



SHIRE OF NARROGIN
PUMP TRACK &
MOUNTAIN BIKE
TRAIL
FEASIBILITY STUDY
2019

Prepared by Common Ground Trails Pty Ltd for the Shire of Narrogin, June 2019.

ACKNOWLEDGEMENTS

Common Ground Trails wishes to acknowledge the contribution of the Project Manager, Susan Guy (Manager Community Leisure and Culture, Shire of Narrogin) Shire of Narrogin staff, project stakeholders as well as the valuable input from, organisation representatives, users and individuals.

The Shire of Narrogin is located on the tribal lands of the Noongar People. We acknowledge the Noongar People as traditional owners of the land and recognise their continuing connection to Country.

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Common Ground Trails Pty Ltd and its employees are not qualified to provide legal, medical or financial advice. Accordingly, detailed information in this regard will require additional professional consultation in order to adequately manage and maintain the facilities and reduce risk.

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EXECUTIVE SUMMARY

Common Ground Trails have been engaged by the Shire of Narrogin to undertake a detailed feasibility study for the development of a pump track facility within Narrogin and a network of mountain bike trails within the vicinity of the town site.

The demand for mountain bike facilities is growing as evidenced by national and local studies. Studies into children's participation in cultural and leisure activities, undertaken by the Australian Bureau of Statistics, indicate the rising popularity of wheeled sports over organised sports. Targeted surveys to determine interest in mountain bike facilities undertaken by Common Ground Trails for both the Shire of Narrogin and other local government authorities in the Perth region indicate a strong interest in purpose designed facilities.

Stakeholder and community engagement involved discussions with key stakeholders, an online community survey and opportunity to discuss ideas with Common Ground Trails staff in person. Meetings to determine opportunities and constraints were held with staff from the Shire of Narrogin, the Department of Local Government, Sport and Cultural Industries (DLGSCI), the Department of Biodiversity, Conservation and Attractions (DBCA) and local community members with a keen interest in mountain biking. The online community survey received 161 responses with a vast majority in favour of mountain bike facilities.

Assessment of potential sites within the Shire was undertaken considering tenure, location, scale, strengths and weaknesses of each site.

Following stakeholder and community engagement and assessment of potential sites within the Shire of Narrogin, Common Ground Trails recommend that development of a pump track (or challenge park) facility and purpose designed mountain bike trails are feasible. Cycling facilities have been proved to offer a multitude of social and economic benefits to communities and Narrogin is well placed to reap these benefits.

Of the sites assessed it is recommended that a pump track (or challenge park including a pump track, bike playground and beginner/intermediate jump lines) be developed adjacent to the existing skate park in Gnarrogin Park. Opportunity to capitalise on existing support infrastructure such as shelter, toilets and access paths as well as proximity to town and complimentary neighbouring recreation uses make this site ideal for a challenge park.

Foxes Lair, the Commonage and Railway Dam are recommended as the most appropriate sites for development of purpose designed mountain bike trails. Proximity to town and scale of the sites together with existing use of the reserves by mountain bikers suggest formal development of mountain bike trails would provide a valuable recreation resource. The scale of the site could comfortably accommodate up to 20km of purpose built mountain bike single track.

Common Ground Trails recommend following the development process as outlined in the **Western Australian Mountain Bike Management Guidelines (link below)^A**. Preliminary costings for each development stage are outlined in the report. The risks to the Shire of Narrogin in developing mountain bike facilities are mainly connected to the use of the track, rather than the planning, design and construction phase and can be managed with appropriate design and management.

A. <https://www.dpaw.wa.gov.au/management/trails>

INTRODUCTION

Recognising the increasing popularity of mountain bike facilities and their economic and social benefits the Shire of Narrogin engaged Common Ground Trails to undertake a detailed feasibility study for the development of a pump track facility within Narrogin and a network of mountain bike trails within the vicinity of the town site.



Precedent image: Kingsley Pump and Jump Trail - City of Joondalup

CONTEXT

SITE CONTEXT

Located approximately 200km south east of Perth, the Shire of Narrogin is a thriving rural community. With a population of just over 5000¹ the Shire acts as a regional centre providing many services to other communities in the South Central Wheatbelt.

DEMOGRAPHICS

When compared to the Western Australian average, the population of the Shire of Narrogin (and the town of Narrogin itself) has a higher proportion of young people under 24 and a lower proportion between 24 and 55 (refer to Figure 1). In terms of population growth Narrogin is predicted to decline from 5,162 recorded in the 2016 census to 4,725 by 2031². The Shire of Narrogin, aware of this projection, has been proactive in developing a suite of plans and strategies aimed to arrest this forecast decline. The proposal to explore the feasibility of bike trails and pump tracks is an example of these initiatives. Recreational infrastructure such as mountain bike trails and pump tracks may well impact positively on retention rates of young families in rural towns as well as present as a tourist attraction.

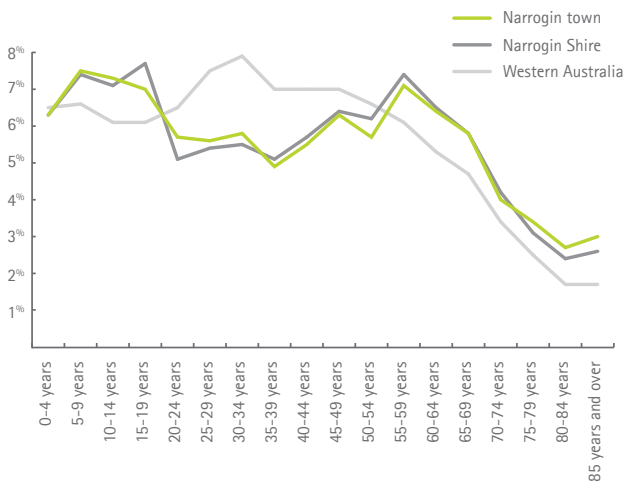


Figure 1. Narrogin townsite, Shire of Narrogin and Western Australia – Age Distribution¹.

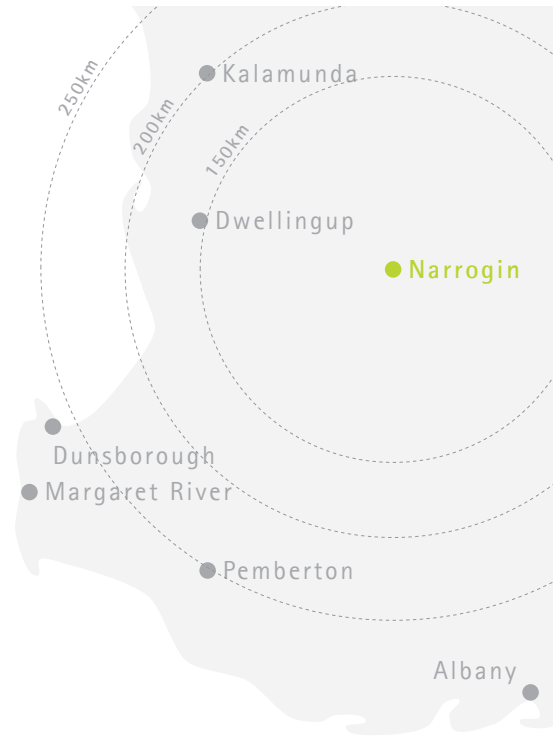


Figure 2. Existing mountain bike destinations

EXISTING CYCLING FACILITIES

The skate and active wheeled sports scene is highly activated and popular within the Perth Region and the greater WA context.

Figure 2 shows the existing mountain bike destinations in WA and in the vicinity of Narrogin. The closest is Dwellingup 150km to the north west.

There is currently a shortage of pump and jump track facilities in the Wheatbelt Region. There is demand for a facility in Narrogin, as indicated by the results of the community engagement undertaken for this feasibility study (refer to consultation section on page 12).

