ENVIRONMENTAL OVERVIEW

PROPOSED DEVELOPMENT OF MULTIPLE ZIPLINES IN MT COOT-THA FOREST RESERVE AND BRISBANE BOTANIC GARDENS

June 2018

This document has been prepared by:

Alan Lee 19 Theale Terrace ASHGROVE QLD 4060

 Tel:
 0413 886 050

 Email:
 alan.lee9491@gmail.com

EXECUTIVE SUMMARY

Brisbane City Council proposes development of seven ziplines on two alignments, plus an elevated suspension bridge and related facilities of car parking, offices, and other buildings within the Mt-Coottha Forest Reserve and Brisbane Botanic Gardens. Environmental parameters have been considered, and it has been determined that significant impacts to the values of the Reserve and Gardens will be caused by the proposed development.

Noise:

Areas of elevated noise up to 98 dB(A) from the activities including persons shouting on ziplines and the noise of zipline spinning wheels on cables would impact on some 305 ha, which is a significant proportion of the Forest and Gardens area. Locations of areas within the Forest impacted by elevated noise include all levels of Ecological Significance, and border the Koala Core Area.

Three areas of residential development are expected to be adversely affected by noise.

Noise impacts on wildlife:

Noise pollution affects all wildlife, but the ones that would suffer most are those that use echolocation and song for communication, for example bats, birds and frogs. Human-caused noise in natural areas has consequences for wildlife and entire ecosystems. It reduces the ability of wildlife to hear natural sounds, which can mean the difference between life and death for many animals.

All wildlife in the noise-impacted areas would be significantly impacted.

Breach of the Environmental Protection Act 1994 and Environmental Protection (Noise) Policy 2008:

Both the Queensland Act and Policy are clear that noise levels in protected areas including Parks and Gardens are an environmental value that must be protected. With the ambient noise level in the Forest Reserve and Gardens estimated to be 40-45 dB(A), and noise levels proposed to increase to 70-100 dB(A) from the proposed development, a significant deterioration of the acoustic environment would result.

The proposed ziplines and suspension bridge would be in breach of both the Act and the Policy.

Breach of heritage listings:

Two areas at Mt Coot-tha are separately listed on the Queensland Heritage Register – the Mount Coot-tha Forest and the Mount Coot-tha Lookout and Kiosk. Heritage listings for both areas are based on history, cultural heritage, aesthetic significance, social, and spiritual reasons. Listings do not include adventure tourism, and this proposed use of the Reserve and Lookout area is incompatible with both listings.

Tree clearing required:

Clearing of trees will be required in several areas of the Mt Coot-tha Forest Reserve and Botanic Gardens to create this proposed development. Firstly, the largest area of expected tree clearing will be over a distance of up to 50 metres wide in a straight line for 1.5 km down Mt Coot-tha to create the alignment for the proposed Megazip (six parallel ziplines). Secondly, trees would to be cleared at the top of the proposed Megazip to create the launch platform. Thirdly, trees would require clearing at various locations along the proposed alignment of the Tree Top Tour. Fourthly, tree clearing is expected to be required for an expansion of the existing Legacy Way car park to create the proposed administration area and additional car parking. Fifthly, clearing of ornamental trees and rainforest trees are expected to be required at the landing pad area of the proposed Megazip within the Brisbane Botanic Gardens.

The proposed tree clearing will have significant adverse impacts on environmental, wildlife, heritage, and amenity values of the areas affected.

Loss of Visual Amenity:

The proposed cleared alignment of the Megazip down the mountain is expected to be easily seen from the Central Business District and up to ten Brisbane suburbs. This will cause a significant loss of visual amenity for a large portion of the residents and visitors of the city.

Reduction of Road Safety:

The zipline proposal would create an estimated 400 additional vehicle movements per hour during peak times of operation. This traffic would be located on Sir Samul Griffith Drive (SSGD), which is a narrow, winding mountain road with minimal warning of sharp bends. It is already hazardous for motorists and cyclists due to its narrowness and the difficulty for cars to pass, especially when cyclists and cars converge in both directions.

Increased traffic would also be created on nearby feeder roads including Mt Coot-tha Road, Birdwood Terrace, Simpsons and Chiswick Roads, which are all narrow and heavily used, especially to service Stuartholme College.

The Mt Coot-tha circuit is one of Brisbane's most popular training routes for road cyclists, and the negative impact on cyclist's safety from additional traffic including trucks and buses is expected to be significant.

Impact on Aboriginal Heritage:

No consultations are known to have taken place between the Turrbal or Jagera People and Brisbane City Council regarding the proposed zipline development. This project is expected to have impacts on the protected area of Mt Coot-tha Forest Reserve is not likely to be welcomed by the Traditional Owners.

BCC documents state that the proposed Indigenous Cultural Heritage Tour and Suspension Bridge will provide "a guided indigenous experience that tells the story of indigenous life prior to colonial settlement using a 335m suspended bridge walk. It will be an engaging walking tour exploring things such as bush tucker, dreamtime paths and hunting".

No further information is currently available about how "indigenous experience" is connected with the proposed suspension bridge. These two would appear to be unrelated, and possibly incompatible if the development proposal conflicts with indigenous heritage.

Impacts on European Heritage:

Lookout and Kiosk:

The zipline development would impact on heritage values of the Lookout because of adverse levels of zipline noise, vehicular traffic, car parking, road safety, and general congestion. No remedial plans have been presented to alleviate these issues, and because of the close proximity of the surrounding forest and relatively low economic value of the proposal, no remedial plans are considered to be likely.

• Walking Trails:

Mt Coot-tha has a network of walking trails that cross its slopes, and these are popular with walkers who wish to exercise within the serenity and amenity of the natural world. Approximately 9.2 km of trails would be impacted by the zipline proposal by noise, loss of amenity and traffic congestion.

• Brisbane Botanic Gardens:

The proposed Megazip would finish near the crescent-shaped lake at the south-western extremity of the Gardens, and persons exiting the ride would then travel by bus along the internal roads of

the Gardens for approximately 1.0 km to the exit of the Gardens. These internal roads are paved pedestrian ways, although they allow minimal traffic for small maintenance vehicles as well as persons with limited mobility to view the flora.

Up to 180 persons landing per hour from the proposed Megazip in this area would require approximately 16 bus movements (22 per bus x 2 movements in and out). Pedestrians viewing the botanical displays would be disrupted by noise, traffic, reduced safety, odour, and loss of visual amenity, and the proposed use of buses on these internal roads is considered to be incompatible with the purpose and use of the Gardens.

Minor Economic Returns:

It is considered that the zipline proposal would be constructed for a cost of approximately \$5million, and would provide economic returns equivalent to a new neighbourhood shopping centre with 20-25 speciality shops. This is a minor economic return.

In addition, secondary benefits from the proposed development such as increasing the number of nights that tourists spend in Brisbane would be expected to be limited. The demographic of adventure tourism is relatively minor compared to typical national and international travellers who are the bulk of existing and future tourism market.

