par or slightly less than the 2019 volume
- Kosciuszko Road from Alpine Way to Sawpit Creek changes from Level of Service E to D
- Kosciuszko Road through Jindabyne (east of Barry Way) performs better, with volumes of less than 600 vehicles per hour (depending on the level of traffic that stop in Jindabyne instead of driving through)
- the road performance during the off-season period is good on all links.

A key consideration of the Southern Connector Road would be in its local connections with Kosciuszko Road and Barry Way, as well as the connections for pedestrians and cyclists travelling across it in a north-south direction. It is important that there are no severance issues created by this connector road and that it does not become a barrier between the township and activity areas to the south such as the Sport and Recreation site and industrial area. This is also important in the context of a potential relocation for school facilities into one site at the Sport and Recreation centre.

Potential issues with the Southern Connector Road include the possible economic impacts by providing a convenient route for passing trade to divert around the town, its long-term limiting effect on the potential expansion of the town to the south and the introduction of a barrier to active transport for vulnerable users which may be further compromised if all schools in the town were consolidated at the Sport and Recreation site.

To address these issues, investment in the town centre, including the redesign of sections of Kosciuszko Road is designed to attract tourists to stop and experience the new town attractions. The relocation of the school to the Sport and Recreation site is expected to expand the town boundary to south of the Southern Connector Road incorporating it within the town rather than making it a border. A pedestrian cycle bridge over the Southern Connector Road to the Sport and Recreation site will also assist in integrating the new road in the town. The pedestrian cycle bridge has been identified as being required in conjunction with the opening of the new school and independent of the timing of the Southern Connector Road.

While it is not needed for traffic capacity reasons, a land reservation for a future road connection from the Southern Connector Road directly to Alpine Way (avoiding the intersection of Kosciuszko Road and Alpine Way). This could preserve the opportunity for a second connection, providing some redundancy in the road network in case of a blockage on the main route.

CONFIGURATION

The Southern Connector Road would be built with one lane in each direction, with a road reservation that could accommodate widening to two lanes in each direction later, if required. Active transport links would be provided alongside the road, preferably on the side of the sport and recreation site on the eastern section.



Figure 6.9 Southern Connector Road indicative cross-section

There would be three major intersections along its length, including Kosciuszko Road at each end and Barry Way in the middle. To preserve the efficiency of the route, it is proposed that the Southern Connector Road would be limited access (no driveways), with a maximum of one minor intersection between the major intersections for access into the adjoining growth areas. The preferred speed limit for the Southern Connector Road is 60–70 km/h subject to detailed design and traffic modelling.

6.5.3 KOSCIUSZKO ROAD URBAN REALM

A priority project is the major improvements to Kosciuszko Road to improve its pedestrian environment and assist in connecting the township to the lake foreshore. This is a key benefit achieved by construction of the Southern Connector Road as traffic is diverted from Kosciuszko Road.

The redirection of traffic would allow the road space on Kosciuszko Road within Jindabyne to be reallocated for other uses. Potential options for the reallocation of road space and traffic calming include:

- section from Kalkite Street to Munyang Street is a candidate to be reduced to one traffic lane each way
- kerbside lane could be converted to parking
- pedestrian facilities including new or upgraded footpaths, new pedestrian crossing facilities and improved access for persons with a disability

- pedestrian crossings could be constructed on kerb extensions (buildouts)
 - marked pedestrian crossings (zebra crossings) may be appropriate depending on number of pedestrians crossing Kosciuszko Road when the peak winter movement to and from the alpine resorts is happening
 - signalised pedestrian crossings may need to be considered if there are a lot of pedestrians crossing at peak vehicle times to prevent queue-back at the crossings
- cycling facilities including cycle lanes and bicycle parking facilities
- reduced speed limits:
 - convert the section from Munyang Street to Kalkite Street (approx. 1 km long) into a High Pedestrian Activity Zone (40 km/h)
 - drop Speed limit on remainder of Kosciuszko Road to 50 km/h
- community Space and Street Furniture including lake viewing platforms, benches and seating areas, upgraded streetscape and lighting.

These works can be implemented as a package once the Southern Connector Road is open and traffic diverts to the new route.

Having easy active travel routes between the sport and recreation facility, the township and the lakefront will be important for fitness circuits and safe walking and cycling routes to school.

Any changes to the existing function, design and layout of Kosciuszko Road through Jindabyne will be subject to the completion of the Southern Connector Road and the approval of Transport for NSW.

The following high-level strategies may also be useful in improving and/or increasing place function both of Kosciuszko Road and the surrounding streets:

- implementing a kerbside parking strategy to provide the right type of parking for each street. Appropriate placement and type of parking could encourage people to come, stay and go, as required. This may include time-limited on-street parking or public car parks, in addition to commuter, private car parks and loading zones
- increase the quantity of bicycle parking spaces across the area, to increase availability and further encourage cycling for short trips to and from the community facilities in Jindabyne
- introduce lower vehicle speeds through installation of shared zones, local area traffic management, high pedestrian activity areas and other similar traffic calming measures. Reducing vehicle speeds in pedestrian heavy areas can improve pedestrian and cyclist comfort levels, perceived safety concerns and encourage walking and cycling
- increase the number of pedestrian and cyclist connections across Kosciuszko Road
- create safe, secure and spacious environments for pedestrians to encourage foot traffic and street level activity and therefore resulting in greater lengths of stay. This may include providing wider footpaths, where possible to encourage outdoor dining areas, as well as public seating to promote more pedestrian activity
- increase appeal of the environment by creating a “nicer place to be” including providing trees, parklets, park benches and green spaces.

The above considerations are all strategies for applying a “Movement and Place” approach to the Jindabyne street network. This assists in defining the streets role in the network and prioritising transport modes or placemaking depending on its position in the hierarchy.

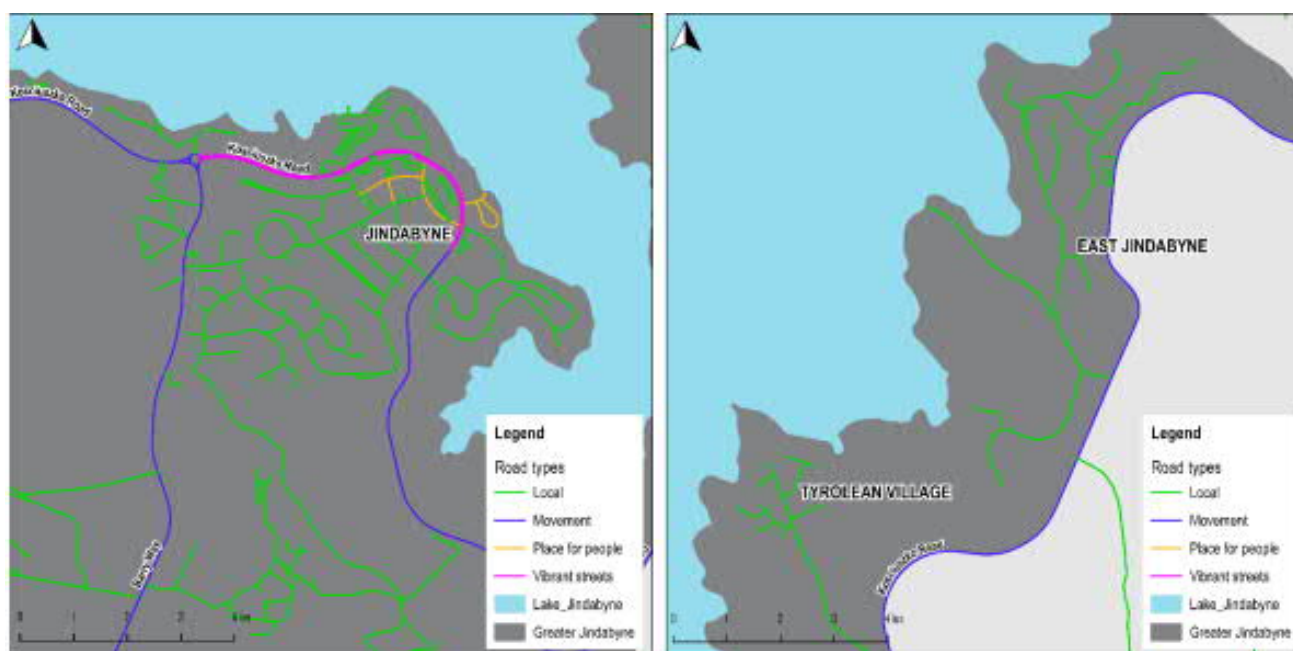
MOVEMENT AND PLACE CONSIDERATIONS

Each street within Jindabyne and the Snowy Mountains should be designed with consideration for its role in road hierarchy and with consideration to the Movement and Place framework. Road treatments should be introduced to emphasise the prioritised mode, whether that be pedestrians and cyclists, public transport or private vehicles.

The proposed categorisation of streets in Jindabyne, Tyrolean Village and East Jindabyne from the Go Jindabyne study are shown in Figure 6.10. The Movement and Place classifications used for the Go Jindabyne Study are explained in Table 6.9. Since this study was completed new guidance on Movement and Place have been issued in the Practitioner's Guide to Movement and Place (Government Architect NSW (GANSW) and Transport for NSW (TfNSW), Issue no. 0.1 — March 2020). Changes include revised movement significance criteria and new place intensity criteria based on a revised understanding of place. This may change some of the classifications in Figure 6.10. However, in general, the previous assessment remains valid.

Table 6.9 Classification of streets (and streetscape)

CLASSIFICATION	FUNCTION
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #ff00ff; margin-right: 5px;"></div> Movement corridor </div>	Vehicle corridors to provide safe and efficient movement of goods and people throughout the precinct. Ideally, they limit their interaction with the town centre and key pedestrian environments.
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #00ff00; margin-right: 5px;"></div> Local streets </div>	Provide vehicle access to residential streets and community facilities. Usually lower in volume and speed compared to a movement corridor. Lower speed environment facilitates cyclist and pedestrian movement over vehicle movement. It provides the fabric of daily lives and facilitates a range of needs from residents and the local community.
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #0000ff; margin-right: 5px;"></div> Vibrant streets </div>	Balances the placemaking aspirations and needs of pedestrians, public transport and vehicle users through the main roads through Jindabyne and the Alpine Resorts.
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #ffa500; margin-right: 5px;"></div> Places for people </div>	Pedestrian and cyclist only areas to improve permeability of Jindabyne along key desire lines, including connectivity between the community facilities and the lake foreshore.



Source: Go Jindabyne Mobility and Connectivity Study Stage 1 Report (GTA Consultants (NSW) Pty Ltd, 23/07/19)

Figure 6.10 Proposed movement and place categorisation – Jindabyne, East Jindabyne and Tyrolean Village

Increasing the place function of streets immediately adjacent to the shopping village in Jindabyne is critical in developing an attractive hub for locals and tourists. A higher place function results in an increased destination value of an area, helping to achieve the desired vibrant environment.

6.5.4 *BARRY WAY*

The creation of the Southern Connector Road could also improve traffic conditions on Barry Way between the new road and Kosciuszko Road. This section experiences queuing at the Kosciuszko Road roundabout during winter peak traffic times.

The relocation of the school to the Sport and Recreation site will necessitate changes to promote safe access and reflect the changing boundary of the town. Barry Way is currently signposted with a speed limit of 100 km/h in the vicinity of the Sport and Recreation site. It is recommended that this should reduce to 80 km/h or 60 km/h at a location south of the Leesville Industrial Area before Lee Avenue for the safety of any pedestrians and the increase in student/staff/parent vehicle traffic.

The change in speed limit should be supported by a change in road environment, to reinforce the change in conditions to drivers. This can occur over time as development spreads south from Jindabyne and north from Leesville.

There are two accesses proposed to the Sport and Recreation site. The existing access at the south of the site (north of Tinworth Drive) is proposed with all movements permitted. The new northern access is located close to a bend that limits sight distance to below the safe levels according to the Austroads Guide to Road Design Part 4A Unsignalised Intersections. Reducing the speed limit to 80 km/h or less would reduce the required sight distance sufficiently to meet the available distance.

Options for the north and south access intersections to the Sport and Recreation site are being explored. Options include roundabouts and/or channelised T-intersections. However, the impact on Tinworth Drive and a nearby property driveway need to be considered. Alternatively, options to combine the south intersection/Tinworth Drive and the north intersection/property driveway intersections could be explored.

Barry Way also provides access to the Leesville Industrial Area via Lee Avenue. This area is earmarked for expansion in the Snowy Mountains SAP Structure Plan, increasing the number of trips travelling in and out of Lee Avenue. Leesville's zoning and proximity to the Park-and-Ride make it a candidate for the depot to house the bus fleet for the mountain shuttle and regular route services.

6.5.5 *REST AREAS AND DRIVER REVIVER*

Drivers to the Snowy Mountains have potentially travelled long distances. There are rest areas for cars and trucks on the Monaro Highway, in Jindabyne (Jindabyne Information Bay – cars only) and within the Kosciuszko National Park. There are no identified facilities between Cooma and Jindabyne. However, in discussions with Transport for NSW, it was noted that drivers can stop in Berridale to rest, which is approximately 30 km (23 minutes driving time) from Jindabyne.

6.5.6 *TOURIST LOOKOUTS*

One of the major elements drawing visitors to the area are the picturesque views of the mountains and lake. However, the major entry roads have high speed limits and there is a lack of safe places to pull off the road to appreciate the views or take a photo. DPIE asked WSP to consider potential locations for new tourist lookouts.

Four potential locations have been investigated, including:

- Option 1 – Kosciuszko Road approaching East Jindabyne 2 km north of Jerrara Drive
- Option 2 – Kosciuszko Road, Tyrolean Village, 1 km south of Jerrara Drive
- Option 3 – Alpine Way, 1.6 km west of Kosciuszko Road
- Option 4 – Hydro Surge Tower, Kosciuszko Road.

All four seem possible from a traffic access point of view. However, further investigations are required to determine if there are any other issues such as ecology, land ownership, etc. that might affect their viability. The Alpine Way one could be linked to the top of a mountain bike run (with potential retail/café opportunities) to give the non-cyclists something to do. In general, left-in/left-out access is proposed from the main road to avoid introducing a road safety issue. All would be subject to further concept and detailed design as well as road safety assessment (the exit of Location 1 has sight distance on the limit of SISD for a 100 km/h downhill road).

The four options are shown in Figure 6.11 to Figure 6.14.



Figure 6.11 Tourist lookout option 1 - Kosciuszko Road, approaching East Jindabyne 2 km north of Jerrara Drive

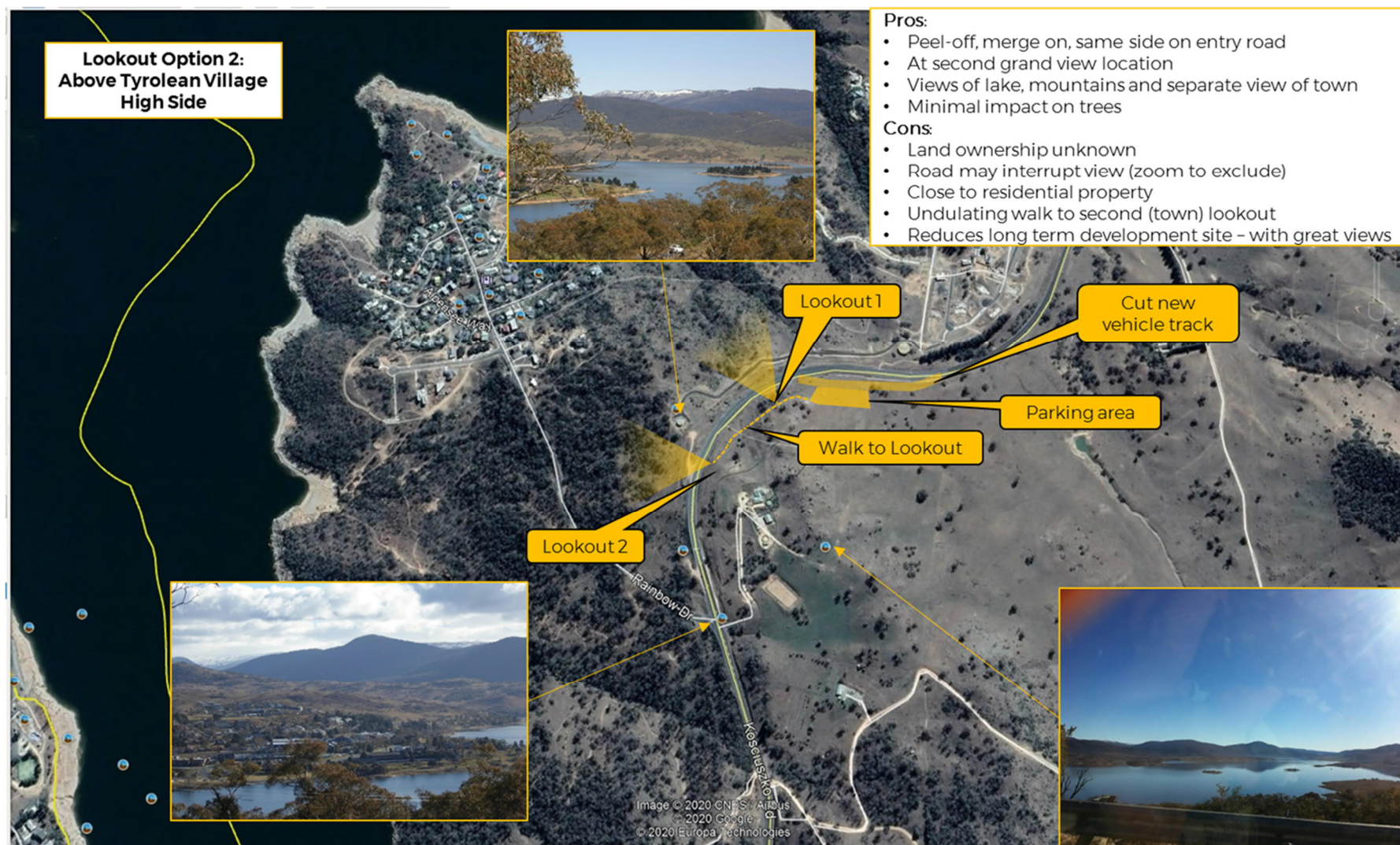


Figure 6.12 Tourist lookout option 2 – Kosciuszko Road, Tyrolean Village, 1 km south of Jerrara Drive

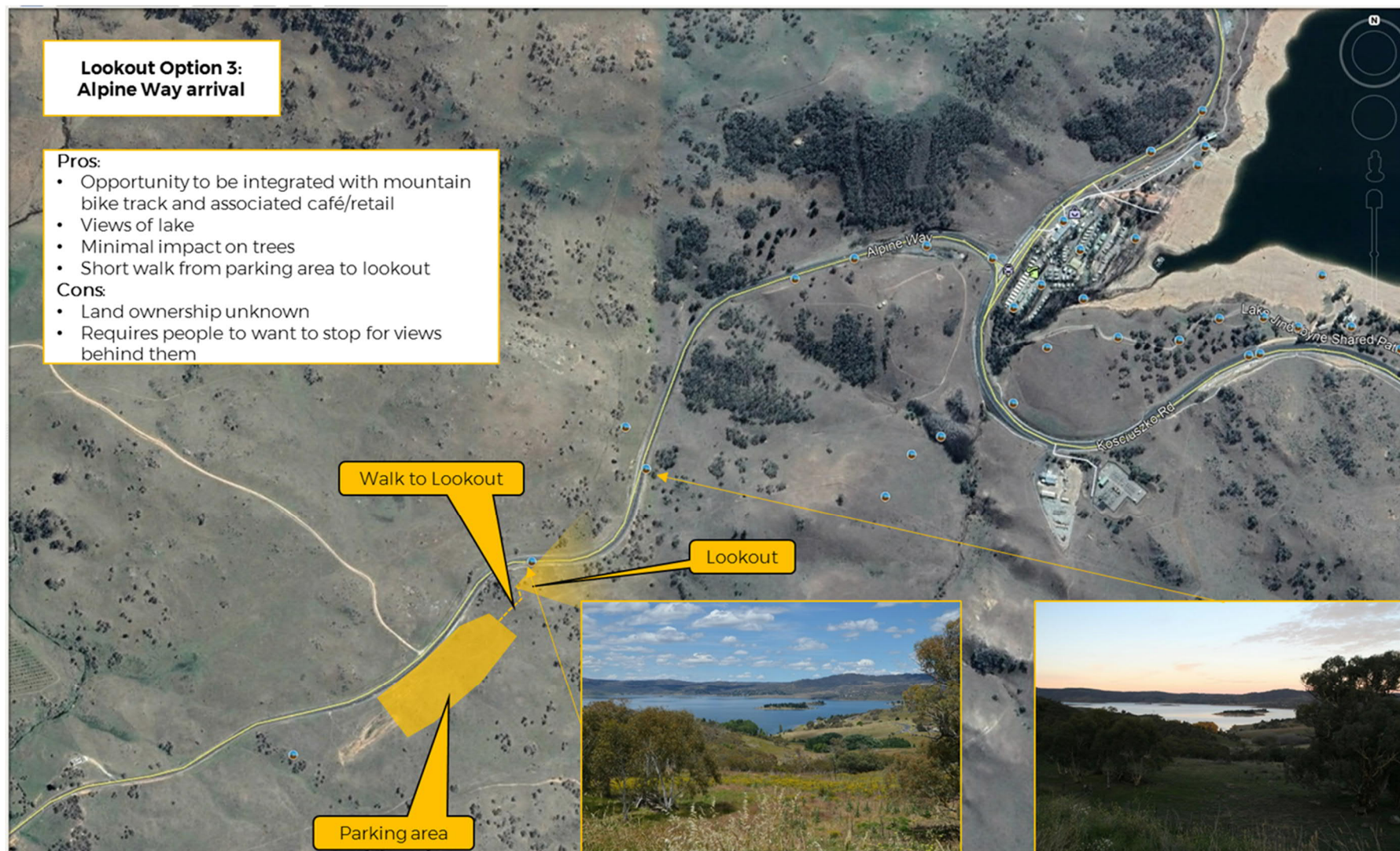


Figure 6.13 Tourist lookout option 3 – Alpine Way, 1.6 km west of Kosciuszko Road

Note: this lookout location is located within the proposed mountain bike park



Figure 6.14 Tourist lookout option 4 – Hydro Surge Tower, Kosciuszko Road

6.5.7 *FREIGHT*

Freight traffic is expected to increase with increased residents, visitors and workers requiring extra supplies, and possible growth of employment within Jindabyne, including at the Leesville Industrial Estate.

Kosciuszko Road and Barry Way provide a freight connection between the Snowy Mountains SAP and the Monaro Highway. However, if Kosciuszko Road becomes congested or blocked by an incident, there are no alternative routes. However, the times that the majority of freight is moving is unlikely to coincide with the peak visitor movement time. Therefore, these roads are expected to be less congested when freight is typically moving.

The Southern Connector Road would offer an alternative route for trucks moving through Jindabyne. If constructed, it could remove truck traffic from Kosciuszko Road, reducing noise impacts and could offer a quicker travel time for trucks. It is also well situated for access to the industrial and service areas of Jindabyne. This could be enhanced further if further employment lands are located close to the Southern Connector Road.

The Southern Connector Road should be constructed at a standard to accommodate B-double and HML vehicles.

Consideration should also be given to the upgrade/replacement of the bridge across the Snowy River in Dalgety to provide an alternative freight route to Kosciuszko Road from the Monaro Highway via Berridale.

A new transport hub has been proposed at Thredbo for storage and deliveries to address the constraints associated with trucks access within the resort. Further investigations and consultation should occur to determine whether this proposal is suitable.

6.5.8 *ROAD SAFETY*

The analysis of crash data in section 3.3.4 indicated that there is a high incidence of vehicles losing control in the snow/icy conditions and running off the road. This may be contributed to by drivers who are unfamiliar with driving in these conditions and failure to apply snow chains before they are needed.

A variable speed limit system could assist in keeping vehicle speeds down, giving drivers time to regain control. A similar weather-dependent speed limit is applied on the M1 Pacific Motorway, north of Mooney, which reduces the speed limit during rain from 100 km/h to 90 km/h.

Anecdotal evidence gathered during the consultation for this study is that road ice has contributed to the accidents on Kosciuszko Road between the Jindabyne Dam and East Jindabyne. Crashes on this section of Kosciuszko Road are likely to have an increasing impact on disrupting traffic flow given its importance for access between Cooma, the eastern villages on Lake Jindabyne and Jindabyne, and airport to Jindabyne movement. Any proposed upgrade of Kosciuszko Road should consider road safety improvements such as the road surface type that reduces the incidence of road ice and wider road shoulders to provide time and space for a driver to regain control of their vehicle in an emergency.

The Monaro Highway although outside the study area, is a main connection for residents and tourists into Jindabyne and the surrounding region. This stretch of highway has known road safety concerns and further road safety or overtaking studies should be undertaken if additional movements into the Snowy Mountains SAP area are expected.

6.5.9 *ROAD SALTING*

Road salt is applied by Transport for NSW to clear snow on roads within the Kosciuszko National Park in liquid and dry forms. However, this can have impacts on the sensitive alpine environmental. Please refer to the Snowy Mountains Special Activation Precinct – Salt Impact Management Plan for an assessment of these impacts, alternative road salt management options and a proposed salt management policy.

6.5.10 SNOW CLEARING

Snow clearing activities will need to continue into the future. However, with a contracting snow season, snow clearing operations may be less frequent in the future. Snow clearing affects the amount of overnight (and day) parking that can be accommodated in alpine areas. Overnight parking is assisted by under-cover and multi-storey parking. However, this adds to the cost of providing parking.

6.5.11 CHAIN BAYS

As mentioned in section 3.3.7, there are three chain bays on the Alpine Way and four on Kosciuszko Road. There has been no issue raised with the number of bays and their capacity raised during the stakeholder consultation. It is understood that occasionally chain bays are required to be used for overflow parking.

There are some concerns for road safety when people are fitting snow chains to their vehicle with moving traffic close by. The design of the chain bays should be reviewed to determine if a barrier can be installed to provide protection for people walking around their vehicle with other vehicles moving past in the slippery conditions.

In the future chain bays will continue to operate, however they should not be used for any overflow parking. Parking should be consolidated, and the demand reduced with other modal transport options. Removing parking from chain bays will improve safety in these areas and improve the customer experience.

6.5.12 CONNECTED AND AUTOMATED VEHICLES (CAVS)

The feasibility of operating connected and automated vehicles (CAVs) in the short to medium term will be challenging in an alpine environment. The reliance on optical guidance is problematic in extreme alpine weather conditions which require pavement delineation, clear windscreens for cameras or roadside infrastructure all of which are challenging to achieve in a National Park setting with snow removal operations in winter. The skills of professional shuttle bus and coach drivers in alpine conditions are likely to remain unchallenged until the technology associated with CAVs is proven in more stable road environments for rapid transit options such as trackless trams.

6.6 FUTURE PARKING

6.6.1 JINDABYNE TOWN CENTRE

Demand for parking in Jindabyne swells during the winter peak season. However, the supply of parking remains the same year-round. This creates difficulties for residents and makes it more difficult for visitors to stop for shopping. However, providing large amounts of additional parking that will remain unused for large parts of the year is not an effective use of space within the town. A separate Jindabyne Town Centre Parking Plan has been undertaken as part of the Snowy Mountains SAP process. This plan can be found in Appendix E.

The Jindabyne parking strategy needs to be balanced with a strong active and public transport strategy. Whilst widespread public and active transport facilities don't exist currently, the Snowy Mountains SAP Master Plan proposes new links and infrastructure. This forms part of the parking solution:

- ensure a walkable town centre to promote a park and walk strategy
- provide safe active transport connections into the Town Centre to allow transport choices other than private vehicle
- promote the Jindabyne shuttle (in later stages) as an additional transport mode for Town Centre connections.

The urban design and development outcomes of the Snowy Mountains SAP Master Plan also informs the parking solution:

- As Jindabyne develops, adequate parking will be required based on DCP rates for the proposed development. This is expected to be provided within the development site and will be assessed with each individual Development Application.

When parking is provided by SMRC, either on street or off street, the general strategy should be a park once and walk strategy. Parking should be promoted on the periphery of the town centre. Parking spaces towards the centre should have a higher turnover or be reserved for pick up/drop off and loading. This approach has many benefits for an alpine tourist town including allowing kerbside space for the streetscape upgrades, making the street more walkable and safer, making people walk past shop windows, encourages a livelier street life and community connections and reduces short trips between different town centre locations.

To preserve the attractiveness of Jindabyne Town Centre, several discrete parking areas are proposed in the Parking Plan with increased supply to provide for future development. This has the advantage of:

- reducing the reliance on on-street parking
- allowing shared facilities, allowing people to park once then visit multiple businesses and reducing the peak demand for parking
- avoiding concentrating too much parking in one location
- spreading facilities within a convenient walk distance of different parts of the Town Centre while locating them towards its periphery, preserving the core Town Centre space for active transport and enhancing their potential for placemaking and dwelling opportunities.

To limit the impact of loss of parking as proposed in the Snowy Mountains SAP Public Realm Concept Design, the following are recommendations to mitigate the impact on nearby businesses:

- Restore some parallel parking on the northern side of Snowy River Avenue between Kalkite Street and Thredbo Terrace: The north side of the street experiences more shading during winter. Prioritising pedestrian movement on the southern side opens the potential for retaining limited parking in bays integrated with the street design. This could potentially provide up to an additional **6 spaces**.
- Retain parking on the north side of Park Road, allowing the southern side to be prioritised for active transport while activating the northern side with parking for the adjacent development. This could potentially provide up to an additional **10 spaces**.
- Preserve traffic capacity westbound on Kosciuszko Road by retaining two lanes during peak periods but allowing kerbside parking during business hours and in the evening. The conversion of the second eastbound lane to parking is supported.

The Parking Plan identified several locations and opportunities to increase the parking supply. These include:

- Kosciuszko Road – opportunity for **93** new parking **spaces** created on-street, as identified in the Snowy Mountains SAP Public Realm Concept Design, offset by a **50-space reduction** on other streets. These 93 spaces are provided in both the eastbound and westbound existing traffic lanes. There will be approximately 53 spaces available for parking during the AM peak as the westbound lane remains open to increase traffic capacity.
- Nuggets Crossing surface car park – potentially expanded to cover the needs of any future redevelopment (estimated as **440 space increase**).
- Mitre 10 surface car park – potentially expanded to cover the needs of any future redevelopment (estimated as **350 space increase**).
- Jindabyne Waterfront Development – potentially expanded to cover the needs of any future redevelopment (estimated as **150 space increase**).

- Jindabyne Central School Site – potentially expanded to cover the needs of any future redevelopment (estimated as **150 space increase**).
- Kalkite Street parking – opportunity to create a two-storey parking facility, potentially providing an additional **62 spaces**.
- Thredbo Terrace parking (adjacent to new medical centre) – opportunity to create a three-storey parking facility, potentially providing an additional **117 spaces**. This parking could be used as an alternative for parking at Banjo Paterson Park during special events.
- Town Car Park – opportunity to relocate the coach spaces to the bus area in front of the Snowy Region Visitors Centre, creating space for an additional **36 car parking spaces**.

ILLEGAL LAKESIDE CAMPING PARKING

Consultation with Snowy Monaro Regional Council indicates that illegal camping is an increasing problem during the summer and winter at various locations around the lake and other locations such as at Thredbo. Council has attempted to control the activity by installing No Stopping signs and sending parking inspectors to enforce the restrictions. While effective at that location, the problem has moved to other areas.

Other areas have used on-the-spot fines for illegal parking, littering, etc. However, signage at camping hotspots has been the most effective solution.

The proposed park-and-ride sites (see section 6.6.2) could be repurposed in summer as a low-cost camping location within walking distance of town. Fines at undesirable locations for camping in combination with a low-cost approved camping area would offer an alternative to illegal camping that could be an additional drawcard for the tourism of the region. Banff Canada has a large area for RV parking on the edge of its township.

6.6.2 *PROPOSED PARK-AND-RIDE*

With limited parking within the National Park, an alternative is to allow people to switch modes, but still drive to the area using a proposed park-and-ride facility. A mountain shuttle service to link the new park-and-ride to the alpine resorts offers flexibility and could make use of buses on weekends that are used for school and regular passenger services during the week. It is envisaged that visitors staying in Jindabyne will use stops throughout the town, whilst visitors from further away will use the dedicated Jindabyne Park and Ride to access the mountain shuttle.

The intersection of Southern Connector Road and Barry Way, shown in Figure 6.5, is approximately 2 km from the centre of Jindabyne. It is seen as a good location for this facility as it could:

- provide good accessibility to the key road network
- intercept vehicles before they add to the identified congestion locations on Alpine Way and Kosciuszko Road
- connect easily to a new mass-transit service (mountain shuttle) to Thredbo and Perisher
- occupy land that is not identified for other uses and will not cause environmental issues (requires further assessment).

The Park and Ride has been progressed in the Snowy Mountains SAP Concept Design. The concept design, shown in Figure 6.15 accommodates 250 carparking spaces, including 5 accessible spaces, motorcycle spaces and spaces for vehicles with trailers. The entrance to the Park and Ride facility is proposed via Barry Way, south of the proposed Barry Way and Southern Connector Road roundabout. A shared path is also proposed along Barry Way to connect to the park and Ride. This facility includes an enclosed bus shelter with bicycle parking, toilet amenities, storage area, a kiosk, lockers, and a seating/waiting area, providing comfort from any unpredictable weather.

Variable message signs (VMS) or other permanent signage should be used to direct people to this facility, rather than continue along the Southern Connector Road to the alpine resorts via private car.

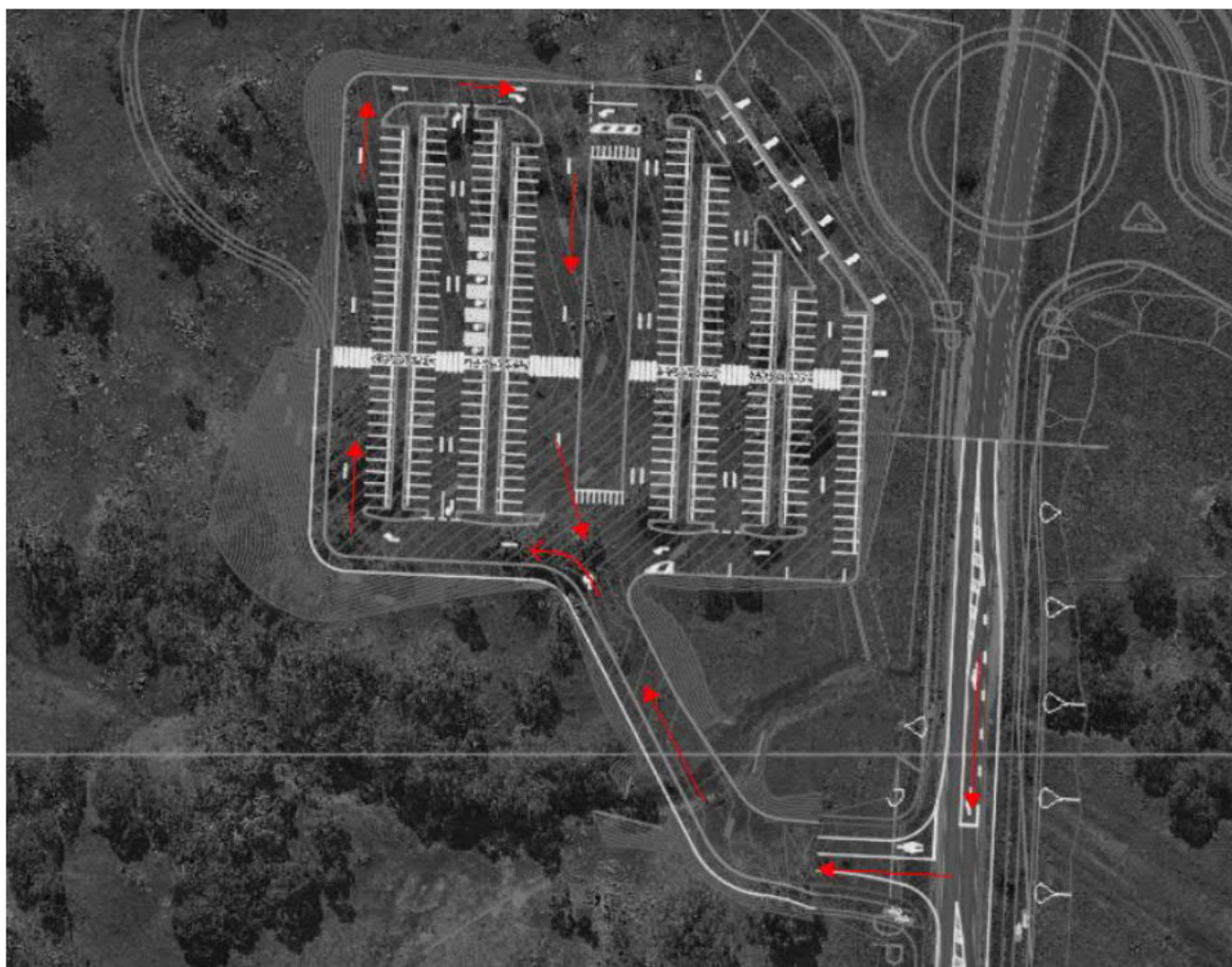


Figure 6.15 Jindabyne Park and Ride concept design (Concept Design Report, 2021)

6.6.3 ALPINE RESORTS

As identified in section 6.1, winter day visitor numbers are expected to increase by approximately 35% by 2031, 70% by 2041 and 35% by 2061, subject to the wider capacity of the National Park. If current behaviour is maintained, these increases would translate to an additional: 2,300 parked cars in 2031, 4,650 parked cars in 2041 and 2,300 parked cars in 2061. Increasing the amount of overnight accommodation and parking at Thredbo, Perisher and Bullocks Flat would have the advantage of relieving the pressure on the daily travel to and from the National Park.

