壹、前言

1.1 出國目的

地球溫室效應的出現，讓人們警覺到地球日益嚴重的環境破壞，包括人類在內的物種生存遭受嚴重威脅，環境保護與永續發展課題已為現代人類必須共同面對的嚴肅課題。

1996 年「經濟合作與發展組織（簡稱 OECD）」針對交通運輸系統的永續發展目標，發表了對永續運輸（Sustainable Mobility or Sustainable Transportation）的基本定義：「運輸在滿足行的需求時，不應該減損民眾的健康與生態系統，其發展應符合：使用可再生資源（renewable resources）之比例須低於資源再生的比率；且使用不可再生資源（non-renewable resources）的比率須低於可再生資源的比率。」於是，大眾運輸系統與綠色運具（或環保節能運具）的開發與推廣，逐漸受到各國的重視。

自行車為汽車尚未普及前，人類非常重要的交通運具。漸漸的，石化燃料取代了人力、獸力，成為主要的動力來源，自行車、獸力車逐漸被汽車、火車所取代，也開啟了運輸工具大量製造都市空氣汙染的時代。

由於自行車不以石化燃料為動力來源的特性，符合節能減碳的現代永續運輸發展概念，而成為永續運輸推動與發展中，深受各國政府與社會重視的一環。

本所為瞭解世界各國推動永續發展相關工作之具體作為，以資借鏡，歷年皆派員出席運輸系統永續發展之相關國際會議，吸取與了解國際發展趨勢與創新作法。本次即以自行車為主題，參與國際會議，藉此了解並學習國際上的發展概況、進程與技術、經驗，並將相關資料攜帶回國以為未來相關研究之參考。

1.2 行程概要

本次出國參加國際會議之名稱為「亞太自行車研討會(Asia-Pacific Cycle Congress，APCC)」及「世界自行車研究研討會(World Cycling Research Forum，WOCREF)」。會議於澳洲布里斯班（Brisbane）南岸（South Bank）地區的「布里斯班會議暨展覽中心（Brisbane Convention and Exhibition Center，簡稱 ECBC）」舉行，其中「亞太自行車研討會(APCC)」之會議期間自民國 100 年 9 月 18 日至 9 月 21 日，為期 4 天；「世界自行車研究研討會(WOCREF)」則緊接於「亞太自行車研討會(Asia-Pacific Cycle Congress，APCC)」結束之後，於同一地點，自 100 年 9 月 22 日至 9 月 23 日，為期 2 天舉行。

本次出國行程自 100 年 9 月 17 日下午由桃園機場搭乘國泰航空班機出發，當日晚間於香港赤臘角國際機場轉搭澳洲航空班機飛往布里斯班，9 月 18 日上午抵達布里斯班。100 年 9 月 18 日至 9 月 21 日於布里斯班（Brisbane）南岸（South Bank）地區參加「亞太自行車研討會(APCC)」，之後緊接於 9 月 22 日至 9 月 23 日在同一地點繼續參加「世界自行車研究研討會(WOCREF)」。並 100 年 9 月 24 日晚間搭乘澳洲航空班機飛往香港，於 25 日清晨抵達香港赤鱲角機場後，轉搭國泰航空班機，同日上午飛抵桃園國際機場。本次行程概要整理如表 1-1。

表 1-1 出國行程摘要表

日期	地點	行程
100.9.17~18	臺北→香港→布里斯班	啟程，參加「亞太自行車研討會(APCC)」
100.9.19~21	布里斯班	參加「亞太自行車研討會(APCC)」
100.9.22~23	布里斯班	參加「世界自行車研究研討會(WOCREF)」
100.9.24~25	布里斯班→香港→臺北	返程

1.3 澳洲及布里斯班簡介

1.3.1 澳洲簡介

澳洲 18 世紀時原為英國的殖民地。1788 年，英國海軍菲利浦（Arthur Phillip）船長率領艦隊登陸澳洲，將其納入英國殖民地版圖。嗣後，英國將澳洲劃分成六個殖民地區域，並分別為其成立各自的「自治政府」。直到 1901 年該六個自治政府合議組成「澳大利亞聯邦國（Commonwealth of Australia）」，並宣布獨立，制定憲法。

根據澳洲憲法，澳洲中央政府採責任內閣制，但仍以英國國王為其國家名義上的元首，為大英國協之一成員國。

澳洲國土面積共計 768 萬 6850 平方公里，相當於台灣（面積約 3 萬 6 千平方公里）的 214 倍。其內分新南威爾斯省（New South Wales）, 昆士蘭省（Queensland）、維多利亞省（Victoria）、南澳省（South Australia）、西澳省（Western Australia）、塔斯馬尼亞省（Tasmania）等 6 個省及北領地(Northern Territory)與首都（坎培拉）特區(Australian Capital Territory)等 2 個特別行政區（見圖 1.1）。至 2010 年為止，澳洲總人口數約為 2,250 萬人，與我國人口相近，其中 90%以上為白人，澳洲原住民僅佔總人口數之 1.7%左右，其餘則為華人及其他各國移民。整體而言，澳洲政權由英國殖民之後裔所建，因此，澳洲人的生活文化及習慣與西歐及美國相近。

澳洲地廣人稀，土地面積廣大，且人口相對於其土地面積屬於稀少，但事實上，澳洲的大部份地區均為沙漠，人民大多聚居於澳洲東部與南部地區，亦為該國的精華區域與政經文化重心。而澳洲人民守法觀念良好，社會福利完善，因此社會秩序穩定，治安良好，為許多國際年輕背包旅遊客喜愛前往自由行旅遊之國家。

圖 1.1　澳洲地圖

資料來源：http://www1.phoenix.com.tw/images/australia/images/australia-map.gif，擷取日期：民國 100 年 11 月 7 日

1.3.2 布里斯班簡介

布里斯班（Brisbane，亦有譯為「布里斯本」）為澳洲昆士蘭（Queensland）省的首府（或稱省會,Capital），位於澳洲東部太平洋沿岸的中央地區，為昆士蘭省的東南部濱海城市（見圖 1.1）。

布里斯班面積共計 1,367 平方公里，約為臺北市（面積約 272 平方公里）的 5 倍，為昆士蘭省的政治、經濟、文化中心，其南邊為國際知名的觀光渡假勝地黃金海岸市（Gold Coast），北邊則為近年來亦戮力於發展觀光渡假產業的陽光海岸（Sunshine Coast）。整個布里斯班地區（包括週圍的衛星城市）總人口數達 200 萬人以上，僅次於雪梨（Sydney）與墨爾本（Melbone）為澳洲的第三大城。

布里斯班處於南半球南迴歸線稍南，屬亞熱帶氣候，地理位置得天獨厚，日照時間既多又長，氣候非常宜人，因此，緊鄰於其南側的黃金海岸與北側的陽光海岸，一直都是國際觀光客渡假的天堂。近年來，布里斯班、黃金海岸與陽光海岸等都市與地區，更配合環保與永續發展議題，積極投入自行車運輸系統的硬體環境營造與設施佈設，對內提倡自行車運動，對外則推廣自行車的觀光旅遊，成效頗豐。

布里斯班濱臨太平洋，市中心位於布里斯班河畔（Brisbane River），國際機場和國際海港則座落於布里斯班河的河口兩旁。1982 年的大英國協運動會、1988 年的世界博覽會，以及 2001 年世界友誼運動會（Goodwill Games）均在布里斯班市舉行，2000 年的雪梨奧運亦有部分運動賽事安排於布里斯班市進行，顯見布里斯班的城市發展程度與重要性。其中 1988 年的世界博覽會會址即在南岸地區（South Bank），現今改建為「南岸公園（South Bank Parkland）」，為布里斯班市舉辦大型活動或嘉年華會的重要場所，其內設有人工造景沙灘，供民眾休閒活動之用，每到假日人潮洶湧，為世界上非常成功的河岸地區改造工程範例（見圖 1.2）。而本次會議的會場場址「布里斯班會議暨展覽中心（Brisbane Convention and Exhibition Center，BCEC）」即緊鄰於南岸公園旁，附近尚有科學館、美術館、圖書館及表演藝術中心等。

圖 1.2　布里斯班南岸公園的人工造景沙灘

資料來源：http://iainhall.files.wordpress.com，擷取日期：民國 100 年 11 月 7 日。

布里斯班市的政府體制很特別，採單一政府的制度設計。全市係由布里斯班市議會（Brisbane City Council）管轄，市政首長由市議會裡的多數黨成員出任並組成行政團隊（相當於一般所稱之「市政府」），負責全市市政，但該行政團隊仍在市議會管轄之下，因此，布里斯班市對外並無獨立的行政機關（在我國稱「市政府」）存在，外界所稱之布里斯班市政府，事實上即為該市之市議會（City Council）。

布里斯班雖有布里斯班河流過，且位於布里斯班河出海口附近不太遠，但市區本身並非一沖積平原，因此地形並不平坦，市區中地勢高低起伏不定，市區內的道路、建築與公園...等各種公共設施，亦明顯可見其隨地勢高低起伏而築，先天上與台北盆地地勢低窪平坦有不小的差異。

布里斯班市市區內的街道呈棋盤式佈設（見圖 1.3），街道之命名亦非常有趣，以東西方向與南北方向區分，東西方向街道均以男性名字命名，南北方向街道則以女性名字命名，外來遊客可在很短的時間內學會如何辨識其街道與方向，間接助益其都市觀光旅遊之推展。

布里斯班市內有三所大學，包括：昆士蘭大學（University of Queensland）、昆士蘭科技大學（Queensland University of Technology）及格里菲斯大學（Griffith University），均為澳洲著名大學，顯示該市學術與研究風氣鼎盛。目前布里斯班市議會在積極推動自行車系統的同時，即與格里菲斯大學（Griffith University）合作，由該大學負責該市自行車活動之相關基礎資料、推廣績效資料的蒐集與研究分析工作，本次的「亞太自行車研討會」與「世界自行車研究研討會」中便有多篇論文係出自於該計畫之研究成果。

圖 1.3　布里斯班市市中心區地圖

資料來源：http://www.aubest.com/big5/vg/vg-2/image/vg-2-map-brisbane-1.gif，擷取日期：民國 100 年 11 月 7 日。

貳、出席研討會紀要

2.1 研討會目的與議題

2.1.1 研討會目的

一、亞太自行車研討會，APCC 會議

本次 APCC 會議的目標在提供一個國際上，尤其是亞太地區，相互學習與經驗分享的平台，會議的定位以實務性質研究為主，希望能讓亞太地區從事於自行車運輸系統構建的實務工作者與專業人員，相互學習與交流經驗，討論並共思最佳的自行車交通系統建構與自行車交通活動推廣的有效方法。

近年來澳洲許多地區，基於永續發展的概念指導，包括雪梨市、阿德雷德市、布里斯班市、黃金海岸市與陽光海岸...等地均積極推動自行車交通系統與推廣自行車交通活動。不但在自行車道的硬體基礎建設上，已逐漸看到成果，更累積了許多推動過程中的心得與經驗。因此，澳洲地方政府熱切希望能有機會與其他都市，甚至是國際上的都市進行交流學習，一方面彼此吸收經驗與觀摩作法，另一方面則推廣自己城市的自行車旅遊。

本次會議由昆士蘭省政府主辦，布里斯班市、黃金海岸市與陽光海岸議會等共同協辦。

為期4天的會議在昆士蘭省首府布里斯班市的布里斯班會議暨展覽中心（Brisbane Convention and Exhibition Center，BCEC）舉行，會場位置緊鄰於 1988 年布里斯班市舉行世界博覽會的南岸公園（South Bank Parkland）旁。會場位置如圖 2.1 所示。

圖 2.1　布里斯班會議暨展覽中心（BCEC）會場位置圖

資料來源：http://www.bcec.com.au/destination/location.aspx，擷取日期：民國 100 年 11 月 11 日。

二、世界自行車研究研討會，WOCREF 會議

本次出國行程的另一項會議—WOCREF 會議，同樣以自行車為主題，但會議內容較偏重學術研究性質，一方面呼應 APCC 會議，推廣自行車交通活動；另一方面則與 APCC 會議在會議性質的定位上作區隔，以吸引更多人參與。

WOCREF 會議目標在提供一個開放自由的自行車研究成果發表環境，該會議歡迎所有研究方法論之自行車研究成果投稿發表，並廣邀包括從事自行車實務工作者、政府部門、學術機關、社區團體及其他對自行車運輸課題有興趣之自行車同好參加，得以交流經驗與知識，希望透過大家共聚一堂的討論，能讓自行車的研究與自行車活動的推廣更加順利，也希望讓各界對於自行車的研究成果，可透過本次會議的機會，讓更多的人及更多的機關能將研究成果切實運用到實務工作之中，進而落實永續的運輸環境與系統建構。

本次研討會包含的領域相當廣，包括自行車道系統的工程面（engineering）、設計面（design）、社會面（sociology）、績效面（performance）、休閒娛樂面（recreation）、效益面（utility）、民眾健康面（health）及經濟面（economics）等各種面向的課題。研討會中發表的部份論文，亦將被收錄於第一期的國際自行車研究（Cycling Research International）網路期刊之中。

本次 WOCREF 會議由國際自行車研究（Cycling Research International）期刊主辦，並獲得黃金海岸市議會（the Gold Coast City Council）與昆士蘭省運輸與主要道路局（the Department of Transport and Main Roads）的協助支援。.

為期 2 天的 WOCREF 會議緊接於 APCC 會議之後，在同一地點布里斯班會議暨展覽中心（Brisbane Convention and Exhibition Center，BCEC）的二樓舉行，會議的規模與參與人數明顯較 APCC 小了許多。

2.1.2 研討會議題

一、 亞太自行車研討會，APCC：

APCC 研討會以自行車交通系統發展為主題，會議內容集中在自行車交通活動中，「路」的規劃、建設與「人」的參與、效益等，而不涉及「車」的技術開發與提升問題，大會所設定的會議子議題有三：

1、 自行車道的規劃、創新與硬體建設

2、 自行車運動的推廣與旅次行為變化

3、 社區共識與自行車文化建立

二、 世界自行車研究研討會，WOCREF：

WOCREF 會議緊接在 APCC 會議之後，延續 APCC 會議主題的討論，以「路」的規劃、建設與「人」的參與、效益等課題為主軸，但偏向於學術性的研究成果交流，同樣亦不涉及有關自行車的「車輛」技術開發與提升問題，廣泛接受各面向或領域的相關主題研究成果發表，所以會議主辦機關並未做議題子題的設定或限制，會議亦只開設一個研討會議室。

2.2 研討會概況與議程

一、APCC 會議

「亞太自行車研討會（APCC）」共有來自超過 6 國家及地區的 174 位專家、研究人員及實務工作者參與，共計發表 62 篇論文。為期 4 天的會議於 2011 年 9 月 18 日下午在布里斯班會議暨展覽中心（BCEC）正式開始報到展開。開幕雞尾酒會在 9 月 18 日下午 5 時由當地知名殘障自行車運動家（Paralympic Cyclist） Chris Scott 代表大會歡迎來自各地的會議參與人士，研討會之開幕儀式則於 9 月 19 日上午舉行。

8 位來自美國、英國、日本、中國大陸、荷蘭、紐西蘭、澳洲等 7 個國家的專家學者受邀在該會議上發表專題演講（Keynote speech），包括 Tim Blumenthal（美）、Sara Carrigan（澳）、Phillip Darnton（英）、Berry De Jong（荷）、Satoshi Fujii（日）、Simon Kingham（紐）、Haixiao Pan（中國大陸）、Sara Stace（澳）等。專題演講（Keynote speech）的題目詳列如下：

1. “Fifteen reasons why bicycling is rolling worldwide and five forces that

stand in the way" (Tim Blumenthal，美國自行車聯盟主席，The President of the Bikes Belong Coalition)

2. "Enhancing the cycling experience" (Sara Carrigan，澳洲籍奧運自行車項目金牌得主，Olympic Gold medallist)
3. "Cycling in the city – are we serious?" (Phillip Darnton，英國自行車協會，Bicycle Association of Great Britain)
4. "Cycling 'experience' on the table" (Berry de Jong，荷蘭 SRE Eindhoven)
5. "Promoting bicycle use of car users through communication"（Satoshi Fujii，日本京都大學都市管理系教授，Professor in the Department of Urban Management, Kyoto University）
6. "The importance of understanding health impacts and the needs of potential cyclists in moving towards an increase in cycling mode share"（Simon Kingham，紐西蘭坎特柏力大學地理系主任暨地理健康實驗室主任，head of the Department of Geography and Director of the GeoHealth Laboratory at the University of Canterbury）
7. "The impact of bike sharing systems on travel behavior: Lessons to be learnt from the largest scheme in the world"（Haixiao Pan，中國大陸同濟大學都市計畫系教授，Professor of the Department of Urban Planning at Tongji University）
8. "Cycling infrastructure for Australian cities"（Sara Stace，澳洲運輸與公共建設局國家主要都市政策組組長，Director of National Urban Policy in the Major Cities Unit, Department of Infrastructure and Transport）

會議另邀 3 位自行車工作者以簡短演說形式發表專題報告（Guest speech），專題報告題目詳列如下：

1. "Journey to Yellow"（Phil Anderson，1978、1994 澳洲聯邦運動會金牌得主）

2. “10 things that the UK has not learnt about cycling”（Phillip Darnton，大不列顛自行車協會，Bicycle Association of Great Britain）

3. “Why youth love the boundaries of extreme sport.....there are no boundaries”（Tim Wood，BMX 賽冠軍，Freestyle BMX Champion）

本次 APCC 會議主要以澳洲本國人士居多。為期 4 天會期，於 2011 年 9 月 21 日結束，大會並安排於會議結束時，由與會人士共同發表「布里斯班宣言（The Brisbane Charter）」，這個以自行車綠色交通工具為主體的宣言，希望從本次會議起步，勾勒出未來亞太地區自行車交通的願景，呼籲各國與各地政府對自行車交通的重視，並勉勵與會者相互砥礪，為自行車交通之推動共盡一己綿薄之力。

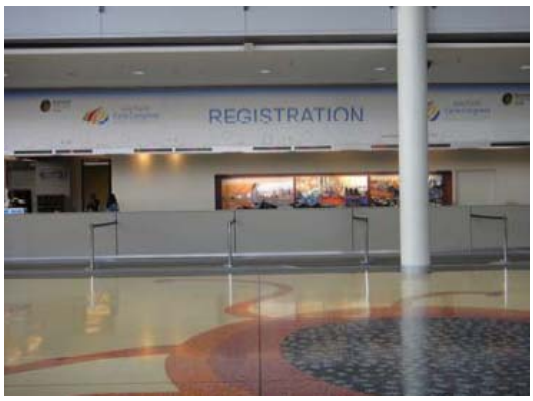
本屆研討會計有 15 個場次，62 篇論文發表，其中口頭發表（Oral presentation）者計 39 篇，海報張貼發表（Poster presentation）者 23 篇，會議議程與分場研討發表之論文標題詳附錄 1。專題演講及會場相關圖片如圖 2.2 所示。

二、WOCREF 會議

緊接於 APCC 會議之後的 WOCREF 研討會共有 7 個論文發表場次，來自包括英國、印度、澳洲、南非等 4 個國家，16 篇研究論文發表。其中第 3 場次（Session 3）—「自行車資料蒐集與分析（Cycling Data Collection and Analysis）」，並非研究論文之發表，而係自行車交通活動基本資料的蒐集與分析方法的介紹，由昆士蘭省運輸及主要道路局 Michael Langdon、澳洲 GTA 顧問公司 Rebecca Lehman 與布里斯班 Griffith 大學 Matt Burke 教授簡報。該簡報內容，事實上係昆士蘭省政府鑑於自行車相關行為特性與基本資料的匱乏，及該資訊對自行車推廣工作與決策的重要性，而委託 GTA 顧問公司與 Griffith 大學在近幾年來持續在布里斯班附近地區所進行的基本資料蒐集與分析方法，為昆士蘭省推動自行車交通整體計畫中之一環。本次會議中做此簡報，顯然主辦單位是希望藉由此一會議平台，讓更多與會者能認識並學習到正確的交通資料蒐集與分析方法。

本次 WOCREF 會議議程之論文標題詳附錄 2。會議相關圖片如圖 2.3 所示。

（a）BCEC 會場外觀



（b）APCC 報到處

（c）專題演講一景

圖 2.2 APCC 專題演講及會場相片集

圖 2.3 WOCREF會議廳一景

參、研討論文重點摘述

3.1 APCC 會議研討論文重點摘述

一、15 個自行車風行全球的理由與 5 個阻礙推動的障礙力量（Fifteen Reasons Why Bicycling Is Rolling Worldwide and Five Forces That Stand in the Way）

作者：Tim Blumenthal（美國自行車聯盟主席）

摘要：

自行車交通的發展是世界的必然趨勢，且未來的自行車交通勢必將更趨於簡便與安全。本文作者以美國的經驗為例，提出 15 個理由來支持自行車未來一定為朝向普及化發展的結果：

1、美國政府在自行車硬體設施方面的投資持續增加（見圖 3.1）

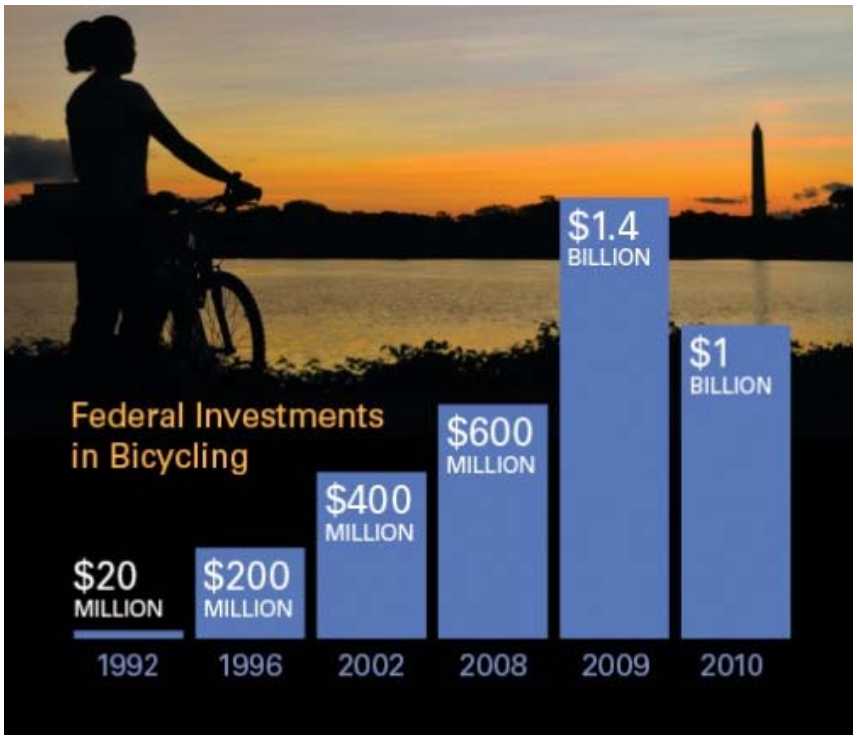


圖 3.1　美國聯邦政府 1992 年以來對於自行車硬體設施的投資金額

資料來源：Tim Blumenthal," Fifteen Reasons Why Bicycling Is Rolling Worldwide and Five Forces That Stand in the Way", APCC, 2011.9.18.

2、越來越多道路出現自行車友善的共用設計型態（如，人行道部分空間與自行車共用）

3、道路上出現為自行車量身設計的創意專用空間（如以彩色鋪面設計，以強化自行車專用的行車或用路空間）

4、道路上出現越來越多的自行車專用車道（Protected bikeways）

5、越來越多的路邊汽車停車位轉變成自行車停車位（bike parking）

6、自行車園區（bike park）的出現（見圖 3.2）

7、各地相繼出現開放道路專供自行車行駛的活動（如無車日活動，見圖 3.3）

8、各地出現專為學童設計的自行車路線或路網

9、各地越來越多的各種自行車會議或研討會舉行

10、 世界上越來越容易看到重要城市的市長也是自行車的愛好者

11、 政府衛生相關單位與民間衛生團體、組織的實質或行動支持

12、 專家學者的鼓吹與呼籲

13、 民間自行車組織如雨後春筍般出現

14、 自行車工業逐漸茁壯的現象

15、 各種統計資料或研究報告均顯示各種自行車相關數據的成長

圖 3.2　美國 Valmont 自行車公園

資料來源：Tim Blumenthal,"Fifteen Reasons Why Bicycling Is Rolling Worldwide and Five Forces That Stand in the Way", APCC, 2011.9.18.

圖 3.3　美國無車日的自行車活動

資料來源：Tim Blumenthal,"Fifteen Reasons Why Bicycling Is Rolling Worldwide and Five Forces That Stand in the Way", APCC, 2011.9.18.

雖然本文認為自行車是未來的必然發展趨勢，但作者仍認為目前美國自行車的推動面臨著 5 個主要的障礙：

1、政府沉重的債務所導致的預算緊縮現象（見圖 3.4）

2、僅有少數人真正認知到機動車輛所造成嚴重的能源消耗與空氣污染問題嚴重

3、關心自行車交通活動的人很多，但真正付諸行動以自行車代步的卻有限

4、國民日益嚴重的肥胖問題，將是自行車推廣的一項障礙

5、道路上仍有許多不安全的駕駛行為，威脅著自行車的安全

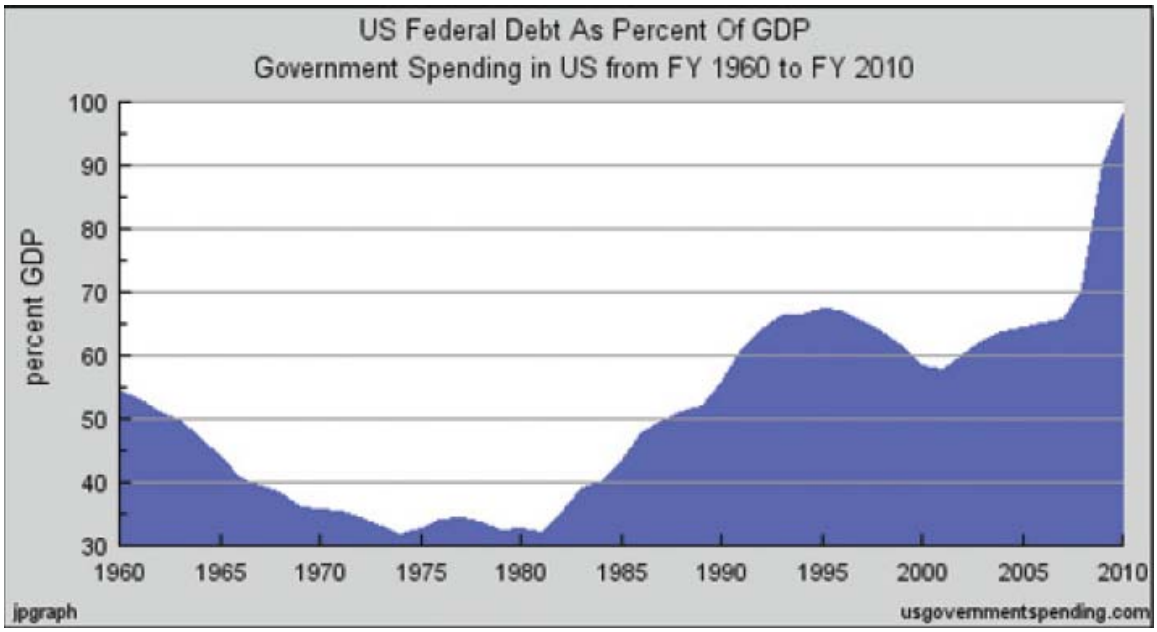


圖 3.4　美國聯邦債務的快速成長

資料來源：Tim Blumenthal,” Fifteen reasons why bicycling is rolling worldwide and five forces that stand in the way”, APCC, 2011.9.18.