1. ABS (2019), 2016 Census data. https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA56460?opendocument. Accessed 17 May 2019

2. DPLH (2019), WA Tomorrow population forecasts. <https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts>. Accessed 17 May 2019

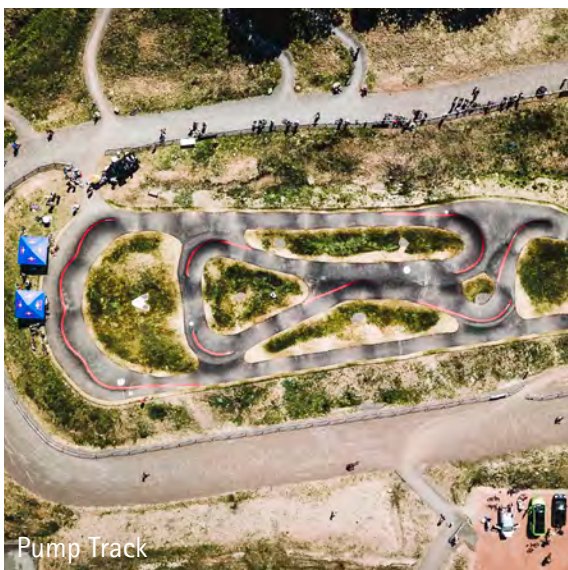
FACILITY TYPES AND TRENDS

In order to assess the suitability and the appropriateness of a cycling facility within Narrogin, it is important that a sound understanding of the potential facilities is established. Within urban interface sites there are a range of facilities that can be developed including; BMX tracks, Pump Tracks, Jump Tracks, Skills Tracks and Safety Tracks. Where there is appropriate land available longer purpose built mountain bike trails may also be appropriate.

PUMP TRACKS

A pump track is a 1-3 metre wide track that can be used for bicycle, skateboard, in-line skates and scooter riders to practice skills on a series of features, such as berms and rollers placed in quick succession. Essentially they are scaled down BMX tracks which do not require pedaling. 'Pump' refers to the action made by riders pushing down with their arms and legs to manoeuvre the bike or board over features to maintain momentum without pedaling or pushing-off the ground. Typically, tracks can be ridden continuously, and different combinations of features can be linked to provide a varied challenge. Bike handling skills can be transferred to other mountain bike tracks. Well designed pump tracks cater for all abilities, with all features being roll-able for beginners, and allowing for progression to pumping, and even jumping for more advanced riders. Riding a pump track is easy and children are typically comfortable using them within 10-20 minutes.

A well designed pump track provides enough challenges to stay attractive for years, because the rollers and berms can be combined and transitioned in different directions, creating opportunity for skilled riders to do jumps and maneuvers. Pump tracks can be made from natural soil, hardened surfaces, wood, fibreglass, concrete or asphalt. Historically pump tracks were constructed from natural soil blends and required significant ongoing maintenance. More recently, world's best practice is tending toward lower maintenance surfacing techniques and materials, such as asphalt, which are inclusive for a larger user base of wheeled-sports including skateboarding, scooters, in-line skates and non-off road bikes.



JUMP TRACKS

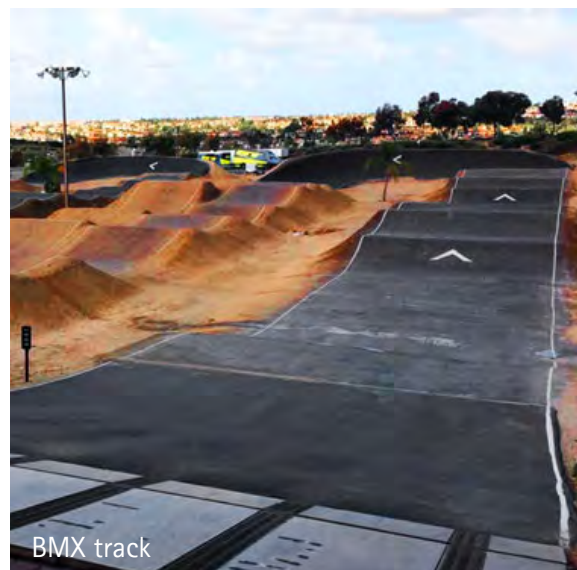
Jump tracks typically feature a series of jumps of various size and technicality in multiple lines. Provision of jump tracks is a vital inclusion allowing for progression for young people through to adults who seek an alternate and often more challenging experience than a pump track. Jumps are developed so that they allow for progression while always keeping safety in mind. Featuring all types of jumps, including table-tops, gaps, step-ups, step-downs and hips, with features linked so riders flow immediately from one to the next. Ideally, a rider will not have to brake between jumps. Well designed jump tracks offer a wide variety of challenges, from easy rollers to big jumps. A diversity of lines will allow riders to build their skills gradually and will create a park that is fun for all abilities. Typically, jump lines are arranged side-by-side in increasing difficulty, all starting at a common roll-in hill and traveling in the same direction. Jump tracks are primarily constructed of soil, however increasingly jump take offs and entire jump lines are being made from hardened surfaces, such as wood, concrete and asphalt. This significantly reduces ongoing maintenance and improves rideability.



Jump lines

BMX TRACKS

BMX tracks typically consist of a single lap track usually between 300-400m, constructed from compacted dirt or asphalt, with a start ramp and features such as tabletops, gap jumps and rhythm sections. BMX racing rewards strength, quickness, and bike handling. BMX tracks are typically used in a structured and organised setting rather than unstructured play.



BMX track

SKILLS TRACKS

Skills tracks feature man-made technical trail features that test the skills of a rider and allow them to try features that they may encounter on trails in the region. Typical features may include log rollovers, log rides, balance planks, rock drops and other technical features. They can also incorporate street features such as rails and wall rides, or freeride stunts like ladder bridges, skinnys, teeters and drops. Importantly all features are built with progression allowing users to start small and build their confidence up to larger features. Successfully executed skills park areas feature a diverse range of materials and can look like well landscaped areas or 'nature play' areas with natural features such as timber, logs and rocks.



Skills features

SAFETY TRACK

Road and Cycle Safety Tracks makes learning road rules fun for young people on bikes and scooters. A Safety Track features a miniature road network giving real-life experiences while learning essential safety skills. Safety Tracks are designed to enable; reading traffic signals, crossing railways and school crossings, negotiating roundabouts and gutters, recognising traffic signs and line marking, and cycling on roads or footpaths. Safety tracks are typically constructed using materials and features as they would be encountered in the real world including asphalt and concrete combined with various line marking and road safety signage. To improve the enjoyment of these tracks, features like fuel stations and parking areas are included for diversity.

The Shire of Narrogin recently installed a small safety track at Ashworth Park which should prove popular with local kids.



Safety Track

BIKE PLAYGROUND

Bike playgrounds include features such as tunnels, ramps, walls, and balance planks and are designed to suit a more playful riding style, incorporating tricks and highly skilled riding. Typically bike playgrounds have a more urban character, with constructed elements rather than more natural features.



Bike Playground

CHALLENGE PARKS

Pump, jump, skills and safety tracks are often integrated into one, larger-scale, seamless facility under the banner of challenge parks. Challenge parks are larger scaled developments featuring multiple bike related facilities and are used to improve riding skills. Their combined facilities provide an excellent entry point into bike riding while offering technical riding features for more advanced riders all within one convenient and safe location.

Challenge parks are typically developed with soft landscaping, hardscaping and site improvements turning the area into an aesthetically pleasing community hub and making them suitable for urban interface developments. Due to their offerings, challenge parks also often act as a trailhead or hub for the area's greater trail networks. Urban interface challenge parks provide significant community benefit with extensive use from youth, but also recreation enthusiasts and, when of significant scale, tourists. Such facilities have proven extremely successful nationally and internationally.

MOUNTAIN BIKE TRAILS

Mountain bike trails are purpose built trails in varying terrain. The terrain available will typically dictate the style of trail built (Refer to Appendix A for full list of different trail types). The terrain in the Shire of Narrogin will suit cross country style trails. Cross country mountain biking utilises a broad variety of track types such as dirt roads, dedicated paths, single tracks and short or long (anywhere from 1 km to hundreds of km's) circuits. Usually, this type of track involves climbing and descending, and depending on the location can cover various degrees of steepness and includes a wide variety of terrain. Cross country riding is one of the most popular and caters to both recreational and competitive riders.



