工作文件：WP/CMPB/15/2012

郊野公園及海岸公園委員會

北大嶼郊野公園“昂坪生態飛索滑行之旅”計劃書

1. 目的

Flying Fox已爲在北大嶼郊野公園內昂坪360附近的政府土地上營辦“生態飛索滑行之旅”提交計劃書，本文件旨在請委員對計劃書提出意見。

2. 背景

2.1 飛索滑行是一種空中歷奇活動，參加者可沿着一組由鍍鋅鋼柱及纜索構成的平衡飛索滑道，借助地心吸力在半空滑翔。Flying Fox是擬議飛索滑行之旅的倡議者，昂坪360將會是項目的商業伙伴。由於項目可成爲香港的旅遊景點，因此初步得到旅遊事務署的支持。

2.2 漁農自然護理署、離島地政處、機電工程署及土木工程拓展署應旅遊事務署邀請，出席於二O一二年八月中舉行的簡介會，會上Flying Fox介紹了項目的內容，並徵詢相關部門對計劃書的初步意見。

3. 飛索滑行之旅

3.1 飛索滑行之旅的起點及終點設於昂坪360纜車站附近，其設施包括兩組跨過山谷而各長300米的平衡飛索滑道、連接長約1公里遠足步行路徑，以及一條跨越深屈峽的50米長吊橋。在1公里的遠足步行路徑中，有430米將會是新建造的。飛索滑道的起點及終點平台是四個雲際站，這些雲際站會固定各條飛索滑道，並爲參加者提供上滑道前及降落後輪候的地點。每個雲際站直徑爲10米，高度爲2至3米。

3.2 四個雲際站佔用的地面面積爲 0.07 公頃，飛索滑道及吊橋需用的半空面積爲 0.19 公頃。Flying Fox 的基礎建設(即四個雲際站及兩組平衡飛索滑道)佔用的土地面積約爲 0.26 公頃。儘管 Flying Fox 的基礎建設實際佔用的土地面積爲 0.26 公頃，但基礎建設連配套設施，包括設於北大嶼郊野公園內的吊橋及遠足步行路徑所佔用的總土地面積約達 380 米長、160 米闊，亦即約 6 萬平方米(6 公頃)。有關飛索滑行之旅的位置圖及平面圖分別載於附件 1 及 2，Flying Fox 擬備的計劃書載於附件 3。

4. 有關郊野公園的考慮因素

4.1 上述項目仍處於初步階段。爲落實項目，便須進一步評估項目對生態及郊野公園遊客的影響、景觀及視覺影響、使用者安全、對郊野公園遊客的潛在風險、噪音等。機電工程署會評估有關系統的安全及安裝事宜，土木工程拓展署則會集中評估安裝基礎設施方面的岩土事宜。此外，由於項目涉及在郊野公園內進行挖泥工程及建築工程，因此很可能屬於《環境影響評估條例》下的指定工程項目。

4.2 此外，請委員加以注意項目涉及的下列事宜對郊野公園土地用途帶來的影響／關注：

(a) 項目的整幅用地爲北大嶼郊野公園內的政府土地。如項目獲得批准，用地會根據離島地政專員的建議，以短期租約形式批予倡議人。

(b) 項目屬收費活動。以往未有容許郊野公園內政府土地作商業用途的先例。

(c) 通往飛索滑道及吊橋的四個雲際站會設置閘門，以防公眾誤闖 Flying Fox 飛索滑道。公眾對有關路徑及項目範圍的通行權，仍有待決定。如果只限付費遊客才可使用有關路徑及範圍，將會引起爭議。

(d) 雖然擬議項目以旅遊及康樂爲目的，但以往並無在郊野公園內進行此類歷奇活動的先例。然而，項目

與郊野公園內土地一般所作的康樂用途(例如野餐及遠足等)存在根本的不同。

(e) 有關活動會使公眾不能享用大面積自然生境(主要爲灌木叢及草地)、破壞景觀，以及在大部分人士作靜態康樂用途的政府土地上牟利，因此環保／遠足團體很可能就建議書提出反對。擬議項目在推廣旅遊業方面可帶來的潛在裨益，或會因其對環境的影響，以及需要處理預料市民及環保／遠足團體會提出的反對而抵銷。

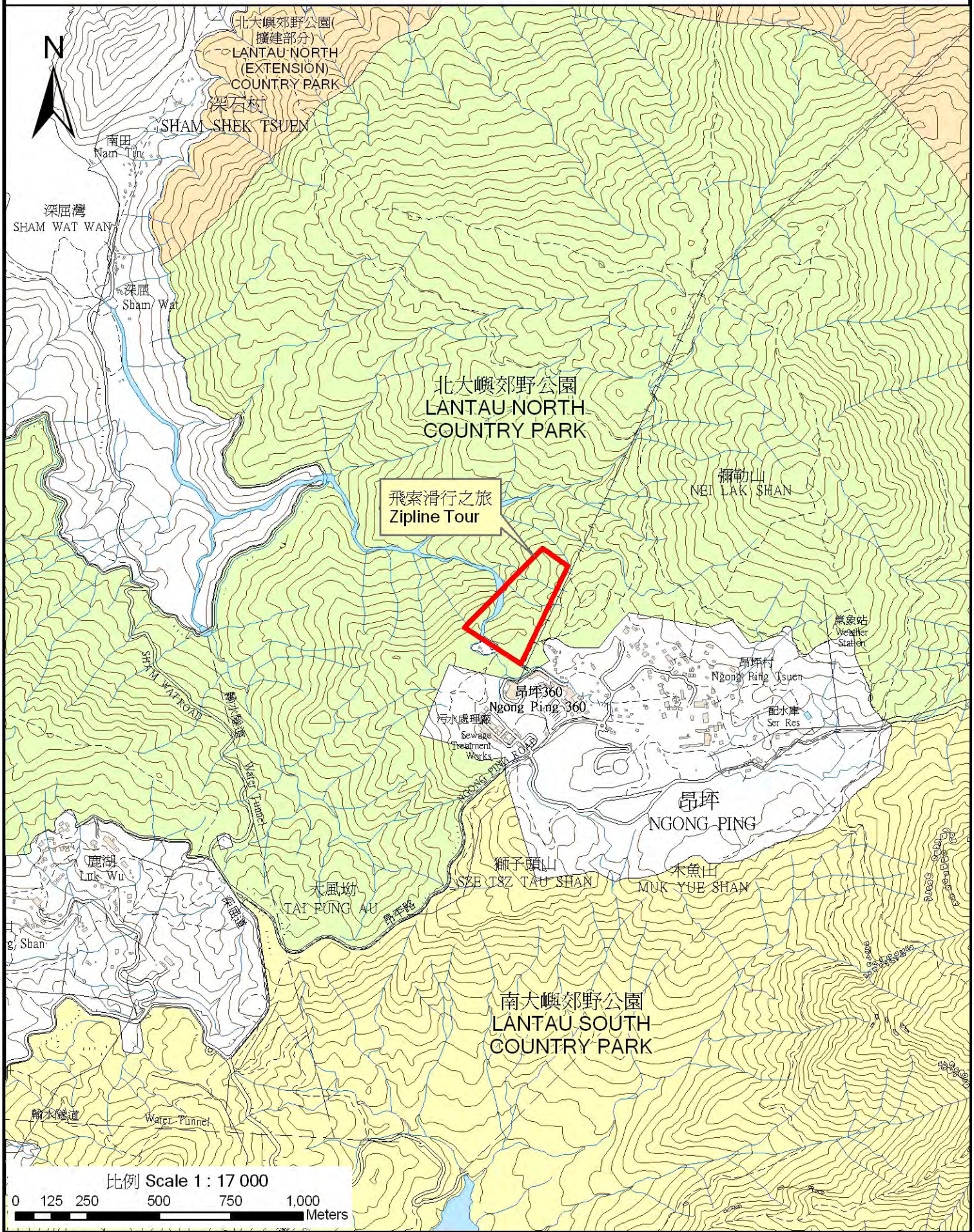
5. <u>徵詢意見</u>

請委員對建議書提出意見。

郊野公園及海岸公園管理局
二O一二年十月

位置圖 LOCATION PLAN

Annex 1
附件一



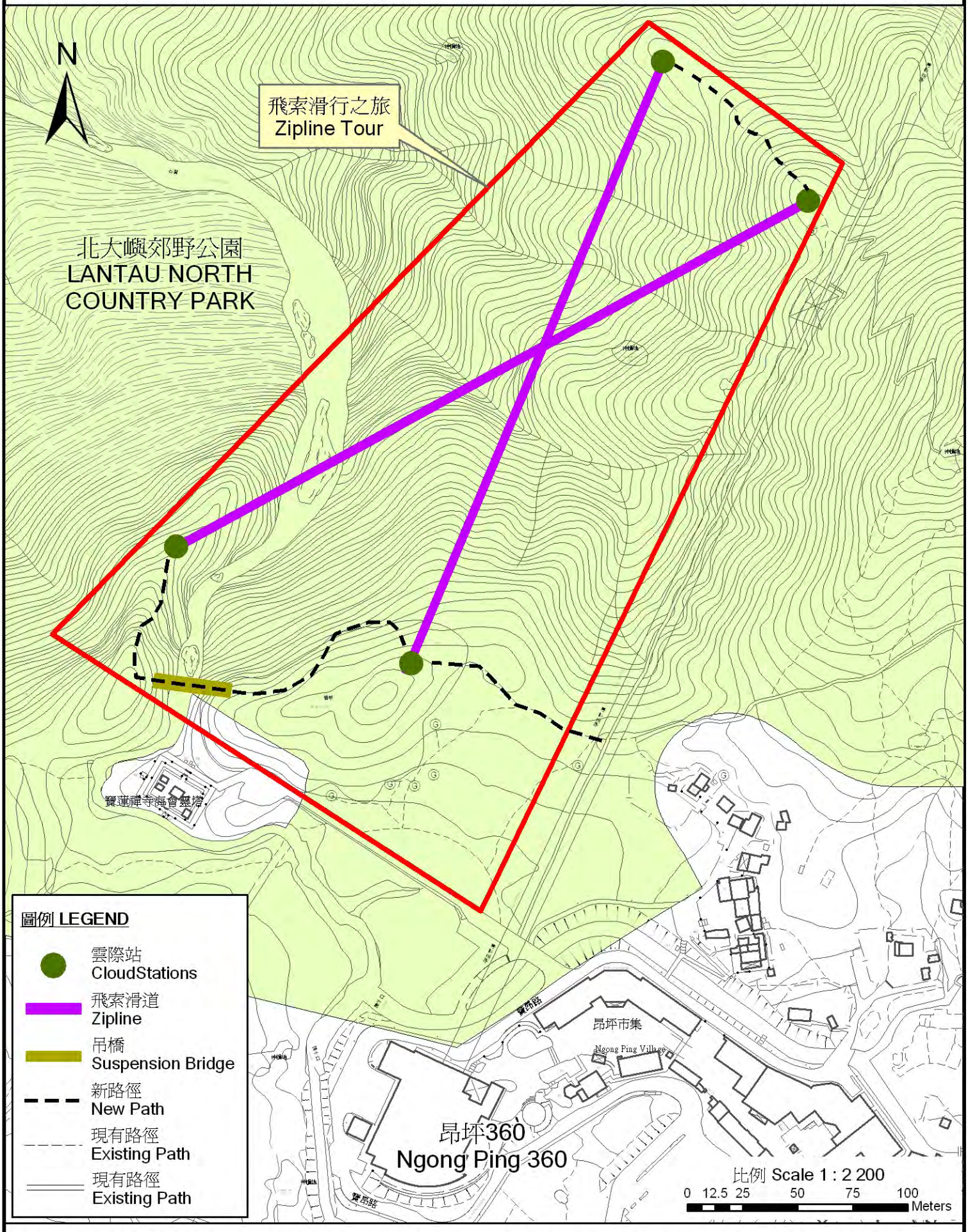
Proposed Eco-adventure Zipline Tour at Ngong Ping, Lantau North Country Park

北大嶼郊野公園『昂坪生態飛索滑行之旅』計劃書

M_MC_2012_102_location

平面圖 LAYOUT PLAN

Annex 2
附件二



Proposed Eco-adventure Zipline Tour at Ngong Ping, Lantau North Country Park
北大嶼郊野公園『昂坪生態飛索滑行之旅』計劃書

M_MC_2012_102_layout

郊野公園及海岸公園委員會

北大嶼郊野公園「昂坪生態飛索滑行之旅」計劃書
2012 年 10 月 17 日

1. 目的

本計劃書旨在向各委員詳述由 Flying Fox 建議在昂坪纜車及昂坪市集旁（即北大嶼郊野公園範圍內佔地約 0.26 公頃之選址）興建生態歷奇飛索滑行之旅項目的各項細節，期望委員會能按《郊野公園條例》批准推行該康樂及教育發展項目。

2. 目標

Flying Fox 的目標爲於大嶼山的大自然美景之中，帶來真正的生態歷奇體驗。透過這種既刺激、富挑戰性，同時做到寓教於娛的戶外旅遊活動，讓旅客能夠用前所未有的方式領略香港的自然美。

3. 飛索滑行之旅：一個崇尚健康的生態歷奇體驗

生態歷奇*屬於輕量以至中量的冒險歷程，讓參加者能夠欣賞到大自然的生物多樣性，學習生態保育的重要，同時飽覽優美的風景地貌。*

而飛索滑行之旅就是其中一種最佳的生態歷奇體驗。它讓參加者能夠深入接觸大自然，探索大開眼界的景觀，並爲所在地帶來最少的環境影響。活動無須能源系統，無須移平山嶺開發道路，無須運用交通工具，亦不會引起任何資源耗損。不論在興建或營運過程中，活動只需與地面輕微接觸，並能夠與四周自然環境和諧地融合爲一。

飛索滑行給予參加者一種暢快飛行的感覺，開拓前所未有的嶄新視野，活動亦適合男女老幼和不同的身體狀況的旅客參與。飛索滑行的長度足以令參加者置身一個壯觀開闊的景緻當中，充份享受「飛行」的趣味；同時間，它亦是一個只需一個上午或下午足可完成的歷奇活動。它鼓勵大眾重新發掘戶外活動的樂趣，推動人們重拾對中量運動的熱愛。

飛索滑行之旅是一種有趣、安全而健康的郊野遊覽方法。它將戶外探索、大自然美景、經驗豐富的導賞、互動的視像資訊平台集於一身，適合任何年齡人士尤其年輕人參與。

4. 大嶼山 Flying Fox – 遊客體驗

Flying Fox 引進的生態歷奇飛索滑行之旅，將包括兩條各長 300 米的平衡滑道，一條 50 米的吊橋，以及約 1 公里的遠足步行路徑。旅程在北大嶼郊野公園的山嶺（接近昂平 360 纜車總站及七號纜塔）進行。

這個60-90分鐘的旅程將包括以下各個項目：

- **訂票**：遊客可從多個渠道訂票，最佳方法爲於現時的網頁www.flyingfox.asia上預訂，網頁提供實時預約系統，接受網上付款並可自動簽發電子門票。遊客亦可於Flying Fox的票務處購買即日門票，票務處位於昂坪360纜車站和昂坪市集。
- **登記及裝備**：參加者將於Flying Fox位於昂坪市集的票務處登記報到，穿上安全裝備，集合成爲最多12人的隊伍。每隊將有兩位訓練有素的指導員隨行，以確保旅程安全。指導員並會對沿途景物作出導賞講解，提升參加者對生態保育與歷史文化的興趣。
- **安全講解**：在開始旅程之前，所有參加者均需接受安全指引和活動講解，學習如何使用各種裝備。
- **前往Zip 1索道**：步行約300米。參加者需由纜車站開始（離地434米），沿現有的昂坪棧道向東北方向步行200米，然後向西北方向沿新步徑（高低起伏的山徑）步行100米到達**Zip 1索道**起點(離地442米)，並接近纜車站北面一個石山山峰的頂點；大約8米的上行坡道。
- **Zip 1索道**：沿300米的平衡飛索滑道，滑過山谷至七號纜塔下較矮的小山丘(離地400米)；大約42米的下行坡道。將深屈與南中國海景色盡收眼底。
- **前往Zip 2 索道**：沿一條全新的蜿蜒路徑，步行約130米至七號纜塔旁較高的山丘(離地432米)；大約32米的上行坡道。
- **Zip 2 索道**：沿300米的飛索滑道，在**Zip 1索道**上空滑過，到達一個石山山咀(離地404米)，鄰近一個由深屈河造成的山峽可觀賞深屈瀑布；大約28米的下行坡道。
- **山脊漫步**：於高灌木叢下沿狹窄的山脊步行80米至吊橋(離地422米)；大約18米的上行坡道。
- **吊橋**：走過50米長的吊橋穿越美麗的深屈峽，橋面距離水面約15-20米。該處的自然景觀仍然保留原始風貌，與昂坪市集卻只有數百米距離。
- **石徑漫步**：走過一條120米長而高低不平的全新石徑，前往Zip 1索道；大約20米的上行坡道。然後再走300米返回纜車站。
- **卸下裝備及購物**：完成旅程後，參加者將返回昂坪市集的Flying Fox票務處交回安全裝備，並可選購品牌紀念品，包括拍攝了自己旅程花絮的高清短片。
- **總旅程長度**：1,580米 (650米爲空中飛索滑行及吊橋漫步，980米爲遠足步行)
- **垂直上坡**(步行)：78米；**垂直下坡** (滑行)：70米
- **戶外學習體驗**：參加者可以在旅程中學習到當地的生態保育知識，觀看一系列的教育展板和聽取指導員的導賞講解。

我們每小時可接待 60 位參加者(每日可接待 480 位)。票價將以現時區內的其它旅遊景點收費作參考，我們亦會研究向弱勢社群提供票價優惠以享受設施。詳情請查閱附件 1 之地圖、相片及設施設計圖。有關基礎設施和建築方法的詳情，請參考附錄 3.2 和以下的 7b 部份。

5. 公司背景

Flying Fox 由 Jonathan Walter 與 Richard McCallum 於 2007 年成立。Jonathan 當年爲駐港英軍(1993-95)，曾參與編輯多份環保及人權刊物。Richard 曾於太古集團與國泰航空任職，工作地點包括香港(2002-04)、巴基斯坦和印度。Flying Fox 的香

港業務由 Ernst Zimmermann 予以協助。Zimmermann 前爲索菲特酒店集團於國內的副總裁以及 Zenith Hotels 行政總裁，並曾於中國內地生活超過 30 年。

Flying Fox 爲英國註冊公司 Zip Adventures Ltd 的營業名稱。公司於印度共營運三條飛索滑道（第四條正在興建之中）。其中兩條毗鄰 15 世紀印度古城拉賈斯坦(Rajasthan)，第三及第四條則分別位於私人及政府擁有的森林之中。

經過過去五年在印度取得的成功經驗，公司現計劃在多個世界級的旅遊目的地引入這種半空的生態歷奇體驗，當中包括香港的大嶼山，以及在英國約克郡以北被列爲一級景觀的霍華德城堡，引入全新的森林樹冠層之旅。

6. 原因與優點 – 附錄 2 摘要

本計劃書以一系列的問答形式，剖析爲何香港需要飛索滑行之旅，爲何選址大嶼山和郊野公園，項目會帶來甚麼好處，以及誰能獲益最多等不同範疇。

a. 爲甚麼香港需要一個飛索滑行之旅?

- *香港有 70% 的面積爲郊野公園，卻欠缺了生態歷奇活動*
- *旅遊事務署視生態旅遊爲吸引海外旅客的優先項目*
- *香港人平日工作繁忙，很需要有趣、能夠減壓的戶外活動以保持健康和活躍*

i) 香港缺乏生態歷奇活動

香港有 70% 的面積爲郊區，而 43% 的面積更被定爲郊野公園或海岸公園。可是，這個「亞洲國際城市」予人的印象，卻是以典型的大都會面貌爲主。

背後其中一個原因，就是香港的生態旅遊和生態歷奇發展，遠較國際上和地區上的其它地方落後。綜觀北美、拉丁美洲、南亞、歐洲、澳洲、新西蘭、泰國、馬來西亞、菲律賓和新加坡，飛索滑行經已發展得相當蓬勃。其中，在美國有超過100個地點有進行此活動，在法國和德國的數量亦以百計，英國的公共森林中亦有30個。

目前，本地居民和訪港旅客可以透過遠足欣賞香港迷人的大自然風貌和生物多樣性，也可以參加漁農自然護理署的戶外教育活動，或是到世界級的國家地質公園參觀，但他們所缺乏的，卻是生態歷奇的有趣體驗，而我們相信現在就是作出改變的時候：香港作爲一個國際城市，擁有許多美麗而管理完善的郊野公園，她值得擁有世界級的生態歷奇設施。

飛索滑行之旅是一種理想的生態歷奇活動：參加者可以在有管理、對環境影響少、安全、備受規管，及方便可達的情況下擁抱大自然，體驗震撼的感官刺激。

ii) 旅遊事務署視生態旅遊爲吸引海外旅客的優先項目

旅遊事務署將生態旅遊訂立爲香港重要的發展目標之一，而香港旅遊發展局亦在 2009 年推出了「香港郊野全接觸」推廣活動，作爲其中一個推廣本港的遠足路徑和天然景點的項目。生態旅遊之所以重要，因爲它能夠增加訪港旅客的人數和多元性，提升旅客的旅遊體驗，推動旅遊業的收益成爲本港的重要經濟之柱。

不少海外旅客認爲，相比於香港市區／人工化的景點，要前往分佈於郊野公園內的遠足路徑不算方便。如果我們的飛索滑道就在北大嶼山，能夠充份利用現時區內的交通網絡，便可成爲香港首個真正交通方便易達的生態歷奇項目，爲本地居民和旅客創造一種獨一無二、用 60-90 分鐘可完成的刺激運動，並可盡情飽覽郊野公園的迷人美景。

香港需要生態旅遊的基建設施，一方面可以在其它鄰近地區的旅遊目的地之中保持競爭優勢，另一方面亦能夠向旅客展現本港多年來在保育方面的努力成果。飛索滑道之旅正好鼓勵原本不打算以傳統遠足方式來遊覽郊野公園的海外旅客，吸引他們以嶄新的方法和角度來欣賞香港動人的大自然景緻和生物多樣性。

iii) 香港人平日工作繁忙，很需要有趣、能夠減壓的戶外活動以保持健康和活躍

香港大學在 2008 年 4 月就《工作生活平衡》的調查結果顯示，82.5%受訪者表示感到有壓力；75.4%表示缺乏運動，間接令日常工作受到影響。而今時今日大家都相信，接觸大自然和進行中量的運動均能減壓，是提昇員工身心健康和生產力的良方。

2005 年，衛生署出版了一份名爲《正視肥胖問題》的報告，內容指出香港人無可倖免受全球的肥胖趨勢影響。社會上 22.3%男士和 20.0%的女士屬於過重，而年輕人的肥胖趨勢已漸趨明顯。理工大學則在 2011 年的一個研究中，發現小學生超重的比例由 1997/98 年的 16.4%，上升至 2008/09 的 22.2%。

2012 年 3 月，當時的食物及衛生局局長周一嶽醫生指出，缺乏運動是肥胖的主要成因之一，可以引致心臟病和糖尿病，長遠而言會影響到社會整體的生產力和生活水平，減低經濟動力和競爭力。周醫生認爲解決方法包括向市民提供更多元化的康樂、體育活動與設施。

衛生署建議兒童每日做最少 60 分鐘中量至劇烈運動，而 18-64 的成年人每周最少做 150 分鐘中度的帶氧運動。

飛索滑行之旅是一種中量的運動項目，當中包括 1 公里的平面步行和接近 80 米的爬升步行。因爲在刺激的飛索滑行之間貫穿著遠足的環節，鼓勵了平日不熱愛遠足的參加者多做運動。飛索滑行之旅能夠爲香港人提供一個嶄新的戶外運動體驗，提倡更健康、更活躍的生活方式。

b. 爲甚麼選擇大嶼山?

