

Before an Independent Hearing Commissioner at Hurunui District Council

under: the Resource Management Act 1991

in the matter of: application RC210098 for land use consent to install
and operate a Gravity-Based Recreation Activity within
the Conical Hill Reserve, Hanmer Springs

between: **Hanmer Springs Thermal Pools & Spa**
Applicant

and: **Hurunui District Council**
Consent Authority

Statement of Evidence of Graeme Abbot

Dated: 23 September 2021

REFERENCE: J M Appleyard (Jo.Appleyard@chapmantripp.com)

Chapman Tripp
T: +64 3 353 4130
F: +64 3 365 4587

60 Cashel Street
PO Box 2510, Christchurch 8140
New Zealand

www.chapmantripp.com
Auckland, Wellington,
Christchurch



STATEMENT OF EVIDENCE OF GRAEME ABBOT

INTRODUCTION

- 1 My full name is Graeme David Abbot.
- 2 I hold the position of General Manager of Hanmer Springs Thermal Pools & Spa (*HSTPS*), a position I have held for over 21 years. Additionally I hold the role of Product Development Manager for Hurunui Tourism.
- 3 Previously I held the position of Sponsorship Manager of Canterbury of New Zealand, and before that I held several managerial positions, including General Manager of LWR Underwear Ltd.
- 4 I have strong interests in the Hanmer Springs community. I am active in the Hanmer Springs Business Association, Hanmer Springs Conservation Trust, and the Hanmer Springs Medical Centre as well as trustee of the Hanmer Springs Community Trust. In 2016 I was awarded the Tourism Industry Champion Award at the New Zealand Tourism Awards.
- 5 My position as General Manager involves setting the long and short term goals and objectives for the business and putting the structure in place to deliver those. This includes appointing and managing a management team, and ensuring the organisation has the health and safety plans in place to ensure staff and customer wellbeing. Ensuring that we provide an excellent experience for our customers and that our staff are trained, motivated and enjoy their roles and are well provided for are key aspects of my role. I am also responsible for preparing a long term sustainable plan for the organisation and providing a commercial return for our shareholder, the Hurunui District Council.
- 6 In my tenure here at HSTPS I have overseen a substantial amount of development work. The most recent being the development of the \$4million cascade pools and conical thrill ride. These projects have sat on top of the day to day running of the complex. As an organisation we have developed considerable skill and expertise in developing and building new attractions.
- 7 I am familiar with HSTPS's application to install and operate a Gravity-Based Recreation Activity (*Flyride Proposal*) within the Conical Hill Reserve, Hanmer Springs (*Site*). I have a good understanding of the background to, and development of, the Flyride Proposal. I am authorised by HSTPS to give evidence on its behalf.

SCOPE OF EVIDENCE

- 8 My evidence provides the following:
- 8.1 an overview of HSTPS;
 - 8.2 an outline of HSTPS's contribution to the Hurunui District;
 - 8.3 a discussion of the background to, and development of, the Proposal;
 - 8.4 a summary of our vision; and
 - 8.5 a description of the operational and design requirements of the Proposal.

OVERVIEW OF HSTPS

- 9 HSTPS has developed over the years a unique identity and reputation as a high quality tourist destination. As a result HSTPS continues to operate, employing a number of people resident in the Hanmer Springs area and ensuring that the Hanmer Springs area as a whole is promoted.
- 10 The first bathhouse opened in Hanmer Springs in 1883. It was one of three official government owned thermal spa tourism facilities in the late 19th century. The other two facilities were the Whakarewarewa Thermal Village in Rotorua and the thermal pools at Te Aroha.
- 11 The complex is operated as a separate business unit of the Hurunui District Council under the name of the Hanmer Springs Thermal Pools and Spa. Profits from HSTPS not reinvested in the operation are returned to the Hurunui District Council and invested in the physical reserves of the wider Hurunui District.
- 12 The longer term management of the reserve has been delegated from the Council to the Hanmer Springs Thermal Pools & Spa Management Committee. The Committee is responsible for administering the reserve under the provisions of the Reserves Act 1977 and in accordance with the Hanmer Springs Thermal Pools Reserve Management Plan. The Hanmer Springs Community Board also contributes assistance in the form of local concern input. The day-to-day operations of the pools is undertaken by staff overseen by myself.
- 13 HSTPS has become an internationally recognised thermal spa complex. It has won numerous tourism and visitor attraction awards over the years, both nationally and internationally. In July of this year HSTPS was announced as a finalist in the 100% Pure New

Zealand Experience Awards 2021. The awards celebrate those who “demonstrate commitment towards their people, community and place through their actions”.