報告最後，作者提出解決自行車發展障礙的具體解決之道，希望幫助大家消除阻力，順利推動自行車運輸活動：

1、需提出一個更能感動人心的騎乘自行車理由

2、強化量化的績效管理方式

3、消除自行車騎乘過程中道路上的不確定或不安全性因素

4、提供新加入者更多的誘因與協助

5、對社會形塑一個簡單明確的自行車意象（simple message）

諸此方法，應將有助於消除自行車推動的障礙。

二、自行車共存交通系統對旅次行為之影響： 以世界觀點的觀察（"The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World"）

作者：Haixiao Pan 教授(中國大陸同濟大學)

摘要：

本研究以浙江省會杭州市為例，探討當地民眾使用自行車的行為特性及介紹該市公共自行車系統的建制與使用現況。

1、杭州市自行車政策概述

杭州這個古老的都市，至今已有兩千年歷史，為中國非常古老的古城之一，現有人口 600 萬人。近 20 年來，杭州市經濟發展迅速，伴隨著小汽車的快速成長。為解決日益嚴重的交通擁擠問題，杭州市政府決定發展大眾運輸系統，並致力於提倡綠色交通運輸。

在此政策目標下，杭州市建立了全中國大陸第二個公車捷運系統（Bus Rapid Transit System，BRT），及全世界最大的公共自行車系統（public bike system）。目前全市的公共自行車已超過 5,000 輛，自行車租借站超過 2,000 處，相較於上海及北京，杭州市擁有政府更多更強大的支持，所以能堅定的努力發展對觀光客與市民友善的便捷與潔淨運輸系統，包括 BRT 系統及公共自行車系統。

本文提出許多統計數據，證明政府的政策支持確實已改變了當地的交通習慣，也一定程度的發生了抑制小汽車使用的效果。

2、近年的交通發展

近年來，杭州市觀光業發展迅速，每年外來觀光客（visitors）人數，從 2001 年的 2,600 萬人次，快速成長至 2009 年的 5,200 萬人次，9 年內觀光客人數成長了將近一倍，成長速度之快，令人驚訝。當地的 GDP 則自 2001 年的 4,000 美元，成長到 2009 年的 12,000 美元。同一時期，道路面積成長 360%，道路長度成長 200%（見圖 3.5），公車數量成長 150%，公車旅次數量則成長 340%。顯示，杭州市的基礎建設與經濟成長速度一樣驚人，尤其應注意的是，當當地 GDP 已經突破 10,000 美元

時，大眾運輸（公共汽車）旅次並未隨著經濟成長或所得提高，而明顯出現流失或轉移到私人運具的現象，這些都應歸功於市政府這些年對綠色運輸系統的強力支持，也是市府努力成果的具體呈現。

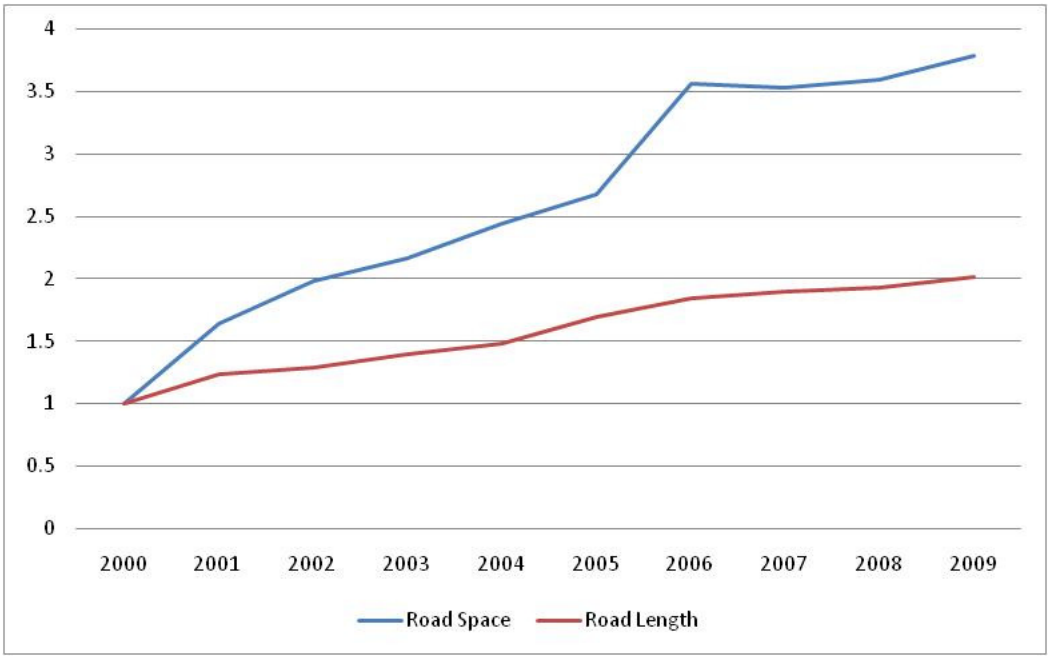


圖 3.5　2000 年至 2009 年間杭州市的道路面積與長度成長比例

資料來源：Haixiao Pan," The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World", APCC, 2011.9.18.

3、杭州市綠色運輸系統

公車捷運系統（Bus Rapid Transit System，縮寫為 BRT）自 2006 年引進杭州市，目前全市共有公共汽車 6,130 輛，每日搭乘公車之旅次高達 200 萬旅次。

近年來，杭州市政府又致力於自行車的推動。目前全市自行車道總面積達 600 萬平方公尺，占全體道路面積的 22%，84%的主要道路上均佈設有專用的自行車道（見圖 3.6、圖 3.7），且至 2007 年以前，已有超過 30%的旅次使用自行車（Bike）或電動自行車（Powered-Bike），顯示自行車在杭州市交通系統中所佔的重要地位。

根據調查統計，目前杭州市的汽車旅次中，仍有 47%的旅次長度在 5 公里以內（見圖 3.8），而由於自行車對於短程旅次市場具有高度的競爭優勢，因此，這些旅次已成為該市自行車推廣的主要爭取對象。

圖 3.6　杭州市的自行車道

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to be learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

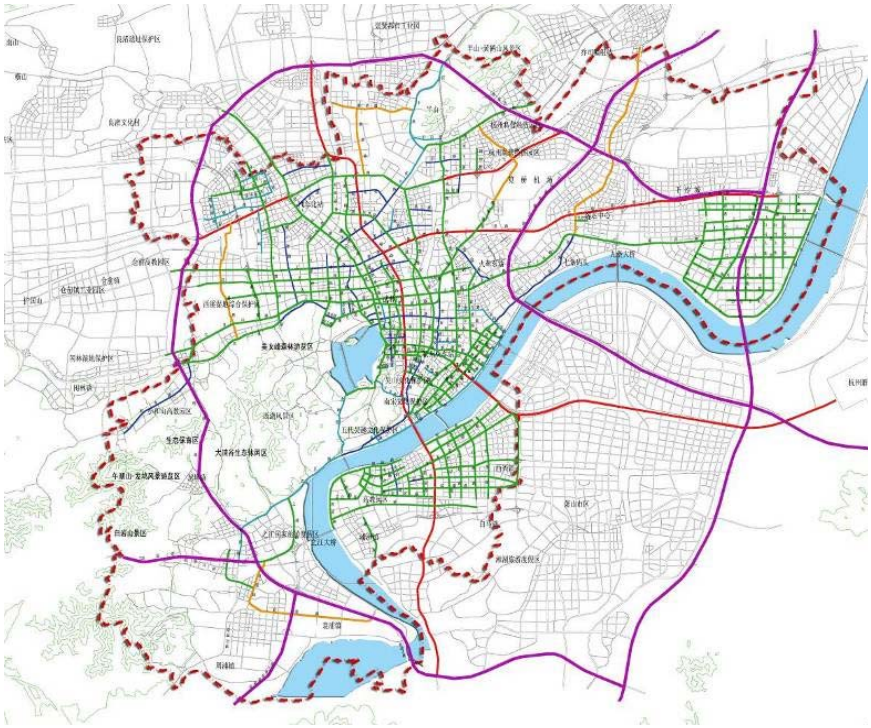


圖 3.7　中國大陸杭州市自行車道路網

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to be learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

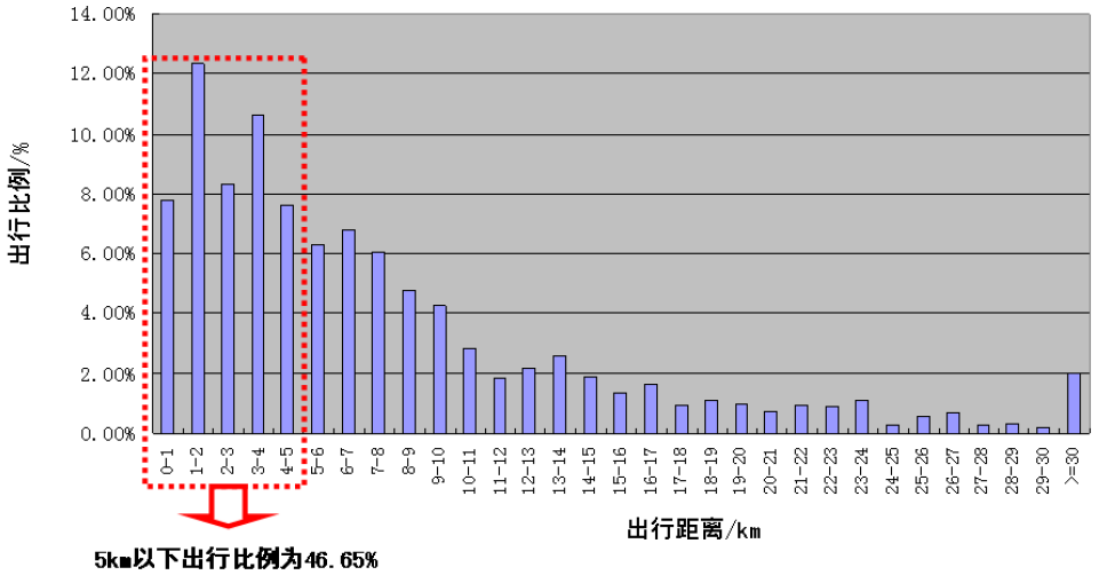


圖 3.8　杭州市 47%的汽車旅次長度分佈

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

4、杭州市對於自行車的功能角色定位

（1）自行車為旅次末端運具：倡導公車與自行車（Bus and Ride，B+R）無縫接駁的交通行為模式（見圖 3.9），以提高大眾運輸使用率

（2）自行車為重要的觀光休閒運具：推動西湖地區的自行車休閒觀光

（3）綠色運具：推廣自行車活動，以減少交通擁擠、汙染，提高都市品質

（4）配合杭州市中遍布大小河流的特性，建構沿河的自行車綠色運輸系統（杭州市長度超過 1 公里的河道共有 291 條，全市河道總長度高達 1,000 公里以上）

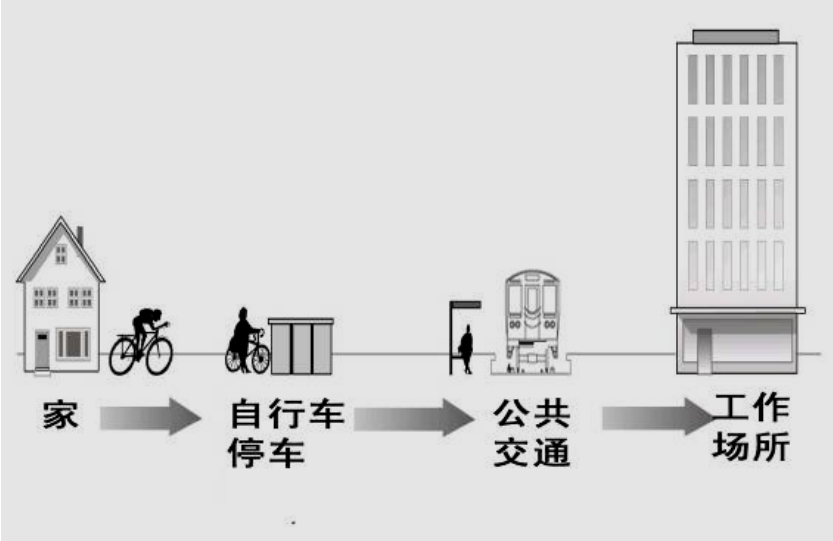


圖 3.9　「B+R」系統示意

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

5、杭州市的公共自行車（Public Bike）發展

（1）自行車與公共自行車之基礎設施

①近年來，杭州市政府對公共自行車系統的直接投入總金額已高達1.8億人民幣（見圖3.10、見圖3.11）。

圖 3.10　杭州市的公共自行車

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

圖 3.11　杭州市公共自行車系統的中央控制中心

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

②公共自行車數量從2008年中的2,800輛，快速增加到2010年底的52,800輛，2.5年間公共自行車數量成長近20倍（見表3-1）。

③公共自行車旅次也由2,000人次/月增加100倍到200,000人次/月（見表3-1）。

④平均每月單一自行車的出租使用次數從0.7次增加到5.7次（見表3-1）。

表3-1　近年來杭州市公共自行車數量與旅次數變化

年.月	公共自行車站	公共自行車數 A	公共自行車旅次數 B	B/A
2008.5	61	2800	2000	0.7
2009.2	350	10000	49360	4.9
2009.5	800	20000	101497	5.1
2009.12	2000	50000	200000	4.0
2010.12	2080	52800	300000	5.7

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

（2）公共自行車費率

圖3.12為杭州路邊公共自行車的收費設備。為鼓勵短程或旅次末端民眾使用公共自行車，杭州市公共自行車採累進費率方式定價，不但提供第1小時免費的優惠，且若利用公車轉乘，

尚有額外增加的0.5小時免費優惠。相較巴黎等其他都市，杭州市的公共自行車費率顯然低廉許多（見圖3.12、圖3.13）。

①第1小時免費。

②第2小時1元人民幣。

③第3小時2元人民幣。

④第3小時後，每小時3元人民幣。

圖 3.12　杭州市公共自行車的收費系統

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

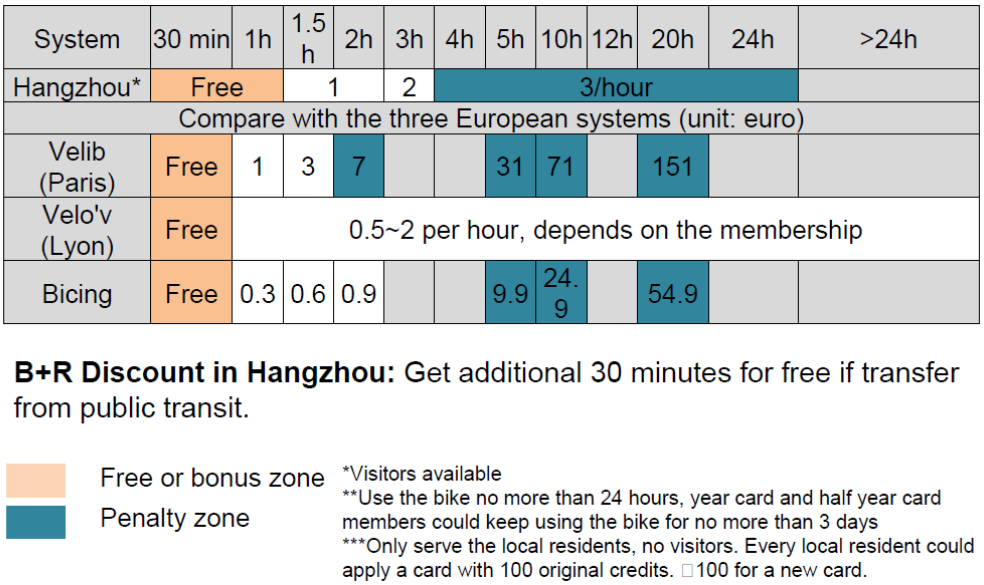


圖 3.13　杭州市與其他城市公共自行車租借費率比較

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

（3）公共自行車的旅次特性分析

①目前杭州市公共自行車每週租借的高峰時間在週末（weekend）期間（見圖3.14）。

②全市89%的公共自行車租借，係出現在西湖四周的三個出租點；出借率前15%的公共自行車出租點係位於觀光區內，顯示杭州市公共自行車之服務對象仍以休閒觀光旅次居多（見圖3.15）。

③西湖周邊公共自行車平均單一自行車每日之轉換率為3.5~5.3次/日/車，但都市外圍地區部分公共自行車之每日轉換率卻不到1次/日/車。

④90%觀光區的公共自行車旅次及70%購物區的公共自行車旅次租借自行車之時間超過60分鐘，尤其觀光區地區更有60%的租借時間超過120分鐘。相對的，住宅區的租借行為中，有85%的租借時間不超過60分鐘。

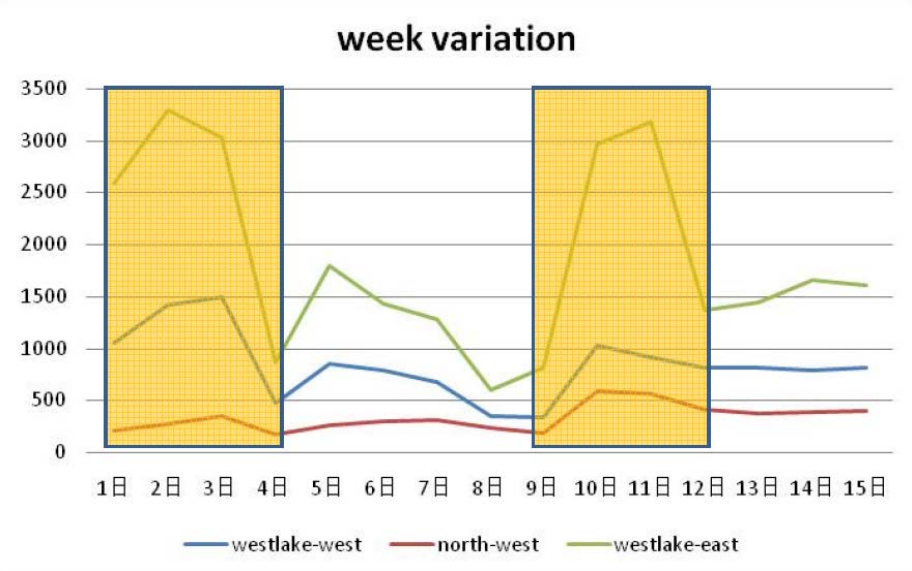


圖 3.14　杭州市公共自行車每日租借輛變化

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

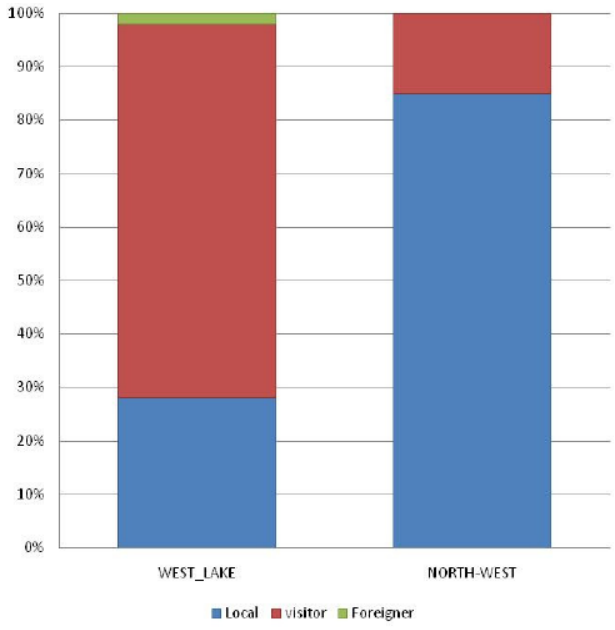


圖 3.15　杭州市公共自行車的使用對象分析

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

⑤公共自行車使用族群的年齡分佈：77%介於20歲到40歲之間，僅6%的使用者年齡超過60歲（見圖3.16）。

⑥公共自行車使用人的職業分析方面，圖3.17顯示主要為白領階級人士在使用。

⑦公共自行車的使用者，大部分屬中低收入者，財富所得高者，佔公共自行車的使用比例很低，不及15%（見圖3.18）。

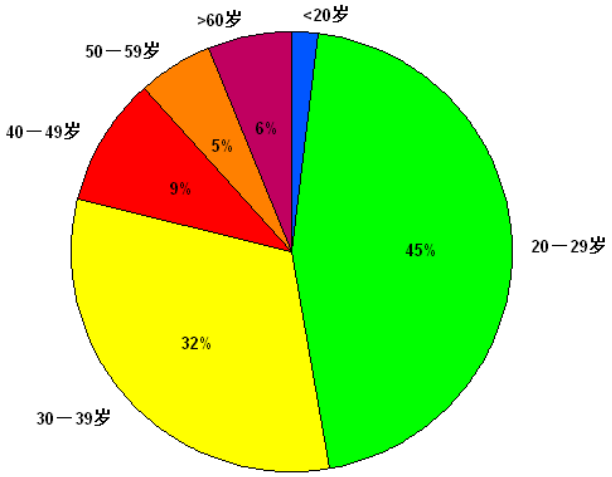


圖 3.16　杭州市公共自行車使用者的年齡分佈

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

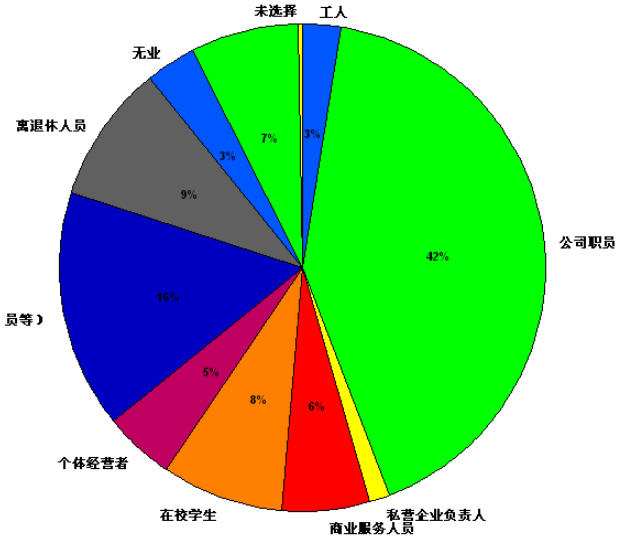


圖 3.17　杭州市公共自行車使用者的職業屬性

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

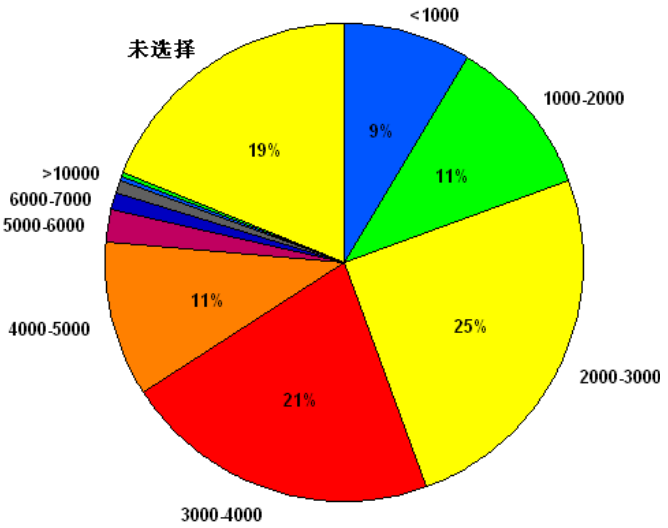


圖 3.18　杭州市公共自行車使用者的所得分佈（單位：人民幣）

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

⑧使用公共自行車的主要理由為：節省時間及便於換乘；其次則是：環保、方便及鍛鍊身體（見圖3.19）。

⑨公共自行車旅次有59.17 %移轉自公車旅次，19%移轉自行人，4.58%移轉小汽車。

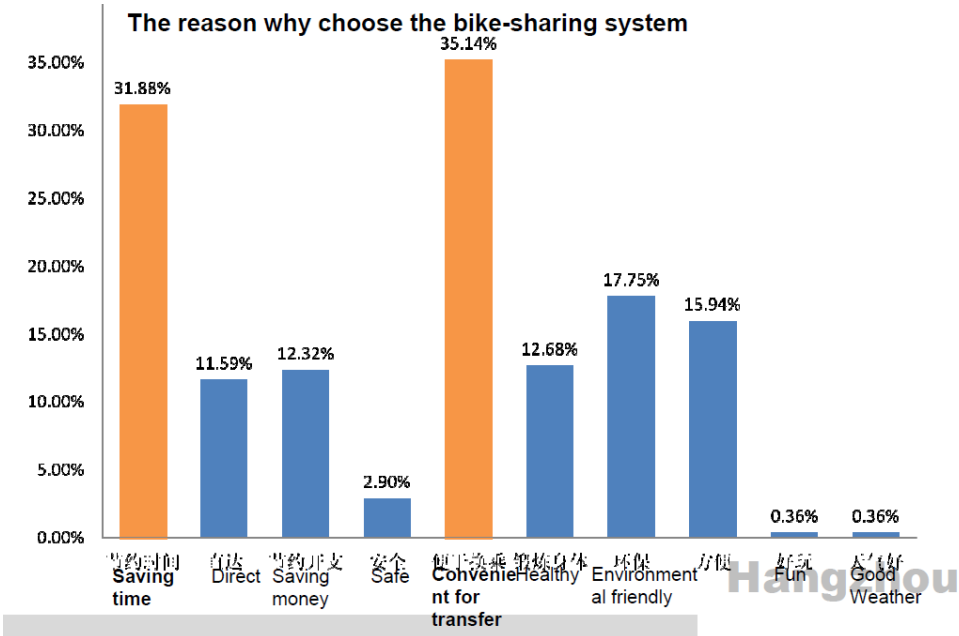


圖 3.19　杭州市公共自行車使用者的主要理由

資料來源：Haixiao Pan,” The Impact of Bike Sharing Systems on Travel Behavior: Lessons to Be Learnt from the Largest Scheme in the World”, APCC, 2011.9.18.