- *北大嶼山已發展成爲一個重要的旅遊與康樂總匯，Flying Fox 無須再開拓全新的選址*
- *Flying Fox 能夠充份利用現時昂坪 360 基建設施的優勢*
- *Flying Fox 能夠爲本地社區和企業帶來投資、就業機會和技術轉移*

i) 北大嶼山已發展成爲一個重要的旅遊與康樂總匯

在過去十年來，北大嶼山已躍身成爲一個旅遊康樂的重點發展地點。規劃署的發展概念聚焦於北大嶼山的重要經濟基建和城市發展，一方面優化現時的交通網絡和基礎建設，同時保留北大嶼山的自然環境，透過保育令該處成爲可持續發展的康樂和旅遊熱點。

爲香港推出一個嶄新的生態旅遊景點，完全符合目前北大嶼山的發展方針。項目可以沿用目前的旅客設施和交通網絡，無須開天闢地在完全未有設施的郊區展開工程。現時北大嶼山的旅遊設施包括亞洲國際博覽館、東涌炮台、昂坪 360 纜車及市集、天壇大佛及寶蓮禪寺、昂坪自然中心及心經簡林等。Flying Fox 將充份利用區內的優勢，開展大嶼山首個生態歷奇項目。

飛索滑行之旅能夠善用北大嶼山目前成熟的旅遊基建設施，將環境保育放在首要考慮。事實上，Flying Fox 的其中一個目標是要奉行環保的大原則（詳見下文），希望塑造昂坪區成爲香港最優秀的生態歷奇景點，在其它人工化的景點如迪士尼和海洋公園之中展現優勢。

ii) Flying Fox 能夠充份利用現時昂坪 360 基建設施的優勢

對旅客來說，最佳的生態歷奇之旅，選址必須方便易達，並能提供充足的遊客設施以滿足需要。除了保留大自然風貌，我們還需要交通道路、洗手間、餐飲設施、急救站、疏散和救援設施。假如區內已有這些設施，就可以避免興建全新的物流基建，亦可避免對環境造成更大負擔。

昂坪 360 因爲能夠提供 Flying Fox 所需要的交通和環境設施，成爲了成功推行飛索滑行之旅的絕佳選址。而憑藉昂坪 360 的優勢，我們希望能夠協助她進一步實現「讓遊客回歸自然」的使命。

iii) Flying Fox 能夠爲本地社區和企業帶來投資、就業機會和技術轉移

香港如果推出飛索滑行之旅，必定能夠爲大嶼山和香港整體創造經濟效益。雖然飛索滑行的建設工程規模較細，但仍然需要大量投資於專業設計、物料、培訓和設施之上。相信大部份的投資項目均會爲本地的供應商締造商機。

項目開始營運之後，需要聘用大約 20 位本地指導員和營運經理，而 Flying Fox 亦會開設全面的技術轉移培訓計劃，爲本地員工提供專業的飛索滑道營運技術，並就員工學習北大嶼郊野公園的生態保育知識上作出投資。

一經啓用，飛索滑行之旅將爲本港庫房增加稅收，並對使用土地繳付地租。我們亦有意將部份收益回饋於當地的保育項目之中。

c. 爲甚麼選址北大嶼郊野公園？

- *它是在香港推行飛索滑行之旅的最佳可持續發展選址：結合陡峭地形、意想不到的 Wow 元素、生態保育、文化傳統氛圍與基礎設施的優勢*
- *活動切合漁農自然護理署的康樂、教育和保育的優先目標和《郊野公園條例》訂明的發展方針。*
- *對接近昂坪的小部份郊野公園範圍帶來輕微影響。*

i) 在香港進行飛索滑行之旅最合適的地點

基於以下四大原因，北大嶼郊野公園絕對是香港最適合進行飛索滑行之旅的選址：

- **陡峭的地形**：北大嶼郊野公園擁有最合適的山丘與山谷組合，令飛索滑行可以單靠地心吸力下坡滑行，無需借助其它的能源驅動裝置。
- **意想不到的 Wow 元素**：參加者在旅程中能夠欣賞北大嶼郊野公園壯觀連綿的山脈、山谷、石山、山峽、瀑布、海景等豐富元素，令旅程更具吸引力。

- **寓教於娛的潛力**：結合北大嶼郊野公園的地理環境、種類繁多的動植物、大佛周邊的文化傳統氛圍，令旅程能夠成爲洗滌身心靈的戶外活動
- **現有的基礎設施**：正如前文討論提及，因爲項目鄰近昂坪 360，能夠充份善用該處的公共交通和物流設施。

ii) 提升康樂活動的樂趣- 吸引年輕人

推行飛索滑行活動，能讓漁農自然護理署吸引更多年輕好動的對象，推廣其在康樂、教育和保育的使命。並能夠令香港成爲在東亞地區之中率先推行這項嶄新生態歷奇活動的城市。

《郊野公園條例》第四部份指出，當局有責任對郊野公園和特別地區推出適當的措施(i)推動其用途與發展，以促進康樂和旅遊業。

推行飛索滑行活動，將能大大促進北大嶼郊野公園的康樂和旅遊發展，尤其當遊客在纜車車廂內眺望到這項非常吸引的設施，而明白到本來根本沒有路徑可以通往這些迷人的地點，就會更渴望參加。活動鼓勵不同年齡性別的參加者來體驗郊野公園的樂趣。在印度，我們的參加者介乎 10 歲到 80 歲，35 歲以下的佔 75%。我們希望項目能吸引更多年輕遊客到訪該區。

iii) 透過戶外體驗和導賞學習保育知識

漁農自然護理署積極透過「*體驗自然*」項目，爲年輕人舉辦一連串的戶外活動，提倡郊野樂行、野外研習和郊野體驗等，另外亦爲學校舉行野外學習活動。昂坪 360 文化中心提供導賞遊，旨在增升公眾對環境和生態保育的意識，鼓勵香港的旅遊業向道德、有責任而可持續的方向發展。

我們的飛索滑行之旅結合遠足、空中歷奇和戶外導賞，能夠充份體現上述的環保精神，協助漁農自然護理署進一步實踐其教育目標。我們銳意爲北大嶼山提供一個互動的學習平台，無論任何年齡的參加者都能夠學習到自己對保育郊野公園的責任、當中的生態保育意義和區內正面臨的環境挑戰等。

- **好玩互動的網站**－ 只需點擊網站中的地圖，即會彈出關於生態和文化相關的有趣資訊，讓遊客在出發前展開學習，亦是活動後理想的伸延閱讀。
- **資訊展板**－ 旅程中參加者會發現不同的資訊展板，以有趣的方式介紹動植物、保育和漁農自然護理署日常工作的資訊。
- **知識豐富的指導員**－指導員會在沿途向參加者講解生態和保育的有趣知識。
- **與大自然重新連繫**－活動期間，參加者可以重拾對奇妙大自然的熱愛與崇敬，以獨一無二的方法，真正融入大自然之中。
- **提升教習效果**：沿著索道滑過山峽，在瀑布旁遠足，跨越壯闊的深谷…這些精彩的歷程將會交織成獨一無二的戶外學習體驗，締造畢生難忘的回憶。

我們很高興能夠有機會與漁農自然護理署與昂坪自然中心合作，攜手策劃項目的教育內容。爲支持漁農自然護理署一直對公眾免費開放使用教育資源的信念，我們亦願意於指定時間向部份公眾團體如學校等提供優惠減費活動。

iv) 透過持續發展旅遊推動環境保育

對 Flying Fox 來說保育所以非常重要，除了因爲我們需要美麗的自然環境來進行活動，亦因爲我們希望向參加者宣揚一個訊息——保育其實可以很有趣，而旅遊業不但可持續發展，亦可以很環保。

根據香港亦有簽訂的國際性《生物多樣性公約》指出，假如本地社區直接參與旅遊營運，可持續發展的旅遊業則能夠對生物多樣性保育發揮正面作用。它能夠提供一個重要的教育機會，增加大眾對自然生態系統的知識和尊重。它將能夠創造就業機會與回報，成爲保育自然環境的誘因。它亦能夠提升大眾對以天然生態系統提供的產品和服務的應有意識。可持續發展的旅遊業顯而易見能夠平衡大眾對經濟與環境的關注，對可持續發展添上實際意義。

雖然保育科學在我們的能力範圍之外，但爲遊客在北大嶼郊野公園提供一次互動有趣的戶外歷奇體驗，必定能夠鼓勵他們更熱愛大自然，並能將這次經驗所學到的知識爲基礎，更深入了解爲何保育那麼重要。

v) 對接近昂坪的小部份郊野公園範圍帶來輕微影響

Flying Fox並不要求使用郊野公園的大面積，我們的項目營運範圍只會貼近昂坪360的纜車站和七號纜塔。由Flying Fox所建設施的地面佔用面積爲740平方米 (0.07公頃)，索道和吊橋所需的半空範圍爲1850平方米 (0.19公頃)。

《郊野公園條例》第十六部份提及到，應該控制任何會明顯影響公眾享受郊野公園和影響公園環境的活動。而我們並不認爲在北大嶼郊野公園推行這項嶄新的康樂活動與條例存在衝突，我們亦會確保公眾和持份者仍然能夠繼續享受遊覽公園的樂趣。

我們建議使用的地點，目前並沒有道路讓公眾前往，亦沒有足夠的設施可以使用。它的東面原爲昂坪 360 的昂坪棧道，並在纜車站 200 米外有一道上了鎖的大閘以防遊客誤闖。除此之外，該區並無其它路徑，而且地面崎嶇不平、地勢陡峭，未能用作爲康樂活動用途。公眾唯一可以使用到郊野公園的這個範圍，就是從纜車車廂中眺望，或是在前往轉向站的郊遊徑上眺望。

d. 好處和受益對象的總結

對漁農自然護理署及郊野公園的好處 ：

- 向旅客展現香港豐富的生態和地貌多樣性，見證漁農自然護理署多年來在保育方面的努力成果
- 令目前的康樂活動更多元化──拉闊到訪郊野遊客層，吸引更多全新、更年輕的遊客
- 以更方便易達的方法，鼓勵海外遊客來港欣賞壯闊動人的大自然景色和了解保育工作
- 在漁農自然護理署的授權下，協助其就康樂、教育和保育方面用途發展郊野公園
- 在提升香港在亞太區內生態旅遊發展上的地位，作出適度貢獻
- 爲特區政府增加地租收入，並可將該款項再次投入應用於保育北大嶼

郊野公園之中

對香港市民的好處：

- 開創「不可不試」的生態歷奇體驗，令香港成爲更吸引外地遊客的旅遊目的地，擴闊遊客群種類
- 爲辛勤工作的香港人提供一個嶄新而有趣的戶外減壓活動，讓他們在清新的空氣中做運動，變得更加健康，特別適合年輕人
- 爲不同年齡的市民（尤其年輕人）提供一個在野外學習的機會，將有趣而深刻的學習體驗牢牢記在腦海
- 吸引投資，創造就業機會，讓本地員工向業界專才學習知識

對大嶼山的好處：

- 回應旅遊事務署將生態旅遊視爲優先項目的發展方向，爲持續發展北大嶼山作出貢獻
- 令大嶼山現有的景點更豐富
- 讓香港市民和外地旅客覺得大嶼山更精彩吸引，間接推動當地的經濟發展
- 讓遊客有更多的景點參觀，在該區停留更長時間，透過遊客增加消費而爲當地創造更多商機

7. 環境影響管理– 附錄 3 摘要

Flying Fox 的環境影響管理策略仍在草擬當中，仍需與漁農自然護理署和其他相關持份者經過討論後再作出修訂。我們曾在北大嶼郊野公園的多個地點作實地考察以取得第一手資料，亦曾按香港鐵路有限公司的「東涌吊車項目環境影響評估報告（最終修訂）」文件（*Tung Chung Cable Car Project, Environmental Impact Assessment (Final)*）作出研究。我們打算沿用該報告中的「環保行爲守則」(Environmental Code of Conduct)。

按我們對《環境影響評估條例》的理解，本項目無須作出一份正式的環評報告。然而，我們相信較理想的做法是以港鐵就纜車所作的環評報告爲參考藍本，清楚指出所有涉及環境影響的項目。

a. 所需用地和半空佔用空間

- 路徑：現時救生徑的200米路段；430米新建路徑；索道之下並無路徑
- 雲際站 (CloudStation) / 降落點：直徑10米，高度2-3米；4個站每個78平方米 =共 312平方米
- 索道的半空佔用空間：2 條平衡索道，每條300米長x 3米闊 = 1800平方米
- 吊橋的半空佔用空間：50米長x 1米闊 = 50平方米
- **Flying Fox專用地面面積：約740平方米/ 0.07公頃**
- **Flying Fox需用半空面積：約1850平方米/ 0.19公頃**
- **專用地面面積及需用半空面積總和：約2,590平方米/ 0.26公頃 (約爲北大嶼郊野公園總面積的0.01%)**
- Flying Fox 所需用地處於昂坪分區計劃大綱(Outline Zoning Plan)以

外。

- 我們需要採用東涌纜車站及昂坪市集的商業用地作爲銷售地點；我們亦需要在纜車站內或鄰近地點使用一個面積不大的房間，以儲存遊客用的安全裝備、其他配件和工具。

b. **建築原則和基礎建設規劃**

- Flying Fox 將採用減少對環境造成影響的建築原則，確保施工管理妥善並符合環保。
- 設計原則包括：避免影響景觀、易於興建、易於保養、美觀並與融入環境。
- 所有建築配件將預先組合完成，以減少於現場儲存物料的需要。物料將以纜車運往現場以減少對環境的影響。預料工程需時 2-3 個月。
- 當設計元素獲得漁農自然護理署及機電工程審批後，我們將按照規劃階段詳載的規定，發出建築方法報告書。
- 四條飛索滑道由直徑12-14毫米的鍍鋅電纜索組成，鋪設於兩個斧形架台之間；每一滑道之上另設一條直徑相約的服務纜，以協助系統的運作煞停。
- 四個雲際站 (CloudStation)分別將四條飛索滑道的一端固定於地面，形成一個供煞停系統使用的建築，並爲遊客提供一個在上滑道前和降落後有秩序地輪候的地點。構思中的設計將使用10米直徑的環形CloudStation，以耐候鋼或鍍鋅鋼打造，建築內使用預先定形的固定物，以減少使用大型鋼筋水泥打造地基。此建築將以小型鋼筋水泥在平坦的地面上打地基；如地面位置不平，所需的地基可能較深。有關情況需要經過地質測量才能決定。
- 如果雲際站(CloudStation)的設計不適合郊野公園環境使用，我們歡迎與漁農自然護理署再進行商討，尋求其他登滑道及降落的設計，如使用木材等天然物料。
- 我們將建築一條長50米、闊1米，重量較輕的吊橋，跨越深屈峽谷。預算將以金屬纜索、天然繩索結合木質甲板建造，並直接固定於岩石上。情況視乎地質測量而定。
- 路徑方面，四條全新路徑的共長430米，闊1米，連貫整個設施各環節，山脊漫步環節的部分路徑爲布滿岩石的山徑，或須作出調節。現有路徑將盡量被保留。
- 我們會邀請漁農自然護理署就路徑設計提供意見，以減輕對環境的影響，例如是否採用石徑、安裝鋼鐵格柵或鋪設木料等。
- 有關興建設施的相片和初步設計圖，請參閱附錄 1。

c. **空氣質素影響評估**

- 因爲工程不涉及大量鑽探和混凝土使用，預料施工期間只會產生極輕微的空氣污染。
- 項目營運無需使用能源，換言之，Flying Fox 的飛索滑行之旅是零排放的活動。
- 爲減低火災危險，項目營運範圍內全面禁烟和不准煮食。

d. **水質影響評估**

- 項目的營運地點爲集水區，我們將需要採取適當的設施以保護水質。
- 施工期間，我們將會採取適當措施以防止建築物料溢出或燃料洩漏，防止河道因侵蝕而沉積，並會減低工程和工人製造的污水對環境的影響。
- 項目營運期間，參加者不准進食和亂拋垃圾。
- 項目並不設洗手間。施工工人與遊客將使用昂坪 360 的洗手間。

e. **廢物管理評估**

- Flying Fox 將制訂一份廢物管理計劃以減低泥石、建築廢物、化學廢物、都市固體廢物帶來的影響。
- 所有廢物將被立即移離現場，並不會儲存於現場或作現場焚化。
- 挖掘所得的泥石將盡量重用於其它用途。

f. **噪音影響評估**

- 地盤將採用產生較少噪音的機器，並在適當的地點使用隔音裝置，減低噪音的影響。
- 我們將注意符合《噪音管制條例》規定，並會考慮對最強接受者(NSRs) 的影響和限制項目噪音維持低於 300 分貝。
- 項目營運時將不會產生明顯噪音，而使用塑膠覆蓋物料可減低索道滑輪所產生的噪音。

g. **生態影響評估**

- 項目營運範圍內的自然生態棲息地包括河道、木林及高灌木叢林，被評估爲具有中等至高等生態價值。Flying Fox 將盡量採用荒廢的農地、草地、高低灌木叢林，而不會使用木林。飛索滑道和吊橋將跨越深屈澗的支流。
- 項目營運範圍內最具生態價值的棲息地爲 Zip 2 索道與吊橋之間的高灌木林，距離約 80 米。
- 我們將採取適當的措施以防高灌木叢截斷，亦會按需要植林以作補償。
- 我們將嚴守避免損害、減輕損害和補償損害的環保大原則。
- 我們將採用適當的措施，以確保河道不受工程廢料、污染物和沉積物影響。
- 大部份需要保育的生物物種廣泛分佈於不同角落，並非集中於一個棲息地。但兩棲類動物因爲移動範圍有限，身處地點比較集中。
- 罕有的枯葉蟾蜍曾在深屈的支流（亦即 Zip 1 索道至 Zip 2 索道之間的路徑）被發現。我們將會採取特別措施以減輕對枯葉蟾蜍的滋擾。
- 相信項目不會對移動能力較高的動物造成明顯影響，例如雀鳥、大型哺乳動物、大部份爬蟲類、蝴蝶和蜻蜓成蟲。
- 我們相信不會出現嚴重的雀鳥衝撞問題。沒有證據顯示該地點是候鳥遷移的路線，亦沒證據顯示該處鄰近候鳥的繁殖地或幼鳥培育地。香港暫時未有雀鳥因爲衝撞纜索而引致大量死亡的報告。

h. **景觀及視覺影響評估**

- 項目對區內景觀及視覺影響並不明顯，原因如下：
- 項目所需要興建的設施與毗鄰昂坪纜車的設施相比，規模遠遠較小。
- 項目設施以能夠自然融入原本的天然景觀和地形爲設計大前提，避免筆直的路徑或突兀的天際輪廓線條。

- 項目設施只能從兩個角度看到：
  - 從纜車車廂中眺望：乘客可在纜車設施後方，看到 Flying Fox 項目設施
  - 從昂坪向北至轉向站的其中一段郊遊徑中眺望：這段郊遊徑的景觀，原本西面已被七號纜塔以東的一個巨型山丘阻擋，當遊客眺望纜車站和其車廂的後方，就會看到 Flying Fox 項目設施。
- 換言之，主要能看到項目設施的旅客均爲昂坪纜車車廂內的乘客，因爲他們本來已較能接受郊野公園內的這些人工的設施，相信不會對規模更小的 Flying Fox 作出反對。

i. **文化傳統影響評估**

- 項目對區內的文化傳統並不會構成視覺或美感上的不良影響。因爲所有項目工程均與禪寺有足夠距離，所涉及的結構亦由木林或山丘隔開。
- 我們將會確保路徑避過任何墓穴，並預留足夠的空間。
- 無論從天壇大佛、寶蓮禪寺或仙人龕位，均不會看到項目設施。
- 項目營運範圍內，並無發現任何風水裝置。

j. **先例：美國黃石公園飛索滑行環評報告(詳見附件 D)**

- 一個由美國政府森林服務機構就於黃石公園內興建七條飛索滑道作所出的環評報告指出，項目並不會影響到易受影響的生物物種，亦不會破壞自然棲息地。
- 評估報告建議如要進行重大的地面工程和使用重型機器，限制只在出現輕微土壤壓實和河流沉積情況的季節進行和使用。

