A Tale of Two Cities: Towards the Pedagogy of Living Labs

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Abstract: The living lab approach to problem solving provides opportunities for open innovation and co-creation with users, or in the context of cities, citizens. How can the living lab methodology be adapted as a pedagogical approach for urban design in the context of ‘wicked problems’? Here we review an intensive transdisciplinary workshop in which multidisciplinary student groups based in Melbourne and Ho Chi Minh addressed the complex challenges of transport, transit, and tourism in these two cities. The aim was to find and communicate relevant data and information to frame a design proposition that would improve inner and cross-city travel. The paper presents an account of the investigation performed in the workshop, the findings and an analysis of the issues conveyed by participants in the two cities.

Keywords: Living lab, sustainability, transport, pedagogy, data gathering, data visualization.

1. Introduction

Communities are emergent, holistic living systems. Understanding the impact of socially complex systems through spatial interactions via the lens of scalability requires the development of new methodological behavioural approaches. The emergent aspect of complex entities, by their very nature, requires an understanding that can embrace unpredictability through emergence. How do we indeed convey this adequately or appropriately?

City infrastructures can now rely on a wealth of new information and technologies, which enables them to ‘sense’ and ‘respond’ intelligently to the needs of their growing populations (IBM n.d.). Although data is ubiquitous in our cities, having access to a large amount of data does not directly aid our attempts to understanding ‘wicked problems’. The dynamic spatio-temporal information about the city, and how it is emerging, may not necessarily be captured in the models or easily extracted from them (Salim et al. 2010). This implies that a pure technological approach does not solve wicked problems. Projects need to combine socio-technical approaches in formulating the right questions—to lead the design process—before exploring the right answers—and thus implementing interventions—that address aspects of these wicked problems.
Nousala (*et al.*) describes issues that relate to a city such as Ho Chi Minh in the following way: ‘knowledge-based groups or communities are complex systems that emerge, evolve and mature through stages that display specific features and capabilities of the community or group’ (2010, p. 983). Understanding these capabilities and features are fundamental to building sustainable economic, social and learning networks systems. Understanding emergent behaviour within and beyond organizational communities requires an understanding of social or sociological aspects (in relation to the explicit formal/physical structures in the organization). The Ho Chi Minh and Melbourne sustainable city issues involve questions focusing on the deeper development and geographic challenges for future design and planning.

How ‘mobile’ these emergent interactions are, is a concept that can be understood via ‘inter-organizational’ and ‘inter-structural’ comparative approaches (Nousala *et al.* 2010). Just as geographical areas may contain characteristics that can help to support the formation of an emergent industry cluster, similar behaviours occur through emergent characteristics of complex systems that underpin the sustainability of an organization. The idea that complex systems have tacit structures, capable of displaying emergent behaviors, is not a common concept. These tacit structures can in turn, impact the structural sustainability of physical entities. Until recently, social complex adaptive systems were largely overlooked due to the tacit nature of these network structures.

To investigate the emergence and uncertainty of the dynamics of cities, the research focused on the themes of transport, transit, and tourism, since these particular themes exhibit spatial and temporal aspects of emergence. The research was performed in an intensive transdisciplinary workshop, which included participants from various disciplines, including environmental and social planning, urban planning, landscape architecture, communication design, computer science, multimedia and business information systems. The objective of the workshop was as follows:

1. Investigate the patterns and trends of emergence that occur in the two cities
2. Integrate design, social and technical methods and the skills required to define, analyze, and visualize an aspect of transport, transit, or tourism of the two cities.
3. Propose a design attempt that deals with the selected aspect of the cities’ wicked problems.

Prior to the intensive workshop week, participants performed background studies on each of the two cities focusing on particular themes. During the five-day workshop, participants gathered the data from the public in a series of surveys, interviews, and focus groups. The participants then analyzed the data along with information obtained from public agencies and the Web, and visualized the information as a series of infographics or data visualizations. Knowledge and insights were then extracted from the data in order to form design proposals in two contrasting contexts. One of the main precedents of the methodology is the living lab approach, which is usually performed in a more arduous and longitudinal study for technology push or adoption in cities or communities. This needs to be adapted for a short delivery and to achieve a pedagogical outcome.
2. The living lab approach

The concept of the ‘living lab’ was introduced by William Mitchell, as a way of exploring and testing solutions for complex problems (Eriksson et al. 2005). Eriksson (et al.) states, ‘Living Lab represents a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts’ (2005, p. 13).