6. 結論與建議

（1）自行車非僅只是少碳節能的綠色運輸，更是在高密度都市環境中具有高效率特性的運具。

（2）杭州市政府的強力支持，是杭州公共自行車系統快速發展的關鍵性因素。

（3）好的自行車基礎建設（infrastructure），尤其是自行車專用車道系統，是推動自行車交通成功的基礎

（4）在杭州，自行車已普遍受到觀光客及一般市民的歡迎，且杭州市的公共自行車系統確實也改變了觀光客的運具選擇方式，但在如何吸引小汽車使用者轉移運具使用習慣到自行車，杭州市仍需要有更多的努力。

三、城市中的自行車—我們認真對待了嗎？（”CYCLING IN THE CITY –Are we serious?”）

作者：Phillip Darnton (英國自行車協會)

摘要：

數十年前，騎乘自行車是每個人生活上必備的重要基本技能，但是曾幾何時，汽車大量入侵道路，嚴重的事故傷亡讓自行車騎士倍感恐懼，日益不友善的道路環境，使得自行車被迫逐步退出道路，今日的道路已被汽車族群完全征服。這正是英國道路環境這幾十年來所上演的真實故事。今天我們所要做的其實就僅只是：如何找回那些以往騎乘自行車的人們？

1、英國交通行為特性之背景介紹

（1）平均每個英國人每天會產生 3 個旅次，每個旅次要花費 1 個小時以上的旅行時間，平均旅次長度 2.4 英哩，但是其中只有 20%的旅次與工作有關，80%的旅次是屬於「家」旅次，且 25%的旅次長度低於 1 英哩。

（2）42%的家庭擁有 1 輛以上的自行車。

（3）自行車旅次之總長度，僅佔全體總旅次長度的 0.6%。

（4）20 年前，55%的上學旅次是使用自行車；今日卻僅有 9%的上學旅次使用自行車，甚至有 43%的上學旅次是使用汽車。

（5）每日上午尖峰，道路上的汽車旅次中有 20%是屬於上學旅次，平均上學旅次的旅次長度為 1.9 英哩。

（6）預估 2015 年道路上的交通需求增加 20%，鐵路需求增加 34%，公車需求增加 23%，全英國每年為交通擁擠付出之成本高達 200 億英鎊。

（7）道路上男性騎士較女性為多，平均 36 位騎士中，26 人為男性，10 人為女性。

2、改變用路人使用自行車的策略

Phillip Darnton 認為，透過下列策略，可有效促使用路人改採使用自行車運具：

（1）長期的重視關心

（2）系統化的設施規劃概念

（3）設施的一致性與連續性

（4）持續且長期的資源投入

（5）整體交通系統的整合性規劃

（6）教育宣導

3、政府可以努力的方向

政府營造友善的自行車用路環境方面，將有利於自行車使用率的提升，而政府可作為的方向有七：

（1）降低道路上的行車速度

（2）校園內學生強制接受自行車騎乘的教育訓練

（3）自行車設施規劃的要求

（4）駕照考試方式的調整

（5）提供財務誘因

（6）道路空間共享

（7）加重行車責任

4、自行車所帶來的益處

（1）減少交通擁擠

（2）有益健康

（3）降低污染所產生的氣候變遷的舒緩

（4）騎乘樂趣多

（5）旅次成本低

（6）生活品質提升

本文作者 Phillip Darnton 強調：當越多人使用自行車時，自行車的使用數量也將越加頻繁，自行車的使用也將越加安全。

四、自行車經驗(“Cycling ‘experience’ on the table”)

作者：Berry de Jong (SRE Eindhoven，荷蘭)

摘要：

荷蘭是全世界發展自行車交通的典範國家，Berry de Jong 認為：在荷蘭騎乘自行車不是一種生活的方法，而是每個人每日生活方式的一部分，也是生活文化的一部分。

荷蘭政府希望提供自行車最完善的設施與使用環境，因此發展出許多獨特的荷蘭經驗與解決自行車使用問題的實驗結論，在在都能提供給其他國家或政府最好的實務經驗、車輛技術的創新、基礎建設的建構方法，增加自行車使用的舒適、方便及安全，進而達到推廣自行車的目的。

然而在荷蘭的都市經驗裡，也證明了：要將都市中自行車旅次比例提高到整體旅次的 15%，絕對是一個可以達到的目標。

1、荷蘭的自行車發展概述

（1）荷蘭為自行車旅次比例最高的歐洲國家，約佔全體旅次的 27%；丹麥第二，自行車旅次比例約 19%；其他的歐洲國家則都不到 10%，僅荷蘭的 1/3 以下（見圖 3.20）。

（2）荷蘭全國每年消費自行車 130 萬輛，總價值約 10 億歐元，現今 84%的荷蘭人擁有一輛以上的自行車，全國總計 1,800 萬輛自行車，每人平均 1.3 輛。

（3）1950 年代，平均每位荷蘭人每年騎乘自行車長度達 1,600 公里，至 2010 年代則降為 900 公里，平均每人每天騎乘自行車 2.5 公里。

（4）荷蘭每年的自行車總里程數超過 150 億公里，佔全部里程數之 8%。

（5）今日荷蘭，超過 36%的短程旅次（長度＜5 公里）係使用自行車完成。

（6）全國 39%的軌道旅次是以自行車作為車站與家之間的接駁運

具。

（7）從歷史的統計資料發現，荷蘭人在 1960 及 1970 年代間，騎乘自行車的里程曾經一度下降，之後又少幅回升，此後則維持平穩，未再下跌，縱便現今 18 歲以上荷蘭人的平均車輛持有率已高達每人 0.5 輛小汽車，但荷蘭人自行車的騎乘長度並未再有下降情形（見圖 3.21）。

（8）不計算共用自行車車道或共用自行車道路，荷蘭全國道路上的自行車專用車道（on-road single used bicycle lanes）（見圖 3.22）總長度 4,700 公里，路外的自行車道路（off-road bicycle paths）總長度則高達 29,000 公里，是路上自行車專用道的 6 倍之多，顯示荷蘭自行車道系統之發展，非依存於現有道路之上，而應是以社區型的通道型態存在為主。

（9）全國自行車旅次中，有高達 50%係使用自行車車道完成。

（10）荷蘭全國每年有 80 萬輛自行車失竊案件，平均每 20 輛中就有超過一輛的自行車遭竊。

（11）在荷蘭的公共自行車，使用 OV-fiets pass 即可輕鬆租借公共自行車。

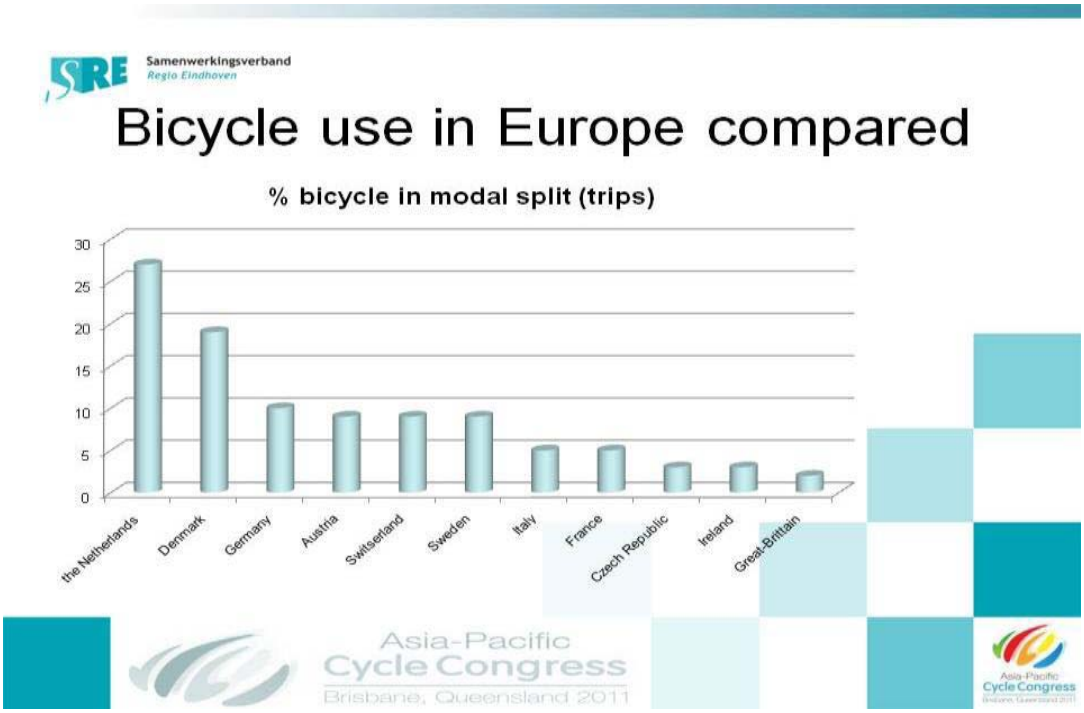


圖 3.20　歐洲各國人民自行車的旅次比例

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

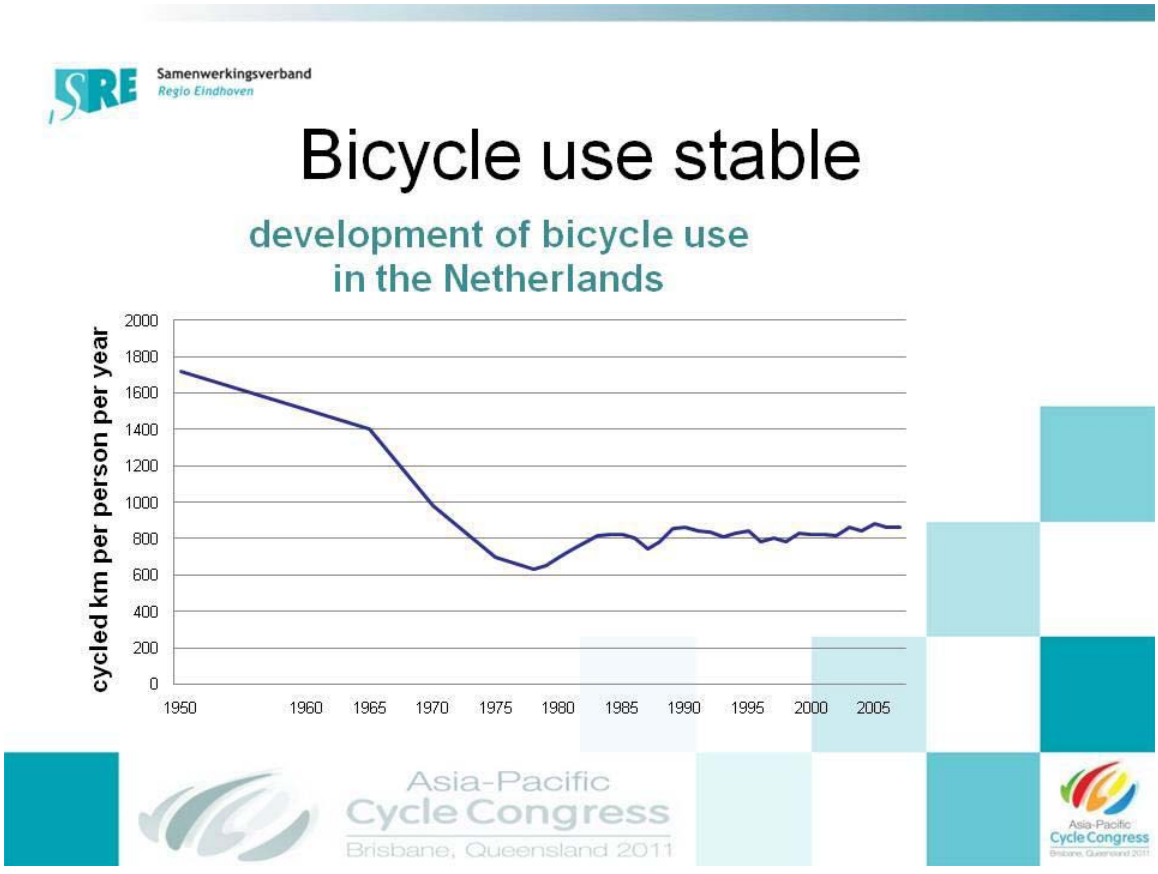


圖 3.21　近 60 年來荷蘭人民平均每年使用自行車的總長度變化

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

圖 3.22　荷蘭的自行車道

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

圖 3.23　荷蘭的自行車停車場

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

2、荷蘭發展自行車的優勢：

（1）荷蘭全國地勢平坦

（2）天氣舒適，適合自行車騎乘

（3）荷蘭是個高密度國家，很多設施或活動都集中一定半徑範圍內，60%的旅次長度低於 5 公里。

（4）近數十年來，自行車設施的規劃與設計，早已融合在所有的都市計畫、運輸規劃及交通計畫之中，無需再刻意政策引導相關硬體的設計，更重要的是可以得到社區居民的全力支持與配合。

超過一世紀的時間，自行車早已是荷蘭人生活文化的一部分。因此，所以許多國家在推動自行車上所面臨的問題，荷蘭都曾經遭遇過，可謂自行車的先驅實驗場，所以荷蘭應可以提供大家很多寶貴經驗。

3、自行車「友善環境」與「友善設施」

荷蘭強調的是提供自行車「友善的環境」，而非僅只是提供自行車「友善的設施」。

友善的自行車設施，常常背後隱含的意味著：一般人在使用自行車時，需要在既有預設的自行車設施之中，例如需騎乘在自行車道之上。但荷蘭更強調的是：一個自行車友善的城市，這個城市應該是讓自行車的使用人在城市的每個角落都感到舒適，而非僅只是在自行車專用道上。所以給予自行車高的社會地位與社會尊重，也是推動自行車友善環境的非常重要一環。

創造自行車友善環境的方法有六：

（1）為所有年齡層的自行車騎士需求考慮

（2）兼顧所有性別者的需求

（3）提供一個安全的騎乘環境，包含交通安全（traffic safety）與社會安全（sovial security）

（4）提供一個舒適的騎乘環境

（5）沒有社會的歧視

（6）讓自行車給民眾深刻的正面印象：如快樂（fun）、輕鬆（relax）、健康（healthy）…等印象。

4、自行車設施設計的五項原則

（1）一致性（coherence）

所有自行車的設施應有一致性的設計，且對於自行車的進出口處與目的端點地點，亦均應有完善的連結或終端設計，以減少騎乘過程中的負擔，增加舒適度。因此自行車設施設計的重點有：

①自行車系統應連結成一完整網路系統

②騎士對於騎乘路線的選擇應有充分的自由度，而非侷限在固定的專用自行車道上。

③設施品質應力求一致

④設施設計應維持連續與一致性，如應避免途中車道或道路寬度的變化。

⑤路線上應避免外部的活動干擾

⑥明顯清晰的標誌或標識系統

（2）直捷性、便捷性（directness）

應盡可能規劃設計自行車直捷的騎乘路線，縮短騎乘距離。因此設施設計的重點有：

①選取最短路徑做設計（見圖 3.24）

②所有路線都要提供雙向騎乘的功能

③減少延滯發生，如設置自行車優先號誌

（a）例一

（b）例二

（c）例三

圖 3.24　荷蘭直捷的自行車路線設計案例

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

（3）吸引力（attractiveness）

自行車設施的設計應要與四周環境融合，且能吸引大家，提高使用意願。

①吸引並富變化的路線環境

②自行車路線應避免與汽車路線同一

③安全的道路（road safety）與安全的社會環境（social security）

④停車簡單、方便（見圖 3.25），並應有效預防失竊發生

圖 3.25　迷人的荷蘭自行車停車場設計

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

（4）舒適性（comfort）

自行車道應確保鋪面的平坦及行駛順暢。而達成此目標之方法有：

①減少自行車騎乘過程中的停等、減速次數—賦予優先通行權（right of way）。

②設置自行車專用號誌

③平整質佳的車道鋪面

④充裕寬闊的車道寬度

⑤遮陽、遮雨與防風設計

⑥減少不必要的道路或路面起伏

⑦「免下車（dismount）」設計（見圖 3.26）

（5）安全性（safety）

自行車的基礎設施設計應確保自行車騎士與其他用路人之安全。而有關自行車安全的重要課題有：

圖 3.26　荷蘭自行車的免下車設計

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

①自行車的傷亡率

在荷蘭，自行車的事故受傷機會是一般汽車的 7 倍（見圖 3.27），自行車平均每 200 萬公里會發生一次嚴重的車禍事故，每 500 萬公里會有一人嚴重傷亡，但一般而言，自行車旅次長度較汽車者短非常多，因此，雖然自行車發生事故與傷亡的機率高於汽車，但社會上一般仍認為自行車是安全的運具，大家仍樂於使用自行車。

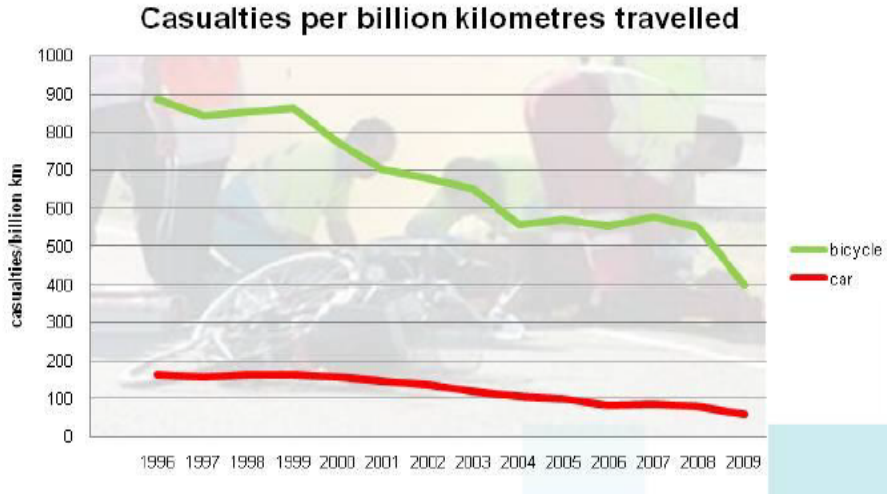


圖 3.27　荷蘭自行車與汽車的事故發生率比較

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

②自行車之相關硬體設施均應確保騎乘時的安全性

無論在路網上、路段上或路口上，相關之硬體設施設

計均應以安全性為最重要考慮（見圖 3.28），同時須符合駕駛人的習慣或期待，才可確保設施發揮最大功能，保障自行車之安全。

圖 3.28　荷蘭的自行車專用號誌

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

③強制戴安全帽的爭議

根據統計，30%的自行車事故傷害屬於頭部受傷，其中超過 45%的傷害可以透過安全帽予以防止避免。但安全帽有礙騎乘時的自由感（feeling of freedom），因此，強制戴安全帽的規定將使自行車騎乘的舒適度（comfort）與方便性降低，進而影響騎乘者的意願，同時也有違自行車發展宗旨中的舒適、快樂與方便等宗旨，所以，在荷蘭並不強制騎乘者須戴安全帽（見圖 3.29）。

圖 3.29　在荷蘭騎乘自行車無需佩戴安全帽

資料來源：Berry de Jong, “Cycling ‘experience’ on the table”, APCC, 2011.09.18.

5、建議（代結論）

本文最後對計畫推廣自行車交通的相關工作者或參與者，提出作者自己主觀的六點建議：

（1）不講大道理（No preaching）

（2）世界的改變非一日能成（The world doesn’t change in a day）

（3）善用電動輔助自行車（Embrace the pedelec/electric cycle）

（4）要看到盲點（Look besides the blinkers）

（5）更加了解自行車（Knowledge about cycling: ‘bikeprint’）

（6）讓自行車被民眾看見（Make cycling visible）

五、活力旅程：澳洲都市的轉變（"Active Travel: Transforming Australia's cities"）

作者：Sara Stace (澳洲運輸與公共建設局國家主要都市政策組組長)

摘要：

1、澳洲「2011-2016 國家自行車政策綱領」

澳洲聯邦政府聯合各省、領地及特別行政區地方政府，提出「2011-2016 國家自行車政策綱領（National Cycling Strategy 2011-2016）」，宣示 5 年內要將全國自行車使用率提升一倍，並於 2011 年 8 月邀集各級政府參加為期兩天的工作會議（workshop）。會議的重點在：確立政策目標、推動的政策步驟與建構整個計畫在資金運用上採用最佳的成本效益管理方法。會中亦分享並討論交流彼此的自行車推動實務經驗與工作心得，並協助聯邦政府做好自己在這整個計畫中所應扮演的功能角色，以求與各地方政府共同合作努力達到計畫最終目標。

2、三個基本信仰

從 1950 年代開始，汽車崛起，蠶食鯨吞著都市交通系統，徹底擊潰其他運具，成為主導著現代都市交通型態的絕對主角，自行車與徒步步行在交通系統中卻反遭邊緣化。

這個改變雖然並非快速，但的確是個難以抵擋的趨勢。至今以汽車為絕對主角的交通時代已是個存在的事實，今倘若要逆轉此一趨勢，則我們必須要在政策的思維上，做出一重大的轉變。

作者認為推動自行車可以節省大量的社會成本，並大膽提出為澳洲的中央與地方省下 10 億元澳幣的挑戰目標（見圖 3.30），包括下列四方面的社會成本減少：

（1）醫療健康成本的支出

（2）道路基礎設施建設與維護成本

（3）環境破壞的社會成本

（4）國民健康所帶來國家生產力的提升，相對也是一種社會生產

總成本的降低

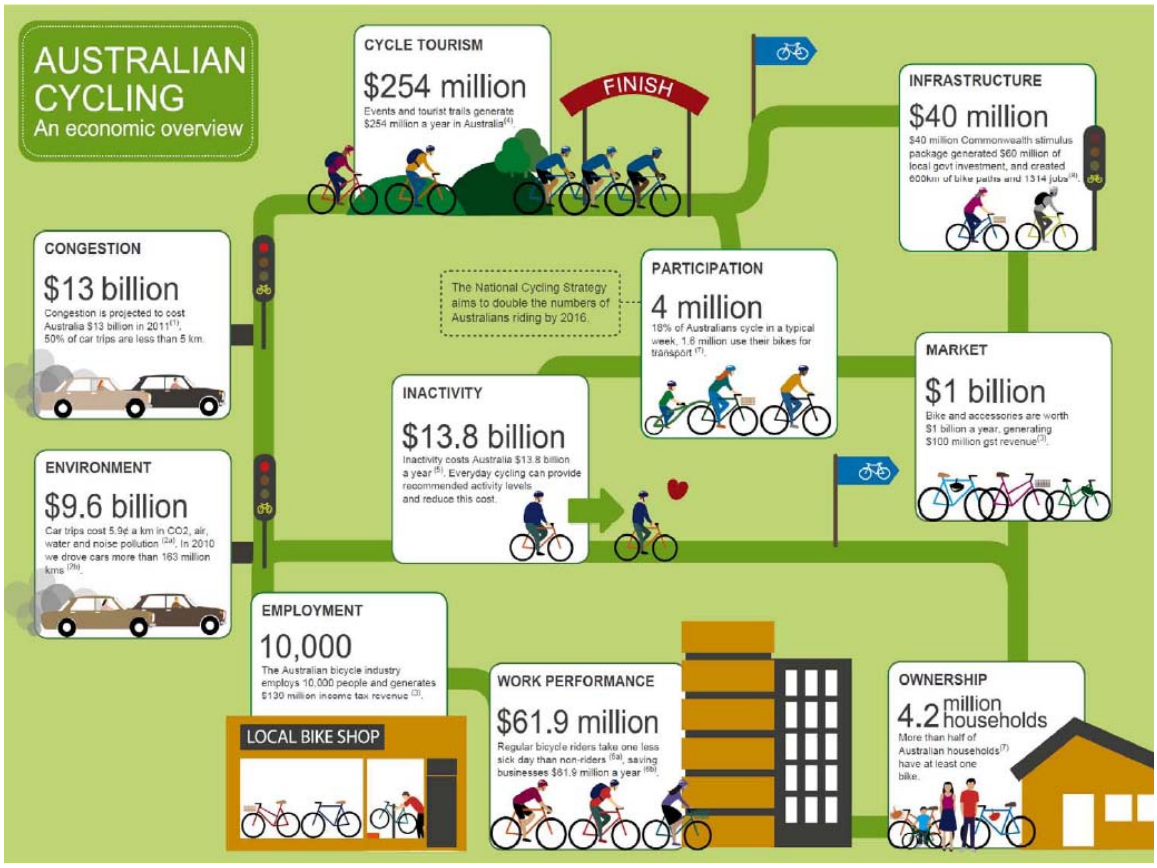


圖 3.30　自行車政策如何達成節省 10 億澳幣

資料來源：Sara Stace," Active Travel: Transforming Australia's cities", APCC, 2011.9.18.

於是，作者提出達成「2011-2016 國家自行車政策綱領」，所有參與工作者都必須在心理上建立三個重要的基本信仰：

（1）堅定相信自行車交通型態是我們整個土地使用與交通系統中不可或缺的一環。

（2）自行車是最健康的交通方式

（3）良善的設施設計是成就計畫成果的必須且重要要件

所謂良善自行車系統的設計控制要素包括：

①自行車路網設計：考慮自行車旅次容受長度不超過 5km；步行旅次容受長度低於 1.5km（見圖 3.31）。

②自行車設施應力求提供兒童及婦女之舒適使用環境。

③減少與汽車間的衝突

④建構自行車與步行的無縫銜接

3、澳洲主要都市的現存問題—一個不永續的運輸系統（unsustainable transport）

（1）高度交通擁擠

（2）高昂的醫療成本

（3）高傷亡率，造成國民生產力降低

（4）石化燃料的使用破壞生態，消耗自然資源

（5）各種汙染的製造

（6）人民欠缺活力的生活活動，導致疾病

（7）交通安全性低

（8）汽車交通型態讓社區失去互動

（9）欠缺與人直接互動的交通行為，影響心理健康

而導致這些問題的主要原因：

（1）都市交通系統是為汽車而設計

（2）土地使用的規劃使得運輸旅次的發生型態受到框限

（3）民眾的生活態度

4、推動自行車的政策層級架構

目前澳洲政府對於推動自行車政策所提出三層政策層級架構思維，如圖 3.32 所示。

5、推動自行車交通的正面積極效益

（1）解決交通擁擠問題

（2）提高公眾健康，減少社會醫療資源花費

（3）環境獲得保護

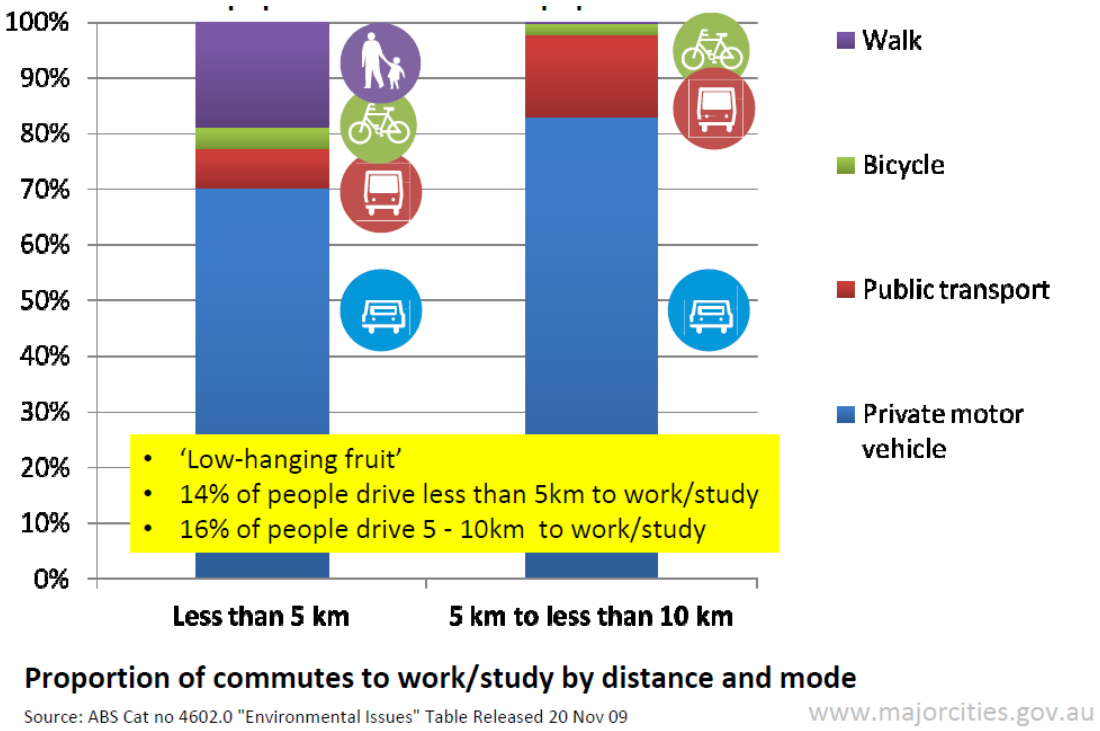


圖 3.31　澳洲民眾旅次長度與運具選擇間之關係

資料來源：Sara Stace," Active Travel: Transforming Australia's cities", APCC, 2011.9.18.