Given the environmental impacts of increasing the footprint of parking within the Kosciuszko National Park beyond existing disturbed sites and the cost of providing multi-storey and basement parking, as well as the constrained road capacity on Alpine Way and Kosciuszko Road, it is recommended that building additional day parking at Thredbo and Perisher beyond what has already been approved is not the preferred transport solution. It is proposed that parking at the alpine resorts be capped at the existing levels plus approved changes, with the following changes described below.

No increases are proposed to overnight car parking in the alpine areas, except for some spaces associated with development at Thredbo. Visitors to the back country is likely to increase over both the winter and summer months. Overnight visitors should be encouraged to park at the Park-and-Ride facility and use the mountain shuttle to access the back country. The limited overnight public parking at Thredbo and Guthega will remain.

An additional car park is proposed for Pipers Gap, near Perisher. This car park will not contain additional spaces but will formalise kerbside parking and replace existing spaces that will be reallocated to development. Any additional parking should be staged to align with the implementation of alternative forms of transport to the alpine resorts. This parking would be supplemented with a Park-and-Ride facility in Jindabyne.

A summary of the proposed existing and proposed parking numbers is provided in Table 6.10. To make this system equitable, a review of parking and Skitube ticket costs is recommended.

Table 6.10 Existing and proposed parking space numbers at alpine resorts - winter

LOCATION	EXISTING			PROPOSED FUTURE		
	Day parking	Overnight parking	Total	Day parking	Overnight parking	Total
Perisher	2,576	119	2,695	2,645	119	2,764
Bullocks Flat	1,973	1,727	3,700	1,973	1,727	3,700
Thredbo	1,136	506 plus 858 private	2,500	1,250	709 plus 858 private	2,817
Total	5,685	2,352 plus 858 private	8,037 plus 858 private	5,868	2,555 plus 858 private	8,423 plus 858 private

6.6.4 SMARTER USE OF PARKING

Parking is a resource that can be managed to get the best and most efficient use and to avoid the need to undertake construction of extra spaces. Some strategies to make better use of the current parking facilities include:

- monitor the number of available parking spaces and make this information available to visitors before they select their method of transport. This can be done by tracking the number of vehicles entering and leaving the National Park through the gates and calibrating using video or sensing technology (subject to ability to operate in snow conditions)
- requiring visitors to pre-book their parking space before arriving, or at the National Park gates (if any are still available). This would include the NPWS parking fee and could be adjusted as a pricing mechanism to make other modes of transport more attractive and would be separate to the NPWS person entry fee. Only the maximum number of permitted spaces would be available to book. Vehicles unable to park due to weather conditions could be offered alternative parking at Bullocks Flat and a discount on the Skitube ticket
- offering parking at Bullocks Flat as a reduced-price alternative (in combination with a review of the Skitube pricing), but still requiring a booking to control numbers
- making parking availability information available to visitors via the NPWS website while providing information on alternative travel options.

6.6.5 ELECTRIC VEHICLE CHARGING STATIONS

With the increase in take up of electric vehicles range anxiety is heightened in locations such as the Snowy Mountains due to the harsh weather conditions and remoteness of destinations. With the greater take-up of electric vehicles, and the modernisation of accommodation, the number and locations of charging points is likely to increase over time.

Vehicle charging stations are currently found in the following locations:

- Jindabyne – Snowy River Avenue Car Park (two), Rydges Horizons (two), The Panorama (two), Alpine Resort Motel (one), Touchdown Lodges (one)
- Perisher – The Man from Snowy River Hotel (one), Corroboree Lodge
- Bullocks Flat – Skitube Station (one), Lake Crackenback Resort (two)
- Thredbo – Thredbo Alpine Hotel (one), 3 Cedar Creek (one).

There are a number of potential sites for additional charging stations, including the park-and-ride where charging for visitor cars could allow people's vehicle to be charged while they enjoy the National Park. It is recommended that the provision of charging stations is undertaken with market providers but also considered in the establishment of new parking facilities as take up grows and evolves from hybrid technology to fully electric.

An electric zero-emissions bus could be used for the new mass-transit system. If adopted, a fast charging station could be accommodated at the park-and-ride and in Jindabyne to reduce charging demand at the depot.

6.6.6 *PERISHER, SMIGGIN HOLES, GUTHEGA*

The proposals for parking at Perisher largely involve relocating current parking to maintain current numbers. The safety concerns for pedestrians from parked vehicles interacting with vehicles alongside Kosciuszko Road remain a priority for NPWS. An additional car park at Pipers gap is proposed. This at-grade car park will formalise the kerbside parking along Kosciuszko Road. It will also accommodate the relocation of some spaces from the Perisher day car park when some of this space is redeveloped.

Further details of the parking proposed for Perisher Pipers Gap, Smiggin Holes and Guthega are shown in Table 6.11. To address the safety concerns and limit the amount of parking in the National Park, the changes include:

- re-organisation of parking at Perisher main village as development occurs in parts of the existing car park
- the creation of a new facility at Pipers Gap on land that is already disturbed, and therefore would not damage the National Park environment
- the new car park at Pipers Gap will allow the removal of car parking from one side of Kosciuszko Road.

The revised parking total represents an increase of 69 day parking spaces compared to the existing situation a 2.7% increase. This incorporates the approved and some of the currently proposed parking changes to comply with essence of the strategy of “no increase in current and approved parking numbers” and alignment with other alternative transport.

Table 6.11 Existing and proposed parking space numbers at Perisher group of resorts - winter

LOCATION	EXISTING			PROPOSED FUTURE		
	Day parking	Overnight parking	Total	Day parking	Overnight parking	Total
Perisher Village	1,185	65	1,250	1,137	65	1,202
Kosciuszko Road to Pipers Gap	360 informal overflow	—	360	356 on one side only	—	356
Pipers Gap	—	—	—	581 proposed formalised parking	—	581
Kosciuszko Road opposite Smiggin Holes workshop	160 informal overflow	—	160	—	—	—
Prussian Creek chain bay	150 informal overflow	—	150	—	—	—
Dainers Gap chain bay	150 informal overflow	—	150	—	—	—
Smiggin Holes	471	29	500	471	29	500
Guthega	100	25	125	100	25	125
Perisher Sub-total	2,576	119	2,695	2,645	119	2,764

An *Options Paper – Perisher Range Resorts access and car parking capacity issues* (February 2021) has been produced by a Working Group including Transport for NSW, NPWS and Perisher (Vail Resorts). It identified similar issues to be addressed in the proposed future situation. The main difference to the strategy in this plan is that the Options Paper sought to increase the overall level of parking to accommodate the maximum parking demand on the majority of days per year. It recommends that the 820 informal spaces be replaced by 1,328 (an increase of 508 spaces), made up of:

- 356 spaces formalised on Kosciuszko Road to Pipers Gap
- 581 spaces at Pipers Gap
- 391 additional spaces at Smiggin Holes (including in front of the workshop) – not included in the recommended parking by this study.

This assessment has considered the wider implications of road safety and congestion on Kosciuszko Road, minimising travel in the National Park and making better use of public transport (such as the Skitube and the Mountain Shuttle connected to a Park-and-Ride facility) to move more people in addition to the increasing demand for parking within the alpine areas.

The proposed increase of 391 spaces in parking at Smiggin Holes is not included in Table 6.11 as it is considered contrary to the “no increase in current and approved parking numbers” strategy when applied in combination with the other changes recommended in the Options Paper. This would also free-up the area at Smiggin Holes workshop for a proposed entry treatment for the area. If the Smiggin Holes increase is considered essential, it could be accommodated with a corresponding reduction to the Pipers Gap formalised parking such that the total number of spaces is the same. It is acknowledged that there is likely to be a greater demand for parking at Pipers Gap over Smiggin Holes.

From a staging viewpoint, it is recommended that the replacement of informal parking alongside Kosciuszko Road with the formalised parking at Pipers Gap and on one side of Kosciuszko Road (outbound) to Pipers Gap be undertaken as a first stage. The parking within Perisher Village can be progressed as developments occur, with the overall number of parking spaces transitioned to the new slightly reduced total. The new Mountain Shuttle operating from Jindabyne and the Park-and-Ride facility and gradual improvements to the Skitube capacity could be options to accommodate any temporary short falls in capacity during construction.

6.6.7 BULLOCKS FLAT

The parking at Bullocks Flat is used by cars and coaches for people using the Skitube. It is also used for overflow parking from Perisher when there are adverse weather conditions. The ridership on the Skitube is forecast to increase in the future. It is estimated that by 2061 a total of 2,813 parking spaces would be required at Bullocks Flat, with a peak of approximately 3,600 in 2039. This can be provided with the current capacity of 3,700 spaces at Bullocks Flat.

Greater use of the parking at Bullocks Flat can be achieved with a comprehensive review of Skitube ticket prices and National Park entry fees, which could make parking and using the Skitube more price competitive.

6.6.8 CHARLOTTE PASS

During summer, vehicles can drive and park at Charlotte Pass. The redevelopment at Charlotte Pass proposed in the Structure Plan and discussed at the Enquiry by Design Workshops modifies existing parking areas and identifies new parking areas:

- the redevelopment of parking in Charlotte Pass will need to consider the increasing demand for summer parking
- additional overnight parking for Charlotte Pass could be provided at Sawpit Creek, with a shuttle bus and the oversnow bus providing a connection during winter
- the limited short stay parking in the turnaround will be maintained and formalised. It should also accommodate a bus zone for coaches/minibuses and a drop off zone only
- formalising roadside parking on the northern verge of Kosciuszko Road between the turning circle and the turn off to the village (Parking Area P1). This would increase the safety of car parking, allow the southern side of the road to be used by pedestrians, be clear of road cyclists climb to the turning circle and be located within the boundaries of the Charlotte Pass ski area

- providing additional parking at Charlotte Pass village (Parking Area P2) and operating a shuttle bus to the Summit Road turn around as well as a chairlift and walking trail to the Summit Walk commencement
- if all parking in Charlotte Pass is exhausted, the shuttle bus should continue to be parking at Perisher Valley car park (Parking Area P3).

Consultation with NPWS indicated that excessive parking occurs during summer on Kosciuszko Road at the turn-around at the commencement of Summit Road near Charlotte Pass, see Figure 6.16. Parking alongside the road occupies the shoulder, making it more difficult for pedestrians and cyclists to get around the parked vehicles.

Parking on the northern side is preferred as it allows drivers to identify whether spaces are available before parking or returning to Charlotte Pass, avoid the drop-off on the southern side and allows pedestrians to walk with traffic on the southern side.

Photos of parking over the Easter long-weekend in 2021 indicate that parking extended from the turn-around down the hill to past the Charlotte Pass turn-off. It is expected that if parking is formalised on the northern side between the turn-around and the Charlotte Pass turn-off, supplemented with additional parking in Charlotte Pass and the shuttle bus from Perisher, this demand will be sufficiently catered for without impacting the National Park environment.



Figure 6.16 Kosciuszko Road/Summit Road parking

6.6.9 *THREDBO*

There are currently development applications for an additional 427 parking spaces at Thredbo. However, several of the development areas identified in the Snowy Mountains SAP Structure Plan affect sites with approvals for additional parking. Considering the sites identified and the need to reduce car usage to the resorts especially for day visitors, it is recommended that:

- car park 3 (203 spaces) be converted from day parking to additional overnight parking
- the proposed expansion of Car Park 4 go ahead (extra 188 day spaces)
- the proposed expansion of Car Park 3 go ahead (extra 135 day spaces).

With other minor adjustments, this recommendation would increase parking by 317 spaces instead of the proposed 427 spaces.

The future provision of parking at private chalets should be guided by a maximum allowance of say, two spaces per dwelling. This would balance the need for access with the improved range of travel choices on offer to Thredbo.

6.7 BUS AND COACH SERVICES

6.7.1 GROWTH OF EXISTING SERVICES

As discussed in Section 3.5, there are currently a large number of bus services operating in the Snowy Mountains SAP including:

- public buses (coaches) to Canberra and Bombala
- community buses within Jindabyne and to/from neighbouring villages
- school buses
- privately run, seasonal shuttle buses between Canberra Airport, Snowy Mountains Airport, Jindabyne and the alpine resorts
- coaches to intra and interstate destinations.

While there is scope for each of these services to grow, with increased frequency to match the increase in residents, seasonal workers and visitors, there is also scope to rationalise this range of services to a network that is more legible to potential customers and consolidates multiple buses providing a similar service. Transport for NSW monitors its regional bus services and plans changes as required in line with service contract reviews and future operating models (e.g. potential for on-demand services).

An Airport shuttle bus service from Canberra Civic to Jindabyne via Canberra International Airport, Cooma and Snowy Mountains Airport is seen as an important upgrade of the existing services to boost the connections to the Snowy Mountains SAP from other parts of Australia.

The tourism developments at Hatchery Bay fall outside the scope of the Park-and-Ride and Jindabyne-based Mountain Shuttles. As these would be privately run ventures, private shuttle buses can provide a convenient service between the developments and the alpine resorts in a similar way to other smaller resorts. Introducing many stops on the Mountain shuttles will reduce its competitiveness with the private vehicle in terms of travel time.

6.7.2 PARK-AND-RIDE AND MOUNTAIN SHUTTLE

The proposed system for the mountain shuttle bus between Jindabyne/the park-and-ride facility and the alpine resorts is a bus-based system. This new service could address the transport needs of visitors and seasonal staff of the resorts. A map of the winter routes is shown in Figure 6.17 and the summer routes in Figure 6.18. The system would have the following attributes:

- rapid limited stop shuttle services to compete with cars in terms of travel times
- accessible low-floor vehicles with space for ski gear
- connection with the proposed park and ride in Jindabyne, at the intersection of the Southern Connector and Barry Way
- new depot located in the industrial areas in Leesville or Jindabyne
- four local (walk-up) stops in Jindabyne plus the new park-and-ride facility. Stops in Perisher Village, Pipers Gap, Bullocks Flat and Thredbo Village
- summer stops at Kosciuszko Trail head, Charlotte Pass, Crackenback and the Adventure Park.
- ability to attach trailers in summer to operate as a Mountain Bike shuttle.

A Mountain Shuttle trial was proposed for the 2021 winter by TfNSW. Unfortunately, this trial was only operating for a few days before it had to be put on hold due to Covid-19 travel restrictions. The Mountain Shuttle would operate as a staged approach, initially picking up passengers at stops around Jindabyne before a dedicated Park-and-Ride facility has been built.

There are also an opportunity to operate the Mountain shuttle as a loop system within Jindabyne in the late afternoon and evening during the winter season to link the town centre with accommodation located throughout Jindabyne utilising the same limited local bus stops. This approach should be further explored with TfNSW in conjunction with planning for the mountain shuttle and regular contracted bus services in the region. Such a service would reduce the peak demand for car parking in the town centre and provide a comfortable service in the cooler months of winter.

To minimise the impact on the National Park, the buses could be an all-electric or hydrogen – zero emissions fleet. Electric charging could be provided within the depot and fast charging at the park-and-ride facility and Jindabyne bus hub. This move towards zero emissions transport would be in line with Transport for NSW’s recently released Future Transport Technology Roadmap 2021–2024.

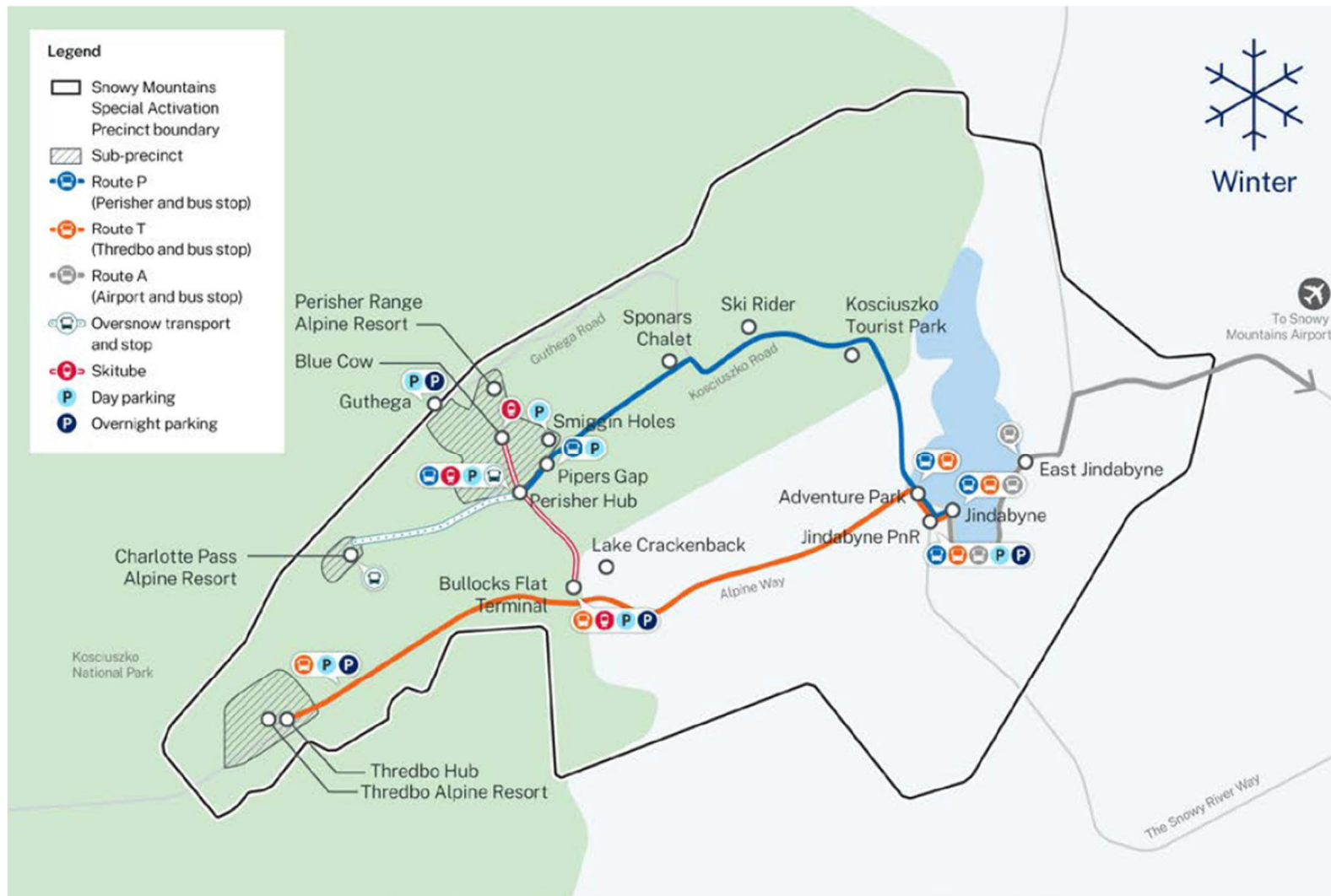


Figure 6.17 Mountain shuttle service – winter

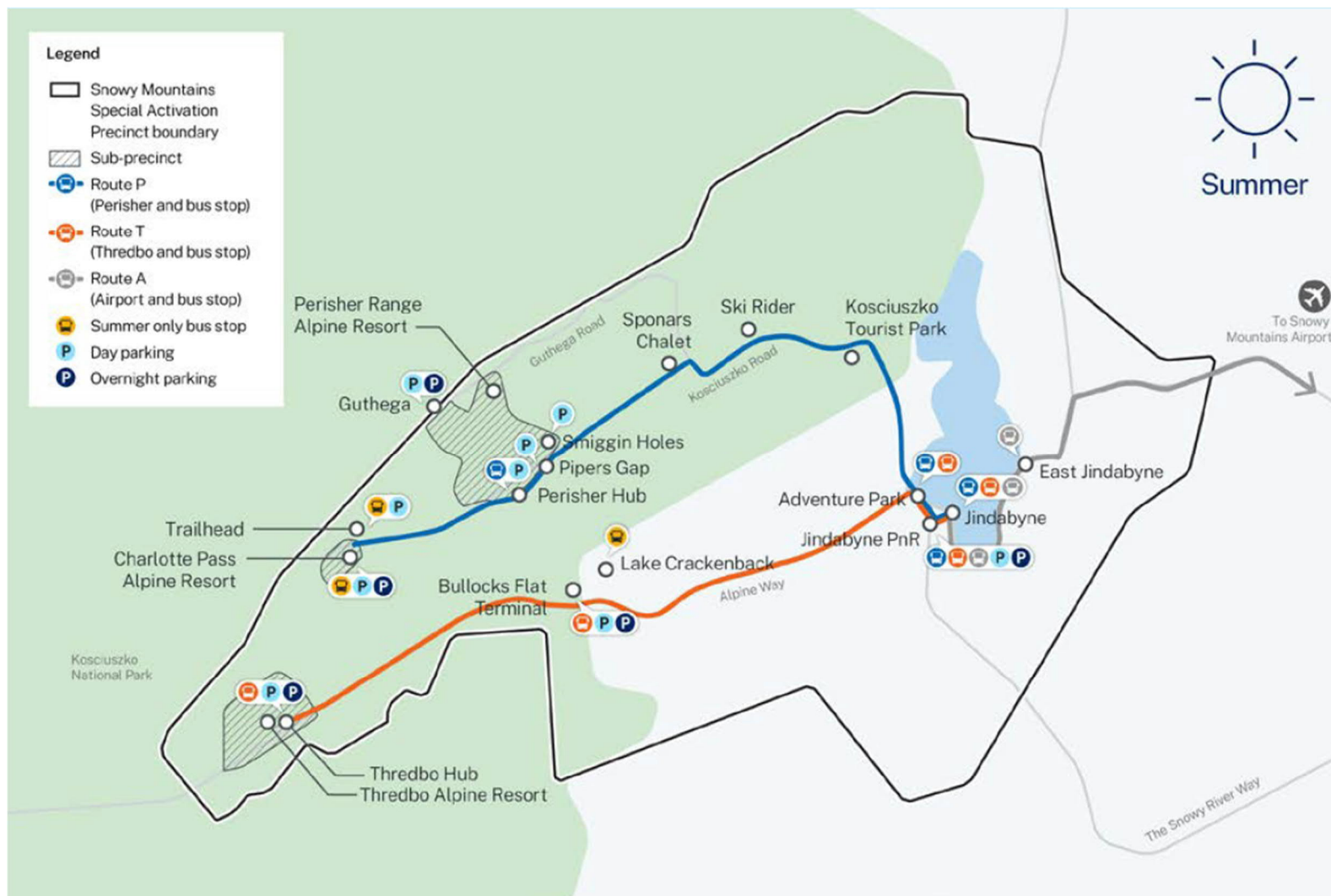


Figure 6.18 Mountain shuttle service - summer

The summer service has been identified to support the demand for visitors to the Kosciuszko Trail head (Perisher route) and mountain biking (Thredbo route). The summer service includes new stops at the Adventure Park, Crackenback, Kosciuszko Trail Head and Charlotte Pass. It is proposed that the shuttle service includes bike trailers to support mountain biking in the region.

Figure 6.19 shows the proposed drop off/pick up movements for the shuttle bus to the Kosciuszko summit walk trail head. The bus will first drop off passengers at the turnaround (P1), before continuing to Charlotte Pass (P2), dropping them off at the turnaround and then continuing back down the Mountain towards Perisher (P3) and on to Jindabyne.



Figure 6.19 Mountain shuttle service – summer route to Kosciuszko summit walk

Some preliminary calculations have been undertaken to estimate the scale of the new services. The key details are:

- distances of approximately 31 km to 37 km
- average speeds of approximately 45 km/h including time at bus stops
- round trip time of approximately 90 to 110 minutes including layover time
- 1.5 to two-hour peak period in winter
- up to 140 services per hour, transporting 7,250 passengers to and from the ski fields in winter
- a fleet of up to 200 buses during peak visitation (year 2039).

A summary of the journey details for the four route is shown in Table 6.12.

Table 6.12 Shuttle bus service summary

SHUTTLE ROUTES	LENGTH (km)	TIME (min)	SPEED (km/h)	TOTAL ROUND TRIP (min)
Jindabyne to Thredbo	37.1	46	48.2	103
Jindabyne to Perisher	33.6	41	49.3	92
PnR to Thredbo	34.8	42	49.5	95
PnR to Perisher	31.3	37	50.9	84

Notes Assumes 10 minutes layover

To operate the bus service with the passenger demands forecast based on the unconstrained visitor and population growth targets, it has been estimated that a fleet of approximately 200 buses would be required. This is a large number, especially given the regional setting it would be operating in. If a larger capacity vehicle were used, the number of services could be reduced.

6.7.3 JINDABYNE SERVICES

To replace the convenience of the current door-to-door services, the bus and coach network needs to be frequent, reliable, lower cost to the passenger and able to serve multiple destinations along the route. Potential services include:

- Airport Shuttle – Cooma to Jindabyne via Snowy Mountains Airport
- East Jindabyne and Tyrolean Village to Moonbah via Jindabyne and The Station
- Jindabyne to Perisher (Mountain Shuttle) – Jindabyne to Pipers Gap and Perisher, extension to Charlotte Pass in summer and low-season
- Jindabyne to Thredbo (Mountain Shuttle) – Jindabyne to Thredbo via Bullocks Flat and Crackenback in summer season.

Where appropriate, these services would have stops for local resident's travel along their route. However, the new rapid services (Mountain Shuttle) would have limited stops to compete with private vehicles in terms of travel time. The proposed Mountain Shuttle route and stops in Jindabyne is shown in Figure 6.20. This shuttle service was ran by TfNSW as a trial in the winter of 2021, before Covid-19 travel restrictions were implemented. It is expected that this trial will continue in 2022. Once the Park and Ride is established, the shuttle will connect this facility with Jindabyne.

The planning and delivery of future local bus services in Jindabyne will be undertaken by Transport for NSW in line with bus service contract reviews which will consider the growth of the township over time.



Source: TfNSW Mountain Shuttle Trial

Figure 6.20 Mountain shuttle service – Jindabyne

6.7.4 SUPPORTING INFRASTRUCTURE

The winter weather conditions in Jindabyne and the rest of the Snowy Mountains SAP make waiting for a bus more challenging than other areas. For all major stops, including the park-and-ride sites, it is recommended that high quality waiting areas with shelter that protects passengers from the weather are provided.

In Jindabyne, the creation of a bus hub offers the potential for a more comfortable waiting area, with air conditioning, seating and toilet facilities. Similar facilities could be provided at Perisher, Bullocks Flat and Thredbo. This would provide a secure place for passengers to wait for their next service and would aid in the activation of the town during winter.

An electric zero-emissions bus could be used for the new mass-transit mountain shuttle. This type of technology has been successfully applied in other alpine areas such as Park City Utah, USA, as shown in Figure 6.21. These vehicles use regenerative braking to charge their batteries on the way down the hill, for use on the return journey and for in-vehicle heating. There may be a need to equip the stops at Thredbo and Perisher with on route charging facilities to allow for the use of zero emission buses on these routes.

The Leesville industrial area is a potential location for a new bus depot to service the increased services around Jindabyne and the park-and-ride shuttle bus. The depot may require access to a power supply capable of charging the electric buses. Subject to the number of buses required for the shuttle service, a fast charging station could be accommodated at the park-and-ride and in Jindabyne to reduce charging demand at the depot.



Figure 6.21 Advertisement for electric bus in Park City Utah, United States

6.7.5 MOBILITY AS A SERVICE (MAAS)

The concept of Mobility as a Service (MaaS) is the aggregation of transport services into an electronic platform which offers a centralised payment mechanism for services. This provides the transport customer with price and scheduling information at their fingertips when using a personal mobile device.

This technology remains in development in Australia and the Snowy Mountains is one location which could benefit from its application. A number of private transport operators have expressed their willingness to operate shuttle services between Jindabyne and the ski fields however there is a concern that a disaggregation of services will dilute demand between services and undermine the travel market's viability.

6.7.6 RIDESHARE

While a taxi service does operate within Jindabyne and to surrounding areas, there is no ride share company currently operating in Jindabyne. This is likely due to the high seasonality of activity in Jindabyne, the compact nature of the township, the long distances between the township and the ski fields and the operation of the Jindabyne night bus for 22 years.

With the growth in demand through increased population and visitation, the viability of providing ride share services will be market-led. Whilst Uber indicated their service would be available in Regional NSW by April 2020, it currently remains unavailable in Jindabyne.

Ride share services provide another alternative to providing more parking but is likely to only be effective within the township of Jindabyne and surrounding villages.

6.8 WALKING

This chapter includes a high-level walking needs assessment, both within Jindabyne and the wider Snowy Mountains SAP. It is understood that there are deficiencies with the existing pedestrian network in Jindabyne. Whilst some concerns may be addressed in the following section, further work will be required such as a Pedestrian Access and Mobility Plan to provide a comprehensive understanding of the issues and future opportunities for pedestrian infrastructure.

A comprehensive overview of the existing pedestrian facilities and hiking options throughout the study area are included in Section 3.

6.8.1 WALKING IN JINDABYNE

The need for safe crossing opportunities and a more integrated pedestrian network within Jindabyne has been raised by numerous stakeholders. The existing pedestrian network is shown in Section 3, Figure 3.20.

Throughout Jindabyne the main community attractors for pedestrians are the schools (Jindabyne Central School and Snowy Mountains Grammar School), the shopping and commercial precinct, the lake foreshore and other sports facilities and playgrounds. In the future, new residential developments around the lake and community developments such as new schools or the proposed alpine training centre would also encourage pedestrian activity.

In addition to the above community attractors, the road network is also widely used for recreational and training purposes as shown in the Strava data analysis in Section 3.

The constraints of the current pedestrian network include:

- Kosciuszko Road acts as a barrier to the lake foreshore with no priority pedestrian crossing opportunities.
- No formalised pedestrian links between the residential areas in East Jindabyne and the town facilities. Only dirt tracks exist currently. There is also no pedestrian links to the south of the town, such as to The Station or Winter Sports Academy.
- There are minimal formalised pedestrian paths across Jindabyne, with footpaths provided only near the foreshore and around the main shopping precinct. This is a barrier to walking, especially for those with reduced mobility such as wheelchair users and prams.
- There are also road safety concerns with the lack of pedestrian facilities. In particular across popular pedestrian demand lines (e.g. to the foreshore), or around the local schools and sports facilities.

Key opportunities to improve the pedestrian network include:

- Safe crossing opportunities across Kosciuszko Road, linking the lake foreshore with the community facilities, tourists and local residents. Pedestrian signals near the commercial precinct could be one opportunity.
- Along the foreshore there are opportunities to create developed promenades as a focal point for Jindabyne. This could include a pedestrian link to the closest island on Lake Jindabyne (approximately 400 metres).
- A shared walking and cycling network connecting the outer villages of Tyrolean Village and East Jindabyne to the main precinct in Jindabyne. Also, to the outer facilities of The Station and the Sports and Recreation Centre to the township.
- Improved facilities linking the main shopping precinct to the surrounding residential streets. This would help encourage mode shift of both local residents and tourists away from private vehicles and alleviate some congestion that's experienced in the shopping centre car parks.
- Pedestrian infrastructure should also be considered in linking the local street network into the schools and sports fields. This would further encourage students within Jindabyne to walk/ride to school safely.
- In general footpaths should be considered in residential areas, including the outer villages of East Jindabyne and Tyrolean Village. Further analysis into the location and width of these footpaths is required on a case by case basis.

These opportunities discussed above are shown diagrammatically in Figure 6.22.



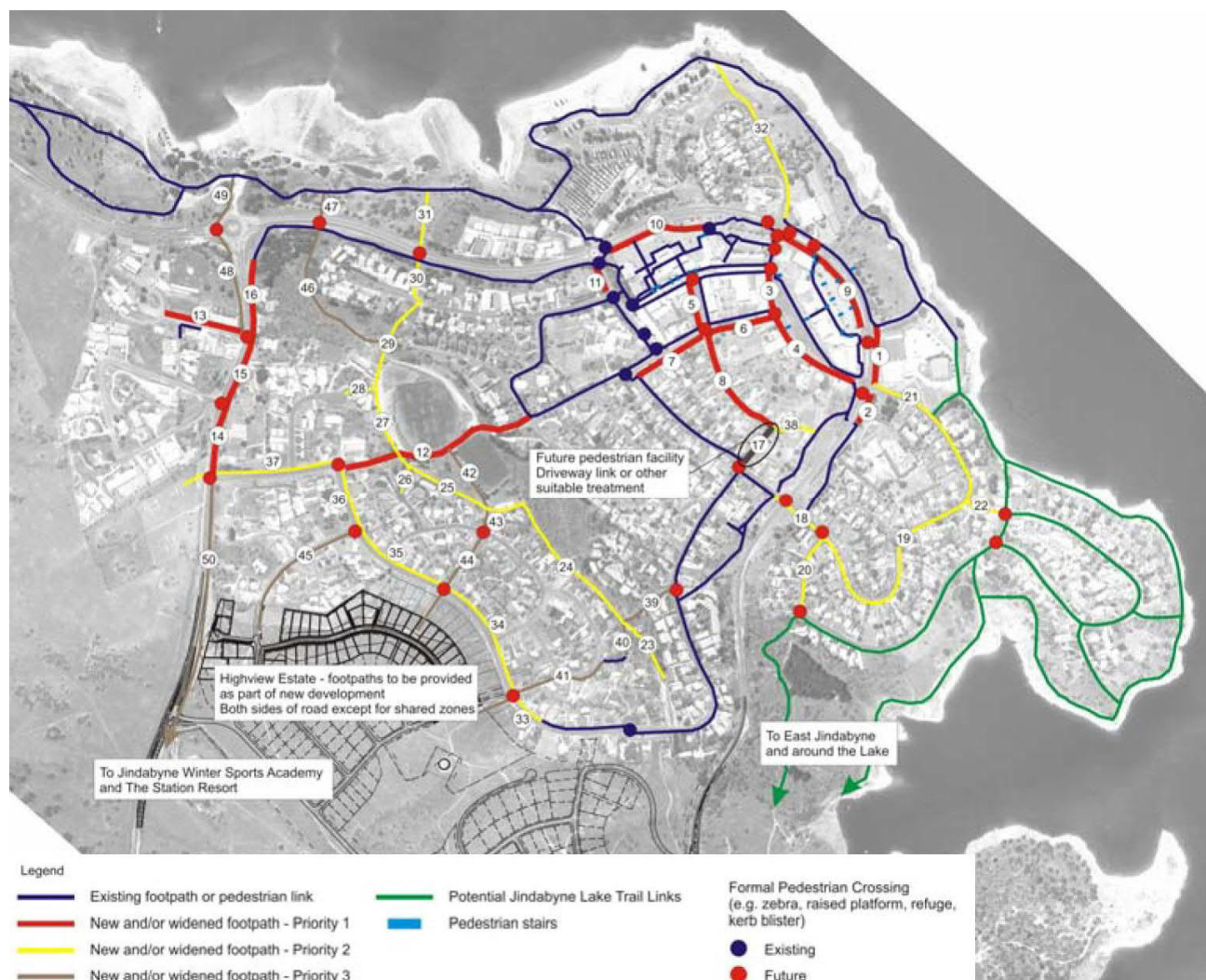
Base map Source: Six maps

Figure 6.22 Improvement opportunities for the pedestrian network

The extending the foreshore path further around Lake Jindabyne is an important opportunity to improve access, create a substantial recreation facility and make a feature of the lake for visitors. The section between Jindabyne and East Jindabyne is considered especially important for local access, and is likely to be one of the best used sections for pedestrians and cyclists.

The pedestrian desire line between Jindabyne and East Jindabyne (via Tyrolean Village) in Figure 6.22, directly across Lake Jindabyne, could augment the foreshore trail, providing a more direct pedestrian link to Jindabyne for locals wanting a convenient path rather than recreation or exercise. It could also have the additional benefits of reducing crowding on the popular section of the foreshore trail and creating a loop starting and finishing on the Jindabyne foreshore, which could attract visitors and locals for exercise and recreation.

The 2010 Traffic and Transport Assessment prepared as part of the Jindabyne Action Plan details improvements to the pedestrian network. It includes analysis of new footpaths and opportunities for pedestrian crossings across Kosciuszko Road. It is understood that since this study was released, priority projects have been completed. These suggested improvements should continue to be considered. The plan categorises the recommended footpaths into three priority categories, as show in Figure 6.23. Many of the Priority 1 upgrades are located around the retail core and along Barry Way with connections through to the current school. Work has already started on some of the Priority 1 upgrades, with progress based on available funding. The Plan notes that based on current funding, it would take 23 years to complete the Priority 1 works.



Source: Jindabyne Action Plan Traffic and Transport Assessment (GTA Consultants 2010)

Figure 6.23 Existing and proposed footpath and crossing facilities

The Snowy Mountains SAP structure plan has included Kosciuszko Road public realm treatments as a priority project. This should continue to investigate a high-quality pedestrian environment across and along Kosciuszko Road. In particular, crossing opportunities near the town centre and at intersections, seamlessly connecting residents to the lake. The Southern Connector Road will also assist in improving the pedestrian amenity as traffic volumes are diverted away from Kosciuszko Road.

The proposed relocation of the high school to the Sport and Recreation site will create the need for safe pedestrian and cycle links to the new location. The creation of the new Southern Connector Road between the township and the new school site, creates a barrier and potential safety risk. To address this issue, a pedestrian and cycle bridge over the Southern Connector Road is suggested. The new bridge would connect to the active transport network within the Sport and Recreation site, and a path within the new residential area in Growth Area 2 shown in Figure 6.5. The bridge could be delivered as part of the early works for the Southern Connector Road. In the long-term a path is planned on the east side of Barry Way, when it is expected that the road would have changed to a more urban environment.