No "Need" Demonstrated for the Proposal:

Typical public need for any development would be demonstrated by providing accommodation for the needy, improving public health, extending life expectancy, reducing traffic, providing clean air or water, or improving the natural environment etc. No such need has been demonstrated by BCC for the zipline proposal, which would be a private development on public land.

If a "need" were identified, then open tenders at alternative locations on private land such as at Mt Sampson, Mt Mee, Clear Mountain, Closeburn, Mt Glorious, Mt Nebo, Camp Mountain, Brookfield, Mt Crosby etc should have been considered.

Ziplines Already Available

Ziplines currently exist, or are in the process of development, at Mt Tamborine, Currumbin and Victoria Point. These ziplines are located on private land.

Overall, Mt Coot-tha Forest Reserve and the Brisbane Botanic Gardens are the cornerstones of conservation and the pinnacle of floral display in Brisbane. The natural amenity of the undisturbed Forest Reserve and its panoramic views of the city from the summit attract thousands of residents and visitors each year who come for passive recreation to enjoy a natural and peaceful environment.

Brisbane is fortunate to have these unique assets underpinning its lifestyle and economy, and these special places must be respected and protected for the important contribution they make towards the cultural, historical, and environmental wealth of the city.

It is concluded from this overview of key elements that the zipline proposal is significantly noncompliant with environmental, cultural, historic and heritage values of the Mt Coot-tha Forest Reserve, the Lookout and Kiosk, and the Brisbane Botanic Gardens, as well as breaching several Local and State planning guidelines and legislation. Further, it is expected to have negative impacts on nearby residential areas through noise pollution.

For these reasons, it is considered that the development proposal is not in the best interests of the residents of Brisbane, and its support by all levels of government is not recommended.

Table of Contents

Page

				-
1	Intro	odu	uction – Proposed Project	1
2	Mt	Cod	ot-tha Forest Reserve	2
3	Incr	ea	sed Noise Levels	3
	3.1	Z	Zipline Noise	3
	3.2	Ν	loise Level of Human Voice and Spinning Wheels on Zipline Cable	3
	3.2.	.1	Noise from six ziplines – the proposed Megazip	4
	3.2.	2	Noise from one zipline – the proposed Tree Top Tour	4
	3.2.	.3	Noise from the proposed suspension bridge	4
	3.3	F	ligh Pitch of Zipline Noise	4
	3.4	L	imited Reduction of Noise by Forest Trees	4
	3.5	V	Vidth and Area of Zone Affected by Noise	5
	3.6	L	ocations of Areas Impacted by Noise	7
	3.7	F	Residential areas impacted by noise	8
	3.8	Ν	loise Impacts on Wildlife	8
	3.8.	.1	Noise Pollution Infiltrating US Protected Lands	9
	3.9	Ν	loise Impacts on Plants	9
	3.10	Ç	Queensland Legislation on Noise in Protected Areas	9
	3.10	0.1	Environmental Protection Act 1994	9
	3.10	0.2	Environmental Protection (Noise) Policy 2008	.10
	3.10	0.3	Summary of Mt Coot-tha Situation Regarding Noise Legislation	.12
4	Her	itaç	ge Values	.13
	4.1	F	leritage Listing of Mount Coot-tha	.13
5	Floi	ra a	and Fauna	.14
	5.1	Т	ree Clearing Required for Ziplines	.14
	5.2	Ir	mpact on Koala Habitat	.17
	5.2.	.1	Nature Conservation (Koala) Conservation Plan 2017	.17
6	Roa	ad ⁻	Traffic and Safety	.18
	6.1	Ir	ncreased Traffic Volumes	.18
	6.2	Ir	mpact on Cyclists and Runners	.20
	6.3	Α	Additional Hazards from Motorists with Car Parking	.22
7	Imp	act	ts on the Brisbane Botanic Gardens	.23
8	Los	s 0	f Visual Amenity	.25

9 L	LOSS	of Cultural Heritage	25
9.1	l	Impact on Aboriginal Heritage	25
9.2	2	Impact on European Heritage	26
ç	9.2.1	Impacts on Mount Coot-tha Lookout and Kiosk	26
ç	9.2.2	Impacts on Mt Coot-tha Walking Trails	27
10	Mi	nimal Economic Returns	28
11	No	o Public "Need" Demonstrated	28
11.	.1	Ziplines Already Available	29
12	Сс	onclusions	29
13	Lir	nitations	29

Environmental Overview Proposed Development of Multiple Ziplines in Mt Coot-tha Forest Reserve and Brisbane Botanic Gardens

1 Introduction – Proposed Project

Brisbane City Council (BCC) announced¹ in late 2017 that "the proposed design has been released and the tender for the design, construction, operation and maintenance of a zipline at Mt Coot-tha has been awarded to Zipline Australia." The preferred tender selected by Council comprises the following three components:

- 1. Megazip comprising six, single-stage, parallel ziplines, 1.44 km long;
- 2. Tree Top Tour comprising one, multiple-stage zipline, 1.50 km long; and
- 3. Indigenous Cultural Heritage Tour comprising one tree-top suspension bridge, 335 m long.

In total, seven ziplines are proposed plus a suspension bridge, and each of the three activities are located separately. The whole project including office facilities and car parking is proposed to be located within the Mt-Coot-tha Forest Reserve.

More detailed information on the proposed project is described in BCC's Newsletter 1, January 2018².



Figure 1: Proposed zipline development activities

¹ https://www.brisbane.qld.gov.au/facilities-recreation/parks-venues/mt-coot-tha-precinct/mt%C2%A0coot-tha-precinctprojects/mt-coot-tha-zipline

² <u>https://www.brisbane.qld.gov.au/sites/default/files/20180115 - mt_coot-tha_zipline_newsletter.pdf</u>

This Environmental Overview is not intended to be a full Environmental Impact Study (EIS), because this would be beyond the skills and resources of the author. In the current absence of an environmental analysis of the impacts of proposed ziplines and suspension bridge, this document aims to outline the likely impacts.

The following environmental parameters are considered in this document:

- Noise
- Heritage values
- Flora and fauna
- Traffic and road safety
- Visual amenity
- Cultural Heritage
- Economic environment
- Alternative locations for similar activities

2 Mt Coot-tha Forest Reserve

Mt Coot-tha Forest Reserve is an area of approximately 800 ha, and is within the boundaries of the City of Brisbane. It is almost wholly surrounded by Brisbane suburbs The Gap, Bardon, Auchenflower, Toowong, Indooroopilly, Chapel Hill, Brookfield and Upper Brookfield.

Only an estimated five percent (<40 ha) of its area is developed for roads, picnic areas, lookout etc, and the rest is in a natural, forested condition. Its location and area are shown in Figure 2 below.