Challenge Park

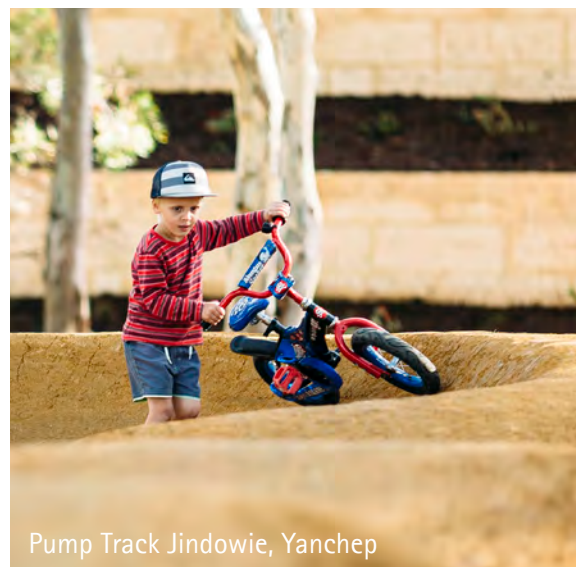


Mountain Bike Trail

BENEFITS OF CYCLING FACILITIES

Due to their ability to cater for people of all ages and families, the demand for pump tracks and challenge parks is quickly growing (refer to Participation and Consultation sections of this report for participation statistics). Challenge parks and mountain bike trails offer a range of benefits. These are set out below:

- Challenge parks cater for the growing trend in cycling as a recreation activity and provide a safe and fun environment for young people to learn bike handling skills. Local mountain bike networks often connect to pump track facilities in parks and public open space where adults and children can ride in a safe environment;
- Provide a low cost recreation opportunity for under privileged community members;
- Attract visitors to the local area, particularly families looking for activities on school holidays;
- Promote physical activity improving health and wellbeing;
- Pump tracks can be built in small areas connecting with existing sporting precincts, parks, trails and even lakes, beaches and golf courses;
- If designed appropriately, pump tracks can cater for a range of users, such as scooters and skateboards but only if surfaced with concrete or asphalt;
- Pump tracks can create passive surveillance through use by community members in otherwise quiet or unused areas;
- Pump tracks can be ridden by people of all ages, from toddlers on pedalless balance-bikes, to teenagers, through to over-55s and older people; and
- Mountain bike trails with a suitable range of classification can be ridden by people of all ages and abilities.



Pump Track Jindowie, Yanchep

PARTICIPATION

Wheeled sports have recently been shown to be growing in popularity over organised sports across Australia. Research undertaken by the ABS into Children's Participation in Sport and Physical Recreation found that participation rates for physical recreation activities such as skateboarding, bike riding and roller blading were much higher than organised sports (Refer to Table 1). The research also indicated increasing participation rates for both males and females (Refer to Table 2). Note data relating to skateboarding and roller blading in the years 2009 and 2012 also incorporates scooter riding. More recent data is yet to be released however in the 6 years since this study anecdotally the popularity of wheeled sports has continued to grow.

Table 1. Comparison of organised sport vs wheeled sports 2012.³

Males	No ('000)	Participation
Soccer	309.7	21.7
Bike riding	998.8	69.9
Skateboarding or roller blading	857.8	60.0
Females	No ('000)	Participation
Dancing	367.4	27.1
Bike riding	770.6	56.8
Skateboarding or roller blading	640.0	47.2

Table 2. Growth in wheeled sports participation rates across Australia 2009-2012.³

	Males		Participation	
	No ('000)		2009	2012
	2009	2012	2009	2012
Bike riding	992.5	998.8	66.1	69.9
Skateboarding or roller blading	780.4	857.8	55.9	60.0
Females	No ('000)		Participation	
	2009	2012	2009	2012
Bike riding	721.1	770.6	54.4	56.8
Skateboarding or roller blading	562.2	640.0	42.4	47.2

Participation in BMX racing has increased dramatically since the discipline made its Olympic debut at the 2008 Beijing Games and Australia is now the second largest BMX nation in the world⁴. Membership of BMX Sports Western Australia has more than doubled since 2005 (1,156 members in 2005 2,810 members in 2017)⁴. BMX club membership in Western Australia has a young demographic, with 72% of riders under 17⁵. BMX and pump track facilities are widely recognised as a primary gateway into cycling (in particular mountain biking) for young people, with participation building skills, physical attributes and tactical knowledge transferable to other cycling disciplines.

Mountain biking in Western Australia is growing in popularity. The Western Australian Mountain Bike Strategy identified young people as being underrepresented in mountain bike participation⁶. Increasing availability and accessibility of different styles of trail offering different levels of technical difficulty is one of the recommendations aimed at reducing barriers to participation⁶.

Anecdotal evidence from recently opened facilities around Perth indicates there is a need locally for more purpose designed facilities. Kingsley Pump and Jump Park in City of Joondalup opened in 2017 and includes a pump track, jump track, and safety track. This facility consistently draws crowds especially on weekends, with people traveling large distances to visit the facility. Dwellingup recently opened a pump track and skate facility, located in the town, adjacent to the existing playground and oval. Locals are enjoying the facility during the week and large crowds are visiting on weekends and during holiday periods. This pump track is the largest in WA currently (approx 800sqm) and features beginner, intermediate and advanced line options.

3. ABS (2012), Children's Participation in Cultural and Leisure Activities, Australia, 2012, code 4901.0.

4. Western Australia Strategic Cycling Facilities Review (2017)

5. BMX Sports Western Australia. (2017). 2016-2017 Annual Report.

6. Western Australian Mountain Bike Strategy 2015 - 2010 Unlocking the potential.

CONSULTATION

As part of determining the feasibility of mountain biking facilities in Narrogin, comprehensive community and stakeholder engagement was carried out in order to gauge community support for the proposal and to:

- Understand the demand for pump tracks, mountain bike trails and other cycle facilities;
- Understand the values and objectives of land managers, agencies, industry organisations, community groups and surrounding neighbours;
- Understand the key issues impacting land managers, community groups and general trail users; and
- Identify potential opportunities for future development.

STAKEHOLDER ENGAGEMENT

As part of the process of collecting information, assessing ideas, issues and requirements, Common Ground met with the Shire of Narrogin's CEO, Manager Community Leisure and Culture, Building Surveyor and Shire Rangers. The key points of discussion included:

- Outlining the different types of mountain bike facilities and their suitability for Narrogin;
- The economic potential of these facilities for the town of Narrogin, and the need for facilities to allow for event opportunities;
- Identification of potential sites for a pump track and mountain bike trails;
- Current known proposals for facilities in the vicinity of the Shire such as Dryandra National Park to the North West of town; and
- Management and maintenance considerations.

Discussions were also held with key government agency's including DLGSCI and DBCA, who indicated support for development of mountain bike facilities in appropriate locations. While there is no formal mountain bike club in Narrogin currently, there are a few keen individuals pursuing the development of the sport locally. Valuable discussions were held with each of these individuals. Discussion focused on creation, use and management of existing trails,

potential locations for a network of trails and desires of the local riders in terms of style of trail.

COMMUNITY ENGAGEMENT

A short online survey was made available for a period of two weeks and promoted on the Shire's Facebook page and through local and broader community email networks, including mountain bike clubs. The intent of the survey was to gain an understanding of:

- The demand for trails within the study area and surrounds;
- Distance users would be prepared to travel to use a facility;
- Preferred trail type;
- Preferred style and difficulty of trail;
- Demographics of participants; and
- Travel habits/ participant experiences.

Complementing the survey, locals were given opportunity to meet with Common Ground staff to engage in discussions around ideas and concerns. Common Ground were available at the Narrogin Coles from 3pm–6pm on the 17 May 2019.