8. <u>安全及風險管理 –附錄 4 摘要</u>

a. **概覽及安全紀錄**

- 飛索滑行非常安全，是一種既刺激又節制的歷奇活動。
- Flying Fox 相信安全第一：自 2009 年 1 月開始，我們已成功完成 200,000 次安全的飛索滑行之旅。

b. **安全標準**

- 我們的設施包括堅固耐用的鍍鋅鋼柱，符合歐洲 EN 15567 對纜索歷奇活動的標準，亦符合 ISO 4309 對纜索的監管規格。
- 機電工程署在參考業界的國際標準時;建議 Flying Fox 沿用《2003 年版機動遊戲實務守則》。

c. **進口設備**

- 參加者所穿載的安全裝備均從國際信譽品牌（如法國的 Petzl 品牌）訂購進口，並符合世界山岳聯(UIAA)水平。
- 參加者將由兩個連接點連繫索道，分別由可負重 22kN 的收緊索（lanyards）接連滑輪系統，以及接連自動上鎖的攀山鉤環（self-locking karabiners）。

- 每位 Flying Fox 指導員均會佩戴有一個救生袋，當中包括救生必須裝備，能夠拯救身處索道任何位置的參加者。

d. **遊客安全指引及守則**

- 參加者在出發前，需接受指導員作出的完整安全指引，並練習滑行技巧。
- 參加者亦需簽署「風險同意聲明」

e. **指導員培訓、監察和溝通**

- 每一個場地均以一個由海外和本地具經驗指導員組成的隊伍營運，再由一位具國際攀山教練資格的經理領導。
- 所有指導員均符合歐洲專業標準，每個月均會就其領團和拯救能力作出評估。他們亦擁有急救證書。
- 旅程中的任何時候，參加者均由 Flying Fox 指導員陪行指導。每次參加者需扣上索道或從索道中解扣離開，均由指導員親手負責處理。指導員亦負責管理參加者在旅程中的安全流程。
- 參加者每次均會組成最多一行 12 人的團隊，由兩位指導員帶領。在遊客高峰期，我們會派兩名指導員在雲際站 (CloudStation)和吊橋協助控制人流。
- 指導員和經理會透過 UHF 手提對講機溝通，所有對話內容均有紀錄。

f. **標準作業流程（SOPS）、風險評估 與緊急措施**

- Flying Fox 與世界級的高空纜索歷奇專家，研究出一套標準作業流程（SOPS），涵蓋所有日常營運細節和急救程序。
- 此標準作業流程與公司政策已詳細刊載於網上的《營運手冊》內。
- 每個場地均有一份每季更新一次的風險評估文件。
- 在不大可能發生的情況下，如設施在遊客滑行過程中停頓，我們的工作人員均受過訓練並有足夠裝備，能於 20 分鐘內將遊客拉回滑道的一端，而無需將其降落至地面。
- Flying Fox 已因應大嶼山的情況制訂出標準疏散守則，以於天氣惡劣的情況下應用。
- 我們將與纜車營運商保持緊密溝通，以便在香港天文台發出惡劣天地警報時即時了解情況並作出回應。我們將採用與 NP360 一致的風速警報標準進行疏散並關閉設施。當出現雷電和暴雨時，設施亦將關閉。

g. **實地檢測**

- **每日檢測項目：**目測設施；參加者出發前檢查安全裝備；試滑每條索道和試用急煞系統。
- **每月檢測項目：**徹底檢查設施；調校索道以確保最高使用安全；仔細檢查和保養個人防護裝備(PPE)。
- **定期/季度檢測項目：**徹底檢查索道是否有破損，檢查關鍵的纜索 U 型螺栓(U-bolt)是否扳鉗至正確的拉力，紀錄所有索道與停留區的拉力讀數，更新風險評估報告，進行地面維修工作。
- **年度驗證：**聘任獨立第三方的專業人士按 EN 標準，對關鍵的安全風險項目進行驗證測試。

h. **管理總部**

- 項目經理將按日或按月簽署確認齊全的文件及安全附件。
- 一份概括已完成監控及培訓的聯網營運報告，將電郵給營運總監。
- 營運經理每月巡查每個工地，以確保文件、培訓及監控均獲妥善處理。

i. **公眾進入**

- Flying Fox 只會准許已完成正確指導與安全指引程序的參加者進入設施範圍。
- 我們將會在可通往索道和吊橋的雲端站(CloudStations)加設閘門，以防公眾誤闖 Flying Fox 設施。
- 我們將與漁農自然護理署討論，是否准許公眾在沒有監管的情況下自由進出 Flying Fox 的路徑。

9. 項目進程

Flying Fox 於 2011 年 8 月來港進行實地考察，初步評估項目的可行性。其後於 2012 年 8 月來港作第二次實地考察並確定項目可行。在首次來港時，我們參與了一個聯席會議，與會者包括旅遊事務署和香港旅遊發展局的代表，我們在會議上介紹了 Flying Fox 的背景和意念。

2011 年 9 月 10 日，Flying Fox 的總監與香港旅遊發展局副總幹事雷詠閒女士在印度新德里會面，討論飛索滑行之旅項目。會面期間雷女士確認項目已獲香港旅遊發展局總幹事劉鎮漢先生與主席田北俊先生的支持。

2012 年 1 月 6 日，Flying Fox 出席了由旅遊事務署召開的跟進會議，會議上我們向旅遊事務助理專員馮浩賢先生及香港旅遊發展局業務拓展總經理郭志傑先生，報告了關於項目可行性的研究數據。

2012 年 8 月 15 日，旅遊事務署召開了第三次會議，會上 Flying Fox 向香港特區政府多個相關部門介紹生態歷奇活動的營運細節，以取得各個部門的意見回饋。與會部門包括旅遊事務署、香港旅遊發展局、漁農自然護理署、機電工程署、土木工程拓展署和地政總署的代表。

各個部門均對項目提供了寶貴實用的意見，並對項目如何通過申請程序作出指引。我們深信項目能夠滿足在香港營運的最高標準要求與符合所有相關法規。其中，我們得到郊野公園主任(大嶼山)楊柳菁博士的提點，建議我們需向郊野公園及海岸公園委員會(CMPB)提交建議書，以取得漁農自然護理署的初步批准。

本建議書爲呈交予郊野公園及海岸公園委員會之初部建議書，期望可以獲得委員會的意見回饋以在適當地方作出修訂，令項目更趨完善。謹此希望本項目能獲委員會的接納與支持，爲香港帶來一個嶄新的生態歷奇旅遊項目。

以下機構與人員曾對建議書作出建議、支持和肯定：

- 旅遊事務署
- 香港旅遊發展局

- 昂坪360有限公司董事總經理邵信明先生
- 香港鐵路有限公司 總持續發展事務經理馮悟文博士

以下段落內容由旅遊事務署提供 ：

“旅遊事務署歡迎在北大嶼郊野公園推行飛索滑行之旅的建議，並鼓勵其它政府相關部門考慮由 Flying Fox 提出的建議書。由於發展同時具備技術可行性和環境合適性，與香港推行綠色環保與生態旅遊的發展方針如出一轍，相信該項目將成爲北大嶼山的嶄新景點，讓世界各地的遊客發現香港郊野公園鮮爲人知的自然美。”

附件 ANNEXES

1. 地圖、相片及設計圖
2. 原因與優點
3. 環境影響管理
4. 安全及風險管理

附錄 APPENDICES

A. 參考資料
B. 定義與詞彙
C. 世界各地在國家公園內的飛索滑道
D. 美國黃石公園研究個案
E. 資訊展版範例
F. 營運地點內的自然棲息地生態重要性
G. 環保行爲守則
H. 風險緩減措施

註： 附錄內載有 Flying Fox 向郊野公園及海岸公園委員會提交建議書的主要內容，我們建議委員會成員在審批飛索滑道之旅的建議時，參閱附錄與附件的全文內容。

本文爲英文建議書之中譯版本，僅供參考之用。如有歧義，概以英文版本爲準。

Working Paper submitted to the Country and Marine Parks Board

Proposed Flying Fox Eco-Adventure Zipline Tour at Ngong Ping, Lantau North Country Park

17th October 2012

ANNEX 1. MAPS, PHOTOGRAPHS & PROPOSED DESIGNS

1.1 Images of Flying Fox installations
1.2 Maps of the operational area and proposed installation
1.3 Photographs indicative of the types of structures envisaged
1.4 Photographs of proposed locations of zipline tour infrastructure
1.5 Images showing the context for visual impacts

Annex 1.1 Images of Flying Fox installations

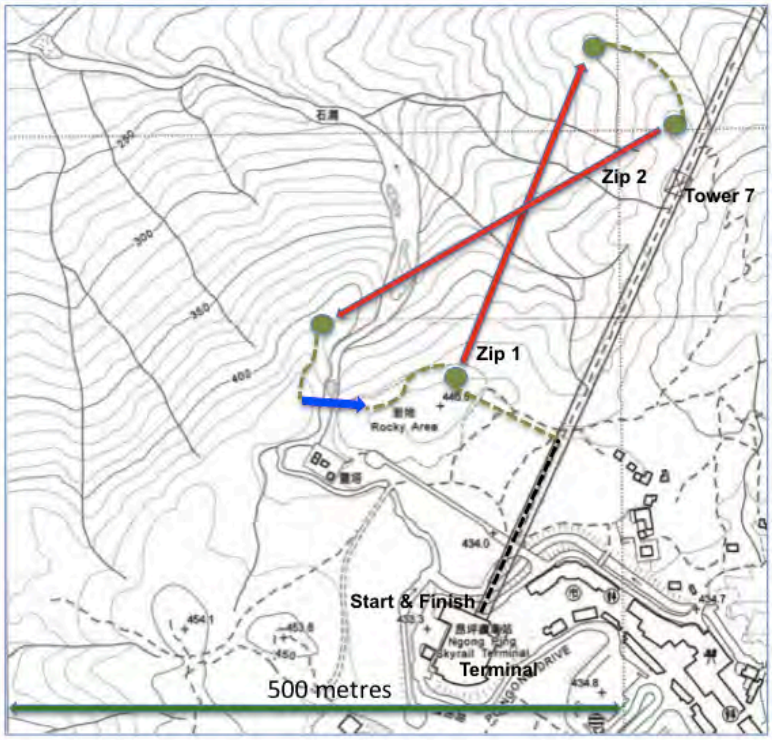
Flying Fox Neemrana

Flying Fox Jodhpur

Flying Fox Kikar

Annex 1.2 Maps of the operational area and proposed installation

Proposed route & footprint of Flying Fox Lantau



- Approach walk: 300m (200m of existing path, 100m of new path)
- Zip 1: 300m twin zipline
- Path to Zip 2: 130m
- Zip 2: 300m twin zipline
- Ridge walk: 80m
- Suspension walkway: 50m span
- Rock ramble: 120m then return to start along approach path
- Total tour length: 1,580m
- Land area for launch / landing: 78m^2 x 4 sites = 312m^2
- Total length of new paths: 430m x 1m wide = 430m^2
- **Total land area approx. 0.07ha**

CloudStation launch / landing

Suspension walkway *New path*

Zipline *Existing path*

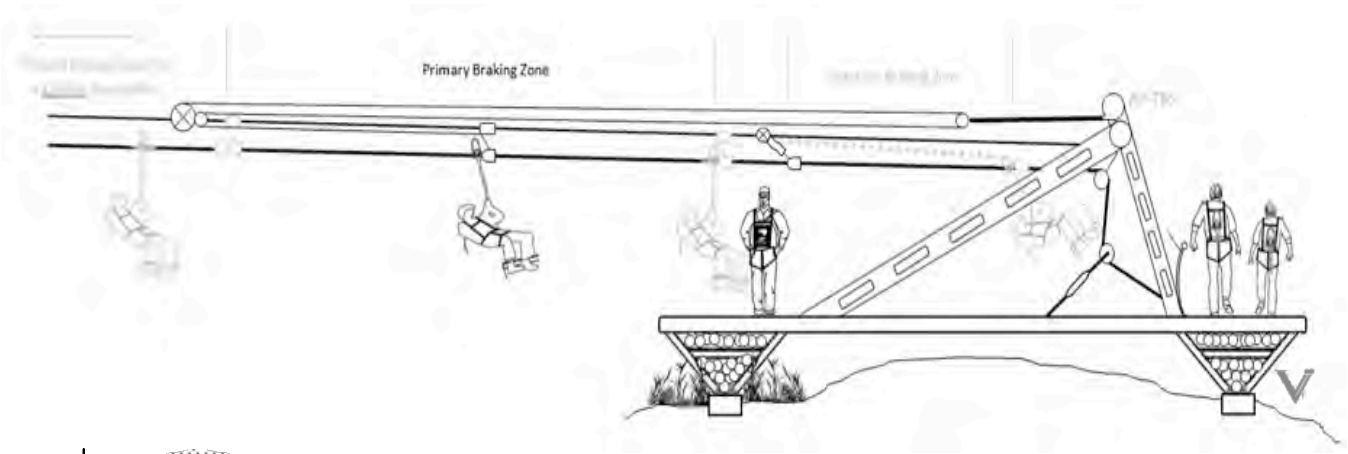
Zip Adventures Ltd 2012©

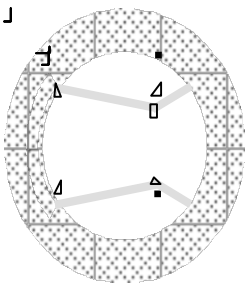
Annex 1.3 Photographs indicative of the types of structures envisaged

Schematic elevation of proposed zipline tour

CloudStation

Sample design elevation & plan for structure of 10m in diameter, 2-3m high, which acts as launch & landing platform, zipline anchoring system and structure to support braking system





<u>CloudStation</u>: bio-mimicry, artist's impression when in location, detail of tread, natural discolouration

Suspension walkway

Wire rope, natural rope & timber deck

Path design options

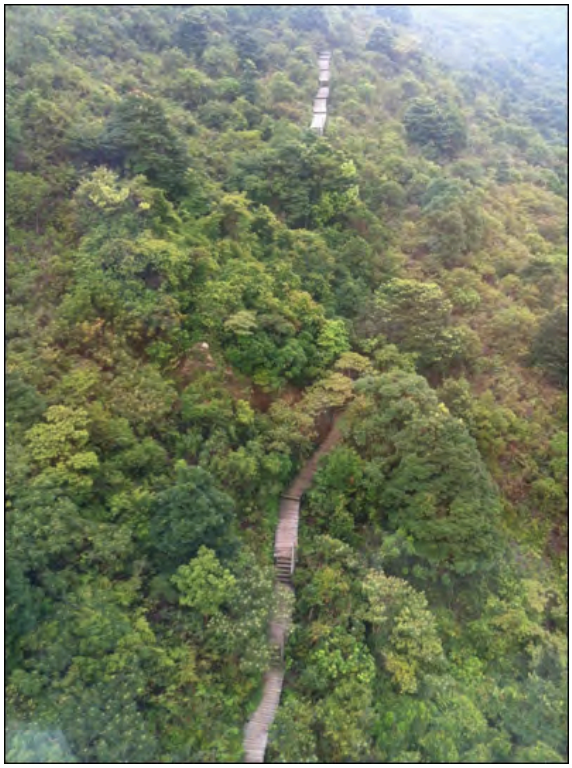
a) Galvanised steel grated & raised walkway

Path design options:

b) Stone paved – as per existing Lantau Trail

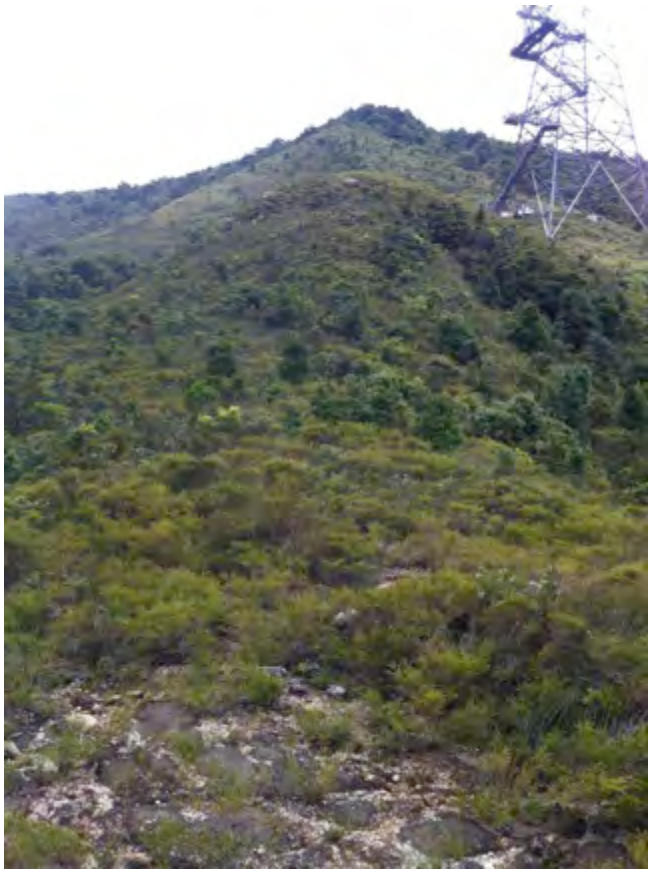
Path design options:

b) Timber raised boardwalk – as per sections of existing Rescue Trail



Annex 1.4 Photographs of proposed locations of zipline tour infrastructure

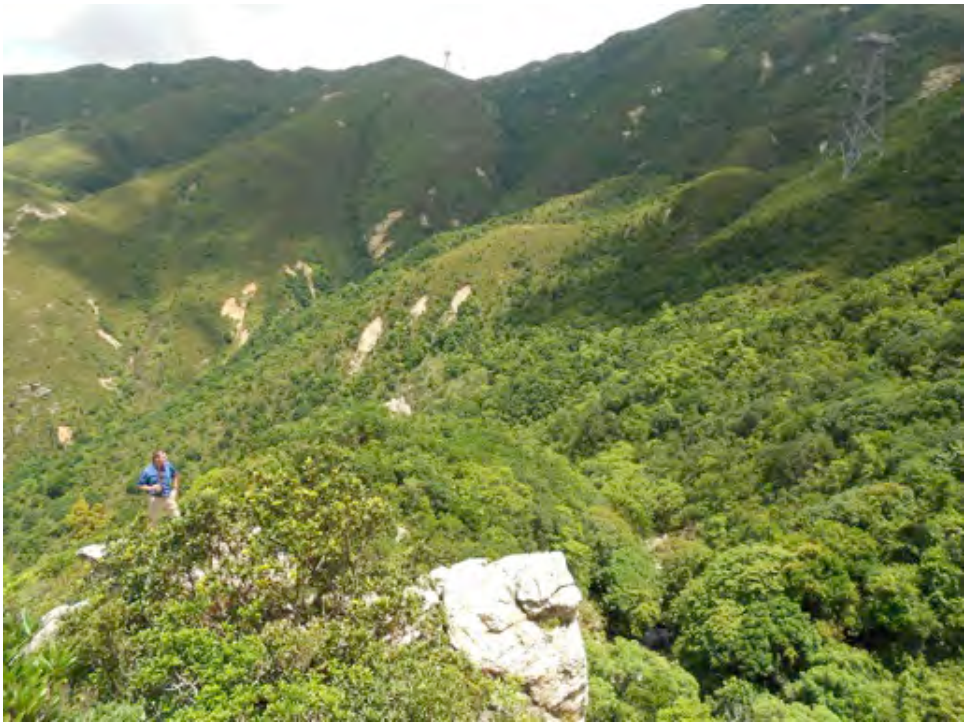
Launch of Zip 1 options – grassland (top) or rocks (bottom)



Landing of Zip 1 and route of path to launch of Zip 2, towards Tower 7

Launch of Zip 2, beside Tower 7

Landing of Zip 2 on rocks



Route of ridge climb from Zip 2 towards Suspension walkway (ridge to right / far side of gorge)

Route of Suspension walkway – rocks to rocks, beneath skyline

Section of Lantau Trail to be used as access path

Annex 1.5 Images showing the context for visual impacts

View of Flying Fox operational area & proposed installation from cable car

- This is the view which the great majority of Country Park users will have of Flying Fox
- The image shows an artist's impression of the zipline tour installation
- Note the 47m high Tower 7 immediately adjacent to the operating area
- Note the 12m high white Terminal Building beyond
- Note that the view is framed by pre-existing cable car infrastructure

Distant view of operational area from cable car

- Note that the view is framed by pre-existing cable car infrastructure
- Note the large knoll to the left of the cable car Tower 7 which conceals the operational area from the Ngong Ping plateau and Lantau & Country Trail

View of operational area from the south-west

- This is a view from a hilltop with no public access paths
- Note the 47m high Tower 7 and cable car gondolas adjacent to the operating area
- Note the upper and lower knolls to the left of the Tower where CloudStations will be located
- The CloudStations will be halo-shaped, 2-3m high and 10m in diameter
- Tower 7 is 47m high and its legs occupy a footprint of 35m x 35m

View of operational area from cable car, as it crosses Tower 7

- This is the view which the great majority of Country Park users will have of Flying Fox
- Note the 12m high white Terminal Building beyond
- Note that the view is framed by pre-existing cable car infrastructure

View of rescue trail from cable car

- Note how visible the trail is, both in terms of finish and straightness
- Flying Fox trails would seek to blend in by using natural materials and meandering around the contours of the land

Working Paper submitted to the Country and Marine Parks Board

Proposed Flying Fox Eco-Adventure Zipline Tour at Ngong Ping, Lantau North Country Park

17th October 2012

ANNEX 2. JUSTIFICATION & BENEFITS

ANNEX 2. JUSTIFICATION & BENEFITS

2.1 Why it's good for Hong Kong

a. Showcase Hong Kong's rich ecological and scenic variety

One of the world's great cities, Hong Kong is also among the most ecologically diverse and professionally-managed nature conservation areas in Asia.

Seventy per cent of the land of Hong Kong is countryside. Forty-three per cent of the total area is under statutory protection as Country or Marine Park, containing an extraordinary and dense variety of plant and wildlife species and landscapes; from sandy and rocky coastlines to wetland, scrubland, grassland and woodland, culminating in towering 3000 ft. peaks.