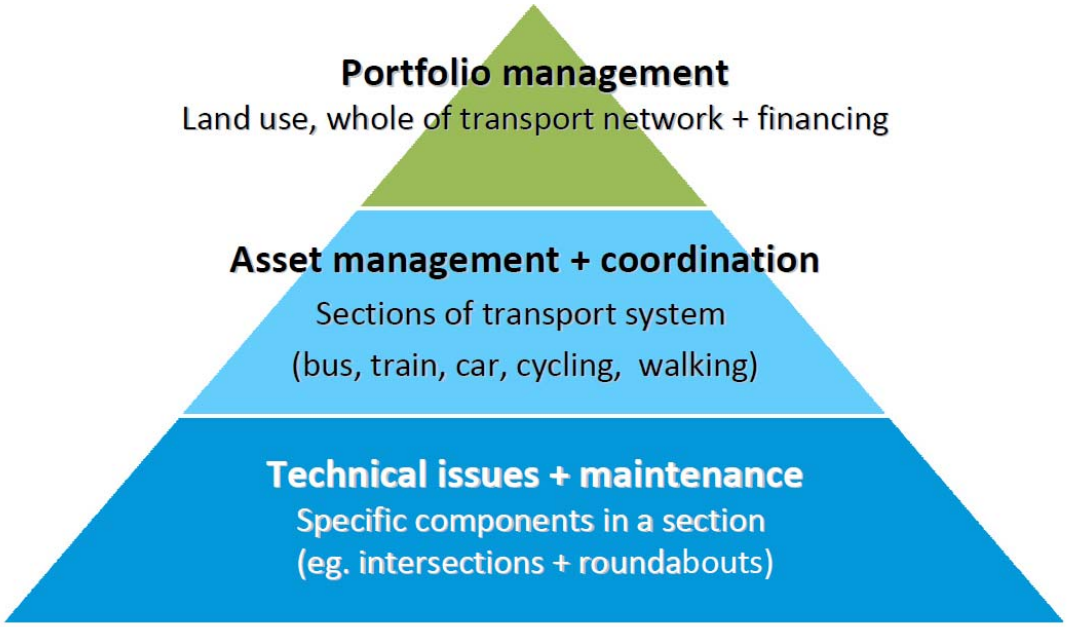


圖 3.32 澳洲自行車政策的層級架構

資料來源：Sara Stace," Active Travel: Transforming Australia's cities", APCC, 2011.9.18.

六、雪梨市分隔式自行車專用道新建的挑戰（"Delivering cycleways: the challenges of separation and retrofit in the City of Sydney"）

作者：Adam Fowler (雪梨市政府，City of Sydney)

摘要：

雪梨市（Sydney）新近在市中心區（city center）與都市近郊（city suburbs）間，新建完成 9 公里的分隔式雙向自行車專用道（bi-directional separated cycleways）。

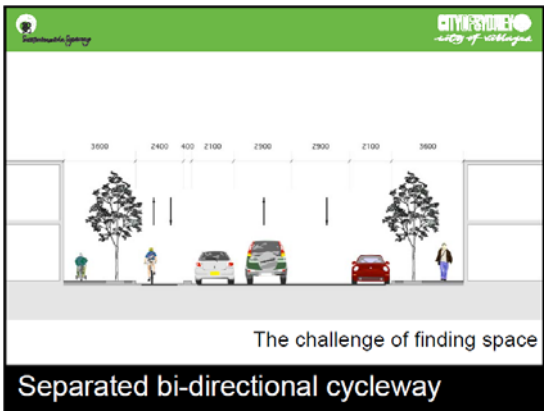
雪梨市自 2007 年起即在政策上設定目標，希望到 2030 年時，雪梨市的自行車旅次比例能提高到 10%以上。於是，雪梨市積極著手思考如何為自行車建構一個更安全、更輕鬆使用的新路網，其中最具關鍵挑戰的即是：如何重新分配道路的既有空間，以創造出新的分隔式雙向自行車專用道（bi-directional separated cycleways）。

本文介紹雪梨市分隔式雙向自行車專用在路段及路口上的佈設原則、設計方式與基本斷面圖。

1、路段上的分隔式雙向自行車專用道佈設，見圖 3.33-圖 3.34。

圖 3.33　雪梨第一條分隔式雙向自行車專用道

資料來源：Adam Fowler, "Delivering cycleways: the challenges of separation and retrofit in the City of Sydney", APCC, 2011.11.18.

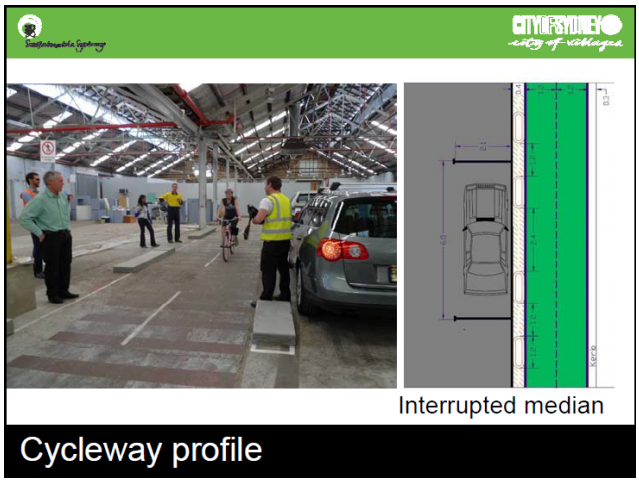


(a)圖例一

(b)圖例二

(c)圖例三

(d)圖例四

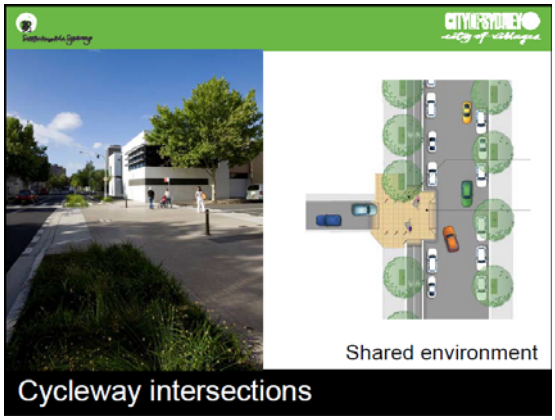


(e)圖例五

圖 3.34　雪梨分隔式雙向自行車專用道標準斷面圖

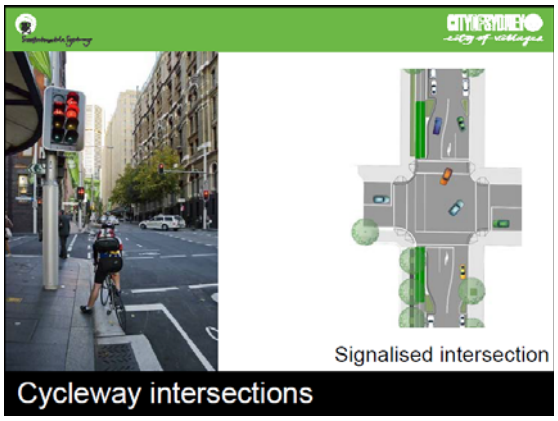
資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

2、路口上的分隔式雙向自行車專用道佈設，見圖 3.35-圖 3.36。



(a)圖例一（非號誌化路口）

(b)圖例二（非號誌化路口）



(c)圖例三（號誌化路口）

(d)圖例四（號誌化路口）

(d)圖例五（「讓」標誌路口）

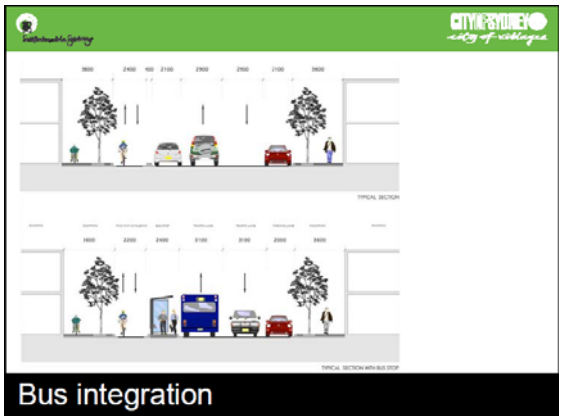
圖 3.35　雪梨分隔式雙向自行車專用道路口佈設標準圖

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

圖 3.36　雪梨分隔式雙向自行車專用道路口寬度不足的佈設

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

3、分隔式自行車專用道與公車專用道的配合佈設，見圖 3.37。



(a)佈設前後斷面圖　　(b)道路佈設實例

圖 3.37　雪梨分隔式雙向自行車專用道與公車專用道的配合佈設

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

4、分隔式自行車專用道與路樹的整合設計，見圖 3.38。

圖 3.38　分隔式自行車專用道與路樹的整合設計

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

5、分隔式自行車專用道與路邊停車彎的整合設計，見圖 3.39。

圖 3.39　分隔式自行車專用道與路邊停車彎的整合設計

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

5、雪梨市分隔式自行車專用道路網分期實施計畫，見圖 3.40。

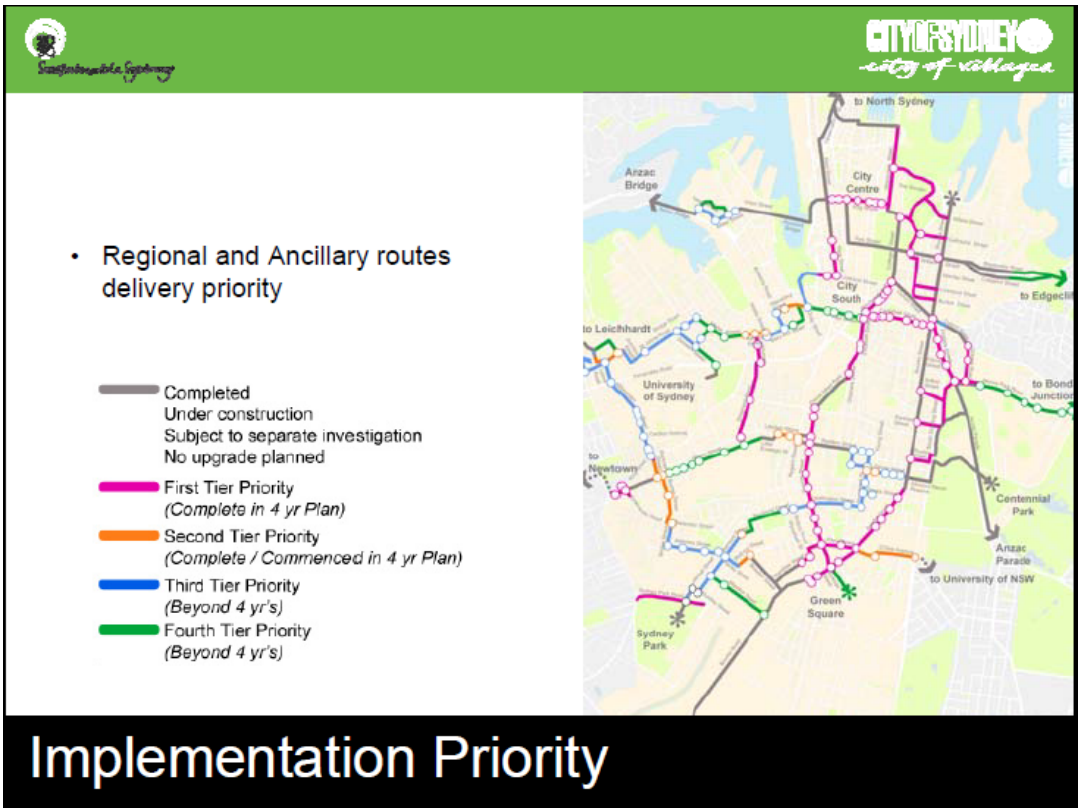


圖 3.40　雪梨市分隔式自行車專用道路網分期實施計畫

資料來源：Adam Fowler, “Delivering cycleways: the challenges of separation and retrofit in the City of Sydney”, APCC, 2011.11.18.

七、布里斯班自行車路網計畫（"Brisbane Cycle Network Plan Review"）

作者：Landsay Enright (布里斯班市議會)、Helen Reilly （布里斯班市議會）

摘要：

「布里斯班自行車路網計畫（Brisbane Cycle Network Plan Review）」是布里斯班市議會（Brisbane City Council）所發佈長期永續自行車路網的整體發展計畫，希望能鼓勵更多的通勤、通學、商業、娛樂旅次使用自行車，並設定目標在 2026 年將自行車旅次的比例由 2009 年的 1.6%提高到 5%，平均每年成長率需達 8%。

本計畫採用策略方法推估目前及未來自行車路網的需求量，同時計畫發展一具吸引力的自行車路網，以吸引更多的旅次使用自行車。

1、先期分析

該計畫先進行先期分析，分析之內容包括：

（1）探討個人選擇使用自行車之決策影響因素

（2）尋找潛在的自行車使用旅次

（3）確立潛在自行車旅次的旅次型態及旅次發生區位或吸引區位

（4）尋找都市內適合自行車騎乘之地區

（5）界定都市內的交通擁擠地區

2、布里斯班現有之自行車道路網

（1）非道路上的共用型自行車路網總長度：450 公里（見圖 3.41）；

（2）道路上的自行車路網（含共用及專用）總長度：650 km

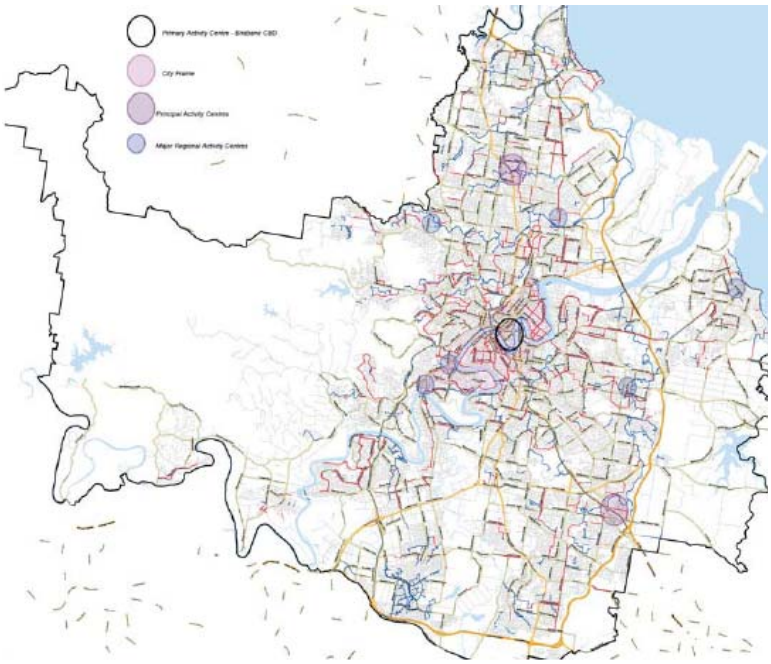


圖 3.41　2011 年布里斯班自行車路網

資料來源：Landsay Enright and Helen Reilly," Brisbane Cycle Network Plan Review", APCC, 2011.9.18.

3、布里斯班自行車旅次特性分析（現況）（見圖 3.42）

（1）74%為「家旅次」。

（2）44%屬於通勤性質之旅次

（3）大部分的非通勤旅次，其旅次長度＜5 公里

Trip Type	Total Trips ,000	Market Share %	Under 5km %	Under 10km %	Cycle MS %	Cycle Dist' %
Home to/from work	700	20	34	61	3.4	44
Home to/from shopping	644	18	73	88	0.9	10
Home to/from school	543	15	80	93	1.5	15
Home to/from social	457	13	63	80	1.5	12
Home to/from other	176	5	79	87	0.4	1
Home to/from higher edu	102	3	44	67	2.1	4
Work to/from other	154	4	59	79	0.7	2
Shopping to/from other	200	6	67	86	0.4	2
Other	557	16	66	83	1.1	11
Totals	3,532	100			1.6	100

圖 3.42　布里斯班自行車旅次目的分析統計

資料來源：Landsay Enright and Helen Reilly," Brisbane Cycle Network Plan Review", APCC, 2011.9.18.

4、具開發潛力的旅次目標對象與潛在市場

（1）旅次長度＜10 公里的通勤旅次：約有 12%

（2）旅次長度＜5 公里的上學旅次：約有 12%

（3）旅次長度＜5 公里的購物旅次：約有 13%

（4）旅次長度＜5 公里的社交旅次：約有 8%

（5）旅次長度＜10 公里的高等教育旅次：約有 2%

（6）旅次長度＜5 公里的工作地非家旅次：約有 2%

本計畫估計未來自行車旅次的潛在市場約尚有 49%，亦為本計畫所設定的推廣目標群對象。

5、優先建構自行車路網之區域

因自行車特別適合於旅次長度低於 5 公里者，根據此特性設定優先建構自行車路網的地區。

（1）有相當高比例的旅次，其旅次長度＜5 公里的地區

（2）土地使用強度高且為混合使用的地區

6、結論

（1）在所有情境下，市中心區仍為最具推廣自行車的潛力地區。

（2）市中心周圍地區在特定情境下具有不錯的開發潛力

（3）根據本研究之分析，本計畫未來推廣所設定的目標地區

①市區（inner city）。

②北方走廊（North corridor）：指 CBD 與 Chermside 及 Sandgate 地區間。

③西北走廊（North west corridor）：指 Kedron 地區與 Mitchelton 及 Ferny Grove 地區間。

④西南走廊（South western corridor）：指 CBD 與 Indooroopilly、Oxley 及 Forest Lakes 地區間。

⑤郊區：包括 Wynnum – Manly 間，Mt Gravatt – Eight Miles Plains 間，Forest Lakes，Mt Ommaney – Sinnamon Park 間，The Gap，及 Sandgate 等地區。

（5）根據本研究之分析，「布里斯班自行車路網計畫」之路網發展策略應為：

①發展地區性的自行車路網，連接住宅區與學校、社區設施、地方就業及消費地點。希望提高自行車旅次比例佔該地區旅次之 40%。

②發展長距離的幹道系統路網，以吸引通勤及高等教育者之旅次。希望提高自行車旅次比例達 23%左右。

3.2 WOCREF 會議研討論文重點摘述

一、分隔式自行車專用道設計準則之建立（"The formulation of guidelines for separated cycleways"）

作者：Katherine McCray (澳洲新南威爾斯省 GTA 顧問公司，GTA Consultants)；Jonathan Giles(澳洲昆士蘭省運輸與主要道路局)

摘要：

澳洲昆士蘭省於 2011 年宣布「自行車基礎建設政策（The Cycling Infrastructure Policy）」，目標在延伸既有的自行車建設政策，以同時提升自行車與其他車輛之用路安全。而為了配合此一政策，昆士蘭省運輸與主要道路局乃構思建立一套自行車道的標準設計準則，以協助該政策之執行。

昆士蘭省運輸與主要道路局認為，分隔式自行車專用道是建立自行車安全環境的一項重要因素，甚至可藉此吸引更多的居民使用自行車，因此，乃參考澳洲以往的自行車設計準則、國際上的相關自行車專用道設計準則與其他實務經驗，嘗試建立一套新的自行車專用道的設計準則，以供使用。

本文簡報中介紹了許多該團隊所構思而出的自行車道設計型態與設計方法，惟大會資料中並無提供本文全文（full paper）或本文簡報之投影片資料，無法於本報告中呈現，至為可惜。

肆、心得與建議

本次出席「亞太自行車研討會(Asia-Pacific Cycle Congress，APCC)」及「世界自行車研究研討會(World Cycling Research Forum，WOCREF)」，除瞭解美國、英國、日本、中國大陸、荷蘭、紐西蘭、澳洲等各地的自行車交通系統推展計畫外，同時亦了解到不同國家對自行車的態度差異與定位方式不同。

茲將本次與會心得及相關建議綜整如下。

4.1 心得

一、各國對自行車的功能定位並非全然一致

自行車為運輸工具的一種，各國自行車的推廣工作大致也都不脫以交通部門為主要執行部門或主要負責部門，但顯然各國對於自行車的功能與定位並非全然相同。除荷蘭外，多數國家對於自行車未來的發展目標大致均只設定在佔全體旅次的 5%-10%之間，顯示縱然各國投入大量資源推動，自行車未來仍無法成為主流的運輸工具，其在交通上的效益，似乎並非多數國家所最主要的著眼所在。

美國、澳洲、英國、紐西蘭等大多數國家，在推動自行車時，都強調自行車在國民健康與環境保護上的功能與意義；中國大陸發展自行車雖然亦希望解決交通問題，但顯然的在其推動過程中，發現自行車在觀光休閒活動上具有顯著成效；荷蘭則認為自行車只是該國國民生活文化的一部分，就如同飲食與生活習慣一般，與民眾生活緊緊相連，自行車設施就如同公園、綠地、廣場般，都是都市或社區公共設施設計時不可或缺的一環，民眾認同支持，汽車使用者也不質疑，因此，政府並不需要有刻意的政策去推廣自行車，只需避免自己的作為破壞或抑制自行車環境的發生，而正因為自行車已融入荷蘭民眾的生活之中，所以，自行車也才能無遠弗屆的存在於荷蘭人的生活環境裡。

二、自行車在短程旅次上具有較高的競爭力

包括荷蘭、日本、澳洲、英國等國在討論自行車旅次的拓展對象時，均不約而同的以旅次長度低於 5 公里以下者為自行車推廣

的主要對象。尤其是對於年輕及通學的旅次，更是新近推廣自行車的國家所設定的主要開發族群。其次則為旅次長度低於 10 公里的通勤、通學旅次；高於 10 公里的旅次，則必須將自行車定位於終端接駁的角色，提供舒適、方便的接駁設施與環境。

三、應提供自行車「友善的環境」，而非僅只是「友善的設施」

多數國家在發展自行車時，多會強調自行車專用車道（bike lanes）或自行車專用道路（bike ways）的設計與建設成果，然而硬體設施畢竟只是「設施」，而非等同於「環境」。

友善的自行車設施，常常背後意味著：一般人在使用自行車時，需要在既有預設的自行車設施之中使用，例如需騎乘自行車應在自行車道上。但荷蘭更強調的是：一個自行車友善的城市，這個城市應該是讓自行車的使用人在城市的每個角落都感到舒適（comfort），而非僅只在自行車專用道上。所以，包括賦予自行車高的社會地位與社會尊重，都是營造自行車友善環境非常重要的一環。

四、 公共自行車的發展與未來

從中國大陸杭州市的實際發展狀況可發現，公共自行車成功的 5 項重要基礎：

（1）充足的都市觀光休閒旅次；

（2）提供較長時間的免費優惠；

（3）方便眾多的借還站點；

（4）方便容易的借還手續；

（5）鼓勵公共運輸的轉乘接駁，提供轉乘者更多優惠。

由於旅次中最大宗的通勤通學等旅次，通常需有「及戶」的功能要求，因此，自備自行車相較於公共自行車，更為貼近需求。反之，觀光休閒旅次…等非重複性出現的交通需求，反應為公共自行車主要可爭取的對象，於是成本低及方便舒適性，將是公共自行車成功與否的重要因素。

五、社區內或社區間的自行車通道，應扮演重要角色

許多國家在發展自行車時，多著重在既有道路上尋找或創造自行車的行車空間。但由荷蘭的經驗卻發現，路外自行車道設施的數量是路上自行車專用道的 6 倍之多，顯示荷蘭自行車道系統之發展，並非依存於現有道路之上，而應是以社區內或社區間的各種正式或非正式通道型態存在為主。因此，若希望將自行車深入民眾生活之中，社區型的自行車通道應是政府發展自行車時應該要重視的一環。

六、自行車硬體設施的投資成本效益低嗎？

由於自行車車道的道路面積小，建設成本低，且因自行車的車體非常輕，對路面壞力極低，使得自行車車道的維護較一般道路簡單許多，成本更是低廉，因此，雖然就單位面積或單位長度的車輛服務數而言，多數自行車道似乎呈現偏低現象，但各國仍認為，就總體成本與其創造的各項效益總和而言，自行車硬體建設的投資價值，應不容質疑。

七、重視自行車在交通、醫療健康、環境保護、觀光休閒產業的效益

各國在發展自行車時，並不只專注於交通功能一個面向的課題，甚至更多的討論是在於醫療健康、環境保護與觀光休閒，推動過程中也會統合相關部門的資源及力量，尤其自行車對於健康醫療方面所創造的效益，更是整體計畫中不能忽視的一部分。相形之下，交通部門所扮演硬體設施提供者的角色，似乎更重於效益收成者的角色，這與我國目前發展的情形似乎也不相同。

4.2 建議

一、審慎思考自行車的長期發展定位，不宜再以交通改善為唯一或主要思維

從國外的經驗可發現，國外對於自行車發展的課題，並不僅只限定於交通部門，甚至對於非交通的醫療健康、環境保護與觀光休閒等課題的重視，更勝於交通問題的解決。畢竟自行車旅次在交

通系統中可能發展的上限，約僅在10%左右，無法改變重要或主要的交通擁擠問題，且自行車所可資替代的旅次，多數均為5公里以下的短程旅次，其節能減碳的效果恐亦非顯著。

但相對的，依據荷蘭經驗，經常騎乘自行車的人，其身體機能狀態較同年齡者年輕5歲，生病的次數也會減少15%。自行車在醫療保健及醫療資源節省上所帶來的成效，似乎更應該受到重視。

鑑此，反思我國目前自行車的發展政策，將大部分的心力與關注均集中在交通效益之上，恐非妥適。或許我國在發展自行車活動時，應先重新確立自行車的政策定位，屬交通的一環？環保的一環？觀光休閒的一環？國民健康的一環？還是國民生活的一環？如何才能將自行車活動持續的推廣下去？不至因政策的更迭而消失，這似乎應是我們第一項應該做好的功課。

二、投入的關心不夠，且過於強調表面的硬體建設成果

近年來，我國政府積極推廣自行車交通活動，但似乎重點都在硬體設施的建設上，尤其著重於計算自行車道的闢建長度與數量。然而，硬體設施的健全固是發展自行車的重要基礎，但是真切的關心與體貼的設計，似乎更能吸引自行車使用者，尤其讓自行車騎士處處感受到獲得尊重，才應更是吸引大家使用自行車的重要因素。

三、減少並克服天候對自行車騎乘的影響，應是發展自行車的重要問題

台灣地區具有人口聚集程度高、多數都市地區地勢平坦及四季溫度差異不大的特性，本是自行車發展的重要優勢條件，惟冬季的寒冷多雨，夏季的酷暑悶熱，卻也相對讓自行車騎士為之却步。因此，因應此種天候上的劣勢，政府應鼓勵創意的自行車與自行車道設計，以降低天候對自行車騎乘意願之影響。