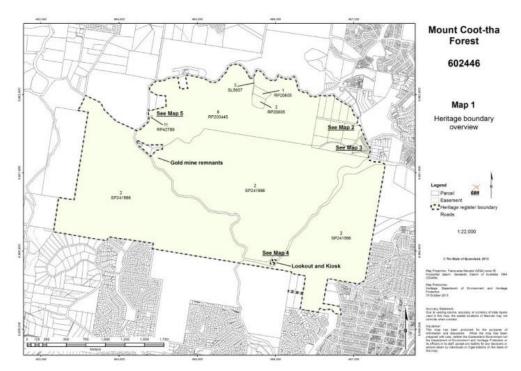


Figure 2: Mt Coot-tha Forest Reserve

The area was gazetted as *Mount Coot-tha Reserve* on the Queensland Heritage Register on 4 September 2007. It is also known on the Register as *Mount Coot-tha Forest*.

The only "Themes" described for the listing are:

- Managing flora and fauna
- Protecting and conserving the environment

Both themes relate to protection of environmental values of the Forest, and are incompatible with the development of adventure tourism such as proposed by BCC. Further information on the heritage listing of the Forest is provided in Section 4.

3 Increased Noise Levels

3.1 Zipline Noise

Ziplines are noisy activities because of the following situations:

1. Noise of spinning wheels on a zipline cable. Example in the following link:

https://www.youtube.com/watch?v=7YqyhwrNW0s;

2. Noise of a shouting human voice on a zipline. Example in the following link:

https://www.youtube.com/watch?v=SMCy8NRoWs4

The examples above show noise levels of one zipline only, not multiple ziplines as proposed at Mt Coot-tha.

3.2 Noise Level of Human Voice and Spinning Wheels on Zipline Cable

The noise level of the human voice³ at a distance of one metre is shown in the following Table 1:

Table 1: Noise from the Human Voice at One Metre

Human Voice Level (dBA)						
Normal Raised Very Loud Shouting						
60	66	72	78			

³ <u>https://www.engineeringtoolbox.com/voice-level-d_938.html</u>

3.2.1 Noise from six ziplines – the proposed Megazip

Noise levels for six adjacent ziplines as proposed for the Megazip are estimated as follows:

Noise of one human voice (shouting)	78 (from Table 1 above)
Noise of additional five human voices	10 (additional dBA)
Noise from spinning wheels on six ziplines	10 (additional dBA)
Total Noise Level	98 dBA

This is approximately the noise of a Jet take-off (at 300 metres), use of outboard motor, power lawn mower, motorcycle, farm tractor, jackhammer, garbage truck⁴.

3.2.2 Noise from one zipline – the proposed Tree Top Tour

Noise levels for one zipline such as the proposed Tree Top Tour are estimated as follows:

Noise of one human voice (shouting)	78 (from Table 1 above)
Noise from spinning wheels on one zipline	<u>5</u> (additional dBA)
Total Noise Level	83 dBA

3.2.3 Noise from the proposed suspension bridge

Noise levels for the proposed suspension bridge are estimated as follows:

Noise of one human voice (raised)	66 (from Table 1 above)
Noise from additional human voices	<u>5</u> (additional dBA)
Total Noise Level	71 dBA

3.3 High Pitch of Zipline Noise

Shouting voices and spinning wheels on zipline cables will create noise levels with an elevated pitch, or higher frequency, especially from female and/or younger riders. Elevated pitch makes the noise more disturbing to other humans and wildlife.

No allowance has been made for high pitch in the calculation of zipline noise in the following subsections, and this has been balanced by not allowing for attenuation of noise from forest trees, as described in Section 3.4 following.

3.4 Limited Reduction of Noise by Forest Trees

Trees in forests generally tend to reduce noise from human activities, however, this is not expected to be significant for the zipline proposal because of the following factors:

- 1. Many trees within and adjacent to the activities are intended to be either fully removed or significantly trimmed, and this will reduce the potential for noise attenuation;
- 2. The proposed ziplines and suspension bridge would be elevated structures close to the tops of trees for most of their lengths, and the noise generated will tend to go over the tops of trees;

⁴ <u>http://www.industrialnoisecontrol.com/comparative-noise-examples.htm</u>

- 3. The forest is mature, with trees at maximum spacing. Mid-height shrubs are either absent or sparse, especially on the ridgelines where the activities are planned. Hence, the density of the Forest and resulting potential for noise attenuation is reduced;
- 4. The Forest is susceptible to bushfires, and this would remove all trees and vegetation, and any noise attenuation from trees will be removed for months or years at a time; and
- 5. Minimal trees are located in the area of the Botanical Gardens where the Megazip is proposed to terminate.

Even though some attenuation of noise may be expected from the trees, no allowance for this attenuation has been made in this document because no allowance has been made for the elevated pitch of noise creating additional environmental harm, and these two situations will tend to balance each other out.

3.5 Width and Area of Zone Affected by Noise

For every doubling of the distance from the noise source, noise levels decrease by approximately six decibels⁵. Hence, in order to reduce the level of noise from the three proposed development activities back to the natural ambient noise level of the forest of approximately 45 dB(A), the **width** of the zones on <u>one side</u> of the activities are shown in Tables 2, 3 and 4 following.

Distance from six ziplines (metres) ¹	Noise level (dB) ²
1	98 ³
2	92
4	86
8	80
16	74
32	68
64	62
128	56
256	50
512	44

Table 2: Effect of Distance to Reduce Noise from Six Ziplines, On One Side (Megazip)

Table Notes

1

2

3

From Section 3.2.1.

Therefore, to reduce noise levels back to the natural ambient level in Mt Coot-tha Forest on <u>both sides</u> of six ziplines would require a width of 1,024 metres plus the width of the six ziplines themselves, which is estimated to be 25 metres. Therefore the **total width** of elevated noise caused by the six ziplines is estimated to be 1.05 kilometres [(512×2) + 25].

The **total length** of elevated noise from the six ziplines is the proposed length of the ziplines plus end effects at the two ends of the ziplines of 512 metres each (1.44 km + [2 x 512 m]), or 2.46 km.

Therefore the **total area** affected by noise from the six ziplines (Megazip) within the Forest Reserve and Botanic Gardens would be:

• Length of affected area (2.46 km) x Width of affected area (1.05 km) = **258 hectares**

Each number is double the one immediately above. Each number is 6 dB(A) less than the one immediately above.

⁵ <u>https://www.engineeringtoolbox.com/voice-level-d_938.html</u>

Distance from one zipline (metres) ¹	Noise level (dB) ²
1	83 ³
2	77
4	71
8	65
16	59
32	53
64	47
128	41

Table 3: Effect of Distance to Reduce Noise from One Zipline, On One Side (Tree Top Tour)

Table Notes

1 2

3

Each number is double the one immediately above. Each number is 6 dB(A) less than the one immediately above.

From Section 3.2.2.

Similarly, to reduce noise levels back to the natural ambient level in Mt Coot-tha Forest on <u>both sides</u> of one zipline would require a width of 256 metres (2 x 128 m).

The **total length** of elevated noise from the zipline is the proposed length of the zipline plus end effects at the two ends of the zipline of 128 metres each (1.5 km + [2 x 128 m]), or 1.75 km.