The countryside and biodiversity of Hong Kong can be enjoyed in a variety of ways by the people of Hong Kong and her visitors. There is an extensive range of nature parks and ecological reserves, varying in scale from botanical gardens and small urban parks to the Hong Kong Wetland Centre and the Hong Kong Global Geopark of China, which encompasses 50 km^2 of the New Territories.

There are over 300 kilometres of hiking trails – and a growing network of designated mountain bike trails – attracting 12 million visits annually. Situated along these trails are beaches, barbecue sites, child recreation areas and interpretation centres. In addition, beyond the Country and Marine Parks, Hong Kong offers a kaleidoscope of outdoor recreation opportunities, from sailing and swimming to golf and go-karting.

Hong Kong has a tremendous variety of scenery and biodiversity for the visitor and the resident alike to enjoy and appreciate, and a proud legacy of conservation and stewardship of its countryside to showcase. This makes Hong Kong the ideal location for an eco-adventure activity.

b. Hong Kong is missing out on eco-adventure

And yet for somewhere with such a high proportion of countryside to urban land, with such a breadth of landscapes and species, and a substantial and sophisticated resident and visiting population, eco-adventure is less developed in Hong Kong than in many other Asian cities or in national parks worldwide.

Before providing examples of eco-adventure which could be replicated in Hong Kong, it is important to clarify what we mean by eco-adventure because it tends to be over used as a catch-all. For a full definition see **Appendix B**; in short, eco-adventure can be defined as *the use of mild or moderate physical adventure to enhance the enjoyment and appreciation of an ecologically diverse, important or scenic landscape.*

Zipline tours (and canopy tours[1]) do this brilliantly. They allow a participant to access wild and pristine locations without significantly impacting those locations; for

[1] A canopy tour is a (usually) guided adventure journey from tree-to-tree specifically within the canopy of a forest by means of platforms, ladders, suspension walkways, alternative

instance, they do not require highly mechanised or powered systems, the construction of invasive roads, use of vehicles, or any resource depletion. The installation and operation of the zipline tour touches lightly on the ground and it is designed to harmonize with its surroundings.

Ziplines give a feeling of flight, opening up exhilarating 'never-before-seen' vistas and perspectives to a large number of people – of all ages and physical abilities. Zipline tours are long enough to allow participants to absorb themselves in dramatic views and interesting interpretation, but short enough to fit into a morning or afternoon's activity. They promote an enjoyment and renewed appreciation of the outdoors and encourage moderate physical exercise.

There are so many commendable zipline or canopy tour eco-adventures around the world that it is difficult to narrow down a few good examples. Canopy and zipline tours exist in North America (the USA has 100 individual sites), Central and South America, South Asia, Europe (the UK Forestry Commission alone has nearly 30 privately operated sites within government forests), Australia and New Zealand. For a selection of international precedents for zipline tours in national parks, see **Appendix C**.

In Southeast Asia they are sparser, but nevertheless there are thriving zipline or canopy tours in Thailand, Malaysia, the Philippines and Singapore. The HSBC Treetop Walk, although it is a canopy not a zipline tour, is a good example of the principle behind eco-adventure. Located in the MacRitchie Reservoir Park, Singapore, it has a dual stated purpose. "Besides providing another avenue for nature recreation for Singaporeans… it also helps to … further our understanding of how forest ecosystems work", according to the National Parks Board website.[2]

Interestingly, rather than being perceived as invasive or harmful to the Park's biodiversity and landscape, this canopy tour – which consists of a sizeable steel suspension walkway and newly constructed timber boardwalks – was conceived as a new way to enjoy and learn about the natural environment and a new form of outdoor recreation for the local population.

Another good example, further afield, is the recently approved 7-zipline tour for the Shoshone National Forest at Yellowstone National Park, USA. In sanctioning this project, the US Department of Agriculture's Forest Service assessment recognised that "the zip line tour would provide a recreation opportunity not currently available in the area."[3]

Zipline tours use topography and dramatic views to produce a completely new form of recreation – which attracts new types of visitors and provides the existing visitor

---

crossings, swings and ziplines. The original canopy tours of Costa Rica are a series of ziplines and suspension walkways which transport participants from platform to platform within and over the rainforest canopy.

[2]http://www.nparks.gov.sg/cms/index.php?option=com_visitorsguide&task=attractions&id=64&Itemid=73

[3] United States Department of Agriculture, Forest Service, August 2012. Predecisional Environmental Assessment: Sleeping Giant Ski Area Development Projects. Wapiti Ranger District, Shoshone National Forest, Park County, Wyoming, p.58-59

with another reason to return. As the promoter behind New Zealand's first canopy zipline tour operation – on the densely forested Mamaku Plateau near Rotorua – explains: "many of our customers will have never walked in forest like this full of giant, centuries old native trees, let alone explored it at heights of 22 metres above the forest floor, where the views are simply breathtaking,"[4]

If this is true of New Zealand, it's true of Hong Kong. How many people in Hong Kong (even those who ordinarily visit a Country Park) have gazed down from a 50m suspension walkway at a waterfall descending through the gorge below, or arrived at a rocky mid-ravine knoll to marvel at a dramatic view of the South China Sea on one side and the towering heights of Hong Kong's second tallest peak on the other? With the zipline tour, this will become a reality.

Currently, Hong Kong does not have a zipline or canopy tour. There is no suitable forested area which can support a canopy tour, but the addition of a zipline tour and suspension walkway would provide an additional and varied recreation activity for its residents and another way in which to experience Hong Kong's unique landscape and biodiversity.

c. Eco-tourism: the missing link in Hong Kong's tourism portfolio

In the words of the Tourism Commission's August 2011 document, *Hong Kong: The Facts*, "the tourism industry is a major pillar of the economy of Hong Kong." The Tourism Commission's objective "is to establish and promote Hong Kong as Asia's premier international city, and a world-class destination for leisure and business visitors."[5]

A world class city which is 70% countryside needs world class eco-tourism.

This explains why the Tourism Commission has identified eco-tourism as a key development objective for Hong Kong. And why HKTB launched *Great Outdoors Hong Kong!* in 2009 "to promote the Hong Kong National Geopark, the natural scenery of outlying islands, popular hiking trails and other green attractions."[6]

Eco-tourism is important because it helps to increase visitor numbers and diversity, and enhance the quality of the visitor experience. From our operations in India, we have identified four elements to this phenomenon: attractiveness; visitor diversification; repeat visits; visit duration:

- **Attractiveness:** at our first location, Neemrana, a 15th century fort in Rajasthan, based on four years of operations, we know that 65% of our current visitors come to the site especially because of Flying Fox. These are new visitors to the location.

[4] Rotorua Canopy Tours director James Fitzgeraldhttp://www.newzealand.com/travel/media/press-releases/2012/7/nature_new-rotorua-canopy-tours.cfm
[5] Tourism Commission, Hong Kong: The Facts, August 2011
[6] Tourism Commission, Hong Kong: The Facts, August 2011

- **Visitor diversification:** the zipline tour also diversifies the visitor demographic – in Rajasthan, whose overall tourist profile is above the age of 35 years, 75% of our participants are aged *below* 35 years.

- **Repeat visits:** a zipline tour is exciting enough to want to do more than once, especially if it also engages the mind – 17% of Flying Fox's Indian customers return for a second time.

- **Visit duration:** by adding an eco-tourism component to an existing tourist location (for example, beside the Ngong Ping 360 cable car and village) tourists will remain on site for longer, which is beneficial for the local economy and for existing tourism providers.

Furthermore, fun eco-adventure will constitute a new and effective way to encourage foreign visitors to experience and appreciate the Country Parks of Hong Kong.

We all wish that foreign tourists to Hong Kong could enjoy, say, the breath-taking grandeur of the hiking trail to Lantau Peak or the serenity of the Sai Kung Country Park; but too often these excursions are eclipsed by 'snappier', more urban and artificial attractions which are perceived as more accessible. Those who know and love Hong Kong appreciate that while hiking through a Country Park should be at the top of the list for visitors to Hong Kong, usually it isn't.

A zipline tour offers the visitor to Hong Kong the unique and enticing combination of 60-90 minutes thrilling exercise and an appreciation of a stunningly beautiful Country Park (and the work of the AFCD in preserving that park).

If it is the objective of Hong Kong to catch up with and to promote world-class eco-tourism, this is the way to do it. Zipline tours allow dramatic wilderness to be experienced in a managed, low-impact, safe, compact, regulated and accessible way.

Tourism is a pillar of the Hong Kong economy. Hong Kong needs to develop its eco-tourism infrastructure to compete with rival destinations in the region and to help showcase its conservation work and legacy to a visiting audience. The zipline tour will encourage foreign inbound tourists who might not ordinarily visit the Country Parks during a visit to Hong Kong to gain an appreciation of the scenery, landscape and biodiversity of Hong Kong. The effectiveness of the zipline tour in this regard is demonstrated by its widespread use in protected landscapes and parks around the globe.

d. Interactive outdoor learning opportunity

In India, our zipline tours combine fun with interpretation. The interpretation depends on the location, but we specifically choose locations which are of natural and cultural interest. We have four locations in India:

- **Neemrana Fort-Palace:** our first zipline tour starts and finishes inside a 15th century hillside palace, located along a branch of the Silk Route in the two-billion year old Aravalli Hills

- **Mehrangarh Fort, Jodhpur:** our second tour is located beside another 15th century palace, one of the largest forts in the world, and encompasses the Rao Jodha Desert Rock Park

- **Kikar Lodge, Punjab:** our third tour is within a private forest and nature resort in the Shivalik foothills; home to leopard, sambar, cheetal and python

- **Kerva Lake, Bhopal:** this tour, which opens in October 2012, is a government funded project between Flying Fox and the Madhya Pradesh Ecotourism Development Board (MPEDB) located above a lake on Forest Department land south of Bhopal, home to a wide variety of migratory bird species

During each tour, which typically lasts about 90-120 minutes, participants learn a little more about the location in an exhilarating, anecdotal and interactive way.

At Flying Fox Jodhpur, for example, the tour begins in a recently restored 18th century Rajput scent garden (home to *Tabernaemontana coronaria* and the sweet smelling *Maurya exotia*). Participants then fly from the garden into the Rao Jodha Desert Rock Park. All our guides receive training from Pradip Krishen, a renowned Indian environmentalist and the Park's restorer and ecologist. This training allows them to talk to participants knowledgeably about the Park's indigenous species; for example about how the *Euphorbia caducifolia* has effective ways of overcoming low rainfall.

The tour then culminates in a long zipline from Jodhpur's City Wall back to the fort; a breath-taking panoramic view which takes in the fort's massive western bastions, its two lakes and the 'Blue City'. This provides an opportunity for guides to talk about the fort's defence systems, how the fort still conserves and uses water from the lakes, and even why the Blue City is blue!

Not everyone who enjoys our zipline tours in India comes for a learning experience – some just want to feel the sensation of flight, admire the views and do something different and unique on their holidays. But in a modest way, the zipline tour can be used as outdoor classroom for people of all ages, but especially young people.

The Flying Fox Lantau zipline tour will combine outdoor adventure, beautiful natural scenery, knowledgeable guides and visual interpretation to provide an interactive learning platform. The act of zipping over the countryside, hiking beside a gorge and over rocky summits and crossing the suspension walkway, will help to reinforce learning by providing a memorable, thrilling outdoor experience. Above all, participants will understand more about the outdoors by having fun outdoors.

For a more detailed vision of how a zipline tour in North Lantau Country Park can be used for outdoor learning and interpretation, see Section 2.4b below.

e. Boosting health & wellbeing

In 2005, the Hong Kong SAR's Department of Health published a report, *Tackling Obesity*, in which it wrote: "Hong Kong is also affected by the global epidemic of obesity. Local data suggest that 20.1% of men and 15.9% of women are overweight,

and 22.3% of men and 20.0% of women are obese… There is also a significant trend among the younger age groups to become obese."[7]

This problem has not gone away. A study by the Hong Kong Polytechnic in September 2011 found that "[t]he prevalence of overweight[ness] including obesity (defined as more than 120% median weight for height) among primary school students, increased from 16.4% in 1997/98 to 22.2% in 2008/09."[8]

One of the causes of obesity is lack of physical exercise. In the Legislative Council, on 28th March 2012, Secretary for Food & Health, Dr York Chow had this to say about the causes of obesity in Hong Kong:

"The rising trend of overweight and obesity is largely attributable to the lifestyles of unhealthy dietary habits, the wide availability of high fat and sugary foods and *the lack of physical activity*." [our emphasis][9]

Obesity matters because, "risk factors such as overweight or obesity are causes to NCDs [non-communicable diseases] such as heart disease and diabetes, which in turn will affect our labour productivity and standard of living in the long run, undermining our economic vitality and competitiveness."[10]

Dr Chow continued that, "[t]he effective tackling of the issue of overweight in our population requires concerted efforts from our society as a whole and collaboration between the Government, public and private organisations."[11]

As such, Hong Kong has to "keep the existing recreation and sports services under review, examining the feasibility of providing more diversified recreation and sports activities and facilities to the public, and creating an environment which is more conducive to active and regular participation by the public in sports and physical activities."[12]

Usefully, the Hong Kong Department of Health has guidelines for recommended daily and weekly physical activity: "[H]ealthy children and youth aged 5-17 years

---

[7] Central Health Education Unit, Centre for Health Protection, Department of Health, Tackling Obesity: It's Causes, the Plight and Preventive Actions, 2005

[8] The Hong Kong Polytechnic University, Research Report on Childhood Obesity, February 2011

[9] Legislative Council proceeding, Press Release 28 March 2012
http://www.info.gov.hk/gia/general/201203/28/P201203280265.htm

[10] Legislative Council proceeding, Press Release 28 March 2012
http://www.info.gov.hk/gia/general/201203/28/P201203280265.htm

[11] Legislative Council proceeding, Press Release 28 March 2012
http://www.info.gov.hk/gia/general/201203/28/P201203280265.htm

[12] Legislative Council proceeding, Press Release 28 March 2012
http://www.info.gov.hk/gia/general/201203/28/P201203280265.htm

should accumulate at least 60 minutes of moderate to vigorous-intensity physical activity every day."[13]

And not just for children. "[H]ealthy adults aged 18-64 years should do at least 150 minutes a week of moderate intensity aerobic physical activity, or at least 75 minutes a week of vigorous-intensity aerobic physical activity. For additional health benefits, *adults should increase their moderate-intensity aerobic physical activity to 300 minutes a week*, or engage in 150 minutes of vigorous-intensity aerobic physical activity a week, or an equivalent combination of moderate and vigorous-intensity activity" [our emphasis].[14]

The zipline tour will provide a moderate level of physical activity, including approximately 1 kilometre of sometimes steep walking trails involving nearly 80 metres of vertical ascent. The difference between a trek in the country and a trek as part of the zipline tour (with due respect for hiking, of which we are avid fans!), is that the zipline tour is interspersed with highly exhilarating and exciting zip lines. They are particularly exciting and motivating for young people.

It is also widely recognised that getting outdoors to do some moderate physical exercise is an excellent stress buster. According to an April 2008 survey on 'work-life balance' by the University of Hong Kong, of 1027 interviewees, "82.5% of people said they suffered stress and 75.4% from lack of exercise", which in turn affected their ability to do their job properly.[15] A little exercise in the outdoors is a good way to rejuvenate and enhance employee productivity and wellbeing.

The zipline tour will offer a new, healthy outdoor activity for the people of Hong Kong. It provides a moderate level of physical activity. Encouraging people, especially young people, to adopt a healthier, more active lifestyle and to get outdoors is a very important part of the future and Flying Fox wants to play a small part in that.

f. Bringing investment, employment & skills transfer

It goes without saying that a zipline tour in Hong Kong will bring additional, direct and indirect economic benefits to the SAR and to North Lantau specifically.

Although the installation for the zipline tour is relatively minimal in scale, the investment required to get the right design and materials and for training and installation is considerable. A significant proportion of this inward investment will be channelled into local suppliers in Hong Kong.

In addition, once operational the zipline tour will employ up to 20 local people to conduct tours and manage the operation under our guidance. Flying Fox will engage in a comprehensive skills transfer programme, providing local staff with a range of

[13] Department of Health, Guidelines on Physical Activity http://www.change4health.gov.hk/en/physical_activity/guidelines/youth/index.html
[14] Department of Health, Guidelines on Physical Activity http://www.change4health.gov.hk/en/physical_activity/guidelines/youth/index.html
[15] The University of Hong Kong, Work Life Balance in Hong Kong Survey Results, April 2008, http://www.hku.hk/press/news_detail_5755.html

practical first aid and industry-leading zipline operation skills as well as knowledge of the ecology and culture of the Lantau North Country Park.

Once open, the zipline tour will add to the tax collection of Hong Kong and pay a rental for the use of the land. We are also interested in channelling a portion of any profits into conservation projects in the local area. On this subject, we look to the Country and Marine Parks Board for guidance.

The zipline tour development will provide inward investment in Hong Kong and its operation will contribute rental and tax revenues to the Government. Specifically it will have a beneficial economic effect on the North Lantau area and create employment and skills transfer opportunities.

2.2 Why it's good for Lantau

Over the past decade, Lantau generally and North Lantau specifically has evolved into an important development area for tourism and recreation. This is not accidental. The website of the Planning Department states that "[o]ur planning vision is to promote sustainable development of Lantau by balancing development and conservation needs. The overall planning concept is to focus major economic infrastructure and urban development in North Lantau to optimise the use of the existing and planned transport links and infrastructure, while protecting the other parts of Lantau, which comprise primarily high-quality landscape and ecologically sensitive natural environment, for nature conservation and environmentally sustainable recreational and visitor uses…."

In particular, the focus is "[t]o strengthen North East Lantau as a major tourism hub, with Hong Kong Disneyland as the focus and compatible tourism and recreational uses in the vicinity".[16]

It concludes that, "[a]s tourism is one of Hong Kong's main economic pillars and there are few alternative locations in Hong Kong suitable for large-scale tourism or recreation facilities, the option for longer term development of the area for large-scale tourism or recreation facilities should be kept open having regard to market demand."[17]

It would seem sensible that a new eco-tourism attraction for Lantau should remain within the existing tourism development 'footprint' of North Lantau – with its network of attractions, facilities and transport infrastructure – rather than opening up a completely fresh or more rural destination.

Currently North Lantau's recreation and tourism infrastructure includes:

- AsiaWorld-Expo (conference, meetings, concert facilities)
- Tung Chung Fort
- Ngong Ping 360 Cable Car
- Ngong Ping 360 Village

[16] http://www.pland.gov.hk/pland_en/lantau/en/digest/overallconcept.html
[17] Land Development Task Force, Concept Plan for Lantau, Public Consultation Document November 2005, p.11-16

- Giant Buddha & Po Lin Monastery
- Ngong Ping Nature Centre
- Wisdom Path

These are excellent tourism and recreation attractions. What is missing from the list, in our opinion and based on our knowledge of the wider industry, is an interactive physical eco-adventure.[18] Fortunately, pre-existing initiatives such as the Wisdom Path and the Ngong Ping Nature Centre (with its guided tours) have laid a strong foundation for the development of additional eco-tourism at this location.

This why we conducted a joint feasibility study into the concept with NP360 and have spent over a year in consultation with the Tourism Commission to develop that feasibility study into a meaningful proposal. Our discussions with the Tourism Commission have confirmed that the development of eco- and outdoor tourism remains their priority for North Lantau.

A zipline tour fits the Tourism Commission's strategy for Lantau and will complement and fit snugly within the 'shadow' of North Lantau's existing large tourism infrastructure, without impacting conservation priorities. In fact, one of Flying Fox's objectives is to showcase conservation principles (see below). It will help to define the Ngong Ping area as Hong Kong's premier eco-adventure destination, as distinct from the more artificial and built-up sites at Disneyland and Ocean Park.

2.3 Why Lantau North Country Park is the perfect location

There are four combined reasons why Lantau North Country Park is not only an ideal location for the zipline tour but quite possibly the only suitable location in Hong Kong for a sustainable zipline tour.

a. Any zipline tour requires a topography comprising of hills and valleys, to permit the natural drape and downward angle required for the zipline to work and to permit its customers to be propelled from one end to the other using only the force of gravity (as no electricity or power is required).

b. For the zipline tour to be an attractive proposition for participants, there needs to be natural drama – the "wow" factor – that sense of flying into the unknown, across wild country, with views which are both dramatic and far reaching, as well as close up views of passing mountainsides and forest canopies.

c. Thirdly, for a zipline tour to be sustainable it must have some content which engages the mind – an outdoor learning component, which combined with physical activity creates the perfect "edutainment" experience. This can be in the form of education about the local ecology or culture, delivered by trained

[18] *Although a bit out-dated, this was noted in the Concept Plan for Lantau, 2005, which recorded "strong support for the countryside recreation facilities and nature-based attractions proposed in rural Lantau. The Hong Kong Tourism Board and the tourism sector were of the view that the countryside recreation and green tourism proposals in the Concept Plan would provide alternative visitor experience, complementing the major tourism attractions on Lantau and in the main urban area."* Land Development Task Force, Concept Plan for Lantau, Public Consultation Document November 2005, p.11-16

guides or through the medium of interpretative information boards. However, to give this educational aspect meaning, there must be sufficient ecological interest at the location in the first place. (See *Education and Interpretation below).*

d. Fourthly, for a zipline tour to succeed in delivering the best possible eco-adventure experience to the highest number of visitors, it needs to be accessible, with sufficient facilities to service their needs. It cannot be in a total wilderness – there must be public access, toilets, food and beverage areas, first aid stations, evacuation and rescue options. Ideally, these infrastructure facilities will already exist onsite, avoiding the need to increase the impact on the environment that comes with building new logistics infrastructure.

North Lantau has the right combination of topography, dramatic views and ecological interest. The provides the necessary transport facilities and other essential amenities. Furthermore, the development of eco-tourism in North and Western Lantau is an objective of the Hong Kong Tourism Commission.