四、積極投入基本資料蒐集與基礎研究工作，才能有助於正確找出問題與持續回饋檢討

建議我國未來應從10個面向著手進行研究，以提升資源的有

效利用：

（1）自行車活動對健康及國民醫療資源節省之影響

（2）自行車對環保課題的貢獻或影響

（3）自行車對交通擁擠改善的效益

（4）自行車對產業之衝擊影響

①自行車產業的產值增加效果

②自行車產業的就業機會增加效果

③其他運具相對產值與就業機會的減少效果

④對道路工程產業產值與就業機會之影響

⑤自行車對觀光休閒產業的影響

（5）自行車安全問題

①硬體設施的安全標準

②自行車技術的提升

③自行車交通規則之研究

④自行車騎士養成教育與訓練

⑤自行車的傷亡率與傷亡防治

（6）自行車的社會安全議題—失竊率與失竊防治

（7）公共自行車的發展與效益問題

（8）建立自行車相關基本資料庫

（9）其他衝擊課題，如社會文化的影響、自行車騎乘的夜間人身安全問題…等

（10）都市地區與非都市地區自行車的潛在市場或競爭優勢

附錄 1

APCC 研討會日程表

PROGRAM

Sunday, 18 September 2011

1700-1900	Welcome cocktail event - Chris Scott, Australian Paralympic Cyclist	Mezzanine Foyer

Monday, 19 September 2011

0900	**Opening Ceremony** Master of Ceremonies, Department of Transport and Main Roads, Queensland, Australia The Hon Annastacia Palaszczuk MP, Minister for Transport and Multicultural Affairs Queensland Councillor Greg Betts, Deputy Chair of Sustainable City Future Committee, Gold Coast City Council Councillor Tim Dwyer, Deputy Mayor, Sunshine Coast Councillor Julian Simmonds, Chairman of Public and Active Transport, Brisbane City Council Sara Carrigan, Australian Professional Cyclist – Enhancing the cycling experience			Great Hall 1
1000	**Cycling in the city - are we serious?** Phillip Darnton, Executive Director of the Bicycle Association of Great Britain			Great Hall 1
1030	MORNING TEA			Mezzanine Foyer
1100	**The impact of bike sharing systems on travel behaviour: Lessons to be learnt from the largest scheme in the world** Prof Haixiao Pan, Tongji University, China			Great Hall 1
	Great Hall 1 Cycleway planning, innovation and infrastructure	**Great Hall 2** Cycling promotion and travel behaviour change	**Great Hall 3** Culture, community, choices	
1130	**Planning for Healthy Spaces and Places** Kirsty Kelly, Planning Institute of Australia, Australia	**Providing a good time on the bike: Cycling Australia's Participation Plan** Alexandra Bright, Cycling Australia, Australia	**Community engagement - is it as easy as build it and they will come? Or is it a case of build it and they will come shouting, screaming and yelling?** Maria Pavlides, City of Sydney, Australia	
1200	**Delivering cycleways: The challenges of separation and retrofit in the City of Sydney** Adam Fowler, City of Sydney, Australia	**Developing a cycling behavioural change strategy for the City of Sydney** Jonathan Daly (GHD) and Caitlin Brookes (City of Sydney), Australia	**Are you a cyclist or do you cycle? The language of promoting cycling** Dr Glen Koorey, University of Canterbury, Christchurch, New Zealand	
1230	**Urban bikeway design guidance from U.S. cities** Andrew Bailey, Kittelson and Associates, United States	**Vision to reality: Promoting change for the Sunshine Coast** Peter Duffy, Sunshine Coast Council, Australia	**Active school travel Brisbane City Council** Sue Wallace, Brisbane City Council, Australia	
1300	LUNCH	Sponsored by		Mezzanine Foyer
	Great Hall 1 Cycleway planning, innovation and infrastructure	**Great Hall 2** Cycling promotion and travel behaviour change	**Great Hall 3** Culture, community, choices	
1400	**Brisbane Cycle Network Plan review** Lindsay Enright (Brisbane City Council) and Helen Reilly (Brisbane City Council), Australia	**TravelSmart** Adam Rogers Department of Transport and Main Roads, Queensland, Australia	**Sensitivity of commuter cyclists to changes in weather in Victoria and Queensland** Geoff Rose, Monash University, Australia	
1430	**Model communities - making walking and cycling the easier transport choice** Gerry Dance, New Zealand Transport Agency, New Zealand	**Train drivers on bikes, a Trojan for cycling integration** Jim Krynen, Public Transport Authority, Western Australia	**Exploring gender differences in recreational and utility cycling in Queensland** Kristiann Heesch, Queensland University of Technology, Australia	
1500	**Evaluation of a mass implementation of green bicycle lanes at high crash intersections in Cairns** Robyn Davies (Department of Transport and Main Roads, Queensland) and Thomas Meldrum (AECOM), Australia	**Surfing the net to find cycling Nirvana: How cyclists use online technologies to choose their cycling destinations** Dennis Punlard, University of Canberra, Australia	**All aboard the Bike Bus: An innovative active school travel mode** Elisha McGuiness (Queensland Health), Ray Plasto (Department of Transport and Main Roads, Queensland) and Mark Allen (Education Queensland), Queensland, Australia	
1530	AFTERNOON TEA			Mezzanine Foyer
1600-1800	4 Parallel Tours: Inner City Bridge Tour | City Highlights Tour | River Loop Tour | Cycle Centres Tour			
1900	Pre-dinner networking drinks	Sponsored by GCI		Great Hall 4
1930	Congress dinner			Great Hall 4

PROGRAM

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1600-1800	4 Parallel Tours: Inner City Bridge Tour | City Highlights Tour | River Loop Tour | Cycle Centres Tour			
1900	Pre-dinner networking drinks	Sponsored by GCI		Great Hall 4
1930	Congress dinner			Great Hall 4

PROGRAM

Tuesday, 20 September 2011

0530	Mount Coot-tha Tour or 1/2 River Loop Tour		
0800	BREAKFAST EVENT Phillip Darnton, Bicycle Association of Great Britain – 10 things that the UK has not learnt about cycling	Sponsored by Hyder	Great Hall 4
0900	The Dutch Bicycle Culture: status, lessons learned and future challenges Berry De Jong, Samenwerkingsverband Regio Eindhoven, Netherlands		Great Hall 1
	Great Hall 1 Cycleway planning, innovation and infrastructure	**Great Hall 2** Cycling promotion and travel behaviour change	**Great Hall 3** Culture, community, choices
0930	What could increased cycling contribute to reducing Australia's transport greenhouse gas emissions? Leigh Glover, GAMUT, Australia	AustCycle – national expansion Gareth Watkins, Austcycle, Australia	The politics of cycling – how government and community can work together The Hon Rachel Nolan MP, Minister for Finance and The Arts , Queensland, Australia
1000	Make it/*feel* safe and they will come: addressing the actual and perceived risks of cycling Jan Garrard, Deakin University, Australia	Women on wheels – learning from the learners Debra Mayrhofer, Edith Cowan University, Australia	My other bike is a car – the story of local transport planning Alton Twine, Gold Coast City Council, Australia
1030	MORNING TEA		Mezzanine Foyer
1100	POSTER SESSION 1		Mezzanine Foyer
1130	The importance of understanding health impacts and the needs of potential cyclists in moving towards an increase in cycling mode share Simon Kingham, University of Canterbury, New Zealand		Great Hall 1
1200	Q&A sessions Cycleway planning, innovation and infrastructure Cycling promotion and travel behaviour change Culture, community, choices		Great Hall 1 Great Hall 2 Great Hall 3
1300	Hypothetical plus Lunch Event: Reaching critical velocity, how do we do it?		Great Hall 4
	Great Hall 1 Cycleway planning, innovation and infrastructure	**Great Hall 2** Cycling promotion and travel behaviour change	**Great Hall 3** Culture, community, choices
1430	The economics of investment in cycling for Queensland Elliot Fishman, Centre for Accident Research and Road Safety, Australia	Supporting cycling to reduce greenhouse gas emissions Athol Moore, Parsons Brinckerhoff, Australia	Australian universities and cycling: Travel demand management and planning for cycling at Griffith University Matthew Burke, Griffith University, Australia
1500	Capacity and conflict on shared use paths: How many is too many? Michael Langdon (Department of Transport and Main Roads, Queensland) and Cameron Munro (SKM), Australia	The effect on frequency of cycling if mandatory bicycle helmet legislation was repealed in Sydney, Australia: A cross-sectional survey Chris Rissel, University of Sydney, Australia	Tour de data – an evidence based journey of cycling opportunities and challenges in Queensland Kellie Doonan, Department of Transport and Main Roads, Queensland, Australia
1530	What shoppers want – the reallocation of road space Tracy Allatt, Beca Infrastructure, New Zealand	Interactions between pedestrians and cyclists in the city centre Narelle Haworth, Centre for Accident Research and Road Safety, Australia	Environmental and use impacts to mountain bike trails in South Australia and Queensland Stu Clement, Stuart Clement Solutions, Australia
1600-1630	POSTER SESSION 2		Mezzanine Foyer
1700-1900	Twilight Tour		

PROGRAM

Wednesday, 21 September 2011

0530	Mount Coot-tha Tour or 1/2 River Loop Tour		
0800	BREAKFAST EVENT — Sponsored by MWH — Great Hall 4 Phil Anderson, Australian Professional Cyclist – Journey to Yellow Tim Wood, Freestyle BMX Champion – Why youth love the boundaries of extreme sport . . . . there are no boundaries!		
0900	Promoting bicycle use of car users through communication — Great Hall 1 Dr Satoshi Fujii, Kyoto University, Japan		
	Great Hall 1 Cycleway planning, innovation and infrastructure	**Great Hall 2** Cycling promotion and travel behaviour change	**Great Hall 3** Culture, community, choices
0930	Infrastructure speed dating: Solving problems for riders so that they will solve yours Harry Barber, Bicycle Network Victoria, Australia	Measuring cycling in the community: Survey challenges and solutions Cameron Munro, SKM, Australia	Three models of public bike system in China and their impact on travel behaviour Haixiao Pan, Tongji University, China
1000	Signing cycle networks: New trends in active transport wayfinding Warren Salomon, Sustainable Transport Consultants, Australia	Waking the giant: An Australian case study in national active travel advocacy Stephen Hodge (Cycling Promotion Fund) and Rohan Greenland (Heart Foundation), Australia	The impacts of public bicycle share schemes on transport choice Elliot Fishman, Centre for Accident Research and Road Safety, Australia
1030	MORNING TEA — Mezzanine Foyer		
1100	Cycling infrastructure for Australian cities — Great Hall 1 Sara Stace, Department of Infrastructure and Transport, Australia		
1130	Fifteen reasons why bicycling is rolling worldwide and five forces that stand in the way — Great Hall 1 Tim Blumenthal, Bikes Belong Coalition, United States of America		
1200	Congress Close - the Brisbane Charter — Great Hall 1		
1300	LUNCH — Sponsored by Lend Lease — Mezzanine Foyer		
1400-1800	Gold Coast Infrastructure Tour		

www.cyclecongress.com

附錄 2

WOCREF 研討會日程表

WOCREF
Bringing cycling research to the world

World Cycling Research Forum

22 – 23 September 2011

Brisbane Convention and Exhibition Centre
cnr Merivale St and Glenelg St,
South Bank, Brisbane, Queensland, Australia

Day One: Thursday 22 September, 2011

08:30 – 09:00	Registration, Plaza Level outside P5
09:00 – 09:40	Welcome and preliminaries: Room P5, Plaza Level Stu Clement, Convenor, WOCREF 2011
	Official Opening: Barry Broe, Brisbane Infrastructure
09:40 – 10:25	Opening Address Kevin Norton, Professor of Exercise Science, University of South Australia **Physiology and the limits of human performance**
10:25 – 10:55	Morning refreshments, Plaza Level
10:55 – 12:15	Session 1: **Environmental and use impacts to mountain bike trails in South Australia and Queensland** *Stu Clement* (Stuart Clement Solutions and IMBA-Au, Australia) **Determinants of captive bicycle rider's routes: case study of Pune, India** Himani Jain, *Geetam Tiwari*, Ashish Bhatia (Department of Civil Engineering, IIT Delhi, India)
12:15 – 13:15	Lunch, Plaza Level
13:15 – 14:55	Session 2: **Financing a revolution** *Matthew Yi* (AECOM, Sydney, Australia) **The formulation of guidelines for separated cycleways** *Katherine McCray* (GTA Consultants, Sydney, Australia) and *Jonathan Giles* (Department of Transport and Main Roads, Queensland, Australia) **Cycle Tourism – what the hell are we talking about?** *Dennis Puniard* (University of Canberra, Australia)

14:55 – 15:25 Afternoon refreshments, Plaza Level

15:25 – 16:55 Session 3: **Cycling Data Collection and Analysis**
Michael Langdon (Queensland Transport, Australia), *Rebecca Lehman* (GTA Consultants, Australia) and *Matt Burke* (Griffith University)

This Masterclass/Workshop will focus on cycling data collection, analysis and reporting from a practitioner's point of view, and will provide 'how-to' guidance based on experience, lessons learned, what works, and what doesn't. The topics of this session include:

- Why good data collection is important - the need to collect and analyse data with every project
- Collection Techniques - current guidance, types, costs, value, and biases you'll need to be aware of
- Analysis Techniques - current guidance, interpretation and common pitfalls
- 'Best Buys' for data – comparing options available and how to get the best return for often limited resources
- Overview of available data – availability state by state, types of data – and what to do when the data doesn't exist

Participants will be able to leave this session with the tools they need to effectively collect, analyse and report on cycling data.

16:55 – 17:00 Close

17:00 – 19:00 Pre-dinner drinks

Supported by Penny Farthings Pushbike Parking (Mark Rossiter)

Penny Farthings

19:00 – **Forum Dinner** (optional)
Obsession, 5 Little Stanley St, South Brisbane

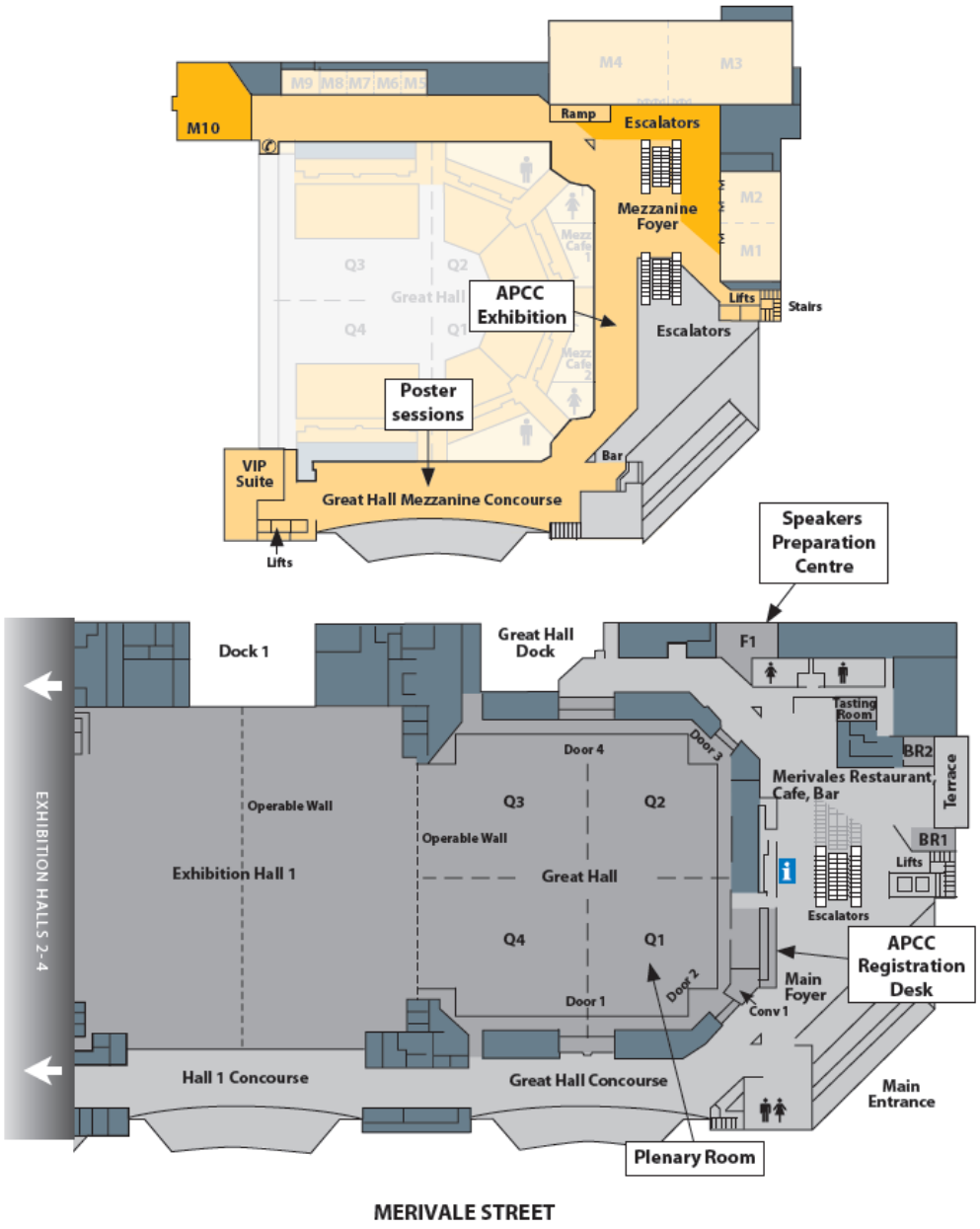
Day Two: Friday 23 September, 2011

08:30 – 09:00	Pre-Forum refreshments, Plaza Level outside P5
09:00 – 09:40	Invited Address Jan Garrard, Deakin University, Melbourne, Australia **Can we apply Dutch-style thinking and action to find and activate Australia's lost cycling cohorts?**
09:40 – 10:50	Session 4: **A methodology for optimizing the location of bike lanes at the network level** *Mahmoud Mesbah* (University of Queensland, Brisbane, Australia), Russell Thompson (Monash University, Melbourne, Australia), Sara Moridpour (RMIT University, Melbourne, Australia) **How to keep cyclists safe? Investigation into the required safe passing distance between cyclists and motor vehicles** *Marianne Vanderschuren* and Andrew Wheeldon (University of Cape Town, South Africa)
10:50 – 11:10	Morning refreshments, Plaza Level outside P5
11:10 – 12:30	Session 5: **Value addition of Cycle Rickshaw Trolley (CRT) in intra-city freight transport: a case study of Delhi** SSLN Sarma, Himani Jain, *Geetam Tiwari* (Department of Civil Engineering, IIT Delhi, India) **Environmental travel time cost model developments from work journey mode comparisons** *Stu Clement* (Stuart Clement Solutions, Australia)

12:300 – 13:20	Lunch, Foyer, Plaza Level outside P5
13:20 – 15:00	Session 6: **The prevalence and causes of foot pain in recreational cyclists: a possible side effect of the South Australian Tour Down Under?** *Hayley Uden*, Sara Jones and Karen Grimmer-Somers (University of South Australia, Adelaide, Australia) **Rates of injuries from mountain biking: a longitudinal study of all mountain bike disciplines** *Julie Leslie* (NSW, Australia) **A social approach to teaching cycling in Melbourne – the Tao of City Cycling** *John Merory* (Austin Health, Melbourne, Australia) and Frank Fisher (Swinburne University of Technology, Melbourne, Australia)
15:00 – 15:20	Afternoon refreshments, Plaza Level outside P5
15:20 – 16:50	Session 7: **Attempts to feminize cycling in London – approaches and contradictions** *Paula Ruoff* (London, UK) **Same road, different journey? Researching women's experience of mass cycling touring** *Simone Fullagar* (Griffith University, Brisbane, Australia) **Veils, velos and values: a lesson from bike-ed** *Debra Mayrhofer* (Edith Cowan University, WA, Australia) and Joanne Burgess (City of Stirling, Australia)
17:00 – 17:10	Forum close: *Stu Clement, Convenor*

附錄 3

APCC 會場平面圖

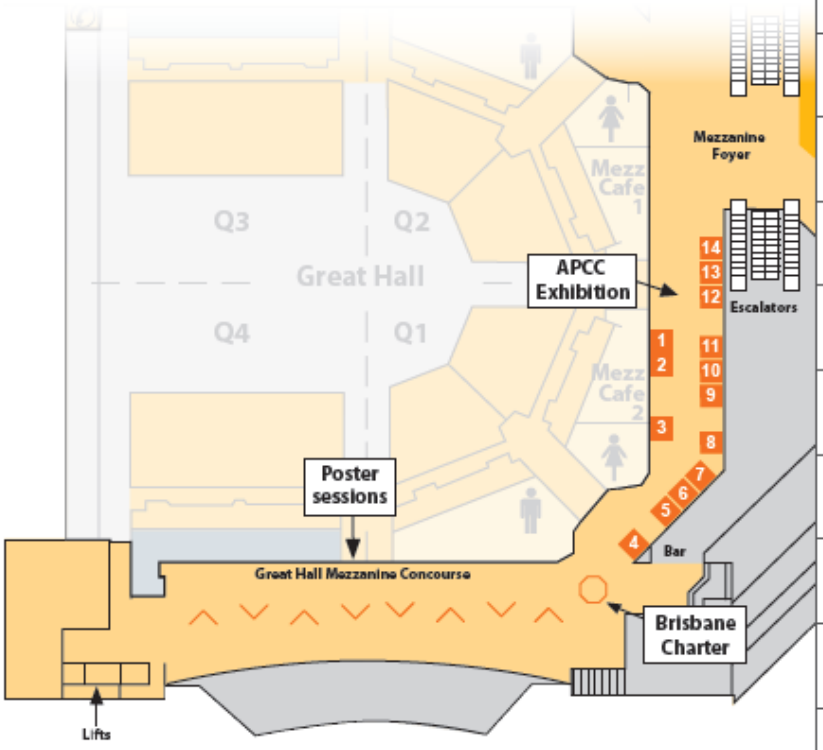


附圖 3.1 研討會會場平面圖

EXHIBITION FLOOR PLAN

Exhibition hours

Sunday, 18 September 2011	17:00 – 19:00
Monday, 19 September 2011	09:00 – 16:00
Tuesday, 20 September 2011	08:00 – 17:00
Wednesday, 21 September 2011	08:00 – 14:00



Booth	Exhibitor
1	
2	Sunshine Coast Council
3	
4	Queensland Government
5	Leda
6	
7	
8	
9	SCODY
10	
11	Outdoor Counters Australia
12	PSA CONSULTING
13	MetroCount
14	Heart Foundation

附圖 3.2 研討會展示攤位平面配置圖

附錄 4

APCC 研討會論文摘要

KEYNOTE SPEAKER ABSTRACTS

Fifteen reasons why bicycling is rolling worldwide and five forces that stand in the way

Tim Blumenthal, Bikes Belong Coalition, United States of America

I will talk about the promising international trends that are making bicycling easier and safer, including separated bikeways, bike-sharing systems, ciclovia/open street events, safe routes to school programs, and the enthusiastic support of big-city mayors. I will highlight major challenges facing bicycling, including budget deficits, the inability of government leaders to recognize the health benefits of cost-effective bike infrastructure investments, and bicycling's lingering perception as a recreational activity that simply isn't a mainstream transportation solution. I will talk about the elements of effective messaging in selling all of bicycling's benefits to government leaders, the media and the general public.

Enhancing the cycling experience

Sara Carrigan, Australian Professional Cyclist, Australia

Cycling has been a huge part of my life that has allowed me to travel the globe, to overcome fears, to be opened up to a world of freedom, endorphins, relationships and happiness, and has allowed me to achieve one of my life dreams of winning Olympic Gold. Having ridden a bicycle both recreationally and competitively in many parts of the world, I have witnessed and experienced different mentalities and approaches from individuals and societies towards cycling.

Specifically in Australia, I have been a part of a huge growth, evolution and attitude towards cycling. In the 16 years of being a cyclist, the relationship between motorists and cyclists has not been rosy, but both parties can harmoniously co-exist in the same environment through correct and relevant education. A fear of the unknown is what paralyses and rouses resentment for both the motorist and cyclist. Knowledge will shift fears and improve attitudes that will ultimately induce a culture of confidence and respect so that anyone can feel comfortable and uninhibited to navigate our roads both on a bike and in a car; enhancing the cycling experience for all road users.

Cycling in the city – are we serious?

Phillip Darnton, Bicycle Association of Great Britain

After a decade of cycling forums, discussion documents and arbitrary targets for increases in cycle trips, the UK Government decided in 2005 to establish an expert, independent group – Cycling England – in order to "get more people cycling, more safely, more often". An initial budget of £5 million pa for specific cycling programs in England (excluding London – separately funded) was allocated.

Between 2005 and 2011, Cycling England (with a full-time team of four) co-ordinated a range of projects, both for infrastructure as well as "soft" measures, across 18 cities and towns. In 2008 the Department of Transport considered that the early success of Cycling England justified an increase in investment in cycling; the budget for the period 2008/2011 was set at £140 million.

While there are many differences between the UK and Australia, there are also some key similarities in the challenges which each faces, including road congestion, increasing obesity and climate change. Attitudes, social norms and habits with regard to travel, especially cycling in urban environments, are also probably fairly similar.

Over the past six years as a result of its efforts to encourage more cycling for short urban trips of up to 5 miles, Cycling England has learnt much about the barriers to behaviour change, and what must be done to bring about a shift to 'everyday cycling'. This presentation will question the commitment and tenacity of leaders and politicians both nationally and locally to the achievement of targets for cycle trips which are commonly espoused. It will offer a range of practical actions, some of which have generated significant increases in urban cycling trips even in a short-time frame; others are, for the UK at least, still regarded as "too difficult", even though their effectiveness is not in doubt.

The presentation will challenge the real readiness of political leaders and key opinion-formers to address the long-term necessity of making cycling a part of an integrated transport strategy.

KEYNOTE SPEAKER ABSTRACTS

The Dutch bicycle culture: Status, lessons learned and future challenges

Berry de Jong, Samenwerkingsverband Regio Eindhoven, Netherlands

The bicycle is a very popular means of transportation in the Netherlands. It is used in 27% of all journeys and for all travel motives. The average Dutchman owns at least one bicycle. For most people cycling isn't a way of life, but a evident part of everyday life. The bicycle is regarded a functional means of transportation.

The Dutch expect the facilities for cycling to be excellent. This, as well the problems that accompany the extensive use of the bicycle, has lead to unique knowledge and tested solutions. There are plenty of best practices and innovations in vehicles, infrastructure and policies, aiming to increase comfort, convenience and traffic safety, and to reduce theft and annoyance. The Dutch are eager to share, for instance via the Netherlands Bicycle Embassy.

Although the Dutch cycle a lot, there's still a huge potential for the bicycle to replace car trips. Some Dutch cities show an overall +15% is possible. That's enough to solve the accessibility problems. The biggest chances are in stimulating regular cyclists to use their bicycle more frequently and at longer distances. The vulnerability of the growing group of senior cyclists is still to be solved.

Promoting bicycle use of car users through communication

Satoshi Fujii, Kyoto University, Japan

The bicycle is a socially desirable travel mode when compared to the automobile. But, cycling is not always socially desirable when compared to walking or public transport. Therefore, promoting the bicycle as a travel mode is necessary when targeting car users. With this in mind, some public authorities have implemented various measures to reduce people's car use and promote alternative modes such as bus, transit, pedestrian and bicycle. In other words, the bicycle has been promoted by public authorities in policies that 'demarket cars'. For example, the bicycle has proven to be an alternate transport mode used frequently by car users, when changing their travel mode. This can be related to the cognitive and behavioral cost required to change the travel mode from car being typically lower when changing to bicycle than to bus, transit and walking. In this presentation, several cases for promoting the bicycle through communication will be discussed, including their theoretical background.