Bergvall-Kåreborn (et al.) elaborates the definition further,

‘A Living Lab is a user-centric innovation milieu built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values’ (2009, p 1).

Bergvall-Kåreborn (et al. 2009) proposes that living lab is both an approach and a milieu (environment, arena), with five key components (research, partners and users, management, approach and, ICT and infrastructure) and five key principles (openness, influence, realism, value and sustainability).

We engage with the living lab process by creating regionally relevant learning hubs through Melbourne, Australia and Ho Chi Minh, Vietnam, both capital cities in their respective states within their country. Santoro and Conte (2006) explain that,

‘[t]he European Network of Living Labs is addressing the collaboration across the Living Labs network to share common and complementary resources, and connect local user communities and companies, in order to create a wider market and provide services that are viable’ (Santoro and Conte 2006, p. 2).

We employ this approach to networking to provide the possibility of improving capabilities for students to experience a range of new skill sets by encouraging contact with local SMEs, micro-entrepreneurs, and other professionals (in both city hubs). Santoro and Conte (2006, p. 2) describe the need ‘to develop, validate and integrate new ideas and rapidly scale-up their services and products from their local region to other regions with different characteristics.’ We wish to engage with the living lab process to enhance and encourage the students to rapidly scale-up skill sets that will provide the capability to effectively integrate the services and products of their local regions. Regionalizing the living lab approach is an innovative response to a need for providing dynamic inter-disciplinary teaching and training for 21st century issues.

With a view to formalizing the living lab process, Pallot (2009) explains the process as involving a multidisciplinary team in four main activities of co-creation, exploration, experimentation and evaluation. For our project, we paired students from Australia with students from Vietnam and asked them to discuss and identify issues dealing with transport, transit and tourism. Below we discuss their stages in this living lab process with a view to highlight how the living lab process works, and explain how the pedagogy and innovation emerges.

1. **Co-creation:** Since a living lab is user-centric, it highly involves the participation of users in the ideation and development process (Pallot et al.)
A living lab integrates technology push and application pull into a pool of views and knowledge that is shared to sustain the ideation of new scenarios, concepts and related artefacts (Pallot 2009). In our project, students conducted user interviews, focus groups, and surveys to gather responses on the existing situations (prior to design interventions) and initial ideas on improving the situations.

2. **Exploration**: The living lab approach facilitates open innovation and integrates users in the development and value creation processes during course of design (Levén and Holmström 2010). It engages all stakeholders, especially user communities, at the earlier stage of the co-creation process for discovering emerging scenarios, usages and behaviours through live scenarios in real or virtual environments (Pallot 2009). The exploration process in our project involves students documenting, analyzing, and visualizing the contexts of the problems through designing and producing data visualizations, infographics and video documentaries.

3. **Experimentation**: The living lab approach implements the appropriate level of technological artefacts in order to experience live scenarios with a large number of users while also collecting data which will be analyzed in their context during the evaluation activity (Pallot 2009). The experimentation process in our project involves students performing the experiments or design interventions, such as through wearing sandwich boards and trying out the ideas with the potential users.

4. **Evaluation**: It assesses new ideas and innovative concepts as well as related technological artefacts in real life situations through various dimensions such as socio-ergonomic, socio-cognitive and socio-economic aspects; make observations on the potentiality of a viral adoption of new concepts and related technological artefacts through a confrontation with users’ value models (Pallot 2009). The evaluation stage has not been done fully in this course due to time constraints of the intensive mode.

By immersing our students into the wicked problems of the city, we encouraged an emergent and innovative approach to solving them. The innovative edge of this workshop is in its creation of pedagogical frameworks for students to work in projects that aim to gather, understand, analyze, integrate, and visualize data for smarter cities using transdisciplinary approaches.

The outcomes of the projects are aimed at making the invisible, visible. The goals of visualization are to create social awareness of the targeted issue, to design an urban intervention, and/or to promote social and behavioral changes (Fogg 2009).