6.8.2 ALPINE RESORT PEDESTRIANS

There is some formalised pedestrian infrastructure within the alpine resorts in the Snowy Mountains SAP area, in particular connecting the day car parking with the alpine resorts. It is noted that in winter, when the resorts have the peak demand, these footpaths may be covered in snow. Slow speed traffic environments should be encouraged within the alpine resorts, acknowledging the high number of pedestrians using the road network.

There are concerns with overflow parking along Kosciuszko Road and the high number of pedestrians walking up to 2 km on the shoulder from their cars to access the alpine resort. In winter when this occurs, the speed limit is dropped to 40 km/h. A wide shoulder for pedestrian access should be considered while parking is maintained at this location.

6.8.3 HIKING

As hiking increases in popularity in the region, the hiking trails have the opportunity to be improved or expanded on. It is noted that the Snowies Iconic Walk is currently being developed. Around the busier walks, such as to the summit of Mount Kosciuszko and at Guthega, facilities can help support tourism growth. This could include picnic tables, toilet facilities and car parking areas.

Additional hiking trails or improved hiking trails could also consider further tourism attractors. Examples include an art walk or educational walk focussing on aspects such as Indigenous heritage.

6.9 CYCLING

6.9.1 CYCLING WITHIN JINDABYNE

As discussed in Section 3.7.3, cycling within Jindabyne occurs predominantly on the road network with the exception of the shared path along the foreshore of Lake Jindabyne. From the open source Strava data, the road network appears to be well utilised by recreational and training athletes. For some cycling users with plenty of experience, the road network may be a comfortable option for them. However, there are many users who do not have the skill or confidence to ride on the road network. There are also locations (such as Kosciuszko Road between Jindabyne and East Jindabyne) where cyclists on the road are viewed as a safety risk.

For shorter trips in and around Jindabyne there are no suitable facilities and users must share the road network. Within Jindabyne itself, many roads are of a slower speed and cycling on the road network may be suitable. There are two routes which should be addressed with a separated sealed cycleway, or at the least marked on-road cycle lanes to provide better cyclist safety and attractiveness:

- Kosciuszko Road from East Jindabyne to Jindabyne
- Barry Way from Jindabyne to The Station.

It is acknowledged that the Lake Jindabyne shared trail is being developed which is discussed further in section 4.6.2. However different cycle groups will use an unsealed shared trail, and this may not reduce the number of cyclists using Kosciuszko Road. Options for this shared trail should investigate creating a sealed shared path from the existing shared path to East Jindabyne.

A bike share scheme for Jindabyne should be investigated. This promotes active transport across town and provides an additional mode choice for tourists, visitors and locals who may not have access to bicycles. Due to the alpine winter environment, this bike share scheme will likely be most popular in the non-winter seasons, however there are opportunities to utilise a bike share scheme all year round.

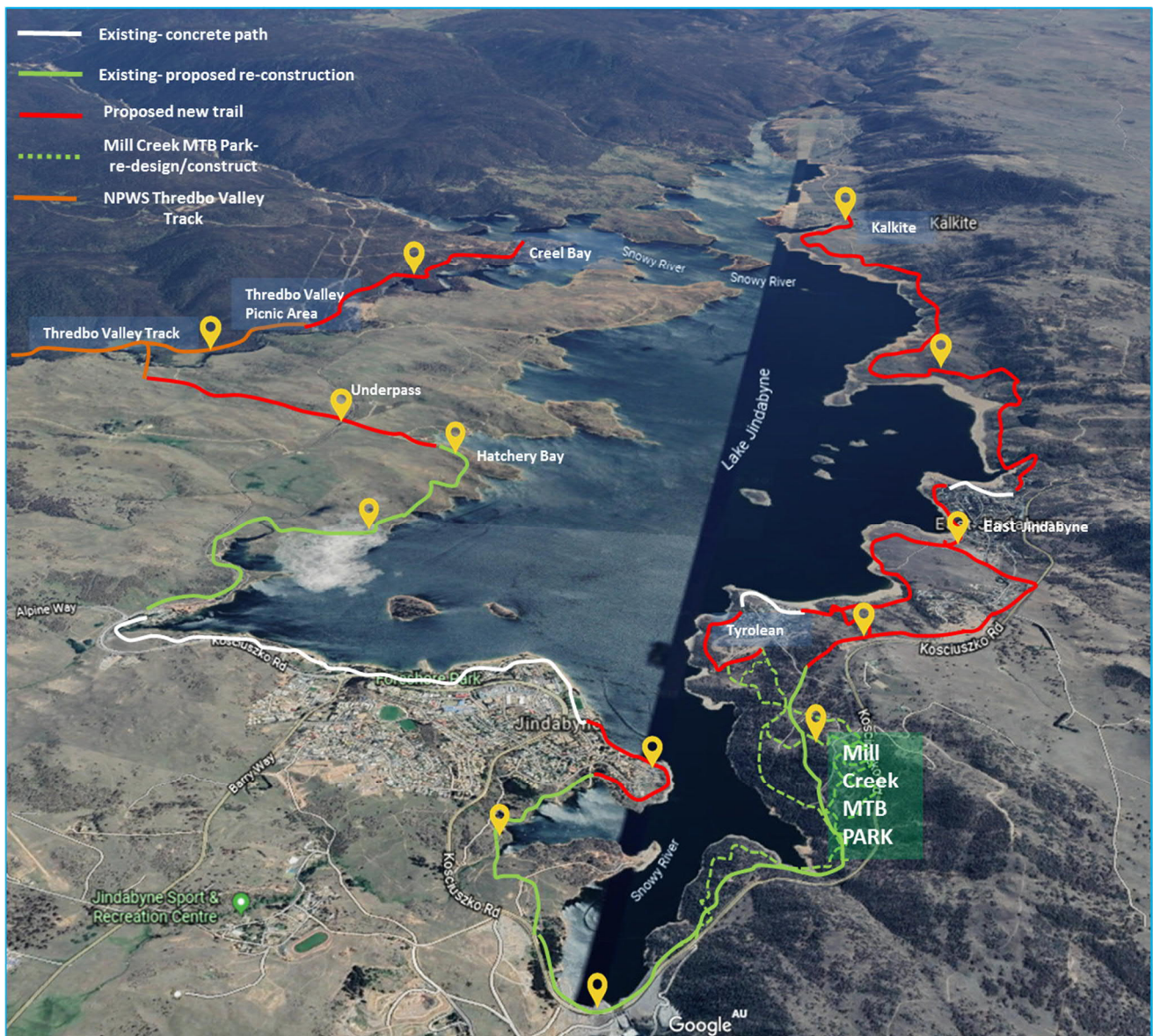
Bicycle parking should also be provided at any community destinations throughout Jindabyne and the surrounding villages. There is no formal bicycle parking requirement listed in the Snowy River Shire Development Control Plan (DCP). It is stated in the DCP to provide parking in high activity areas and near shopping centre entrances. Bicycle parking should also be provided at key recreational destinations both within Jindabyne (such as the foreshore) or around the Snowy Mountains SAP region.

6.9.2 LAKE JINDABYNE SHARED TRAIL

The Lake Jindabyne Shared Trail which extends along the lake foreshore has been a potential project for several years. Discussions with Snowy Monaro Regional Council have suggested that funding has been approved to secure a shared trail from Kalkite to East Jindabyne. Although this project is still in development, it will broaden the walking and cycling opportunities within the region. It is anticipated this shared path will be a popular walking and cycling route for tourists and locals alike.

SMRC completed a feasibility study for the Lake Jindabyne 'Around the Lake' Trail Experience in October 2021. Whilst this investigated a number of options, the preferred option for further investigations was a water-based transport service linking key destinations of the Lake Jindabyne Shared Trail across the lake. The currently proposed route by Snowy Mountains Regional Council is shown in Figure 6.24. It extends to Creel Bay on the western shore and Kalkite on the eastern shore.

There has been a Development Application for a link between East Jindabyne, Tyrolean Village and Cobbon Crescent. This link is viewed as critical as it provides an option for residents of East Jindabyne and the Tyrolean Village to access town via an off-road link. The current option for cyclists accessing town is to use Kosciuszko Road which is a high-speed road with challenging curves and gradients which presents a safety risk to cyclists and other road users. Consideration should be given to providing a sealed cycle path or shared path along this route. This will be more appealing to commuter (and some recreational) cyclists and will reduce the number of cyclists using the section of Kosciuszko Road into town.



Source: Snowy Mountains Regional Council, October 2021

Figure 6.24 Lake Jindabyne Bicycle and Shared Path route

One addition to the concept design would be a pedestrian and cycle bridge across the lake from Banjo Paterson Park in Jindabyne to the eastern shoreline south of Tyrolean Village – a distance of approximately 580 metres. This bridge would substantially reduce the walk and cycle distance between Jindabyne and Tyrolean Village and East Jindabyne by approximately 7.5 km. It is acknowledged that this bridge link may impact the navigation of sailing craft moored at Copper Tom and require approval from Snowy Hydro. The link and an iconic design could become a focal point for tourists visiting the Snowy Mountains SAP and provide relief for the constrained sections of shared path across the dam.

6.9.3 MOUNTAIN BIKING

The Snowy Mountains area continues to grow as a destination for mountain bikers. The investment in trails by the NPWS and Thredbo alpine resort have created a momentum for visitation in the non-ski season.

The Kosciuszko National Park Cycling Strategy (Office of Environment and Heritage, 2017) outlined a strategy with an aim to achieve the following outcomes:

- increased contribution towards conservation of park values through growth in new markets that enjoy and value National Parks
- environmentally sustainable, fit-for-purpose cycling opportunities that enhance or protect conservation, recreational, social and cultural values
- increased visitation including overnight stays to the Kosciuszko National Park and surrounding region
- transparent and consistent assessment of new proposals to ensure they achieve the outcomes above.

NPWS identified that there is strong evidence that the demand for cycling experiences is increasing in NSW and Australia. The Snowy Mountains SAP study area and Kosciuszko National Park are uniquely situated to capitalise on this growing demand.

Some of the key actions from this strategy relevant to the Snowy Mountains SAP include:

- protect significant and popular bushwalking experiences in the park by keeping bikes off these tracks, as per the Plan of Management for Kosciuszko National Park. Examples would include the Main Range to Kosciuszko Summit, Waterfall Track, the majority of the Pallaibo Track and Dead Horse Gap to Thredbo Village
- ensure all proposals for new trails are assessed against criteria designed to ensure that only tracks that can deliver positive and ecologically sustainable outcomes for conservation, recreation and tourism are approved
- consider opportunities for new trails that meet ecological sustainability, visitor safety, resource availability and quality experience criteria
- encourage private investment in cycling opportunities
- electric or e-bikes are defined as a bicycle designed to be propelled by human power with auxiliary propulsion motors generating a combined power output not exceeding 250 watts. These bikes are allowed on all fire trails, management trails and tracks within the park that are approved for cycle use in the plan of management
- complete the extension to the Thredbo Valley Track
- explore options and the ecological feasibility of extending the Thredbo Valley Track from Thredbo to the Cascades Trail via the river
- advocate for and collaborate with other stakeholders to complete the proposed Lake Jindabyne Foreshore Track linking Jindabyne with the Thredbo Valley Track extension
- focus promotional effort on a number of quality mountain-biking experiences to simplify decision making for new park visitors
- over the next decade, focus investment in Kosciuszko National Park on a selection of “Top Rides” that will complement other cycling opportunities outside the park
- collaborate with the alpine resorts to maximise and improve the connectivity of cycling experiences across the park, ensuring consistency in sustainable track construction and management
- explore options with stakeholder groups for shared mountain bike trail maintenance and potential new single-track development within the park.

NEW MOUNTAIN BIKE OPPORTUNITY

From the Snowy Mountains SAP planning process, a new mountain biking area has been identified in the hills to the south-west of Jindabyne on the east side of Alpine Way. The area identified for the new mountain bike facility is shown in Appendix C. The site was selected based on its hilly terrain and views of Lake Jindabyne. In combination with other facilities, it would offer a boost for summer tourism, allowing mountain bikes a range of trail options.

It could potentially link to a chair or gondola, allowing cyclists the opportunity to cycle down and use the gondola/chairlift to get back up the hill, before starting their next run. Access to this facility has been considered in the early planning for the Southern Connector Road to ensure grade separation for cyclists is achieved from the Lake Jindabyne foreshore.

Cycling access to this facility from Jindabyne Town Centre will be supported by the existing foreshore shared path and an active travel overpass across Kosciuszko Road. Limited parking will be provided at the site to encourage visitors to walk or cycle from the Town Centre.

6.9.4 ROAD CYCLING

The Snowy Mountains area is becoming increasingly popular for recreational road cyclists due to past events such as Etape Australia which last operated in 2019. The alpine region with its varied and challenging terrain and quiet country roads is a drawcard for cyclists. Currently road cyclists share the road with vehicles which limits road cycling to only confident cyclists. It is also a road safety risk for all road users.

The planned Lake Jindabyne trail discussed above in Section 6.9.2 is not proposed to be sealed and on road cyclists would continue to use the Snowy Mountains road network. Opportunities to improve the on-road cycling facilities and road safety include:

- wider shoulders and more passing opportunities for vehicles, particularly on steeper climbs
- improved road signage warning motorists as well as safety campaigns focussing on road behaviour around cyclists such as one metre matters
- work with Transport for NSW and cycling organisations to investigate the appropriateness of providing cycling lanes along sections of public roads within Kosciuszko National Park; investigate the need for roadside signs indicating shared use for cyclists.

Other opportunities to be explored is to create sealed, off road routes. This could include sealing part (or all) of the Lake Jindabyne trail. Another option located just outside the Snowy Mountains SAP is to create a rail trail along the disused Monaro Rail Line. Sealing of that project was estimated to add \$10–15M extra to the capital cost.

It is noted however that on road cycling will always remain popular in the high country. Steps should be taken to create a safer environment for cyclists and all road users within the region.

6.9.5 MONARO RAIL TRAIL

A rail trail is a multi-use recreation trail constructed on a disused railway corridor (public land) for non-motorised users. There are over 100 established rail trails in Australia, many of which are in Victoria and they attract thousands of visitors from all over Australia including from NSW (where there are none at present on Government owned railway corridors). Although rail trails are extremely popular with all types of recreational cyclists, they are also very well used by walkers/hikers, horse riders (where permitted), joggers, trail runners, people in wheelchairs, people in mobility scooters, parents pushing prams, school groups, clubs and families.

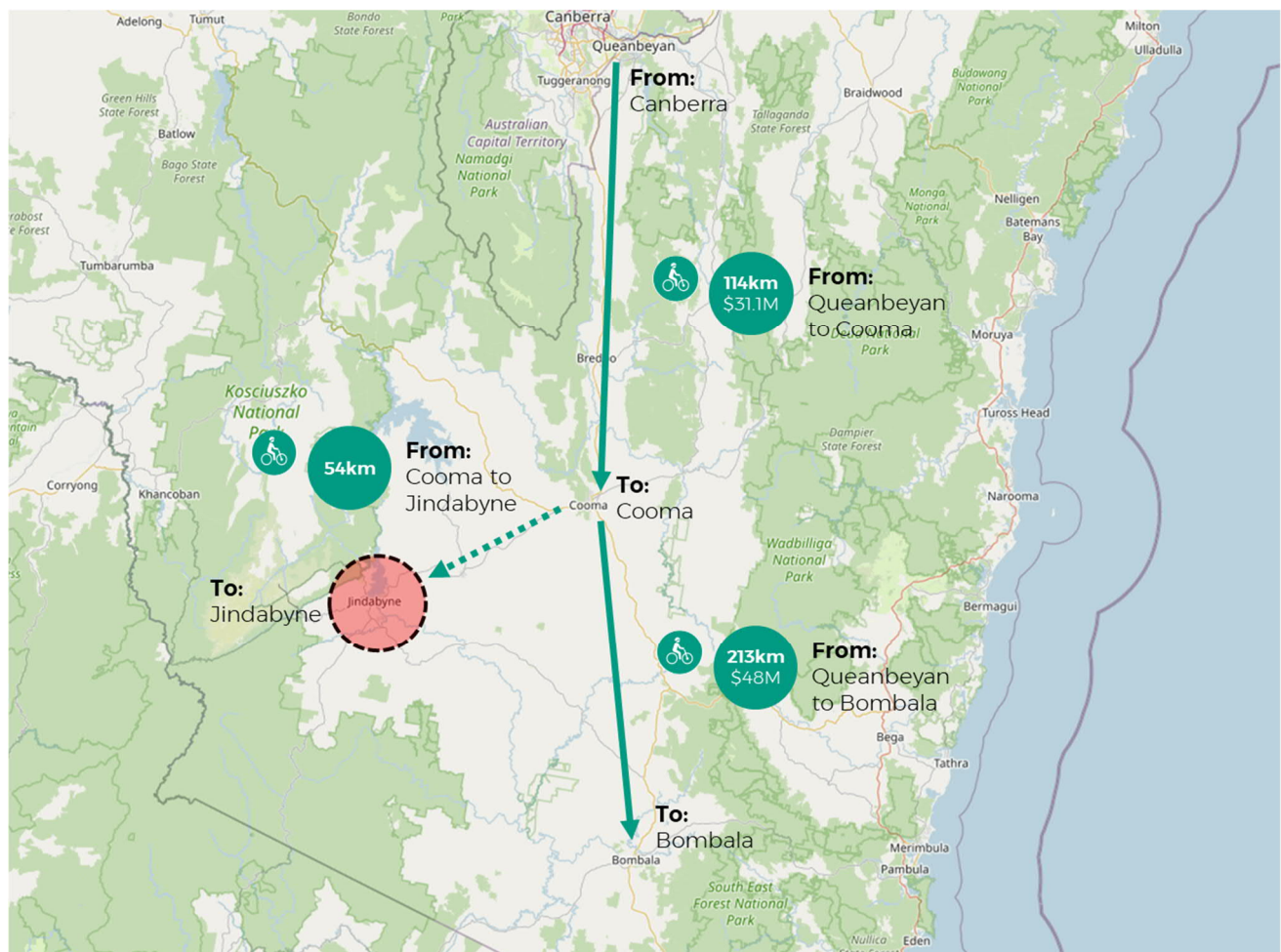
To sustain all year-round tourism in order to capitalise on the economic benefits that tourists bring, the Snowy Monaro Regional Council (SMRC) identified the need to develop all-year round activities that complement the “snow season”. The establishment of a rail trail between Queanbeyan and Bombala was one such activity and therefore SMRC commissioned a feasibility study. The 213 km railway corridor between Queanbeyan in the north and Bombala in the south has been disused since 1988.

From SMRC's feasibility study, the following key finding was made in relation to the reactivation of rail services on the line and its compatibility with a rail trail:

"It is very evident that, should it be proven feasible that a train could be re-established on the corridor between Queanbeyan and Bombala, a trail could not share the same corridor as that train service. It is assumed (in the absence of any other information about the train proposal) that the train may utilise not just the same corridor as the disused railway line, but all of the bridges, the tunnel and all of the high embankments and deep cuttings. To have a trail alongside an operating railway in the same corridor would necessitate replicating all of those original bridges, replicating most of the embankments and probably many of the cuttings, and circumnavigating the tunnel. Nothing of the original railway formation could be used – and therefore all that infrastructure that rail trail users come to see and appreciate would not be experienced".

(Transplan; Mike Halliburton Associates for SMRC, October 2019).

The probable costs for the entire rail trail from Queanbeyan to Bombala is estimated at \$48M for 213 km (not including sealing the track). The cost of the Monaro Rail Trail in the area relevant to the Snowy Mountains SAP i.e. Queanbeyan to Cooma is \$31.1M for 114 km. Whilst this link would be a generator of cycle tourism to the region, a missing connection to Jindabyne/connection to a future Lake Jindabyne shared trail (an additional distance of 54 km via Kosciuszko Road), would limit its impact on economic development in the Snowy Mountains SAP and potentially its attraction for the broader project.



Source: Transplan; Mike Halliburton Associates for SMRC, October 2019

Figure 6.25 Proposed Monaro Rail Trail

6.10 WATER TRANSPORT

6.10.1 RECREATIONAL USES

These recreational uses outlined for Lake Jindabyne in Section 3.6 can be encouraged to increase in the future to reinforce Lake Jindabyne as a recreational attraction. If feasible, special events focussed on the lake could be organised for the summer period. Triathlons, Dragon Boat regattas, and other adventure races are frequently held on Lake Jindabyne. Additional events could include regattas, boat parties and kayak/canoe/rowing races.

As the demand for recreational boating increases, there may be a need for an additional boat ramp. This should be explored on the western edge of the lake, to tie in with redevelopment of this area.

6.10.2 ROLE IN TRANSPORT NETWORK

The major issues affecting the operation of a permanent transport service on the lake are the variable lake levels controlled by Snowy Hydro, and the lack of a clear demand driver around the lake other than Jindabyne itself. The variable lake level issue can mean the shoreline changes by a hundred metres. This makes it difficult to install permanent wharf facilities.

There are lake-based water-transport services at various locations around the world. These include:

- Queenstown, New Zealand – scenic sight-seeing cruises are offered on Lake Wakatipu using historic and more modern craft. Prices are NZ\$52.50 per person and include a farm visit on the other side of the lake. A public ferry operates 11 daily services on the Frankton arm of the lake connecting lakeside communities to Queenstown. Fares are NZD\$10 for a single journey and \$15 for a return. Discounts are offered for guests at the hotel at the last stop.
- Lake Como, Italy – three ferry routes service the towns around the lake, a slow service, a fast hydrofoil and a ferry with car-carrying. Tickets cost between 5 and 15 Euros.
- Lake Trasimeno, Italy – services to towns around the lake and two popular islands within the lake.

However, all have a clear demand driver that supports the service. This can be a popular tourist attraction (e.g. the MONA gallery in Hobart) that either has limited or no alternative access, or multiple towns with substantial populations to generate trips and a competitive travel time compared to driving, walking or the bus.

At the moment, Lake Jindabyne does not appear to have this clear demand driver. The driving time from Jindabyne to Tyrolean Village, East Jindabyne and Kalkite are 9, 12 and 17 minutes respectively, which would be on-par with the boating times (estimates at 6, 11 and 21 minutes).

With Kalkite, East Jindabyne and Tyrolean Village having a combined population of 833 in 2016, and no clear tourist destination at the north end of the lake, the demand driver does not appear to be present at the moment. However, if specific tourist developments with shoreline access were developed in the future, this could be revisited. In addition, if the shared hiking/cycling path around the lake were completed, the distance involved lends itself to being completed in multiple stages. A lake-based transport service could pick the hikers/cyclists up at the end of the day and return them in the morning to continue their journey.

A study into the potential for a lake-based transport service was undertaken for the Go Jindabyne study. Through a comparison to other alpine lakes around the world found that:

- most lakes have private operators
- many services are tourist based with a range of different destinations and durations
- using water-based services for both public transport and tourist services could be beneficial for Jindabyne
- most services operate year-round, however a precedent for Lake Jindabyne would be Lake St Clair in Tasmania which has scheduled summer services and operates winter services on demand.

It concluded that further investigation would need to be undertaken regarding costs associated with a tourist service including the fleet, infrastructure, operations or maintenance, as well as demand estimation and patronage.

SMRC completed a feasibility study for the Lake Jindabyne 'Around the Lake' Trail Experience in October 2021. Whilst this investigated a number of options, the preferred option for further investigations was a water-based transport service linking key destinations of the Lake Jindabyne Shared Trail (e.g. Kalkite and Creel Bay) across the lake. This would likely be privately operated with government support in the initial stages. Further investigations into demand for this type of service, and financial viability for scheduled services or on demand operation should be investigated.

6.10.3 VESSEL OPTIONS

Based on information from Council, it is understood that there was a plan for wharf as part of a marina on the long point that juts into the lake at the north-west corner. However, the proposal has stalled.

The variable lake levels which are controlled by Snowy Hydro would mean that a long floating pontoon system, that can provide access at the anticipated lake levels would be required at each stop location. This would add to the cost of the service.

A vessel type that could overcome the lake level differences is a hovercraft. It could operate from a dock above the high water level and can travel over the bank to the lake regardless of its level. These vessels can be built for a range of sizes and have been used to provide passenger services in other locations. Modern versions are equipped with quiet engines and can operate at a cruising speed of 20 to 35 knots. An example is shown in Figure 6.26.

If a private operator did submit a proposal for a service, it would need to be assessed for its commercial viability, compliance with Transport for NSW guidelines, environmental (including noise) impacts and ability to safely operate with other recreational uses on the lake. It would also require approval from Snowy Hydro who manage the flows to and from the lake.



Source: http://www.australianhovercraft.com/series_30.htm

Figure 6.26 Example of a passenger hovercraft that can take 10 to 30 passengers

7 ACCESSING THE SNOWY MOUNTAINS SAP

The assessment and consolidation of transport connections to access the Snowy Mountains SAP has been informed by the key government policies below and the Snowy Mountains SAP Project Inception guidance provided by DPIE.



It uses the same definition of customers as outlined in section 9.1.

7.1 CONNECTIONS

The transport-related access impacts have been considered in terms of the potential opportunities to create benefits for:

- Throughput – from increasing capacity to match demand, expanding the network and increasing the occupancy of vehicles, and therefore the efficiency of the transport system.
- Directness – reducing the overall journey time, increasing the convenience and the size of group that can be accommodated.
- Weather – from managing the impact of adverse weather, improving the reliability of the transport system, improving shelter and increasing the size of the fleet to cater for different weather conditions.
- Technology – making use of technology advancements and providing flexibility to adopt future improvements in technology related to customer guidance, technology within vehicles and timetabling.
- Parking – in terms of the location, quantity and technology that manages its use.
- Internal Park Movement – whether they assist movement within resorts, to hiking and mountain biking and whether they provide a shuttle service.

Each of these aspects has been assessed in terms of the problems faced and the evidence that confirms them. Solutions are proposed to form part of the overall strategy.

Table 7.1 Connections – Throughput

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Kosciuszko Road between East Jindabyne and the Jindabyne Dam wall can be congested at times. — This affects the ability of residents and visitors to be able to get to Jindabyne. — It also affects the access between Jindabyne and the Snowy Mountains Airport. 	<ul style="list-style-type: none"> — Kosciuszko Road has a theoretical hourly throughput of 1,000 vehicles per hour in each direction. — The road has a winding alignment and can become icy affecting its capacity and safety. 	<ol style="list-style-type: none"> 1 Upgrade parts of Kosciuszko Road to improve access and road safety between East Jindabyne and the Jindabyne Dam. 2 Upgrade Snowy River Way to provide alternative route.

Table 7.2 Connections – Directness

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Limited transport options between the Snowy Mountains Airport and Jindabyne. — Lack of alternative routes to Jindabyne, especially for heavy vehicles. — Incomplete walking and cycling connections between Tyrolean Village/East Jindabyne and Jindabyne. — Lack of transport options between The Station, the new school site and Jindabyne. 	<ul style="list-style-type: none"> — Airport currently accessible by car, taxi or shuttle buses. — One heavy vehicle approved route to Jindabyne via Kosciuszko Road from Cooma. — Issue of pedestrian access between Jindabyne and eastern villages raised in community consultation for Go Jindabyne. 	<ol style="list-style-type: none"> 1 Use increased flights and passenger numbers to justify a greater range and frequency of transport options between the Airport and Jindabyne. 2 Provide shuttle buses from west shore developments to Perisher and Alpine Way tourist developments to Bullocks Flat and Thredbo. 3 Upgrade Snowy River bridge at Dalgety to provide an alternative route to Kosciuszko Road and a tourist drive. 4 Provide a sealed commuter route from East Jindabyne to Jindabyne to encourage safe cycling between the two areas. Connect this to the existing sealed shared path along the foreshore of Lake Jindabyne. 5 Provide cycling options such as cycle lanes or a separated cycleway between Jindabyne and The Station. 6 Complete the proposed Lake Jindabyne Foreshore Trail linking Jindabyne with the Thredbo Valley Track extension.

Table 7.3 Connections – Weather

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— One vehicle route between Jindabyne and KNP and the alpine resorts passes through Kosciuszko Road – no alternative if weather or an accident blocks this section of road.	— Comments about streets being cold and wind-swept during winter.	1 Plan for the road corridor from Southern Connector Road to Alpine Way in the future.

Table 7.4 Connections – Technology

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Fast changing weather and parking supply levels leads to unreliable information. — Lack of up to date or accurate transport information for customers to make reliable and convenient travel choices about how they will travel to the alpine resorts.	— Car parking regularly at capacity in the winter. — No real time information of Skitube patronage or wait times. — No indication of likely travel times to destinations during or before commencement of journey to inform travel choices.	1 Introduce real time parking information to manage public car parking. 2 Provide driver guidance on road closures and redirect customers to the Skitube and buses where possible. 3 Provide real time timetabling information for Skitube and Mountain Shuttles and park-and-ride capacity and incorporate into existing commuter travel applications. 4 Ensure communications coverage to support roll out of new technologies.

Table 7.5 Connections – Parking

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Balancing the winter and summer parking needs.	— Parking is in short supply in winter. — In the off-peak season the parking remains unused, creating empty spaces.	1 Introduce real time parking information to manage existing capacity. 2 Seek land uses that will be as active in summer as winter to match parking demand.

Table 7.6 Connections – Internal movement

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Connectivity between tourist developments spread out around the Snowy Mountains SAP.	— Long distances between isolated attractions and other activities.	1 Provide safe pedestrian and connections for adjacent developments. 2 Bus network to include stops at tourist developments, where possible.

7.2 PLACE

he transport-related place impacts have been considered in terms of the potential opportunities created to influence:

- Anchors/Destinations – including Jindabyne, The Perisher group of resorts, Charlotte Pass, Guthega, and trail heads for hiking and mountain biking.
- Hubs – in terms of transport, park-and-ride and the airport.
- Amenity – from visual, passenger comfort and public spaces including the town centre and retail core.
- Corridors – influencing how legible they are, the sensitivity of the environment through which they pass, whether they are weather affected and how constrained they are.
- Environment – including the protection/managing of human impact and how they affect the picturesque National Park setting.
- Seasonality – whether they provide in winter, summer, or year-round benefits/impacts.

Table 7.7 Place – Anchors/destinations

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Potential for lots of anchors/destinations spread around the Snowy Mountains SAP.	— Developments planned along rural roads with no facilities for walking and cycling.	<ol style="list-style-type: none"> 1 Maximise opportunities for mountain biking in the area. This includes promoting the use of existing fire trails and management trails. Opportunities to link existing trails within the high country including the alpine resorts. 2 Further develop mountain biking with dedicated mountain bike parks with single tracks, pump tracks and skills areas. 3 Connect tourist developments with a mountain bike trail/foreshore trail. 4 Expand bike hire across developed areas of the Snowy Mountains SAP.

Table 7.8 Place – Hubs

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Airport located 35 minutes' drive from Jindabyne.	<ul style="list-style-type: none"> — The private vehicle is still the dominant modal choice. — Remote Airport locations have impact on transport with low take-up of rental car. 	<ol style="list-style-type: none"> 1 Improve connections for bus and coach services between the airport and Jindabyne.

Table 7.9 Place – Amenity

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Most anchors and destinations are not contemporary or take advantage of the unique natural landscape.	— Lack of paths for walking and cycling.	<ol style="list-style-type: none"> 1 Further develop the lake foreshore to create an attractive, developed promenade as a feature. 2 Design of the public realm to encourage more walking and cycling.

Table 7.10 Place – Corridors

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Kosciuszko Road and Alpine Way will become dotted with destinations. — Tourist vehicles stopping and joining could reduce road capacity. 	<ul style="list-style-type: none"> — Main sightseeing tourist times are at different times of the day from park visitor movement to/from the alpine resorts. — Corridors are a scenic drive in their own right. 	<ol style="list-style-type: none"> 1 Continue extending the shared trail loop around Lake Jindabyne from Kalkite to Creel Bay for hiking and mountain biking and hosting sports events. The section of this shared trail between East Jindabyne and Jindabyne should be sealed to provide of road cycling options to commuter cyclists. 2 Operate public transport services along Kosciuszko Road and Alpine Way to service the new tourist developments.

Table 7.11 Place – Environment

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — The impacts of more use by polluting vehicles can directly be related to climate change resulting in the reduction in snow depths. 	<ul style="list-style-type: none"> — Reduction of the snow season that brings people to the region. 	<ol style="list-style-type: none"> 1 Improve ways to move around the Snowy Mountains SAP without a vehicle.

Table 7.12 Place – Seasonality

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Seasonal influence with a large focus currently on winter, need to acknowledge that there are challenges associated with the other seasons also. — Viability of business and supporting services during three seasons outside winter. — Lack of consistency of service provision across the year. 	<ul style="list-style-type: none"> — Availability of fleet and workforce with seasonal changes. 	<ol style="list-style-type: none"> 1 Ensure core facilities and services remain open in three seasons. 2 Consider on demand services or shorter shuttles in three seasons. 3 Build economy around mountain biking, hiking, food and events in three seasons.

7.3 SUSTAINABILITY

The transport-related sustainability has been considered in terms of the potential opportunities created to influence:

- Trip generation – in terms of the number of trips, type (purpose) of the trip, the time of the trip and the mode of transport.
- Safety – for all road users, especially vulnerable ones such as pedestrians and cyclists, for workers and for wildlife.
- Social – access for all customers and access at all times.
- Type of vehicle – including the ability of the type of power to contribute to sustainability and low emissions (including electric and hydrogen).
- Economic Development – cost competitiveness between modes, cost of entry, competitiveness with other alpine destinations, financial sustainability and the cost of construction and maintenance.

Table 7.13 Sustainability – Trip generation

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Isolated tourist developments will require higher trip numbers than developments next to each other with a range of services. — Decreasing use of sustainable transport options in favour of private vehicles taking up more of the finite road capacity. 	<ul style="list-style-type: none"> — Travel (and emissions) dominated by car. — Distance between planned developments. 	<ol style="list-style-type: none"> 1 Move away from car-based solutions as the default with an increased use of public transport capturing more people in less vehicles. 2 Leveraging technology to support travel demand management by targeted in vehicle occupancy, time of day travel. 3 Utilise a ridesharing app to increase vehicle occupancy.

Table 7.14 Sustainability – Safety

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Road safety issues on Kosciuszko Road between East Jindabyne and the Jindabyne Dam wall. — Provide a safe transport environment for all road users within Jindabyne. 	<ul style="list-style-type: none"> — Higher than State average of crashes due to weather and unique environmental conditions. — Private vehicles and cyclists create safety concerns in summer. 	<ol style="list-style-type: none"> 1 Upgrade parts of Kosciuszko Road to improve access and road safety between East Jindabyne and the Jindabyne Dam. 2 Promote safer cycling opportunities for on-road cyclists with increased signage and road safety campaigns.

Table 7.15 Sustainability – Social

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— Isolated tourist developments make it difficult for people with lower mobility or no vehicle to get around town increasing social exclusion.	<ul style="list-style-type: none"> — Travel (and emissions) dominated by car. — Distance between planned developments. 	<ol style="list-style-type: none"> 1 Improve accessibility for all mobility with an accessible transport service that serves tourist developments as well as Jindabyne. 2 Accessible mode choices available for all customers.

Table 7.16 Sustainability – Vehicles

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— High number of private vehicles whilst lower proportion of high capacity vehicles.	<ul style="list-style-type: none"> — Competitiveness with other Low amount of charging facilities within resorts for electric vehicles. — Due to national regulations there are low levels of low emission vehicles accessing. 	<ol style="list-style-type: none"> 1 Investigate bike-share and e-bike and e-scooter opportunities for tourism around Jindabyne, particularly through the summer months with options to extend it all year round. 2 Address the balance in volume between private vehicles and public transport which reduces the number of vehicles and those likely to be carried in low emission vehicles.

Table 7.17 Sustainability – Economic development

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
— The economy of the town is largely influenced by the number of visitors attracted to the Snowy Mountains SAP.	— Lack of activity and services in the three seasons.	<ol style="list-style-type: none"> 1 Consider unique features to introduce to hiking trails in the Snowy Mountains SAP such as a sculpture or art walk, or an educational walk focussing on the indigenous heritage, natural environment or surrounding economy and infrastructure (e.g. Snowy Mountains Scheme).

7.4 SUMMARY OF KEY TRANSPORT ACTIONS

The key recommendations for transport initiatives to achieve the Vision for access to the Snowy Mountains SAP are summarised in Table 7.18 below and are shown on Figure 8.1 overleaf.

Table 7.18 Snowy Mountains SAP other areas – Key transport initiatives

SOLUTIONS	CUSTOMERS						KEY FACTORS
	Residents	Visitors	Families	Athletes	Touring	Freight	
Connection Initiatives							
Services – Support the airport with increased public transport services to Jindabyne and resorts	✓	✓					Journey time reliability, convenience, space for luggage
Services – Revise bus network to include new tourist and growth areas in East Jindabyne, the west shore and along Alpine Way	✓	✓					Service options, modal choice, across the day and evening with convenient trips, reduce isolation of new developments
Infrastructure – Upgrade Snowy River bridge at Dalgety					✓	✓	Alternative freight route to Kosciuszko Road, part of tourist drive
Infrastructure – Sealed commuter pedestrian and cycle route from East Jindabyne to Jindabyne	✓	✓					Road safety, connectivity, mode choice, recreation
Place Initiatives							
Infrastructure – Revise Kosciuszko Road through Jindabyne to take advantage of reduced traffic	✓	✓					Comfort, amenity, high quality experience, connectivity to foreshore
Infrastructure – Extend lakeside cycle route around lake	✓	✓					Maximise interaction with lake, summertime activity
Policy – Maximise opportunities for mountain biking	✓	✓		✓			Reinforce summertime activity
Infrastructure – Create new roadside lookouts		✓					Road safety, tourism
Sustainability Initiatives							
Infrastructure – Upgrade parts of Kosciuszko Road between East Jindabyne and the Jindabyne Dam	✓	✓				✓	Road safety, access
Policy – Promote safer cycling opportunities for on-road cyclists	✓	✓					Road safety campaigns, increased signage
Policy – Connect new development areas to hiking trails	✓	✓					Connect to wider network, locations of indigenous heritage, natural environment

Notes Please refer to section 9.1 for a description of the customer types and needs.