A vast majority of respondent's were in support of both a pump track facility and purpose built mountain bike trails (refer to Figure 3). Of those respondents who identified as not local a network of trails 10–20km in length would be enough to entice them to Narrogin and over 20km would prompt return visits. Respondent's rider ability was spread from beginner to advanced indicating a facility and trails which cater for beginners and for rider progression is needed. A majority of respondents were in the age group 35–44 however 52% of respondents in this age bracket indicated they ride with their children, suggesting a higher proportion of youth interest than the age of survey respondents would indicate. A vast majority of general comments received through the survey were positive and in favour of mountain bike facilities in Narrogin (refer to Appendix C).

Stakeholder and community engagement suggests that the local and broader community would use a pump track and mountain bike trails

in the Shire. Establishment of a facility should also consider design for beginners ensuring potential for growth in participation and maximising of the benefits of cycling within the community.

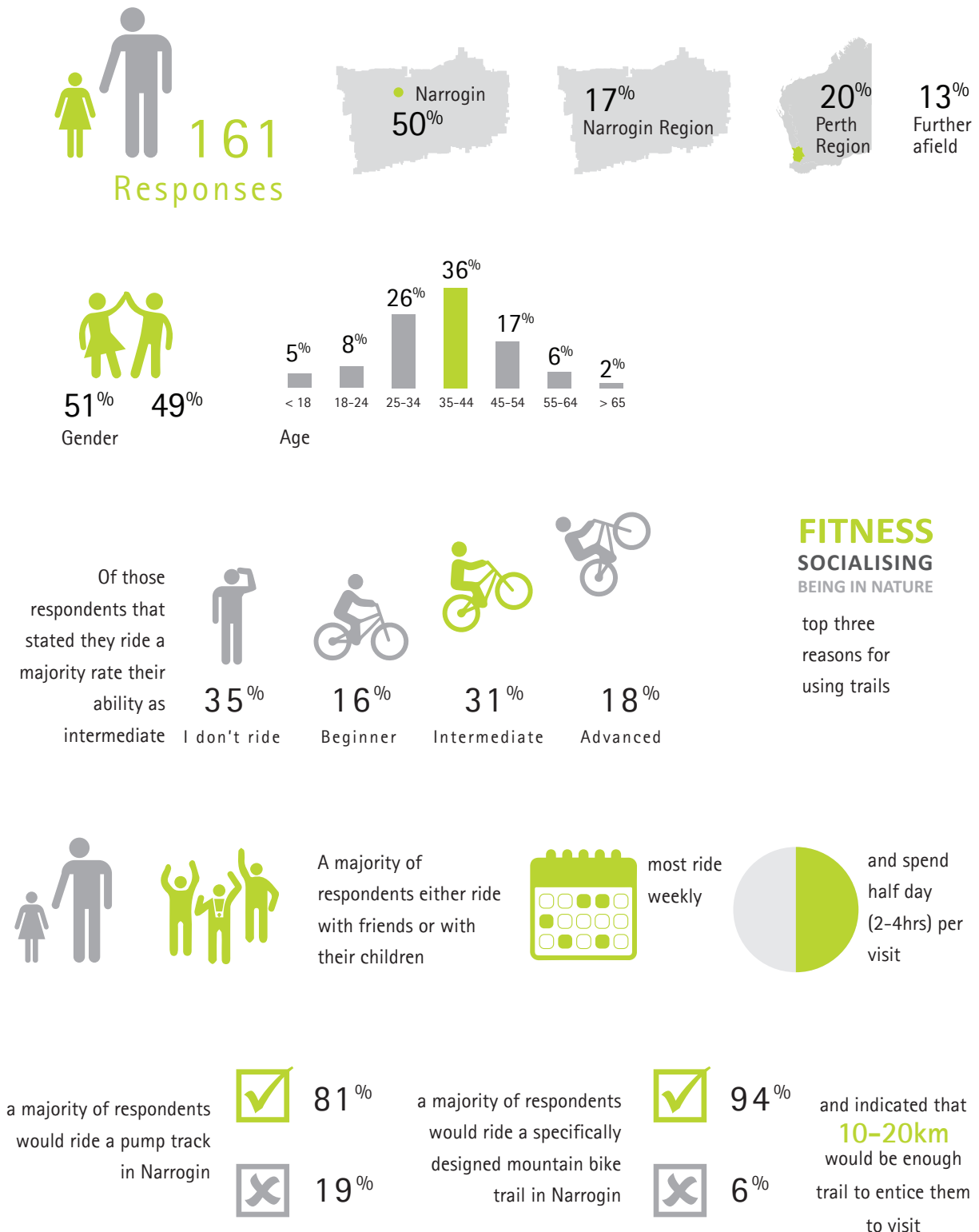


Figure 3. Snapshot of results from the community survey conducted by Common Ground in May 2019.

SITE ASSESSMENT

While there is potential for significant community and social benefit through the development of mountain bike facilities, there are also risks associated with inappropriate development. The cornerstone of successful development is appropriate site selection. The following characteristics must be considered when identifying and assessing a site:

- Proximity to supporting recreation activities;
- Accessibility for users;
- Connectivity to related activities;
- Terrain and geology of site;
- Hydrology / drainage;
- Tenure and deliverability;
- Competing site uses;
- Impact on surrounding land use;
- Scale of site; and
- Flora, fauna, cultural and hygiene constraints.

In order to establish if Narrogin has an appropriate location for a challenge park and a network of mountain bike trails an assessment of potential sites was undertaken. Sites were identified through stakeholder consultation and desktop analysis. A range of sites were immediately ruled out due to having significant existing development and established use. An on ground review and desktop assessment of the identified sites was undertaken using a broad set of criteria including:

- Tenure - appropriate land manager;
- Location - proximity to existing recreation areas;
- Scale - physical and usable size of site;
- Strengths - positive attributes of the site; and
- Weaknesses - negative attributes of the site.

Refer to Figures 4 and 5 and Tables 3 and 4 for site assessment details.