3. **The contexts of the investigation: Transport, transit, and tourism**

Ho Chi Minh City, formerly known as Saigon, is the multicultural centre of Southern Vietnam, a city which blends the colours and life of South East Asia with a built architecture of stunning French heritage. Melbourne, the capital of Victoria, and second largest city in Australia, is instead, a centre for art, design and innovation, characterized by an ever-growing population, boasting cultural roots from every continent of the world. Both cities are expanding and the need for new residential areas is pushing developers to build further and further from the city centres. This trend, although necessary, is creating instant towns and
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Cities that lack the social richness and cultural significance of much older neighbourhoods. The results are more often than not, clean-edged, dull areas that cannot offer the same quality of service as the inner city districts.

While Melbourne’s population is gradually becoming more and more aware of environmental sustainability because of water scarcity and the growing needs of landscape conservation, the citizens of Ho Chi Minh City have yet to appreciate and understand the full potential of a sustainable city. The problems they face, such as traffic and pollution, are a by-product of a government that did not implement environmental sustainability policies in tandem with social sustainability policies.

Cities with transport systems that are highly dependent on private vehicles typically have issues with traffic congestion and poor air quality. The global trend of urbanization is placing many cities’ transport systems under stress. Finding ways to move people safely, efficiently, cost effectively and sustainably around cities is a challenge for many planners and governments. Ho Chi Minh City (HCMC) and Melbourne are two cities that have experienced significant population growth in recent years. In terms of transport, both cities suffer from the issue of roadway congestion and adverse environmental impacts such as air pollution (Barter et al. 2003, Kerr et al. 2010).

HCMC has low levels of car ownership and high levels of motorbike ownership, with an estimated 291 motorbikes per 1,000 people (Barter et al. 2003). In comparison, Australian cities have low levels of motorbike ownership with an estimated 13.4 motorbikes per 1,000 people and high rates of car ownership (575.4 passenger cars per 1,000 people) (Barter et al. 2003). Vietnam is the fourth largest motorcycle market, globally (Lin et al. 2012). Nguyen and Tran (2012) estimate HCMC has 2.3 million motorbikes and 0.2 million motor vehicles.

Traffic in HCMC is congested and slow with estimated speeds ranging from 10 kilometres per hour (Truitt 2008) to 25 kilometres per hour (Ooi 2009). Matsuhashi (et al. 2005) and Minh (et al. 2005) argue that the volume of motorbikes in HCMC affects the flow of other road-based vehicles and slows traffic. The slow moving traffic also impacts upon the public transport system, as it is also predominantly road-based (in the form of buses) (Barter et al. 2003). As such, Matsuhashi (et al. 2005) argues if the share of public transport increased in HCMC, average speeds would increase by more than 10 per cent, improving the efficiency of the transport system (Matsuhashi et al. 2005).

Another feature of transport in HCMC is poor air quality (Barter et al. 2003, Ho et al. 2009, Ho et al. 2011). Motorbikes are the main contributors to poor air quality in HCMC (Ahmed and Fien 2010, Bui et al. 2012, Ho et al. 2011, Hung et al. 2010). Barter (et al. 2003) estimates the total emissions per urban hectare of HCMC and other ‘Low Income Asian Cities’ to be 13,357 kilograms per urban hectare (Barter et al. 2003). More recently, Ooi (2009) estimated HCMC’s total emissions at 24,231 kilograms per urban hectare. In comparison, the total emissions for Australian cities are 2,749 kilograms per urban hectare (Barter et al. 2003). One of the contributing factors to this difference is population density. HCMC and other ‘Low Income Asian Cities’ are denser than Australian cities with 205.6 persons per urban hectare compared to 15.0 persons per urban hectare, respectively (Barter et al. 2003).