Therefore the **total area** affected by noise from the zipline (Tree Top Tour)) within the Forest Reserve would be:

• Length of affected area (1.75 km) x Width of affected area (256 m) = 44.8 hectares

Distance from one zipline (metres) ¹	Noise level (dB) ²
1	71 ³
2	65
4	59
8	53
16	47
32	41

Table 4: Effect of Distance to Reduce Noise from the Suspension Bridge, On One Side

Table Notes

1

2

3

Each number is double the one immediately above. Each number is 6 dB(A) less than the one immediately above. From Section 3.2.3.

Similarly, to reduce noise levels back to the natural ambient level in Mt Coot-tha Forest on <u>both sides</u> of the suspension bridge would require a width of 64 metres (2 x 32 m).

The **total length** of elevated noise from the suspension bridge is the proposed length of the bridge plus end effects at the two ends of the bridge of 32 metres each ($335 \text{ m} + [2 \times 32 \text{ m}]$), or 399 m.

Therefore the **total area** affected by noise from the suspension bridge within the Forest Reserve would be:

• Length of affected area (399 m) x Width of affected area (64 m) = 2.5 hectares

Hence, the total area affected by noise from the two separate ziplines and suspension bridge would be the addition of the above three areas (258.0 + 44.8 + 2.5) or 305.3 ha. This is a significant proportion of the areas of the Forest Reserve and Botanic Gardens, and the negative impact of noise on the Forest and Gardens would be considerable.

The size and impact of elevated noise on human activities will vary according to a range of conditions such as time of day (or night), weather conditions such as cloudiness, temperature inversions, air absorption and other atmospheric effects, ground absorption, and reflection from hard surfaces⁶ etc. Any activities of the proposed development at night time will cause additional adverse impacts and disturbance by noise for nearby residents.

3.6 Locations of Areas Impacted by Noise

Locations of areas that would be impacted by elevated noise from the three activities are shown outlined **red** in Figure 3 below. These areas are compared with the areas of Ecological Significance determined by Council within the Reserve.

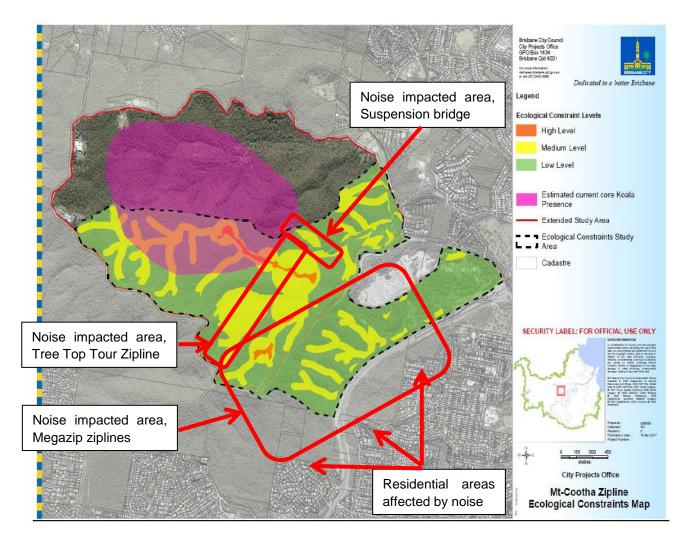


Figure 3: Locations of noise impact.

⁶ <u>https://www.ehp.qld.gov.au/licences-permits/pdf/noise-measurement-manual-em1107.pdf</u>

It is noted that the areas of noise impact includes the edge of the Koala Core Area. This is not the *whole* area where koalas live, as koalas will roam throughout the Forest, including the area of potential noise impact shown above. The impacted zone also includes areas shown with "High Level" and "Medium Level Ecological Constraints" including the areas of protected owl species described in Section 5.

Based on Council's own mapping of ecological constraints, elevated noise from the proposed activities will make significant impacts on high-value wildlife areas.

3.7 Residential areas impacted by noise

Residential areas with potential to be impacted by noise from the proposed Megazip are shown in Figure 3 to be at the eastern and southern extremities of the Megazip affected area. The largest of these affected areas is the eastern area shown in Figure 4 below.

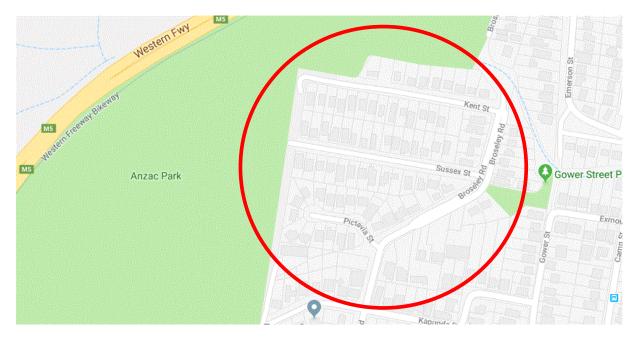


Figure 4: Eastern residential area with potential for impact from Megazip noise.

Southern residential areas with potential for impact by Megazip noise are Blackstone, Lytham, Thea, Greenhood Streets, Crag Road and (northern) Taringa Parade general areas.

Any evening or night-time activities of the development proposal would have additional potential to create impact.

3.8 Noise Impacts on Wildlife

Noise pollution affects all wildlife, and the ones that would suffer most are those that use echolocation and song for communication, for example bats, birds and frogs. Human-caused noise in natural areas has consequences for wildlife and entire ecosystems. It reduces the ability of wildlife to hear natural sounds, which can mean the difference between life and death for many animals.

Implications for wildlife are significant, particularly as the ability to hear certain sounds are vital for wildlife behaviours such as locating food, avoiding predators and finding a mate. For example, bats

rely on high frequency sonar to detect highly mobile prey, while smaller animals and even insects are among the many species that advertise their dominance and desirability using vocalisations.

Bird diversity and abundance has been shown to decline as a result of chronic noise levels produced by humans. High intensity sound induces fear, which forces species to abandon their habitat. In loud places, studies have found that some birds must sing at higher frequencies if possible, bats and owls can have trouble finding prey, terrestrial insectivores lose habitat by avoiding areas with man-made noise, and frogs can struggle to find mates.

A population's evolutionary trajectory can be altered by sapping resources normally devoted to other activities and thus lead to profound genetic and evolutionary consequences. Species that experience hearing loss and the reduction of usable habitat that noisy areas cause, which in the case of endangered species, may be part of the road to extinction.

3.8.1 Noise Pollution Infiltrating US Protected Lands

Noise pollution in protected natural areas in the United States has been recognised for some time, as described in following link:

Noise Pollution Infiltrating US Protected Lands

US Environmental legislation states that "Natural quiet is a resource and a value to be protected..."

3.9 Noise Impacts on Plants

Plants don't hear sound, but noise will still have indirect effects on plants. Human noise has ripple effects on long-lived plants and trees that can last for decades even if the sources of noise subside.