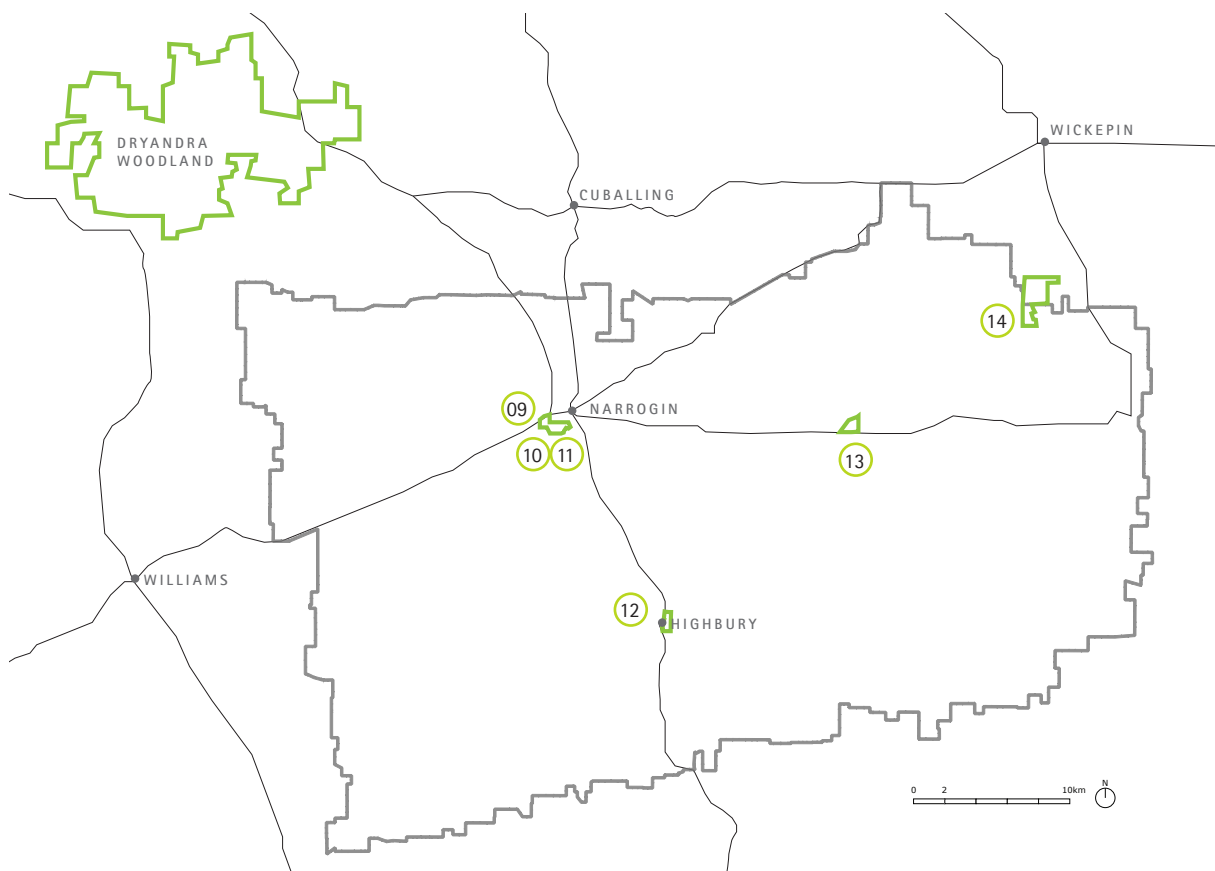


Figure 4. Sites assessed for a mountain bike trail network. Dryandra Woodland wasn't assessed but is identified and located as it is a site with proposed mountain bike trails.



Figure 5. Sites assessed for a challenge park and mountain bike trail network

CHALLENGE PARK SITES

Table 3. Challenge park site assessment

ID	LOCATION	TENURE	SCALE (Ha)	USE/ZONING	STRENGTHS	WEAKNESSES
01	Pitt St	Shire Reserve	0.6622	Recreation	Connectivity to future related trails, appropriate terrain, tenure and deliverability, no competing site uses, scale of site.	Potential impacts on surrounding residential areas, accessibility for users.
02	Archibald Park	Shire Reserve	4.8241	Recreation	Connectivity to future related trails, tenure and deliverability, no competing site uses, scale of site.	Accessibility for users, terrain requires significant work to make suitable.
03	Former Railway Tennis Club (southern end of Gnarojin Park)	Shire Reserve	1.7301	Community and Recreation	Proximity to supporting recreation activities, accessibility for users, connectivity to future related trails, appropriate terrain, tenure and deliverability, no competing site uses, minimal impact on surrounding land use, scale of site.	Requires drainage upgrade.
04	Adjacent skate park (within Gnarojin Park)	Shire Reserve	0.4084	Community and Recreation	Proximity to supporting recreation activities, accessibility for users, appropriate terrain, tenure and deliverability, no competing site uses, minimal impact on surrounding land use, scale of site.	Distance from future related trails.
05	BMX/Old Golf course	Crown Reserve	1.4678	Recreation	Proximity to related recreation activities, appropriate terrain, tenure and deliverability, no competing site uses, minimal impact on surrounding land use, scale of site.	Distance from future related trails, accessibility for users.
06	Garfield St	Shire Reserve	1.0812	Recreation	Appropriate terrain, tenure and deliverability, no competing site uses, scale of site.	Potential impacts on surrounding residential areas, distance from future related trails, accessibility for users.
07	Little athletics	Shire Reserve	0.6063	Recreation	Appropriate terrain, tenure and deliverability, no competing site uses, scale of site.	Potential impacts on surrounding residential areas, distance from future related trails, accessibility for users.
08	Northwood St	Shire Reserve	1.2254	Recreation	Appropriate terrain, tenure and deliverability, no competing site uses, scale of site.	Potential impacts on surrounding residential areas, distance from future related trails, accessibility for users.

Of the sites identified and assessed within Narrogin, Common Ground recommends that site 04 adjacent to the existing skate park is the most appropriate for development of a challenge park. Features which make this site desirable include;

- Potential central trail head for future trail networks;
- Sufficient scale to host full challenge park;
- Improvement of disturbed and minimally managed site;
- Enhanced community based entry statement for township;
- Accessibility from town centre;
- Proximity to existing skate park precinct;
- Appropriate terrain and geology;
- Existing and proposed hydrology / drainage solutions;
- Site under management of Shire;
- No competing site uses and complimentary neighbouring use in the skate park;
- Minimal impact on surrounding land use;
- Existing mature trees on site for shade; and
- Existing support infrastructure including Changing Places accessible toilet facility.

The proposed site is a unique opportunity to develop a leading bike facility within the urban context of Narrogin. The ideally located site offers current and future potential for development of an outstanding facility catering for diverse user groups, promoting progression and allowing for entry into mountain biking as a recreation and sport. This facility has the potential to be one of the benchmark community mountain bike facilities for Australia and has the potential to showcase Narrogin's unique characteristics.

While the feasibility study was asked to investigate a pump track only there is potential for the site to also host other complimentary cycling facilities such as a bike playground and beginner/intermediate jump lines. A more advanced jump facility would be best placed at Site 02 Archibald Park with the possibility of a community managed facility should there be sufficient interest from riders (refer to City Park case study, pg 29). Archibald Park is more suited to this type of facility due to existing disturbance and scale of site.

The Narrogin Park Masterplan does not include a pump track, however the Shire agrees the Masterplan's intent was to identify areas within the Park to activate. There is sufficient space adjacent the skate park for a pump track facility (and a bike playground and beginner intermediate jump lines). Placement of a pump track here fits with the intent of the Masterplan to place recreation/play areas on the ends of the north-south axis of the Park. The Masterplan proposal for native plantings and a social/events space in this vicinity, wouldn't be impacted (refer to Figure 7).



Figure 6. Recommended site for pump track, bike playground and beginner/intermediate jump lines.



Figure 7. Recommended location for pump track, bike playground and beginner/intermediate jump lines in context of the Gnarojin Park Masterplan.



Figure 8. Gnarojin Park – Recommended approximate location for pump track, bike playground and beginner/intermediate jump lines.



Pump Track, Dwellingup, Western Australia



Berm features



Roller features



Pump Track, Dwellingup, Western Australia



Jumps



Pump Track, Waller Park, Queensland



Bike Playground

Figure 9. Example facility and feature images.

MOUNTAIN BIKE TRAIL NETWORK SITES

Table 4. Mountain bike trail site assessment

ID	LOCATION	TENURE	SCALE (Ha)	USE/ZONING	STRENGTHS	WEAKNESSES
09	Foxes Lair Reserve	Shire Reserve	64.432	Recreation	Existing network of community built trails, scale of site, appropriate terrain and geology, proximity to town.	Significant Flora and Fauna values
10	Commonage	Shire Reserve	53	Recreation	Existing network of community built trails, scale of site, appropriate terrain and geology, proximity to town.	Significant Flora and Fauna values
11	Railway Dam	Shire Reserve	16	Recreation	Existing network of community built trails, appropriate terrain and geology, proximity to town.	Areas of disturbed land not suitable for trails. (note these disturbed areas are suitable for advanced jump lines)
12	Highbury Nature Reserve	Crown Land	51	Nature Reserve	Proximity to services in Highbury, scale of site.	Nature Reserve precludes all recreation activity apart from walking. Distance from large population centre.
13	Yilliminning Rock	Crown Land	80	Recreation and Open Space	Scenic landscape.	Significant Flora and Fauna values, scale of available space for trails
14	Bird Whistle Nature Reserve	Crown Land	1031	Public Purpose / Nature Reserve	Appropriate terrain, no competing site uses, scale of site.	Significant Flora and Fauna values, distance from population centre. Nature Reserve precludes all recreation activity apart from walking.