Heywood (2011) argues that congested traffic produces greater emissions than traffic that flows freely around a city. According to Heywood (2011), the aim of sustainable transport is
not to eliminate the use of private vehicles but to promote greater use of public transport, walking and cycling to achieve a greater balance between transport modes. Cities whose transport system is highly dependent on private vehicles consume more transport energy per capita than cities with a balance between transport modes (Heywood 2011). The use of private vehicles is targeted by supporters of sustainable transport because their usage is known to contribute to environmental pollution, noise pollution, decreased air quality, greenhouse gas emissions, and fossil fuel consumption (Collins and Chambers 2005, Stradling 2011). In addition, reducing the dependence on private vehicles within a transport system decreases the overall operating cost of the city’s public transport system (Heywood 2011). Another significant economic incentive for reducing the dependence on private vehicles in cities such as Melbourne and HCMC is that it makes the city less susceptible to unstable oil prices (Heywood 2011).

Both Ho Chi Minh City and Melbourne are cities with high private vehicle usage. In Melbourne, the majority of private vehicles are cars whereas in HCMC, the majority of private vehicles are motorbikes. For both cities, private vehicles have a significant impact on air quality. According to the EPA (2012), motor vehicle emissions contributed the following levels of pollutants to the overall air quality in Melbourne:

- 72 per cent of all carbon monoxide (CO);
- 70 per cent of all nitrogen oxides (NOx);
- 28 per cent of all volatile organic compounds (VOC); and
- 6 per cent of all sulphur dioxide (SO2).

In HCMC, motorbike emissions have contributed the following levels of pollutants to the city’s air quality:

- 94 per cent of CO;
- 30 per cent of NOx;
- 69 per cent of VOC; and
- 63 per cent of SO2 (Dung and Thang 2009).

Of chief concern with regard to the prevalence of motorcycles in Vietnam is the fact that the bulk of motorbikes used are poor in quality and technical standards. A study taken in 2007–8 found that 98 per cent of the bikes used are 4-stroke engines, and use technology older than the EURO II standard (Ho and Clappier 2011). Increasing numbers of people making use of motor-based transit has led to an explosion in emission levels in HCMC. This in turn leads to an increase in associated health risks. For example, the emissions have caused more than 90 per cent of children under the age of five years to suffer from respiratory illnesses. Emissions and transit problems are becoming significant public health problems in HCMC and will require more drastic government intervention if not dealt with.

The weather is another factor, which confounds any attempt at completely solving the city’s problems within these contexts. The preferred mode of transport within Ho Chi Minh City is motorbikes, but there are still many pushbikes being ridden around the city. However, there are frequent storms with torrential rain, which can make these modes of transport even more dangerous than they already are. Also when it’s raining, tourists are less likely to walk around the city to visit various sights.
The following section presents three case studies that were explored out of the five student projects during the intensive workshop.

4. Case studies

4.1 Case study 1: Coffee transit bus: A social design proposal to change students’ commuting behaviour from private vehicles to public transport

During the research phase, the student group was drawn towards investigating the modes of transport used by students commuting to and from RMIT’s South Saigon campus. According to Collins and Chambers (2005, p. 641), the mode of transport individual’s use for commuting is one of ‘the most environmentally significant decisions’ made by individuals. The research undertaken in HCMC explored students’ attitudes towards commuting from a social, cultural, and psychological perspective. The research is informed by a community planning perspective, which draws upon the use of objective quantitative measures, objective social indicators and qualitative social meaning drawn from a community’s lived experience (Heywood 2011). The research is also influenced by the theory that urban traffic is ‘shaped by local systems of meaning’ (Truitt 2008, p. 4)

The group also noted, that commuters make decisions about their mode of travel based on perceived and actual experiences with infrastructure. Cost and psychological factors also appeared to play a significant role in determining the mode of transportation selected. They decided that promoting public transport usage might be one way in which cities can address the issues of congestion and air quality, and set about designing a new system that would persuade commuters to change their commuting behaviour (moving to use public transport). These strategies would include a range of activities, incentives, barriers and inducements. The strategies must be culturally and socially relevant and reflect the lived experiences of commuters.