Lantau North Country Park and the adjacent Ngong Ping Cable Car and Village form an ideal location as they deliver these four key components:

- Topography: the right combination of hills and valleys for ziplines to work
- "Wow" factor: highly dramatic views of mountains, valleys, rocky outcrops, gorges and waterfalls, sea views
- "Edutainment" potential: the combination of geography, rich flora and fauna, and the cultural interest surrounding the Giant Buddha, make this an outstanding location for outdoor learning
- Existing infrastructure: the zipline tour benefits from its location next to NP360, with its logistical facilities, including:
    - Public access by cable car or bus
    - Food and beverage facilities
    - Toilet facilities
    - First aid facilities
    - Rapid rescue and evacuation facilities (which will complement Flying Fox's own rescue and evacuation plans

2.4 Why it's good for the AFCD

The fact that a small corner of the North Lantau Country Park is ideal for the installation of a zipline tour is not on its own a good enough reason to go ahead. Just because the topography, aesthetics and accessibility of the site are ideal does not mean it should happen. There has to be more to this project than that.

We believe the reason the project should proceed is because it presents a good opportunity for AFCD to showcase its principles, embrace the values at the heart of Country Parks and be at the forefront of an exciting new form of eco-adventure – not previously realised in the East Asian region but popular in North & South America, Europe and Australia.

The zipline tour will burnish the eco-tourism credentials of AFCD and showcase the stewardship of the AFCD to Hong Kong residents and especially to foreign visitors to Hong Kong. To explain this in more detail we have taken three core principles from the Country Parks Ordinance as our themes:

a. Recreation & enjoyment

The AFCD's website states: "Over 12.5 million visitors [to Country Parks] were recorded in 2008 and most visitors engaged in leisure walking, fitness exercises, hiking, barbecuing, family picnics and camping."[19] The mandate of and method for the management of the Country Parks is codified in the *Country Parks Ordinance*, of which *Section 4. Duties of the Country and Marine Parks Authority, part (c),* states:

"It shall be the duty of the Authority-
(c) to take such measures in respect of Country Parks and special areas as he thinks necessary-

> *(i) to encourage their use and development for the purposes of recreation and tourism;* [our emphasis]
> (ii) to protect the vegetation and wild life inside Country Parks and special areas;
> (iii) to preserve and maintain buildings and sites of historic or cultural significance within Country Parks and special areas but without prejudice to the Antiquities and Monuments Ordinance (Cap 53); and
> *(iv) to provide facilities and services for the public enjoyment of Country Parks and special areas."*[20] [our emphasis]

Meanwhile, Section 16 of the Ordinance (Control of Use of Land) refers to controlling any use which would "substantially reduce the enjoyment and amenities of the Country Park". We see no contradiction between encouraging new recreation and tourism within the Country Park and ensuring continued enjoyment of that Park by the public and local stakeholders.

The corner of Lantau North Country Park which Flying Fox proposes to use, what we call the "operational area", is currently inaccessible to the public and local stakeholders. The eastern side of the operational area is bounded by the Cable Car's rescue trail. However hikers on this trail are greeted with a locked gate across the trail 200m from the Terminal Building which states: "No Unauthorised Entry". There are no other physical trails into the operational area and the ground is rough, steep and often densely shrubbed; hence the area is inaccessible for recreational purposes to all but the most adventurous and determined users.

It also helps to look at international precedents. For example, the US Forest Service recently published an environmental assessment of a (considerably more extensive) 7-zipline tour in the Shoshone National Forest, Yellowstone National Park (**see Appendix D**). The assessment found that: "[t]he proposed zip line project will provide additional recreation opportunities on the forest and will not significantly affect other recreation opportunities on the Wapiti Ranger district… [and also] would

[19] http://www.afcd.gov.hk/english/country/cou_lea/our_work.html

[20] CAP 208 COUNTRY PARKS ORDINANCE, S 4 Duties of Authority

not significantly affect forest recreation resources. *The proposed action, would not have any negative effects on any existing developed or dispersed recreation sites."* [our emphasis][21]

In fact, Flying Fox would suggest that rather than having any negative impacts, the zipline tour would have the opposite effect and actually *increase* the enjoyment and amenities of the Country Park. A Flying Fox zipline tour eco-adventure will greatly enhance the recreation and tourism potential of Lantau North Country Park – especially as the operating area we are proposing is tantalisingly viewable from the cable car but currently virtually inaccessible.

The tour will encourage a different demographic of recreational visitor to experience the Country Park; we hope a wider range than currently hike or trek. In India our customers range from the ages of 10-80 years but the activity is particularly appealing to young people and to families with children – 75% of Flying Fox's existing customer base in India is aged below 35 years. Interestingly, a 2010 Mckinsey & Co. study commissioned by NP360 identified 'families with children' as a visitor segment that was under-represented in Ngong Ping; the report suggested more eco-tourism initiatives as a way to reach that segment.

To summarise, the zipline tour will provide a new type of recreation inside Lantau North Country Park, which will in turn open the area to a new type of visitors, allowing the AFCD to further promote conservation and education values to visitors, and to showcase its stewardship of the area.

b. Education & Interpretation

The AFCD is proactive in organising outdoor learning activities for school children and young people in Hong Kong. This includes the Nature in Touch Programme (and Nature in Touch Volunteer Programme) which prioritises "Hiking, Countryside Learning and Outdoor Experience."[22] Also, guided tours at the Lions Nature Education Centre, the Schools Visit programme, guided field study for secondary schools and Hiking and Planting days.

In the project area, the Ngong Ping Nature Centre provides guided tours and aims to "enhance visitor's knowledge about the biodiversity and nature landscape, and to promote public awareness of environmental and ecological conservation, and above all to encourage ethical, responsible and sustainable Hong Kong tourism".[23]

We believe Flying Fox's zipline tour, with its combination of hiking, aerial adventure, and outdoor interpretation will help AFCD deliver on these objectives. We want to build on these excellent initiatives, incrementally enhancing the eco-adventure opportunities available in North Lantau.

---

[21] United States Department of Agriculture, Forest Service, August 2012. Predecisional Environmental Assessment: Sleeping Giant Ski Area Development Projects. Wapiti Ranger District, Shoshone National Forest, Park County, Wyoming, p.58-59

[22] http://www.natureintouch.gov.hk/learning/activity/school_field_studies/0/521. Also, the Country Parks – Ranger Services Division's first stated aim is: "Visitor services and education." [22]

[23] http://www.np360.com.hk/en/lantau-outdoor-fun/land/np-nature-centre.html

The zipline tour can become an ‘outdoor classroom’ for North Lantau, in which residents and tourists of all ages learn more about the role of the Country Parks, their ecological benefits and importance, and the conservation challenges they face.

By combining outdoor adventure, beautiful natural scenery, knowledgeable guides and visual resources we can create an interactive learning platform. This is how it will work:

- An engaging website will allow visitors (particularly families and young people) to prepare before they go, and undertake follow up learning or activities afterwards. This website could include, for example, a ‘clickable’ map with pop-up information on items of ecological or cultural interest.
- During the tour, participants will reconnect with their environment and reinvigorate a sense of reverence for nature by immersing themselves in a corner of wilderness made uniquely accessible.
- Interpretation boards (**see Appendix E**) in Chinese and English will provide fun, visual information about:
    - the flora and fauna indigenous to Lantau Island
    - some of the key conservation issues facing Hong Kong & its Country Parks
    - the stewardship and conservation initiatives of the AFCD protecting the Country Parks
- Our knowledgeable guides will be on hand to engage in a fun and elementary way with participants. At set ‘stations’ along the route, participants will be introduced to concepts such as geography, biodiversity, conservation, ecology, sustainability, hydrology
- Because it is not possible to absorb all of this in in one go, participants will want to return to learn and experience more, and with each repeat visit their understanding of the area will deepen.
- The act of zipping over the countryside, hiking up beside the river gorge and crossing the suspension walkway, will help to reinforce their learning by providing a memorable, thrilling outdoor experience.

We welcome the opportunity to work with the AFCD and Ngong Ping Nature Centre to help us develop our website and onsite interpretation boards and to enhance the quality of ecological awareness among our customers.

We also appreciate that one of AFCD’s priorities is to deliver countryside learning and outdoor experiences free to the public; for that reason we are open to the idea of providing at-cost or concessionary eco-adventure zipline tours to select public groups, for example school children at designated times. We would look to the Country and Marine Parks Board to provide guidance on this subject.

c. Conservation through sustainable tourism

Conservation is important to Flying Fox. For a fuller exploration of our Environmental Impact Management strategy, please refer to Section 3. However, conservation is not only important in the way we build and operate our zipline tours but also in the messages we want to convey to our participants.

A key issue for Hong Kong is how to strike a delicate balance between economic growth and conservation priorities. It is an inescapable fact that Hong Kong's rich natural heritage is often threatened by urban expansion and it is vital that residents and visitors to the territory have opportunities to understand the importance of the territory's green assets. To this end, the zipline tour will increase the number of visitors who go beyond the man-made confines of Ngong Ping village into the wilderness beyond, increasing their appreciation for the countryside.

Conservation is not passive. It has to be passed from generation to generation in a sustainable way. As a 2002 report authored in Hong Kong points out, "Many countries eager to make conservation economically profitable have embraced eco-tourism, including Hong Kong."[24]

The international Convention on Biological Diversity (of which Hong Kong is a signatory) is clear that eco-tourism, while it can negatively impact biodiversity when done incorrectly, has an important part to play in conservation:
"Tourism based on the natural environment (ecotourism) is a vital growing segment of the tourism industry and… tourism does present a significant potential for realizing benefits in terms of the conservation of biological diversity and the sustainable use of its components."[25]

The Convention adds: "Sustainable tourism can make positive improvements to biological diversity conservation especially when local communities are directly involved with operators... Moreover, sustainable tourism can serve as a major educational opportunity, increasing knowledge of and respect for natural ecosystems and biological resources." [26]

Furthermore, in the Convention's *Guidelines on Biodiversity and Tourism Development,* the authors note that:

"[s]ustainable tourism can generate jobs and revenues, thus providing an incentive for preserving natural areas. It can also raise public awareness of the many products and services provided by natural ecosystems and biological resources and respect for traditional knowledge and practices. Sustainable tourism clearly has the potential to reconcile economic and environmental concerns and give a practical meaning to sustainable development." [27]

The Flying Fox zipline tour is not a scientific project and the science of conservation is well outside our competency. However, we believe that in providing visitors to Lantau North Country Park with an engaging, fun outdoor experience we will

---

[24] CREATING OPPORTUNITIES: SAVING HONG KONG'S NATURAL HERITAGE
Joyce Wan & Anastasia Telesetsky, January 2002
civic-exchange.org/en/live/upload/files/200201_NaturalHeritage.pdf

[25] Convention on Biological Diversity, Tourism, Introduction
http://www.cbd.int/tourism/intro.shtml

[26] Convention on Biological Diversity, Tourism, Introduction
http://www.cbd.int/tourism/intro.shtml

[27] Convention on Biological Diversity, Development of Guidelines for Sustainable Tourism in Vulnerable Ecosystems, 2004. http://www.cbd.int/tourism/intro.shtml

encourage them to appreciate the Country Parks a little bit more, and take away from the experience a slightly better knowledge of why conservation matters.

2.5 The Triple Bottom Line

As we have seen, recreation, education and conservation are key concerns of the AFCD and are the *raison d'etre* for the Country Parks. Tourism can help deliver in these three areas, but it has to be sustainable and environmentally friendly. At Flying Fox we aim to embrace the philosophy and practice of the "Triple Bottom Line", summarised in the catchphrase *People Planet Profit.*

THE TRIPLE BOTTOM LINE

PEOPLE: Socially responsible

- Our concept provides Hong Kong's residents and visitors with a world-class, safe, interactive outdoor recreation and learning adventure experience
- Our guests will not only have a great time, they'll learn a little more about themselves and their environment in the process
- We seek to work with AFCD to recruit & train tour guides from within Hong Kong, transferring skills in zipline tour & adventure management

PLANET: Environmentally friendly

- Our footprint will be light or – for zipline tracks – non-existent!
- Our installation uses no power and has zero emissions
- Our pathway designs allow penetration of light and moisture
- We will strive to promote greater understanding of environmental issues among our guests

PROFIT: Financially sustainable

- Our business model will be commercial in order to be self-sustaining
- No seed funding, capital expenditure or ongoing funding is required from the Hong Kong Govt.
- We will pay rental income to the Hong Kong Govt. which can be ploughed back into initiatives of benefit to Lantau North Country Park

2.6 Summary of project benefits

For AFCD:

- Showcase the extraordinary diversity and richness of Hong Kong's ecology and landscapes, as well as the remarkable conservation initiatives and stewardship of the AFCD
- Diversify current eco-adventure and recreation opportunities – which will in turn diversify the visitor profile to the countryside and encourage a new type of visitor
- Encourage foreign visitors to Hong Kong to appreciate the wonder of its scenery and conservation record – in an accessible way
- Assist the AFCD with its mandate to encourage the use and development of the countryside for the purposes of recreation, education and conservation
- In a modest way, enhance and burnish Hong Kong's eco-tourism credentials in the region
- Generate rental income for the Hong Kong Govt. which can be ploughed back into initiatives of benefit to Lantau North Country Park

For Hong Kong residents:

- Increase the attractiveness of Hong Kong as a tourism destination and broaden the spectrum of foreign visitors
- Provide the hard-working people of Hong Kong with a fun, outdoor stress-busting new recreation – which is also healthy because it gets people – especially kids – exercising in the fresh air
- Provide a medium for interactive education and ecological learning for all ages, especially for young people and school children, on the premise that new knowledge 'sticks' in the mind better if the participant is engaged and having fun
- Invest in Hong Kong and generate employment opportunities as well as skills transfer from industry experts

For Lantau:

- Contribute to the continued development of North and Western Lantau, in line with the Tourism Commission's development objectives
- Complement the impressive existing attractions of Lantau
- Enhance the appeal of North / Western Lantau for Hong Kong residents and foreign tourists, which in turn will be good for the economic prosperity of the area
- Retain tourists in the area for longer, which will lead to increased revenue generation for local people and businesses

Working Paper submitted to the Country and Marine Parks Board

Proposed Flying Fox Eco-Adventure Zipline Tour at Ngong Ping, Lantau North Country Park

17th October 2012

ANNEX 3. ENVIRONMENTAL IMPACT MANAGEMENT

ANNEX 3. ENVIRONMENTAL IMPACT MANAGEMENT

3.1 OVERVIEW

3.1.1 Methodology

What is presented here is Flying Fox's draft Environmental Impact Management strategy, to be finessed in discussion with AFCD and other interested stakeholders.

We have drawn on first hand research during numerous site visits to Lantau North Country Park in August 2011 and August 2012; as well as on desk research based on the following publications:

a. *MTR Corporation Ltd, Tung Chung Cable Car Project, Environmental Impact Assessment (Final), March 2003* (referred to hereafter as the "Cable Car EIA")
b. *Country Parks Ordinance (Cap. 208)*
c. *AFCD website material*
d. *United States Department of Agriculture Forest Service August 2012, Predecisional Environmental Assessment Sleeping Giant Ski Area Development Projects, Wapiti Ranger District, Shoshone National Forest Park County, Wyoming, USA*

Note on terminology: the term "Study Area" refers to the entire area under consideration by the Cable Car EIA; the term "operational area" refers to the specific area, within the Study Area, which relates to Flying Fox's zipline tour installation and operations.

3.1.2 Objectives

- Describe Project and associated works
- Describe community and environment likely to be affected
- Provide alternatives to avoid and minimise environmental impacts
- Quantify emission & sources and propose mitigation measures to reduce pollution of air and water resources during construction and operation
- Quantify waste sources and propose mitigation measures
- Quantify noise sources and propose mitigation measures
- Quantify potential damage to flora, fauna and natural habitats & propose mitigation measures
- Quantify potential landscape and visual impacts & propose mitigation measures
- Quantify potential impacts on sites of cultural heritage & propose mitigation measures
- Specify methods and standards to be included in design, construction and operation necessary to mitigate identified environmental impacts and cumulative effects
- Specify environmental monitoring and audit requirements to ensure effective implementation of environmental protection measures

3.1.3 Project requirements

- Recognition of the unspoilt and natural beauty of the majority of the route
- Selection of a route which would be of benefit to, and would be acceptable to existing residents, users and visitors of Ngong Ping
- Minimisation of the overall environmental impacts during both construction and operational phases
- Minimisation of the number of sensitive receivers affected by visual or noise-related impacts
- Adoption of an *Enviromental Code of Conduct* for the project by all contractors, workers, employees and end-users

3.1.4 Requirement for a formal Environmental Impact Assessment

Flying Fox defines its zipline eco-adventure tour as a Tourist and Recreational Development.

According to Schedule 2 of the *Environmental Impact Assessment Ordinance* promulgated by the Environmental Protection Department (EPD) of the Hong Kong Government, under section "O. Tourist and Recreational Developments", the following types of project are required to carry out an Environmental Impact Assessment:

> **"O.1.** An outdoor golf course and all managed turf areas.
> **O.2.** A marina designed to provide moorings or dry storage for not less than 30 vessels used primarily for pleasure or recreation.
> **O.3.** A horse racing course.
> **O.4.** A motor racing circuit.
> **O.5.** An open firing range.
> **O.6.** An open air concert venue with a capacity to accommodate more than 10 000 persons.
> **O.7.** An outdoor sporting facility with a capacity to accommodate more than 10 000 persons.
> **O.8.** A theme park or amusement park with a site area of more than 20 ha in size *(Added L.N. 205 of 1999);"*

Flying Fox's eco-adventure tour does not fall under any of these categories; in particular, the tour capacity is considerably less than 10,000 persons and the site area is also considerably less than 20ha in size.

Furthermore, the EIA Ordinance, Schedule 2, Section "Q. Miscellaneous" states the following exceptions within Country Parks do not require EIAs (our highlighting in yellow):

"Q.1. All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed Country Park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest, except for the following---

(a) minor maintenance works to roads, drainage, slopes and utilities;
(b) minor public utility works including the installation of telecommunication wires, joint boxes, power lines with a voltage level of not more than 66 kV, and gas pipelines with a diameter of 120 mm or less;
(c) education and recreational facilities not otherwise designated projects listed in Parts A to P and approved by the Country and Marine Parks Authority;
(d) all earthworks relating to forestry, agriculture, fisheries and the management of vegetation;
(e) New Territories exempted houses;
(f) footpaths and facilities relating to sitting out areas;
(g) minor facilities relating to the management and protection of marine parks, marine reserves, Country Parks and special areas;
(h) all works not otherwise designated projects listed in Parts A to P undertaken by the Country and Marine Parks Authority under section 4 of the Country Parks Ordinance (Cap. 208) or section 4 of the Marine Parks Ordinance (Cap. 476) for developing and managing Country Parks and special areas, marine parks and marine reserves;
(i) maintenance of existing waterworks installations; or
(j) minor works including---
improvements to catchwaters;
the provision of---
(A) water pipes and valves of diameter 450 mm or less;
(B) water tanks;
(C) hydrological stations and associated structures; and
(D) village supply schemes.

Q.2. Underground rock caverns."

Consequently it would appear from the provisions of the EIA Ordinance that a formal EIA for this project is not required. However, it is clearly desirable to address the issues of environmental impacts in all forms, using the *MTR Corporation Ltd, Tung Chung Cable Car Project, Environmental Impact Assessment (Final), March 2003* as the baseline survey for our operational area and template document.

3.2 PROJECT INTRODUCTION

3.2.1 Project vision

Flying Fox's vision is to create a genuine eco-adventure in a wild and beautiful corner of Lantau Country Park. Our mission is to provide a thrilling, challenging, outdoor educational experience which reinvigorates our visitors' reverence for the natural beauty of Hong Kong.

3.2.2 Project outline

Flying Fox Lantau will be a 60-90 minute eco-adventure located in the hilly country of Lantau North Country Park to the north of the Ngong Ping cable car Terminal Building and to the immediate west of Tower 7. It will comprise the following

elements:

- **Booking:** guests will have several ways to book the experience – the best offers will be in advance through the existing web portal **www.flyingfox.asia** which provides a real-time reservation system, accepts online payments and issues automated e-tickets. Alternatively guests will be able to book and pay on the day at Flying Fox sales outlets, located near the NP360 terminals at Tung Chung and in Ngong Ping village.
- **Check in & Gear up**: guests will check in at the Flying Fox office in Ngong Ping village, get fitted into safety harnesses and join a pod of up to 12 people; two trained instructors will accompany them at all times to ensure their safety and provide commentary on points of ecological and cultural interest.
- **Safety briefing & Orientation**: all guests will receive a safety briefing and orientation in how to use the equipment before embarking on the zipline tour.
- **Approach to Zip 1: 300m walk**, starting from the Terminal Building (elev. 434m), walk 200m north-east along the existing rescue trail, then 100m north-west on a new path across undulating land to the start point of Zip 1 (elev. 442m), near the crest of a rocky summit to the north of the Terminal Building; approx. **8m of ascent**.
- **Zip 1: 300m parallel ziplines** fly across the valley to the lower knoll (elev. 400m) beneath Tower 7; approx. **42m of descent**.
- **Path to Zip 2: 130m hike** to the upper knoll (elev. 432m) beside Tower 7, along a meandering new path; approx. **32m of ascent**.
- **Zip 2: 300m zipline** across the valley, crossing above Zip 1, to land on a rocky spur (elev. 404m) beside the gorge created by the Sham Wat Stream; approx. **28m of descent**.
- **Ridge walk: 80m hike** beneath Tall Shrub up a narrow rocky ridge to the suspension walkway (elev. 422m); approx. **18m of ascent**.
- **Suspension walkway: 50m long**, crossing the spectacular Sham Wat gorge at approx. 15-20m above stream level.
- **Rock ramble: 120m hike** on a new path over rocky ground to the start of Zip 1; approx. **20m of ascent**; return **walk of 300m** along the approach path back to the Terminal Building.
- **De-kit and shop:** guests will return to the Flying Fox office in Ngong Ping village where they will return their safety equipment and have the opportunity to purchase branded merchandise, including HD HeadCam video footage of their journey.
- **Total tour length: 1,580m**
- **Total length of hiking: 980m**
- **Total distance travelled in the air (on ziplines & suspension walkway): 650m**
- **Total vertical ascent (hiking): 78m**
- **Total vertical descent (zipping): 70m**
- The tour's carrying capacity will be around 60 persons per hour (480 persons per day).
- *Note: the proposed outline above is feasible but still provisional and subject to change based on final geotechnical surveys and ongoing dialogue with Hong Kong Government departments.*

For a map of the operational area and proposed installation, see **Annex 1.2.**

3.2.3 Participatory not passive

The experience will be participatory, requiring guests not only to fly along ziplines, but also to hike, explore their environment and engage in an ecological journey – distinguishing it from amusement rides.