Many plants and trees rely on birds and other animals to deliver pollen from one flower or tree to the next, or to disperse their seeds, however, many birds and animals adapt to the noise by changing their behaviour or moving to quieter places. Consequently, noise pollution alters the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants will do worse in noisy areas while others may do better, depending on how the community of creatures around them changes. Ripple effects can be far reaching and long lasting, especially for trees, which often take decades to grow from seedlings into maturity.

An indirect and profound outcome from elevated noise can be encroachment of weeds to fill the vacuum that endemic species once occupied.

3.10 Queensland Legislation on Noise in Protected Areas

3.10.1 Environmental Protection Act 1994

Queensland's *Environmental Protection Act 1994* (the "Act") established a statutory basis to recognise environmental values important to the community, while the *Environmental Protection (Noise) Policy 2008* identified the acoustic features of environments to be enhanced or protected.

Section 8 of the Act states that the Environment includes -

- (a) ecosystems and their constituent parts, including people and communities; and
- (b) all natural and physical resources; and
- (c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
- (d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

Section 9 of the Act states that an Environmental value is -

- (a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- (b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

Section 12 in Subdivision 2 of the Act (Environmental Contamination) states that -

Noise includes vibration of any frequency, whether emitted through air or another medium.

Section 14 in Subdivision 3 (Environmental Harm and Nuisance) states that -

- (1) Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.
- (2) Environmental harm may be caused by an activity—

(a) whether the harm is a direct or indirect result of the activity; or

(b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

3.10.2 Environmental Protection (Noise) Policy 2008

The 2008 *Environmental Protection (Noise) Policy* (the "Policy") established a range of "acoustic quality objectives" based on WHO criteria. These are "maximum" sound levels that should be experienced in the acoustic environment of an area or place, and are soundscape values that define measures of "Quiet" to "Loud". Environmental values to be enhanced or protected under the policy are the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems as well as other human-based needs for reduced noise such as sleep and study.

The Policy reiterates requirements of the Act by stating in **Section 7 of Part 3** (Environmental values and acoustic quality objectives) -

Section 7 of Part 3 Environmental values for the acoustic environment

The environmental values to be enhanced or protected under this policy are-

(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems

Section 8 of the Policy states that -

Acoustic quality objectives for sensitive receptors

(1) An acoustic quality objective stated in schedule 1, column 3 for a sensitive receptor stated in column 1 and for a time of day stated in column 2, is prescribed for enhancing or protecting the environmental value stated in column 4 of the schedule for the objective.

Acoustic quality objectives stated in the Policy are provided in Table 5.

Table 5: Schedule 1 of the Policy (Acoustic quality objectives)

Column 1	Column 2	Column 3	Column 4
Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)	Environmental value
protected area, or an area identified under a conservation plan under the Nature Conservation Act 1992 as a critical habitat or an area of major interest	anytime	the level of noise that preserves the amenity of the existing area or place	health and biodiversity of ecosystems
park or garden that is open to the public (whether or not on payment of an amount) for use other than for sport or organised entertainment	anytime	the level of noise that preserves the amenity of the existing park or garden	community amenity

The Policy does not provide a quantitative objective (dBA) that must be maintained in protected areas such as Mt Coot-tha Forest Reserve and Botanic Gardens, but instead states that the level of noise must preserve the amenity of the existing area or place.

"Amenity" in relation to noise levels has historically been described more in terms of human situation rather than for the environment. Intrusive noise and/or annoyance can be defined in terms of impact, referenced to before, during and after some identified noise event.

"Intrusive noise, to an individual, is a sound whose character (such as audibility, dissonance, duration, loudness, tonality, pitch or timbre) is perceived adversely compared to the character of the environment in the absence of that sound."

Wellbeing and amenity can therefore be qualified and quantified in terms of "quiet" and "noise":

- No adverse effect, pleasurable sounds or peace and tranquillity; quietness
- Minor adverse effect, minor irritation; minor intrusion of noise on occasion external to the home, no modulation or distinctive tonality
- Adverse effects more than minor; intrusive noise audible on occasion within the home, no modulation or distinctive tonality
- Nuisance adverse effect; intrusive noise heard within or exterior to the home on a regular or definable basis, modulation or distinctive tonality may be present; causing anger, annoyance, or adverse health reactions including sleep disturbance
- Significant adverse effect; irrespective of sound character causing annoyance or anger and or adverse health reactions including sleep disturbance.

The Queensland Policy demonstrates that environmental qualities affecting both human and ecosystem (biodiversity) health can be defined in an effective and practical manner in different legislative frameworks relating to amenity.

Explanatory Notes to the Policy state:

"It is not intended that, as part of achieving the acoustic quality objectives, any part of the existing acoustic environment be allowed to deteriorate (p. 9)"

"The acoustic quality objectives are to inform the decision making process including any conditions relating to noise levels in relation to the decision. The objectives assist in identifying whether the environmental values are protected (p. 10)"

3.10.3 Summary of Mt Coot-tha Situation Regarding Noise Legislation

Both the Queensland Act and Policy are clear that noise levels in various situations are an environmental value that must be protected. Further, the environmental value of protected areas is the health and biodiversity of ecosystems (Column 4), and the acoustic quality objective is the amenity of the existing area (Column 3).

Current noise levels in the Forest Reserve and Botanic Gardens are only background except immediately beside the roads and tracks. With the background noise level in the Forest and Gardens estimated at 40-45 dB(A), and with noise levels proposed to increase to an estimated 70-100 dB(A), a significant deterioration of amenity of the acoustic environment would be caused.

Noise generated from the proposed ziplines and suspension bridge would be significantly in breach of relevant sections of both the Queensland *Environmental Protection Act 1994* and the *Environmental Protection (Noise) Policy 2008*.

4 Heritage Values

4.1 Heritage Listing of Mount Coot-tha

Two areas at Mt Coot-tha are separately listed on the Queensland Heritage Register, as described following.

Mount Coot-tha Forest was listed on the Queensland Heritage Register on 4 September 2007 having satisfied the following criteria:

- The place is important in demonstrating the evolution or pattern of Queensland's history.
- The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage.
- The place has potential to yield information that will contribute to an understanding of Queensland's history.
- The place is important because of its aesthetic significance.
- The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
- The place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

Mount Coot-tha Lookout and Kiosk was listed on the Queensland Heritage Register on 13 January 1995 having satisfied the following criteria:

- The place is important in demonstrating the evolution or pattern of Queensland's history.
- The place is important in demonstrating the principal characteristics of a particular class of cultural places.

Overall, the heritage listings for both areas are based on history, cultural heritage, aesthetic significance, social, and spiritual reasons. Listings are not based on adventure tourism, and this proposed use of the Reserve and Lookout is incompatible with both listings.

5 Flora and Fauna

It is beyond the scope and resources of this overview document to describe the flora and fauna of the Mt Coo-tha Forest Reserve in any detail. Local residents know that the area is still in its natural condition, and other than the TV stations, basic development comprises the ring road, lookout, and few picnic areas.