Of the sites identified and assessed within the Shire, Common Ground recommends that Foxes Lair Reserve, the Commonage and Railway Dam are the most appropriate for development of mountain bike trails. Features which make these sites desirable include;

- Sufficient scale for up to 20km of trail;
- Appropriate terrain and geology;
- Accessibility from Narrogin town site;
- Site under management of Shire;
- Complimentary site uses; and
- Minimal impact on surrounding land use

Yilliminning Rock was ruled out due to the scale of the site and natural values. Other reserves within the Shire of Narrogin including Birdwhistle Nature Reserve and Highbury Nature Reserve have been ruled out based on land tenure. These reserves are classed as Nature Reserves with the primary purpose under the Conservation and Land Management Act 1984 for the conservation of flora and fauna (Section 6 (5)). The only conditionally permissible recreation activity within gazetted nature

reserves is passive bushwalking activities on trails specifically developed for the interpretation and appreciation of flora and fauna.

It should be noted that the 2011 Dryandra Woodland management plan⁶ proposes development of mountain bike trails in the western region of the park. While development of these trails is not imminent, cyclists already use the fire roads and management roads and Narrogin is well placed to leverage tourism/ economic benefits from this destination. Development of mountain bike trails in Foxes Lair, Commonage and Railway Dam sites should complement the experience developed in Dryandra Woodland and promotion and marketing should consider linking the two experiences.

6. Department of Environment and Conservation (2011) Dryandra Woodland Management Plan No. 70.

There is an existing network of community built mountain bike trails within the Foxes Lair, the Commonage and Railway Dam sites which have informally developed over several years. Any proposed development of mountain bike trails on these sites should involve an audit of these trails to assess their long-term sustainability and suitability for inclusion in a coherent network of trails which would contain a range of trail classification. The scale of these sites could potentially and comfortably accommodate up to 20km of purpose built mountain bike single track.

Trail development should follow best practice development procedures as outlined in the Western Australian Mountain Bike Management Guidelines. Common Ground recommends that mountain bike trails be developed in stages as outlined below.

STAGE 1	<p>Site Assessment</p> <p>For Foxes Lair, Commonage and Railway dam sites</p> <p>Including detailed trail audits, Flora and Fauna study, Aboriginal Cultural Heritage study, and Phytorphora hygiene study</p>
STAGE 2	<p>Concept Development</p> <p>For Foxes Lair, Commonage and Railway dam sites</p>
STAGE 3	<p>Detailed Design and Construction</p> <p>For trails within Commonage and Railway Dam sites</p>
STAGE 4	<p>Detailed Design and Construction</p> <p>For trails within Foxes Lair</p>

The Foxes Lair, Commonage and Railway Dam sites are popular local reserves which also cater for bushwalking, trail running, picnics and organised events such as orienteering. Consideration of other park uses is essential in development of mountain bike trails. In cases where the risk of user conflict is low and trails are low speed for cyclists, consideration can be given to dual use trails. However it is recommended that where possible walk and mountain bike trails be single use and specifically designed for each user group.

The recently completed Shire of Narrogin Walk Trails Master Plan recommended formalising existing walk trails within Foxes Lair and the Railway Dam Reserve with general trail maintenance and installation of standardised signage and interpretation along each route. These routes should be taken into account during concept development for mountain bike trails and maintained as walk only trails.

Given the significant flora and fauna values in Foxes Lair and the network of existing walk trails it is recommended that the bulk of mountain bike trails be focussed within the Commonage. The balance of walk and mountain bike trails should be carefully considered in the concept development stage.

Sustainable trails meet user's needs, reduce environmental impact and require less maintenance. The way to achieve this is to develop the right trail, in the right area, the right way and for the right reasons. Following best practice development procedures as outlined in the [Western Australian Mountain Bike Management Guidelines](#) will ensure that mountain bike trails developed in Foxes Lair, the Commonage and Railway Dam are sustainable from an environmental and user perspective.

Department of Water managed land to the south west of Foxes Lair has potential to host future expansion of mountain bike trails, however at this stage restrictions on recreation activity will limit development of trails.

TRAIL DEVELOPMENT

A staged planning and development process is highly recommended to achieve a successful pump track and mountain bike trail facility. The development process is similar to most construction projects with planning, design and construction stages. The full recommended development process is outlined in the Western Australian Mountain Bike Management Guidelines. The key stages are briefly discussed below.

PLANNING

Determining the framework for a project is vital to its ongoing success. The framework stage uses stakeholder consultation to document the project brief, scope, scale and target user groups, stages of development, funding sources, management and overall objectives. The resulting project framework is used as a overall project brief to guide future stages.

CONCEPT DESIGN

While the project framework informs the concept design process, it is also important to achieve community buy in at this early stage. Typically, a community design workshop is undertaken to ascertain the design aspirations of the end users, looking into what features and characteristics are desired. This workshop should be led by an experienced facilitator and professional designer. The concept design will consider access, site topography, drainage, constraints and other important elements. Recommendations on facility inclusions and surface materials are typically made at this stage. The final concept provides a report and layout of the track showing the design intent and opinion of probable cost. While detailed feature surveys are not required at this stage, they do assist the process. The documentation and reports created in the concept design stage should be sufficiently detailed to assist funding applications.

FUNDING

With the concept design completed and opinion of probable costs established there is typically sufficient documentation and project understanding to seek external funding or undertake fundraising.

DETAILED DESIGN

The detailed design stage documents all construction requirements in detailed drawings and written specification. Detailed designs can include a bill of quantities establishing the overall material requirements. In addition to documenting the facility earthworks and track finishing, it is important that full soft and hard landscaping design is undertaken at this stage. The final detailed design documentation will enable successful construction pricing and tendering.

CONSTRUCTION

Construction of pump tracks generally involves the use of building machinery such as excavators, skid steers and roller compactors. While some earth moving work can be performed by general civil contractors or Shire staff, specialised building skills and shaping techniques are essential to achieve the flow, pump and jump actions that riders are seeking. Community involvement and creating a sense of ownership of pump tracks is also important, which in the long term can lead to assisted management. Working with community groups to involve volunteers in the build process, ensuring a safe and professional work environment is one way of achieving sense of ownership.

MANAGEMENT

Ongoing management is vital to maintaining user safety and user experience. Management and maintenance requirements can vary significantly depending on the materials and finishes used to construct the facility.

DELIVERY

There are number of delivery methods which can be considered for the development of the trails. The three primary delivery methods are; professional, professional with volunteer assistance and volunteer lead. Delivery methods are often determined by location of the development and the quality of facility required. Facilities developed in urban and urban fringe are typically lead or undertaken by professional designers and contractors. Developments located in the natural landscape have a higher potential for volunteer development. The following outlines the benefits and constraints with each of the delivery methods.

PROFESSIONAL

Professional design, by industry specific designers, typically yields high quality and accurate documentation enabling competitive and accurate pricing. Professional design can be costly but typically ensures successful and highly desirable facilities. Typically professional designers will host workshops to foster community participation and ownership. Professional construction, by industry specific contractors, ensures high quality with a high level of accountability. Professional construction is most appropriate when the project incorporate hardened surfaces and landscaping requirements. It does however have higher capital costs and can lead to reduced ownership if not successfully delivered. Development progress is typically fast.

PROFESSIONAL WITH VOLUNTEER ASSISTANCE

Community lead design with professional documentation can yield high quality and accurate documentation and community ownership. It remains costly and can have compromised design outcomes if not successfully managed. Professionally lead construction, by industry specific contractors, with volunteer assistance can yield high quality but with a reduced level of accountability. Volunteer assisted construction is most appropriate when the project incorporates a combination of natural and hardened surfaces. Volunteer assisted projects can be difficult to price and unless volunteer involvement is significant, it can increase the cost of development through increased management requirements.

VOLUNTEER

Community lead design with minimal input from professionals can be low cost but can often lead to lower quality documentation and potentially less useable facilities. Volunteer lead construction is most appropriate for natural surface developments in urban fringe and natural landscape settings. Accountability of the final outcome is significantly reduced and development progress is typically slow. Volunteer lead construction can lead to significant community ownership, if the final product is desirable.