3.2.4 Project structures

The physical structures required for creating Flying Fox Lantau can be broken down as follows:

a. **Zip lines**. The zips comprise of parallel twin ziplines, each approx. 300m long; hence the total number of zipline cables to be erected is four. The lines themselves are 12-14mm diameter galvanised wire rope; with an additional service line of similar diameter above each zipline to facilitate operation of the braking system.

b. **CloudStations.** Four CloudStations will anchor each zipline termination to the ground, provide a structure on which to mount the braking system and allow guests to gather in an orderly manner before launch and after landing. The proposed design is to install four separate halo-shaped CloudStations, manufactured out of galvanised or weathering steel. The design allows for pre-formed ballast to be installed into the halo structure of the CloudStation, reducing the need for large concrete foundations. The structure will sit on small concrete feet where the ground is flat; deeper foundations may be required where the land is uneven – to be determined by a geotechnical survey. The originally proposed dimensions were 14m diameter x 3m height. However, this can be reduced to 10m diameter. *Should the CloudStation design be considered inappropriate for the Country Park setting, we are open to dialogue with AFCD over alternative launch/landing structures, using more natural materials, e.g. timber.*

c. **Suspension walkway.** A single lightweight suspension walkway will be erected across the gorge created by the Sham Wat Stream. It will be approx. 50m in length, constructed of wire rope, natural rope and wooden decking; it will be anchored directly into the rock – subject to a geotechnical survey.

d. **Paths.** Some new pathways will be built to connect the various sections of the journey; approx. 430m of new paths will be required, to be built in conformity with AFCD guidelines for paths in Country Parks. Some steps may be required to negotiate the rocks along the "Ridge Walk". Existing paths will be utilised where possible. *AFCD is invited to discuss low impact path design options, e.g. stone paths, grated steel walkways or timber boardwalks.*

For photographs and designs indicative of the types of structures envisaged, see **Annex 1.3.**

3.2.5 Land & airspace requirements

a. Existing paths: 200m of rescue trail leading north-east from Terminal Building (used for approach walk and return walk)
b. New paths: 430m long x 1m wide = 430m2
c. Launch & landing points (CloudStations – halo design of 10m diameter): 4 sites each of 78m2 = 312m2
d. Total land area dedicated to Flying Fox: approx. 740m2, or 0.07ha
e. Airspace for ziplines: 2 separate lines of 300m long x 3m wide = 1800m2
f. Airspace for suspension walkway: 50m long x 1m wide = 50m2
g. Total airspace required by Flying Fox: 1850m2, or 0.19ha
h. Total land area and airspace required: 2,590m2 or 0.26 hectares
i. The total land area required represents 0.01% of the total land area of Lantau North Country Park's 2,200 hectare total area.
j. The proposed Operating Area falls entirely outside the Outline Zoning Plan for Ngong Ping
k. We will require the use of commercial space in Tung Chung and Ngong Ping village as sales outlets; we will also require the use of a small room in or near the Terminal Building for storing safety equipment, spare materials & tools.
l. Note: it is not a Flying Fox requirement to build paths or firebreaks along the ground beneath ziplines; the ground beneath the ziplines remains pristine and untouched
m. Proportional impact on the Country Park (as a percentage of the total 1,580m journey):
    i. Zip lines: 600m = 38%
    ii. New paths: 430m (not incl. 100m reused on return walk) = 27%
    iii. Existing paths: 400m (incl. 200m reused on return walk) = 25%
    iv. Suspension walkway: 50m = 3%

3.2.6 Design principles

Flying Fox's designers have framed the following key principles to inform the design of the zipline tour structures:

a. Visually low impact
b. Light enough to minimise wind loads but stiff enough to resist those wind loads
c. Constructability – assembled in segments which can be air lifted to site
d. Maintainability – selecting structural form which avoids corrosion & facilitates onsite maintenance
e. Aesthetics & integration in environment
f. Uniformity of design

3.2.7 Construction philosophy & method statement

Flying Fox will employ a low impact construction philosophy to ensure a well managed and environmentally friendly installation. The tour is expected to take approximately six months to fabricate and construct. The on-site time for construction is predicted to be around 2-3 months. These are some strategies that will help minimise construction impact:

- Most infrastructure is fabricated off-site. Installation therefore becomes simply a matter of importing the material and assembling the units. This strategy keeps environmental impact and on-site time to a minimum
- Use only hand, mules, ziplines or a helicopter to import materials
- Include environmental impact issues on each Work Method Statement
- Remove foreign soil and seed from shoes and clothing before attending the site
- Stick to the defined access routes and work zones
- Only remove/lop vegetation of greater then nominated girth after approval from AFCD
- Report sightings of significant fauna or flora to AFCD
- Source labour and building supplies locally where possible
- Ensure fuel and oil containers are leak free before being brought on site and that they remain capped when not in use
- Top up petrol powered tools more than 50m from any water source or use spill trays
- Notify AFCD immediately should an environmental incident occur
- Be courteous and honest to Country Park users and interest groups
- Respect all on-site sensitive environmental issues.
- Adhere to fire risk management strategies
- Adhere to other conditions stipulated by AFCD
- A construction method statement will be prepared once design parameters have been agreed with AFCD and EMSD, and following the detailed planning phase.

3.3 AIR QUALITY ASSESSMENT

3.3.1 Potential impacts on air quality during construction

Hong Kong has tight controls on dust generation during construction projects, including the Air Pollution Control Ordinance. Possible causes of dust generation during the construction of Flying Fox Lantau include:

a. Construction of pathways
b. Drilling of foundations for CloudStations
c. Drilling anchor points for suspension walkway

3.3.2 Mitigation measures during construction

a. Minimal use of concrete to construct pathways. Options include: wooden boardwalks, grated steel causeways, stone paths with concrete pointing only
b. Covering of building materials during construction to prevent dust entering atmosphere

3.3.3 Comparison with NP360

According to the EIA conducted for NP360: “the dust generated from excavation for the towers and earthworks for the construction of emergency rescue trail would be of small scale, localised and short-term and no ASRs [Air Sensitive Receivers] have been identified within the study boundary”.

Given that NP360 installed 7 towers with an individual footprint of 35m x 35m and a height of, in the case of Tower 7, 47m, we believe that any dust generation during the installation of Flying Fox, whose infrastructure is considerably smaller than NP360's, will be negligible.

3.3.4 Potential impacts on air quality during operation & mitigation measures

Flying Fox uses no powered parts during its operations. Guest walk from one zipline to the next, while the energy required to impel guests down each zipline is provided by gravity only. Hence, Flying Fox is a zero emissions activity.

In addition, we prohibit smoking by guests while they are wearing their safety harnesses. Hence, there will be no air pollution due to smoking. This also reduces the fire risk and consequent air pollution arising from hill fires.

Consequently, no mitigation measures are required.

3.4 WATER QUALITY ASSESSMENT

3.4.1 Background

Flying Fox's operational area lies within the Ngong Ping Water Gathering Ground (WGG), which is part of the North Western Water Control Zone. The project will be mindful of the Water Supplies Department (WSD) guidelines on protection of Water Gathering Grounds.

Protection of the WGG is of the utmost importance and an emergency contingency plan for construction and operational phases of the works is required to protect this resource.

There are no alterations to watercourses proposed as a result of the construction of any Flying Fox zipline tour elements.

3.4.2 Location specific sensitivities

Both ziplines fly over 3 minor tributary branches of the Sham Wat Stream; while the suspension walkway crosses the gorge created by the major tributary of the Sham Wat Stream where it emerges from the Ngong Ping plateau to the north west of the cable car Terminal Building.

3.4.3 Potential impacts on water quality during construction

a. Accidental spillage of materials or fuels
b. Wastewater generated by workforce
c. Domestic waste generated by workforce

3.4.4 Mitigation measures during construction

a. The minimal amount of concrete required for the CloudStation footings will be brought in ready-mixed or hand mixed onsite. Ballast for the CloudStations will be precast.

b. The Contractor will not be permitted to rinse out any containers or materials contaminated with concrete or to discharge such wastewater within the Country Park.

c. A spill control plan will be prepared to mitigate the impact of any fuel spillage from portable generators or hand tools; drip trays will be specified as requirements for the generators; no refilling of fuel-powered plant will be permitted within 50m of any watercourse.

d. No fuels will be permitted to be stored in the Country Park, thereby reducing the potential for accidental spillage while unattended.

e. At the CloudStation locations within the Water Gathering Grounds there will be measures taken to minimise rainfall ingress through erection of canopies over the installation areas to direct rain water off the CloudStation footprint; the perimeter of the work sites can be fenced off to prevent off site migration of materials.

f. The anticipated workforce onsite will not exceed 6-10 persons at one time. Given the proximity of the cable car Terminal Building, all onsite workers will be required to use toilet facilities at Ngong Ping to avoid the need to erect temporary toilet facilities within the Country Park.

g. No kitchen or canteen facilities will be provided within the Water Gathering Grounds. All workers will be required to take their daily rations to site.

h. Workers will be required to take all waste materials (lunchboxes, waste papers, construction wastes etc) out of the Country Park each evening.

i. Notices will be displayed to remind workers not to discharge any contaminants or wastewater into the nearby environment during the construction phase of the project.

j. No fertilizers or pesticides will be used in the Country Park or Water Gathering Grounds.

k. Environmental training and audits will provide an effective control of any malpractice.

3.4.5 Potential impacts on water quality during operation

a. Wastewater generated by guests
b. Domestic waste generated by guests

3.4.6 Mitigation measures during operation

a. Guests will not be permitted to take food with them while on the Flying Fox zipline tour; drinking water will be issued in recyclable containers
b. Guests will be reminded that littering is strictly forbidden within the Country

Park; Flying Fox instructors will ensure enforcement of this policy and collect any litter dropped by guests at the end of each day

c. Guests will not be permitted to go to the toilet within the Water Gathering Grounds; Flying Fox instructors will ensure guests have the opportunity to go to the toilet before embarking on the zipline tour, and will ensure enforcement of this policy at all times

3.5 LIQUID AND SOLID WASTE MANAGEMENT ASSESSMENT

3.5.1 Potential types of waste generated during construction

a. excavated materials – e.g. vegetation and topsoil removed from site clearance around the CloudStation locations and along new paths
b. construction waste materials;
c. chemical waste material; and
d. municipal wastes.

3.5.2 Mitigation measures during construction

a. Creation of a Waste Management Plan (WMP) prior to construction aimed at minimizing waste generation, maximising recycling onsite, and the setting up of appropriate routes for waste disposal. The WMP will refer to the Waste Disposal Ordinance (Cap. 354) & relevant regulations.
b. Excavated materials will where possible be re-used – for example, excavated stone will be used to build new paths; material excavated during path construction will be backfilled to avoid the export of soil offsite.
c. All construction, chemical and municipal waste materials will be transported out of the Country Park by helicopter or cable car.
d. An area within the construction site will be designated to allow for sorting and segregation of materials into those which can be re-used and those requiring disposal.
e. Material deliveries onsite will be carefully coordinated to minimise storage times onsite
f. Site staff will be trained in waste minimization practices
g. Waste products will be transported offsite as soon as possible
h. No onsite burning will be permitted
i. Accurate waste records will be maintained

3.5.3 Potential types of waste generated during operation

a. Littering by guests while on the zipline tour
b. Waste generated by materials brought onsite for maintenance purposes

3.5.4 Mitigation measures during operation

a. Guests will not be permitted to take any food with them while on the Flying Fox zipline tour; drinking water will be issued in recyclable containers
b. Guests will be reminded that littering is strictly forbidden within the Country Park; Flying Fox instructors will ensure enforcement of this policy and collect

any litter dropped by guests at the end of each day
c. Flying Fox's Waste Management Plan will continue to be applied during maintenance works

3.6 NOISE IMPACT ASSESSMENT

3.6.1 Potential noise impacts during construction

a. Use of mechanised plant or machinery onsite
b. Drilling into rock
c. Helicopter landing and take-off while delivering materials onsite

3.6.2 Mitigation measures during construction

a. The project will be mindful of the Noise Control Ordinance (Cap. 400) which defines the Acceptable Noise Level in the Ngong Ping area to be 60dB during daylight and evening hours 0700-2300) and 50dB during the night time (2300-0700)
b. Flying Fox will identify representative Noise Sensitive Receivers (NSRs) within 300m of the project limit, in order to assess noise impacts and develop mitigation measures
c. We will explore the possibility of transporting materials to site by cable car to avoid the requirement for helicopters
d. Should drilling into rock be required, such work will be prohibited on Sundays, public holidays and any time between 1900-0700; and if required a Construction Noise Permit will be sourced for any such work during daytime hours from Monday – Saturday
e. Only quiet, well-maintained plant will be operated on-site and plant will be serviced regularly during the construction works;
f. Machines and plant that may be in intermittent use will be shut down between work periods or throttled down to a minimum;
g. Plant known to emit noise strongly in one direction, will, where possible, be orientated to direct noise away from the NSRs;
h. Material stockpiles and other structures will be effectively utilised, where practicable, to screen noise from on-site construction activities.
i. Movable noise barriers can be utilised as required.

3.6.3 Potential noise impacts during operation & mitigation measures

a. The zipline tour installation does not use any motorised elements, so there will be no engine noise associated with operations
b. The passage of the guest trolley on the zipline can generate some noise. This can be mitigated by the use of plastic-sheathed wire rope, which, according to data from the US, reduces trolley noise by 60%.
c. Guests can spontaneously whoop with delight or shout with exhilaration while zipping; this is a natural impulse which Flying Fox would not seek to curtail unless it became an issue for NSRs.

3.7 ECOLOGICAL IMPACT ASSESSMENT

3.7.1 Objectives of the ecological impact assessment

The objectives of this assessment are as follows:

a. Establish an ecological baseline for the operational area, identifying the ecological significance of the principal habitats present
b. Assess the ecological impacts of the zipline tour
c. Develop feasible and effective mitigation measures for significant impacts
d. Determine whether residual, post mitigation impacts are acceptable
e. Assess the post mitigation acceptability of the design

3.7.2 Ecological baseline survey of the operational area

Flying Fox proposes to use the EIA conducted for the Tung Chung Cable Car Project as the baseline ecological survey for the operational area. The findings of the EIA can be supplemented by onsite ground truthing as required.

3.7.3 Habitats within operational area

According to an analysis of the habitat map presented in Fig. 7.3 of the Tung Chung Cable Car EIA, the habitats featured in Flying Fox's operational area can be identified as follows:

a. Route from cable car Terminal Building to launch of Zip 1 – Abandoned cultivation & Grassland
b. Zip 1 launch – Grassland
c. Zip 1 landing – Low Shrub
d. Path from landing of Zip 1 to launch of Zip 2 – Low Shrub
e. Zip 2 launch – Low Shrub
f. Zip 2 landing – Tall Shrub
g. Path from Zip 2 landing to suspension walkway – Tall Shrub
h. Path from suspension walkway back to start – Grassland
i. None of the paths proposed by Flying Fox cross any watercourses; however the tour passes close to watercourses as follows:
    a. Both ziplines fly over three minor tributary branches of the Sham Wat Stream near Tower 7
    b. The suspension walkway crosses a major branch of the Sham Wat Stream, at a height of approx. 15-20m
    c. The path from the landing of Zip 1 to the launch of Zip 2 passes approx. 20-30m to the south of a watercourse where the Leaf Litter Toad has been observed
j. The operational area does *not* impinge on any areas of woodland, the vegetation type of highest ecological importance in the area.

3.7.4 Ecological significance of habitats within operational area

An evaluation of the ecological significance of the various different habitat types found within Flying Fox's operational area is contained in the Tung Chung Cable Car EIA. For an anaylsis of their significance within Flying Fox's operational area, see **Appendix F**. What follows is a summary:

a. **Abandoned cultivation:**
    i. Species diversity is low to moderate
    ii. Moderate ecological value
b. **Grassland:**
    i. Species diversity is low
    ii. Low ecological value
    iii. Grasslands do support some rare and/or protected plant species such as orchids, two restricted range birds and one rare snake.
c. **Low Shrub:**
    i. Species diversity is low to moderate
    ii. Low ecological value
d. **Tall Shrub:**
    i. Species diversity is moderate to high
    ii. Moderate to high ecological value
    iii. Tall Shrub supports five rare or uncommon bird species
e. **Watercourses:**
    i. The natural watercourses within the Study Area are evaluated as of high ecological value and species rich
    ii. Sham Wat Stream (SWS) is considered a very productive ecosystem
    iii. The uncommon Leaf Litter Toad has been observed in a tributary branch of the SWS

3.7.5 Types of potential ecological impacts

The potential ecological impacts arising from construction activities fall into two categories:

a. Direct impacts due to habitat loss (e.g. loss of vegetation)
b. Indirect impacts due to increased human activities and disturbance (e.g. noise, air quality, water quality, fire impacts)

Potential operational phase ecological impacts consist of the following:

a. Disturbance due to increased human activities (e.g. noise, domestic waste, fire risk)
b. Barrier effects of paths
c. Possible bird strikes

A summary of the potential impacts of construction on different habitats within the operational area, along with proposed mitigation measures, is presented below.

3.7.6 Mitigation principles

The following ecological impact mitigation principles will be strictly adhered to, in order of priority:

a. Avoidance: Potential impacts should be avoided to the maximum extent practicable by adopting suitable alternatives

b. Minimization: Unavoidable impacts should be minimized by taking appropriate and practicable measures such as constraints on intensity of works operations or timing of works operations

c. Compensation: The loss of important species and habitats may be provided for elsewhere as compensation. Enhancement and other conservation measures should always be considered whenever possible.

3.7.7 Potential ecological impacts of construction on habitats, and mitigation measures

a. Abandoned cultivation

i. The approach route from the cable car Terminal Building to the launch of Zip 1 crosses an area of abandoned cultivation
ii. We propose to use 200m of existing paths and trails (including the Lantau Trail and the NP360 Emergency Trail) to cross this area
iii. Consequently there will be no habitat loss and no mitigation measures required

b. Grassland

i. The approach route from the cable car Terminal Building to the launch of Zip 1 crosses an area of grassland, after the route leaves the Emergency Trail mentioned above, for a distance of approx. 80-100m.
ii. The path from the suspension walkway back to the start also covers rocky grassland for approx. 100-120m.
iii. Given the paths will be 1m wide, the total grassland area to be covered by new paths is therefore approx. 200m2.
iv. The CloudStation launch of Zip 1 will be on rocky grassland, occupying approx. 78m2 of land
v. In line with the Cable Car EIA, “considering the extent of grassland habitats in the local area… minimal ecological impact is anticipated from grassland habitat removal”.
vi. The impact from new paths can be mitigated by selecting a style of pathway (e.g. raised wooden boardwalk or grated steel deck) which lifts the pathway above ground level and permits rainwater and light to penetrate to the earth, as well as allowing minor taxa to pass beneath the pathway.
vii. Due to the rocky nature of the route from the end of the suspension walkway back to the start, the pathway will probably need to be elevated a little from ground level for engineering reasons.
viii. To reduce the impact of the pathways further, we have designed the return route from the suspension walkway to link up with the approach route to Zip 1 from the Cable car terminal, thereby avoiding the need of building a completely new return path.
ix. The impact from the CloudStation has already been mitigated during the design process, by envisaging the use of pre-formed ballast contained within the above-surface structure of the CloudStation to avoid the necessity for deep concrete foundations; in addition the decking of the CloudStation will be grated steel raised above ground

level to permit rainwater and light to penetrate to the earth, as well as allowing minor taxa to pass beneath the platform.

x. The impact from the CloudStation could be mitigated further by reducing the diameter of the installation (currently envisaged to be 14m – small diameter to be confirmed if possible)

c. Low Shrub

i. The landing of Zip 1, the path from the landing of Zip 1 to the launch of Zip 2, and the launch of Zip 2 all occupy areas of low shrub, near to Tower 7.

ii. The two CloudStations will occupy a total land area of approx. 300m2, while the path will meander for about 130m between the two CloudStations, occupying a further 130m2 of land area.

iii. In line with the Cable Car EIA, "minimal ecological impact is anticipated from low shrub habitat removal".

iv. The impact from the path and CloudStations could be mitigated further by taking the measures mentioned in section b. above.

d. Tall Shrub

i. The landing of Zip 2 and the path from there 80m up to the suspension walkway passes through an area of Tall Shrub.

ii. The CloudStation will occupy 78m2 of land while the path will occupy approx. 80m2 of land.

iii. This is the most ecologically high value area on the zipline tour.

iv. According to the Cable Car EIA: "No rare or protected flora was recorded in this habitat along the development footprint… The potential impact is considered moderate, however mitigation measures should minimise any ecological impacts… Clearing these habitats will require mitigation (compensatory planting)."

v. In order to mitigate the ecological impact of the CloudStation, we propose situating the structure on the spur of a rocky ridge which, although defined as a Tall Shrub habitat, does not appear to feature any tall shrubs presently; given the rocky steep terrain, it will be necessary to install foundations to support the CloudStation; however, there will be no requirement to remove any tall shrub species.

vi. The path leading steeply up the ridgeline for approx. 80m to the suspension walkway leads through an area of existing Tall Shrub, some of which would have to be cleared to make way for the path. We could consider compensatory planting to reduce the impact of this path construction.

e. Watercourses

i. None of the paths proposed by Flying Fox cross any watercourses; however the tour passes close to watercourses as follows:

   a. Both ziplines fly over three minor tributary branches of the Sham Wat Stream near Tower 7

   b. The suspension walkway crosses a major branch of the Sham Wat Stream, at a height of approx. 15-20m

c. The path from the landing of Zip 1 to the launch of Zip 2 passes approx. 20-30m to the south of a watercourse where the Leaf Litter Toad has been observed

ii. Flying Fox does not require paths or fire breaks to be constructed beneath the ziplines or suspension walkway for safety or operational reasons. During the construction process, line launchers will be used to rig the zipline cables, avoiding the need for workers to walk the full line of the zipline routes. Consequently, the watercourses will not be affected by the construction or operation of the zipline tour.

iii. Great care will be taken during the design and construction of the path from the landing of Zip 1 to the launch of Zip 2 to ensure that no damage – due to either human disturbance or spillage of construction materials or fuels – occurs to the riparian vegetation along the Sham Wat Stream tributary harbouring the Leaf Litter Toad.

f. Photographs

For photographs of the proposed locations for zipline tour infrastructure, see **Annex 1.4**.