Mount Coot-tha Forest provides an important natural habitat for plants and animals. Approximately 450 vertebrate fauna and 800 native plant species occur in Mt Coot-tha Forest, including a number of rare and threatened species.

Vegetation of Mount Coot-tha is mainly dry eucalypt forest including Spotted gum (*Corymbia varigata*), Grey gum (*Eucalyptus propinqua*), Forest red gum (*Eucalyptus tereticornis*) and Narrow-leafed ironbark (*Eucalyptus crebra*).

Various species of acacias, including Brisbane Golden Wattle (*Acacia fimbriata*) and Broadleaf Wattle (*Acacia implexa*) are predominant in the understorey shrubs, along with grass trees *Xanthorrhoea* species. Native grasses, primarily Kangaroo grass (*Themeda triandra*) and Blady grass (*Imperata cylindrica*) make up the minimal ground cover.



The topography of Mt Coot-tha provides a variety of habitats for many species of fauna, including koalas. Three rare species of owl - Powerful owl (*Ninox strenua*), Masked owl (*Tyto novaehollandiae*) and Sooty owl (*Tyto tenebricosa*) are found there.

Other fauna common for the area are goshawks, kites and eagles, wrens, robins and other small forest birds, gliders, possums and bats.

5.1 Tree Clearing Required for Ziplines

Tree clearing will be required to create access for the ziplines. The single-stage zipline Tree Top Tour may be able to wind through narrow corridors between trees, however, the estimated 50m wide Megazip corridor would require clearing of the alignment.

Some of the clearing can be estimated from the "before" and "after" situations of the proposal at the Megazip takeoff and landing locations, as indicated in Figures 5, 6, 7 and 8.

Current Situation



Figure 5: Current situation at Megazip take-off location.



Proposed tree clearing

Figure 6: Tree clearing at Megazip take-off location.

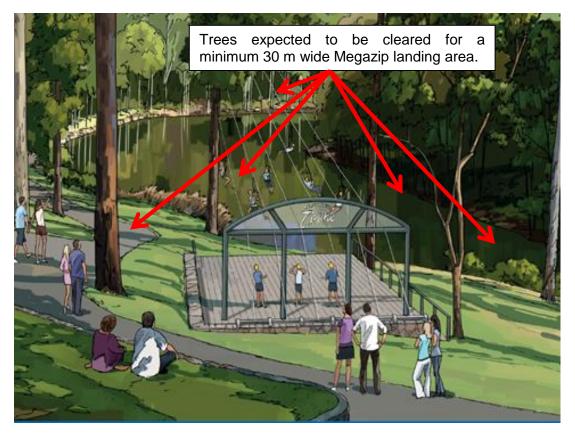


Figure 7: Tree clearing expected to be required in the Botanic Gardens for Megazip landing.



Figure 8: Rainforest trees at the western end of the lake in the Botanic Gardens expected to be cleared for Megazip pre-landing zone.

5.2 Impact on Koala Habitat

Koalas are known to live in the Mt Coot-tha Forest Reserve, and the "core" koala area is shown coloured pink in Figure 3 in this document (reference Brisbane City Council). Please note that this is only a "core" area, and that koalas will roam throughout the Forest.

Koalas in the wild face a series of threats to their continued survival, and the main threat is loss of habitat. From 2009 to 2014, about 10,000 koalas were admitted to four emergency shelters in southeast Queensland, out of an estimated local population of fewer than 20,000 animals. Injuries were mainly caused by dog attacks and car strikes. Of those admitted for treatment, rehabilitation was largely unsuccessful, as only two per cent of koalas admitted for fractures from car strikes were rehabilitated and released. The rest died or had to be put down.

Research by many authorities agree that Koala numbers are in decline. They are listed as Vulnerable in Queensland, NSW and the ACT under the Commonwealth Environment Protection and Biodiversity Conservation Act. They also are listed as Vulnerable on the International Union for the Conservation of Nature's Red List of Threatened Species.

Noise levels up to 100 dBA would occur from the proposed development, and this is more than double the natural background level in the forest of 40-45 dBA. It is clear that this development would have significant negative impacts on the habitat of koalas, as well as all other species of wildlife in the Reserve area.

5.2.1 Nature Conservation (Koala) Conservation Plan 2017

The Queensland Nature Conservation (Koala) Conservation Plan 2017 states in Section 4(1) that:

The main purposes of this plan are ----

- (a) to promote the continued existence of viable koala populations in the wild; and
- (b) to prevent the decline of koala habitats.

The whole of the local government area of Brisbane (including the Mt Coot-tha area) is in Koala District A, as described in the Plan.

As koalas are known to be present throughout the Mt Coot-tha Forest Reserve, the zipline proposal is considered to be non-compliant with the Conservation Plan.

6 Road Traffic and Safety

Only one road, Sir Samuel Griffith Drive (SSGD) circles the mountain and would service all traffic for the zipline proposal. Brisbane City Council conducted an *Operation Review*⁷ of SSGD in 2007, and the following points were made in the Situation Analysis:

"The road (SSGD) is a steep, narrow and mountainous two-way, two-lane road, without separate cycling and pedestrian pathways. These pathways have not been provided due to the difficulty and impact to the bushland of constructing these.

Use of the road shoulder by cyclists and pedestrians is not viable, due to its uneven, rocky and often narrow nature. Instead, these users must mix with traffic on the roadway, presenting a potential safety risk.

If the road were a regular, slow-paced tourist drive this may not present a problem, but it also provides the sole access to a number of community services and facilities generating frequent vehicle trips, including: Channel 7, 9 and 10 television studios, Mt Coot-tha lookout which attracts regular tour bus operations, Stuartholme College, and various reserves and walking tracks.

The road has become a popular training route for serious cyclists over recent years, due to its steep, challenging nature. Groups of cyclists often monopolise a single lane and travel slowly up the steeper sections, causing motorist frustration. Even with one cyclist using the road, the narrow vehicle lanes mean motorists are forced to cross the centre line to overtake, often when visibility of oncoming traffic is limited."

Only minimal progress has been made since 2007 on alleviating these issues, with widening of a few bends so that runners or walkers can get off the main carriageway. These widenings are not suitable for cyclists or vehicles.

Some of the dangers of the road system are shown in Photos 1-4 following.

6.1 Increased Traffic Volumes

No information has been provided by BCC on increased traffic volumes from the proposed activities, however, when the activities would be operating at the maximum rate, the following additional people and traffic have been estimated:

Megazip	180 people per hour (6 ziplines x 30 persons – one person/zipline/2 minutes)
Tree Top Tour	30 per hour (one person/2 minutes)
Suspension bridge	500 people per hour (9 persons / minute)
TOTAL	710 people per hour

Therefore, at times of peak demand, the additional road traffic, *ie* above the current traffic volume, is estimated to be as shown in Table 6:

⁷ https://www.pria.com.au/documents/item/4440

Section of SSGD	Additional buses per hour	Additional cars per hour	Additional motor cyclists per hour	TOTAL ADDITIONAL PER HOUR
Northern	2	50	5	57
SSGD	(40 people per	(two people per	(one person per	
	bus)	car)	m.c.)	
Southern	6	135	10	151
SSGD	(40 people per	(two people per	(one person per	
	bus)	car)	m.c.)	
			TOTAL	208

Table 6: Estimated Additional Vehicles from Ziplines

The expected additional 208 vehicles required is doubled to approximately 400 vehicle movements per hour because each vehicle is required to move twice, both in and out of the area.