The importance of understanding health impacts and the needs of potential cyclists in moving towards an increase in cycling mode share

Simon Kingham, University of Canterbury, New Zealand

There is an increasing move in many parts of the world to get more people using the bicycle as their mode of transport. Reasons for this include climate change, peak oil, traffic congestion and health. The latter can be of particular importance if a broad range of benefits is included. Understanding these and the financial value of them is crucial in making cost effective investment decisions. A key driver of many transport planning and engineering decisions is safety. This can sometimes be to the detriment of wider health-related benefits if safety based decisions actually make cycling a less attractive option to the very people that are being targeted as new cyclists. This presentation will examine the importance of understanding the range of health impacts and also the needs of potential cyclists in moving towards an increase in cycling mode share. It will draw on some recent research that has identified the importance of planning, designing and implementing cycling infrastructure correctly, if we want to make the bicycle a healthy and attractive option to potential new users.

KEYNOTE SPEAKER ABSTRACTS

The impact of bike sharing systems on travel behavior: Lessons to be learnt from the largest scheme in the world

Haixiao Pan, Tonji University, China

Hangzhou the capital city of Zhejiang Province has a history spanning more than 2000 years.

With rapid economic development over the past 20 years, the growth in motorisation is beyond what was expected.

To relive urban traffic congestion, it is necessary to promote innovation in encouraging public transport and non-motorised green travel alternatives.

Following the introduction of a second bus rapid transit system in China, the city of Hangzhou established the world's largest public bike system. The system has more than 50,000 bikes and 2000 service stations. The system has strong government support compared to two other models of public bike system in Beijing and Shanghai, with the aim to ensure the city is clean and has convenient urban transport for tourists and local citizens. It is a breakthrough in urban transport policy in China, as the bicycle was often considered in a poor light.

Now the system has spread widely to many cities in China.

Based on a survey of public bike users, travel behaviour change has been analysed.

The results show that promoting bicycle travel can greatly improve urban mobility and somewhat curb the automobile usage, if combined with travel demand management measures.

We stress that promoting bicycle travel needs government support. This includes encouraging collaboration with enterprises for better and efficient technology and services to take full advantage of society's resources.

Cycling infrastructure for Australian cities

Sara Stace, Department of Infrastructure and Transport, Australia

Our Cities, Our Future: a national urban policy for a productive sustainable and liveable future, articulates the role of the Australian Government in facilitating better outcomes in our cities – whether through direct investment, or in partnership with key stakeholders. It includes commitments to incorporate active travel into the Department of Infrastructure and Transport portfolio; to monitor and report on progress toward achieving the national cycling participation target by 2016; to further consider effective active transport action strategies; and to encourage the development of urban areas that promote healthy lifestyles through cycling and walking.

In August this year the Major Cities Unit and Infrastructure Australia co-hosted an intensive two-day workshop to share best practice and experience from around the nation and assist in developing the Commonwealth Government's position on improving active travel in cities.

The *National Cycling Strategy 2011–2016* signed by the Commonwealth, State and Territory Governments set an ambitious target to double the rate of cycling in Australia between 2011 and 2016. The workshop set out to determine what strategic moves we need to make in order to achieve this target, and how to structure best practice cost-benefit analyses for project funding. This presentation by Sara Stace will summarise the outcomes of this work.

GUEST SPEAKER ABSTRACTS

Journey to Yellow

Phil Anderson, Australian Professional Cyclist, Australia

Completed 13 Tour de France events.

Since 1994, the year of my retirement as a professional cyclist I have returned to every Tour de France as a tour operator.

In the early eighties, and before I started to cycle professionally, there was very little information available in Australia about cycling as a sport.

Before embarking on my European campaign, I read Russell Mockridge's book "My World on Wheels". It gave me a little insight to this huge event, but little could really prepare me for my life as a professional cyclist.

I was invited to ride professionally for the Peugeot squad in 1980. In accepting this position I was no longer able to represent my country at the Olympics however the decision was relatively simple.

I worked hard for the Peugeot Team and gained selection for the 1981 Tour de France squad. The Peugeot Team was a French team and my selection was somewhat controversial however my job was clear, to help the newly employed team leader arrive at the mountains in the best shape he could be in to contest the overall outcome of the tour.

Little did I realise that my life was about to dramatically change when 5 days in to the 1981 tour I won the prestigious yellow jersey from the legendary Bernard Hinault.

Cycling history was made as I was the first ever non-European rider to ever wear the Yellow Jersey. An Australian rider on a French team, this was an assault on all the great traditions of this famous race.

Breaking this barrier paved the way for Le Mond, Armstrong and Cadel. Non Europeans who have made history by winning the tour with teams built around them expressly for this purpose.

10 Things the UK has not learnt about cycling

Phillip Darnton, Bicycle Association of Great Britain

Between 2005 and 2011, the UK government invested £165 million exclusively in schemes designed to increase cycling as a key mode of transport for short urban trips. In addition, the Greater London Authority was separately funded to achieve at least 5% of all trips in London by bike by 2025 – both the introduction of the Congestion charge in the central zone, and the launch of a Cycle Hire scheme were part of this initiative.

Despite this considerable focus on "utility" cycling, there are a number of fundamental factors in the UK which stand in the way of a sustained growth in short cycle trips. This presentation will enumerate some of the blockages to the creation of a 'cycling culture', and contrast the attitudes and behaviour of the UK, both corporately and individually, to those which prevail in continental Europe. This presentation will highlight lessons which Britain has not so far learnt about how to create communities in which cycling is not seen as marginal or eccentric behaviour. In so doing, it will illustrate some of the mistakes which need not be repeated in other communities who are seeking to encourage cycling as an attractive and logical alternative to the car for short urban trips.

GUEST SPEAKER ABSTRACTS

Why youth love the boundaries of extreme sport.....there are no boundaries!

Tim Wood, Freestyle BMX Champion, Australia

I have observed and participated in the sport of freestyle BMX for around 30 years and found that this sport while perceived as "anti social" by some has allowed me to express myself, push boundaries and use energy that otherwise may have been diverted to drugs or alcohol.

My talk, in combination with a demonstration, will show that the bicycle is not just a form of transport but can be a lifestyle and a good addiction for our youth. If we support the positive aspects of riding a BMX bike for any young person that may have a need to push limits, we may well save them a lot of pain and possibly their life in future years.

ORAL PRESENTATION ABSTRACTS

01 Planning for Healthy Spaces and Places

Kirsty Kelly, Planning Institute of Australia

Physical inactivity is estimated to cost the Australian community around $10 billion annually in direct health care costs; obesity costs are as high as $5 billion. Common lifestyle choices of increased inactivity and car dependency are significant contributors to chronic diseases, including cardiovascular disease and diabetes. They are also affecting the sustainability of Australian cities and towns, particularly given the relationship between greenhouse gas emissions from motorised transport and climate change.

Research shows that regular physical activity can not only reduce the risk of chronic disease but also improve people's mental health and wellbeing. The way streets, neighbourhoods, towns and cities are planned, designed and built affects the nature of, and the extent to which people can and do use these places.

A unique collaboration has developed between health, local government and planning peak bodies across sectoral interests and broadening spheres of influence, with funding support from the Australian Government Department of Health and Ageing, to prepare national planning guidelines to promote the health benefits from the design and management of places which promote active lifestyles to built environment professionals.

The Healthy Spaces and Places website guides planners on how to incorporate active living principles into the built environment. It aims to draw together not only on planners and related practitioners but also health professionals to address the challenges of the built environment contributing to lifelong healthy living. Decision makers, including elected representatives and senior managers, and communities themselves are also a focus of the project.

02 Delivering cycleways: The challenges of separation and retrofit in the City of Sydney

Adam Fowler, City of Sydney, Australia

The City has recently completed construction of 9km of bi-directional separated cycleways within the City centre and inner city suburbs. This paper will overview the design development of these new facilities.

In 2007, the City set an ambitious target to get more people to choose cycling as a transport choice, more often. A cornerstone of the strategy was the development of a new network of infrastructure to make it safer and easier to cycle. One of the key challenges has been to retrofit separated bike facilities into Sydney's narrow, busy streets, while mitigating the impact of new cycleways on pedestrians and other road users.

The paper will explore the principles and challenges of the adopted bi-directional separated system. Design components and typical configurations will be outlined in detail. A suite of completed projects (total value approx $40m) will be presented to illustrate some common and specific issues, and report the patronage of these newly completed routes.

The City's new approach to footpath marking and conflict management on shared paths will also be outlined. Shared Paths are a secondary part of the infrastructure strategy used by the City to establish a network of priority routes across the Local Government Area.

The paper will conclude with a number of key lessons learnt which are informing the design detail, the delivery process, and the shape of the forward program.

ORAL PRESENTATION ABSTRACTS

03 Urban bikeway design guidance from U.S. cities

Conor Semler, Kittelson & Associates, United States
Jamie Parks, Kittelson & Associates, United States

For a profession that cherishes standards and regulations, American transport engineers have long operated without clear guidance and direction in bikeway planning. Moreover, state highway officials – who are responsible for most of the U.S. design guidance – have not prioritised planning for bicycle facilities. So a collection of about 20 cities recently came together to form the National Association of City Transportation Officials (NACTO) to encourage the exchange of transport ideas, insights, and practices while fostering a collaborative approach to key national transport issues.

NACTO undertook development of the Urban Bikeway Design Guide, which can be found at www.citiesforcycling.org, because many of its members found existing design manuals inadequate for promoting bicycle transport. To create the Guide, officials from NACTO cities and a team of planners and designers conducted an extensive survey of expert knowledge, existing guidelines from countries and cities around the world, and innovative projects in the U.S.

The focus of the guide is street facilities, including cycle tracks or protected bike lanes, which provide more separation between cyclists and motor vehicle traffic. The online Guide includes detailed plan drawings, three-dimension renderings of the designs, and pictures of actual projects from around the country. The NACTO Guide is poised to be adopted by individual cities, counties, or states as either a stand-alone document or as a supplement to other roadway guidance documents.

The authors describe the research and development that went into the Guide's production and its potential to improve bicycle facility design.

04 Providing a good time on the bike: Cycling Australia's participation plan

Alexandra Bright, Cycling Australia, Australia

Cycling Australia (CA) is the peak body for the sport of cycling recognised by the Australian Government (ASC & AIS) and the International Cycling Union (UCI). CA has been the peak competitive body for cycling for 130 years. Traditionally, its role has been solely as a racing organisation, focusing on the provision of road and track racing opportunities for the racing enthusiast through the federation's eight state/territory constituent affiliates and their affiliated clubs. With the announcement in November 2010 of $11 million per annum of funding to national sports organisations in the form of new sport participation funding, CA, in conjunction with its affiliate disciplines, BMX Australia (BMXA) and Mountain Bike Australia (MTBA), has shifted its focus from being a pure racing organisation to one that provides opportunities for the novice rider, to the "weekend warrior" to the elite racing cyclist vying for Olympic glory. The new sport participation funding will allow CA to increase their scope of involvement in cycling to provide and facilitate opportunities for people to participate at all levels of the cycling pathway. The organisation's philosophy of "cycling for all" and providing a good time on the bike is at the forefront of the participation plan. With the appointment of a National Participation Coordinator, a suite of participation strategies will be delivered Australia-wide over the next four years, providing opportunities for everyone to participate in cycling. This presentation focuses on the "cycling for all" philosophy and presents the future directions of Cycling Australia and its affiliates.

ORAL PRESENTATION ABSTRACTS

05 Developing a cycling behavioural change strategy for the City of Sydney

Jonathan Daly, GHD, Ireland
Caitlin Brookes, City of Sydney, Australia

The City of Sydney, like many Australasian cities, faces a number of physical (built and natural) and social challenges in creating a more cycling-friendly city. In 2007 the Council began tackling the physical issues through their ambitious cycling strategy which set a target for 10 per cent of all trips by bicycle by 2016, from a base of less than two per cent. The strategy proposed the development of an AUD80 million network of separated cycleways and shared paths. In 2010, recognising that the plan would mean a significant physical and social change in how the city would be used by its residents, businesses and visitors, the Council developed a behaviour change strategy to complement the cycleways network. In addition to getting more people cycling for all journeys, the strategy also identified programs and initiatives to create a more harmonious relationship between all users of shared space, both on-road and off-road. The result sets strategic direction for cycling behaviour change in the City of Sydney. A total of 12 strategic directions were identified, which will take the form of a range of programs and initiatives to be implemented together with the proposed infrastructure improvements, to create a physically, institutionally and socially supportive environment to foster a culture of cycling in Sydney.

06 Vision to reality: Promoting change for the Sunshine Coast

Peter Duffy, Sunshine Coast Council, Australia

It is anticipated that the Sunshine Coast's population will continue to grow to an estimated population of approximately 500,000 by 2031. Addressing the transport infrastructure needs of a growing population while maintaining the lifestyle values of the Sunshine Coast and achieving Council's goal to become "Australia's most sustainable region - vibrant, green, diverse" is a significant challenge.

Achieving sustainable transport outcomes will be an essential element in meeting this goal and so for the first time on the Sunshine Coast comprehensive parking management, active transport, public transport, roads and freight strategies are planned to be developed, providing the impetus for change. The first of these plans to be adopted is the Active Transport Plan which sets out a comprehensive framework for walking and cycling on the Sunshine Coast. It makes clear that providing sustainable transport networks with safe pathways, footpaths and on-road cycling facilities while supporting pedestrians and cyclists in their choices is key to the vision of sustainability.

Whether you have your own bike, are looking to purchase one, or hire one, the Sunshine Coast is a diverse and exciting region waiting to be explored with an abundance of on and off road bicycle lanes and bush trails. The adventurous can take on the rocky shoreline, coastal lowlands, saltwater lakes and river system or the extensive hinterland trail network which is ideal for long distance cycling or the thrills of off-road mountain biking. Commuters or tourists wanting to take in the scenery at a slower pace are well catered for on the Sunshine Coast. A majority of the major service centres and tourist attractions are located within close proximity to bike paths or cycle lanes.

Cycling has a wide range of benefits; health, financial and environmental, so by cycling to work, to the local shop, to the beach or to University it is making a positive contribution to personal health and the environment.

TravelSmart Sunshine Coast encourages drivers to consider leaving the car at home and to walk, cycle, carpool, ride a scooter or use public transport, and contribute to making the Sunshine Coast Australia's most sustainable region. Promotion of cycling and travel behaviour change are fundamental to achieve a shift in travel demand from a predominant use of the private motor vehicle to greater use of cycling and alternative transport modes.

With the adoption of the Active Transport Plan an integrated approach to transport strategy and planning with cycle promotion and travel behaviour change, Council has taken a major step in achieving its goal with respect to sustainable transport. This paper explores the journey to implement the Active Transport Plan and key aspect of behavioural change and marketing.

ORAL PRESENTATION ABSTRACTS

07 Community engagement - is it as easy as build it and they will come? Or is it a case of build it and they will come shouting, screaming & yelling?

Maria Pavlides, City of Sydney, Australia

Having a vision to build a cycling friendly network that will be well used and loved by your local community is one thing, getting the community on board whilst you design and build your network is another.

Who would have thought the simple act of cycling would upset so many people.

A disengaged and disgruntled community can polarise a vision or project. Clear principles of engagement that are well understood by project teams, politicians and communities can help to ensure that your community's expectations are well managed, and therefore your project is well managed.

This paper will examine the City of Sydney's experiences relating to community consultation during the design, build and ultimate sell of its ambitious 200km cycleway network.

Key community engagement, communication, media and marketing principles will be highlighted in this paper that can help any local community during the implementation of a cycling vision.

08 Are you a cyclist or do you cycle? The language of promoting cycling

Dr Glen Koorey, University of Canterbury, Christchurch, New Zealand

Promoting more cycling in Australasia is still an exercise fraught with much adversity, both from the general public and from decision- and policy-makers. It is therefore crucial that anyone working towards a better cycling environment is careful in how they present their case, lest they end up "scoring an own goal" or furthering existing mis-conceptions.

Some key examples of this include:

- Referring to "cyclists" rather than "people who cycle", the former often conjuring up images of a relatively small bunch of "weird" people who only ever cycle.
- Asking to "provide cycle facilities" rather than "provide for cycling", when many treatments that greatly benefit cyclists often involve no dedicated cycle facilities.
- Publicly highlighting safety problems for cyclists in an attempt to get improvements, when the net effect may be to increase the general perception of cycling as "dangerous".

This presentation will discuss some of the potential pitfalls encountered by the author over the years and try to suggest the best way forward. Other subtle examples of unintended bias against cyclists, often communicated by the media, and public officials/documents, will also be highlighted.

ORAL PRESENTATION ABSTRACTS

09 Active school travel Brisbane City Council

Lea Gamble, Brisbane City Council, Australia
Lyndal Peters, Brisbane City Council, Australia
Stacey Hall, Brisbane City Council, Australia
Maddy Pappas, Brisbane City Council, Australia
Marina Novak, Brisbane City Council, Australia

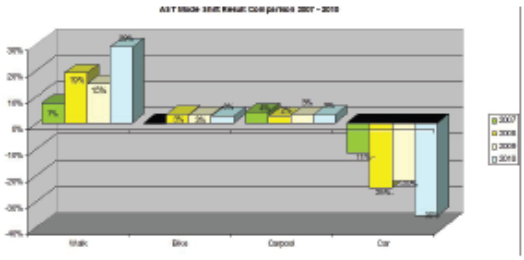
Since 2004 Brisbane City Council (BCC) has been delivering the highly successful Active School Travel (AST) program. To date 96 Brisbane schools have participated in the program and achieved significant behavioural change, improving the health of the children and local road safety. In 2010 walking trips across the 21 participating schools increased 29% and sole family car trips dropped 35%. The results prove that the program is world best-practice.

The AST program reduces traffic congestion by increasing the number of families who walk, cycle, car pool or use public transport for at least some of their journeys to and from school. A diverse suite of initiatives provide families with information, motivation and opportunity to adopt active travel modes.

BCC helps each school develop a School Travel Plan (STP), providing a framework to facilitate behaviour change. It is supported by a number of initiatives including a weekly active travel day - Walking Wheeling Wednesday plus Bike Skills Training, Walking School Buses, Park and Stride, Carpooling and Road Safety Education.

The AST program aims to achieve a target of 10% reduction in sole family car trips. The average changes in individual mode share across all schools participating in the program in 2010 on the journey to school were:

- 35% reduction in sole family car trips (70.6% to 35.2%)
- 29% increase in walking trips (19% to 48%)
- 2% increase in bike trips (4% to 6%)
- 3% increase in carpooling trips from 4% to 7%



10 Brisbane Cycle Network Plan review

Lindsay Enright, Brisbane City Council, Australia
Helen Reilly, Brisbane City Council, Australia

The Brisbane Cycle Network Plan Review is aimed at developing a long term sustainable cycle network plan for Brisbane City to encourage further growth in commuting, business, recreation, and utility cycle trips.

Brisbane City has a population of around one million people and is the economic centre of the South East Queensland Region. The new cycle network plan will be a critical component in supporting growth in cycle trips from around 1% of all trips currently to 5% by 2026.

The project has adopted an evidence based strategic approach to estimating existing and future demands on the network and developing a network conducive to encouraging increased cycle trips by all sectors of the community.

Population, employment and land use planning projections were analysed to identify primary feeder locations (population) and attractor locations (employment, schools, centres, etc) for future cycle trips. Outputs from journey to work data and transport modelling were used to identify opportunistic areas to replace car based trips with cycle trips. A "cycle-ability" assessment of

Brisbane suburbs was undertaken, based on topography, land use, traffic conditions and road/cycle path connectivity, to identify areas conductive to cycling.

The plan adopts an integrated network approach to accommodate both short length local trips and longer length commuting and recreational trips through an integrated network of arterial, district and local cycle links. The new cycle plan will be used to inform land use, transport and economic planning decisions in Brisbane City and to inform future cycle network infrastructure needs.

11 Model Communities – making walking and cycling the easier transport choice

Gerry Dance, New Zealand Transport Agency, New Zealand

The New Zealand Transport Agency (NZTA) announced in June 2010 that two provincial towns will become New Zealand's first walking and cycling model communities. New Plymouth and Hastings will collectively receive funding of $8.8m to help create an environment that will make walking and cycling easy transport choices for people in New Plymouth and Hastings.

Model Communities is a concept based on the UK cycling demonstration towns but in the New Zealand context, that have shown successful results in getting more people cycling. In addition the New Zealand approach is endeavouring to deliver a more holistic integrated planning approach embracing walking, cycling, public transport and other investment and partnering opportunities.

This presentation will outline the process undertaken to select, and recommend these two locations including the evaluation and assessment component. It will then highlight the partnering approach NZTA is taking working closely with New Plymouth and Hastings to progress their approved investment packages of activity. For the next two years we'll also be focussing on learning as much as we can about investing in model communities, so this knowledge can be shared with the many other communities who have shown real enthusiasm about moving in this direction.

12 Evaluation of a mass implementation of green bicycle lanes at high crash intersections in Cairns

Robyn Davies, Department of Transport and Main Roads, Queensland, Australia
Thomas Meldrum, AECOM, Australia

Coloured surface treatments were applied to bicycle lanes at high crash intersections in a mass implementation program in Cairns in 2008, funded under the Safer Roads Sooner Program. An evaluation of the implementation of the treatments was carried out by the Department of Transport and Main Roads to understand whether they affect driver and cyclist behaviour in such a way that it improves cyclist safety.

The evaluation focused on the lateral distance of the motor vehicle to a passing cyclist and the bicycle lane. Further analysis was completed on determining the amount of motor vehicle encroachment in the bicycle lane. An interaction severity table was constructed to gather unique observations and the lane users were observed from traffic camera footage.

A significant increase in the lateral distance between motor vehicles and cyclists, and between motor vehicles and bicycle lanes was observed at a majority of the sites after the installation of the green treatment. At a roundabout, there was a significant reduction in both the total percentage of motor vehicles encroaching on the bike lanes as well as the mean encroachment distance. There was an increase in cycle lane use after the green treatment had been installed. The evaluation provided good evidence to suggest that driver behaviour was affected by the treatments in such a way that may have improved cycling safety. At this stage, there are insufficient years of crash data and bicycle counts available to make any firm conclusions about whether the treatments have reduced cycling crash rates.

ORAL PRESENTATION ABSTRACTS

13 TravelSmart

Adam Rogers, Department of Transport and Main Roads, Queensland, Australia
Judene Wallace, Department of Transport and Main Roads, Queensland, Australia

The TravelSmart presentation outlines Queensland's approach to travel behaviour change. TravelSmart is a Department of Transport and Main Roads initiative that is changing the way people travel.

TravelSmart projects are targeted at schools, workplaces and the wider community to inform and motivate people about travel behaviour change. Queenslanders can save time, money and the environment if they walk, cycle, carpool or use public transport. Raising awareness of cycling, encouraging behaviour change and cycle safety are important elements of TravelSmart projects.

The workplaces project motivates companies to get their employees thinking about their travel behaviour. The project team assists workplaces to develop and implement sustainable travel plans and provides materials including transport kits and information stations used to guide workers to participate in sustainable transport options. Cycle challenges and bicycle maintenance workshops are held in participating workplaces.

The schools project is a fun, hands-on initiative encouraging students to use their imagination and think up new ways to travel smart to and from school. TravelSmart is supporting 35 schools to develop School Travel Plans that offer a range of fun activities including the creation of Park and Walk Maps, Walk to School days, Cycle to School days, class challenges, and bicycle skills sessions. Bicycle education is a key initiative of the project that assists the improvement of cycling skills and helps instil confidence in young riders.

TravelSmart recently completed the delivery of the world's largest travel behaviour change project, targeting over 320 000 households in Brisbane South, Gold Coast, Sunshine Coast and Caboolture encouraging households to make changes to their travel behaviour through individualised journey planning. Key findings will be outlined and the learnings that have been gained will be discussed.

The delivery of the TravelSmart program will increase public awareness and education about the economic, health and environmental benefits of active and sustainable transport options, particularly cycling.

14 Train drivers on bikes, a Trojan for cycling integration

Jim Krynen, Public Transport Authority, Western Australia

In late 2006, the Public Transport Authority (PTA) embarked on a rare cycling integration pilot program for its staff.

The program – Cycling 100 – aims to encourage employees to start cycling to or from work. Under the program, participants are given a free bicycle in return for their commitment to cycle a minimum of 60 kilometres a week for six months. Program participants are required to complete a medical and fitness assessment at the start of the program and compile a travel diary to record their journeys. At the end of the program, cardiovascular and other tests are undertaken to identify the environmental, health and other gains for the staff involved – and for the wider community.

Already, the PTA has:

- progressed new and improved cycling-related policy;
- delivered new public bike parking facilities at metropolitan stations;
- created and implemented community information campaigns to increase the uptake of cycling;
- proven itself as an organisation committed to overcoming barriers to cycling;

- supported and sponsored bicycle-related charity events;
- invested in community bicycle programs; and
- developed and implemented more than 40 independent integration initiatives to improve the links between cycling and public transport.

The Cycling 100 program was a bold step by the organisation to engage a group of its employees that were often detached from, or reluctant to participate in, the organisation's staff programs – its train drivers. Train drivers work under quite different conditions to the majority of the other employees within the PTA.

15 Surfing the net to find cycling Nirvana: How cyclists use online technologies to choose their cycling destinations

Dennis Punlard, University of Canberra, Australia

Cycle tourism is becoming recognised as a significant niche sector of the tourism market. It is a relatively new area of academic research. Much of the research to date both in Australia and overseas has concentrated on recreational cycling, however there is considerable evidence to support a much broader definition of cycle tourism to encompass mountain biking and competitive and challenge events.

This paper will explore the various definitions of cycle tourism in an Australian context and propose a definition based on recent Australian research.

Having proposed a definition of Cycle Tourism the paper will detail some recent research on the size and scope of cycle tourism in the Australian Capital Territory region and will explore how cyclists use modern technology to choose their cycling destinations. The paper explores how cyclists use websites, online maps and especially social networking tools to choose their cycling destinations.

The presentation is largely based on a Ph D being carried out by the author at the University of Canberra, but includes the results of some recent research carried out on behalf of Capital Region Tourism to set the parameters for a cycle tourism strategy for the Region.

16 Sensitivity of commuter cyclists to changes in weather in Victoria and Queensland

Farhana Ahmed, Institute of Transport Studies, Monash University, Australia
Geoff Rose, Institute of Transport Studies, Monash University, Australia
Christian Jakob, School of Mathematical Sciences, Monash University, Australia

This paper aims to enhance understanding of the impact of weather on cyclist travel behaviour specifically in the context of commuter cycling. A literature review is used to highlight not only the methodologies that have been employed in previous studies but also the nature of the insight they have provided into the extent to which weather impacts bicyclist travel behaviour. The empirical component of this paper draws on data from two states which have been active over many years in encouraging the use of the bicycle for transportation. The two states considered are Victoria and Queensland. Ridership counts and weather data are then used to develop an aggregate demand model that provides quantitative insight into the effects of weather on bicyclist volumes. The results indicate that cycling volumes are responsive to changes in different weather parameters. The paper identifies the relevance of this research to the field of transportation policy in general, and bicycle transportation in particular. Important directions for future research are also identified.

ORAL PRESENTATION ABSTRACTS

17 Exploring gender differences in recreational and utility cycling in Queensland

Kristiann Heesch, Queensland University of Technology, Australia
Jan Garrard, Deakin University, Australia
Shannon Sahlqvist, UKCRC Centre for Excellence in Diet and Activity Research (CEDAR), Institute of Public Health, United Kingdom

Objective: Participation in recreational and utility cycling differs substantially between men and women in the USA, UK, and Australia. Our aim was to conduct a detailed examination of gender differences in recreational and utility cycling, using a sample of Australian adult cyclists.

Methods: In an online survey, 1862 members of Bicycle Queensland (aged 18-90 years) reported recreational and utility cycling patterns, trip purposes, and use of, and preferences for, different types of bicycle infrastructure. Gender differences were examined using linear and logistic regression models.