3.7.8 Summary of mitigation measures to reduce habitat loss, by infrastructure

a. Paths

i. The route has been designed to use existing paths where possible and to reuse both new and existing paths, to reduce the construction of new paths to a minimum.

ii. Existing paths account for 400m or 25% of the total tour length of 1,580m.

iii. New paths account for 430m or 27% of the total tour length of 1,580m.

iv. Path design to reduce erosion of topsoil and vegetation can be developed in consultation with AFCD. Options include:

- Stone pointed with cement – naturalistic, but forms a barrier and covers the earth, durable, can be slippery when wet
- Raised walkway of grated galvanised steel – allows ingress of light and rainwater to earth, allows small taxa to pass beneath walkway, not naturalistic, will not decay, less slippery than stone or wood when wet.
- Raised boardwalk of timber – allows ingress of rainwater to earth, allows small taxa to pass beneath boardwalk, naturalistic, will decay quicker than steel, slippery when wet.

b. CloudStations

i. The original design conceived large CloudStations of 14m in diameter in order to accommodate up to 30 guests at a time on the structure, avoiding the need for them to wander across unprotected land. This design totals 154m2 of land requirement per CloudStation. For four CloudStations, that totals over 600m2 of land.

ii. We are confident that the CloudStation design could be modified to reduce the diameter to 10m. This would halve the land area required to 78m2 per CloudStation, or a total 312m2 for all four CloudStations.

iii. It is possible that the CloudStations' diameter could be reduced further still, subject to confirmation from the design engineers.
iv. If the galvanised steel structure of the CloudStations is not desirable in a Country Park, we can consider using a timber structure instead.

c. Zip lines

i. The ziplines themselves are an inherently ecologically low impact form of travel. They do not disturb the flora or fauna beneath them. They do not require a path beneath them. They require very little trimming of vegetation. Consequently they are probably the lowest impact form of travel across a mountain landscape.
ii. The Flying Fox ziplines total 600m in length – 38% of the entire tour length of 1,580m.

d. Suspension walkway

i. Our design engineers are confident that the suspension walkway can be anchored into the natural rockfaces on either side of the Sham Wat gorge. This will avoid the need to lay concrete foundations.
ii. The suspension walkway will pass 15-20m above the level of the stream.
iii. Consequently the ecological impacts of the suspension walkway will be negligible.

3.7.9 Potential ecological impacts of disturbance due to construction and operation, and mitigation measures

a. Potential disturbance impacts on flora and fauna species due to increased human activities during construction include:
   i. Waste and contamination
   ii. Soil erosion and sedimentation
   iii. Air pollution (dust)
   iv. Trampling of grass and shrub species
   v. Fire risk
   vi. Noise and lighting
   vii. Extraction of water from watercourses

b. The working capacity of the Flying Fox zipline tour is approx. 480 persons per day. Potential disturbance impacts on flora and fauna species due to increased human activities during operation include:
   i. Domestic waste
   ii. Soil erosion
   iii. Trampling of grass and shrub species
   iv. Fire risk
   v. Noise

c. Mitigation measures will be taken as follows:
   i. Strict adherence to the Flying Fox Waste Management Plan during both construction and operations; no machine will be maintained or refuelled within 50m of a watercourse; litter control will be strictly enforced by onsite instructors during operations

ii. Covering with tarpaulins of any soil exposed during the construction process, to avoid ingress of rainwater and subsequent erosion; particular care taken to avoid ingress of any construction materials into the Sham Wat Stream and its tributaries; exposed areas will be revegetated
iii. Covering of building materials during construction to prevent dust entering atmosphere
iv. Strict adherence to existing paths during construction and operations; fencing off construction sites to minimise trampling of grass and shrub species
v. Any areas of temporary vegetation loss will be revegetated with suitable species
vi. Total ban on smoking in the operational area during both construction and operations to minimise fire risk; installation of relevant fire fighting equipment as required
vii. Noise mitigation measures will be enforced during the construction period as mentioned above; night time construction and operations will be avoided; permanent lighting of the zipline tour installation is not considered necessary for safety or operational reasons.
viii. Extraction of water from watercourses for construction purposes is not permitted in Country Parks – this will be strictly enforced during the construction phase.

3.7.10 Potential ecological impacts on fauna due to operational disturbance

The following material is quoted verbatim from the Cable Car EIA:

a. "Disturbance is an unavoidable impact of the operation process. Disturbance will generally have insignificant impacts on mobile taxa, or taxa which do not have highly specific habitat requirements, such as birds, large mammals, most reptiles, and butterfly and dragonfly adults, and in these cases disturbance impacts will be avoided by ensuring operational activities are undertaken according to Environmental Code of Practice and the proposed mitigation measures."

b. Barrier effects of paths: "The emergency rescue trail [in Flying Fox's case, the access path] is narrow and the impact of 'exposed areas' will generally not impact on fauna species. It is possible that some cryptic species (e.g. Short-legged Toad) avoid the trail as a consequence. The trail is unlikely to act as a barrier to movement of such species between areas of suitable habitat bisected (and or fragmented by) the trail. This impact is considered to be insignificant.

3.7.11 The possibility of bird strikes

We have consulted with our Australian design engineers on this point. They confirm that out of the approximately 400 zipline installation projects in which they have been involved, they have never heard of any instances of mortality due to bird strikes.

In addition, the following material is quoted verbatim from the Cable Car EIA:

a. "Bird collisions are not considered a potential significant impact, as no evidence is present that the area is a migratory bird flight path or an area situated close to breeding or feeding colonies of migratory birds."

b. "The impact of electrocution of raptors is considered to be the main cause of mortalities of Bonelli's Eagle *Hieraaetus fasciatus* in Europe (Manosa and Real 2001 *In* Ove Arup & Partners Hong Kong Ltd, 2002). The cables of the Cable Car System will not be electrified and no mortalities are anticipated." Flying Fox's cables are also not electrified.

c. "It is anticipated that non-migratory species will not to be impacted upon. They will have familiarly with the Cable Car System (once operating) and will have a lower potential to collide with the cableway or towers."

d. "No bird species mortality has been reported from the collision of bird species into structures from the construction or operation of the Ocean Park Cable Car System or transmission lines in general in Hong Kong."

3.7.12 Summary of potential impacts of construction and operation on key species

These impacts are discussed in the Cable Car EIA and reproduced verbatim in summary form below:

a. Mammals (Ferret Badger, Barking Deer & Seven-banded Civet): "Insignificant impact from construction disturbance. The species is expected to be able to temporarily relocate/ adapt."
b. Birds: "Insignificant impacts are predicted as no nesting trees will require removal. The cable car structures are unlikely to cause disturbance (i.e. noise) due to the mobility of the species."
c. Amphibians: "Potential impacts may result from construction near the Ngong Ping stream and subsequent disturbance (sedimentation and pollutants) without mitigation measures."
d. Reptiles: "Insignificant impacts associated with construction."
e. Insects (including birdwing butterflies): "No impacts predicted, as habitat will not be disturbed during construction activities."

3.7.13 Ecological impact management – conclusions

a. Ecological value of operational area.

i. According to the Cable Car EIA, the Study Area (and by extension Flying Fox's operational area) "contains a variety of habitats, of which the most ecologically valuable are streams, secondary woodland, and tall shrub habitat. … Overall, the Study Area is assessed to be of medium to high ecological value."

b. Impact on habitats and flora

i. According to the Cable Car EIA, "Many streams and forest habitats in the Study Area are of particularly high ecological value due to a low level of anthropogenic disturbance, and it is crucial that impacts to these highly sensitive habitats are avoided or minimised wherever possible."

ii. Flying Fox will be using areas of abandoned cultivation, grassland, low shrub and tall shrub, but no woodland. The ziplines and suspension walkway will cross over various branches of the Sham Wat stream
iii. The most ecologically valuable habitat along the route of the Flying Fox zipline tour is the Tall Shrub leading from the landing of Zip 2 up the ridgeline to the suspension walkway – a distance of 80m.
iv. Mitigation measures will be taken to ensure minimal lopping of tall shrubs and compensatory planting as required.
v. Mitigation measures will be taken to ensure no waste products, pollutants or sedimentation affect the watercourses within the operational area.

c. Impacts on fauna

i. According to the Cable Car EIA, "The species of conservation interest appear to be widely distributed in the wider survey area and do not appear confined to any single location. The exception to this is amphibians that have relative low mobilities and may be impacted upon by sedimentation and contamination."

ii. The uncommon Leaf Litter Toad has been observed in a Sham Wat tributary stream near to the path leading from Zip 1 to Zip 2. Particular care will be taken to ensure its habitat and behaviour are not disturbed.

3.8 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

3.8.1 Impact Assessment Methodology

In line with the Cable Car EIA, the assessment of the potential landscape and visual impacts of the proposed works comprises two distinct sections as follows:

- baseline survey
- potential impact assessment

A preliminary survey has already been conducted of views towards the proposed zipline tour development, which could be developed further as follows:

- The visual envelope (2km distance or defined by natural or manmade features) within which the proposed development may be contained whether wholly or partially within views, including indirect effects such as temporary contractor's works areas.
- The visually sensitive receivers (VSRs) within the visual envelope whose views will be affected by the scheme.
- The baseline survey describes and records by photograph typical views from within visual envelope for low-level & high level viewpoints

The sensitivity of each receiver group and quality of views typically will be based on the following:

- *High*: e.g. residential properties, upland hillwalkers and visitors to Ngong Ping.
- *Medium*: e.g. workplaces, schools etc.
- *Low*: e.g. recreational facilities or partially screened views etc.

The assessment of potential visual impacts will result from the following:

- identification of the sources of visual impacts and their magnitude that would be generated during construction and operation; and
- identification of the principal visual impacts with particular consideration given to the degree of change to the baseline conditions.

The impact assessment will compare the typical existing views identified in the baseline survey of the key receiver groups and the potential view after the proposed works are complete. Some typical factors affecting the magnitude of changes and sensitivity for assessing visual impacts will include the following:

Factors affecting the magnitude of change:

- compatibility of the project with the surrounding landscape;
- duration of impacts under construction and operation phases;
- scale of development;
- reversibility of change;
- viewing distance; and
- potential blockage of view.

Factors affecting the sensitivity of receivers:

- value and quality of existing views;
- availability and amenity of alternative views;
- type and estimated number of receiver population;
- duration and frequency of view; and
- degree of visibility.

A set of photomontage images can be used to compare views of existing site conditions, the unmitigated impacts of the zipline tour installation, and the views following mitigation measures.

3.8.2 Existing landscape and baseline context

The Cable Car EIA subdivided its Study Area into key landscape character units (LCUs) within 500m of the proposed cable car development. For the purposes of Flying Fox, the entire zipline tour installation is contained with LCU11, defined as follows:

"LCU 11. (Upland Terrain) This LCU comprises the spectacular topography of the hills and hinterland of Tung Chung and San Tau. The slopes and ridges are typically steep and vegetated by extensive areas of scrub and grassland criss-crossed by a number of walking trails. There are copses of trees in the more sheltered ravines and lower slopes. The cable car development will result in the temporary loss of scrub and grassland during construction of Towers 3, 4, 5, 6 and 7 as well as the Angle Station between Towers 5 and 6. It is not anticipated that any trees within this LCU will be affected directly by the cable car which will pass overhead with generous clearance. However, the current proposal to build a rescue trail will require clearance of vegetation and this is discussed in more detail below. The main landscape impact is likely to result from the intrusion of the man-made structures into an otherwise undeveloped landscape."

It is worth noting that the new paths which connect the start and finish of the zipline tour to the cable car Terminal Building lie adjacent to, but do not cross, LCU 15, defined as follows:

"***LCU 15. (Burial Areas)*** This LCU comprises burial sites with a number of graves and a columbarium. The centre of the site is relatively level ground surrounded by a series of small rocky knolls with mainly hillside scrub and grass vegetation cover. A small stream meanders across the site. There is a belt of amenity tree planting by the side of the access road. The cable car terminal is located within this LCU and although it does not impact directly on the graves it will result in the permanent loss of mainly scrub and grass vegetation and require re-channelling of the stream course."

The only point at which the zipline tour crosses LCU15 is when guests use the pre-existing trail from the Terminal Building to the point where the new path branches north-west towards the launch of Zip 1. The new path has been designed specifically to avoid the boundary of LCU15.

Clearly, since the research was carried out for the Cable Car EIA, the Cable Car itself has now been constructed and this development has had its own impact on Flying Fox's operational area, thereby generating its own impacts on the landscape and views of the baseline area in question.

Specifically, within Flying Fox's operational area, which broadly consists of the hilly basin drained to the west by the Sham Wat Stream, the following cable car installations now exist:

- **Tower 7:** measuring 47m high, with a ground footprint of 35m x 35m, this tower is directly adjacent to the Flying Fox operational area
- **Ngong Ping Terminal Building:** measuring 12m high with a ground footprint of 20m x 60m, this building lies less than 200m from the launch of Zip 1, atop the Ngong Ping plateau
- **Tower 3:** measuring 16m high, with a ground footprint of 35m x 35m, this tower lies approx. 900m from the landing of Zip 1 and launch of Zip 2.
- **Rescue trail:** measuring approx. 450m long x 1.5m wide, this straight stone trail runs underneath the cable car from the Terminal Building to a point beyond Tower 7, directly adjacent to the Flying Fox operational area

3.8.3 Potential landscape and visual impacts

Potential impacts can be divided into temporary impacts due to construction works and permanent impacts due to the development footprint of the completed structures.

a. Temporary impacts – construction

i. Four halo-shaped CloudStations, each measuring approx. 14m in diameter; these will require approx. 20m x 20m of space each for assembly and installation

ii. One suspension walkway measuring 50m long x 1m wide; this will not require any additional construction space as it will be anchored into steep rock faces

iii. Four new paths, measuring in total approx. 430m long x 1m wide; these will require minimal additional construction space, probably another metre to either side of the path track.

b. Permanent impacts – footprint of structures

i. Four CloudStations, each 10m in diameter (78m2 in area) and 2-3m in height
ii. One suspension walkway, measuring 50m x 1m, at a height of approx. 15-20m above the river
iii. Four new paths, measuring approx. 430m x 1m
iv. Four aerial ziplines, running for 300m each in two parallel tracks 3m apart; each zipline measures approx. 12-14mm in thickness

3.8.4 Assessment of potential landscape and visual impacts – magnitude of change

Below is our assessment of the potential impacts of the Flying Fox zipline tour, in terms of the factors affecting magnitude of change (large, intermediate, small, negligible):

a. Compatibility of the zipline tour with the surrounding landscape

i. The surrounding landscape is dominated on its eastern flank by the man-made intrusion of the cable car. Given the height of the nearest cable car structure – the 47m high Tower 7 – as well as the 450m long rescue trail, we would assess the landscape impact of the zipline tour to be small.
ii. While the straight line of the rescue trail is visually harsh, Flying Fox's paths will meander naturally, making use of contours, natural vegetation cover and rock formations, to blend in better with the landscape; by these measures we would ensure that our paths generate a small visual and landscape impact
iii. The surrounding landscape to the west is more naturalistic, although the first signs of construction of the new Hong Kong-Macau road bridge are now visible from the site. The landscape and visual impact of the zipline tour from this perspective will be slightly greater; however, the scale of the proposed development compared to the scale of the landscape features themselves is minimal, suggesting a small magnitude of change to the landscape and view.

b. Duration of impacts under construction and operation phases

i. Construction will take approx. 6 months broken into two phases: pre-fabrication of all components (3 months); installation of all components onsite (2-3 months). Therefore the duration of impacts during the construction phase will be limited to 2-3 months.
ii. The duration of impacts during the operation phase will be for as long as license as the Hong Kong Government grants for operational use of the installation.

c. Scale of development

i. The scale of the development is small compared to the cable car development immediately adjacent to the Flying Fox operational area.

ii. While Tower 7 of the cable car is 47m high with a footprint occupying 1,225m2, the Flying Fox CloudStations will each be 2-3m high with a footprint of 78m2 – approx. 6% of the footprint of one cable car tower. All four proposed CloudStations will occupy a visual footprint of 312m2, approx. one quarter the footprint of one cable car tower.
iii. The length of the cable car rescue trail in this part of the landscape adjacent to Flying Fox's operational area is 450m; this compares to approx. 430m of new paths proposed by Flying Fox; while the Flying Fox paths are of a similar length to the rescue trail, they will appear smaller scale for two reasons: 1) the 430m of paths are split into four separate short paths; 2) the paths will meander in a naturalistic fashion
iv. The two sets of twin zipline cables are each 300m long and 12-14mm in diameter, compared to the cable car cables which stretch for over 5,000m with an approx. diameter of 54mm; consequently the ziplines will be virtually invisible compared to the cable car cables. The main visual element will be the guests flying down the ziplines, but again they will appear very small compared to the size of an individual cable car gondola.
v. The suspension walkway is 50m long, less than the width of the Terminal Building, and just 1.5m high, compared to the 12m height of the Terminal Building; consequently the suspension walkway will appear delicate in comparison.

d. Reversibility of change

i. The zipline tour installation has been designed to use the minimum amount of foundations possible; all components will be pre-fabricated offsite and assembled onsite.
ii. This leaves open the possibility of dis-assembling the components at some stage in the future and removing them from the site, leaving a minimal footprint behind.
iii. The reversibility of the paths would depend on whether they are made of stone or using a timber or grated steel deck – the stone design would be less easily reversed.

e. Viewing distances – from the north and above

i. The nearest view of the zipline tour installation will be from the cable car gondolas themselves as they approach from the north. At their closest point they will pass approximately 50m above and 30m to one side of the launch of Zip 2.
ii. While this viewing distance is small, it can be argued that this specific set of "visually sensitive receivers" (VSRs), in the act of using the cable car, has already adapted to the idea of a man-made construction within this particular enclave of Lantau North Country Park.
iii. In addition, their view of the zipline tour will be framed by a view of the infrastructure of cables, towers and gondolas which is conveying them towards Ngong Ping.

f. Viewing distances – from the east and above

i. The second set of VSRs would be hikers using the nearby Lantau Trail and/or Country Trail. These two trails lead separately from the Ngong Ping plateau,

around the western flank of Nei Lak Shan, converge to the north-east of Tower 7 and lead as one path towards the Angle Station.

ii. However, at the point where these paths are nearest to the zipline tour installation, the view of Flying Fox is obscured as the paths pass behind a knoll feature (Spot height 491.6m) lying close to the south east of Tower 7.

iii. Near where the two paths converge, on a spur at 470.8m, a view of the launch of Zip 2 (at a height of 430m) is likely at a distance of approx. 300m. However, this view of Flying Fox – and all the views of Flying Fox from this footpath as it leads towards the Angle Station – will be framed in the foreground by the cable car infrastructure of cables, towers and gondolas.

iv. So it can coherently be argued that the view from this path has already been significantly impacted by the cable car, and the addition of the zipline tour infrastructure will be visually negligible.

g. Viewing distances – from the south

i. From Ngong Ping plateau, the Flying Fox zipline tour has been carefully designed to ensure none of the infrastructure is skylined or silhouetted on any visible ridge or hill top.

ii. Consequently, the installation will be virtually invisible from the Terminal Building and completely invisible from the Buddha, Po Lin monastery, and the columbarium, referred to on the 1:10,000 map series as Ling Tap.

h. Viewing distances – from the west and below

i. The nearest viewpoint from the west is the road to Sham Wat as it nears the coast. The road at this point is nearly 2km distant from the Flying Fox installation and over 400m lower in elevation.

ii. It is therefore likely that the zipline tour will be virtually invisible from this distance, especially given the outline of the cable car infrastructure immediately beyond.

i. Potential blockage of view

i. The analysis above makes clear that at no point are any existing views blocked by the zipline tour installation.

ii. The two main viewpoints of Flying Fox will be from: 1) the cable car gondolas themselves, from which the view is already partially blocked by cable car infrastructure; 2) the hiking trails around the flank of Nei Lak Shan, from which the views of Flying Fox will feature the cable car infrastructure in the foreground

3.8.5 Assessment of potential landscape and visual impacts – sensitivity of receivers

Below is our assessment of the potential impacts of the Flying Fox zipline tour, in terms of the factors affecting the sensitivity of receivers (large, intermediate, small, negligible):

a. Value and quality of existing views

i. As established above, there are two sets of existing views of Flying Fox's operational area: 1) From the north from within the cable car gondolas; 2) From the east from the hiking trails around Nei Lak Shan.

ii. Both of these views have already been compromised by the existing cable car infrastructure; hence the addition of Flying Fox's installation will have a negligible visual impact on the value and quality of the existing views.
iii. There are no views of the operational area from the Ngong Ping plateau to the south, as there are no public access footpaths to the top of the hill overlooking the operational area.
iv. The views of the operational area from the west are at a distance of nearly 2km, near Sham Wat. This distance is far enough to render the impact of Flying Fox on the value and quality of the view from Sham Wat to be negligible.

b. Availability and amenity of alternative views

i. For the hikers, there are innumerable alternative views of the Country Park afforded by the Lantau Trail
ii. For users of the cable car, the view of Flying Fox is one among many views of both natural and man-made features during the journey from Tung Chung to Ngong Ping.

c. Type and estimated number of receiver population

i. The population using the cable car annually is approx. 1.7 million
ii. The population using the Lantau Trail and Country Trail from Ngong Ping to the Nei Lak Shan Angle Station is not known to Flying Fox.
iii. Hence the vast majority of VSRs will be cable car users. It has been argued above that this receiver group, in the act of using the cable car, is already adapted to the idea of man-made structures within the Country Park environment, and is therefore unlikely to view the Flying Fox installation from a negative angle.

d. Duration and frequency of view

i. The principal receiver group, cable car users, will view the Flying Fox installation for approx. 5 minutes on their journey from the Angle Station towards the Terminal Building
ii. While the frequency of view will be high (1.7 million views per year), the duration will be relatively low (5 minutes for each passing gondola)

e. Degree of visibility

i. The CloudStations will be the most visible part of the installation, but the combined footprint of all four CloudStations will be approx. half the footprint of one cable car tower
ii. The paths will meander to blend into the topography and reduce visibility
iii. The suspension walkway will be less than the width of the Terminal Building and below the skyline of the Ngong Ping plateau
iv. The zipline cables will be approx. one quarter the width of the cable car cables and virtually invisible from any viewpoint
v. The guests flying on the ziplines will be visible as small moving objects within a large landscape
vi. Overall the degree of visibility is assessed as small

3.8.6 Measures to mitigate the landscape and visual impacts

Although the landscape and visual impacts of the Flying Fox zipline tour installation are assessed as small, the following mitigation measures have been or can be considered to reduce the impact further:

a. Bio-mimicry: the CloudStation's halo design has been conceived to mimic the natural knoll formations found in the operational area, as well as mimicking the circular plinth of the Great Buddha.

b. Naturalistic routes: the routes taken by the connecting paths have been designed to meander around the contours, behind rock formations and beneath shrub cover to disguise their appearance as far as possible.

c. Path design: the paths can be made in a variety of materials: 1) stone pointed with cement; 2) wooden raised boardwalk; 3) grated raised steel walkway. Flying Fox invites AFCD to comment on the environmental and visual merits of each style.

d. Platform design: the current CloudStation design proposes to use either galvanised or weathering steel as the main material. This type of material is widely used in the US and Australasia in zipline and canopy tour construction within country or national parks. Over the years, the metal discolours and takes on the visual appearance of its background, without losing structural integrity. However, the steel could be painted in a way which camouflages its natural colour and sheen to blend it into the background.