HSTPS’S CONTRIBUTION TO THE HURUNUI DISTRICT

- 14 HSTPS represents a significant resource for both the Hanmer Springs area and the Hurunui District as a whole. It is critical to the community, being the largest employer. HSTPS employs over 100 staff throughout the complex. This normally peaks in the busy summer months, particularly in January. Many other jobs in Hanmer Springs would not exist without the visitors drawn to the area by the thermal pools complex.
- 15 A number of businesses in Hanmer Springs rely on visitors that come for the Thermal Pools. It is conservatively estimated that HSTPS contributes in excess of \$5million directly to the local economy each year through wages and operational expenditure.
- 16 Our focus in recent years has been on building stability and a strong base for the community to drive innovation and growth in the district, while continuing to recover from the November 2016 earthquake. It had been predicted that 2019-2000 would be a record year in both patronage and profitability, benefitting the entire Hurunui District.
- 17 That changed suddenly in March 2020, with the unprecedented events arising from the COVID-19 pandemic. The country being placed into lockdown for an extended period from the end of March had an immediate effect on the performance of HSTPS. The complex was closed from 22 March 2020 until 25 May 2020. And even then, it was open with severe restrictions until the country when back into Alert Level 1 on 9 June 2020.
- 18 HSTPS pays the Hurunui District Council a \$2million dividend each year. Due to the effects of being unable to trade during the COVID-19 lockdown period last year this was not achieved in FY 2020. However, due to stronger than expected trading in FY 2021 the dividend was able to be paid. In fact, this year we have made a record profit.
- 19 Over 500,000 people visit the HSTPS complex per year. Before COVID-19, about 15-20 per cent of these were international visitors. These have largely been replaced by domestic visitors in the 2020-2021 year.
- 20 Every year HSTPS hosts a large number of schools at the Thermal Pools. Prior to COVID-19, we had 14,000 students at schools around Canterbury visiting the Pools per year. About 10,000 were primary school students.

- 21 HSTPS is proud to sponsor Mainland Football, Mainland Netball, and Wellbeing North Canterbury. It also supports any of the larger events in the village. This includes but is not limited to:
- 21.1 The Hanmer Springs Fete;
 - 21.2 The North Canterbury wine and food festival Bandquet,
 - 21.3 The music festival which started this year;
 - 21.4 Hosting Canterbury Rugby;
 - 21.5 The Hurunui Garden Festival; and
- 22 Various adventure race events. In the new COVID-19 landscape it is critical for tourism destinations such as Hanmer Springs to expand and improve their activity offering in order to remain competitive in the new domestic tourism landscape.

BACKGROUND TO, AND DEVELOPMENT OF, THE PROPOSAL

Funding and initial design

- 23 HSTPS applied for funding from the Provincial Growth Fund (*PGF*) in mid-2019. The application was made with a view to grow the range of attractions in Hanmer Springs. This would attract new visitors into the village as well as increase the length of time that visitors stay.
- 24 With the launch of Conical Thrill (New Zealand's largest aquatic thrill ride) and the new Cascade Pools in 2019 we have shown that a new development attracts growth in visitor numbers. Until the COVID-19 pandemic hit, HSTPS experienced a 10 per cent growth in the regular number of visitors. Yield per customer also grew from \$15 NZD to almost \$19 NZD – a nearly 27% increase.
- 25 In August 2020 Hurunui District Council was granted \$2.2 million (excluding GST) from the PGF to construct a downhill amusement ride on Conical Hill in Hanmer Springs. The Council agreed that it was a project worth pursuing and that HSTPS should progress the project through to construction, with a future decision to be made on the operation of the ride. HSTPS has experience in both operating a world-class tourist attraction, and in administering a reserve in accordance with a Reserve Management Plan.
- 26 The original PGF application proposed a flying-fox type ride coming down the south face of Conical Hill. This meant it would interact with the existing walking track. Following a series of public consultation meetings (which are discussed in more detail below), the proposed course was changed so that the ride would come down the unused western side of Conical Hill.