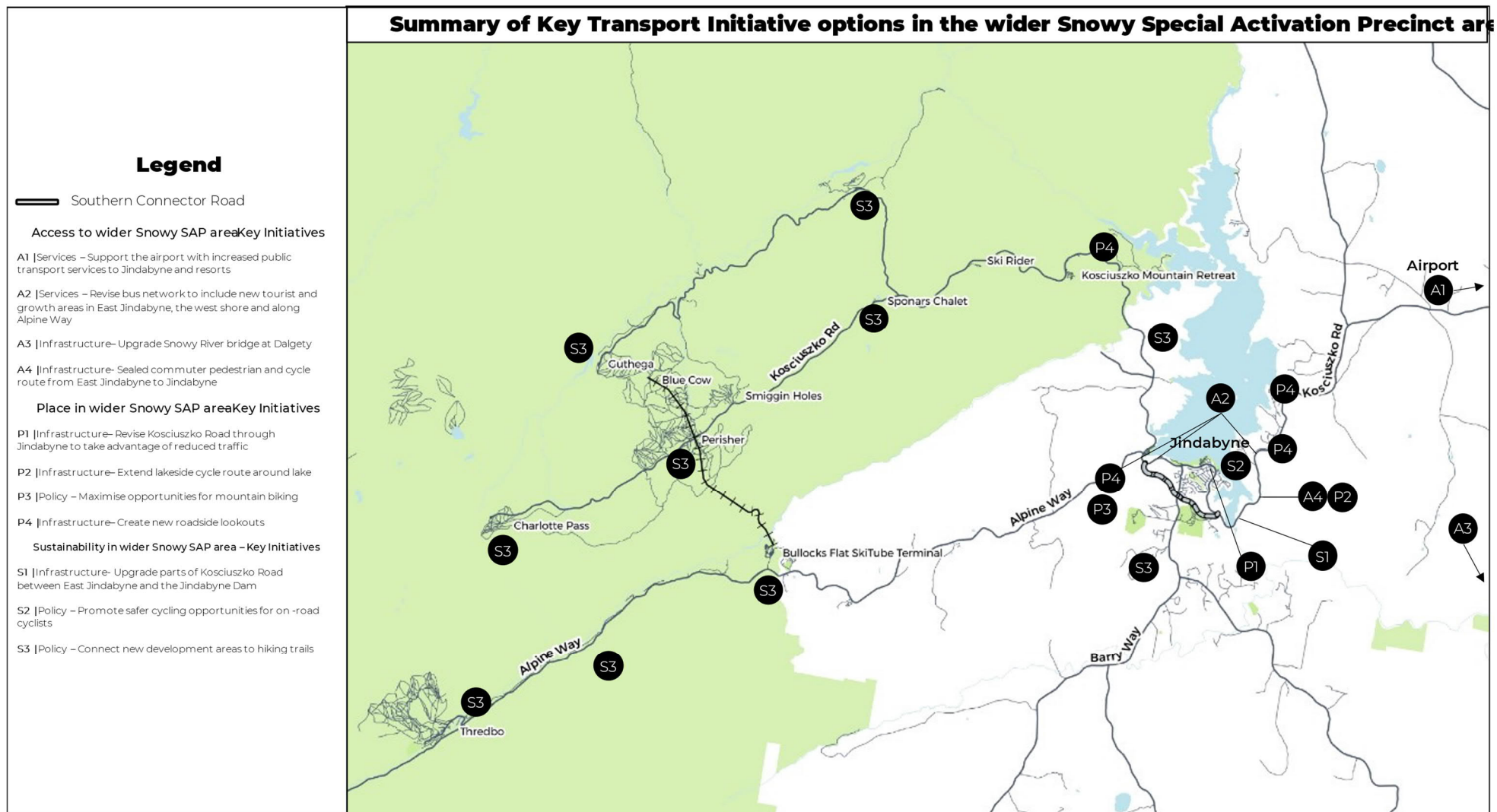


Figure 7.1 Map of Snowy Mountains SAP other areas (outside Jindabyne and Kosciuszko National Park key transport initiatives

8 JINDABYNE ACCESS

The assessment of Jindabyne's transport needs has been informed by the key government policies below and the Snowy Mountains SAP Project Inception guidance provided by DPIE. The Go Jindabyne Study undertook a comprehensive assessment of the needs of Jindabyne. This study has assessed the additional transport needs created by Jindabyne's position at the heart of the Snowy Mountains SAP area.



It uses the same definition of customers as outlined in Section 5.1. However, the emphasis on the transport needs of residents is higher than the KNP Access Strategy.

8.1 CONNECTIONS

The transport-related access impacts have been considered in terms of the potential opportunities to create benefits for:

- Throughput – from increasing capacity to match demand, expanding the network and increasing the occupancy of vehicles, and therefore the efficiency of the transport system.
- Directness – reducing the overall journey time, increasing the convenience and the size of group that can be accommodated.
- Weather – from managing the impact of adverse weather, improving the reliability of the transport system, improving shelter and increasing the size of the fleet to cater for different weather conditions.
- Technology – making use of technology advancements and providing flexibility to adopt future improvements in technology related to customer guidance, technology within vehicles and timetabling.
- Parking – in terms of the location, quantity and technology that manages its use.
- Internal Park Movement – whether they assist movement within resorts, to hiking and mountain biking and whether they provide a shuttle service.

Each of these aspects has been assessed in terms of the problems faced and the evidence that confirms them. Solutions are proposed to form part of the overall strategy.

Table 8.1 Connections – Throughput

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Kosciuszko Road and Barry Way are congested by vehicles passing through town and originating from accommodation in town driving up to the alpine resorts. — This affects the ability of residents and visitors to be able to move around the town. — It also affects the amenity within the town with a slow-moving line of traffic making it difficult to cross Kosciuszko Road. 	<ul style="list-style-type: none"> — Kosciuszko Road has a theoretical hourly throughput of 2,400 vehicles per hour. — The roundabout at Kosciuszko Road and Barry Way has its own capacity. — Kosciuszko Road between Barry Way and Alpine Way was recently widened to two lanes to cope with the short winter peak movement up to the alpine resorts. — Public buses run infrequently and have limited coverage. — Outside of the winter peak, road capacity is not an issue. 	<ol style="list-style-type: none"> 1 Rerouting of traffic to avoid the winter congestion through Jindabyne via the new Southern Connector Road. 2 If the movement of cars through Kosciuszko Road can be moved, increased crossing opportunities for pedestrians and cyclists can be created.

Table 8.2 Connections – Directness

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Infrequent public transport and lack of pedestrian and cycle infrastructure means that the car remains attractive. Public transport is not time competitive with car. — Public transport could be caught in congestion with cars. 	<ul style="list-style-type: none"> — Limited service coverage and times of operation. — Limited passenger information services for transport. 	<ol style="list-style-type: none"> 1 Introduce a Jindabyne shuttle service to connect with the Alpine areas. 2 Increase opportunities for on demand buses or coaches to connect with the airport and outer villages. 3 Identify opportunities for new public and private bus and coach services 4 Improve the interchange experience in Jindabyne. 5 Rationalise public transit connecting Jindabyne to the surrounding alpine resorts, airport and surrounding tourist areas. Scheduled regular shuttles are required to make public transport more attractive and visible for visitors and residents. 6 Consider any private-led proposals for a lake-based ferry/water taxi service.

Table 8.3 Connections – Weather

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — There is a lack of shelter for pedestrians walking along streets around the retail area. — Long wait times between bus services and lack of shelter makes catching public transport uncomfortable during poor weather. 	<ul style="list-style-type: none"> — Comments about streets being cold and wind-swept during winter. 	<ol style="list-style-type: none"> 1 A bus hub within Jindabyne with indoor waiting area for passengers. 2 Greater use of awnings to protect pedestrians and shelters for bus and coach passengers.

Table 8.4 Connections – Technology

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Fast changing weather and parking supply levels leads to unreliable information. — Lack of up to date or accurate transport information for customers to make reliable and convenient travel choices about how they will travel to the alpine resorts. — Lack of Shared Mobility services available in Jindabyne. 	<ul style="list-style-type: none"> — Car parking regularly at capacity in the winter. — Car parking levels not monitored. — No real time information of ski tube patronage or wait times. — No indication of likely travel times to destinations during or before commencement of journey to inform travel choices. 	<ol style="list-style-type: none"> 1 Develop a Mobility as a Service electronic platform. 2 Introduce real time parking information to manage public car parking. 3 Provide driver guidance on road closures and redirect customers to the Skitube and buses and coaches where possible. 4 Provide real time timetabling information for Skitube and Mountain Shuttles and park-and-ride capacity and incorporate into existing commuter travel applications. 5 Investigate improvements in technology to monitor levels of hiking and cycling in the park. 6 Ensure communications coverage to support roll out of new technologies.

Table 8.5 Connections – Parking

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Demand for parking in winter outstrips supply. — Residential street parking capacity with multiple vehicles visiting rental accommodation. 	<ul style="list-style-type: none"> — Parking is in short supply in winter. — In the off-peak season the parking remains unused, creating empty spaces. — Larger vehicles unable to move through streets blocked with multiple vehicles from rental accommodation. 	<ol style="list-style-type: none"> 1 Introduce real time parking information to manage existing capacity. 2 Changes to on-street parking on Snowy River Avenue and Gippsland Street. 3 Potential for additional parking on Kosciuszko Road. 4 Increasing the amount of timed on-street parking to greater higher parking turnover. 5 Consideration of additional off-street parking and paid parking to manage the demand. 6 Accommodate the rise of shared vehicles, allocating kerbside space or dedicated parking spaces for these vehicles.

Table 8.6 Connections – Internal movement

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Car focussed, infrequent, seasonal. — It is difficult to move around Jindabyne as a pedestrian or cyclist. 	<ul style="list-style-type: none"> — Limited footpaths within town. — Lack of footpaths has been mentioned many times in consultation with locals. 	<ol style="list-style-type: none"> 1 Improve the walkability around Jindabyne, connecting key destinations such as the shopping precinct, schools and recreational areas to residential areas. 2 Provide safe connections for cycling to key destinations such as shops, schools and community centres. 3 Increase investment in the Jindabyne Action Plan roll-out of footpaths. 4 Create cycle paths connecting to key routes out of town. 5 Complete the proposed Lake Jindabyne Foreshore Track to Tyrolean Village.

8.2 PLACE

The transport-related place impacts have been considered in terms of the potential opportunities created to influence:

- Anchors/Destinations – including Nuggets Crossing, the town centre, lake foreshore and new school and sport and recreation precinct.
- Hubs – in terms of public transport, park-and-ride service.
- Amenity – from visual, passenger comfort and public spaces including the town centre and retail core.
- Corridors – influencing how legible they are, the sensitivity of the environment through which they pass, whether they are weather affected and how constrained they are.
- Environment – including the protection/managing of human impact.
- Seasonality – whether they provide in winter, summer, or year-round benefits/impacts.

Table 8.7 Place – Anchors/destinations

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> Many anchors and destinations in Jindabyne established but tired. Poor balance of movement and place – more space for vehicles, less space for people. 	<ul style="list-style-type: none"> Lack of competitive demand (alternative attractions) to stay in Jindabyne rather than visit ski fields. 	<ol style="list-style-type: none"> 1 Provide better spaces for people along Kosciuszko Road after Southern Connector Road is built. 2 Investigate opportunities for a pedestrian link or boardwalk to the islands near Jindabyne. This would further capitalise on Jindabyne's waterfront location.

Table 8.8 Place – Hubs

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> Low profile quality hub in Jindabyne. No established park-and-ride facility in Jindabyne. 	<ul style="list-style-type: none"> The private vehicle is still the dominant modal choice. Underutilisation of the transport hub at the Visitor Centre in Jindabyne despite quality facilities. 	<ol style="list-style-type: none"> 1 Promote the existing transit hub at the Visitors Centre in Jindabyne as the hub for a Mountain Shuttle. 2 Establish new stops around Jindabyne to collect passengers for the Mountain Shuttle. 3 Establish a new Park-and-Ride facility outside Jindabyne with good access to the Southern Connector Road to intercept vehicles from outside the Snowy Mountains SAP. 4 Provide an enjoyable customer experience within the transport hubs: <ol style="list-style-type: none"> a Safe, comfortable and accessible access for all b Integrate retail opportunities c Include way-finding and real time information. 5 Invest in facilities that provide passenger comfort, including heated, enclosed waiting areas at major bus stops.

Table 8.9 Place – Amenity

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Long moving queue of car passing through Jindabyne to get to alpine resorts reduces amenity. — Most anchors and destinations are not contemporary or take advantage of the surrounding landscape. — Transport vehicles are not sustainable and emit noise and fumes which is in contrast to the pure alpine environment. 	<ul style="list-style-type: none"> — Lack of paths for walking and cycling. — Poor access to open space and dispersed centres of activity. — Limited electric charge points. 	<ol style="list-style-type: none"> 1 Further develop the lake foreshore to create an attractive, developed promenade as a feature of Jindabyne. 2 Provide better spaces for people along Kosciuszko Road after Southern Connector Road is built. 3 Create car free zones within resorts with associated parking areas and shuttles. 4 Redesign car parking to incorporate more pedestrian access, landscaping to screen or within buildings. 5 Design of the public realm to encourage more walking and cycling.

Table 8.10 Place – Corridors

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Kosciuszko Road through Jindabyne is not a place that attracts people to stop and enjoy the town. — Kosciuszko Road does not connect with the lake foreshore well. 	<ul style="list-style-type: none"> — Corridors are a scenic drive in their own right. 	<ol style="list-style-type: none"> 1 Improve the pedestrian permeability across Kosciuszko Road, linking the foreshore and making it more accessible for residents and visitors. This could be provided with formalised pedestrian signals, particularly near the shopping precinct.

Table 8.11 Place – Environment

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — The impacts of more use by polluting vehicles can directly be related to climate change resulting in the reduction in snow depths. 	<ul style="list-style-type: none"> — Reduction of the snow season that brings people to the region. 	<ol style="list-style-type: none"> 1 Support the installation of more charge points for electric vehicles. 2 Improve ways to move around Jindabyne without a vehicle.

Table 8.12 Place – Seasonality

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Seasonal influence with a large focus currently on winter, need to acknowledge that there are challenges associated with the other seasons also. — Viability of business and supporting services during three seasons outside winter. — Lack of consistency of service provision across the year. 	<ul style="list-style-type: none"> — Car parking is set up for winter demand resulting in an oversupply in summer (and spring/autumn). — Availability of fleet and workforce with seasonal changes. 	<ol style="list-style-type: none"> 1 Investigate seasonal uses for parking including low-cost camping at winter park-and-ride sites, space for markets within Jindabyne. 2 Ensure core facilities and services remain open in three seasons. 3 Consider on demand services or shorter shuttles in three seasons. 4 Build economy around mountain biking, hiking, food and events in three seasons.

8.3 SUSTAINABILITY

The transport-related sustainability has been considered in terms of the potential opportunities created to influence:

- Trip generation – in terms of the number of trips, type (purpose) of the trip, the time of the trip and the mode of transport.
- Safety – for all road users, especially vulnerable ones such as pedestrians and cyclists, for workers and for wildlife.
- Social – access for all customers and access at all times.
- Type of vehicle – including the ability of the type of power to contribute to sustainability and low emissions (including electric and hydrogen).
- Economic Development – cost competitiveness between modes, cost of entry, competitiveness with other alpine destinations, financial sustainability and the cost of construction and maintenance.

Table 8.13 Sustainability – Trip generation

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none">— The number of trips continues to increase in winter despite lower snow depths.— Decreasing use of sustainable transport options in favour of private vehicles taking up more of the finite road capacity.	<ul style="list-style-type: none">— Travel (and emissions) dominated by car.— Time of trips is concentrated in the AM peak to match the resort opening times.— Lack of attraction to stay in Jindabyne for retail or tourism offering as an alternative day activity to travel to resorts.	<ol style="list-style-type: none">1 More attractions in Jindabyne to allow people to link multiple activities in the one trip.2 Move away from car-based solutions as the default with an increased use of public transport capturing more people in less vehicles.3 Leveraging technology to support travel demand management by targeted in vehicle occupancy, time of day travel.4 Utilise a ridesharing app to increase vehicle occupancy.

Table 8.14 Sustainability – Safety

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Provide a safe transport environment for all road users within Jindabyne. 	<ul style="list-style-type: none"> — Safety is across many aspects of transport. — Higher than State average of crashes due to weather and unique environmental conditions. — Private vehicles and cyclists create safety concerns in summer. 	<ol style="list-style-type: none"> 1 Reduce Speed Limit in Jindabyne on Kosciuszko Road. 2 Ensure places to walk and cross streets safely for pedestrians. 3 Introduction of more driver guidance through application of ITS. 4 Investigate the provision of wildlife crossings if there are trends in collision locations.

Table 8.15 Sustainability – Social

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Access constraints created due to limited parking supply in winter. — Lack of footpaths makes it difficult for people with lower mobility to get around town increasing social exclusion. 	<ul style="list-style-type: none"> — Demand for businesses with parking when on-street parking is full. 	<ol style="list-style-type: none"> 1 Improve accessibility of Jindabyne for all mobility types by expansion of the footpath and crossing network. 2 Accessible mode choices available for all customers.

Table 8.16 Sustainability – Vehicles

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> High number of private vehicles whilst lower proportion of high capacity vehicles. 	<ul style="list-style-type: none"> Competitiveness with other Low amount of charging facilities within resorts for electric vehicles. Due to national regulations there are low levels of low emission vehicles accessing the park 	<ol style="list-style-type: none"> Support the installation of more charge points for electric vehicles. Investigate bike-share and e-bike and e-scooter opportunities around Jindabyne, particularly through the summer months with options to extend it all year round. Address the balance in volume between private vehicles and public transport which reduces the number of vehicles and those likely to be carried in low emission vehicles.

Table 8.17 Sustainability – Economic development

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> The economy of the town is largely influenced by the number of visitors attracted to the Snowy Mountains SAP region. Potential transport solutions would incur significant costs against low patronage. Three season transport services are likely to require significant subsidies. 	<ul style="list-style-type: none"> Competitiveness with other destinations e.g. Victoria and New Zealand. Level of vehicle quality used for transport within resorts. Lack of activity and services in the three seasons. 	<ol style="list-style-type: none"> Utilise rapid shuttles as a flexible rapid transit option which can match seasonal demands but provide the same quality as higher capacity public transport options. Explore partnerships with private operators such as resorts to provide more sustainable travel options or modernize existing public transport systems. Develop employment generating solutions for locals e.g. drivers for rapid shuttles. Seasonal pricing mechanisms to attract visitors to the three seasons.

8.4 SUMMARY OF KEY TRANSPORT ACTIONS

The key recommendations for transport initiatives to achieve the Snowy Mountains SAP Vision for Jindabyne are summarised in Table 6.18 below and are shown on Figure 8.1 overleaf.

Table 8.18 Jindabyne – Key transport initiatives

SOLUTIONS	CUSTOMERS						KEY FACTORS
	Residents	Visitors	Families	Athletes	Touring	Freight	
Connection Initiatives							
Infrastructure – Southern Connector Road	✓	✓				✓	Journey time reliability, traffic relief in town, access to southern areas
Services – Revise bus network	✓	✓					Service options, modal choice, across the day and evening with convenient trips
Infrastructure – Improve footpath and crossing network through town targeting key pedestrian routes and destinations	✓	✓	✓				Ease of access, social inclusion, improve mobility, road safety
Infrastructure – Improve connections for cycling to key destinations such as shops, schools and community centres	✓	✓	✓		✓		Road safety, mode choice, connect to touring routes
Place Initiatives							
Infrastructure – Revise Kosciuszko Road through Jindabyne to take advantage of reduced traffic	✓	✓					Comfort, amenity, high quality experience, connectivity to foreshore
Infrastructure – Create bus hub in town at Information centre	✓	✓	✓		✓		Focal point of KNP access, passenger comfort, weather protection
Policy – Rationalise allocation of on-street parking within retail core and balance with off-street public parking	✓	✓					Increase space available for public areas, reduce car dominance
Sustainability Initiatives							
Policy – Reduce speed limit on Kosciuszko Road in Jindabyne	✓	✓	✓				Road safety, amenity
Policy – Vehicle charging stations to assist Zero Emissions vehicle fleet	✓	✓					Reduce range anxiety, combine with retail opportunities
Policy – Investigate bike-share and e-bike and e-scooter opportunities around Jindabyne	✓	✓			✓		Focused on summer months, add to visitor experience, matched with improved cycle path facilities

Notes Please refer to section 9.1 for a description of the customer types and needs.

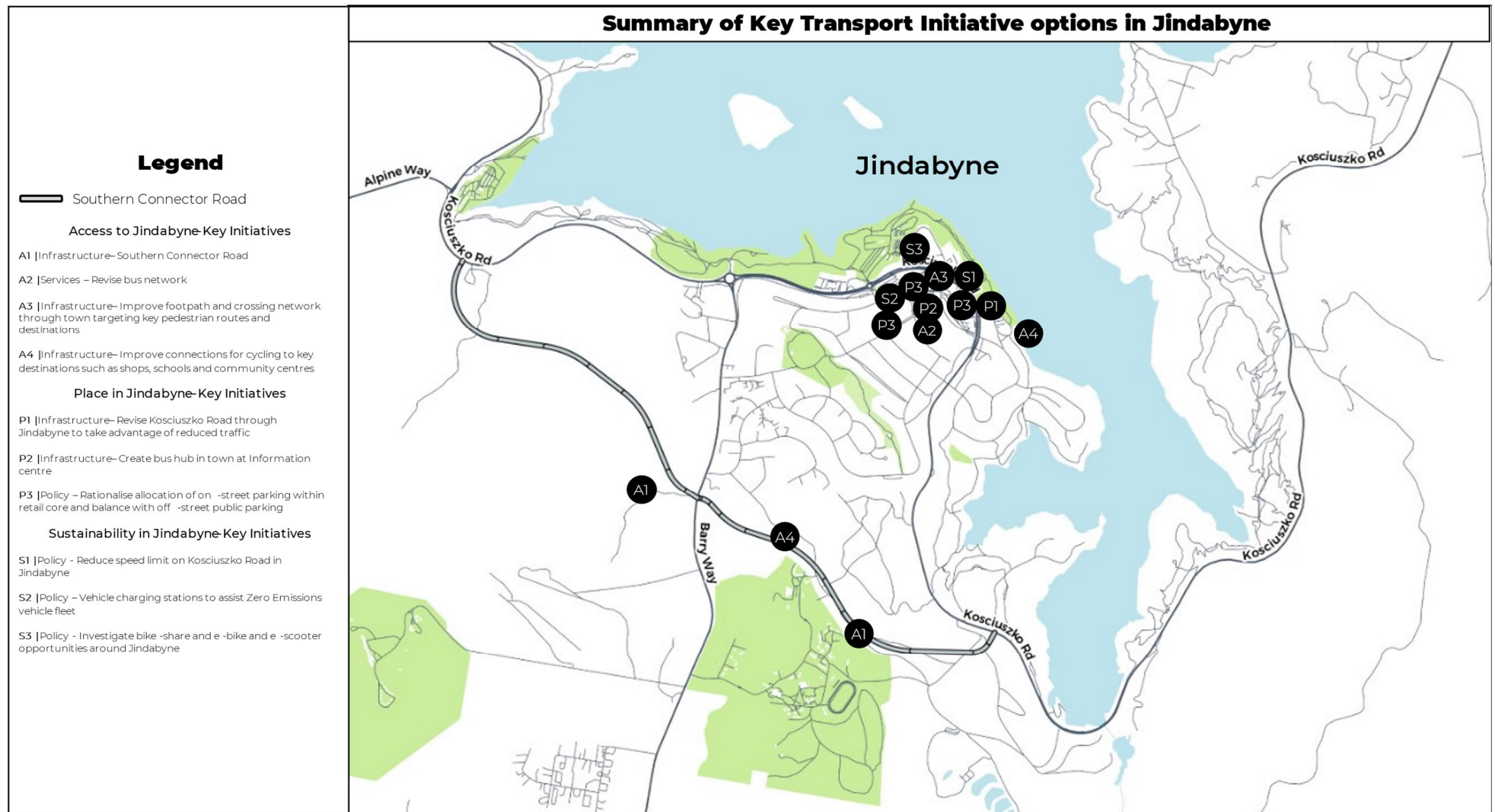


Figure 8.1 Map of Jindabyne key transport initiatives

9 KOSCIUSZKO NATIONAL PARK ACCESS STRATEGY

This Kosciuszko National Park Access Strategy has been informed by the key government policies below and the Snowy Mountains SAP Project Inception guidance provided by DPIE.



9.1 CUSTOMERS

It has focussed on the customer groups outlined in the guiding government policy Future Transport 2056, which incorporated the Regional Services and Infrastructure Plan as well as the stages of the visitor's journey from the guiding government policy Future Transport 2056 which incorporated the Tourism and Transport Plan.



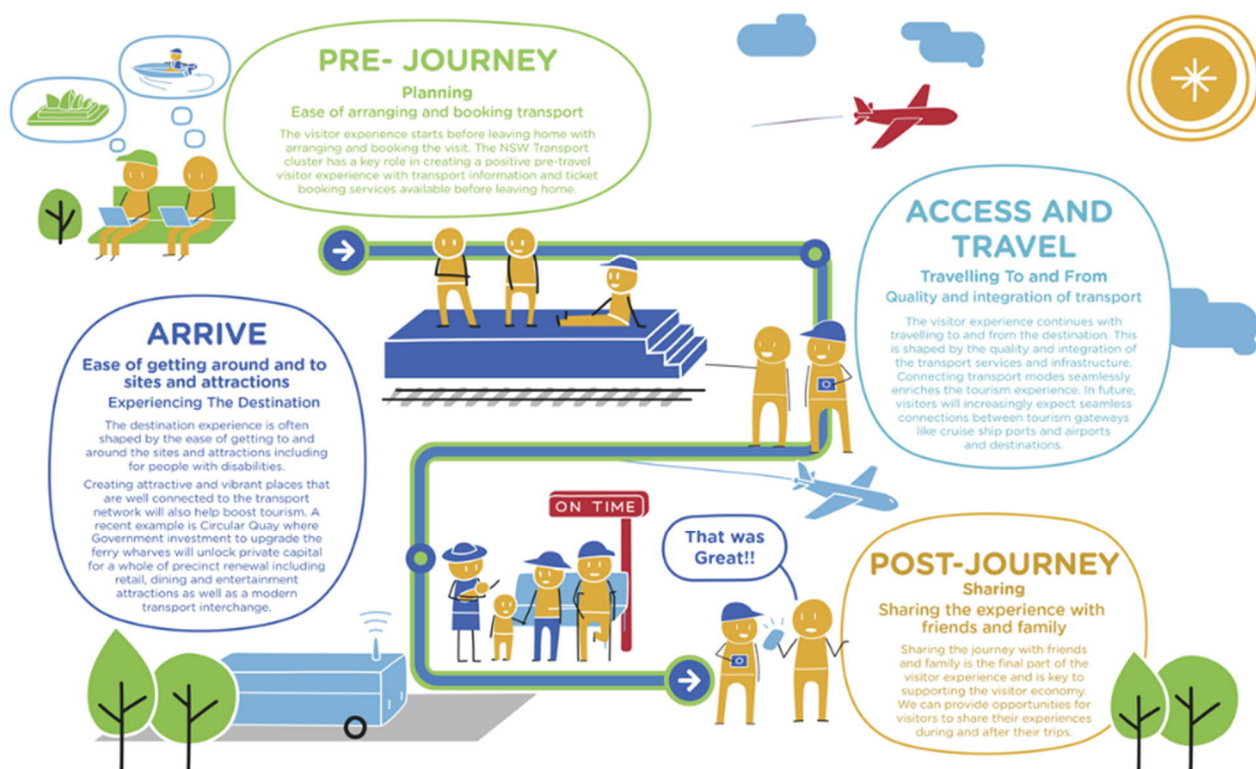

















Figure 9: Stages in a visitor's journey

The preparation of the Kosciuszko National Park Access Strategy has been informed by defining the different customer groups (in no particular order of preference), spending type and their purpose unique to the Snowy Mountains SAP and informed by Future Transport 2056. The strategy also focusses on the key customer experience focus areas.

Customer groups	Type	Purpose	Experience
 Residents	 Price point	 Active	 Quality
 Visitors	 Spender	 Leisure	 Choice
 Athletes			 Service
 Families			 Convenience
 Touring			 Reliability
			 Frequent

The customers are considered to be characterised by the groups outlined in Table 9.1 along with the factors that govern their experience.

Table 9.1 Customer groups

GROUP	EXAMPLE PERSONA	KEY CUSTOMER EXPERIENCE FACTORS
Residents	<ul style="list-style-type: none"> Local Jindabyne residents enjoying their backyard Seasonal workers accessing the Park to work at the resorts. 	Journey time reliability, frequent trips
Visitors	<ul style="list-style-type: none"> A large group of family/friends heading on a skiing/mountain biking trip. They have mixed skiing/cycling abilities and are after a diverse range of activities on their holiday. 	Travel choice, frequent services, opportunities for quality, frequent trips
Athletes	<ul style="list-style-type: none"> A group of athletes who are at Sport and Rec/KNP for a weeklong training camp. 	Journey time reliability, accessible to groups, comfort
Families	<ul style="list-style-type: none"> A family (with children) driving up to the snow/National Park for a day trip, staying in Jindabyne. 	Comfort, ease of access, convenience
Touring	<ul style="list-style-type: none"> The “Grey Nomad”, accessing the Park in summer for hiking, motorcycle touring and other leisure opportunities. 	Comfort, safety, opportunities for quality, ease of access

Based on this, the experience of the customer has been considered in terms of:

- Quality: Providing a range of experiences to suit different budgets and preferences and a travel experience to match the price point of lift tickets.
- Choice: Allowing for choice to match circumstances and acknowledging that there is no “one size fits all” solution.
- Service: Providing an option that meets the customer expectations.
- Convenience: Making the experience easy and enjoyable for all and seeking shorter walks with gear from transport at resorts.
- Reliability: Ensuring that the experience will be delivered the same each time and that it provides a responsive on-demand services.
- Frequent: Providing a service that is available for when the customer needs it, which could be less frequent if good real time information is available to communicate services with the customer.

KNP needs to cater for a wide variety of visitors and residents (activities, price points, comfort, etc), while balancing the potential to share the park with all and protecting the environmental qualities that attract visitors in the first place. Currently there is a lack of consideration of “whole of journey” experience from the time of arriving in the region to the time of departure. Car travel currently dominates the access to KNP, in part because the current pricing supports this, especially for family and friend groups.

Currently there is a lack of transport options with a price point to cater for a wide range of budgets (backpackers, families, luxury market). The range of transport options needs to be expanded to cater for a varied customer groups; individuals vs large groups. A comprehensive review of transport costs needs to be undertaken to use affordability to drive transport patterns that assist in achieving the vision of the Snowy Mountains SAP and reduce the cost and impact of transport upgrades. The pricing system needs to be flexible and competitive to allow all customers to enjoy the National Park all year round.

The transport solutions that are proposed need to be bespoke solutions that will benefit all customers. They also need to plan for operation across seasons, times of the day and to different locations, e.g. snow play vs skiing vs leisure activities.

The current transport system caters for the winter demand, whereas the vision for the Snowy Mountains SAP is for greater use of the National Park all year round.

It is acknowledged that not all park users in winter are entering for skiing/snowboarding. There are also customers for snow play, cross country skiing, scenic drive, workers etc, and that the transport choices to be responsive to a wide range of customer needs.

As the number of visitors to KNP increases in the future and the time of visitation changes to greater summer use, these aspects will become more important. For context, the current internal population of the National Park is shown overleaf in Figure 9.1.

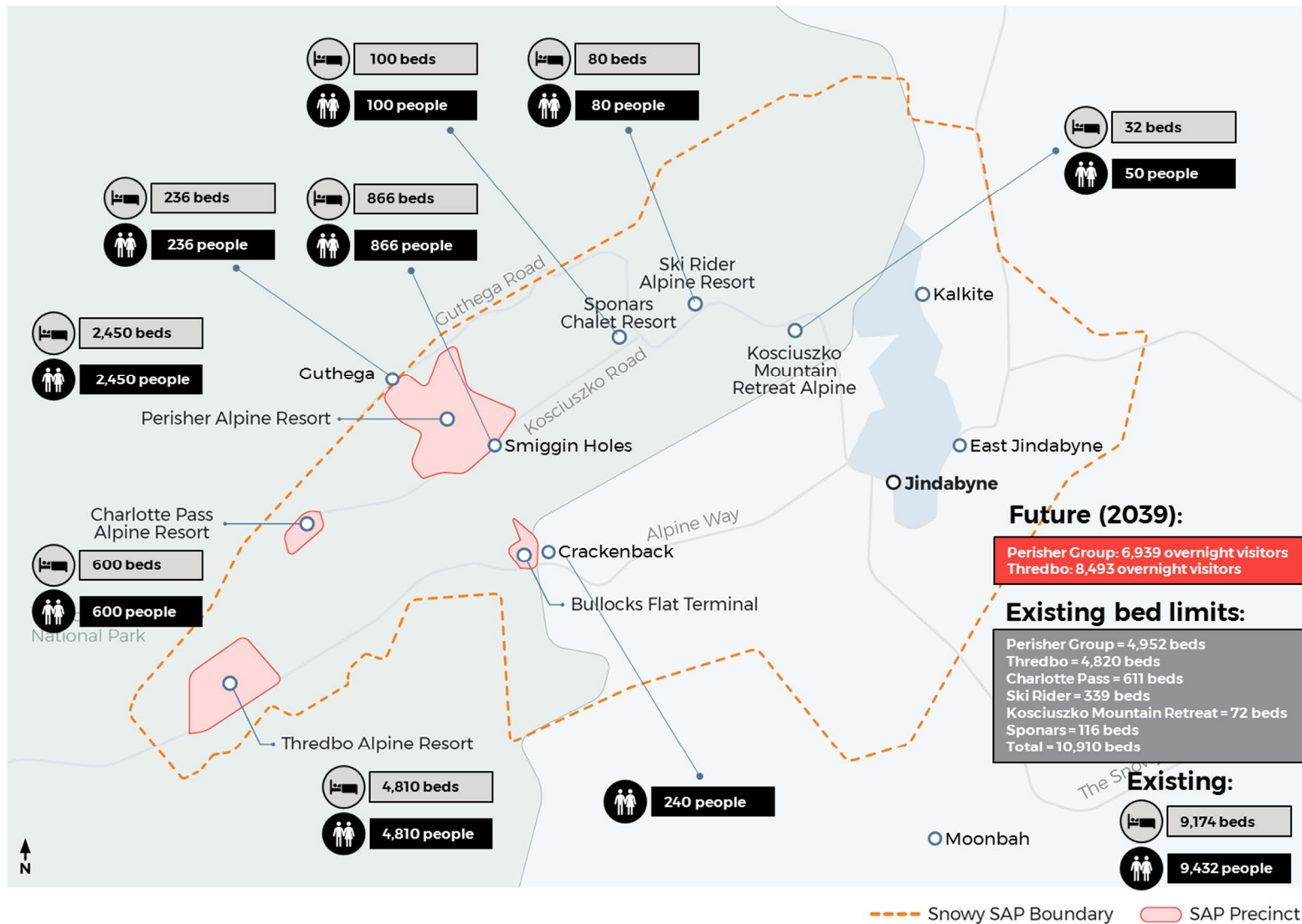


Figure 9.1 Kosciuszko National Park internal population

9.2 CONNECTIONS

The transport-related access impacts have been considered in terms of the potential opportunities to create benefits for:

- Throughput – from increasing capacity to match demand, expanding the network and increasing the occupancy of vehicles, and therefore the efficiency of the transport system.
- Directness – reducing the overall journey time, increasing the convenience and the size of group that can be accommodated.
- Weather – from managing the impact of adverse weather, improving the reliability of the transport system, improving shelter and increasing the size of the fleet to cater for different weather conditions.
- Technology – making use of technology advancements and providing flexibility to adopt future improvements in technology related to customer guidance, technology within vehicles and timetabling.
- Parking – in terms of the location, quantity and technology that manages its use.
- Internal Park Movement – whether they assist movement within resorts, to hiking and mountain biking and whether they provide a shuttle service.

Each of these aspects has been assessed in terms of the problems faced and the evidence that confirms them. Solutions are proposed to form part of the overall strategy.