Overall, more than 200 additional vehicles per hour would accumulate at the top of Mt Coot-tha. This is expected to be 4-5 times the current rate during peak time, and will cause traffic congestion and reduced road safety on the mountain.

Increased traffic would also be created on nearby feeder roads including Mt Coot-tha Road, Birdwood Terrace, Simpsons and Chiswick Roads, which are all narrow and heavily used, especially to service Stuartholme College.



Figure 9: Sir Samuel Griffith Drive on the southern side.

6.2 Impact on Cyclists and Runners

The Mt Coot-tha circuit is unique for an Australian capital city and has become popular as a training route for road cyclists and runners. The circuit offers advantages of an aerobic hill climb, good asphalt surface, little vehicular traffic, shaded roads during hot weather, a pleasant natural environment, and a coffee shop in the middle.

Cycling is one of the fasting growing sports and forms of exercise in the world, and scores of cyclists use the narrow, winding SSGD for exercise and training every day and especially on weekend mornings.

Bicycle Queensland has cycling events up the mountain, including the "<u>Coot-tha Challenge</u>", which is a timed ride up the northern part of SSGD as part of the Great Brisbane Bike Ride. This section of the road is closed to all other traffic at the time. Some members of the Japanese national cycling team trained around SSGD in February 2018.

Despite its advantages, SSGD is hazardous for cyclists due to its narrowness and the difficulty for cars to pass. This is especially the case when cyclists and cars pass head-on, as the road is not wide enough for safe passing.

As the most vulnerable and numerous users of SSGD, cyclists will be at the greatest risk from increase in traffic volume from the proposed development.



Photo 1: Typical passing of a cyclist throughout the length of SSGD.



Photo 2: A cyclist coming at speed downhill at the point of crossing for the proposed "arrival centre" car park. Forward vision of this intersection is minimal.



Photo 3: Cyclist coming down SSGD from the Lookout (see Photo 4).



Photo 4: Same location as Photo 3, about 30 seconds later.

6.3 Additional Hazards from Motorists with Car Parking

Car parking at the Lookout is already at full capacity at premium times of the week such as weekends when demand from the zipline activities would also peak. This will create vehicle congestion around the lookout area with resulting traffic chaos.

7 Impacts on the Brisbane Botanic Gardens

The Megazip is proposed to finish near the crescent-shaped lake at the south-western extremity of the Brisbane Botanic Gardens, and persons exiting this ride would then travel by bus approximately 1.0 km along internal roads of the Gardens, assuming that this route did not include any roads through the adjoining quarry. If the Megazip exit is partly through the quarry, then the exit route will still comprise approximately 500 metres along the Gardens' internal roads, and then 500 m through the quarry.

Internal roads of the Gardens are essentially paved pedestrian ways, although they allow minimal traffic for maintenance vehicles as well as persons with limited mobility to view the flora.

Up to 180 persons per hour would be landing from the proposed Megazip in the Gardens, and approximately 16 bus movements per hour (22 persons per bus x 2 movements in and out) would be required to take them away. With a bus service required every 6-7 minutes at the Megazip landing, bus movements would be every 3-4 minutes in the two-way sections of road in the Gardens, and every 6-7 minutes in the single-lane sections of road.

The total area of the Gardens would be affected because the full extent of the one-way circuit of internal roads would be required for the buses.

Pedestrians viewing the botanical displays would be significantly disrupted by noise, traffic, reduced safety, odour, and loss of visual amenity, and the proposed use of buses on these internal roads is considered to be incompatible with the purpose and use of the Gardens.

Overall, impact of the proposed development on the Brisbane Botanic Gardens is considered to be negative.



Figure 10: Proposed bus route would be along all roads within the Gardens from Megazip landing area near the lake.



Photo 5: Narrow (4 metre wide) internal roads of the Gardens proposed for buses 2 - 3 m wide traversing every 3-4 minutes in the double-lane sections of road.



Photo 6: Visitors to the Gardens will be negatively affected by buses on these internal roads.

8 Loss of Visual Amenity

The Megazip would be some 25 metres in width, and would be located on the southern side of Mt Coot-tha in full view of the Central Business District and at least 10 suburbs of the city. Trees will be either fully cleared or significantly trimmed for the alignment, leaving behind only minimal vegetation.

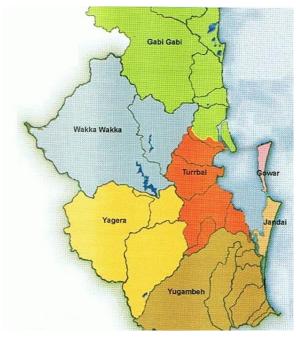
The Megazip would be easily seen from a distance, and will cause a significant loss of visual amenity for many residents and visitors of the city.

9 Loss of Cultural Heritage

9.1 Impact on Aboriginal Heritage

The name Mt Coot-tha comes from the Aboriginal "ku-ta", meaning a place of honey.

The earliest historical records of Tom Petrie, the founding family of modern-day Brisbane, suggest that prior to European settlement in Brisbane in 1825, the Turrbal people occupied the area of land extending from the coast of Moreton Bay inland to Gold Creek or Moggill, as far north as North Pine, and south to the Logan River (area shown red in the figure below).



The dense inhabitation of indigenous people was one of the reasons that attracted the early settlers to 'Meeaan-jin' (Turrbal name for Brisbane) following their initial abortive settlement at Humpybong (Redcliffe) in 1824.

A study of cultural heritage was carried out as part of the Environmental Impact Study for the Northern Link road works (Legacy Way) in 2008⁸. Part of the study area included the Mt Coot-tha Forest Reserve.

Whilst the Legacy Way project is different from the current zipline project, the Turrbal People were commissioned by Brisbane City Council to provide a cultural heritage report of the Northern Link Study Area (Turrbal 2008:6). Turrbal identified a number of places within the Study Area to be of cultural significance, namely Mt Coot-tha – identified as a

Dreaming site of the Turrbal People, associated with the honey-bee dreaming.

Turrbal also identified that an important Aboriginal pathway existed between Mt Coot-tha and Roma Street. Coronation Drive and Milton Road follow part of the route of this pathway (Turrbal 2008:56).

⁸

http://eisdocs.dsdip.qld.gov.au/Legacy%20Way%20Project%20(Gazetted%20as%20Northern%20Link%20Road%20Tunnel)/EIS/Volume%201%20-%20EIS/12-cultural-heritage.pdf

Aboriginal cultural heritage places were identified during this research, specifically Mount Coot-tha and Toowong Scrub was a major resource area and from which human bones and artefacts are known to have been collected.