Ride procurement

- 27 A competitive procurement process began shortly after the government announced the funding. Cequent, a New Zealand project management consultancy, was appointed to manage the procurement process and subsequent project development.
- 28 Christchurch-based Holmes Solutions was ultimately selected as the preferred provider to design, supply and install the ride. Holmes Solutions had previously developed its Switchback™ technology for a downhill ride at Lumberjack Feud Park in Pigeon Forge, Tennessee.
- 29 Key reasons for choosing Holmes Solutions were that:
- 29.1 it had the best and most unique ride product;
 - 29.2 it had the best design philosophy of working in tune with the natural environment;
 - 29.3 it is a local business. This keeps the investment within New Zealand and supports New Zealanders in these challenging COVID-19 times;
 - 29.4 keeping the supplier local means the chance of needing to import parts for the ride is reduced. Importation of parts is risky as ports and shipping times have been under considerable pressure due to COVID-19; and
 - 29.5 being Christchurch based it is close to the development. This means any issues on the project are able to be dealt with quickly.
- 30 Switchback™ is the perfect union of a zipline and rollercoaster. The combination of cable and rail allows Holmes Solutions' Switchback™ to transition from a wire onto a metal track to travel around corners, and take varying pathways – including through tree canopies, making it ideal for Conical Hill.

Concept and detailed design phase

- 31 Following selection of Holmes Solutions, a design team was assembled and concept design completed by the end of 2020.
- 32 The initial resource consent application was made in February 2021. The team continued to work on the detailed design for the project and in June 2021 an amended application was made. This was largely because more trees needed to be removed than what was provided for in the initial application, and slightly taller support towers were required to ensure rider clearance above ground. Some changes to the start and stop stations were also made.

Wildlife Act 1953 Authority

- 33 HSTPS have experience in carrying out developments over sensitive habitats. The most recent example of this is the lengths we went to protecting the redwood trees when we constructed the cascade pools. I will not go in to the details of that due to time suffice to say it was quite a process.
- 34 HSTPS became aware in February 2021 of the need to obtain a Wildlife Act Authority under section 54 of the Wildlife Act 1953. This is because there are four known species of lizards residing on Conical Hill within the Flyride Site.
- 35 We engaged a herpetologist, Dr Mandy Tocher. Ms Tocher surveyed Conical Hill and prepared a Lizard Management Plan for the Department of Conservation. Wildlife Authority applications are processed by the Department of Conservation.
- 36 The Wildlife Act Authority is a separate process to the consenting process. The Authority is required, irrespective of the outcome of the Resource Management Act and Reserve Act requirements, in order for the project to go ahead.
- 37 Dr Mandy Tocher has included the lizard management plan as Appendix 2 of her statement of evidence. I won't go into the detail here, but the purpose of the plan it to ensure that the lizards and fauna habitat are protected when it comes to the construction phase. This includes a mitigation package as well as longer term initiatives that will enable lizard populations within Conical Hill Reserve and adjacent areas to be maintain at higher levels than observed presently.
- 38 In addition to the mitigation package, HSTPS is seeking a conservation covenant over rough gecko habitat on private land. Negotiations are underway with a third party to secure the covenant. The covenant would apply over a site/s where rough geckos are known to exist as a viable population, and at a site/s linked to a wider rough gecko population. It is expected that management of any covenant would also benefit other lizard species residing there.
- 39 The Department of Conservation has advised that only a minor revision is required in order to finalise the lizard management plan. This is to include the details of the covenant, should it be secured.

Consultation

- 40 Although it is acknowledged that consultation for resource consent applications is not mandatory under the Resource Management Act 1991, HSTPS's philosophy for the last decade has been to publically notify any significant works it undertakes. From the outset our plan

was to actively seek as much public input as possible into the proposal.

- 41 The reason for this is that we are seeking to build what is in effect a public recreation and tourism asset. The more input we have at an early stage the more likely it will meet the needs and aspirations of our customers, the public.
- 42 From an early stage we actively and widely consulted with members of the community on the proposal so as to assist them to understand the project and our objectives. We also wanted to update them as to technical work underway. Further, consultation sought to obtain constructive feedback that was incorporated into the proposed plan.
- 43 HSTPS undertook public consultation by way of community meetings. Three community meetings were held. The first was shortly after the funding announcement. As I mentioned earlier, the initial proposal was for the ride to come down the south face of Conical Hill – over the existing main walking track. At the first community meeting, concerns were raised regarding noise effects on the walk and neighbouring households, and potential impact on the walking experience. Additionally, feedback was received about the impact on wildlife, and the effects of using the trees to support the ride and tree fall risk.
- 44 By the time of the second round of meetings in November 2020, we had changed the proposed route to take the course over the west side of the hill. This was so that the ride would not impinge on the main walking track experience. Changing the proposed route also reduces the potential for noise exposure for any residents around the hill. The changes to the course design highlighted at the second meeting were well-received by all those in attendance.
- 45 The procurement process also occurred between the first and second meetings. As I explained earlier, Holmes Solutions were selected as the best partner to design, and supply the technical components of the ride. The community feedback at the second community meeting about the new technology was very positive.
- 46 After the second community meeting we proceeded with further detailed designs, incorporating the new location. Holmes Solutions proposed to use seven steel support towers, rather than using trees as part of the course. This addressed the community feedback received in relation to the effects of using trees to support the ride.
- 47 HSTPS held a third community meeting shortly after the original resource consent application was lodged in February 2021. The key issues that had been addressed in the application were shared. This included our engagement of:

- 47.1 acoustic experts to assess the potential noise impacts of the ride in the surrounding area and to take measurements to model the impact of the Flyride;
 - 47.2 an expert to assess the recreational impact on the hill;
 - 47.3 specialists to assess the visual impact of the structures on the top of the hill from the village;
 - 47.4 geotechnical specialists to assess the state of the rock and assist with the selection of pole location as well as design of the poles; and
 - 47.5 a herpetologist (lizard expert) to survey the hill and determine the effects on lizards that might be living on the hill.
- 48 In addition to the community meetings HSTPS have engaged with Te Runanga o Kaikoura.
- 49 The Department of Conservation were also consulted early on. HSTPS discussed the wider project with the Department of Conservation and then more specifically addressed matters relating to lizards. Discussions with the Department of Conservation are ongoing while the Wildlife Act Authority application is processed.
- 50 HSTPS has also liaised with Rayonier Matariki Forests as construction vehicles will need to access the site over existing forestry tracks. An Access Licence will be in place between Rayonier Matariki Forests and HGM Construction. HGM Construction have experience in constructing adventure infrastructure and will be constructing the Flyride. Access rights have been granted by Ngai Tahu Forestry which owns the surrounding forest.

THE VISION

- 51 Our vision is to provide enhanced recreation opportunity within Hanmer Springs. Apart from the large pull of the Thermal Pools there is a small range of paid activities in Hanmer Springs when you consider that over 500,000 visitors visit the town each year. What is currently on offer is either at the lower end of pricing at under \$15 for an Adult (for example, AmazeNGolf, Crazy Putt, Animal Park) or at the upper end of domestic market pricing, at over \$100 each (for example, eBike Hire, Spa Massage, Jet Boating, Quad Biking).
- 52 There is an opportunity for the Flyride project to attract visitation and spend in the price bracket between \$15 and \$100. At this stage we anticipate pricing will be:
- 52.1 \$25-\$35 for an Adult.

52.2 \$20-\$30 for an Senior.

52.3 \$15-\$25 for a Child.

- 53 For repeat visitors and residents there will be annual passes offering discounted rates. It is anticipated that the ride will also have dynamic so that off peak times are cheaper. Visitors signed up to a loyalty scheme will also get special pricing.
- 54 The Flyride would give both day trippers from Christchurch and overnight visitors from further afield more chance to spend money in the village and stay longer. It has the potential to become a "must-do" attraction for both regular and new visitors to the village. The operation is expected to be run as a separate business unit so that if outside investment is interested in taking ownership of the attraction this is easily possible.
- 55 The Conical Hill Flyride would be the first Switchback™ ride in New Zealand, and only the second in the world. This will bring national and international attention to Hanmer Springs. It will create 23 new jobs and is expected to inject \$4 million into the local economy in its first five years.
- 56 We are confident that the Flyride will be a viable and robust tourist attraction. It complements the character of the Hanmer Springs area and will fill a "gap" in existing activities. The proposed site is strategically located near to the Thermal Pools complex, an already busy tourism spot. The Flyride would give a boost to the tourism sector, which has been impacted by the COVID-19 pandemic.

Sustainability and the environment

- 57 Our mission is to provide a safe, fun, accessible and environmentally friendly experience for all people. Underpinning all of our development is our fundamental sympathy for the natural world. This is our core belief. It will be the basis for our operation and every decision we make in this project.
- 58 We made a decision early on to use solar power as the only power source on the hill rather than running mains electricity on the hill. The roof on the top station is angled in order to catch more sunlight. The roof on the bottom station would get limited sun so the solar panels will only be on the start station roof. The trolleys have a battery incorporated into the seat which is charged as the trolley goes down the course with the rider. The trolley then drives itself back up to the start station by itself.
- 59 The Flyride incorporates a solar power generation system at the start station. This will power the ride. It is supplemented by a 'back-up' diesel generator to power the system in the event of power loss within the solar system. It may also operate for periods of extended

inclement weather resulting in reduced power generation. The solar system has been designed so that it can be utilised year-round and only require the diesel back-up power in unusual circumstances.