4.1.1 Co-Creation

The students designed two paper-based surveys, two interactive voluntary focus group meetings and an online survey to explore solutions (and experiment with the data via visualizations, consideration of attitudes and researching of scenarios). Data on RMIT HCMC students’ travel behaviour was collected over a period of one month, commencing late November and finalized in mid-December 2012. Most of the data was collected via paper-based surveys. The surveys were written in English and students were asked to provide responses in English, with one exception in the second survey. RMIT Saigon South campus is an English speaking campus with high rates of English literacy. However, for survey one and two a Vietnamese-speaking researcher was on hand to explain the questions and interpret results when responses were given in Vietnamese. Two other data collection methods were used during this research. The first was an interactive student workshop and the second, an online survey. During the interactive student workshop, both researchers were present. To assist students with the online survey an introduction was provided which explained the nature and context of the research.

Qualitative data was collected in the first two surveys and during the interactive workshop. The interactive workshop was filmed and responses were coded based on themes. These themes along with other qualitative data taken from the surveys were validated against
published journal articles including ethnographic, anthropological, student travel and transport research.

Some of the key research findings are as follows:

- Four out of five RMIT HCMC students ride a motorbike to campus and one in ten commute by bus (See Figure 1).
- Students had very different ideas on environmental sustainability. When asked, students had a hard time understanding the meaning of sustainability, especially in the environmental context. Students tend to associate sustainability to more specific and familiar topics such as pollution or environmental issues. While this is not wrong, it is not the core meaning of sustainability. The graph breaks down the report into four categories: Sustainability, Pollution, Environment and techniques (See Figure 2).

![Figure 1: Commute mode by RMIT students to Saigon campus.](image1)

![Figure 2: Visualization of what sustainability means to students of Saigon campus](image2)

4.1.2 Exploration
Here the background and experiences of the team members are very different and each brings opposing diverse views, attitudes and constraints to the co-creation of their solution and knowledge. They work through a range of strategies that includes consideration of incentives, barriers and inducements, which might be culturally and socially relevant to reflect the lived experiences of commuters.
One of the most effective ways to address traffic congestion and traffic generated air pollution is to expand the public transport system, while simultaneously reducing private vehicle usage. According to Phu (2007) mass public transit systems are unlikely to be part of HCMC’s public transport solution as the start-up costs are prohibitive. Historically, Vietnam has been unsuccessful in securing adequate foreign investment to subsidize major public transport infrastructure projects (Phu 2007). Consequently, unless new revenue raising schemes can be found, it is unlikely that the city’s traffic issues will be solved with the introduction of a train, light rail, or metro-style system.

According to Stradling (2011), individuals draw upon their actual or anticipated travel experiences of commuting modes when deciding how they will travel to their destination. As such, we were interested in understanding the reasons why students were willing or unwilling to consider commuting to campus by bus. Students who typically commuted to campus by motorbike were asked whether they had considered commuting to campus by bus. One in three motorbike commuting students said they would consider travelling to campus by bus. This suggests there is some scope to modifying commuting behaviour.

The main reasons given by students that would not consider commuting to campus by bus are shown in Figure 3. The first five reasons are infrastructure related reasons (Kerr et al. 2010). The remaining reasons are psychological reasons (Kerr et al. 2010).

![Figure 3: Motorbike commuters’ attitude towards commuting by bus.](image)

### 4.1.3 Experimentation

Following the survey, the student team generated a number of research questions:

- How do we promote more sustainable transport behaviour by students attending RMIT Saigon South campus?
- How do we reduce the number of students commuting to campus by motorbike?

Understanding why students prefer to ride their motorbikes to Saigon South campus is essential to finding ways to promote public transport usage and reduce private vehicle usage (Kerr et al. 2010). Kerr (et al. 2010, p. 1), contends that any strategy aimed at persuading commuters to move from private vehicle usage to public transport usage, needs to address the acceptability of commuting by private vehicles and the ‘perceived control over travel’ when travelling by private vehicle. In addition, Kerr (et al. 2010) recommends including psychological or physical barriers to help persuade commuters to change their behaviour. The
barriers should cause individuals to question their ability to commute by private vehicle (Kerr et al. 2010). Examples of barriers include tolls, parking restrictions, and increased parking fees (Kerr et al. 2010).