Results: Compared with women, more men cycled for recreation (73% vs 65%; p<0.001) and utility (47% vs 37%; p<0.001) in the previous week, and men cycled more minutes (p<0.001). Among utility cyclists, men took more cycling trips for utility in the last week than women did (p<0.001). More men cycled to work (84% vs 76%; p=0.007), but more women cycled to visit friends (17% vs 10%; p=0.006) or recreational facilities (35% vs 26%; p=0.01). Both men and women achieved high levels of physical activity through either recreational or utility cycling. They differed in their use of, and preferences for, different types of bicycle infrastructure for both utility and recreational trips (p<0.05).

Conclusions: These findings indicate some similarities, but also some important differences, in patterns of recreational and utility cycling in female and male cyclists in Queensland. Recommendations are made for addressing the gender gap, particularly for utility cycling, which has multiple individual and community benefits.

18 All aboard the Bike Bus: An innovative active school travel mode

Elisha McGuiness, Queensland Health, Australia
Ray Plasto, Department of Transport and Main Roads, Queensland, Australia
Mark Allen, Education Queensland, Australia

Overview: The issue of active transport has recently emerged as an environmental, economic and social issue. Working with schools on non curriculum based activities has proved challenging in the past but a unique collaborative partnership across various departments and layers of government in north Queensland has seen the successful completion of a 1 year pilot of a supervised cycle to school program - the Bike Bus.

Methods: After being successfully pioneered at Trinity Beach State School demand for Bike Buses grew and opportunity to strengthen the program with support from Government arose. Health, Education, Transport & Main Roads, Local Government and James Cook University collaborated to develop tools, evaluation and funding opportunities that would support schools across Queensland to establish their own Bike Buses with consideration for route infrastructure, volunteer and risk management, marketing and evaluation.

Results: A generic Bike Bus resource that can be adapted to local school context and needs is due to be web launched in May 2011. 5 schools have consistently maintained their commitment to their Bike Buses throughout 2010 (some schools with up to 90 riders each day) and intend to into the future. Up to 9 more schools in the region are requesting support to establish their own Bike Buses.

Conclusion: Schools are unique environments in their own right. Bike Bus is able to contribute to sustained behaviour change related directly to school travel choices whilst providing complimentary outcomes in the areas of education, health, environment, safety and community in one unique and fun strategy.

ORAL PRESENTATION ABSTRACTS

19 What could increased cycling contribute to reducing Australia's transport greenhouse gas emissions?

Leigh Glover, GAMUT, Australia

Cycling's potential in environmentally sustainable transport receives modest recognition in many state and local government climate change policies; however, it currently performs only a minor transport role. Compared to international locations exhibiting best practices, it has often been regarded that Australian cities cannot aspire to high cycling rates. Contrasting with consistently low citywide cycling rates, selected inner-city locations in Australia have relatively higher cycling rates. Setting public policy to encourage greater Australian cycling rates and emulating the international best practice locations involves the issue of the extent to which the conditions associated with success can be created. This paper examines the question of identifying the potential of cycling in Australian cities to reduce greenhouse gas (GHG) emissions from the transport sector. There are several steps to this analysis, starting with a description of transport sector GHG emissions and current cycling rates. A review of current climate change and cycling policies, federally and by the states and territories, describes the aspirations of current policies. Selected best international practice locations for high cycling rates are examined and comparisons drawn against Australian cycling rates. An analysis is made of the potential GHG emissions reduction at a nominal target year of 2030. A discussion canvasses several key issues and conclusions are drawn that Australian climate change policy makers have neglected the potential GHG savings from investment and policy development in cycling for transport.

20 Make it *feel* safe and they will come: addressing the actual and perceived risks of cycling

Jan Garrard, Deakin University, Australia

Traffic safety concerns are a major constraint on cycling in Australia. Risk perception and risk communication research indicates that people's risk perceptions may be as important as actual risks in shaping behaviour. The relative contribution of risk perceptions and actual risk to what has been termed 'fear of cycling' in car-oriented countries like Australia is unknown, but both are likely to be important.

This paper proposes that the concept of traffic risk as a barrier to cycling might best be viewed as a 'risk iceberg', with a small number of fatalities at the tip, followed by broadening layers of serious injuries, minor injuries, near misses, harassment, and general disregard on the part of drivers for the safety of cyclists. In terms of risk assessment, which is often conceptualised as the product of potential harm and probability of occurrence, a large number of low-harm incidents can also contribute to substantially heightened risk concerns. Consequently, experiences and perceptions towards the base of the 'risk iceberg' may shape cycling behaviour as much as, or possibly more than, the relatively infrequent fatalities and serious injuries that form the tip of the iceberg.

Addressing traffic safety concerns as a means of increasing cycling participation must therefore include measures that make people feel safe, in addition to measures that reduce the risk of injury.

ORAL PRESENTATION ABSTRACTS

21 AustCycle – national expansion

Gareth Watkins, AustCycle, Australia

What is AustCycle?

AustCycle is Australia's only national cycling accreditation program which provides education and training to community members to encourage them to get on their bikes and ride. Whether for commuting purposes, for leisure or travel, AustCycle trains people of all ages and backgrounds with the skills and confidence required to ride further, more often, more confidently and more safely, resulting in healthier, happier Australians and a safer, cleaner environment.

There is a significant need for cycling education and training in the broader community.

With the benefits of cycling including

- Reduced congestion
- Lowers environmental footprint
- Health and Fitness – 61% adults are overweight or obese
- Affordability
- Social inclusion
- Extended access when used with other transport
- Community safety - more riders increase awareness, tolerance and acceptance of riders
- Teaching bikes skills reduces collisions and misadventures

The Australian Government has recently granted AustCycle $1 million over a three year period to roll out the AustCycle program as part of their Healthy Communities Initiative (HCI). The HCI program aims to reduce the prevalence of obesity in Australia by maximising the number of at-risk individuals engaged in healthy lifestyle programs.

Bike riding has skills that develop through practice, experience and repetition. Just because you learnt to ride by balancing and pedalling doesn't necessarily mean you learnt the skills to emergency brake, manoeuvre/corner or slow ride.

AustCycle plays an important role in fostering confidence and enthusiasm to start or restart someones cycling journey. Our presentation will focus on our progress so far with the HCI program.

22 Women on wheels - learning from the learners

Debra Mayrhofer, Edith Cowan University, Australia
Joanne Burgess, City of Stirling, Australia

The gender disparity in cycling participation in Australia has been an ongoing issue for both researchers and policy makers for many years. Although the motivators, supports and constraints which influence women's participation have been explored in other studies, this has been done in the context of encouraging lapsed or novice riders to widen their cycling experience. This paper examines these issues and the subsequent practical and communicative strategies used for implementing a cycle skills program for adult female learners in Western Australia. The Women on Wheels (WOW) program began in 2006 to encourage women to ride to work. However in subsequent years it changed focus as the demand for learn to ride programs from women increased.

The WOW program is now run by the City of Stirling and has attracted a culturally diverse cohort of more than 100 women, with 15 different cultural groups represented so far, but most surprising for the researchers has been the age of the participants, with the

majority of absolute beginners being over 50 years of age. Initial post-program evaluations of participants showed a low take up of regular cycling following the program, and as a result, WOW now includes other components, including Wheelie Wonderful Women, a social riding group; and Wenches with Wrenches, a series of women's bike maintenance workshops. One on one interviews were triangulated with pre-and post-program surveys in this case study to determine the priority of various motivators and barriers for mature learners and to use them to inform pedagogic practices.

23 The politics of cycling – how government and community can work together

The Hon Rachel Nolan MP, Minister for Finance and The Arts, Queensland, Australia

Making cycling happen requires a fundamental change in how governments make plans and decisions.

With only 1.5% of people across Australia cycling regularly to work it's unlikely that the people planning your roads, lobbying for change or making the decisions around your cabinet table will be converts themselves.

Without a push, decisions can be made without safe cycling being even considered.

In the last year that I was Transport Minister the Queensland Government spent $100m on cycling – far more than any other government in the country and enough to promote riding and make meaningful improvements to infrastructure across the state.

So how does that happen?

Of course, a lot of it was on track before I occupied the chair but in a short time we found it was possible to form a meaningful cycling coalition.

- We implemented a policy to build a bike track alongside any new or significantly upgraded public highway.
- We changed the rules for council funding so they had to build proper transport links with their cycling money not just footpaths in circles around parks.
- We backed the existing cycling groups and their events.
- We established a State Bicycle Council so the pressure and the ideas are entrenched in government should the current public service and political leadership move on.
- We even initiated this Congress.

Critically though, we kept cycling on the agenda – with key people meeting about it, trusting one another and coming up with new ideas all the time.

That's what I believe is critical – collaboration and positive energy.

Getting more people cycling more often is creating social change. Like any social change it's hard but cyclists are energetic people with a compelling case.

By creating a coalition enormous change can be made and the broader community can be much better off as a result.

ORAL PRESENTATION ABSTRACTS

24 My other bike is a car - the story of local transport planning

Alton Twine, Gold Coast City Council, Australia

How much of local transport planning is about the bike? How much should it be about?

These are issues faced by many transport planning professions, particularly those engaged in developing and planning for active transport in our cities.

Using a number of examples from Australia and overseas, Alton Twine (Manager, City Transport, Gold Coast City Council) will examine the role of cycling in local transport planning and pose a number of potentially confronting questions for critical examination by the audience.

An overview will be presented on the current development of the Gold Gold Coast City Council Transport Strategy, looking particularly at the potential for active modes, which places the topic of this presentation into a real-world context.

For example: the current Gold Coast City Transport Plan was developed in 1998 and targets a cycling mode share of 6% by 2011. Based on ABS data from 2006, the current cycling mode share is 1.3%. The Gold Coast is by no means alone in this mis-match between targeted and actual cycling rates.

So, what has gone wrong?

Is my other bike really a car or can we turn this around?

25 The economics of investment in cycling for Queensland

Elliot Fishman, Centre for Accident Research and Road Safety, Australia
Jan Garrard, Deakin University, Australia
Todd Litman, Victoria Transport Policy Institute, Canada
Ian Ker, CATALYST Consulting, Australia
Chris Rissel, University of Queensland, Australia

Benefit cost analysis is a key component of the decision making process for transport infrastructure investment. Government has become increasingly familiar with developing benefit cost ratios for conventional, motorised transport investment, but for walking and cycling, it is largely an experimental field.

Awareness within government and the general community is growing regarding the benefits of cycling. Insufficient knowledge prevents these benefits from being translated into the conventional benefit cost analysis framework.

Queensland Health, aware of the above limitations, commissioned research into assessing the cost and benefits of greater levels of walking and cycling for Queensland. Relying on the latest national and international data, as well as consultation with key members of the Queensland public sector, this report is Queensland's latest assessment of the economics of active transport investment.

This paper provides a comprehensive analysis of the latest literature evaluating the economic impacts of active transport programs and projects. It provides a critical analysis of the models and tools used to assess the costs and benefits of active transport interventions.

Key values are provided for a wide range of impacts associated with active transport, such as congestion, greenhouse gas emissions and health benefits of cycling as well as the costs associated with programs aimed at increasing bicycle modal share. It offers recommendations to create robust methods of integrating the latest information to better assess active transport proposals from a cost benefit perspective.

ORAL PRESENTATION ABSTRACTS

26 Capacity and conflict on shared use paths: How many is too many?

Michael Langdon, Department of Transport and Main Roads, Queensland, Australia
Cameron Munro, Sinclair Knight Merz, Australia

Off-road paths shared between cyclists and pedestrians are common across many Australian cities. Most were built to serve primarily recreational roles for visitors and residents. However, the increasing popularity of cycling for commuting, as well as the attractiveness of many paths as feeder routes into city centres, has exacerbated perceived and actual safety concerns between users. These safety concerns, in addition to Government policies encouraging cycling, lead to a need to better understand the capacity and frequency of conflict on shared use paths.

In this study a model has been developed that predicts the frequency of encounters between path users. By defining thresholds for the frequency of these encounters which are acceptable, in much the same way as levels of service are derived on roadways, the capacity of paths can be determined. This information in turn provides guidance to the path designer in determining an appropriate path width and whether users (cyclists and pedestrians) should be segregated. This paper describes the model theory and limitations, results of validations undertaken in Brisbane and Melbourne and the implications for path design and conflict management.

27 What shoppers want – the reallocation of road space

Shane Turner, Beca Infrastructure, New Zealand
Tracy Allatt, Beca Infrastructure, New Zealand
Lorien Tarjomis, New Zealand

Retailers often object to road space reallocation projects as they will negatively impact on local businesses, primarily as a result of loss of parking. The reason parking is considered vital is that local business owners often overestimate the importance of the car based business and underestimate the value of cyclists and pedestrians.

International studies have shown that cycling and walking are important to the local economy and car access is not the primary concern of shoppers. However, only local evidence on the economic and social benefits of providing for pedestrians, cyclists and public transport will convince retailers of the benefits.

A New Zealand based research study collected data from New Zealand shopping centres located on minor arterial roads or in central cities to identify how local shopping centres are currently used, to understand the economic impact of different transport users in their local areas and what factors are important in choosing to shop in local areas for shoppers and retailers.

The economic data that shows sustainable transport users contribute at least a third of the total spend in the local shopping centres and some retailers understand that people do walk and cycle to the shopping centre. The key finding is that retailers and shoppers have different priorities, retailers consider parking is the primary concern, whereas, shoppers consider the type of shop available in shopping centres to be vital. High quality urban design and provision for sustainable transport were also identified as important by shoppers and retailers.

ORAL PRESENTATION ABSTRACTS

28 Supporting cycling to reduce greenhouse gas emissions

Athol Moore, Parsons Brinckerhoff, Australia

Over the past 60 years most of the western world has followed an unsustainable transport path that is dominated by the private car. If the whole world followed this example the consequences would be disastrous. The United Nations Environmental Program (UNEP) recently launched a guidebook for reducing transport-related greenhouse gas emissions for countries in Asia, Africa, Latin America and Eastern Europe to assist in achieving a more sustainable transport future. The guidebook has a two pronged approach: moderating the demand for motorised transport; and reducing the energy intensity of motorised transport. Facilitation of cycle travel is an important element of moderating demand. This paper is based on my research undertaken to develop the cycling section of the guidebook and my experience facilitating the growth in cycling in impoverished South African rural communities.

The paper provides an overview of the environmental and broader benefits of cycling, including some international examples thereof. The benefits identified include economic, social and environmental benefits. Measures that have proved successful in supporting cycling worldwide are identified, with some examples provided. The purpose of the measures is to: provide safe cycling routes; ensure appropriate land use, development planning and regulation; make bicycles more affordable; enable access to servicing and parts; increase bicycle security; and raise the status of cycling.

29 The effect on frequency of cycling if mandatory bicycle helmet legislation was repealed in Sydney, Australia: A cross sectional survey

Chris Rissel, University of Sydney, Australia
Li Ming Wen, University of Sydney, Australia

Background: Australia has national, state and city targets to increase levels of cycling. The possible effect of repealing mandatory bicycle helmet legislation on the frequency of cycling in Sydney is examined.

Methods: A cross sectional survey by a market research company was conducted in Sydney, Australia. Participants were 600 residents 16 years and older. Data was collected in October 2010 using computer assisted telephone interviews from randomly sampled households, with one respondent per household. The primary outcome measures were propensity to cycle more if a helmet was not required, and how often a respondent who cycled would cycle without a helmet.

Results: One in five (22.6%, 95% CI 18.8-26.4%) respondents said they would cycle more if they did not have to wear a helmet, particularly occasional cyclists (40.4% of those who had cycled in the past week and 33.1% of those who had cycled in the past month). Among those who had not cycled in the past year (representing more than half the sample) 18.9% said they would cycle more if they did not have to wear a helmet. Almost half (47.6%) of respondents said they would never ride without a helmet, 14.4% said "all the time", and 30.4% said "some of the time".

Conclusion: If only half of the 22.6% of respondents who said they would cycle more if they did not have to wear a helmet did ride more, all local, state and national targets for increasing cycling would be achieved by repealing mandatory bicycle helmet legislation.

30 Interactions between pedestrians and cyclists in the city centre

Narelle Haworth, Centre for Accident Research and Road Safety, Australia
Amy Schramm, Centre for Accident Research and Road Safety, Australia

The city centre (CBD) represents a complex environment for cycling with large volumes of pedestrians and motorised vehicles and frequent signalised intersections. Much of the previous literature has focused on cyclist-motor vehicle interactions because of

the safety implications for cyclists, but there is increasing concern from pedestrians about the threats they perceive from cyclists. In the absence of objective data, this has the potential to lead to restrictions on cyclist access and behaviour. This presentation reports the development of a method to study the extent of cycling in the CBD and the frequency and nature of interactions between cyclists and pedestrians. This method was applied in Brisbane in 2010 to gather data on cycling before the introduction of a bicycle hire scheme. Queensland is one of the few Australian jurisdictions that permits adults to cycle on the footpath, even when not accompanying a child and this was examined. 1992 cyclists were observed at six locations in the Brisbane CBD, during 7-9am, 9-11am, 2-4pm and 4-6pm on four days in October 2010. The majority (85.5%) of cyclists were male, and 21.8% rode on the footpath. Females were more likely to travel on the footpath than males. One or more pedestrians were within 1m for 18.1% of observed cyclists, and one or more pedestrians were within 5m for 39.1% of observed cyclists. There were few conflicts, defined as an occasion where if no one took evasive action a collision would occur, between cyclists and pedestrians or vehicles (1.1% and 0.6% respectively).

31 Australian universities and cycling: Travel demand management and planning for cycling at Griffith University

Matthew Burke, Urban Research Program, Griffith University, Australia
Neil Sipe, Urban Research Program, Griffith University, Australia
Stephen Horton, Urban Research Program, Griffith University, Australia

Universities are often well-suited to cycling. However mode shares for cycling at Australian universities are often very low, with many suburban campuses being automobile-dominated. Griffith University has changed its focus in recent years, beginning to adopt travel demand management and attempting to attract more staff and students onto public transport, walking and cycling. This paper reports on the university's efforts, research that has been conducted to support these initiatives, a new initiative with Brisbane City Council, and the challenges that exist. Cycling is well supported by the university, with new end-of-trip facilities emerging at the Nathan campus and further improvements planned. Path improvements have assisted at the Brisbane campuses, and the South Bank campus is now supported by Brisbane's public bicycle hire scheme. Students in urban and environmental planning programs are assisting by collecting data, including bicycle counts at the Gold Coast and Brisbane campuses. Bicycle advocacy has also strengthened, especially at the Nathan campus where a formal bicycle user group has formed. However, plots of staff and student residential locations for the Nathan and Gold Coast campuses show strong spatial dispersion of staff and students across the urban areas, placing many beyond easy cycling distance. And there are challenges in the topography of the Nathan and Mount Gravatt campuses, network development in Brisbane and the Gold Coast, in providing improved end-of-trip facilities, and in the residential location decisions being made by incoming students.

32 Tour de data - an evidence based journey of cycling opportunities and challenges in Queensland

Kellie Doonan, Department of Transport and Main Roads, Queensland, Australia

People across Queensland are seeing the benefits of cycling as part of their travel options. With an estimated 160 000 to 170 000 cycle trips across Queensland each weekday (2009), a large increases in work-related cycle travel, and increased recognition of the need for sustainable transport modes, the demand for cycling solutions has never been higher.

The Department of Transport and Main Roads encourages active transport, including cycling, as part of an integrated land use and multi-modal transport system for Queensland. This presentation provides an evidence based overview of the opportunities and challenges for cycling in Queensland, the department's response to achieve 'more cycling, more often' and how recent programs and investments are working toward this goal.

ORAL PRESENTATION ABSTRACTS

33 Environmental and use impacts to mountain bike trails in South Australia and Queensland

Stu Clement, Stuart Clement Solutions, Australia

In recent years considerable effort has been made here in Australia to adopt building techniques that make recreational trails for walking, mountain biking and horse riding more durable and have less impact on their surrounds than most of the trails built in earlier times. The guidelines for such construction are published by the International Mountain Bicycling Association (IMBA). Trail builders in Australia have been encouraged to adopt the guidelines through the efforts of Mountain Bike Australia (MTBA) and its subsidiary IMBA-Australia (IMBA-Au).

How "sustainable" are these mountain bike trails? Several previous studies in Australia, New Zealand, England and the United States have produced results that rely on a single measurement of a trail transect profile and an assumption of where the trail surface lay when the trail was built. This paper reports on three studies over twelve-month periods of three single tracks built to the IMBA guidelines: two are in South Australia and one is in Brisbane. For each of the trails two parameters were recorded once every three months at twenty randomly-placed transect points. The parameters are (1) the transect profile and (2) the used tread width. The great majority of users on all three trails are mountain bikers with the rest being walkers. Additionally, the number of users for each trail was gathered and the rainfall at the nearest Bureau of Meteorology site was recorded. From these data the amount of wear is estimated under the recorded conditions of use and rainfall.

The trail in the Brisbane study was subject to use of 31 passes per day and 1,135mm of rain over the study year and the SA trails experienced just under 700mm of rain each and 12 and 30 passes per day. Of the 60 transects in all three studies, 34 showed no change in transect profile, 18 minimal, 4 noticeable and 4 considerable or substantial. All of these last four deviated to some extent from the guidelines but at only one was there evidence of gouging, deep wheel ruts or channels caused by erosion or use. Some of the used tread widths at the transects narrowed and some widened but none of the sixty exhibited tread creep to outside the edges of the trails as built.

While continual maintenance of trails is always required, maintenance is likely to be required more often in those parts of trails that deviate too far from the IMBA guidelines while trail sections built within the guidelines will consume much less of the trail maintenance budget.

34 Infrastructure speed dating: Solving problems for riders so that they will solve yours

Harry Barber, Bicycle Network Victoria, Australia

Governments face a number of substantial problems including inactivity and traffic congestion. High up the problem list is the significant cost of the traditional responses to these problems such as swimming pools and new roads. Today each level of government is interested in capturing the benefits that arise from increased riding levels and seeks to invest in cost effective, practical and quick to implement bicycle infrastructure.

But how do you know that the intervention you plan will deliver the benefit that you seek? What problems are the different types of riders trying to solve? Which infrastructure will trigger increased usage and by whom?

This session offers some 'thinking tools' to help investors ensure that there is a direct connection between the fundamental problems they are trying to solve and the bike riding solutions that they provide.

ORAL PRESENTATION ABSTRACTS

35 Signing cycle networks: New trends in active transport wayfinding

Warren Salomon, Sustainable Transport Consultants, Australia

Cycle network signage, particularly directional and wayfinding signage, is a crucial aid to navigation and the safe operation of a bicycle transport system. Providing high quality direction signage for cycle routes benefits the community because it expands use of the cycle network by providing cohesion and legitimacy, it increases the visibility of routes designed to make cycling more accessible and it guides local people and those from further afield to significant destinations within the network.

During the past decade Warren Salomon has studied the field both locally and internationally. During that time he has undertaken major signing projects for Australian local and state governments, including the Queensland Cycle Network Directional Signage Guidelines, City of Sydney Cycle Network Signage Strategy and a recreational path signage system for Parramatta council.

In this paper and accompanying visual presentation Warren will cover the key issues for effective cycle route signing. His presentation will be illustrated with numerous examples of wayfinding signs and systems for cycling and will describe an effective and cost effective strategy for increasing cycling through the implementation of improved cycle network wayfinding systems.

36 Measuring cycling in the community: Survey challenges and solutions

Cameron Munro, Sinclair Knight Merz, Australia

Measuring the level of cycling in the Australian population is a key component of measuring the success of local and population-level interventions to encourage cycling. This may be measured as cycling participation (i.e. how many people are riding over a given timeframe) or as travel (i.e. how many bicycle trips are made, over what distance and/or for what time). However, the relatively low levels of cycling across the Australian community present significant methodological challenges to obtaining an accurate estimate of cycling participation.

This paper will demonstrate two survey methods that have been recently implemented in Australia to measure both cycling participation and travel. Both survey activities provide information on cycling activity in Australia that has not previously been available. However, the focus of this paper will be on the methods used to obtain such survey data in a cost effective manner. Specifically, the use of combined mode telephone and online) surveys and interview techniques that improve the response rates will be discussed. It is anticipated that these methods would be useful to other practitioners considering repeat surveys of this type over time, or for local area surveys which could then be compared with the state or national-level data. The intent is for the methods to be readily implementable across jurisdictions in a cost effective manner using a consistent survey instrument and methodology.

37 Waking the giant: An Australian case study in national active travel advocacy

Stephen Hodge, The Cycling Promotion Fund, Australia
Rohan Greenland, The National Heart Foundation of Australia

A multi-dimensional advocacy campaign for Active Travel will be showcased. Conducted by the Australian bicycle industry's Cycling Promotion Fund, the Heart Foundation, Australian Local Government Association and the bus and rail transport industry groups (Bus Industry Confederation and Australasian Railways Association), the presentation will illustrate the broad scope of activities undertaken with the objective of getting active travel - cycling, walking and public transport - firmly on the national agenda.

Active travel has traditionally been seen as a local & state/territory responsibility, not a national one. Yet the national government has the capacity to supercharge the commuter revolution that is underway in Australian cities and towns.

Specifically, some of the activities the campaign has undertaken and which will be discussed are:

- Appropriate active travel policies
- Joint events and lobbying activities through the formation of a Vision for Active Transport group
- Responses to major government inquiries and discussion papers
- Advocacy for and promotion of robust benefits of cycling and walking infrastructure
- Advocacy for and promotion of robust benefits of integration of active modes with public transport.

38 Three models of public bike system in China and its impact on travel behaviour

Haixiao Pan, Department of Urban Planning, Tongji University, China
Yang Tang, Department of Urban Planning, Tongji University, China

To relive urban traffic congestion, it is necessary to promote non-motorized green travel alternatives. Focusing on three different bicycle transportation development systems in Beijing, Hangzhou and Shanghai, this paper discusses characteristics of three systems and their improvements.

A questionnaire survey of public bicycle system users was conducted in each city. Based on the survey data, the paper first identifies the key differences among the three systems – for example the system in Hangzhou has a strong emphasis on serving the large number of tourists, whereas the systems in Beijing and Shanghai are more oriented to commuters.

Comparisons are made in terms of services, facilities, users and operation management. The paper then discusses the impacts on travel behaviour in each city. It explains the reasons for the customers' preference of the bike-sharing system, and estimates the effect of substituting bicycles for other travel modes.

The paper points out that promoting bicycle travel can greatly improve urban transportation systems and somewhat curb the usage of automobiles. We also stress that promoting bicycle travel needs government support that includes encouraging collaboration with enterprises for better and efficient technology and services in order to take full advantage of the society resources.

39 The impacts of public bicycle share schemes on transport choice

Elliot Fishman, Centre for Accident Research and Road Safety, Australia

The objective of this paper is to assess a variety of public bicycle share schemes in terms of their impact on transport patterns. By analysing data on current usage rates, average trip length and purpose, this paper investigates the contribution public bicycle schemes make to the transport system. This includes an analysis of the public bicycles' ability to act as a feeder mode for public transport. Australian and European schemes are included in the analysis, using the latest available information. Results illustrate average trip duration of less than 30min, with distances under 4km per trip. Positioning of bicycle parking 'pods' are an essential determinant of usage and distance travelled. Key recommendations are provided to maximise the contribution bicycle share schemes have on the wider transport system.