COMMUNITY CONTRIBUTION

In addition to volunteer involvement, there are a number of additional areas where the Narrogin community can contribute significantly to the facility development.

Due to the prominent location of the recommended sites, and considering the potential scale, professional design and construction with community input and contribution would likely yield the best outcome for the overall development. As identified should there be sufficient community interest in ongoing management Archibald Park would be ideally suited to development of a set of community designed, built and managed dirt jumps.

RISK MANAGEMENT

The risks to the Shire of Narrogin in developing mountain bike facilities are mainly connected to the use of the track, rather than the planning, design and construction phase. Using a contractor with experience in design and building similar tracks removes much of the risk. Usage risks include the site being used for anti-social behaviours such as drinking; track deterioration; and physical injury to users. Anti-social behaviours can be discouraged through surveillance of the site, by other users, CCTV, or regular patrols. The risk of track deterioration can be managed by appropriate design and surfacing (asphalt for pump track) and installing sufficient drainage systems. Physical injury to users is a moderate risk which the Shire of Narrogin should be able to manage.

The Shire of Narrogin already has a BMX track and skate park operating within the shire and has public liability insurance commensurate with the risk, however riders use the tracks at their own risk and the Shire of Narrogin is able to mitigate some of the risk by ensuring the tracks are always in good repair and fit for use. In this sense an asphalt track which does not deteriorate quickly is safer than a non-surfaced track which quickly shows wear and is easily damaged by wet weather.

SUMMARY

Following stakeholder and community engagement and assessment of potential sites Common Ground Trails recommend that development of a pump track (or challenge park) facility and purpose designed mountain bike trails are feasible within Narrogin Shire. Cycling facilities have been proved to offer a multitude of social and economic benefits to communities and Narrogin is well placed to reap these benefits.

Of the sites assessed it is recommended that a pump track (or challenge park including a pump track, bike playground and beginner/intermediate jump lines) be developed adjacent to the existing skate park in Gnarojin Park. Opportunity to capitalise on existing support infrastructure such as shelter, toilets and access paths as well as proximity to town and complimentary neighbouring recreation uses make this site ideal for a challenge park.

Foxes Lair, the Commonage and Railway Dam are recommended as the most appropriate sites for development of purpose designed mountain bike trails. Proximity to town and scale of the sites together with existing use of the reserves by mountain bikers suggest formal development of mountain bike trails would provide a valuable recreation resource. The scale of the site could comfortably accommodate up to 20km of purpose built mountain bike single track. Proposed development of mountain bike trails in Dryandra Woodland to the north west of Narrogin will compliment development of trails closer to town and add to the appeal for riders visiting from outside the region.

In terms of next steps, should Council support development of a pump track (or challenge park) and mountain bike trails as per the development process outlined in the [Western Australian Mountain Bike Management Guidelines](#), it is recommended that a concept plan for each site be developed. Common Ground strongly encourages the Shire of Narrogin to include the community in this process ensuring outcomes on the ground that are supported by and cater for the needs of the local community.

PRELIMINARY COSTINGS

CHALLENGE PARK

The following table provides the opinion of probable cost (OPC) for design and construction for each element in a challenge park. These costs are based on Common Ground Trails recent experience in designing and constructing challenge parks. Note staged development is possible.

ELEMENT	OPC DESIGN	OPC CONSTRUCTION	FUNDING SOURCE	OPC MAINTENANCE	NOTES
CONCEPT DEVELOPMENT	\$30,000	N/A	External funding partnership/grant	N/A	Concept design for whole site, to determine final site layout
PUMP TRACK	\$20,000	\$200,000 (400sqm track)	External funding partnership/grant	\$10,000/pa (recurrent internal budget)	Surrounding landscape design separate
JUMP TRACK	\$15,000	\$200,000	External funding partnership/grant	\$10,000/pa (recurrent internal budget)	Beginner and intermediate lines set to fit comfortably within the site
SMALL BIKE PLAYGROUND	\$5,000	\$100,000	External funding partnership/grant	\$5,000/pa (recurrent internal budget)	
TOTAL	\$70,000	\$500,000		\$25,000/pa	

MOUNTAIN BIKE TRAILS

The following table provides an outline of the OPC for each stage of the trail development process for approximately 20km worth of specifically designed trail.

These costs are based on Common Ground Trails recent experience in designing and constructing mountain bike trails.

STAGE	ELEMENT	OPC	FUNDING SOURCE	NOTES
1	SITE ASSESSMENT	\$30,000	External funding partnership/grant	Site assessment for all three sites (Foxes Lair, Commonage and Railway Dam) including undertaking Flora and Fauna studies, Aboriginal Cultural Heritage study and Phytophthora Hygiene study.
2	CONCEPT PLANNING	\$20,000	External funding partnership/grant	Concept design for all three sites, to determine trail network style and extent, include a thorough audit of existing trails and considering other trail users.
	SUB TOTAL STAGE 1&2	\$50,000		
3	CORRIDOR EVALUATION	\$5,000	External funding partnership/grant	For up to 10km of trail within Commonage and Railway Dam sites
	DETAILED DESIGN	\$30,000	External funding partnership/grant	
	CONSTRUCTION	\$400,000	External funding partnership/grant	
	SUB TOTAL STAGE 3	\$435,000		
4	CORRIDOR EVALUATION	\$5,000	External funding partnership/grant	For up to 10km of trail within Foxes Lair
	DETAILED DESIGN	\$30,000	External funding partnership/grant	
	CONSTRUCTION	\$400,000	External funding partnership/grant	
	SUB TOTAL STAGE 4	\$435,000		
TOTAL (FOR ALL ALL 4 STAGES)		\$920,000		

Note management/maintenance costs will be approximately \$40,000 / pa for 20km worth of mountain bike trail.

Site assessment and concept planning should be undertaken for all three sites concurrently so that a vision and coherent layout is developed for the trail network. Given the current population size of Narrogin, staging corridor evaluation, detailed design and construction is recommended, starting with approximately 10km (distance to be determined in concept planning stage) in the Commonage and Railway Dam sites. Approximately 10km of trail will adequately service the current population and combined with a pump track in the townsite should be enough to entice visitors and build excitement

for further trail development. This approach will also allow time for the local mountain bike community to develop to a point where a club could potentially be formed to oversee maintenance of the trails. Staged development will also allow for demonstration of the social benefits of mountain bike trails and the minimal environmental impact of sustainably built trails.

APPENDICES

APPENDIX A

Mountain Bike Trail Types

Trail type defines the style of trail and its typical attributes. Different trail types suit different styles of riding and typically each trail type will have a specific kind of mountain bike designed to suit. Different cohorts use different types of trails and all trail types can have varying classifications.

CROSS COUNTRY (XC)

Primarily singletrack orientated with a combination of climbing and descending trails and natural trail features of varying technicality. Cross Country trails appeal to the majority market and can cater for timed competitive events. Typically bikes are lightweight with shorter travel dual suspension or no rear suspension.

ALL MOUNTAIN (AM)

Similar to Cross Country and primarily singletrail orientated, with greater emphasis on technical descents, with nontechnical climbs. All mountain trails can cater for timed enduro competitive events. Bikes are typically light-medium weight with medium-travel dual suspension.

DOWNHILL (DH)

Purely descent only trails with emphasis on speed and technical challenge. These trails can cater for timed downhill competitive racing. Downhill trails appeal to the more experienced market and typically require uplift to the trailhead via chairlift or vehicle shuttle. Bikes are designed for descending and are typically long-travel dual suspension and built for strength over weight.

FREERIDE (FR)

Typically descent focused trails with emphasis solely on technical challenge. Freeride trails feature both built and natural terrain technical features with a focus on drops and jumps. Appeals to the more experienced market and caters for competitions judging manoeuvres and skills only. Bikes are typically medium to long-travel dual suspension and are built for strength.