Table 9.2 Connections – Throughput

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Roads are at capacity in peak winter season in peak hours to access resorts. — Ability for road expansion currently limited due to sensitive environment, leaving a finite capacity. — Occupancy of vehicles not optimised or incentivised. — More vehicles with less occupancy mean slow speeds in peak winter season. — Infrequent public transport with low visibility of service information means that alternatives such as car remain attractive. — High capacity vehicles such as coaches discouraged and not priced equitably. — Access to some smaller resorts are at the control of larger resorts. — High capacity public transport like Skitube has limited capacity. 	<ul style="list-style-type: none"> — Kosciuszko Road and Alpine Way have a maximum theoretical hourly throughput of 1,000 vehicles per hour. At average 3 people/vehicle this is 3,000 people per hour, see Figure 9.2. Both corridors into KNP are at capacity in Winter. — Perisher Range resorts car parks have a capacity of 6,400 spaces. Thredbo car parks have a capacity of 2,500 spaces. Parking reaches capacity by 9.15 am on peak weekends. — No barriers to access by car – parking, chain bays and road upgrades all have supported this. — 2020 prices for KNP entry is \$29/vehicle/day, \$12/motorcycle/day, public transport user is charged \$11.45–\$3.60/day (adult-child) – once more than two people are in each vehicle it is cost positive to drive. — Skitube has a finite capacity due to rolling stock and platform lengths. Privately owned and operated so would require business case to justify upgrade or expansion. The Skitube only operates during winter season. — Coaches with snow play customers discouraged by resorts due to low propensity to spend vs occupancy of valuable land. — No coordinated network of public transport services or a single information platform to access KNP. — Lack of availability of local drivers and fleet to operate coaches and buses to move large volumes. — Demands for throughput vary between seasons. Infrastructure responses would need to consider the impact of throughput for 7 weeks of the year and the spatial impacts on the remaining 42 weeks. 	<ol style="list-style-type: none"> 1 It is not proposed to restrict any existing access to the park. However, future access will be limited to current levels through the amount of parking provided, number of stayers within resort and the provision and capacity of alternative modes of transport 2 No net growth in vehicle volumes – Address balance of occupancy of vehicles through introduction of higher capacity vehicles such as shuttle buses, facilitating an increase in people movement in the same number of vehicles. 3 Address the imbalance of park access fees for cars vs public transport passengers. 4 Review the reduction in coach parking at Perisher Range resorts. 5 Introduce a Park-and-Ride location in Jindabyne and associated Mountain Shuttle. 6 Introduce demand management measures. Target the occupancy of vehicles. Explore the opportunities for pricing mechanisms to influence vehicle occupancy to spread peak loads in winter. 7 Introduce scheduled rapid transit services, between Jindabyne, Perisher/Thredbo, Airport and villages for residents and visitors to access KNP. 8 With the introduction of new Mountain Shuttles invest in improved passenger waiting area facilities (bus stops and interchange hubs). 9 Targeted road improvements to improve the throughput and use by higher capacity vehicles (bus and coaches) such as overtaking lanes.

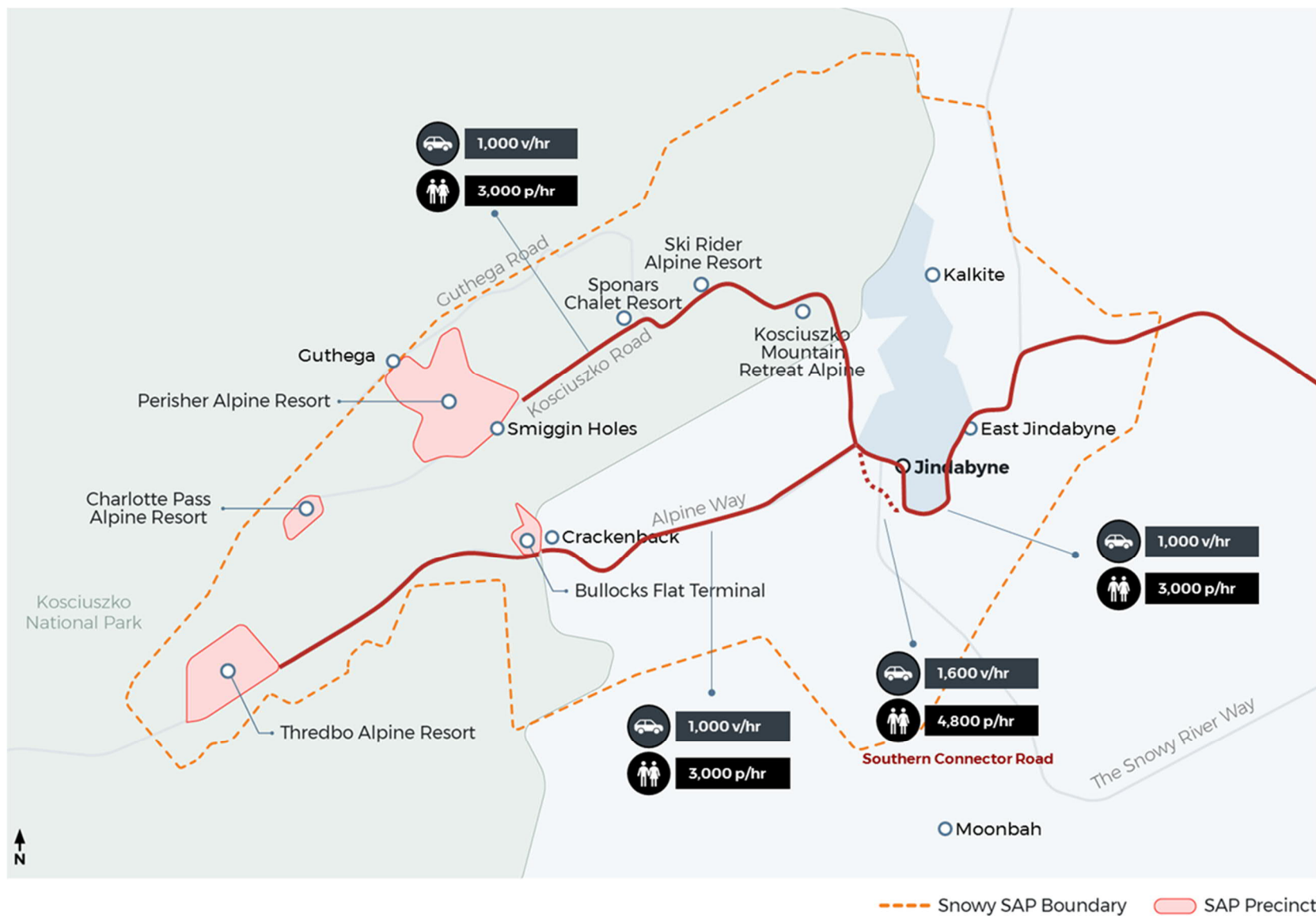


Figure 9.2 Key road capacity

Table 9.3 Connections – Directness

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Public transport is not time competitive with private car. — Public transport could be caught in congestion with cars. — Transfer of modes is not attractive and seen as inconvenient for families. — Multiple stops would slow down public transport service. 	<ul style="list-style-type: none"> — No coach parking at Perisher (located at Smiggin Holes). — Car parking located close to base stations at resorts. — Waiting time for public transport eats into precious holiday time. — Group size slows the directness of trip – multiple origins and destinations of members. — Using the Skitube requires a transfer at Bullocks Flat. — Resort accommodation provides independent shuttle services. — Limited passenger information services for transport. — Lack of Shared Mobility services available in Jindabyne. 	<ol style="list-style-type: none"> 1 Minimise stops on “turn up and go” Mountain Shuttle service, shown in Figure 9.3. 2 High frequency of Mountain Shuttles in peak periods minimising waiting times. 3 Locate stops for Mountain Shuttles in central locations to serve multiple trip ends. 4 Locate Mountain Shuttle stops and coach parking at resorts closer to base stations than private vehicles. 5 Target customers in smaller group sizes for Mountain Shuttle services. 6 Ensure Mountain Shuttles and coaches get priority at areas of congestion on network, e.g. express lanes at KNP gates. 7 Improve the interchange experience at hubs e.g. Skitube, resorts, trailheads, Jindabyne. 8 Investigate family group discounts for Skitube services. 9 Investigate Opal card usage on Skitube.

Table 9.4 Connections – Weather

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Adverse weather in winter impacts the operation of the key corridors serving KNP. — Travel becomes slow, and congested. — Slower travel leads to increased emissions and poor journey time reliability. — Access is restricted to car parking due to snow removal requirements. — Driving becomes dangerous due to low visibility, icy roads and the lack of experience of drivers operating in alpine conditions. — The requirement to fit snow chains is uncomfortable and frustrating and can create other safety issues at chain bays. — Road operations requires intensive management. — Requirement to apply salt to roads to aid snow removal. — There is a lack of quality shelter for public transport users and limited fleet availability in poor weather events to meet demand. 	<ul style="list-style-type: none"> — Significant recurrent cost for road maintenance. — Variability in travel time on large snowfall days. — Snow chain bays established in areas of typical snow fall. — Extensive signage and infrastructure to create safe driving conditions and driver advisory. — Studies into the effects of salt on watercourses. — Established sections of Live Traffic app to deal with snow conditions. — Use of variable message signs to alert drivers of requirement to carry snow chains 	<ol style="list-style-type: none"> 1 Reduce the requirement to travel in adverse weather by increase alternative bad weather day attractions in Jindabyne for all types of customers e.g. retail, indoor activities. 2 Introduce weather activated intelligent transport systems (ITS) to better alert drivers and reduce manual traffic management operations. 3 Introduce predictive traffic management systems to better manage adverse weather events. 4 Continue to enhance the cost and attractiveness of Skitube for travel. 5 Promote the Mountain Shuttles as an alternative to driving. 6 Supplement Mountain Shuttle fleet based upon long range weather forecasts. 7 Formalise car parking to facilitate better snow removal and maintain capacity. 8 Flexible pricing mechanisms which respond to weather-driven demand.

Table 9.5 Connections – Technology

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Customer information and guidance is time responsive in alpine environment. — Road operations are labour intensive. — Fast changing weather and parking supply levels leads to unreliable information. — Lack of up to date or accurate transport information for customers to make reliable and convenient travel choices. — Absence of vehicle occupancy data which can better inform demand management measures. 	<ul style="list-style-type: none"> — Car parking supply regularly at capacity. — Car parking levels monitored and reported manually. — No real time information of ski tube patronage or wait times. — No coordinated legible public transport system. — Real time information lacking to convey messages of road closures, chain fitting etc. — No indication of likely travel times to destinations during or before commencement of journey to inform travel choices. 	<ol style="list-style-type: none"> 1 Introduce real time parking information to manage existing car parking capacity. 2 Introduce predicative traffic management systems which respond to weather and congestion. 3 Provide driver guidance on road closures or chain fitting and redirect customers to the Skitube where possible. 4 Introduce more variable message signage at key decision points including within Jindabyne to reduce manual installation or changing of messaging. 5 Investigate technology to monitor vehicle occupancy to better inform demand management strategies. 6 Provide real time timetabling information for Skitube and Mountain Shuttles and park-and-ride capacity and incorporate into existing commuter travel applications. 7 Introduce smart payment systems e.g. Opal which integrate with lift tickets and provide incentives and provides access to Skitube. 8 Investigate technological upgrades to the Skitube to increase throughput. 9 Investigate improvements in technology to monitor levels of hiking and cycling in the park. 10 Ensure communications coverage on key corridors and resort areas to support roll out of new technologies.

Table 9.6 Connections – Parking

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Demand for parking in winter outstrips supply. — Demand continues to increase despite limited supply. — Spatial requirements for parking in winter dominate landscape in summer. — Areas identified for resort development are on existing car parking spaces. — Car parking prioritised for resort customers. — Limited overnight parking for visitors to the backcountry. — Existing car parking is at capacity at some locations in summer. 	<ul style="list-style-type: none"> — Demand for parking in winter outstrips supply. — Demand continues to increase despite limited supply. — Spatial requirements for parking in winter dominate landscape in summer. — Areas identified for resort development are on existing car parking spaces. — Car parking prioritised for resort customers. — Existing car parking is at capacity at some locations in summer. — Car parks are at capacity in some locations during summer such as Charlotte Pass. — Informal car parking at trail heads. 	<ol style="list-style-type: none"> 1 Introduce real time parking information to manage existing capacity. 2 No net increase of parking at resorts in KNP above existing/approved to match road capacity, see Figure 9.3. 3 Introduce park-and-ride facility in Jindabyne supported with a Mountain Shuttle service. 4 Park-and-ride provided for overflow/overnight parking, connected to ski fields (particularly Charlotte Pass) via Mountain Shuttle e.g. Perisher. 5 Maximise the use of underutilised parking at Bullocks Flat for Perisher in association with Skitube. 6 Implement restrictions on when parking/travel to the resorts is available. e.g. Snow play may be limited to certain times of the day. 7 Create formalised area for snow play within resorts where there is safe transport access and amenity (Pipers Gap). 8 Provide and encourage other transport mode choices – Skitube, Mountain Shuttles, Coaches, see Figure 9.4. 9 Use of parking within the redeveloped Charlotte Pass village and Perisher car park with an associated Mountain Shuttle for summer parking for access to Charlotte Pass hiking trail head.

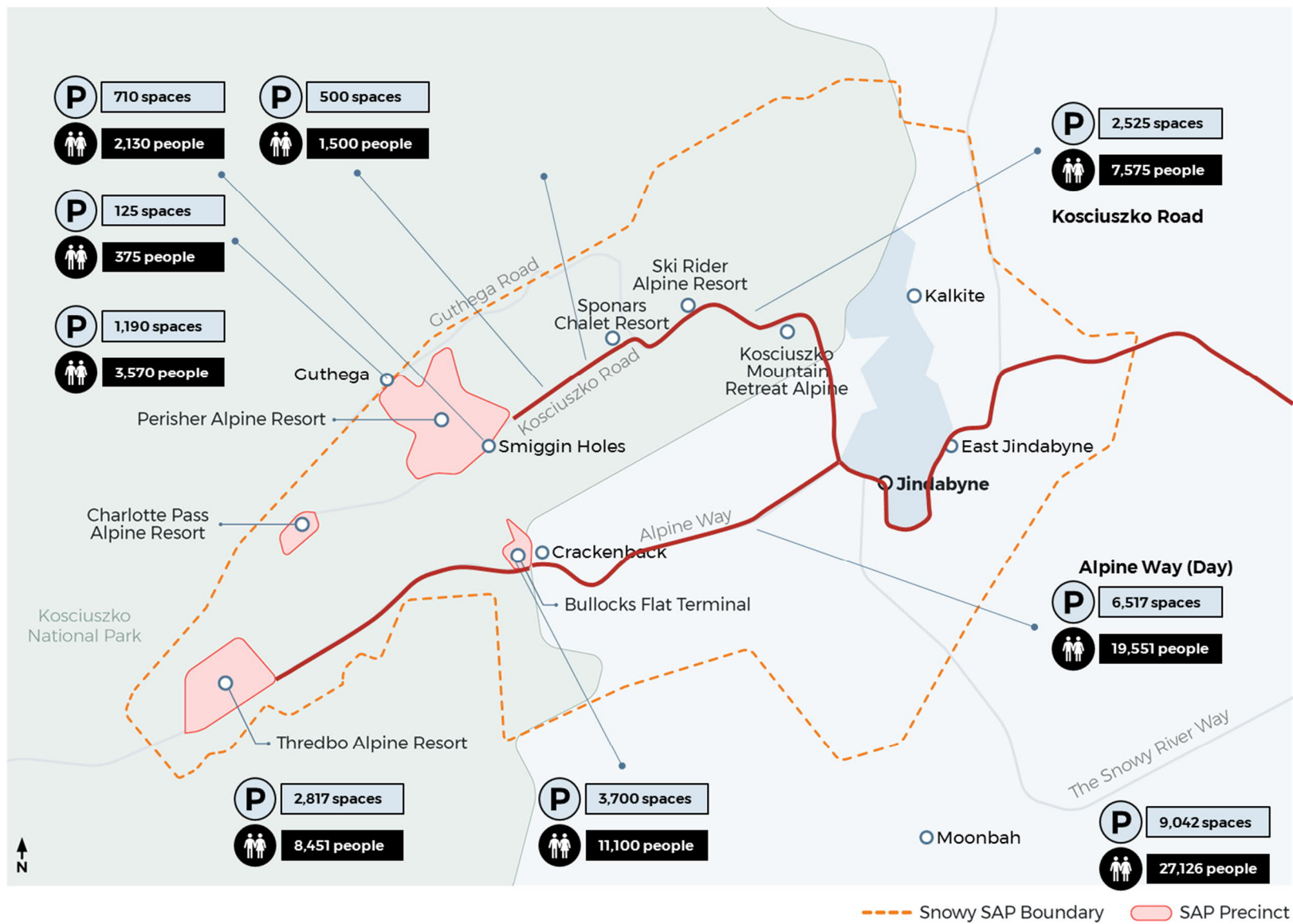


Figure 9.3 Winter car parking capacity

Table 9.7 Connections – Internal park movement

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Car focussed, infrequent, seasonal. — Access through the National Park is difficult without a private vehicle. — Existing Shuttle services are focussed on within resort transfers. 	<ul style="list-style-type: none"> — Limited summer season shuttle buses. — Parking at capacity at hiking trail head at Charlotte Pass in summer. — Skitube does not operate outside of winter season. — No MTB shuttle service back to Thredbo from Gadens Trout hatchery on Thredbo Valley Trail. 	<ol style="list-style-type: none"> 1 Mountain Shuttle buses through the National Park in all seasons. Investigate “On demand” services in summer. 2 All weather shelters whilst waiting for Mountain Shuttles in the resort or to Jindabyne (and beyond) in winter. 3 Mountain Shuttle services to accommodate equipment (skis/snowboards, bikes, backpacks etc.).

9.3 PLACE

The transport-related place impacts have been considered in terms of the potential opportunities created to influence:

- Anchors/Destinations – including The Perisher group of resorts, Charlotte Pass, Guthega, their related impacts on Jindabyne, and trail heads for hiking and mountain biking.
- Hubs – in terms of transport, park-and-ride and the airport.
- Amenity – from visual, passenger comfort and public spaces including the town centre and retail core.
- Corridors – influencing how legible they are, the sensitivity of the environment through which they pass, whether they are weather affected and how constrained they are.
- Environment – including the protection/managing of human impact and how they affect the picturesque National Park setting.
- Seasonality – whether they provide in winter, summer, or year-round benefits/impacts.

Table 9.8 Place – Anchors/destinations

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Anchors and destinations are at various levels of development completeness: <ul style="list-style-type: none"> — Jindabyne established but tired — Thredbo Village established and modern — Perisher established, dispersed, awaiting further development to create improved public realm. — Different levels of activity, visitation at each place. — Different destinations and attractions within the Snowy Mountains SAP are not well connected by modes beyond cars. — Poor balance of movement and place – more space for vehicles, less space for people. — Some anchors like hiking and MTB trail heads in KNP are important but small in scale and dispersed. 	<ul style="list-style-type: none"> — Lack of promotion of anchors and destinations as sustainable travel offerings. — Lack of competitive demand (alternative attractions) to stay in Jindabyne rather than visit ski fields. — Large areas of car parking at Perisher, low priority for pedestrians. — Footpaths on roadways in Thredbo. 	<ol style="list-style-type: none"> 1 Enhance the attraction of anchors and destinations through quality upgrades to accommodation, public realm, and retail offerings: <ol style="list-style-type: none"> a Jindabyne town centre, Perisher village b promote Thredbo, Crackenback, Charlotte Pass and Guthega as summer gateways to hiking and mountain biking. 2 Upgrade Mountain Shuttle facilities and associated pedestrian access within resorts. 3 Package summer activities together such as hiking and mountain biking with associated transport options.

Table 9.9 Place – Hubs

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Low profile quality hub in Jindabyne. — Current airport located 30 minutes' drive from Jindabyne. — Underutilised Park-and-Ride facility and Skitube at Bullocks Flat. — No established park-and-ride facility in Jindabyne. 	<ul style="list-style-type: none"> — The private vehicle is still the dominant modal choice. — Remote Airport locations have impact on transport with low take-up of rental car. — Underutilisation of the transport hub at the Visitor Centre in Jindabyne despite quality facilities. — Ageing infrastructure – Skitube, town centre. 	<ol style="list-style-type: none"> 1 Promote the existing transit hub at the Visitors Centre in Jindabyne as the hub for a Mountain Shuttle. 2 Establish a new Park-and-Ride facility within Jindabyne with good access to the Southern Connector to intercept vehicles from outside the Snowy Mountains SAP. 3 Establish the airport as an anchor for a shuttle bus service. 4 Provide an enjoyable customer experience within the transport hubs: <ol style="list-style-type: none"> a safe, comfortable and accessible access for all b integrate retail opportunities c include way-finding and real time information. 5 Upgrade Mountain Shuttle facilities and associated pedestrian access in resorts.

Table 9.10 Place – Amenity

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Most anchors and destinations are not contemporary or take advantage of the unique natural landscape. — Transport facilities detract from the visual amenity of the National Park. — Transport vehicles are not sustainable and emit noise and fumes which contrasts with the pure alpine environment. — Different climatic conditions above the tree/snow line which directly impacts amenity and ability for the success of planting. 	<ul style="list-style-type: none"> — Lack of paths for walking and cycling. — Poor access to open space and dispersed centres of activity within villages. — Need to reduce emissions and congestion throughout KNP. — Limited use of Low Emission Vehicles. — Limited electric charge points. — Large areas at resorts paved with limited vegetation screening. 	<ol style="list-style-type: none"> 1 Support the introduction of zero emission vehicles (ZEVs) for use within KNP. 2 Create car free zones within resorts with associated parking areas and shuttles. 3 Redesign car parking to incorporate more pedestrian access, landscaping to screen or within buildings. 4 Provide and encourage other mode choices – Skitube and Mountain Shuttle buses. 5 Design of the public realm to encourage more walking and cycling

Table 9.11 Place – Corridors

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Kosciuszko Road/Alpine Way are unique corridors with many different functions. — Alpine Way services both resorts – Thredbo and Skitube to Perisher, as well as continuing through to the western portion of the National Park and the Victorian border. 	<ul style="list-style-type: none"> — Corridors are a scenic drive in their own right. — The Alpine Way has several tourism attractions located on it between Jindabyne and Lake Crackenback. — Weather affected and suffer capacity issues during peak periods. — Require environmental control/management with a price point at the Park entrances. 	<ol style="list-style-type: none"> 1 Ensure the visual amenity of the corridors are maintained. 2 Corridor widening or other upgrade works will need to consider the impact to the sensitive environments. 3 Market tourist attractions along the corridors e.g. Alpine Way as a trail to the resorts. 4 Manage access to corridors in poor weather from Jindabyne through variable message signage.

Table 9.12 Place – Environment

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — The impacts of more use by polluting vehicles can directly be related to climate change resulting in the reduction in snow depths. 	<ul style="list-style-type: none"> — Limits on development through bed numbers. — Limits on areas of development within KNP. — Demand for skiing remains on an upward trend despite reducing snow depths year on year. — Standards for the sustainable construction of Mountain Bike and Hiking Trails. 	<ol style="list-style-type: none"> 1 Maintain limits on further infrastructure development with better management of existing resources. 2 Further promote the environmental values of the Kosciuszko National Park and the impacts that car-based travel has upon it. 3 Engage and educate the community on the sustainability requirements of mountain biking and hiking.

Table 9.13 Place – Seasonality

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Seasonal influence with a large focus currently on winter, need to acknowledge that there are challenges associated with the other seasons also. — Viability of business and supporting services during three seasons outside winter. — Lack of consistency of service provision across the year. — Some key transport such as Skitube does not operate in three seasons. 	<ul style="list-style-type: none"> — Car parking is set up for winter demand resulting in an oversupply in summer (and spring/autumn). — No Skitube operation outside winter. — Availability of fleet and workforce with seasonal changes. 	<ol style="list-style-type: none"> 1 Ensure core facilities and services remain open in three seasons. 2 Consider on demand services or shorter shuttles in three seasons. 3 Utilise large expanses of car parking for alternative uses in quieter seasons. 4 Build economy around mountain biking, hiking, food and events in three seasons. 5 Formalise the existing parking at the turn around and provide overflow parking within the redeveloped Charlotte Pass Village.

9.4 SUSTAINABILITY

The transport-related sustainability has been considered in terms of the potential opportunities created to influence:

- Trip generation – in terms of the number of trips, type (purpose) of the trip, the time of the trip and the mode of transport.
- Safety – for all road users, especially vulnerable ones such as pedestrians and cyclists, for workers and for wildlife.
- Social – access for all customers and access at all times.
- Type of vehicle – including the ability of the type of power to contribute to sustainability and low emissions (including electric and hydrogen).
- Economic Development – cost competitiveness between modes, cost of entry, competitiveness with other alpine destinations, financial sustainability and the cost of construction and maintenance.

Table 9.14 Sustainability – Trip generation

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — The number of trips continues to increase in winter despite lower snow depths. — Decreasing use of sustainable transport options e.g. coaches in favour of private vehicles taking up more of the finite road capacity. — More trips utilising pick-up and drop-off in general vehicles due to constraints on parking. — Lack of village in Perisher requires more people to travel to resort. 	<ul style="list-style-type: none"> — Travel (and emissions) dominated by car. — Time of trips is concentrated in the AM peak to match the resort opening times. — More trips recorded by NPWS cameras than that provided by parking supply suggesting drop-off and pick-up activity. — Lack of attraction to stay in Jindabyne for retail or tourism offering as an alternative day activity to travel to resorts. 	<ol style="list-style-type: none"> 1 Move away from car-based solutions as the default with an increased use of public transport capturing more people in less vehicles. 2 Packaging travel with resort and park access for those who use public transport. 3 Leveraging technology to support travel demand management by targeted in vehicle occupancy, time of day travel. 4 Develop Perisher Village to maintain activity within the resort longer. 5 Review the costs of transport and park access (including Skitube) for local residents and workers through annual passes. 6 Introduce incentives for resort users for sustainable travel. <ol style="list-style-type: none"> a half-price lifts tickets for every 10 rides b chance to ski on a closed run c food and beverage vouchers. 7 Utilise a ridesharing app to increase vehicle occupancy.

Table 9.15 Sustainability – Safety

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Provide a safe transport environment for all users of the Park. — Safety is compromised by extreme weather conditions e.g. snow and bushfires. — Conflicts between hikers and mountain bike riders as trails become more popular. — Significant impact on wildlife due to collisions with vehicles. 	<ul style="list-style-type: none"> — Safety is across many aspects of transport and impacts both humans and fauna. — Higher than State average of crashes due to weather and unique environmental conditions. — Private vehicles and cyclists create safety concerns in summer. — Park, transport and resort workers are exposed to safety risks in the road corridor, particularly in difficult weather. 	<ol style="list-style-type: none"> 1 Ensure adequate safety provisions in place for workers: snow clearers, chain fitters, traffic management workers, etc through greater application of technology. 2 Introduction of more driver guidance through application of ITS. 3 Investigate the provision of wildlife crossings if there are trends in collision locations.

Table 9.16 Sustainability – Social

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Access constraints created due to limited parking supply in winter which are controlled by resorts. — Park users such as cross-country skiers and those undertaking snow play are actively discouraged due to low propensity to spend within resort. 	<ul style="list-style-type: none"> — Different user groups in the Park: Casual snow play vs resort skiing/snowboarding. — Restriction on coaches bringing snow play visitors to resorts. — Discounts on Skitube process for Perisher annual pass holders. — Discounts on multi-year all parks passes for KNP entry. 	<ol style="list-style-type: none"> 1 Customer groups restricted to different times of the day, e.g. private vehicle access for snow play outside of the peak periods. 2 Accessible mode choices available for all customers. 3 Address equity in park access fees between vehicles and public transport. 4 Review pricing for annual passes for locals.

Table 9.17 Sustainability – Vehicles

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Winter Vehicles accessing and operating within the park are not considered low emission vehicles. — Due to extreme weather conditions there is a use of lower quality vehicles for shuttles within resorts. — High number of private vehicles entering the National Park whilst lower proportion of high capacity vehicles. 	<ul style="list-style-type: none"> — Competitiveness with other Low amount of charging facilities within resorts for electric vehicles. — Due to national regulations there are low levels of low emission vehicles accessing the park. — The take up of ZEV Shuttles would be higher than using a current vehicle as the environmental benefits are higher in profile for the customer. There are few levers to increase the use of shuttles and this is key. 	<ol style="list-style-type: none"> 1 Support the installation of more charge points for electric vehicles. 2 Address the balance in volume between private vehicles and public transport which reduces the number of vehicles and those likely to be carried in low emission vehicles. 3 Opportunity for zero emission vehicles to operate within resorts (electric, hydrogen, etc.). 4 Include transport as a key component of the sustainability plan and marketing for the Snowy Mountains SAP. 5 Consider restricting winter access to KNP to vehicles suitable for the conditions (e.g. four-wheel drives and appropriate ZEV). Other vehicles required to park at park-and-ride or Bullocks Flat for the Skitube.

Table 9.18 Sustainability – Economic development

PROBLEM/ISSUE	EVIDENCE	PROPOSED SOLUTION
<ul style="list-style-type: none"> — Winter activities are already considered a high cost tourism activity. — KNP access fee is considered a high cost access control mechanism. — Harsh weather conditions at cost and complexity to transport operations. — Potential transport solutions would incur significant costs against low patronage e.g. Skitube extensions. — Three season transport services are likely to require significant subsidies. 	<ul style="list-style-type: none"> — Competitiveness with other destinations in terms of KNP access charges e.g. Victoria and New Zealand. — Level of vehicle quality used for transport within resorts. — The limited upgrades to key public transport systems owned and operated by resorts e.g. Skitube. — Lack of activity and services in the three seasons. 	<ol style="list-style-type: none"> 1 Competitiveness in pricing and service options when compared with other destinations. 2 Utilise Mountain Shuttle buses as a flexible rapid transit option which can match seasonal demands but provide the same quality as higher capacity public transport options. 3 Explore partnerships with private operators such as resorts to provide more sustainable travel options or modernize existing public transport systems. 4 Develop employment generating solutions for locals e.g. drivers for Mountain Shuttle services. 5 Seasonal pricing mechanisms to attract visitors to the three seasons. 6 Explore how winter season charges can subsidize three season operations.

9.5 SUMMARY OF KEY TRANSPORT ACTIONS

The key recommendations for transport initiatives to achieve the Snowy Mountains SAP Vision for the Kosciuszko National Park are summarised in Table 9.19 below and are shown on Figure 9.5 overleaf.

Table 9.19 Kosciuszko National Park Access Plan – Key Initiatives

SOLUTIONS	CUSTOMERS					KEY FACTORS
	Residents	Visitors	Families	Athletes	Touring	
Connection Initiatives						
Infrastructure – Improved public transport facilities (road priority, stop infrastructure, etc.)	✓	✓				Journey time reliability, comfort, convenient trips
Services – Create a frequent and rapid Mountain Shuttle service linking key destinations	✓	✓				Service options, modal choice, frequent and convenient trips
Infrastructure – Implement real time information to manage parking capacity		✓	✓		✓	Informed choice, communicated service options
Infrastructure – Introduce ITS to alert drivers to conditions and improve road safety	✓	✓	✓		✓	Road safety, informed choice, improved customer experience
Place Initiatives						
Infrastructure – Improved place making at transport hubs both in KNP and at hubs including Jindabyne	✓	✓	✓		✓	Comfort, high quality customer experience, destination – retail opportunities
Policy – Maintain visual amenity and preserve the unique natural environment by capping parking supply to existing/approved levels	✓	✓	✓	✓	✓	Enhanced experience - quality
Policy – Promote Kosciuszko National Park as a year-round destination with emphasis on Mountain bike, hiking and altitude training		✓	✓	✓	✓	Choice, convenience, alternate experiences
Sustainability Initiatives						
Policy – Encourage a transport modal shift away from cars and support travel demand management	✓	✓	✓		✓	Choice, service reliability, convenience
Policy – Equitable access to KNP for all with competitive transport pricing for sustainable modes	✓	✓				Equitable, service quality
Policy – Priority access given to Mountain Shuttles and other high occupancy vehicles	✓	✓		✓		Enabling a frequent service, convenience, allows for journey time reliability
Policy – Transport solutions that target employment in the region	✓					Quality of services, regional employment

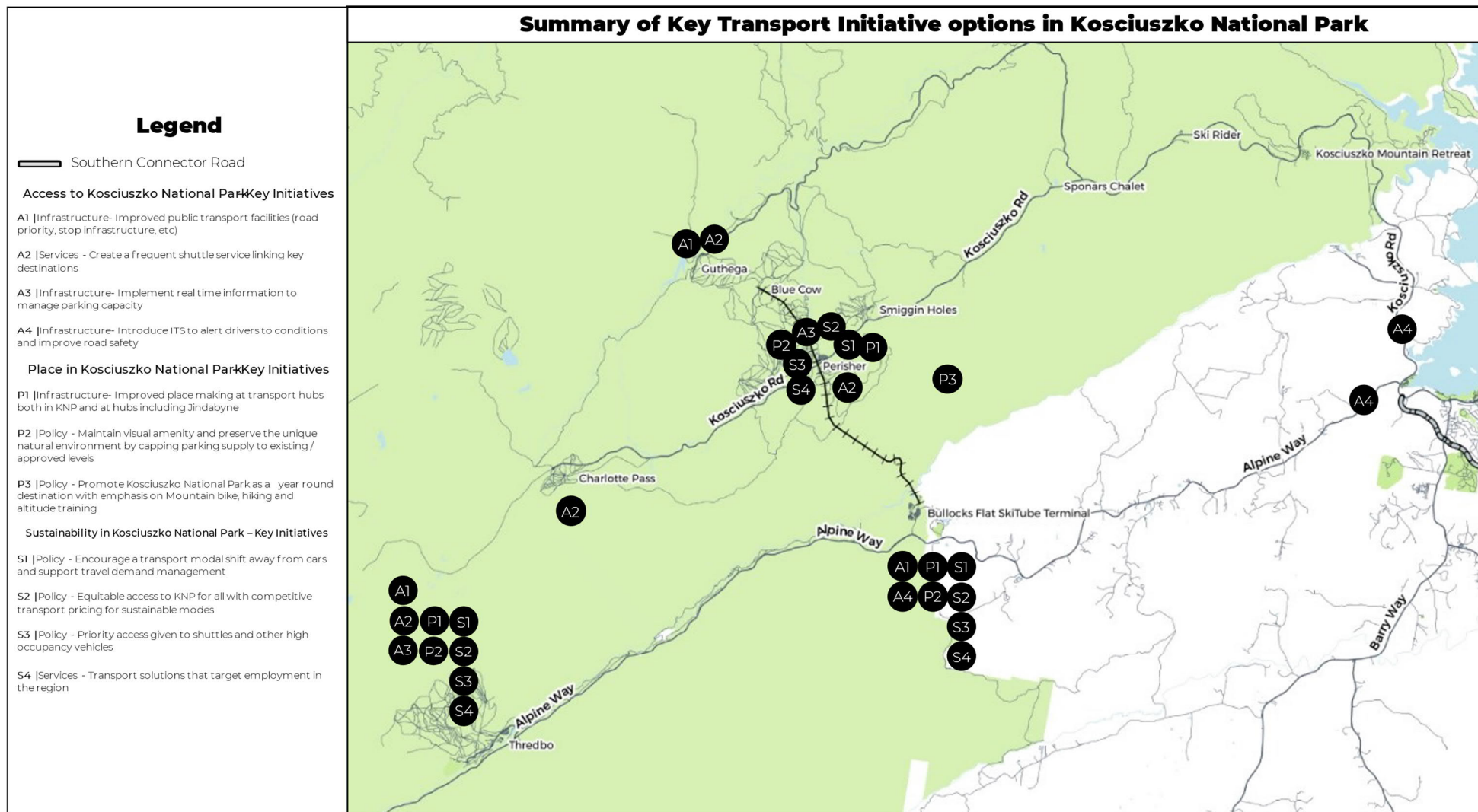


Figure 9.5 Map of Kosciuszko National Park key transport initiatives

10 IMPLEMENTATION

The transport assessment for this study has recommended several pieces of infrastructure to provide for future development within the Snowy Mountains SAP and in the surrounding transport networks to support access to the Snowy Mountains SAP within Jindabyne and to the National Park. It is envisaged that the development in the Snowy Mountains SAP would contribute to the cost of some of this infrastructure. Where the infrastructure provides a wider regional benefit, this contribution may be for only a part of the full cost.

10.1 INTEGRATED TRANSPORT NETWORK

A list of the transport infrastructure projects suggested for the Snowy Mountains SAP has been compiled based on the analysis in sections 7 to 9. The list shown in Table 10.1 is based on the assessment undertaken for this study. This list requires further consultation with the relevant agencies and are not government policy.

10.2 INFRASTRUCTURE TIMING

An assessment of potential timeframes for the suggested transport upgrades is also included in Table 10.1. The assessment considers the need for the infrastructure based on the delivery of developable regional enterprise land as well as coordination with other major developments. These development timeframes are approximate, based on the strategic nature of the assessment. It is recommended that the performance of the road network be monitored, and the list of upgrades and their timing be reviewed periodically to ensure the underlying assumptions of traffic growth remain suitable in the future.

The timing of changes to parking within the Kosciuszko National Park will be determined by how quickly the resorts move to progress the approved and planned developments. However, projects such as the Pipers Gap parking area should be identified as a priority due to the road safety benefits of consolidating overflow parking on one side of Kosciuszko Road.

10.3 FUNDING AND DELIVERY

The delivery of the package of road and public transport upgrades outlined in Table 10.1 may require funding from a range of sources including State government, Council and possibly contributions from businesses or other developers. To provide a preliminary understanding of the possible contributions to the cost of works, high-level strategic cost estimates have been prepared.