- 60 Holmes Solutions have previously developed an eddy current braking system which will be used for the trolleys on the Flyride. Unlike mechanical brakes, the eddy current braking system is based on friction and kinetic energy, relying on electromagnetism to slow down and stop the trolleys. The system is self-regulating which means the braking resistance automatically adjusts to provide consistent braking across a wide range of participants. Children and Adults enjoy a consistent and similar experience. Other benefits of the eddy current braking system are that it creates very little noise and is low maintenance due to having no contacting parts (such as brake pads) that wear out or fail.
- 61 The ride is designed to blend into the natural environment by using natural colours and timber where possible. The toilet at the top station is not connected and will be emptied on a scheduled basis. Although the Hurunui District Council have recently put in a toilet block at the base of the existing walking track up Conical Hill we thought it responsible to install one at the top as well.
- 62 We have engaged Toitū Envirocare at the Thermal Pools to assess and improve our carbon footprint. They will also be engaged in relation to the Flyride. Given the design of the Flyride and our decision not to transport visitors to the start of the ride at the top of the hill we anticipate the carbon footprint will be very low. We will strive to be carbon zero.
- 63 HSTPS is committed to improving the general condition of Conical Hill. As outlined in the evidence of **Rob Greenway**, although the walking track is well-maintained, the quality of the entrance area and the facilities of the summit are in poor condition. In addition, many weeds have established on the hill, including the exotic introduced pine species that are prevalent over the forest land. A lot of indigenous vegetation has been lost over the years to these introduced species.
- 64 We have successfully developed native plantings throughout the Thermal Pools complex and would do the same for Conical Hill. The Lizard Management Plan includes supporting and expanding native plants on Conical Hill, including pockets of Kanuka that used to be more widespread.
- 65 It is likely that the lease with the Hurunui District Council will include an arrangement whereby a set percentage of turnover is used to upgrade Conical Hill. Any future operator would be bound by the same lease. This will ensure Conical Hill receives some much needed ongoing investment.

Health and safety

- 66 Holmes Solutions has developed an Amusement Standard Compliance Strategy to allow worldwide Switchback™ distribution which we have reviewed. Holmes Solutions have selected ASTM International as the governing standards body for the Switchback™ system. ASTM amusement ride standards are widely recognised and are well aligned with ISO, EN and other international standards.
- 67 The ISO and IEC functional safety standards will be complied with. The Switchback™ system includes a number of automated safety systems that will detect errors and intervene as required to keep riders safe. For example, onboard safety controllers monitor the trolley position on the route and ensure that trolley speed stays within safe limits; and a route safety controller communicates with all of the trolleys to ensure that they do not collide with each other.
- 68 Specific New Zealand standards will be used as applicable, including the New Zealand Building Code. AS/NZS 1170 will be used to ensure all loads such as earthquake loading and wind loading are compliant with the local area requirements.
- 69 Holmes Solutions have engaged Coulter Engineering to undertake a third party peer review for all of the safety critical Switchback™ systems, to confirm design approach and compliance with the governing standards.
- 70 In addition to the applicable standards, the Flyride will comply with the WorkSafe New Zealand Best Practice Guidelines for Safe Use of Machinery. These guidelines detail the safety steps that must be taken at each step from machine design right through to decommissioning.
- 71 The Flyride will operate under the Amusement Device Certification. This requires an annual check in the first year and then certification renewal every two years. The ride will have an ongoing maintenance programme.
- 72 There will also be a comprehensive health and safety system in place. This will include, for example, a briefing at the start of each ride regarding all rules and safety procedures, ensuring riders are safely fastened into the seat before being launched onto the course, and not operating in adverse weather conditions.

OPERATIONAL ASPECTS AND DESIGN REQUIREMENTS

Anticipated operational aspects

- 73 The Switchback™ system allows a number of speeds and riders profiles to be set. Initially there will be three speed levels taking between 70 and 120 seconds. The maximum speed will be capped at 50km/h.