The CloudStation design originally envisaged a structure with a 14m diameter. This can be reduced to 10m diameter, thereby halving the land area from 154m2 to 78m2 per CloudStation, consequently halving the landscape and visual impact of the installation.

Alternatively, the CloudStation design could be replaced by a more traditional timber launch and landing structure if AFCD deem such a structure to be more in keeping with the environment and aesthetic of the Country Park. However, some structural steel is likely to be required for the anchoring and redirection of the ziplines themselves.

e. Suspension walkway design: it is proposed to use steel wire rope only for the load bearing portions of the suspension walkway – the most visible materials will be natural rope lengths suspending the timber decking.

f. Replanting or transplanting: where the path leads through Tall Shrub from the end of Zip 2 up to the suspension walkway, we propose transplanting or replanting any shrubs removed to create the 80m pathway.

3.8.7 Conclusion

The landscape and visual impacts of Flying Fox's zipline tour installation will be small, for the following key reasons:

- The infrastructure is considerably smaller in scale than the current cable car infrastructure which lies immediately adjacent to Flying Fox's operational area.

- The infrastructure has been designed to bed into the landscape and topography, avoiding straight-line paths or silhouetting structures on skylines.
- The installation can only be seen from two existing viewpoints:
  i. The cable car gondolas themselves, from which the view of Flying Fox is framed by foreground views of the cable car installation
  ii. The section of Lantau Trail and Country Trail leading from Ngong Ping plateau to the Angle Station. The view of Flying Fox from these trails is itself framed in the foreground by the cable car infrastructure of towers, gondolas and cables.
- The great majority of viewers will be from the cable car itself – these viewers, in the act of taking the cable car, have arguably adapted to the concept of man-made structures in the Country Park and will be unlikely to object to the much smaller Flying Fox installation adjacent to the cable car.

For a set of images showing the context for the likely visual impacts, see **Annex 1.5.**

3.9 CULTURAL HERITAGE IMPACT ASSESSMENT

3.9.1 Archaeological sites

According to the Cable Car EIA, "No archaeological sites have been recorded in areas which will be directly impacted by the proposed project…The steep slopes [of Nei Lak Shan] are not suitable for settlement and there is no record of occupation or cultivation".

3.9.2 Monastery and Great Buddha

The Po Lin or 'precious lotus' monastery was founded in 1905 and officially inaugurated in 1928. The Tian Tan or Great Buddha was completed in 1993. However, the Flying Fox zipline tour installation will not be visible or audible from either the Great Buddha or the monastery, which lie respectively 600m and 700m away from the nearest proposed Flying Fox structure.

3.9.3 Ling Tap columbarium

Our field survey has confirmed that the only cultural or heritage resource within 200m of the project boundary is the columbarium known as Ling Tap. This structure lies at an elevation of 429m approx. 90m to the south of the proposed location of the suspension walkway, which will be at an elevation of 420m. Between the columbarium and the suspension walkway is a knoll of 437m elevation. Given that the suspension walkway is located at an elevation 17m below the summit of the knoll, it is assessed that the suspension walkway is beyond the audible as well as visual range of the columbarium.

3.9.4 Graves

Maps and ground truthing have revealed the locations of several graves on the south-eastern slopes of the knoll feature known on the 1:1000 map as "Rocky Area" (Spot height 446.5m), lying to the north of the Terminal Building and to the east of Ling

Tap. Flying Fox has adjusted the approach path from the Terminal Building to the launch of Zip 1 to give these graves a wide clearance.

3.9.5 Fung Shui

The Cable Car EIA found two fung shui features in the Study Area – the Elephant's Trunk (which lies on the coast near Tin Sam) and the Dragon's Back (which runs down the mountain spine north from the Angle Station). Neither feature is near Flying Fox's operational area.

3.9.6 Conclusion

There will be no adverse visual or aesthetic impacts on the area's cultural heritage due to the proposed project, as all works areas are located at a sufficient distance from the monastery and associated structures and are separated from them by wooded or hilly areas.

3.10 ENVIRONMENTAL CODE OF CONDUCT

Flying Fox proposes to adopt the "Environmental Code of Practice for the Works of Tung Chung Cable Car Project" presented in the Cable Car EIA – see **Appendix G**. This booklet will be provided to all personnel directly and indirectly involved in the construction works for this project. In addition training will be given to the workforce to ensure there is full comprehension and 'buy-in' to the environmental policies being adopted for this project.

3.11 YELLOWSTONE PARK ZIPLINE CASE STUDY

3.11.1 Environmental assessment

In August 2012 the United States Department of Agriculture, Forest Service, published *Predecisional Environmental Assessment: Sleeping Giant Ski Area Development Projects. Wapiti Ranger District, Shoshone National Forest, Park County, Wyoming*. The assessment considered the environmental impact of upgrading the summer adventure activities at the Sleeping Giant ski area, within a national park/forest, of which a zipline project formed one part.

It was not suggested that the zipline project alone required an environmental assessment; but the project formed part of a larger upgrade which did require such an assessment. See **Appendix D** for a summary of the assessment's findings.

3.11.2 Proposed zipline tour within national park / forest

The zipline project consisted of:

- **7 ziplines** (compared to Flying Fox's two parallel ziplines)
- **1 suspension walkway**
- **8 steel tower anchor stations between 2.5m and 14m high** (compared to Flying Fox's four 2-3m high CloudStations)

- **Total impact on ground 0.4ha** (compared to Flying Fox's 0.07ha)
- **Total project area of 7.7ha**

3.11.3 Impact assessment & conclusions

The assessment examined seven areas of potential impact and came to the following conclusions:

- Cutting 10-20 trees scattered across the project area would have no effect on diversity
- Major groundwork and use of heavy equipment should be limited to seasons when minimal soil compaction or sediment delivery to rivers would occur
- There would be no effects to sensitive species of wildlife and no habitat loss
- Limiting operations of the ziplines from 8am to 7pm would be a mitigating factor
- The project area of 7.7ha is too small to constitute a significant impact to any species listed
- Surface erosion would be minimal due to the small area of 0.4ha disturbed
- No fire risk attached to the construction or operation of the ziplines
- Use of a rubberized zipline would eliminate any noise from the zipline
- The project would provide a recreation opportunity not currently available in the area and would not have any negative effects on existing recreation sites in the forest
- Structures and land form alterations should in their design borrow from naturally established form, line, color and texture

Working Paper submitted to the Country and Marine Parks Board

Proposed Flying Fox Eco-Adventure Zipline Tour at Ngong Ping, Lantau North Country Park

17th October 2012

ANNEX 4. SAFETY & RISK MANAGEMENT

ANNEX 4. OPERATIONAL SAFETY & RISK MANAGEMENT

4.1 Overview and safety record

Ziplines are an extremely safe, exhilarating and inclusive form of adventure activity. Our tours are the only zipline activities in India which conform to international standards on construction and operations. Below is more information about our safety record and protocols.

Since opening in January 2009, we have operated approximately 200,000 safe zipline descents. During this period we have enjoyed a 100% safety record, with zero accidents requiring hospitalization. In a survey of 1,521 guests over a 15 month period in 2009-10, 98.9% of our guests scored our Safety Briefing with 5 points out of 5, while 99.1% rated our Instructors with 5 out of 5.

4.2 Safety standards & associations

At Flying Fox, safety is our No. 1 priority. Our installations, which consist of robust and permanent galvanized steel posts and cables, are designed by some of the world's leading zipline technicians. We currently conform to the European Standard which encompasses zipline tours (EN 15567 Parts 1 & 2) and to ISO 4309 which governs the use of wire rope.

For the installation in Hong Kong, we have already entered into discussions with the EMSD about which safety standards are most applicable; the current consensus is to apply the Hong Kong *Code of Practice for Amusement Rides* 2003, with reference to applicable international industry standards where appropriate, including:

- EN 15567 Parts 1 & 2 – the European Standard for *Sports and recreational facilities – Ropes Courses – Part 1: Construction and safety requirements; Part 2: Operation requirements*
- EN 13411 – the European Standard for *Terminations for steel wire ropes*
- ISO 4309 – the International Standard for *Cranes – Wire ropes – Care, maintenance, installation, examination and discard*
- AS 2316.1 – the Australian Standard for *Artificial Climbing and Abseiling Structures*
- *Challenge Course and Canopy/Zip Line Tour Standards, Seventh Edition 2008* – published by the US-based Association for Challenge Course Technology (ACCT)

Flying Fox is also a member of various professional associations, including the Adventure Tour Operators Association of India (ATOAI) and the Association for Challenge Course Technology (ACCT). Flying Fox would seek to work with the Tourism Commission of Hong Kong to ensure that these international standards for zipline tours are introduced to Hong Kong.

4.3 Imported equipment

The safety equipment worn by participants while zip lining is called Personal Protective Equipment (PPE). All our PPE is imported from leading international

brands such as Petzl of France, and it conforms to UIAA standards. Our PPE design ensures that each guest is connected to the wire by two separate and secure points of attachment while descending the zipline – one principal pulley and one safety backup, connected to the guest by lanyards and self-locking karabiners with a safe working load of 22kN. It is physically impossible for a guest to become disconnected from the zipline once he or she is corrected attached.

In addition to the safety equipment worn by participants, each Flying Fox instructor carries a rescue bag onsite which includes the equipment necessary to rescue any participant at any point mid-span along the zipline. We do not practise rescues using vertical lowering from the zipline to the ground as this exposes the guest to unnecessary risk. We have all the portable equipment required to recover guests to either end of the zipline while remaining safely attached at all times. All instructors are First Aid trained and carry a First Aid kit with them.

4.4 Guest safety briefing and practice

Guests are thoroughly briefed, verbally and in writing, about the physical and mental requirements for zipping. They receive a full safety brief from one of our instructors and each guest practices zipping techniques themselves before embarking on the full zipline tour. In addition, they sign a “Risk Acknowledgment and Disclaimer Form” which absolves the company of liability in the event of negligence on the part of the guest.

4.5 Instructor training, supervision & communication

Each Flying Fox site is managed by an experienced team of expatriate and local instructors, led by a Manager who holds either a British or international climbing / mountaineering qualification. He is supported by a Senior instructor, who deputizes as Duty manager in the absence of the Manager.

All our instructors are trained to European standards before the commercial season starts. They receive refresher training and are assessed in their operational and rescue protocols every month during the operating season. They also hold First Aid certificates.

Guests are supervised at all times by Flying Fox instructors, who are responsible for clipping all guests onto the ziplines at each launch and unclipping them at each landing, as well as managing the safe flow of participants around the tour.

Guests will travel in groups of up to 12 persons at a time, supervised by two instructors. During periods of high occupancy, we will staff each CloudStation and the Suspension walkway with two instructors to improve the safe flow of guests.

Communication between instructors and the duty manager will be by hand-held UHF radio (“walkie-talkie”); all radio communications are logged.

4.6 Standard Operating Protocols & emergency procedures

Flying Fox has developed its own Standard Operating Protocols (SOPs), in conjunction with consultants from some of the world's leading high wire adventure operators. These protocols are contained in our Operations Manual & Annexes. We train all our instructors in the following safety critical areas:

- Fitting guest safety harnesses
- Delivering a clear, intelligible safety brief
- Conducting a group safely over rough terrain
- Safe clipping and unclipping of guests to the ziplines
- Safe progression of a group of guests through the entire zipline experience
- Radio protocols – all instructors carry UHF radios and report back to Base on every aspect of the zipline tour; Base in turn logs every event and radio call in the Radio Log
- First Aid relevant to our mountainous locations
- Standard rescue techniques to recover guests who do not reach the end of the zipline – instructors are trained and equipped to complete such rescues within 10 minutes
- Specialized rescue techniques to recover guests mid-span on the zipline, in the unlikely event of gear failure – there is no requirement to lower guests to the ground; instructors are trained and equipped to complete such rescues within 20 minutes.
- Evacuation SOPs in the event of poor weather, which will be customised to suit the specific site in Lantau (see **Fig. 4.1** below).

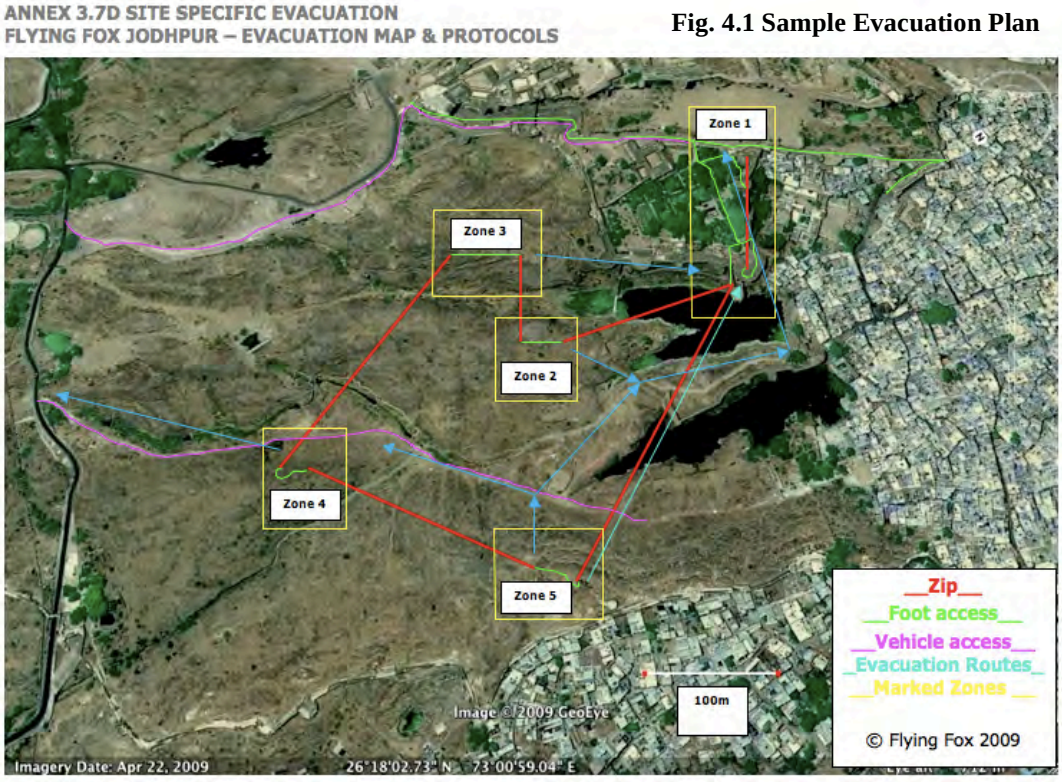


Fig. 4.1 Sample Evacuation Plan

- Significant incident protocols, including the evacuation of injured guests by stretcher. These protocols include liaising with the landlord's onsite team, local emergency services and creating a comprehensive paper trail of Witness statements and Significant incident reports to ensure the event is correctly documented.
- *Note: We will be in close contact with the cable car operators to ensure that we are "in the loop" on any severe weather warnings issued by the Hong Kong Observatory; we will adopt similar windspeed warning criteria as NP360 for evacuating and closing the site. The site will close during electrical storms and heavy rain.*

4.7 Risk assessments

Each site has a Risk Assessment document which is updated on a quarterly basis. It comprises two sections: a set of generic risks common to all zipline sites; and a set of risks specific to the particular site.

The severity of each risk is scored on a scale of 1-5, while the likelihood of a risk is scored on a scale from 1-3. Our management team work with the onsite staff to ensure that mitigation measures are in place to reduce the severity and likelihood of the risks. However, if the total score for a specific risk reaches over 6, then more effective precautions are implemented.

4.8 Site inspection regime

We have four distinct inspection regimes:

i. Daily checks – every day, our instructors conduct the following:

- Visual check of every aspect of the physical installation
- Visual check of the zipline tour environment, including paths, trees, slopes etc.
- Physical test ride of each zipline & braking system before opening to the public
- Physical check of all PPE before use by guests

ii. Monthly checks – every month, our Managers and Senior Instructors conduct the following:

- Thorough check of every aspect of the installation, including all nut/bolts, critical wire rope terminations, turnbuckles, shackles, concrete footings, steel & welded components, zipline integrity, braking system, platforms & paths – looking for any signs of tampering, metal fatigue or degradation
- Retuning of ziplines to ensure maximum ride safety, obstacle clearance and correct speed
- Thorough check and maintenance of all the PPE, utilizing a grading system to monitor wear and tear (Good, Monitor, Quarantine). Any equipment suspected of wearing out is quarantined, removed from the site and assessed by our Operations Manager.

iii. Periodic/Quarterly checks – Head Office ensures that the following happens periodically:

- All ziplines are inspected visually for wire breaks and conform to ISO 4309
- All critical wire rope U-grip terminations are torque-wrenched to the correct tension in N/m
- Tension reading of all ziplines and stays, using digital Tensiometer – adjustment of zip and stay tensions as required to bring within safety parameters
- Risk Assessment is reassessed and revised
- Any groundwork repairs to paths, platforms or slopes are completed

iv. Annual certification – each year, an independent third party expert:

- Inspects and certifies our installations and operations to European standards
- Conducts onsite proof tests on any safety critical anchors

4.9 Head Office oversight

In order to ensure a safely operating installation and workforce, the inspection regime and staff training clearly have to be as good in practice as they are on paper. To that end, Flying Fox Head Office has established the following systems to ensure onsite compliance to our protocols:

- A full set of paperwork Annexes, relating to each safety critical inspection or training objective, to be completed and signed off by the Manager on a daily and monthly basis
- An online Operations Report, summarizing the inspections and training completed, to be emailed on a weekly basis to the Director of Operations at Head Office
- Full time Operations Manager, whose job it is to visit each site at least once per month to:
  - ensure that all safety-related paperwork is in order
  - conduct safety training and assessments for the Manager and instructor team
  - conduct First Aid refresher training
  - make spot checks on the installation and operations

4.10 Public access

Flying Fox limits access to its installations only to those guests who have undergone the correct induction and safety briefing procedure. The equipment can be dangerous if used by members of the general public who have not been correctly briefed or who are not supervised by Flying Fox instructors.

For this reason, we would need to limit public access to the installation itself, by gating off the CloudStations which provide access to the ziplines, and also the Suspension walkway.

The question of whether to permit public access on Flying Fox's pathways to non-

Flying Fox guests was raised in a preliminary meeting with AFCD. It should be noted that NP360 currently restricts public access to its rescue pathways.

However, we could consider permitting unaccompanied public access along our pathways during operational hours, to permit the public to enjoy the landscape from a different perspective or to watch Flying Fox guests flying through the air. Flying Fox welcomes the views of the AFCD and CMPB on this point.

4.11 Risk management summary

a. Staff training

- Instructor competencies are identified
- Trainee instructor induction process is established
- Hazard and incident forms are provided
- Emergency procedures are established
- Risk Management Strategy is established
- Standard Operating Procedures are established
- All work at height is done in accordance with Occupational Health and Safety Regulations and activity context
- Appropriate Personal Protective Equipment (PPE) meets industry standards and is supplied
- Graduated training method is established
- Instructor Training Manual is produced
- Instructor training and assessing results are documented and kept
- Periodic quality assurance assessment strategy is established
- Instructor disciplinary procedures are established

b. Tour Operation

- Risk identification and management is consistent with relevant standards
- Guest induction process is established
- Hazard and incident forms are provided
- Emergency procedures are established
- Risk Management Strategy is established
- Appropriate PPE meets industry standards, is inspected, maintained and supplied
- Standard Operating Procedures are established
- Safety Manual is produced
- Periodic inspections are conducted
- Local emergency services are invited to familiarise themselves with the tour and the in-house emergency procedures
- Reasonable measures to prevent unauthorised access can be designed