Table 10.1 Proposed infrastructure and service improvement

SOLUTIONS		AREA	TIMEFRAME	AGENCY RESPONSIBLE	COMMENTARY
Access Initiatives					
A.1	Services – Support the airport with increased public transport services to Jindabyne and resorts	Access to SAP	On-going	Transport for NSW, SMRC, private transport operators	Tied to flight and passenger increases, introduced early to influence positive behaviour
A.2	Services – Revise bus network to include new tourist and growth areas in East Jindabyne, the Hatchery Bay and along Alpine Way	Access to SAP	Short to Medium-term	Transport for NSW	Consider access to new development areas as they commence release
A.3	Infrastructure – Upgrade Snowy River bridge at Dalgety	Access to SAP	Medium term	Transport for NSW	To provide alternative route to Jindabyne Dam
A.4	Infrastructure – Sealed commuter pedestrian and cycle route from East Jindabyne to Jindabyne	Access to SAP	Short-term	SMRC	Addresses existing issues and provides for future growth
A.5	Infrastructure – Southern Connector Road	Access to Jindabyne	Short-term	Transport for NSW	Coordinated with Park-and-Ride and Shuttle Bus service
A.6	Services – Revise bus and coach network	Access to Jindabyne	Short to Medium-term	Transport for NSW	Establish network of services
A.7	Infrastructure – Improve footpath and crossing network through town targeting key pedestrian routes and destinations	Access to Jindabyne	Short to Medium-term	SMRC	Access to relocated school a priority
A.8	Infrastructure – Improve connections for cycling to key destinations such as shops, schools and community centres	Access to Jindabyne	Short-term	SMRC	Access to relocated school a priority
A.9	Infrastructure – Improved public transport facilities (road priority, stop infrastructure, etc.)	Access to KNP	Short to Medium-term	Transport for NSW	Coordinated with revision of bus network
A.10	Services – Create a frequent and rapid Mountain Shuttle service linking key destinations	Access to KNP	Short-term	Transport for NSW	Coordinated with Southern Connector Road and Park-and-Ride

SOLUTIONS		AREA	TIMEFRAME	AGENCY RESPONSIBLE	COMMENTARY
A.11	Infrastructure – Implement real time information to manage parking capacity	Access to KNP	Short-term	Transport for NSW, NPWS	Coordinated with Park-and-Ride and Shuttle Bus service
A.12	Infrastructure – Introduce ITS to alert drivers to conditions, parking provisions and improve road safety	Access to KNP	Short-term	Transport for NSW	Introduced early to gain maximum benefit from project
Place Initiatives					
P.1	Infrastructure – Extend lakeside cycle route around lake from Creel bay to Kalkite	Access to SAP	Short to Medium-term	SMRC	Developed in stages, priority from Jindabyne to East Jindabyne, then to Hatchery Bay
P.2	Infrastructure – Create new roadside lookouts	Access to SAP	Short to Medium-term	Transport for NSW, SMRC	Road safety, tourism
P.3	Infrastructure – Revise Kosciuszko Road through Jindabyne to take advantage of reduced traffic	Access to Jindabyne	Short-term	SMRC	Following opening of Southern Connector Road
P.4	Infrastructure – Create bus hub in town at Information centre	Access to Jindabyne	Short-term	Transport for NSW, SMRC	Supports Shuttle Bus service and network review
P.5	Infrastructure – Improved place making at transport hubs both in KNP and at hubs including Jindabyne	Access to KNP	Short-term	SMRC, NPWS, Perisher, Thredbo	Supports Shuttle Bus service
Sustainability Initiatives					
S.1	Infrastructure – Upgrade parts of Kosciuszko Road between East Jindabyne and the Jindabyne Dam	Access to SAP	Short-term	Transport for NSW	Addresses existing issues and provides for future growth

Notes Short-term = before 2031, Medium-term = before 2041, Due to peak population by 2039, no long-term projects

10.4 SHUTTLE BUS

The shuttle bus service is a key element of the travel demand management strategy. Early delivery will assist create a convenient service that attracts people back to use it each year. A trial service was planned for the 2021 winter season, unfortunately this was postponed due to the reintroduction of Covid-19 restrictions.

INITIAL SERVICE

- Shuttle bus to be operational within 4 years
- Jindabyne to Thredbo and Perisher could be implemented first, followed later by park-and-ride to Thredbo and, Perisher service when this facility becomes operational
- Headway of 10 minutes to each to Thredbo and Perisher
- Fleet of 24 buses.

BY 2031

- Headway of 5 minutes to each to Thredbo and Perisher
- Shuttle bus to continue for summer operation, providing access to the trail heads at Thredbo, Charlotte Pass, and the Adventure Park
- Fleet of over 100 buses.

PEAK OPERATION (2039)

- Headway of under 5 minutes to each to Thredbo and Perisher
- Fleet of over 200 buses.

Following the peak, services can be matched to changes in passenger demand. After each year, passenger numbers should be reviewed to tailor the balance of Perisher and Thredbo services.

10.5 PARK-AND-RIDE CAR PARK

It is recommended that the land for the Park-and-Ride be secured. The Park-and-Ride can be built in one go or staged to meet the changing demand, providing the land is secured initially. The delivery of the Park-and-Ride facility should be timed with the Southern Connector Road. The shuttle bus can operate only from stops in Jindabyne in the short term, moving to the Park and Ride once completed. Provision for 250 carparking spaces is expected to be operational on Day One with the estimated peak by 2039, and there is potential to further expand the Park and Ride facility if the demand increases.

10.6 SKITUBE

The current lease for the land on which the Skitube operates is due to expire in year 2030. This provides a useful horizon for an investigation and decision for the continuation of the service. Planning for the Skitube should commence well before the 2030 lease expiry to provide sufficient time for investigation, design and procurement of any system upgrades.

If patronage grows with Perisher visitation, it is estimated that 2,200 passengers during the peak hour (2039) can be achieved by running 4 car sets with a 15-minute headway with existing rolling stock or upgrade rolling stock based on design life. Further liaison is required with Vail Resorts to confirm that the increase from the existing capacity can be achieved.

A review of ticket prices in combination with NPWS park access fees should be undertaken in conjunction with planning for the shuttle bus service.

11 NEXT STEPS

The next steps in this study include:

- Identification of a preferred demand scenario and more detailed assessment to identify a “road map” for its achievement.
- Concept designs for each of the priority transport projects identified in the Snowy Mountains SAP Structure Plan. These have now been completed as part of the Snowy Mountains SAP Concept Design Report (October 2021):
 - Detailed traffic modelling and concept designs of the Southern Connector Road.
 - Assessment of further detail into the proposed park-and-ride and mountain shuttle transport solution, including concept designs of the park-and-ride and bus stops.
 - A corridor study of Kosciuszko Road through Jindabyne, focussing on public realm improvements and pedestrian connectivity.
- Parking strategy for the Jindabyne Town Centre considering the new streets and development opportunities in the master plan (this has been completed in an update to this report and is attached in Appendix E).
- Additional priority transport projects which should be progressed include:
 - A travel plan to support the new Sport and Education Precinct, ensuring students have safe access to the relocated school.
 - Recommencing the Mountain Shuttle trial which was put on hold in 2021 due to Covid-19 restrictions.
- Cost estimates of priority projects identified in this report and the structure plan (this was completed in the Snowy Mountains SAP Concept Design Report, October 2021).
- Investigations into improving connections into the region:
 - A road safety study of the Monaro Highway from the ACT Border to Cooma and Kosciuszko Road between Cooma and Jindabyne.
 - Opportunities for Snowy Mountains Airport upgrades to support additional capacity.
- Implement pedestrian and cycling improvements throughout the Jindabyne Town Centre, including provision of safe pedestrian facilities across key roads.

APPENDIX A

TRAFFIC VOLUME DATA



A1 TRAFFIC BETWEEN JINDABYNE AND THE ALPINE RESORTS

The location of available traffic count data is shown on Figure A.1. The traffic data is summarised in Table A.1.

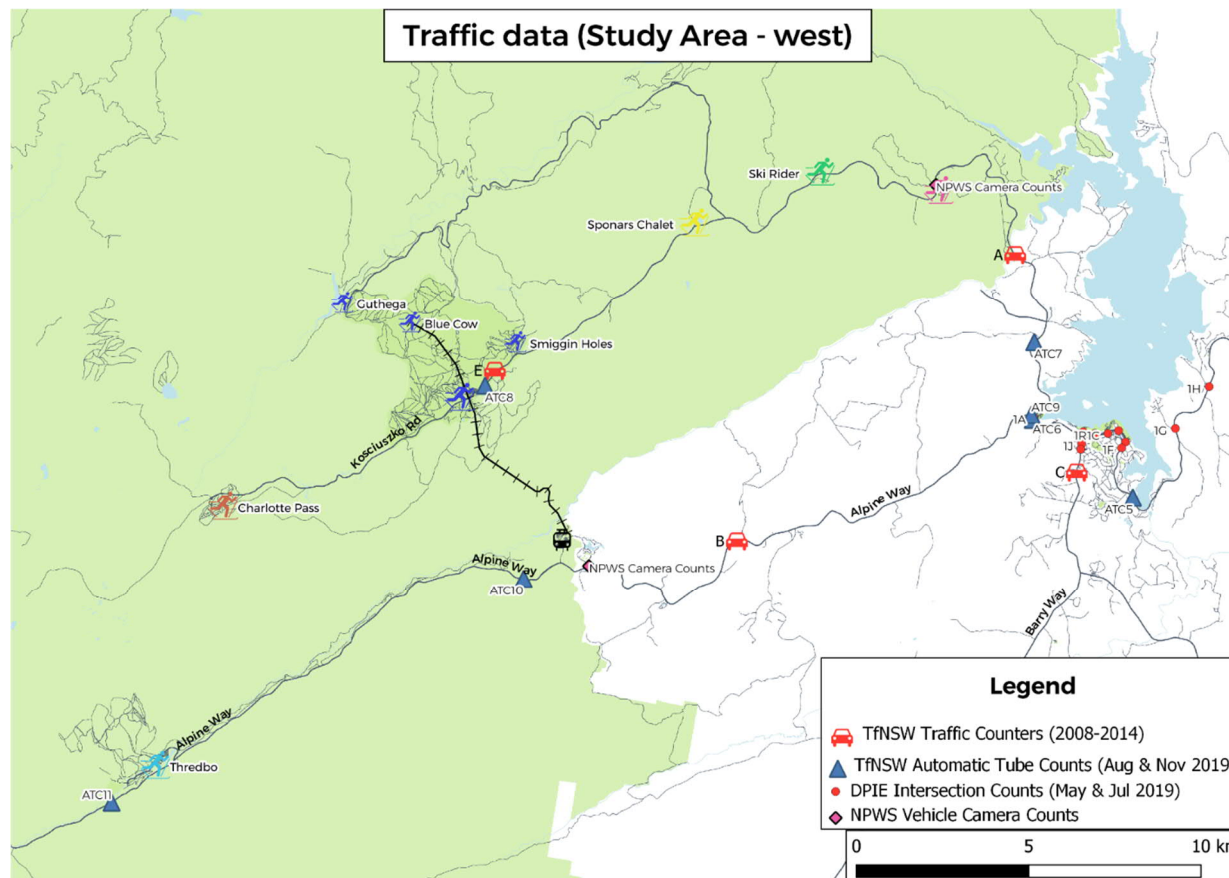


Figure A.1 Available traffic count data between Jindabyne and the alpine resorts

Table A.1 Summary of traffic data for Kosciuszko Road and Alpine Way between Jindabyne and the alpine resorts

CODE	LOCATION	LANES	HIGH SEASON (JULY AND AUGUST) 2019		LOW SEASON (MAY) 2019		DISCUSSION
			Peak hour volumes (One direction)	Daily volumes (Both directions)	Peak hour volumes (One direction)	Daily volumes (Both directions)	
1A ¹ and ATC6 ²	Kosciuszko Road, east of Alpine Way	2 in each direction	1,250 vph on weekdays, 1,950 vph on weekends	10,600 vpd on weekdays, 15,300 vpd on weekends	180 vph on weekdays	n/a	Capacity recently upgraded in 2018
ATC7 ² and A ³	Kosciuszko Road, north of Alpine Way	1 in each direction	530 vph on weekdays, 1,100 vph on weekends	4,100 vpd on weekdays, 6,400 vpd on weekends	120 vph on weekdays, 40 on weekends	1,000 vpd on weekdays, 700 vpd on weekends	Close to capacity on weekends in high season. Weather conditions further reduce capacity
E ³ and ATC8 ²	Kosciuszko Road, east of Porcupine Road	1 in each direction	200 vph on weekdays	1,500 vpd on weekdays			Within capacity. Weather conditions and pedestrians mean traffic growth is discouraged
ATC9 ²	Alpine Way, west of Kosciuszko Road	1 in each direction	720 vph on weekdays, 1,100 vph on weekends	6,600 vpd on weekdays, 9,350 vpd on weekends			Close to capacity on weekends in high season. Weather conditions further reduce capacity
B ³	Alpine Way, east of Bullocks Flat	1 in each direction	290 vph on weekdays, 470 vph on weekends	2,600 vpd on weekdays, 4,400 vpd on weekends	130 vph on weekdays, 90 vph on weekends	800 vpd	Within capacity. Weather conditions reduce capacity
ATC10 ²	Alpine Way, west of Bullocks Flat	1 in each direction	270 vph on weekdays, 420 vph on weekends	2,800 vpd on weekdays, 3,940 vpd on weekends			Within capacity. Weather conditions reduce capacity
ATC11 ²	Alpine Way – west of Thredbo	1 in each direction	Less than 10 vph	Less than 100 vpd			Low traffic

- (1) Traffic surveys for Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019) in May and July 2019.
- (2) Transport for NSW classified tube counts taken in August and November 2019, November counts factored to May 2019
- (3) Transport for NSW Traffic Volume Viewer, A and B 2014 counts factored up to 2019 and E: 2008 factored up to 2019.

A2 TRAFFIC IN JINDABYNE

The location of available traffic count data, mainly from the Go Jindabyne Mobility and Connectivity Study, is shown on Figure A.2. The traffic data is summarised in Table A.2.

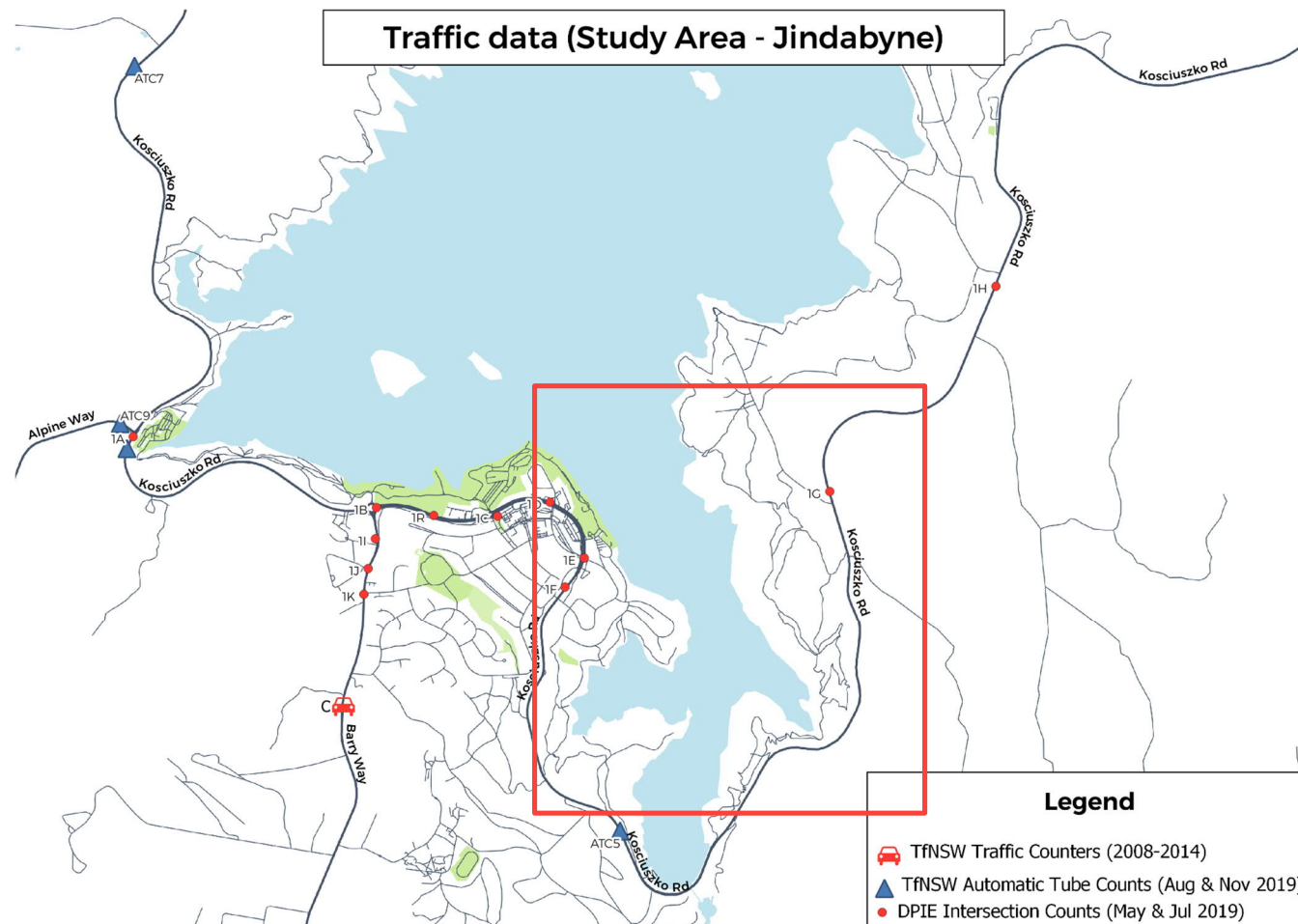


Figure A.2 Available traffic count data in Jindabyne

Table A.2 Summary of traffic data for within Jindabyne

CODE	LOCATION	LANES	HIGH SEASON (JULY AND AUGUST) 2019	LOW SEASON (MAY) 2019	DISCUSSION
			Peak hour volumes (One direction)	Peak hour volumes (One direction)	
1B ¹	Kosciuszko Road at Barry Way	2 westbound, 2 eastbound	1,520 vph on weekdays, 1,830 vph on weekends	300 vph on weekdays	Capacity recently upgraded
1C ¹	Kosciuszko Road at Kalkite Street	2 in each direction	1,480 vph on weekdays, 1,670 vph on weekends	430 vph on weekdays	Close to capacity in high season
1D ¹	Kosciuszko Road at Thredbo Terrace and McLure Circuit	2 in each direction	1,000 vph on weekdays, 1,160 vph on weekends	280 vph on weekdays	Within capacity
1E ¹	Kosciuszko Road at Thredbo Terrace and Banjo Paterson Crescent	2 in each direction	830 vph on weekdays, 950 vph on weekends	300 vph on weekdays	Within capacity
1F ¹	Kosciuszko Road at Munyang Street and Banjo Paterson Crescent	1 in each direction	730 vph on weekdays, 890 vph on weekends	280 vph on weekdays	Close to capacity in high season
1B ¹	Barry Way at Kosciuszko Road	2 in each direction	750 vph on weekdays, 820 vph on weekends	330 vph on weekdays	Within capacity, but affected by roundabout performance in high season
1I ¹	Barry Way at Poley Cow Lane	2 in each direction	890 vph on weekdays, 780 vph on weekends	330 vph on weekdays	Within capacity
1J ¹	Barry Way at Nettin Circuit	2 in each direction	840 vph on weekdays, 740 vph on weekends	320 vph on weekdays	Within capacity
1K ¹	Barry Way at Reedys Cutting Road	1 northbound, 2 southbound	760 vph on weekdays, 650 vph on weekends	300 vph on weekdays	Within capacity (larger volume in southbound direction with 2 lanes)
C ³	Barry Way, north of Bungarra Lane	1 in each direction	190 vph on weekdays, 120 vph on weekends	120 vph on weekdays, 80 vph on weekends	Within capacity

- (1) Traffic surveys for Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019) in May and July 2019.
(2) Transport for NSW classified tube counts taken in August and November 2019, November counts factored to May 2019
(3) Transport for NSW Traffic Volume Viewer, C: 2008 factored up to 2019.

A3 TRAFFIC BETWEEN JINDABYNE AND BERRIDALE

The location of available traffic count data is shown on Figure A.3. The traffic data is summarised in Table A.3.

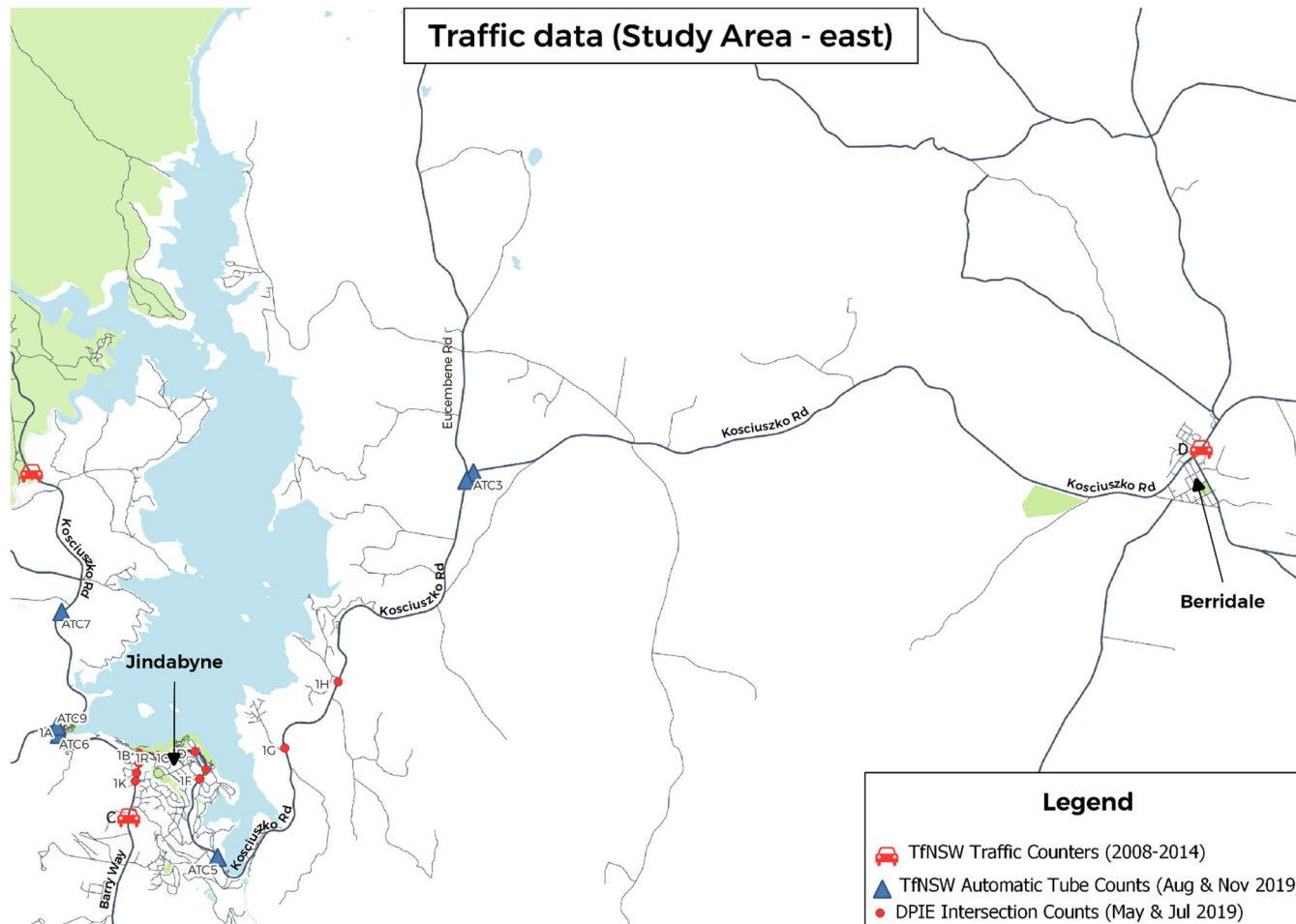


Table A.3 Summary of traffic data for Kosciuszko Road between Jindabyne and Berridale

CODE	LOCATION	LANES	HIGH SEASON (JULY AND AUGUST) 2019		LOW SEASON (MAY) 2019		DISCUSSION
			Peak hour volumes (One direction)	Daily volumes (Both directions)	Peak hour volumes (one direction)	Daily volumes (Both directions)	
ATC5 ²	Kosciuszko Road – 1.68 km south of Munyang Street	1 in each direction	500 vph on weekdays, 840 vph on weekends	8,000 vpd on weekdays, 10,700 vpd on weekends			Traffic volumes indicate Kosciuszko Road is busy, but operating within capacity during the high season
1G ¹	Kosciuszko Road and Rainbow Drive (Kosciuszko Road)	1 in each direction with climbing lane eastbound	660 vph on weekdays, 800 vph on weekends		280 vph on weekdays		
1H ¹	Kosciuszko Road and Jerrara Drive (Kosciuszko Road)	1 in each direction	650 vph on weekdays, 780 vph on weekends		250 vph on weekdays		
ATC4 ²	Kosciuszko Road, south of Eucumbene Road	1 in each direction	500 vph on weekdays, 840 vph on weekends	6,100 vpd on weekdays, 8,700 vpd on weekends			
ATC3 ²	Kosciuszko Road, east of Eucumbene Road	1 in each direction	290 vph on weekdays, 580 vph on weekends	5,600 vpd on weekdays, 8,200 vpd on weekends			

- (1) Traffic surveys for Go Jindabyne Mobility and Connectivity Study (GTA Consultants, 2019) in May and July 2019.
- (2) Transport for NSW classified tube counts taken in August and November 2019, November counts factored to May 2019
- (3) Transport for NSW Traffic Volume Viewer, A and B 2014 counts factored up to 2019 and E: 2008 factored up to 2019.

APPENDIX B

FREIGHT DATA



B1 TRANSPORT FOR NSW FREIGHT DATA

Table B.1 outlines the data for Snowy Mountains local government area from the Transport for NSW freight model.

Table B.1 Summary of existing (2016) freight volumes (annual kilotonnes)

COMMODITY	INTERNAL	IMPORTS	EXPORTS
Forestry	260 (94%)	115 (50%)	504 (94%)
Food		40 (18%)	
Other Consumer Goods		30 (13%)	
Fuel		20 (9%)	
Steel		7 (1%)	
Horticulture		6 (1%)	
Livestock	17 (6%)	3 (1%)	19 (4%)
Meat		1 (1%)	10 (2%)
Milk		2 (1%)	
Timber		2 (1%)	2 (<0%)
Motor vehicles		2 (1%)	
	Small quantities of meat and wine grapes	Small quantities of wine grapes	Small quantities of wine and wine grapes
Total	278 (100%)	228 (100%)	535 (100%)

Source: Transport for NSW Freight Forecast from the Strategic Freight Model, September 2018

Notes Origin and/or destination = Snowy Mountains local government area for 2016

APPENDIX C

STRUCTURE PLAN AREA DETAILS





- | | |
|-----------------------|-----------------------|
| Sub-precinct boundary | Accommodation/Housing |
| Key public space | Commercial |
| Node | Mixed use |
| Parking | Road corridor |
| Active frontage | Existing development |
| Shared path | |
| Plaza | |
| Open space | |

APPENDIX D

WEEKDAY ROAD NETWORK PERFORMANCE



D1 WINTER WEEKLY FUTURE PERFORMANCE

The results for the winter weekday peaks with the Southern Connector Road are shown in Table D.1.

Table D.1 Mid-block road capacity assessment – winter weekday volumes – with Southern Connector Road

ROAD LOCATION	2019 PEAK HOUR	2031 FORECAST	2041 FORECAST	2061 FORECAST
Alpine Way (Bullocks Flat to Thredbo)	B	B	B	B
Alpine Way (Kosciuszko Road to Bullocks Flat)	D	D	E	D
Kosciuszko Road (Alpine Way to Sawpit Creek)	C	C	D	C
Kosciuszko Road (Barry Way to Alpine Way)	C	B	B	B
Kosciuszko Road (east of Barry Way)	B	A	B	B
Kosciuszko Road (east of Kalkite Street)	B	C	C	C
Kosciuszko Road (Jindabyne Dam)	D	E	E	E
Kosciuszko Road (Eucumbene Road to East Jindabyne)	C	D	D	D
Kosciuszko Road (Berridale to Eucumbene Road)	B	B	C	C
Barry Way (south of Kosciuszko Road)	A	B	C	C
Barry Way (south of Snowy Mountains Way)	A	B	B	B
Southern Connector Road (east of Barry Way)	-	A	B	A
Southern Connector Road (west of Barry Way)	-	B	D	C

The results for the winter weekday peaks with the Southern Connector Road are shown in Table D.2.

Table D.2 Mid-block road capacity assessment – off-peak weekday volumes – with Southern Connector Road

ROAD LOCATION	2019 PEAK HOUR	2031 FORECAST	2041 FORECAST	2061 FORECAST
Alpine Way (Bullocks Flat to Thredbo)	A	A	A	A
Alpine Way (Kosciuszko Road to Bullocks Flat)	A	A	A	A
Kosciuszko Road (Alpine Way to Sawpit Creek)	A	A	A	A
Kosciuszko Road (Barry Way to Alpine Way)	A	A	A	A
Kosciuszko Road (east of Barry Way)	A	A	A	A
Kosciuszko Road (east of Kalkite Street)	A	A	A	A
Kosciuszko Road (Jindabyne Dam)	B	C	C	C
Kosciuszko Road (Eucumbene Road to East Jindabyne)	A	B	B	B
Kosciuszko Road (Berridale to Eucumbene Road)	A	A	A	A
Barry Way (south of Kosciuszko Road)	A	A	B	B
Barry Way (north of Snowy Mountains Way)	A	A	A	A
Southern Connector Road (east of Barry Way)	-	A	A	A
Southern Connector Road (west of Barry Way)	-	A	B	B

APPENDIX E

JINDABYNE TOWN CENTRE PARKING PLAN



Department of Planning and Environment

JUNE 2022

Snowy Mountains Special Activation Precinct

Jindabyne Town Centre Parking Plan

wsp



Table of contents

1	Introduction	1
1.1	Project background	1
1.2	Purpose of this plan.....	1
1.3	Study area	2
1.4	Policy review	3
2	Background review	4
2.1	Existing conditions.....	4
2.2	Previous parking strategies	9
2.3	Current planning controls	10
3	Parking considerations.....	12
3.1	Parking strategy.....	12
3.2	Integrated strategy.....	13
3.3	Existing parking conditions	13
3.4	Future parking demand	19
3.5	Snowy Mountains SAP Public Realm Concept Design	21
4	Parking recommendations	22
4.1	Jindabyne Town Centre.....	22
4.2	Foreshore parking	32
4.3	Mobility parking	32
4.4	Trailer and larger vehicle parking	33
4.5	Alternative parking strategies	33
4.6	Short Term Rental Accommodation (STRA) parking controls	34
4.7	Future proofing	34
4.8	Further monitoring of parking	35
5	Limitations	36

List of tables

Table 2.1	Comparison of parking requirements from Snowy River Council and Cooma-Monaro Shire Council.....	10
Table 3.1	Parking capacities within Jindabyne.....	17
Table 3.2	Parking demand within Jindabyne.....	17
Table 3.3	Proposed floorspace projections within Jindabyne.....	19
Table 3.4	Proposed future on-street parking changes as part of Snowy Mountains SAP Public Realm Concept Design.....	21
Table 4.1	Jindabyne Town Centre parking summary.....	24
Table 4.2	Parking pricing strategies and actions.....	31

List of figures

Figure 1.1	Jindabyne Town Centre structure plan.....	2
Figure 2.1	Jindabyne Town Centre.....	4
Figure 2.2	Jindabyne Town Centre promenade	4
Figure 2.3	Kosciuszko Road adjacent to Town Centre	5
Figure 2.4	Snowy River Avenue at Gippsland Street.....	5
Figure 2.5	Snowy River Avenue towards Thredbo Terrace.....	6
Figure 2.6	Level difference between the Town Centre and Snowy River Avenue	6
Figure 2.7	Underutilised bus bays in Town Centre	6
Figure 2.8	Bus bays in NPWS Visitors Centre.....	6
Figure 2.9	Cycling retailer in Town Centre with no supporting cycling infrastructure	7
Figure 2.10	Poor pedestrian connections between Town Centre and foreshore parklands.....	7
Figure 2.11	Existing movement and place conditions.....	8
Figure 3.1	Scale of vehicle demand across 2018 – Offseason to busiest day	14
Figure 3.2	Current parking restrictions in Jindabyne.....	15
Figure 3.3	Current parking supply, September 2018 demand, December 2018 demand and estimated peak demand	16
Figure 3.4	Thredbo Terrace car park – opportunities for expansion	18
Figure 3.5	Town Centre bus bays – potential for conversion to angle parking	18
Figure 3.6	Snowy River Avenue – Investigate angle parking on northern kerb	18
Figure 3.7	Gippsland Street – Maintain parking	18
Figure 3.8	Introduce angle parking on northern kerb of Park Road	18
Figure 3.9	Snowy River Avenue – improve footpaths on sunny side of street	18

List of figures (continued)

Figure 3.10	Estimate of future parking demand based on Snowy Monaro Regional Council DCP rates.....	20
Figure 4.1	Jindabyne Town Centre parking summary map by car park.....	28
Figure 4.2	Jindabyne Town Centre parking summary map by zone	29

List of appendices

Appendix A	Snowy Monaro Regional Council Development Control Plan Parking Rates
Appendix B	Parking opportunities

1 Introduction

1.1 Project background

The Snowy Mountains Special Activation Precinct (SAP) Draft Master Plan has considered the potential for future development within the township of Jindabyne as well as the adjacent areas of the Snowy Mountains. This proposed additional development is likely to lead to an increased demand for parking from new visitors to the region.

In direct response to submissions for the Draft Master Plan, the Department of Planning and Environment (DPE) engaged WSP to develop a parking plan for Jindabyne to manage this increase in demand in-line with the sustainable goals of the Snowy Mountains SAP and the objective of supporting the visitor economy in the area. This report sits alongside a suite of Snowy Mountains SAP reports which promote sustainable transport across the region. Whilst this report continues to recommend public and active transport as part of the parking solution, further details of these initiatives can be found in the Transport Technical Report, Snowy Mountains Structure Plan and Snowy Mountains Master Plan.

1.2 Purpose of this plan

This parking plan outlines the parking requirements, opportunities and suggests solutions for government and industry investment in parking. The plan includes the following components:

- quantitative review parking provision in the Town Centre
- identification of requirements for additional public parking and recommended locations
- recommendations for mechanisms to manage public parking
- recommendations for performance criteria for parking provision associated with new developments.

1.3 Study area

The study area for the Jindabyne Town Centre parking plan is shown in Figure 1.1. Whilst the Plan is focused on the Town Centre, the plan also provides some general considerations for foreshore parking and parking requirements for wider Jindabyne, particularly considering tourism parking rates.



Source: Snowy Mountains Special Activation Precinct Master Plan (DPE, June 2022)

Figure 1.1 Jindabyne Town Centre structure plan

1.4 Policy review

A review of local government parking policy has been undertaken to establish the baseline statutory planning context for the provision of parking for existing development in the town centre. It should be noted that the Snowy Monaro Regional Council inherited legacy parking policies from prior to its amalgamation with adjacent council areas. The planning policies below have been reviewed and assessed in relation to the development proposed through the Snowy Mountains SAP Draft Master Plan.

- Snowy River Development Control Plan, Snowy River Shire, 2013.
- Cooma-Monaro Shire Development Control Plan, Cooma-Monaro Shire, 2013.
- Snowy Monaro Local Strategic Planning Statement, Snowy Monaro Regional Council, 2020.
- Go Jindabyne Master Plan Mobility and Connectivity Study, GTA Consultants for Department of Planning, Industry and Environment (DPIE) 2019.

2 Background review

2.1 Existing conditions

In developing this plan, the unique characteristics of the regional town and tourism destination that make Jindabyne unique have been considered. The existing context of the Jindabyne Town Centre has been summarised in Figure 2.11. It considers both the place function and the movement networks of the town centre.

2.1.1 Existing place

Jindabyne Town Centre provides opportunities for good and services to not only to local residents, but a large tourism demand that is growing beyond the traditional winter peak into a more year-round destination with a focus on cycling and hiking. The key characteristics associated with its place function include:

- Three retail precincts:
 - Town Centre
 - Nuggets Crossing
 - Snowy River Avenue/Gippsland Street.
- These retail precincts accommodate ski hire, a supermarket, specialty retail and food and entertainment venues.
- The three retail precincts currently operate relatively independent of each other due to the absence of connected pedestrian paths, significant level differences in the urban realm and a lack of continuous active frontages.
- The town sits on the side of a hill and gradually slopes downwards to the foreshore of Lake Jindabyne.
- The town is also susceptible to winds which makes outdoor dining less attractive during most of the seasons in this alpine environment.
- Off-street surface parking dominates the streetscape and is mostly accessed off Kosciuszko Road.
- The peak demand for the Town Centre activity occurs in the afternoon during peak seasons when tourists end their adventurous activities in the mountains (e.g. skiing, cycling, hiking, fishing, exploring). This journey is usually associated with grocery shopping, returning hire equipment or dining out. Due to the terrain, most retail outlets are predominantly accessed by private vehicle.
- Unlike larger regional townships with stand-alone supermarkets, Jindabyne has only a small-scale supermarket which is incorporated into the Nuggets Crossing retail complex and therefore shares its parking with other specialised retail outlets.
- Venues at the edge of the town centre such as the Jindabyne Bowling and Sports Club attract significant amounts of activity through their large bistro and bar facilities which appeal to a family market.
- The presence of “shop-top” accommodation in sections of the town centre also generates parking demands in the same locations and peak times as retail activity.



Figure 2.1 Jindabyne Town Centre



Figure 2.2 Jindabyne Town Centre promenade

2.1.2 Existing movement

The existing movement corridors in the Jindabyne town centre are via main roads and local roads. These key movement corridors feed the main off-street car parks and include:

- Main roads:
 - Kosciuszko Road
- Local roads:
 - Thredbo Terrace, Kalkite Street, Gippsland Street and Park Road
- Large surface car parks exist in front of the Town Centre and Nuggets Crossing
- Pedestrian networks:
 - footpaths are absent from the southern side of Kosciuszko Road in front of Nuggets Crossing and the Town Centre
 - a lack of continuous and easily navigable footpaths between the three main retail precincts
- Lack of designated cycle infrastructure in the form of shared paths.