PARK (PK)

Built feature environment with emphasis on manoeuvres, skills and progression. Appeals to wide market including youth and can cater for competitions judging aerial maneuvers. Can include jump and pump tracks and skills park. Typically dirt surfaced but can include hardened surfaces. Bikes are typically built for strength, with short travel suspension.

TOURING (TR)

Typically long distance riding on reasonably uniform surface conditions and lower grades. Touring trails are dual direction linear trails or long distance circuits with a focus on reaching a destination. Touring trails can include rail trails, access/ fire roads and singletrack. While there is a limited market for long distance mountain biking, touring trails can be ridden in sections making them accessible to all. If carrying panniers bikes are usually robust with limited suspension, however, for short sections or day trips most mountain bikes are suitable.

While diverse, each of the trail types meet a different market segment. It is important that the majority of trails cater for the existing and potential market majority.

APPENDIX B Case Studies

KINGSLEY PUMP AND JUMP TRACK, PERTH

In 2017 the City of Joondalup opened a bike orientated park within the Shepherds Bush Reserve in the suburb of Kingsley. Located along Barridale Drive, and accessible via the Perth Bicycle Network, the facility is often accessed via bike. The previously dilapidated site is now extremely popular and well used by the community. The challenge park meets the needs of a diverse range of users from young children to the adults and is extremely popular with families. It caters for beginners through to advanced riders in a well thought out and integrated layout.

The Shepherds Bush Park has dedicated parking, playground, picnic and BBQ facilities and grassed area. Most importantly the overall development features three dedicated bike facilities. These are described below.

JUMP TRACK

The Shepherds Bush Reserve facility features two jump lines, rated intermediate and advanced. Each jump line begins on a large asphalt start ramp, features four step up table top jumps and a large return berm with hipped jump entry option. The jumps range from 1.2m to 2m high and are up to 4.5m long. To minimise maintenance each of the jumps features an asphalt lip combined with a clay landing which reduces risk of injury. The jump track integrates seamlessly with the pump track allowing experienced riders to transition between and providing a consistent finish. To reduce risk the intermediate and advanced jump lines are demarcated with blue and red painted lines.



PUMP TRACK

The reserve also features a highly used asphalt pump track. The pump track is designed to cater for a range of users and has easily rollable lines combined with larger optional transfer lines. The pump track is demarcated with green line work allowing parents to advise and monitor young riders. The asphalt surface was utilised to reduce ongoing maintenance. The pump track is utilised as part of the return track to the jump tracks allowing users to effortlessly pump their way back to the top of the start mound.

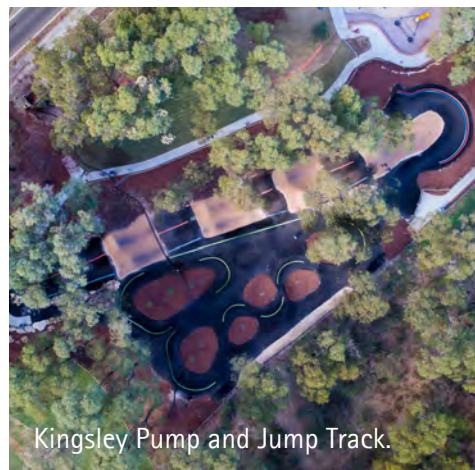
The jump track and pump track are surrounded by a low fence which manages risk of young children accidentally wandering into a high speed area. The area is accessible through two gated entries at either end of the jump lines which also feature safety signs and bins.

SAFETY TRACK

Catering for young children, the Shepherds Bush Reserve facility also features a road safety track. The simple track design features an asphalt surface with signed intersections and roundabout as well as a parking areas and fuel station.

All of the facilities in the greater Shepherds Bush facility are designed to cater for cyclists but scooter and skateboarders frequent the area.

One of the primary reasons the facility is popular with families is the diversity of experiences combined with rest areas and sheltered spaces. The extremely popular facility has something for everyone.



Kingsley Pump and Jump Track.

CITY BIKE PARK, ADELAIDE

City Bike Park is located in Adelaide's CBD. Hand built and maintained by a dedicated crew of volunteers, the park is one of the best known dirt jump trail spots in Australia. This facility is a good example of how the riding community can be effectively engaged to activate and enhance public space.

Originally built in 2004, the park has been through a number of phases of redesign, coming from a competition based facility to more of an all-inclusive recreation facility with jumps to suit beginners, intermediate and advanced riders. The park has been designed, built and managed by a dedicated group of volunteers, until 2017 when the Adelaide City Council raised some concerns regarding insurance. Negotiations resulted in the volunteer crew being retained and a third party trail building company engaged for safety assessment/auditing and an operational framework put in place. Adelaide City Council provide ongoing support in the form of tools and supplies.

Management of the jumps also involves watering before use, covering and chaining when not in use and restricting and monitoring use after rainfall events all tasks which are undertaken by volunteers.

The success of City Bike Park is primarily due to the enthusiasm, and dedication of a few individuals within the community and also the support from the City of Adelaide. For further information on the history of City Bike Park refer to www.citydirtcrew.com.

While the level of community interest in a cycle facility in Narrogin would suggest that a similar community led jumps line could be feasible, ongoing commitment to maintain is unknown.



APPENDIX C

General comments from community survey conducted by Common Ground Trails in May 2019.

It would be a great addition to our town

It's a brilliant idea! The mountain biking community is growing and it would be a tourist attraction.

It is great for tourism

Up until the last 5 years Narrogin Town Council have regularly maintained trails throughout Foxes Foxes Lair, Around the Railway dam and along the railway line which have been used for the last 35 years that I have been here, for all sorts of bike riding, pushing prams, children with scooters, mobility scooters, walking. I would love to see this made MULTI use, not just one group. Pretty much all towns except Narrogin seem to have well maintained trails usable by everyone. No reason not to incorporate mountain biking as well.

It would be fantastic for Narrogin to provide a nature base tourist attraction

Such a good idea! We're down in Tarwonga a couple of times a year and would be epic to have something active to do.

Request a tender from WA trail builders to obtain a cross section to determine a suitable builder. There are different materials for the finishing off of trails that are sustainable.

Be great to be able to stop in Narrogin on way to/from other locations like collie and dwellingup

Great for both locals and visitors to the town.

It's a worthwhile investment into a rural town

Confirming the health aspect and provision of an activity for young people.

This is a fantastic idea.

Needs to be interesting, cater for tourists not just locals, good length. Consider reserves such as Yilimining/ Wikepin way

Kids need something

A great physical activity for every age group.

Great ideas! Keep it up.

"Preferably put the mountain bike trails in foxes lair, foxes lair would be a good spot for the trails because there is already some good trails in there and it would be for the trails to intertwine. me and my family love mountain biking in foxes lair, foxes lair is a really nice and relaxing place to be. with all the wildlife around you.

It would be ideal to build the pump track at the skatepark

please put the pump track near the skate park.

Pump track - location next to skate park would be ideal Mountain Bike Trails -Further development of trails in a GE vicinity of Foxes Lair would be great. More flow, develop some berms and obstacles. Well done.

It would have to be very high standard or unique trail to entice people out there

I have just recently been to the new pump and skate board track with my grandchildren it is very well supported and I feel would be very good for our town

We really need these in narrogin please!!!

10-20km would entice me to come to narrogin, >20km+ would entice me to come back again

There's already some good mtb trails in Narrogin so it wouldn't take much to make them next level

This a great thing for the town, it's youth but also all ages. And also enticing for others to come out and enjoy which will give NARROGIN a boost

Get them both because it would attract more people that enjoy mtb to the narrogin area

There is a BMX track I don't think it gets used much anymore. What about spending money to improve what we already have.

It can give more activity for patents with young kids and also can attract more people to town

I just want to shred!

A pump track would be an excellent investment for a range of age groups, who wish to utilise these facilities to enhance their skills. With the abundance of nature reserves, mountain bike trails would add to the development of areas such as Foxes Lair and Railway Dam. This can be another way for interconnection throughout the community with what Narrogin has to offer.