The Turrbal report makes the following recommendations in relation to the "cultural and spiritual significance of the project route to the Turrbal people:"

• That the Brisbane City Council as the project proponent, opens discussions and negotiations with Turrbal representatives regarding native title matters, as the proposed project constitutes a future act within the meaning and definition of the Native Title Act 1993.

As a minimum, no consultations are known to have occurred between the Turrbal or Jagera People and Brisbane City Council regarding the proposed zipline development. The previous Legacy Way project had only minimal impact on Mt Coot-tha Forest Reserve, however, the current project with major impacts from ziplines on the protected area of Mt Coot-tha Forest Reserve is likely to be less amicably received by Traditional Owners.

BCC documents for the zipline proposal state that the proposed Indigenous Cultural Heritage Tour and Suspension Bridge will provide "a guided indigenous experience that tells the story of indigenous life prior to colonial settlement using a 335m suspended bridge walk. It will be an engaging walking tour exploring things such as bush tucker, dreamtime paths and hunting".

However, no detailed information has been provided by BCC about how the "indigenous experience" relates to the proposed suspension bridge. These two may be incompatible if the development proposal conflicts with indigenous heritage. This "experience" could be provided without a suspension bridge, and information on *bush tucker, dreamtime paths and hunting* would arguably be more meaningful if it was provided at ground level where examples would be available.

9.2 Impact on European Heritage

Cultural heritage focuses on aspects of the past which people value and which are important in identifying who we are. Cultural heritage incorporates places, objects, artefacts, documents, beliefs, skills and practices.

Three special places of significant heritage value that would be impacted by the zipline proposal are:

- 1. Mt Coot-tha Lookout and Kiosk;
- 2. Walking trails; and
- 3. Brisbane Botanic Gardens, Toowong.

Each of these are discussed in the following sub-sections.

9.2.1 Impacts on Mount Coot-tha Lookout and Kiosk

Extensive documentation is available about the unique value of the Mt Coot-tha Lookout and Kiosk to the people of Brisbane. The Lookout has been a vantage spot for the quiet enjoyment of the panorama of the city and surrounding bushland of the Forest Reserve ever since European settlement.

The zipline development would impact on heritage values of the Lookout because of adverse levels of zipline noise, vehicular traffic, car parking, road safety, and general congestion. No remedial plans

have been presented to alleviate any of these issues, and because of the close proximity of the surrounding forest, any remedial plans would be problematic.

9.2.2 Impacts on Mt Coot-tha Walking Trails

Mr Coot-tha has a network of trails that cross its slopes, and these are popular with walkers who exercise within the serenity and amenity of the natural world. Trails that would be impacted by the zipline proposal are as follows. (Numbers relate to the BCC pamphlet Mt Coo-tha Forest Track Map).

No. 37: Frogmouth Trail (1.5 km) No. 55: Lace monitor Track (400 m) No. 56: Aboriginal Art Trail (925 m) No. 57: Hovea Track (300 m) No. 58: Summit Track (1.9 km) No. 64: Pinnacle Trail (1.5 km) No. 65: Citridora Trail (2.7 km)

In total, 9.2 km of walking trails would be adversely impacted by the ziplines by noise and visual amenity.

10 Minimal Economic Returns

Ziplines comprise adventure tourism that requires a degree of fitness, good health and youthful exuberance. However, their appeal to a broader demographic and economic benefit is limited, for the reasons shown in Table 7 below.

Table 7:	Economic	characteristics of z	iplines
----------	----------	----------------------	---------

No.	Characteristics	Zipline
1	Demographic appeal	Appeals to young thrill seekers.
2	Use by disabled persons	Limited to nil.
3	Cultural appeal	Limited, if any, appeal to Chinese / Asian / Indian cultures who will provide the bulk of international tourism now and in the future.
4	Tourism promotion	Will not be attractive to middle-aged or older persons including Baby Boomers who comprise a major portion of Australian tourists to Brisbane.
5	Attraction for local residents	Limited attraction for residents of certain ages in Brisbane.
6	Potential to improve the Lookout buildings and facilities	No plans or capacity to improve the Lookout.
7	Potential to create an additional tourism experience elsewhere beyond the primary experience.	No potential.
8	Job creation during construction	Estimated 20-40 persons for six months.
9	Job creation during operation	Estimated 25 new jobs.

Overall, it is considered that the zipline proposal would comprise an approximate \$5milion development that would provide similar economic returns to a new neighbourhood shopping centre with 20-25 speciality shops. This economic return would not cover the losses of its negative impacts on cultural, historic and environmental values etc.

In addition, secondary benefits from the proposed development such as increasing the number of nights that tourists spend in Brisbane would be expected to be limited. The demographic of adventure tourism is relatively minor compared to typical national and international travellers where the bulk of the existing and future tourism market exists.

11 No Public "Need" Demonstrated

Public need for a development proposal could be demonstrated by such factors as reducing traffic, providing accommodation for the homeless, improving health or life expectancy, providing clean air or water, improving the natural environment etc. No such public need has been demonstrated by BCC for the zipline proposal, which would be a wholly private development.

Also no open tenders for alternative locations for proposed ziplines were called by BCC such as on private land at Mt Sampson, Mt Mee, Clear Mountain, Closeburn, Mt Glorious, Mt Nebo, Camp Mountain, Brookfield, Mt Crosby etc.

11.1 Ziplines Already Available

Ziplines currently exist, or are in the process of development, at Mt Tamborine, Currumbin and Victoria Point. These ziplines are located on privately owned land.

12Conclusions

Mt Coot-tha Forest Reserve and the Brisbane Botanic Gardens are the cornerstones of conservation and the pinnacle of floral display in Brisbane. The natural amenity of the undisturbed Forest Reserve and its panoramic views of the city from the summit attract thousands of residents and visitors each year who come for passive recreation and enjoy a natural and peaceful environment.

Brisbane is fortunate to have these unique assets underpinning its lifestyle and economy, and these special places must be respected and protected for the important contribution they make towards the cultural, historical, and environmental wealth of the city.

It is concluded from this overview of key elements that the zipline proposal is significantly noncompliant with environmental, cultural and historic values of the Mt Coot-tha Forest Reserve, the Lookout and Kiosk, and the Brisbane Botanic Gardens, as well as breaching several Local and State planning guidelines and legislation. Further, it is expected to have negative impacts on nearby residential areas through noise pollution.

For these reasons, it is considered that the development proposal is not in the best interests of the residents of Brisbane, and its support by all levels of government is not recommended.

13Limitations

This document is intended as private study to provide preliminary information to assist understanding of the nature and implications of the development proposal. It is not intended to be a full environmental impact assessment, which would be beyond the skills and resources of the author.

Most information in the document was available from public sources at the time of preparation, however, the development proposal may change over time such as new activities, different locations of activities, or different intensities of activities, and any changes would require new consideration of their impacts.

Users of this document should do so only at their own risk and liability. The document should not be used for any legal proceedings without the consent of the author.