Figure 2.3 Kosciuszko Road adjacent to Town Centre



Figure 2.4 Snowy River Avenue at Gippsland Street

2.1.3 Existing constraints, challenges, and opportunities

The community response to the Draft Master Plan, targeted stakeholder engagement and WSP analysis has identified the following issues, opportunities, and challenges for the provision of parking in Jindabyne Town Centre:

- Parking needs to accommodate the local population as well as tourists to the area. Tourism changes the parking demand profile significantly over the year and creates parking concerns for locals in peak season.
- There is currently insufficient parking to access services in town centre during peak times. This is generally considered to be in the PM, during the winter season (particularly school holidays and weekends).
- Tourists primarily access the Snowy Mountains SAP area by private vehicle. This exacerbates the parking issue during peak tourism periods. Access to the region was excluded from the SAP scope, however the Transport Report continues to recommend modal choice and reduce the reliance on private vehicles.
- There is also insufficient parking to access recreational areas and the lake foreshore with parking located away from the key destinations along the foreshore.
- The Council car parks at Kalkite Street and Thredbo Terrace are located on the periphery of the Town Centre and do not adequately support the Town Centre. Opportunities for walking connections to be strengthened to make these car parks more attractive.
- Tourism accommodation has an undersupply of car parking. This is exacerbated by the increase in short term residential accommodation in residential streets.
- The existing parking supply issues are expected to increase with increasing visitation and population growth planned in the Snowy Mountains SAP.

- Currently Jindabyne has limited active transport connections into the Town Centre. The Town Centre is dominated by private car use. There is an opportunity to improve sustainable transport options (walking, cycling and bus) to encourage locals and tourists to use other transport modes to access the Town Centre. This includes active transport connections to the lake to encourage visitors to access the foreshore.
- No regular public bus routes operate in Jindabyne. Several private bus shuttles operate to connect tourists to the ski fields only.
- The Jindabyne climate creates a challenging environment to encourage active or public transport use. It is also noted that in many other ski towns around the world, transport for tourists is dominated by public or active transport.
- Safety and security issues exist with people camping overnight in their cars along the foreshore.
- Need to provide parking spaces for RVs and cars with trailers within the town centre to cater for the tourism demand. This is more prevalent in the summer season.
- Parking in the future to be incorporated on Kosciuszko Road as through traffic demand is shifted to the proposed Southern Connector Road.
- Opportunity to encourage the uptake of electric vehicles with innovative parking policies. This may also become a constraint in the future with increased demand for public charging stations.



Figure 2.5 Snowy River Avenue towards Thredbo Terrace



Figure 2.6 Level difference between the Town Centre and Snowy River Avenue



Figure 2.7 Underutilised bus bays in Town Centre



Figure 2.8 Bus bays in NPWS Visitors Centre



Figure 2.9 Cycling retailer in Town Centre with no supporting cycling infrastructure



Figure 2.10 Poor pedestrian connections between Town Centre and foreshore parklands



Figure 2.11 Existing movement and place conditions

2.2 Previous parking strategies

2.2.1 *Snowy Monaro Local Strategic Planning Statement*

The Local Strategic Planning Statement (LSPS) released by the Snowy Monaro Regional Council in 2020 provides a detailed investigation into the plans for the Snowy Monaro community over the next 20 years. It looks at the environmental, social, and economic land use needs of the area and details the future vision for the region and outlines 12 planning priorities. It also includes town plans with specific objectives and actions for Jindabyne and other surrounding towns in the region. The key defining theme of Jindabyne in the LSPS is “Tourism Hub”.

An action item is to work with the Snowy Mountains SAP team to investigate and resolve traffic and parking issues in and around Jindabyne. This report aims to provide a high-level parking plan to inform Council, NSW Government and private developers of the parking issues and recommendations for Jindabyne.

2.2.2 *Go Jindabyne*

In November 2019, the Deputy Premier and Minister for Regional NSW announced the Go Jindabyne project (DPIE, 2019). Go Jindabyne was a visionary project focussed on the township aimed at supporting a more sustainable region, balancing recreational, economic, social, and cultural values. The holistic nature of the project called for a comprehensive engagement approach that took in community and business values as well as government agencies’ management perspectives.

For parking in Jindabyne, the main recommendation of the study was: “*Explore the viability of a Transport hub / park and ride facility on both ends of Jindabyne’s town centre*”. The principle of creating a parking area outside the town centre was to improve traffic conditions and safety within Jindabyne. Residents and visitors would be encouraged to park outside the core and walk to centre. There was potential to integrate the new parking facility with bus services. The viability of a transport hub has been progressed in the Snowy Mountains SAP Master Plan.

2.2.3 *Snowy Mountains Special Activation Precinct (SAP)*

The Snowy Mountains Special Activation Precinct (SAP) Draft Master Plan includes changes to Jindabyne’s land use and transport network that will change the parking conditions as the Master Plan is realised over the short and long term. The future parking supply outlined in this Plan has been developed from future floor space yields proposed in the Master Plan.

The Master Plan proposes a parking area outside the town near the intersection of Barry Way and the proposed Southern Connector Road, to operate primarily as a park and ride facility for people travelling to the alpine resorts. In later stages of development, a dedicated Jindabyne shuttle service has been suggested to operate around town. This may assist in reducing the parking demand in Jindabyne and increase public transport use. Opportunities for overflow parking from residential streets in the Park and Ride facility are also being investigated. However, the core function of the Park and Ride is to encourage public transport use to the alpine areas. Any other uses would be secondary and should not detract from its intended purpose.

2.3 Current planning controls

The parking controls for development in Snowy Monaro Regional Council are covered by the two Development Control Plans from the two amalgamated Councils. A selected list of parking rates for land uses within the Jindabyne Town Centre are shown in Table 2.1. The full list of land uses, and their parking rates are outlined in Appendix A: Table A.1.

Table 2.1 Comparison of parking requirements from Snowy River Council and Cooma-Monaro Shire Council

Development type/ land use	Snowy River Council parking requirements	Cooma-Monaro Shire Council parking requirements
Casual Accommodation		
Bed and Breakfast accommodation	1 space per bedroom, and 1 space for owner	1 space per customer bedroom plus 2 spaces for the owner
Hotel or Motels accommodation (including pubs where accommodation provided)	1 space per unit/room, and 2 spaces per managers residence, and 1 space per 2 employees	1 space per bedroom plus 1 space for every two employees
Backpackers' accommodation	Off street parking requirements assessed on merit	N/A
Farm stay accommodation	1 parking space per guest room	N/A
Serviced apartments	1 parking space per 1-bedroom serviced apartment unit, or 2 parking spaces per 2 or more bedroom serviced apartment, and 1 parking space per 2 employees	N/A
Commercial – Office/Retail		
Commercial premises including offices	2.5 parking spaces per 100 sqm Gross Floor Area (GFA)	1 space per 40 sqm GFA
Shops (retail)	4 parking spaces per 100 sqm GFA For ski hire premises: 6.7 parking spaces per 100 sqm GFA	1 space per 40 sqm GFA (including storage areas for goods pending their display or sale to customers in the shop, but not including loading bays)
Restaurants or Cafes	5 parking spaces per 100 sqm GFA 1 parking space per 6.5 sqm of public dining area 1 parking space per employee	1 space per 5 seats (whether the seats are located inside premises or on the footpath)
Shops Neighbourhood shops	1 parking space per 20 sqm Gross Leasable Floor Area (GLFA)	

Source: Cooma-Monaro Shire Development Control Plan 2014 (Amendment 2) (Snowy Monaro Regional Council, 2014), Snowy River Development Control Plan 2013 (Snowy Monaro Regional Council, 2013)

For casual accommodation, there is a strong principle of one parking space per guest room, in addition to the requirements of live-in managers/employees. The mix of retail and commercial development within the Town Centre will play an important role in determining the overall quantity of parking, with rates ranging from 2.5 to 6.7 spaces per 100 sqm GFA. There is potential for shared use of the parking supply between businesses, reducing the overall land required.

2.3.1 *State Environmental Planning Policy (Housing) 2021 (Housing SEPP)*

Communities have reported negative impacts in areas where short term rentals have increased for several issues including parking and traffic movements. Research by the University of Sydney¹ identified a need to adjust planning controls to define types of properties and control the amount of parking. The State Environmental Planning Policy (Housing) 2021 (Housing SEPP) came into effect in November 2021. The Housing SEPP applies consistent regulation of short-term rental accommodation (STRA) across NSW.

The Housing SEPP includes a new STRA planning policy framework comprises new standard provisions and introduces:

- a new definition for STRA, hosted STRA and non-hosted STRA
- an exempt development pathway for:
 - hosted STRA in a dwelling, 365 days per year
 - non-hosted STRA in a dwelling, 180 days per year in Greater Sydney and nominated regional NSW LGAs and 365 days per year in all other locations; and
- an exemption of bookings of 21 consecutive days or more from day limits for non-hosted STRA.

As summarised above, the Housing SEPP includes provisions which enables STRA to be undertaken as 'Exempt' development, with no requirement for planning approval (i.e. by way of Development Application) and no requirement to provide parking. The requirements of the SEPP prevail over a local environmental planning instrument or policy (such as an LEP or DCP), as well as any inconsistencies with another SEPP. The implications of this are that Council cannot impose supplementary parking requirements which contravene the general requirements for STRA provided in the Housing SEPP.

The STRA policy is supported by the implementation of a new Government-run STRA register that will track day limits of each STRA dwelling and provide details to assist local councils with monitoring STRA in their local government areas (LGA). This provides an avenue for Councils to monitor and document impacts such as on-street parking congestion in surrounding streets.

¹ Planning responses to online short-term holiday rental platforms, Research Project for Australian Coastal Councils Association Inc. (Gurran et al, September 2018)

3 Parking considerations

3.1 Parking strategy

3.1.1 *Kerbside uses*

There are a variety of users of the Jindabyne Town Centre, many of which require different needs and priorities. The parking plan recognises that parking for private vehicles is only a portion of the solution. The town centre both now, and in the future needs to be able to respond to the needs of a variety of users. Some user groups include:

- **Buses/public transport vehicles:** space is required both for set-down/pick-up and for layover. Both uses require the kerbside or dedicated bus bay for a short amount of time. The large amount of tourism within Jindabyne calls for several spaces within the town centre to accommodate for bus set-down/pick-up, as many people utilise public transport to get into Jindabyne town centre. The purpose built facility in the National Parks and Wildlife Centre should remain the focus for bus services to the Town centre as it has dedicated saw tooth bays, shelter and customer facilities and efficient entry and exit routes to and from Kosciuszko Road.
- **Taxis/rideshare:** the space is required for rideshare services is likely to grow into the future. Convenient locations near community, medical, food and entertainment destinations are required for the set-down/pick-up of passengers.
- **Loading and servicing:** space is required to allow loading and service vehicles appropriate places to stop. These spaces are often time restricted. Ramps may be useful in these spaces to assist with the loading/unloading of goods. This is particularly important within the town centre to allow for products to be loaded into stores.
- **Mobility/accessible users:** marked spaces should be dedicated to users with reduced mobility. These spaces should be conveniently located, especially around medical or community facilities. These spaces should also be specifically designed, with ramps or aligned with the kerb.
- **General parking:** private vehicle parking may utilise the kerbside and public off-street parking. This may be short term or long-term parking spaces. They could also be free or priced parking spaces.
- **Emergency and essential services:** space may need to be allocated to emergency vehicles. This is more relevant outside land uses such as medical facilities, including Snowy River Health Centre, sporting grounds or event spaces. In an emergency, vehicles will use any space that is most convenient, e.g., loading zones, authorised zones etc.
- **Tourism:** spaces for recreational and tourism uses can be considered, such as accommodating larger vehicles like private coaches, minibuses or accommodating private RVs, campervans etc. Spaces should be able to accommodate larger vehicles to stop to set-down/pick-up passengers and for layovers for an extended period. Nuggets Crossing car park already facilitates longer vehicles.
- **Authorised vehicles:** space may be required for authorised council vehicles. This could be the case outside council buildings, post offices, parks, etc.
- **Cyclists:** the kerbside could be prioritised for cyclists with dedicated lanes where possible. This could be either one direction on either side of the road for a two-way road, or one kerbside lane could be used for a bi-directional cycleway. An alternative could be to provide cycle lanes in dedicated off road facilities, given the wide verges in Jindabyne and provision of open space across town, including along the foreshore.
- **Pedestrians:** space is required for dedicated crossing opportunities. Available space may also be used to widen footpaths and allocate a shared space for pedestrians and cyclists.
- **Other:** Kerbside space could also be used for parklets or other leisure uses on a permanent or temporary basis. This could also apply to off street car parks for alternative uses outside of the peak tourist periods.

3.2 Integrated strategy

The Jindabyne parking strategy needs to be balanced with a strong active and public transport strategy. Whilst widespread public and active transport facilities don't exist currently, the Snowy Mountains SAP Master Plan proposes new links and infrastructure. The public and active transport recommendations are discussed in the Transport Technical Report, as well as the Structure Plan for the Snowy Mountains SAP. These active and public transport recommendations forms part of the parking solution:

- ensure a walkable town centre to promote a park and walk strategy
- provide safe active transport connections into the Town Centre to allow transport choices other than private vehicle
- promote the Jindabyne Mountain Shuttle (in later stages) as an additional transport mode for Town Centre connections
- encourage and facilitate transport to the SAP area via alternative transport modes (bus, plane, carpooling).

The urban design and development outcomes of the Snowy Mountains SAP Master Plan also informs the parking solution:

- As Jindabyne develops, adequate parking will be required based on DCP rates for the proposed development. This is expected to be provided within the development site and will be assessed with each individual Development Application.
- When parking is provided by SMRC, either on street or off street, the general strategy should be a park once and walk strategy. Parking should be promoted on the periphery of the town centre. Parking spaces towards the centre should have a higher turnover or be reserved for pick up/drop off and loading. This approach has many benefits for an alpine tourist town including allowing kerbside space for the streetscape upgrades, making the street more walkable and safer, making people walk past shop windows, encourages a livelier street life and community connections and reduces short trips between different town centre locations.
- Locate large capacity off-street parking on the periphery of the town centre and encourage more walking within its core utilising upgraded streetscapes. This keeps traffic on the edge of the town centre and prioritises the movement of walkers and cyclists and improves amenity.

3.3 Existing parking conditions

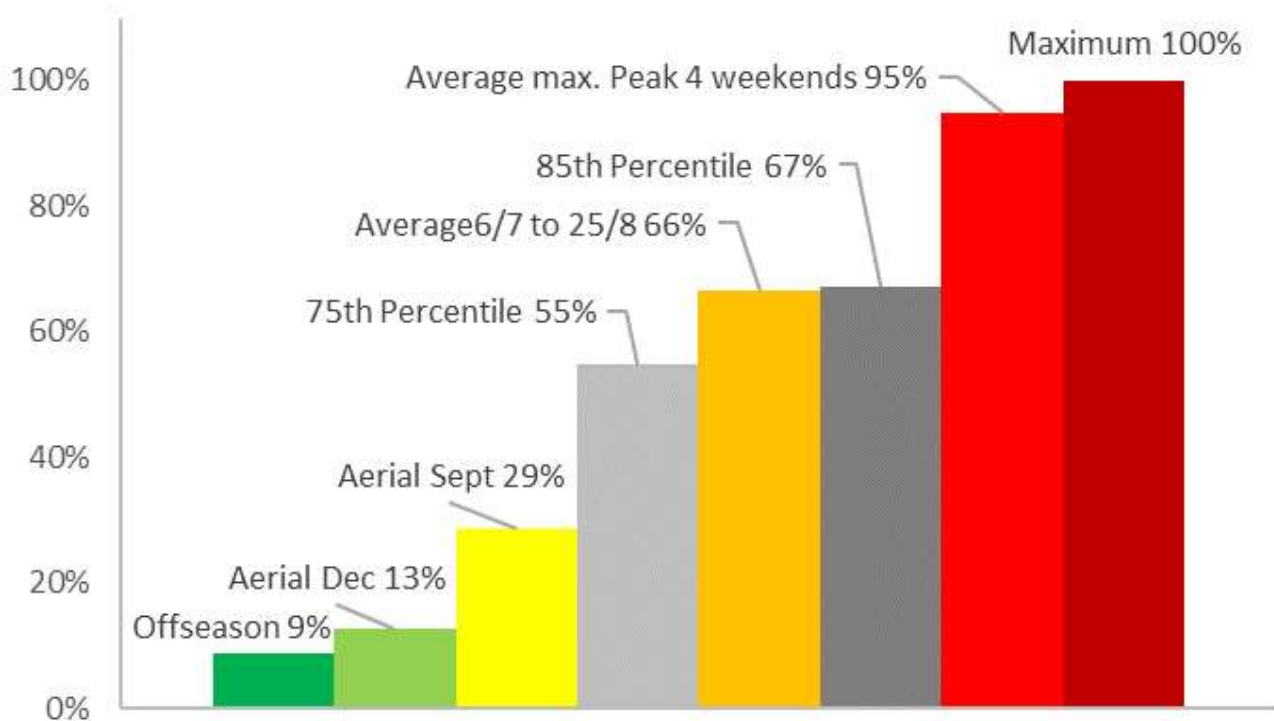
Demand for parking in the Jindabyne town centre varies greatly between the peak winter season and the “green seasons”. For much of the year, parking is more than adequate for the permanent town residents. Feedback from Snowy Monaro Regional Council and the community indicates that parking demand increases steeply during winter weekends as the number of people visiting the ski fields swells. This makes it difficult for residents to find parking to go about their regular activities.

3.3.1 *Available data and time of year*

Existing parking conditions were assessed using aerial photography as specific parking survey data was not available. In the absence of specific parking data, a methodology was required to estimate existing demand, and to work out what increase in parking is needed to meet future forecasts. Anecdotal evidence suggests there was insufficient parking at peak winter times. However, this does not say how much of a deficit, how long it lasts or how much latent demand exists.

Due to the impact of Covid travel restrictions, the methodology for the parking inventory assessment has used aerial photography as close as possible to peak winter season demand before the start of Covid's impacts. The available dates were Thursday, 20 September 2018 (on the shoulder of the winter season) and Wednesday, 26 December 2018, both sourced from Google Earth.

To gauge how much of the peak season demand these aerial surveys represent, National Parks and Wildlife camera data for vehicle movements on Kosciuszko Road at the Sawpit Creek access gate leaving the National Park were analysed. If the busiest day across the year represents 100% demand, the results indicate that the demand in December is 13% and the September demand is 29% of the maximum demand, as shown in Figure 3.1.



Source: National Parks and Wildlife Service Kosciuszko Road car counts 2018

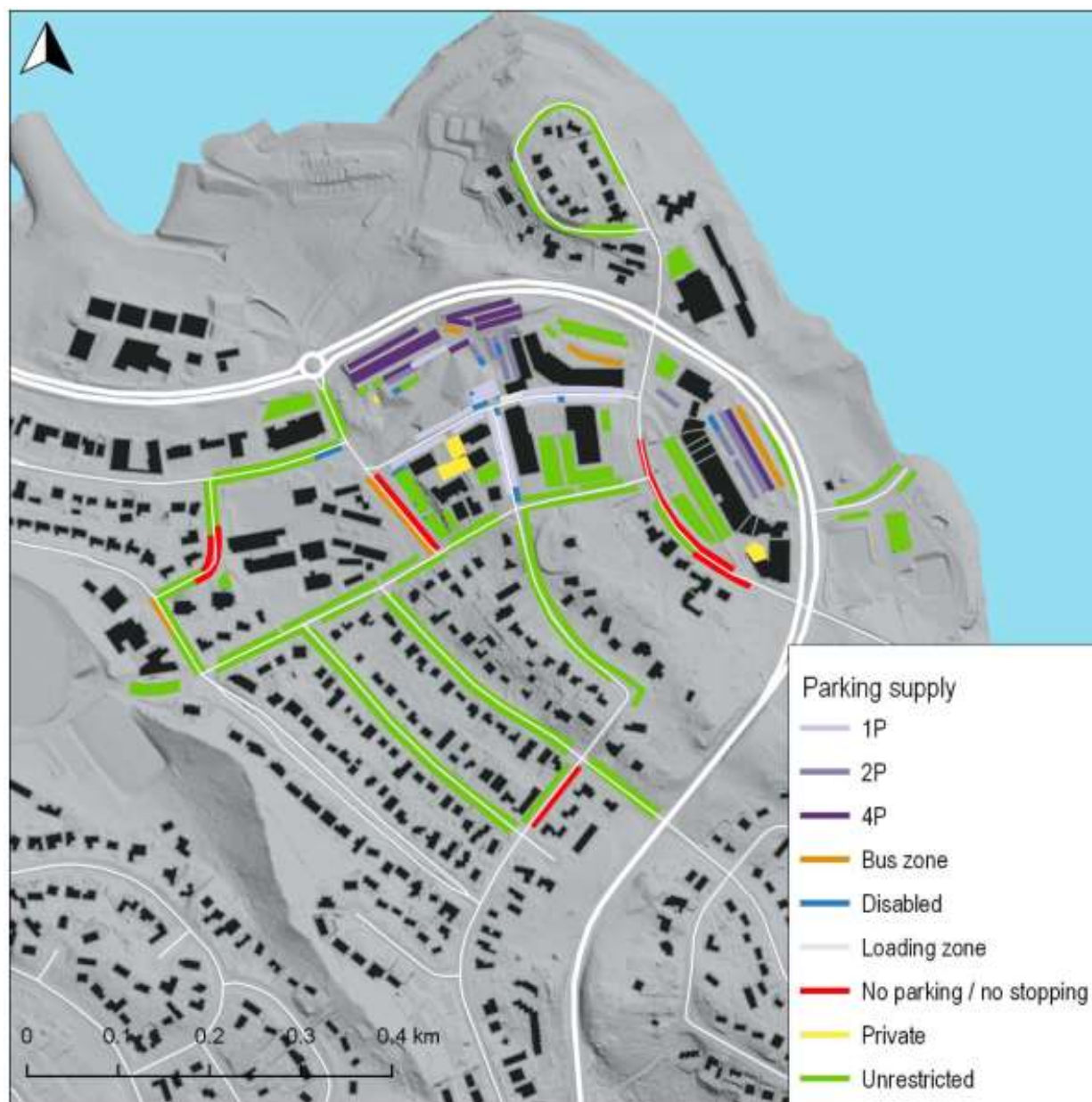
Figure 3.1 Scale of vehicle demand across 2018 – Offseason to busiest day

Based on this methodology, the average demand during the winter “high” season (6 July 2018 to 25 August 2018) is approximately equal to the 85th percentile demand (67%). The average of the four busiest weekends during the winter season is equal to approximately 95% of the maximum day’s demand.

It is understood that peak parking demand is in the morning (as people travel to the ski fields) and in the afternoon (as people return, wanting supplies for the evening or to return ski gear. Aerial photography is typically taken around midday as shadows are smaller providing better images. This time difference is likely to result in an under-estimate of peak winter time parking demands. From comments received during the Snowy Mountains SAP process, it is understood that the primary impact on locals from the surge in parking demand is that they are restricted in their ability to carry out normal tasks. By considering the demand in the middle of the day during business hours, this assesses the impact of local residents to go about normal business.

3.3.2 Parking restrictions

Current parking restrictions are shown in Figure 3.2. Most on-street and the majority of off-street parking is unrestricted. Time-restricted parking is located within the retail and commercial core to provide parking turnover for businesses. There is currently no paid parking in Jindabyne.



Source: GTA analysis

Source: *Go Jindabyne Mobility and Connectivity Study Stage 1 Report (GTA Consultants (NSW) Pty Ltd, 23/07/19)*

Note: SMRC have identified changes to the existing conditions in 2022; There is time limited parking in the medical centre carpark (marked in the above map as unrestricted parking). The bowling club carpark is privately owned (marked as unrestricted in green).

Figure 3.2 Current parking restrictions in Jindabyne

3.3.3 Parking supply

The public on-street and off-street parking supply of areas within Jindabyne have been estimated from aerial photography. Jindabyne was divided into 10 areas to provide information on how much parking is available in the town centre and in the residential areas around it. The parking supply data, along with the counts of demand are shown on Figure 3.3.

Legend

- # Zone
- x | x Parking supply
- September 2018 parking demand (% of total supply)
- December 2018 parking demand (% of total supply)
- Current peak parking demand (% of total supply)

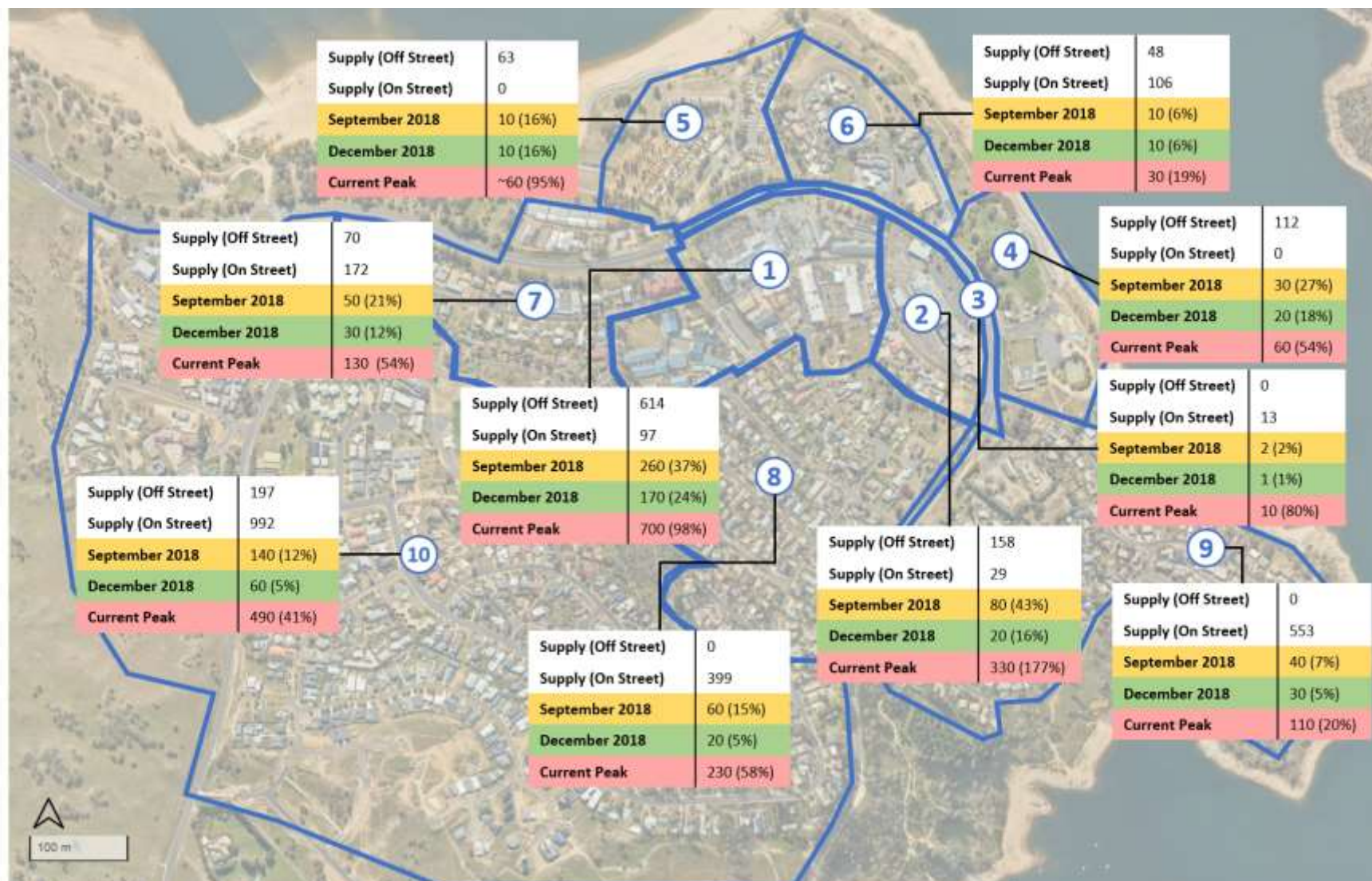


Figure 3.3 Current parking supply, September 2018 demand, December 2018 demand and estimated peak demand

Notes Off-street parking supply excludes parking within private residential land

A total on-street of approximately 2,350 parking spaces were identified, along with approximately 1,280 off-street spaces (Town Centre only, excludes private residences). The number of spaces by zone and the number on-street and off-street is shown in Table 3.1.

Table 3.1 Parking capacities within Jindabyne

Parking zone	Off street parking supply	On street parking supply	Total
1	614	97	711
2	158	29	187
3	13	0	13
4	112	0	112
5	63	0	63
6	48	106	154
7	70	172	242
8	0	399	399
9	0	553	553
10	197	992	1,189
Total	1,275	2,349	3,623

The results of the aerial photography counts are shown in Table 3.2. The September photograph, which is closest to the winter peak time, had the highest number of vehicles parked, compared to the December count.

Table 3.2 Parking demand within Jindabyne

Parking zone	September 2018 demand	December 2018 demand	Total (proportion of total supply)
1	262	165	427 (60%)
2	78	22	100 (54%)
3	2	1	3 (2%)
4	27	19	46 (41%)
5	10	10	20 (32%)
6	10	10	20 (13%)
7	48	30	78 (32%)
8	57	18	75 (19%)
9	43	28	71 (13%)
10	141	62	204 (17%)
Total	678	363	1041 (29%)

Notes Kalkite Street public off-street car park had not been expanded to its current capacity at the time of the aerial photograph. Its supply was approximately 64 spaces.

Using these count results and the anticipated increase in demand during peak wintertime, it is estimated that the current peak demand exceeds the supply in Zone 2 by **145 vehicles**, while Zone 1 has a supply equal to the demand. Other zones had sufficient capacity. The implications of this are that at peak times there will be parking spill-over from Zone 2 to the surrounding zones.



Figure 3.4 Thredbo Terrace car park – opportunities for expansion



Figure 3.5 Town Centre bus bays – potential for conversion to angle parking



Figure 3.6 Snowy River Avenue – Investigate angle parking on northern kerb



Figure 3.7 Gippsland Street – Maintain parking



Figure 3.8 Introduce angle parking on northern kerb of Park Road



Figure 3.9 Snowy River Avenue – improve footpaths on sunny side of street

3.4 Future parking demand

Future development projections included in the Snowy Mountains SAP Draft Master Plan have been used to forecast future parking demand within Jindabyne. This assumes that the amount of development within Jindabyne Town Centre will respond to the increase in the number of visitors to the alpine regions as well as visitors to Jindabyne itself. The forecasts separate planned floorspace changes into short-term and long-term. The floorspace forecasts within the Town Centre zones are outlined in Table 3.3. Zones 4, 7, 8, 9 and 10 are residential zones.

Table 3.3 Proposed floorspace projections within Jindabyne

Parking zone	Short term development (sq.m)	Long term development (sq.m)	Total
1	26,818	38,980	65,798
2	11,664	3,360	15,024
5	10,680	0	10,680
6	0	4,080	4,080
Total	49,162	46,420	95,582

Source: Jensen Plus, 15 December 2020

Notes Short-term = before 2031, Long-term = by 2041

The potential parking demand for this floorspace increase has been estimated using the Snowy River Development Control Plan 2013. The amount of parking will depend on the mix of floorspace land use (expected to be retail, commercial, restaurants and ski hire). For the purposes of this assessment, we have assumed the following percentages of land use. These assumptions are estimates of the future floor space uses only.

- Zone 1: 50% retail shops, 10% ski hire shops, 20% offices, 20% restaurants
- Zone 2: 50% retail shops, 10% ski hire shops, 20% offices, 20% restaurants
- Zone 5: 60% retail shops, 40% restaurants.
- Zone 6: 60% retail shops, 40% restaurants.

Shared usage of parking is possible where it is provided in a central parking area that is open to the public, rather than reserved exclusively for one business. This allows people to park and visit several shops during the one trip. It also allows businesses with different peak demand times to use the parking spaces at different times, for example parking used for shops during the day and restaurants during the night. Previous studies of town centres have indicated that reductions of 10% to 20% are realistic with a mixture of business types. To avoid the costly oversupply of parking, to promote park once and walk shopping and to encourage use of active transport for trips within the town centre, a **20% reduction** has been applied in the overall demand.

Using the assumptions listed above, the amount of parking has been estimated as **1,300 additional spaces**, at 2.45 parking spaces per 100sq.m across Jindabyne Town Centre. This estimate is a strategic estimate of future parking demands. It is recommended that this should be considered a maximum increase, with the transport assessment of each development assessing its needs and recommending a lower level of parking is justified. The parking needs of the supermarket have been assumed to be provided within the Nuggets Crossing site. The parking provision in the Nuggets Crossing site will be assessed as part of its development application, taking into consideration the amount of supermarket, small shop, service industry and other floorspace.

These floorspace and parking rate details, percentages and other assumptions may change in the future when details of the particular developments planned for each individual site are known. It is understood that each development will submit its development application based on its particular characteristics. For example, a smaller floorspace would require a smaller amount of parking. These assumptions on type of development are made for the purpose of this Parking Plan. The future floorspace provisions are assumed in the Snowy Mountains SAP Draft Master Plan and may be changed through the development of the Master Plan.

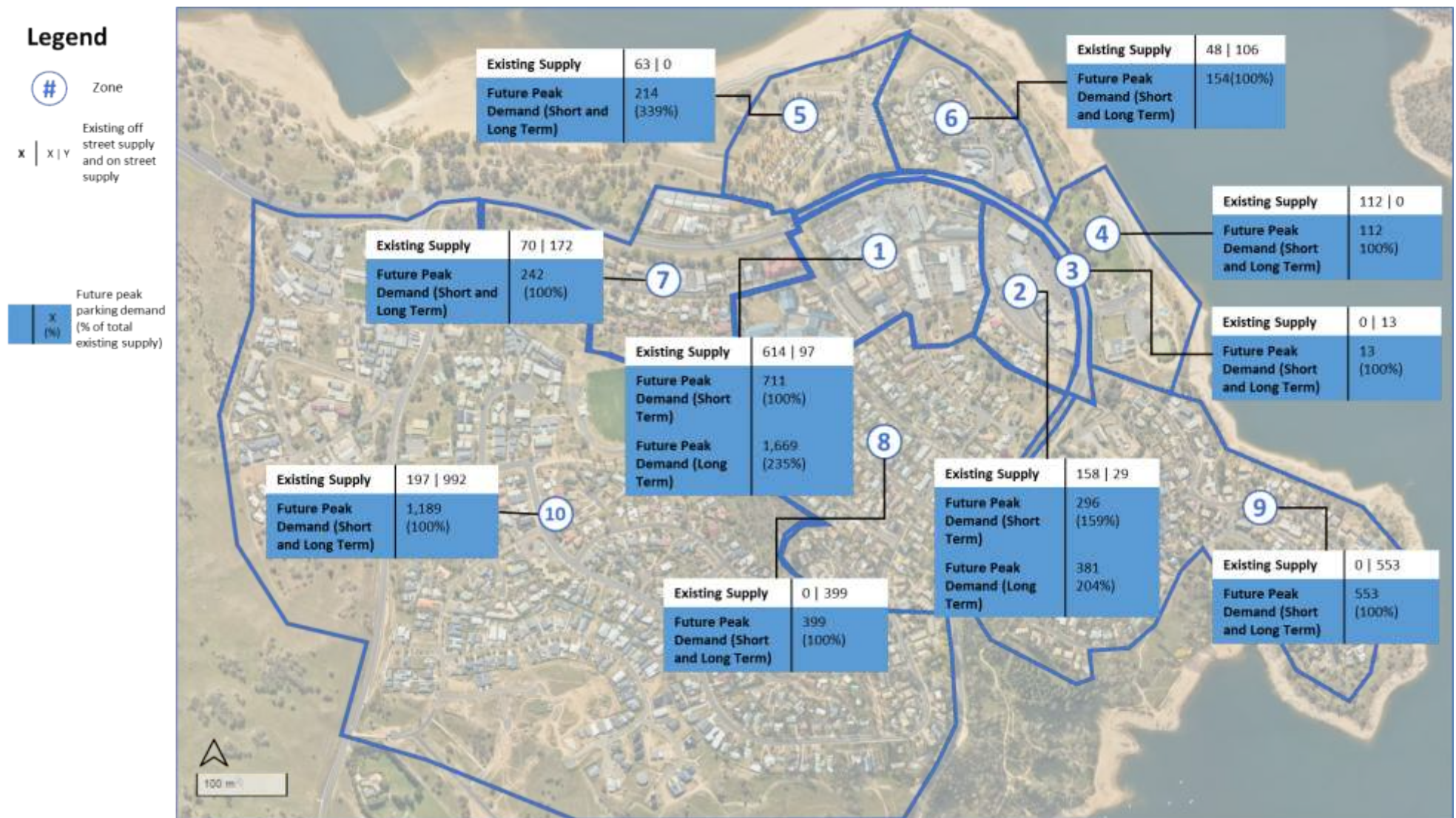


Figure 3.10 Estimate of future parking demand based on Snowy Monaro Regional Council DCP rates

3.5 Snowy Mountains SAP Public Realm Concept Design

The Snowy Mountains SAP Public Realm Concept Design prepared for Department of Regional NSW (Regional NSW) by Aurecon in October 2021 has been reviewed to identify the proposed parking changes. The public realm changes within Jindabyne Town Centre incorporated streetscape changes that will affect the amount of on-street parking to support improvements to the urban amenity. These changes include:

- the reduction of traffic on Kosciuszko Road (by the creation of the proposed Southern Connector Road) allowing some road space to be reallocated for kerbside parking
- the full or partial pedestrianisation of streets within the Town Centre including Snowy River Avenue
- the widening of footpaths to provide more space for walking, cycling and urban spaces.