POSTER PRESENTATION ABSTRACTS

40 Enhancing customer-experience through Regional Cycling Consultative Forums

Pranish Rai, Roads and Traffic Authority, New South Wales, Australia
Matt Faber, Roads and Traffic Authority, New South Wales, Australia

In recent times, there has been a great onus on New South Wales (NSW) government agencies to lead from the front with a customer-centric focus in the delivery of their services. Stakeholders have also grown to expect that NSW government agencies will take into consideration the needs and requirements of the community at large when delivering road networks and projects. As a result, customer service is currently a high priority item within the NSW government road and transport sector vision. While, community consultative procedures in road and network development have largely been a part of both NSW Government and Road's and Traffic Authority (RTA) business processes, stakeholder consultation on cycling infrastructure and services, in particular, has tended to receive lowered importance.

The NSW RTA has recently led an initiative as both an enabler and a participant, in establishing a formal communication channel across NSW government agencies, cycling stakeholders and the broader community. The focus has been on how best to improve the customer service culture, and research new and innovative techniques to connect with people and communities. This has included the formation of Regional Cycling Consultative Forums (RCCFs) across both regional and metro NSW areas, to engage with a whole of government delivery of cycling services and infrastructure. The new RCCFs provide an avenue for a vast array of cycling stakeholders and community members, local council representatives, Bicycle User Groups, medical practitioners, NSW Police Force, Department of Planning NSW, NSW Health, Department of Education, Tourism NSW, and Environment NSW to participate in an open forum, ask questions and obtain feedback on matters of cycling interest.

With a total of four whole-day cycling forums across NSW having been arranged to date, feedback received from user-surveys of forum participants have emphasised the significance of the consultation process in enhancing their customer experience. The forums have also provided useful cycling knowledge, resources, discussion topics of local issues, as well as action items, in line with the next community consultation meeting. The RCCF process is an evolving one, and a web-based portal on www.bicycleinfo.nsw.gov.au is also underway providing forum participants with access to all forum resources, local cycling news, as well as key regional contact information.

41 Safer cycling environments - planning for the future, learning from the past

Shane Turner, Beca Infrastructure, New Zealand
Tracy Allatt, Beca Infrastructure, New Zealand
Rohit Singh, Beca Infrastructure, New Zealand
Tim Hughes, New Zealand Transport Agency, New Zealand

Cycling is integral to the planning of our future networks to help reduce congestion, improve physical activity and provide more travel choice. However, the key barriers to encouraging more cycling are still: the risk of being involved in crashes; on-road cycle safety; and perceived danger.

For cycle planners, many questions still remain. Are on-road cycle lanes actually safer for cyclists? Do bike boxes and Advanced Stop Lines really create a safer environment? Are we designing "an inherently safe system"?

Historically, the actual safety of the cycling environment has been difficult to catalogue due to the declining number of people cycling and relatively small proportion of cycle crashes on our roads. To tackle this problem, several New Zealand and Australian research projects have recently been conducted which used crash data to produce crash prediction models for cyclists and pedestrians.

Based on the outcomes of this research, this paper will present an evidence based approach addressing some of the key questions practitioners and users face when designing the cycling network of the future. Following the cycle design hierarchy principles, the paper provides some evidence on the impact of reducing traffic speeds and volumes on cycle safety. Other key aspects such as; cycle lane width, shoulder width, the effect of flush medians on cycle safety; and the importance of colour will be explored.

POSTER PRESENTATION ABSTRACTS

42 Evaluation of narrow traffic lanes on cyclist safety: Gold Coast, Queensland

Robyn Davies, Department of Transport and Main Roads, Queensland, Australia
Thomas Meldrum, AECOM, Australia

Gold Coast City Council (GCCC) installed narrow traffic lanes and marked a road shoulder for bicycles on the Gold Coast Bridge (also known locally as the Sundale Bridge) on the Gold Coast Highway in July 2008. The original outside traffic lane in each direction was reduced from 4.3m to 3.2m to fit the new 1.1m marked shoulders onto the existing carriageway. As part of the installation, GCCC engaged Transport and Main Roads to conduct a formal evaluation of the safety performance of the works via studying the effects on driver and cyclist behaviour of the new lane configuration. The study used video footage, speed data and bicycle counts before and after the new lane configuration.

The introduction of the narrower traffic lanes on the Gold Coast Bridge appears to have resulted in a small reduction in traffic speeds. The narrowing of the traffic lanes and the introduction of a shoulder/cycle lane reduced the lateral distance of the motorists as they passed the cyclist. However the amount of encroachment in the adjacent lane also reduced, indicating that lane discipline improved and driver behaviour became less sporadic. In addition, motorists travelled on average further out from the bridge railing, significantly reducing the chance of a cyclist being rear-ended and effectively allowing more room for cyclists to ride. Results from this evaluation indicate that cyclist safety may have increased by reducing the width of traffic lanes across the Gold Coast Bridge.

43 Linking cycling growth with infrastructure: inner Brisbane's experience

Mark Dorney, Department of Transport and Main Roads, Queensland, Australia

The poster shows maps from 1986 to 2006 based on data collected as part of the five yearly Census by the Australian Bureau of Statistics. The data is drawn from the questions relating to place of employment, and the method of transport used to get to work.

The maps are thematically shaded to show the percentage of people riding a bike to their workplace in the Central Business District of Brisbane and immediately surrounding suburbs as a proportion of all travel to work. Overlain are changes in bicycle infrastructure over that period.

The analysis shows clear and strong links between infrastructure and increased bicycle mode share. The analysis also shows the importance of quiet access routes to the bicycle facility and the significant gains that can be achieved through the completion of important "missing links".

An investigation into this increase and how it relates to the development of major cycling infrastructure over the period may provide insights into increasing cycle mode share in other areas.

POSTER PRESENTATION ABSTRACTS

44 Using geographic information systems (GIS) for cycleway planning to everyday use

Peter Duffy, Sunshine Coast Council, Australia

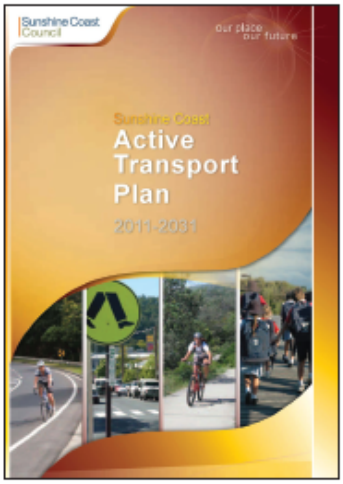
Geographic information systems (GIS) are moving from a 'nice to have' extra in cycle infrastructure planning to an essential part of the planning and operation of cycle programs.

The Sunshine Coast Council has used GIS in developing the Sunshine Coast Active Transport Plan 2011-2031 and in implementing a number of the adopted actions. The Plan required the amalgamation of data of varying quality and content from the three previous Sunshine Coast councils to create a comprehensive and consolidated dataset of off-road pathways and on-road facilities. GIS is leveraging this data to add increasing value to many other activities. The strategic planning of the cycle network relies heavily on spatial information as does the prioritisation of future capital and operational works programs. Asset management and the new planning scheme are other areas that benefit. Being able to display information geographically also helps to communicate council's plans for cycling to the community and is even helping cyclists plan trips online.

This presentation will show how the Sunshine Coast Council has turned basic cycle data into rich value added information that is supporting a rapid growth in cycling.

45 Sunshine Coast Active Transport Plan 2011-2031

Peter Duffy, Sunshine Coast Council, Australia



The Sunshine Coast Active Transport Plan 2010-2031 sets out a comprehensive framework for walking and cycling on the Sunshine Coast. The Plan makes it clear that providing sustainable transport networks with safe pathways, footpaths and on-road cycling facilities while supporting pedestrians and cyclists in their choices is key to our vision of sustainability.

The policies and actions in the Plan make planning for active transport current, consistent and coordinated. Actions are tailored for the Sunshine Coast with a focus on connecting communities to centres, public transport and schools.

There is a new focus and priority on walking, cycling and public transport above personal vehicle use, through planning, development and urban design. The Plan details the important supporting services and infrastructure such as end-of-trip facilities and safe, continuous and direct walking and cycling networks connecting people to where they want to go.

The safety of our residents as they travel is a high priority. Improving road safety and infrastructure will be combined with programs that develop skills and awareness for all road users. Information, education and encouragement will make cycling and walking real transport options and see the cycling and walking culture flourish on the Sunshine Coast.

POSTER PRESENTATION ABSTRACTS

46 Innovation in Local Government active transport planning and delivery

Peter Duffy, Sunshine Coast Council, Australia

The existing extent and type of hard and soft cycling infrastructure is producing participation levels significantly below those targeted. What innovative methods of planning, delivery and promotion are available to local governments within the usual budget constraints?

As well as looking at best practice both within Australia and overseas, there is also room for new affordable approaches using developing technology. Options can range from GIS software, graphic design, smart phone apps and even social media.

What are some of the options?

47 Why do people ride on the footpath?

Narelle Haworth, Centre for Accident Research and Road Safety, Australia
Amy Schramm, Centre for Accident Research and Road Safety, Australia

An internet survey of more than 2,500 Queensland adult cyclists found that more than a third of respondents reported riding on the footpath, a practice which is legal in Queensland but not in most other Australian States and Territories (unless accompanying a child 12 years of age or younger). About two-thirds of the footpath cyclists reported that they did so reluctantly. This paper begins with a description of the characteristics of those who ride on the footpath and their trips. It then goes on to examine whether perceived skill levels, perceived danger of riding on the road and past injury experience as well as demographic factors predict how much or whether people will ride on the footpath (and whether this is by choice or reluctantly). It also identifies factors that would discourage people from riding on the footpath, such as having a road bike. The paper concludes with a discussion of the implications of these findings for the role that footpaths can and should play in cycling networks.

48 Catering for cycles at public transport stations: encouraging and expanding the catchment

Murray Henman, Department of Transport and Main Roads, Queensland, Australia

In recent years and particularly with the publication of the draft Integrated Transport Plan for South East Queensland (Connecting SEQ 2031), there has been a move from the Queensland Government to change the transport mode share from private vehicles to active and public transport.

Currently many people who use public transport drive to park and ride facilities at train and bus stations; some driving less than 1 km, and others travelling significant distances, passing other stations on the way.

One effective means to assist the move from private vehicles to bicycles is to increase cycling access to and facilities at public transport stations and stops.

This study develops a methodology and tool to assess and provide recommendations for the provision for cycle parking and end of trip facilities at public transport stations and stops.

These facilities provide increased travel options, and given a quality network of cycle paths lead to public transport, can expand the catchment distance from a 10 minute walking distance of 800m to an equivalent cycling distance of 3km.

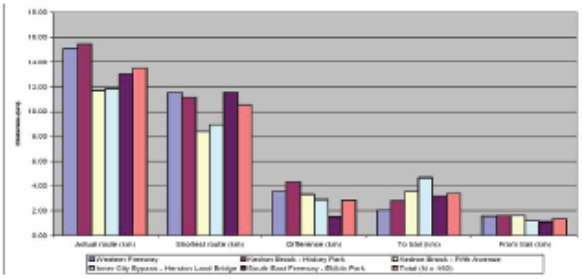
As well as providing dual benefits of increasing active transport mode share and supporting greater public transport patronage, cycle parking takes up less room and is much cheaper to provide than car parking.

By analysing various factors including current (or expected) trip numbers, the local cycle network and topography, and distance from major centres, this assessment tool provides recommendations for numbers and type of cycle parking that should be provided at public transport stations.

POSTER PRESENTATION ABSTRACTS

49 Analysing Brisbane cyclists' travel behaviour to determine corridor catchments and route choices

Michael Langdon, Department of Transport and Main Roads, Queensland, Australia
Mick Proctor, Griffith University, Australia



Brisbane's dedicated bikeways have been predominately built on available public land, this land may have been unused land that was included in an existing road reserve such as alongside a major motorway or land considered to be within a floodplain of a creek. Although several dedicated active transport corridors exist within Brisbane's urban area, these are not always the most direct connections and there are missing links on the approaches to Brisbane's Central Business District (CBD). This research attempts to aid planners by analysing current cycling behaviours, to gauge potential corridor catchment of a future cycleway completing these 'missing links'. The model for this research partly replicates the research by Krizek et al. (2007), who examined the travel behaviour of cyclists using dedicated cyclist infrastructure in Minneapolis, (Minnesota, USA,) instead of taking the shortest possible route. This research found that on average, in Brisbane, cyclists would willingly travel 3.345km from an origin point such as a home, to access one of Brisbane's dedicated off-road bikeways, rather than taking a more direct route (using roads and footpaths) towards their destination. In addition, it was found that cyclists travel on average 1.332km upon leaving a bikeway to reach a final destination such as an office in the CBD. Further analysis of the data found that cyclists were willing to travel on average 27% further to use a dedicated off-road cycling facility when compared to the shortest possible route using the road network.

50 Brisbane City Council bikeway safety signage program

John Lee, Brisbane City Council, Australia

Brisbane has over 1000 kilometres of bikeways. A review in 2007 recommended the installation of directional and distance signage. The signage allows users to be more aware of their physical location in case of an emergency and improves navigability across the bikeway network.

A trial of signage was conducted and a survey of users indicated it was successful.

Further consultation led to the development of the Brisbane City Council Bikeway Signage Manual. The Manual provides consistent way-finding and directional signage for use on Brisbane's bikeways. It also increases levels of personal safety and user confidence by allowing users to easily identify their location.

Signage is being installed across most of Brisbane's major bikeways.

Moreton Bay Cycleway (MBC) Signage

The Councils surrounding Moreton Bay (Brisbane, Redland and Moreton Bay Regional Council) developed unique signage for a 150 kilometre cycleway, the longest continuous cycle route on the east coast of Australia and a unique new tourist opportunity for South East Queensland and Australia.

The signage system is being implemented throughout the Moreton Bay Cycleway. The aim of the signage system is to direct, inform and regulate all user groups and to promote the branding and identity of the Moreton Bay Cycleway throughout each of the Councils.

Alongside main identification signs, directional signs and distance markers have been developed to assist public safety along the cycleway.

POSTER PRESENTATION ABSTRACTS

51 Being inclusive: providing wheelchair landings on bikeways

Mark McDonald, Department of Transport and Main Roads, Queensland, Australia

Many new paths are constructed with gradients that trigger Australian standard 1428 requirements for wheelchair landings. This paper examines combinations of path geometry and wheelchair landings and what influence this has on comfort and safety for a variety of path users. This paper looks at two recent bikeway projects in Brisbane (Toowong overpass and Gateway Bikeway) which offer the ability to assess real world effects of path geometry and wheelchair landings on cyclist and wheeled user dynamics. A VERICOM digital accelerometer is used to measure the dynamic relationship between forward speed, landing forcing, stability and stopping capability. Finally, this paper discusses methods of path design and construction to satisfy accessibility, comfort and safety for all path users.

52 Bike lane network design problem

Mahmoud Mesbah, University of Queensland, Australia
Russell Thompson, Institute of Transport Studies, Monash University, Australia

Cycling is a sustainable mode of travel and can improve the health and wellbeing of riders. Cycling can also benefit other road users by reducing carbon emissions from travelling and relieving congestion in the transport network. According to the draft 'Connecting SEQ 2031', one of the active transport targets is to reach an 11 percent mode share by cycling in South East Queensland by 2031. However, one of the concerns of the cyclist is the risk of riding in the mixed traffic conditions. There has been no methodology proposed to design an integrated network of bike lanes. This paper develops an optimization method to design a network of bike lanes. The emphasis is to keep a connected network by addition of the new bike lanes to the existing facilities. The optimization formulation takes into account both on-road and off-road bike paths and a limited budget for implementation. The results can be used to determine the location of future bike lanes. An application of the methodology is demonstrated using an example network.

53 Development of a cycle flow plan for Christchurch using travel diaries

Shane Turner, Beca Infrastructure, New Zealand
Michael Ferigo, Christchurch City Council, New Zealand
Tracy Allatt, Beca Infrastructure, New Zealand

Understanding cycle demands in an urban transport network is a key input into developing an effective cycle network plan. Like most 'cycling cities' Christchurch conducts cycle counts on key routes. However this does not provide cycle flow data for each transport corridor. To develop a cycle flow map of the city, Christchurch City undertook a cyclist survey of the city using travel diaries.

The project involved the recruitment of 400 cyclists to participate in a weeklong survey of their cycling activity. The participants recorded key information about their cycling trips and hazardous locations. The project identified the routes used by different user groups and plotted these on GIS maps, including commuter trips to work and to education facilities, trips for recreational purposes and for other purposes. In total, the surveyed participants made nearly 4,000 cycling trips.

The surveyed data showed that most cycling trips are made on major arterial roads leading toward the city centre and on popular recreational and sport training cycling routes. However, the major earthquake that hit Christchurch in February 2011, and closed the Central Business District area, has changed commuter travel patterns within the city. The earthquake has displaced a number of businesses and people, which has led to a more dispersed development pattern. The paper will discuss the changes in travel patterns (over next five years) and how the data collected in this study can be used to identify the catchment for commuter cyclists to the new employment hubs.

POSTER PRESENTATION ABSTRACTS

54 More people choose cycling: Far North Queensland gears up

Ray Plasto, Department of Transport and Main Roads, Queensland, Australia

Far North Queensland enjoys a 2.7% cycling rate, triple the national average. Engineering, education and evaluation are making cycling safer and easier and demonstrate a clear commitment to helping advance the Queensland Government's Towards Q2: Tomorrow's Queensland vision.

A broad, pro-active approach has been taken by the Department of Transport and Main Roads (TMR) assisted by partnerships across government to encourage more people to take up the 'green' commuter option, encourage more cycling in the community and promote a healthier lifestyle.

A Principal Cycle Network Plan (PCNP), the first to be recognised in a statutory land use plan - the Far North Queensland Regional Plan 2009 – 2031 has been adopted. This reinforces the solid work by TMR to make cycling more accessible, and will contribute to making cycling a legitimate transport and recreation option.

Work is nearing completion to deliver the first cycleway project in the PCNP. This 6.5km cycleway will connect Aeroglen to the Cairns CBD. Other work has resulted in significant improvements to cycle infrastructure in the region, as evidenced by feedback provided by its biggest users — the cyclists.

Additionally TMR has been involved in a pilot Ride to School (Bike Bus) program being delivered through a number of Cairns primary schools. This program offers school children an exciting new way to ride to and from school with adult supervision.

Collectively, these initiatives contribute to making cycling a way of life in Far North Queensland, which is critical to the region maintaining and building on its high cycling participation rate.

55 The relative importance of factors influencing bicycling crash risk

Simon Washington, Centre for Accident Research and Road Safety, Australia
Narelle Haworth, Centre for Accident Research and Road Safety, Australia
Amy Schramm, Centre for Accident Research and Road Safety, Australia

A focus of governments to increase active travel has motivated renewed interest into cycling safety. Not surprisingly, understanding the relative role of numerous factors in bicyclist crash risk is critically important for identifying effective policy tools, for informing bicycle infrastructure investments, and for identifying high risk bicycling contexts. This research need is highlighted by the fact that bicyclists are more likely than motorists to experience a near-miss crash, and are up to 14 times more likely to be involved in a serious injury crash. This paper presents a quantitative analysis of factors that influence bicyclist self-reported crash frequency, including distance ridden on various facilities (bike paths, roads, etc.), rider conspicuity, riding environment (rural, urban), and attitudes about risk taking. Possible feedback among these factors is explicitly considered, such the effect of attitude on crash risk and crash risk on attitude. The relative roles of these factors in influencing crash frequencies among a sample of 2500 Queensland adult cyclists is explained.

POSTER PRESENTATION ABSTRACTS

56 The evolution of an industry: getting more people on bicycles

Peter Bourke, The Cycling Promotion Fund, Australia

Over the past decade the number of bicycles sold in Australia has risen dramatically, we are witnessing an explosion of interest in riding bikes, for sport, for health and for transport.

What has been the role of the Australian bicycle industry and how has it responded to this opportunity and challenge?

In 1999, key companies within the industry, identified that supporting a 'better' environment for bike riding was as important as price, product and promotion, in selling their bikes.

The industry identified that by working together, far more could be achieved to get people on bikes, the industry formed and sponsored the Cycling Promotion Fund, a targeted approach to improve the environment for all cyclists, not just selling a single label.

Specifically, some of the activities the campaign has undertaken and which will be discussed are:

- Building a base, selling the benefits
- Evolution of industry thinking
- Development of an advocacy focus
- Why is advocacy a corner stone to the growth of the industry?
- What has been achieved

57 A guide to signing cycle networks: showing the way to more cycle trips

Robyn Davies, Department of Transport and Main Roads, Queensland, Australia
Murray Henman, Department of Transport and Main Roads, Queensland, Australia

Every transport system needs signs to help users find their way around the network and to make full use of the system's infrastructure. Signage is a critical component used to legitimise and assist the many and varied trips which cyclists make daily within Queensland cities and towns.

In 2009 the Department of Transport and Main Roads completed its Queensland Bicycle Network Signage and Mapping Project. This project was undertaken in order to assist development of convenient and legible directional and information signage and best practice mapping for the Queensland cycle network. Direction and information signage and mapping for bicycle routes ensures that cyclists and others can use networks to their full potential and make quick and accurate route choices.

A well developed signage and mapping system encourages safer use of the network. In a recent survey of Queenslanders who own a bicycle, 29% reported that better directional signage would be a motivator for them to ride more often, and 44% said that bicycle mapping would encourage more frequent cycling (Market Communications Research 2010).

The outputs for the Queensland Bicycle Network Signage and Mapping Project included a technical note for the Traffic and Road Use Manual (TRUM), an advisory guide developed to assist network planners to implement recommendations made in the TRUM note, and Cycle Note B11 detailing best practice bicycle mapping.

POSTER PRESENTATION ABSTRACTS

58 Counting pedestrians, cyclists and pedestrian conveyance devices in Brisbane, Australia - an exploration of methodology, site selection, data analysis and lessons learned

Michael Franz, Brisbane City Council, Australia

Brisbane City conducts a range of traffic counts including automated, manual and video counts to gather data on cyclists, pedestrians and other non-motorised users.

Non-motorised traffic counts have been continuously conducted since 2004 and show a steady increase in the use of facilities. Between 2004 and 2010 weekday cycling trips have increased by 49% while pedestrian trips during the same period have increased 27% and some major inner city sites such as Victoria Bridge have shown volumes in excess of 20,000 users per day.

In addition to manual counts automated counters have been used in Brisbane since the installation of the first automated counter in 2009. Since then the city has installed more permanent counters, now continuously monitoring pedestrian and cyclist movements at 10 key sites throughout the city, including major shared paths, bridges and crossings into the Central Business District. The selection of future sites has been focused on movements along key routes into suburban centres. While automated counters provide a continuous record of activity, geometric design, facility location and types and volumes of users have a great impact on the resulting count accuracy.

Accelerated spending in recent years on cycling and pedestrian infrastructure in Brisbane has had a positive impact on the use of facilities. Overall observations show a growth in walking and cycling in Brisbane with weekday AM and PM peak periods experiencing an average increase of 102% from 2004 to 2010.

59 Completing the missing links in a cycle network as a way to increase usage: Brisbane's Western Freeway Bikeway

Michael Langdon, Department of Transport and Main Roads, Queensland, Australia

The Department of Transport & Main Roads has been collecting sample surveys of bicycle activity on bikeway assets from 2002 to the present. An examination of data from the Western Freeway has revealed a dramatic increase in bicycle numbers between 2006 & 2007. In August/September 2006 the 'missing link' in the Western Freeway Bikeway between Fig Tree Pocket and Sinnamon Park was completed, allowing an uninterrupted off-road bicycle and pedestrian connection between the Western Freeway Bikeway and the Centenary Highway Bikeway. This paper shows the results of the analysis of that data providing evidence of the increase in usage that can occur when a major 'missing link' is completed. The results obtained from the bicycle counts taken along the Western Freeway Bikeway Corridor from the year 2002 to the year 2008 support the following findings: (1) Average daily usage from 2002-2006 was consistent (with the exception of a counter malfunction in 2003) at an average of 130 cyclists per weekday and 117 per weekend whereas the average for 2007-2008 was 219 per weekday and 217 per weekend. (2) The completion of the 'missing link' from Fig Tree Pocket to Jindalee in late 2006 most likely resulted in an increase of the average daily numbers of cyclists on the Western Freeway Bikeway of 55% (52% during the weekday and 58% during the weekend), as this same increase was not recorded at any other site across Brisbane.

POSTER PRESENTATION ABSTRACTS

60 River crossing boosts cycling: evidence from Brisbane's Eleanor Schonell Bridge

Michael Langdon, Department of Transport and Main Roads, Queensland, Australia
Heather Horne, Department of Transport and Main Roads, Queensland, Australia

This paper presents the evidence of the impact that the construction of the Eleanor Schonell Bridge had on the cycling population, and in particular the impact on the Brisbane Central Business District (CBD) cycle network, from a cyclist intercept survey undertaken soon after construction. The results suggested that introduction of the Bridge had created a river crossing opportunity for residents of the suburbs south/west of the South East Freeway to access St Lucia, Indooroopilly and the Brisbane CBD (via Bicentennial Bikeway). While most respondents had previously been cyclists, the results showed that of those who did change their behaviour, the greatest transport mode shifts are from: Car as driver (23%), Bicycle & Ferry (21%), Ferry (15%), Ferry & Walk (10%), and Ferry & Car as driver (8%). The mode shift results show that as well as providing for existing cyclists, ferry passengers and some car drivers did shift modes to cycling. The travel behaviour change figures collected show a 40% increase in the number of cyclists who cycled on a daily basis, a 36% increase in the number of cyclists who cycled 2-4 days a week, and a 60% decrease in the number who cycled a few days a fortnight.

61 Characteristics of new Queensland cyclists

Amy Schramm, Centre for Accident Research and Road Safety, Australia
Narelle Haworth, Centre for Accident Research and Road Safety, Australia

Various state and local government initiatives have been implemented to encourage Australians to ride bicycles for congestion and health reasons. A survey of more than 2,500 Queensland adult cyclists found that approximately one fifth are new riders, who have only been riding regularly for the previous two years or less. This paper begins with a description of differences between new riders and continuing riders who have been riding regularly for five years or longer. The paper will identify whether new riders are more likely to ride for transport or recreation, what types of bicycle they are riding, if they prefer bike paths or riding on the road, and if they are more likely to take actions that improve their conspicuity. It then goes on to examine differences between new and continuing riders in their perceptions of their skill levels and the danger of riding on the road, as well as injury experiences. The paper concludes with a discussion of the implications of these findings, and how they may influence programs to encourage more people to take up cycling.

POSTER PRESENTATION ABSTRACTS

62 Australia Ride

Phil McDonald, All Trails Bicycle Tours, Australia

Australia Ride is made up of 20 individual stages, each between 4 to 14 days in duration, that link up to create a fully supported and achievable cycling route around Australia. 16 stages will circumnavigate the Australian mainland, two more will cross the continent from south to north and the final two stages will loop around Tasmania.

Beginning in Cairns, Queensland in April 2012, Australia Ride is the evolution of AllTrails, a cycling company that has successfully run over 100 tours throughout Australia for over 14 years. We provide cyclists, in teams or as individuals, the opportunity to take part in unforgettable cycling adventures throughout Australia and the chance to fulfil the dream of riding from city to city, across a state, or around our unique continent in its entirety.

The 20 stages will be completed between 2012-2014 and cover over almost 20,000 kms of sealed road through Australia's most remarkable and iconic landscapes. After 2014 all stages will be repeated. Cyclists can ride any stage or do the lot.

This is an environmentally friendly adventure with a highly experienced support team creating safer riding conditions and organising all accommodation and camping options, meals, water, bike and luggage transfer and support.