- 74 Each trolley can carry a maximum safe operating load of 150 kilograms. This can be one person or two persons in tandem, provided their combined weight is no more than 150 kilograms.
- 75 Our main target customers for the Flyride are those who visit the Thermal Pools. We are only expecting a small proportion of customers that use the Flyride to not visit the pool complex.
- 76 As outlined in the original application, the Flyride Proposal has a target of 50-60 passengers per hour.¹ Peak demand will only be achieved when there are 'fast rides' only and the ride is operating at 100 per cent efficiency. We anticipate that some inefficiencies will occur through 'no-shows', unexpected delays, and weather.
- 77 The table in **Appendix 1** of my evidence shows the projected capacity of the Flyride, including analysis of 'fast rides' and 'slow rides'.
- 78 **Mr de Verteuil** visited Hanmer Springs on Saturday, 24 April 2021 and undertook a traffic assessment. Saturdays almost always are our busiest day of the week. His visit also coincided with a public holiday. This was so that he could assess existing parking demand in order to project the change in demand for parking with the Flyride operating. In April 2021 our data indicates that the average group size visiting the Thermal Pools was 2.75.

Design requirements

- 79 There are a number of design requirements and key considerations that have influenced (and in some cases constrained) the proposal. These include:
- 79.1 the strong community preference for the ride to travel down the western face of Conical Hill;
- 79.2 the desire to reduce the quantity of poles, and limit the size of the start and stop stations, in order to minimise visual impacts;
- 79.3 the natural topography of Conical Hill limits the locations at which poles can be reasonably accessed and constructed;
- 79.4 the natural vegetation on Conical Hill constrains the 'corridor' of the ride. We have strived to reduce vegetation removal where possible;

¹ Application to Hurunui District Council for Land Use Consent and Reserves Act Permission, February 2021, at paragraph 28.

- 79.5 the need to design a system that is enjoyable to ride and creates the desired rider dynamics;
- 79.6 the need for a trolley system that minimises noise emissions; and
- 80 creating a ride that ensures rider safety. This has been a paramount consideration and requires the poles to be at a minimum height to avoid risks such as riders clashing with natural features in Conical Hill. Through our public consultation and engagement of various experts and specialists we have ensured the proposal will achieve all operational and design requirements.

RESPONSE TO SUBMISSIONS AND SECTION 42A REPORT

- 81 I have read the submissions and Section 42A report on the application. HSTPS has engaged various experts as they are best placed to assess effects of the proposal and address any technical aspects.
- 82 However, I do wish to briefly comment on one concern that was raised in two submissions.² These two submissions suggest that the application proposes to use the existing access at 34 Acheron Heights as a walking / biking track to the Reserve. The Overall Development Plan³ shows *existing tracks and features*. The application does not propose to use (or encourage) use of the existing track at 34 Acheron Heights. HSTPS intends to promote use of the common access at the top of Conical Hill Road. This will be through various mechanisms, including through the Flyride website, any websites the ride is advertised through, signage and customer service within the ISITE information centre at the exit of the Thermal Pools, and on signage outside the Thermal Pools.

CONCLUSIONS

- 83 Our vision is to provide a world-class adventure activity in Hanmer Springs. The Flyride would be the first in New Zealand, and only the second in the world.
- 84 Our mission is to provide a safe, fun, accessible and environmentally friendly experience for all people.

² Submissions of Gavin Martin and Nigel and Claire Shatford.

³ Included on page 11 of Appendix 2 to the original application.

85 Through our experience in developing tourist attractions and the public consultation we have undertaken I believe that the Flyride will meet the needs and aspirations of the public.

Dated: 23 September 2021

Graeme Abbot

APPENDIX 1

	Slow Ride Only (120 seconds)			Fast Ride Only (70 seconds)		
	Needs 4 on line			Only 3 on line		
Number of Trolleys	5	6	7	5	6	7
One Cycle All Trolleys Down Seconds	240	270	300	190	220	250
Return Journey Seconds	135	135	135	135	135	135
Complete Cycle Seconds	375	405	435	325	355	385
Complete Cycle Minutes	6.25	6.75	7.25	5.4	5.9	6.4
Cycles Per One Hour	9.6	8.9	8.3	11.1	10.1	9.4
Number of rides per hour	48.0	53.3	57.9	55.4	60.8	65.5
Tandem Ride % Mix	7%	7%	7%	1%	1%	1%
Tandem Rides per hour	3.4	3.7	4.1	0.6	0.6	0.7
Non Tandem Rides per hour	44.6	49.6	53.9	54.8	60.2	64.8
Total Riders per hour	51.4	57.1	62.0	55.9	61.5	66.1