A summary of the proposed changes is included in Table 3.4. The net change in on-street parking is an **additional 40 spaces**.

Table 3.4 Proposed future on-street parking changes as part of Snowy Mountains SAP Public Realm Concept Design

Parking – on-street	Existing	Proposed	Net difference	Comment
Kosciuszko Road	13	106	93	New parking
Kalkite Street	0	4	4	Current parking arrangement retained, with the street moving into school site. On-street parallel parking is proposed on the western side of Kalkite St
Park Road	22 (approx.)	0	-22	10 formalised perpendicular parks removed. Removal of informal parking to the north side with narrowing of road carriageway.
Snowy River Avenue – Kalkite Street to Gippsland Street	24	0	-24	All parking removed
Snowy River Avenue – Gippsland Street to Thredbo Terrace	38	16	-22	Formalised perpendicular parking removed. Replaced with parallel in between trees.
Gippsland Street	28	26	-2	Removal of some existing bays to accommodate tree and Water Sensitive Urban Design planting and some parallel bays to accommodate cycle parking.
Thredbo Terrace	0	0	0	No change
Total	112	152	40	The uplift is approx. 35% more parking than the current provision.

Source: Snowy Mountains SAP Public Realm Improvements, Town Centre to Lake Connectivity, and Kosciuszko Road Treatments Concept Design Report, Aurecon, 8 October 2021

The streetscape improvements are supported to improve the “place quality” within Jindabyne. However, it is noted that the spatial change in parking will mean the loss of all on-street parking on some streets, centred around the blocks of Snowy River Avenue, Park Road and Kalkite Street.

4 Parking recommendations

Several parking recommendations have been developed for the Jindabyne Town Centre. Whilst there are options to provide additional car parking, customers attitudes towards car parking will need to shift. Locals and tourists may be required to park further away from their destination, pay for parking or switch to alternative modes as the demand for parking increases.

The increased parking demand in the future require a strategy to manage the provision of parking. While the park and ride facility offer the potential for overflow parking, its distance of 1.8km is not conducive to walking for all visitors. A connecting bus service would make this trip easier, but it would still require extra time to get in and out of the Town Centre.

4.1 Jindabyne Town Centre

To preserve the attractiveness of Jindabyne Town Centre, several discrete parking areas are proposed with increased supply to provide for future development. This has the advantage of:

- reducing the reliance on on-street parking
- allowing shared facilities, allowing people to park once then visit multiple businesses and reducing the peak demand for parking
- avoiding concentrating too much parking in one location
- spreading facilities within a convenient walk distance of different parts of the Town Centre while locating them towards its periphery, preserving the core Town Centre space for active transport and enhancing their potential for placemaking and dwelling opportunities.

To limit the impact of loss of parking as proposed in the Snowy Mountains SAP Public Realm Concept Design, the following are recommendations to mitigate the impact on nearby businesses:

- Restore some parallel parking on the northern side of Snowy River Avenue between Kalkite Street and Thredbo Terrace: The north side of the street experiences more shading during winter. Prioritising pedestrian movement on the southern side opens the potential for retaining limited parking in bays integrated with the street design. This could potentially provide up to an additional **6 spaces**.
- Retain parking on the north side of Park Road, allowing the southern side to be prioritised for active transport while activating the northern side with parking for the adjacent development. This could potentially provide up to an additional **10 spaces**.
- Preserve traffic capacity westbound on Kosciuszko Road by retaining two lanes during peak periods but allowing kerbside parking during business hours and in the evening. The conversion of the second eastbound lane to parking is supported.

In addition, we have identified several locations and opportunities to increase the parking supply. These include:

- Kosciuszko Road – opportunity for **93** new parking **spaces** created on-street, as identified in the Snowy Mountains SAP Public Realm Concept Design, offset by a **50-space reduction** on other streets. These 93 spaces are provided in both the eastbound and westbound existing traffic lanes. There will be approximately 53 spaces available for parking during the AM peak as the westbound lane remains open to increase traffic capacity.
- Nuggets Crossing surface car park – potentially expanded to cover the needs of any future redevelopment (estimated as **440 space increase**).
- Mitre 10 surface car park – potentially expanded to cover the needs of any future redevelopment (estimated as **350 space increase**).

- Jindabyne Waterfront Development – potentially expanded to cover the needs of any future redevelopment (estimated as **150 space increase**).
- Jindabyne Central School Site – potentially expanded to cover the needs of any future redevelopment (estimated as **150 space increase**).
- Kalkite Street off-street parking – opportunity to create a two-storey parking facility, potentially providing an additional **62 spaces**.
- Thredbo Terrace parking (adjacent to new medical centre) – opportunity to create a three-storey parking facility, potentially providing an additional **117 spaces**. This parking could be used as an alternative for parking at Banjo Paterson Park during special events.
- Town Car Park – opportunity to relocate the coach spaces to the bus area in front of the Snowy Region Visitors Centre, creating space for an additional **36 car parking spaces**.

The multi-storey off-street parking at Kalkite Street and Thredbo Terrace will involve additional cost that needs to be weighed against the benefit for the town. As smaller facilities, there is potentially a higher cost per space than a larger facility. However, because of their smaller size, they will have smaller impacts on the surrounding community.

An alternative option for the additional Kalkite Street public parking increases (off-street) would be to amalgamate them onto the parking area for the redeveloped Jindabyne Central School site. While this may have advantages in terms of lower cost per parking space, it would concentrate the impacts on the access routes (potentially Kalkite Street and Park Road). It may also affect the potential reuse of the site for other purposes. This alternative can be reviewed once more details of the future plans for the Jindabyne Central School site are known.

Table 4.1, Figure 4.1 and Figure 4.2 summarises the Jindabyne Town Centre parking recommendations, with a detailed description of the recommendations provided in Appendix B.

For times when the winter peak demand exceeds the recommended supply the park and ride facility could be used for overflow parking, noting that its main purpose is to provide access to the alpine areas via the Snowy Mountains shuttle bus. The Snowy Mountains shuttle buses could provide a free connection between this parking facility and Jindabyne Town Centre. Real-time parking availability signs would be required to direct visitors to park at this facility when parking within the monitored public parking areas of the town centre are approaching capacity.

The proposed Jindabyne Town Centre parking context is summarised in Table 4.1 below. The reference number of the parking location is linked to Figure 4.1. A summary of the parking supply by zone is also included in Figure 4.2.

Table 4.1 Jindabyne Town Centre parking summary

Ref	Zone	Parking	On street/ off street	Public/ private	Existing	Proposed	Net difference	Comment
1	1	Nuggets Crossing	Off street	Private	287	727	440	Adequate car parking facilities should be provided in any future development of this site. Proposed parking has been calculated based on the car parking provision rate (discussed in Section 2.3) and mixed use development as shown in the Draft Master Plan.
2	1	Snowy Region Visitor Centre	Off street	Public	42	42	0	No changes are proposed. This car park should continue to serve a bus function and existing parking should be maintained. Any redevelopment of this site may see opportunities to restructure the parking and increase supply.
3	1	Kalkite Street	On street	Public	0	4	4	It is assumed that the existing one-way street is returned to two way with the redevelopment of the existing school site. The eastern side of the road should allow parallel parking to support the Town Centre.
4	1	Kalkite Street	Off street	Public	85	147	62	There is an opportunity to add a multi deck car park to this site which would allow an additional 62 spaces. However, despite the additional car parks gained, this may not be justified against the cost of creating a multi-story car park. An alternative would be to accommodate this net increase within the redeveloped Jindabyne Central School site.
5	1	Park Road	On street	Public	22	10	-12	Retain parking on the north side of Park Road, allowing the southern side to be prioritised for active transport while activating the northern side with parking for the adjacent development. There may be options for increasing the number of formal 90-degree spaces on the north side of Park Road.

Ref	Zone	Parking	On street/ off street	Public/ private	Existing	Proposed	Net difference	Comment
6	1	Snowy River Avenue – Kalkite Street to Gippsland Street	On street	Public	24	6	-18	On Snowy River Avenue, placemaking should be encouraged on the southern side of the street. This side receives more sun and is better placed for more pedestrian activity and placemaking (outdoor dining, etc). Prioritising pedestrian movement on the southern side allows for the potential to retain limited parking in bays on the north side, integrated with the street design.
7	1	Snowy River Avenue – Gippsland Street to Thredbo Terrace	On street	Public	38	16	-22	
8	1	Gippsland Street	On street	Public	28	26	-2	The existing angled car parking on the eastern side should be retained. The parallel parking on the western side is removed to allow for active transport facilities.
9	1	Mitre 10	Off street	Private	68	420	352	Adequate car parking facilities should be provided in any future development of this site. Proposed parking has been calculated based on the car parking provision rate (discussed in Section 2.3) and mixed use development as shown in the Draft Master Plan.
10	1	Jindabyne Central School Site	Off street	Private	0	151	151	Adequate car parking facilities should be provided in any future development of this site. Proposed parking has been calculated based on the car parking provision rate (discussed in Section 2.3) and mixed use development as shown in the Draft Master Plan. Alternative to off-street parking increase on Kalkite Street site.
11	2	Memorial Hall	Off street	Public	21	21	-21	Existing parking at the Memorial Hall site is mostly informal and will be impacted by the development of the Jindabyne Library.
12	2	Adjacent to Medical Centre	Off street	Public	43	160	117	There is also an opportunity to add a multi deck car park to this site, creating an additional 117 car parking spaces. This would provide additional parking near Banjo Paterson Park. This location also has opportunities for alternative uses in off peak seasons. Examples include outdoor markets and dining.

Ref	Zone	Parking	On street/ off street	Public/ private	Existing	Proposed	Net difference	Comment
13	2	Town Centre	Off street	Public	94	130	36	The bus bays on the northern edge of the car park may be consolidated in the Snowy Region Visitor Centre. There may also be opportunity to relocate the buses to Kosciuszko Road (outside of the morning peak). This would allow for additional car parks in the Town Centre car park. These spaces could also facilitate parking for the foreshore uses/Banjo Paterson Park.
14	3	Kosciuszko Road	On street	Public	13	106	93	<p>A trial of parallel parking on Kosciuszko Road should be investigated. This could be implemented prior to the proposed Southern Connector Road if it is held outside of the winter peak.</p> <p>The eastbound direction could allow parallel parking all day (although time restricted), whilst the westbound direction should only allow parking outside of the morning peak.</p> <p>Note that the additional 93 spaces created by this opportunity offset 50 spaces which are reduced in the Public Realm Concept Design. The Public Realm Concept Design also identifies wider upgrades to Kosciuszko Road including street trees in the median and pedestrian crossing opportunities. Retaining two westbound lanes in the AM peak would require adjustment of the public realm concept design for this side of Kosciuszko Road.</p>
15	4	Banjo Paterson Park	Off street	Public	42	42	0	No change is proposed. Opportunities exist to better integrate this car park within the existing footprint to fit additional spaces if required.
16	4	Bowling Club	Off street	Private	70	70	0	No change is proposed
17	5	Jindabyne Waterfront Development	Off street	Private	63	214	151	Adequate car parking facilities should be provided in any future development of this site. Proposed parking has been calculated based on the car parking provision rate (discussed in Section 2.3) and mixed use development as shown in the Draft Master Plan.
18	6	Lake Jindabyne Hotel	Off street	Private	36	36	0	No change is proposed

Ref	Zone	Parking	On street/ off street	Public/ private	Existing	Proposed	Net difference	Comment
19	6	Caltex & Snow City Ski Hire	Off street	Private	12	12	0	No change is proposed
Other general parking								
	1	Miscellaneous	Off Street	Public	117	117	0	No change is proposed
	2	Town Centre laneway	On Street	Public	29	29	0	No change is proposed
	6	Residential	On street	Public	106	106	0	No change is proposed
	7	Residential	On street	Public	172	172	0	No change is proposed
	7	Residential	Off street	Private	70	70	0	No change is proposed
	8	Residential	On street	Public	399	399	0	No change is proposed
	9	Residential	On street	Public	553	553	0	No change is proposed
	10	Residential	On street	Public	992	992	0	No change is proposed
	10	Residential	Off street	Private	197	197	0	No change is proposed
Total on-street					2376	2,419	43	
Total public off street					444	638	194	
Total private off street					803	1,897	1,094	
Total					3623	4,954	1,331	

Figure 4.1 displays each of the above parking locations overlaid on a map of Jindabyne Town Centre. The parking spaces can be located by their reference number in the table above. Figure 4.2 summarises the parking supply by zone.



Figure 4.1 Jindabyne Town Centre parking summary map by car park

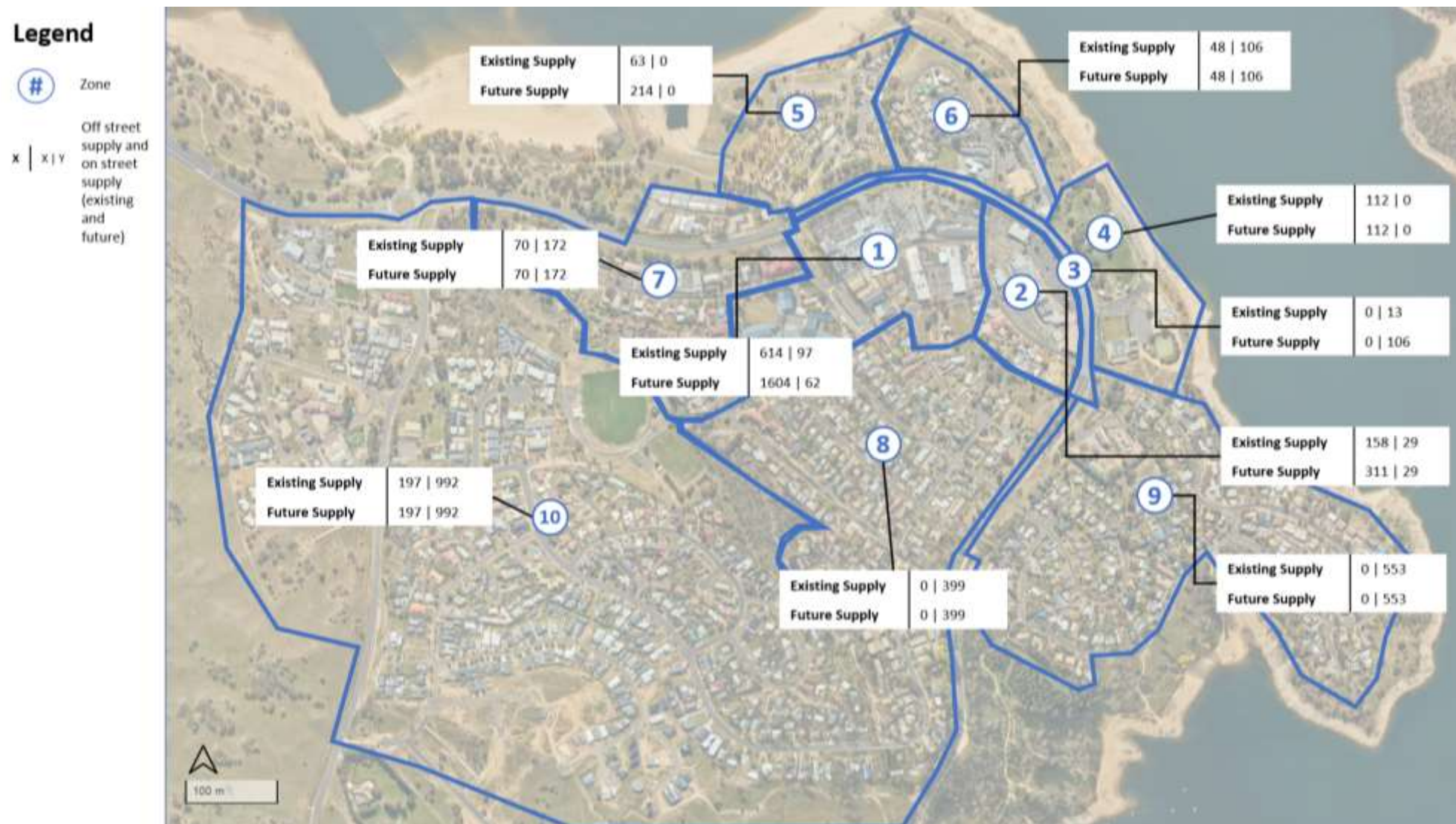


Figure 4.2 Jindabyne Town Centre parking summary map by zone

A check of the amount of space the recommended parking would occupy assuming an average space per parking space of 25 square metres per parking space has been made. In general these parking numbers would occupy between 15% and 50% of the net developable area. However, due to the intensity of development proposed for the Town Centre sites (including the Nuggets Crossing Shopping Centre, Mitre 10, 'Old Town Centre', the swimming pool site and the Gippsland Street sites), parking is estimated to occupy approximately 150% of the site area. This implies that parking would need to occupy up to 1.5 to 2 levels of these potential multi-storey developments.

4.1.1 Staging

It is envisaged that the changes to on-street parking including the changes on Kosciuszko Road, Kalkite Street, Park Road, Snowy River Avenue and Gippsland Street will occur within the short-term (i.e. by 2031). The changes to off-street parking will be driven by the timing of individual developments.

Kerbside parking on Kosciuszko Road could be trialled by Snowy Monaro Regional Council as a precursor to the planned street design changes. It is recommended that the times initially be set for outside of peak traffic movements (9am to 3pm and after 6pm) seven days per week to avoid traffic congestion implications. The potential for this trial would need to be considered in combination with the safety of pedestrian crossing opportunities, which could also be implemented before the permanent street design changes occur.

Considering the likely timing of development outlined in Table 3.3, and taking into consideration the changes to the supply of on-street parking and parking to be provided as part of individual developments, it is estimated that 109 additional public parking spaces are required in the Town Centre in the short term (by 2031).

There are two options for a short-term increase in the Town Centre:

Option A = 141 spaces including:

- 43 additional on-street spaces
- 36 additional surface parking spaces within the Old Town Centre (with the relocation of bus/trailer parking)
- 62 spaces in the upgraded Kalkite Street off-street public parking facility.

Option B = 160 spaces including

- 43 additional on-street spaces
- 117 in the proposed facility adjacent to the Medical Centre on Thredbo Terrace.

Both options provide a larger number than required. Option A is recommended as it minimises the oversupply and spreads the parking increase around the Town Centre.

The long term public parking would include whatever isn't built in the short term plus the long-term private development parking.

4.1.2 Parking timing and pricing strategies

There may be a role for priced parking, or at more innovative timed parking to manipulate the parking demand in the future. Any introduction of paid parking within Jindabyne and the Snowy Mountains region more broadly should align with the following objectives:

- Parking fees should be structured to encourage modal shift to more sustainable modes through:
 - being more expensive than catching the Jindabyne shuttle bus,
 - encouraging park and ride and the mountain shuttle as a viable option,
 - priced high enough for locals and tourists to consider active travel to the Jindabyne Town Centre.

- Parking fees should be structured to align with the Jindabyne Town Centre visions:
 - any fee structure should discourage parking for long periods close to the Town Centre shops, or along streets which are prioritised for pedestrians/urban amenity or other uses
 - priced parking should provide minimal impact to locals by providing free parking options at an alternative location, likely on the periphery of the town centre
 - it shouldn't discourage parking to limit visitors to key businesses across Jindabyne.

Any introduction of paid or timed parking should be introduced in a staged approach to limit the impact to residents and businesses. Technology for priced parking is rapidly changing. Further investigations into the most appropriate method would be required. For Jindabyne, it is recommended that timed parking strategies are implemented first, before any priced parking strategies.

Some pricing/timing strategies and their associated benefits have been suggested in Table 4.2.

Table 4.2 Parking pricing strategies and actions

Pricing and timing strategy	Details	Benefits
Convenience based pricing system: by location	<ul style="list-style-type: none"> — Introduce a cost to key parking spaces only — Reduce/remove the pricing as the location becomes less convenient. 	<ul style="list-style-type: none"> — A higher turnover of desirable car parking spaces — Sustainable transport modes are encouraged — Free parking still exists on the periphery/in less desirable parking spaces — Encourages all day visitors to cheaper/free parking spaces — The most popular parking locations are recognised economically
Convenience based pricing system: by time	<ul style="list-style-type: none"> — Restrict the closer/more desirable spaces to a short turnover and push longer spaces to the periphery of the town centre — Favour short-term users in the parking price/restrictions. e.g. the first 15 minutes free 	<ul style="list-style-type: none"> — More short-term parking available near key destinations (e.g., for pick up/drop off of ski hire) — Limit the impact of the parking increase on businesses — Encourages all day visitors to park further away or transition to other transport modes
Convenience based pricing system: by type of parking	<ul style="list-style-type: none"> — Free parking at park and rides (could include overnight car parking) — Cheaper parking in off-street car parks — Most expensive parking in on-street spaces 	<ul style="list-style-type: none"> — Remove excess cars from suburban streets to overnight car parks — Reduces the attractiveness of on-street car spaces, freeing them up for other kerbside uses, such as improving the Town Centre amenity and walkability
Redistribute parking revenue	<ul style="list-style-type: none"> — Redistribute parking revenue into investing in sustainable transport modes 	<ul style="list-style-type: none"> — Increased revenue from parking can assist in improving sustainable transport modes. Examples include cycle paths, improved bus infrastructure, better way finding, improved street environment etc.

4.1.3 *Funding*

Potential sources of funding for public parking include:

- Section 94 contributions for residential development
- specific developer contributions for non-residential developments, in the form of a deed of agreement, voluntary planning agreement or works in kind
- decoupled parking – providing a minimal amount of parking on-site and a contribution for the remainder to Council for the public facility
- revenue from parking fees
- general revenue.

The most appropriate funding mechanism or combination of mechanisms will depend on the preferred option for public parking and its timing. Cash-in-lieu and other developer contributions are flexible, but have an issue that the contributions received may arrive at a slower rate than that required to provide the required facilities in a timely manner. The preferred funding mechanism should take into consideration the timing implications of when the infrastructure is needed and when funds would be available.

4.2 Foreshore parking

The changes planned for the Lake Jindabyne foreshore are designed to enhance its quality for active and passive recreation and as a tourist destination. Providing additional parking in the foreshore area is likely to have a negative impact on its open space qualities.

It is recommended that no additional parking should be created along the foreshore as this high value land is better used for development that supports the vision for the Lake foreshore and public open space. Parking required to support the new development should be contained within their site with access to Kosciuszko Road via side streets where possible.

The SAP has promoted a walkable and cyclable street network to connect the town centre to the foreshore without the need to drive and park. The recommended new parking within the town centre will have a dual use for visitors parking to visit the shops & restaurants and visitors for the foreshore as well.

It is noted that the Jindabyne Concept Design does not make allowance for vehicle parking at the Clay Pits site, near the roundabout intersection of Kosciuszko Road and Barry Way. Given the continuing potential for this location to be used as a staging point for people using water craft (e.g. canoes & kayaks) on Lake Jindabyne, it is recommended that the existing parking areas be retained or replaced at the same capacity (like for like). Further, it is recommended that the Widows Inlet boat ramp should be prioritised for future growth in boat launching.

Parking for the Mountain Bike / Adventure Park is expected to be provided at the upper level with access from Alpine Way. To reduce the need for parking at the park, a grade-separated crossing of Kosciuszko Road is planned allowing people to walk / cycle to the new tourist destination.

4.3 Mobility parking

It is important that all private and public and commuter parking facilities, as well as passenger pick-up and drop-off facilities include provisions for disabled parking and access. It is recommended that 3 per cent of parking be allocated to people with mobility issues to comply with the Australian Standards, and that it be located closest to activity centres.

4.4 Trailer and larger vehicle parking

A current location used by vehicles towing trailers in the Old Town Centre parking area has been recommended for conversion to 90 degree parking to accommodate an increase in overall parking spaces. It is envisaged that short-term parking for these vehicles and other longer vehicles could be relocated to the western/southern side of Kosciuszko Road, which has a long section of parallel parking. Trailer parking is available at the various foreshore boat ramps and launching locations.

It is recommended that any new off street parking facilities consider a layout that allows for trailer parking, or longer vehicle parking across two spaces. Specific trailer parking spaces could also be included if relevant to the proposed land use of the development site.

4.5 Alternative parking strategies

As previously discussed, providing adequate parking in Jindabyne is only half the solution. Sustainable transport modes, such as walking, cycling and buses should be encouraged to reduce the parking demand and increase the amenity of the Town Centre. Strategies to increase these sustainable modes should also be adopted, as well as amending the parking provision. Many of these strategies have already been discussed in the Transport Technical Report and included in the Snowy Mountains Master Plan.

- Include time limited spaces near ski hire retail, and other short term uses, creating a high turnover for pick up/drop off.
- Explore opportunities for large-scale retail to be relocated to the periphery or outside of the Jindabyne Town Centre. This will prioritise the Town Centre for specialty retail and tourism and community uses.
- Where on street parking exists, allow parking on one side of the street only. This reflects the kerbside hierarchy of not only providing space to vehicles, but to pedestrians and cyclists. Parking on only one side of the road allows the opposite kerbside to be reallocated and footpaths widened for pedestrians and urban amenity.
- Increase and improve the active transport links to the town centre to encourage mode shift away from private vehicles. This includes providing dedicated, safe infrastructure on key routes across Jindabyne. This could be provided through dedicated on- or off-road facilities. The provision of safe connections across roads (e.g.; Kosciuszko Road) is also important to facilitate access into the town centre.
- Provide clear and safe pedestrian and cycling facilities across Kosciuszko Road to allow connections to the foreshore from Town Centre car parks.
- Reduce the speed limit in the Town Centre streets to 30km/hr to improve pedestrian safety and amenity, and further encourage active transport.
- Continue to operate the shuttle bus around Jindabyne after the ski resorts have closed to provide alternative access the Town Centre. This has the potential to expand to a dedicated Jindabyne bus service. Appropriate stop infrastructure and pedestrian connections should be provided to ensure the success of public transport in Jindabyne. More details on the proposed bus service are included in the Transport Technical Report.
- A large Park and Ride is proposed at the intersection of Barry Way and the proposed Southern Connector Road. The role of this facility is to encourage the use of public transport to the alpine areas. Utilising parking to support Jindabyne Town Centre and surrounds would have to be considered carefully and not detract from its intended purpose. Use of this parking area can be encouraged during peak winter weekends for people to park once and visit Jindabyne and then the alpine resorts (or vice versa) using the Snowy Mountains Shuttle buses.

- Provide a dedicated car park for overnight parking to facilitate overflow vehicles from residential streets. This could be provided as a section of the Park and Ride so that transport is provided via the shuttle back to Jindabyne. Accommodation providers would subsidise this car park if they cannot provide adequate parking facilities at the accommodation facility. An overnight car park would require restricted access/security to deter overnight campers in the region.
 - Support opportunities for private investment in shared bike/mobility schemes. This will likely serve a tourism function with the shared path along the foreshore. However, it also has the opportunity to provide visitors with options for travelling around Jindabyne. The success of tourism bike share schemes will increase with improved safety and accessibility of cycling through dedicated infrastructure.
 - Provide adequate bike parking facilities at key locations across the Town Centre and foreshore parks.
-

4.6 Short Term Rental Accommodation (STRA) parking controls

Implementation of parking permits which restrict the duration of on-street parking in certain congested areas are considered to be a viable option to control parking impacts caused by STRA. This could be limited to certain streets, or be enforced across all residential streets in Jindabyne. It could also be time period limited to only the ski season.

It is anticipated that this form of parking regulation could lead to eventual travel behavioural changes over time and encourage more sustainable forms of transport to the Jindabyne region, such as carpooling or public transport use. There could also be options to have excess overnight parking located elsewhere (e.g. part of the park and ride) which could reduce the impact of this scheme on tourists.

It is also recommended that the NSW Government considers the STRA controls in the State Environmental Planning Policy (Housing) 2021 (Housing SEPP) specifically for Jindabyne at the earliest review opportunity.

DPE and SMRC should continue discussions on the opportunities and constraints of a residential parking scheme. It is expected that DPE and SMRC will continue to explore parking policy options for Jindabyne and the wider Snowy Mountains SAP area which is appropriate for residents and tourists alike.

4.7 Future proofing

Electric vehicle (EV) charging spaces should be incorporated into public off-street parking areas to satisfy the increasing use of these vehicles and reduce range anxiety. Charging capabilities should be provided in longer-stay car parks and the proposed Park and Ride, particularly as Jindabyne services a larger tourism demand and accommodation providers may not be equipped to provide EV charging. It is noted that charging capabilities currently exist with the NRMA charging station in the Kalkite Street off-street car park.

The NSW Government released its Electric Vehicle Strategy in June 2021 to support the uptake of EVs across NSW. Considerations for Jindabyne in this strategy include:

- It is estimated that by 2030, EVs will make up more than half of new car sales.
- Ultra-fast chargers will be located at 100 km intervals along all major highways in NSW. Although Jindabyne is not on a major highway, due to its regional significance, ultra-fast chargers would be appropriate in the Park and Ride facility.
- Currently NSW has not updated regulations to state how new developments will be required to be EV ready. Outside of Australia, other jurisdictions have required new developments to have a portion of their car parking equipped with charging facilities.

4.8 Further monitoring of parking

This study has been prepared with an estimate of existing parking at different times of the year. It is recommended that further monitoring of parking in Jindabyne be undertaken. This could include undertaking parking surveys during winter and summer peak seasons. It is envisaged that this Plan could be revised when new parking information becomes available and as details of new developments are lodged.

5 Limitations

Due to the absence of actual parking data due to Covid travel restrictions (that suppressed the winter visitation in 2021, making surveys atypical) and Master Plan timeframes, this study has a methodology to estimate existing demand using aerial photography. It is envisaged that the estimates used in this study will be replaced with actual parking surveys when a suitable winter season occurs. This would allow the estimates of future parking demand to be revised and updated.

The estimates of future parking demand are based on the floorspace projections used for the Snowy Mountains Special Activation Precinct. If there is a change in the floorspace when these developments are built, this will change the demand for parking.

As noted in the report, each individual development will make its own assessment of parking demand once details of the land use type and size are available. This may also change the demand for parking in Jindabyne.

The assumptions on the type of retail land use and the discounts for shared parking use are approximate, based on previous studies. They are used for this strategic planning study for the purpose of estimating parking demand as a whole in the absence of more specific data. Changes in these assumptions could change the estimate of total parking demand.

Appendix A

Snowy Monaro Regional Council
Development Control Plan Parking Rates



A1 DCP parking rates

The parking controls for development in Snowy Monaro Regional Council are covered by the two Development Control Plans from the two amalgamated Councils. The full list of land uses, and their parking rates are outlined in Table A.1.

Table A.1 Comparison of parking requirements from Snowy River Council and Cooma-Monaro Shire Council Development Control Plans – Full list

Development type/ land use	Snowy River Council parking requirements	Cooma-Monaro Shire Council parking requirements
Residential		
Dwelling house	2 parking spaces per dwelling house	2 spaces per dwelling
All other forms of residential accommodation (classified by Snowy River Council as attached dwellings, attached dual occupancy, detached dual occupancy, multi dwelling housing, residential flat buildings and semi-detached dwellings)	1 parking space per 1 or 2 bedroom dwelling 2 parking spaces per 3 bedroom dwelling 1 parking space for each bedroom where a dwelling has more than 3 bedrooms Visitor parking (for multi dwelling housing and residential flat buildings): 1 designated visitor parking space per 3-5 dwellings, or 2 designated visitor parking spaces per 6 or more dwellings or part thereof	1 space for a one-bedroom unit 1 space for every two-bedroom unit 2 spaces for every three (or more) bedroom unit) Plus 1 additional space for every 3 units (as visitor parking)
Secondary dwellings	No additional parking spaces are to be provided on the site	N/A
Group homes (transitional and permanent)	2 parking spaces per group home	N/A
Shop top housing	1 parking space per 1 or 2 bedroom dwelling 2 parking space per 3 or more bedroom dwelling Shared resident and commercial/retail parking spaces may be considered where it can be demonstrated there will be an adverse impact on on-street or public parking spaces	N/A
Hostels	1 parking space for each 5 dwellings in the hostel 1 parking space for each 2 persons employed in connection with the development and on duty at any one time, and 1 parking space suitable for an ambulance	N/A

Development type/ land use	Snowy River Council parking requirements	Cooma-Monaro Shire Council parking requirements
Casual Accommodation		
Bed and Breakfast accommodation	1 space per bedroom, and 1 space for owner	1 space per customer bedroom plus 2 spaces for the owner
Hotel or Motels accommodation (including pubs where accommodation provided)	1 space per unit/room, and 2 spaces per managers residence, and 1 space per 2 employees	1 space per bedroom plus 1 space for every two employees
Backpackers' accommodation	Off street parking requirements assessed on merit	N/A
Farm stay accommodation	1 parking space per guest room	N/A
Serviced apartments	1 parking space per 1 bedroom serviced apartment unit, or 2 parking spaces per 2 or more bedroom serviced apartment, and 1 parking space per 2 employees	N/A
Caravan parks	1 parking space per caravan site, and 1 space per 10 long term sites, and 1 space per 10 short term sites	N/A
Camping grounds	Off street parking requirements assessed on merit	N/A
Eco-tourist facilities	1 parking space per accommodation unit, and 1 parking space per 2 employees	N/A
Commercial – Office/Retail		
Commercial premises including offices	2.5 parking spaces per 100 sqm GFA	1 space per 40 sqm Gross Floor Area (GFA)
Shops (retail)	4 parking spaces per 100 sqm GFA For ski hire premises: 6.7 parking spaces per 100 sqm GFA	1 space per 40 sqm GFA (including storage areas for goods pending their display or sale to customers in the shop, but not including loading bays)

Development type/ land use	Snowy River Council parking requirements	Cooma-Monaro Shire Council parking requirements
Service stations and convenience stores	1 parking space per 20 sqm GFA of convenience store, and 1 parking space per 200 sqm site area (Where a work bay is proposed, additional parking will be required at the rate of 4 spaces per service bay)	2 spaces for staff parking Plus 3 spaces per work or service bay Plus 5 spaces per 100 sqm or part thereof GFA of any convenience store on-site Plus 15 spaces per 100 sqm or part thereof GFA or 1 space per 3 seats, whichever is the greater, for any restaurants provided on-site
Vehicle sales or hire premises	1 parking space per 2 employees 1.5 parking spaces per 200 sqm sale yards/showroom, and 6 parking spaces per service bay	1 space per 130 sqm Site Area plus 3 spaces per work bay (for vehicle servicing facilities) In addition, adequate space must be provided on site for display vehicles. Display vehicles are not permitted to use the above required parking spaces.
Car tyre retail outlets	N/A	The greater of: 3 spaces per work bay or 1 space per 40 sqm GFA
Bulky goods/retail outlets	1 parking space per 50 sqm GFA	1 space per 50 sqm GFA If office or café space is included, car parking will need to be provided in accordance with the rates for these areas
Drive-in/Take-away food and drink premises	Where no on-site seating is provided: 1 parking space per 8.5 sqm GFA 1 parking space per employee Where on-site seating is provided: 1 parking space per 10 sqm GFA, and 1 parking space per 5 seats (internal or external), or 1 parking space per 5 seats (internal) whichever is greater Where on-site seating and drive through facilities are proposed 1 parking space per 2 seats (internal), or 1 parking space per 3 seats (internal and external) and queuing area of 10-12 cars within the drive-through as measured from the pick-up point 1 parking space per employee	Developments with no on-site seating: 12 spaces per 100 sqm GFA Developments with on-site seating: 12 spaces per 100 sqm GFA, or greater of: 1 space per 5 seats (internal and external), or 1 space per 2 seats (internal only) Developments with on-site seating and drive through facilities: Greater of: 1 space per 2 seats (internal), or 1 space per 3 seats (internal and external) plus queuing area for minimum of 5 cars

Development type/ land use	Snowy River Council parking requirements	Cooma-Monaro Shire Council parking requirements
Restaurants or Cafes	5 parking spaces per 100 sqm GFA 1 parking space per 6.5 sqm of public dining area 1 parking space per employee	1 space per 5 seats (whether the seats are located inside premises or on the footpath)
Function centre	N/A	1 space per 5 seats
Garden centre	Off street parking requirements assessed on merit	Minimum 5 spaces plus 1 space per 100 sqm Site Area used for plant propagation or sale
Pubs	5 parking space per 100 sqm GFA 1 parking space per 3.5 sqm of licensed floor area (i.e., bar, lounge, beer garden and games room) 1 parking space per 40 sqm GFA of office space 1 parking space per 6.5 sqm of public dining area or refreshment room 1 parking space per employee, and 2 parking spaces per managers residence While no additional car parking is required for beer gardens and un-roofed areas in hotels/clubs, any enclosing of these areas by roofing will render them liable for additional n-site car parking at a rate of 1 space per 2.5 sqm licensed floor area	
Shops Neighbourhood shops	1 parking space per 20 sqm Gross Leasable Floor Area (GLFA)	
Entertainment facilities	Greater of: 1 parking space per 7 seats, or 1 parking space per 4 sqm of GFA	Greater of: 1 space per 20 sqm GFA, or 1 space per 10 seats

Source: Cooma-Monaro Shire Development Control Plan 2014 (Amendment 2) (Snowy Monaro Regional Council, 2014), Snowy River Development Control Plan 2013 (Snowy Monaro Regional Council, 2013)

Appendix B

Parking opportunities



B1 Kalkite Street

An additional 62 parking spaces is proposed to be added via a two-storey parking facility.



B2 Thredbo Terrace

An additional 117 parking spaces is proposed to be added via a three-storey parking facility.



B3 Old Town Centre

An additional 36 parking spaces is proposed to be added by relocating the existing coach spaces.



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