An early proposition for RMIT Saigon South campus is to restrict motorbike parking and eventually, ban motorbikes. The idea was tested on the second survey conducted on campus. Students who usually commuted to campus by motorbike were asked what they would do if they were not allowed to park their motorbike on campus tomorrow? The responses are summarized in Figure 4. Almost half (45 per cent), of RMIT students said they would commute to campus by bus instead. A further 19 per cent said they would commute using some other mode of transport (other than a motorbike or bus). There were similar results when students were asked what they would do if they were banned from riding their motorbike to campus tomorrow? (Figure 5). Other responses of note included, one in eight students stating that they would park somewhere else, if prohibited from parking on campus. This illustrates the need to find a suitable alternative for students so that our sustainable transport strategy does not generate an unintended consequence such as moving motorbike parking off campus to another location (near campus).

Based on qualitative research methods in the co-creation and exploration processes, this project recommends establishing a private bus network for RMIT students attending South Saigon campus to be funded by the University.

4.1.4 Evaluation
The ‘Coffee Transit Club’ bus network is a social design proposal that reflects the social and cultural context of commuting patterns in HCMC. The research and design has been informed
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by infrastructure, cost and psychological factors that influence students’ commuting behaviour. Data used to support the development of the proposal and to understand the psychological, social and cultural meanings associated with travel in HCMC were collected using quantitative and qualitative research strategies. The design proposal has regard to the lived experience of our population of interest, the students attending RMIT South Saigon campus.

The ‘Coffee Transit Club’ bus network would have no physical bus stops. Instead, the coffee house would have a sticker displayed on their window with the ‘Coffee Transit Club’ logo (Figure 6). Students would be encouraged to wait for the bus inside the coffee shop (Figure 7). According to French (et al. 2010) when public transport is perceived as a positive experience, students are more likely to choose this as their commuting mode. This is one of the rationales for associating the bus service with coffee houses.

![Coffee Transit Club logo](Figure 6)

The ‘Coffee Transit Club’ bus network aims to address traffic congestion and air pollution in HCMC by promoting more sustainable transport behaviour. The design proposal includes a range of incentives, barriers and inducement strategies to assist behavioural change. Initial market testing suggests that the design proposal is palatable to current students attending RMIT Saigon South (Figure 8 and 9). Even without promoting the incentives and barriers associated with the proposal the initial response has been positive. As four out of five students surveyed currently commute to campus by motorbike, 58 per cent of respondents said they would be extremely likely or very likely to use the bus service and a further 33 per cent said they were moderately or slightly likely (Figure 9). This survey leads us to believe

![Coffee Transit Club Collection Points and Routes](Figure 7)
that if you offer an attractive alternative with appropriate incentives, barriers and inducement strategies you may be able to persuade students to modify their commuting behaviour. The social design proposal would also provide RMIT Vietnam with a sustainable transport strategy that reflects the University’s commitment to sustainability.

Figure 8: Frequency of attending coffee houses

![Image]

Figure 9: Likelihood of using a private bus service

4.2 Case study 2: The ‘Social Effect’ data visualization and interactive space design: Can an interactive landscape be culturally and socially effective in informing environmental sustainability?

The ‘Social Effect’ tackles environmental as well as cultural issues in order to create a social environment, which is both interactive and instructive. It is not meant to push for a drastic change in students’ behaviour (or understanding of the ‘being green’ concept), yet it aims to provide a space, which can nurture and inform a more interesting approach to the issue.

Through the research and sharing of ideas and cultures, this team concentrated their efforts on the students at RMIT University in Ho Chi Minh City. For the purpose of this research, this team is interested in delving deeper into the Saigonese culture and lifestyle to understand and unravel their differences and similarities in a matter of social activities and environment. The goal is to formulate a plan, and later a design, to propose a change and possibly a solution to one of Ho Chi Minh City’s many problems.

4.2.1 Co-Creation
The data collection consisted of a closed answer questionnaire and three open-ended questions. While the former aimed at gathering an overall understanding of the personal and daily habits of RMIT HCMC students, the latter informed a list of habits, needs and entertainment objects closely related to the University campus.
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The closed questionnaires are categorized into the following sections: family and close acquaintances, food habits, environment, activities/interests, transport, and general. For example, in the activities/interests section, the question ‘Do you play any sports?’ saw 47 out of 70 students (67 per cent) answering yes with 27 per cent of them listing badminton (or swimming, 17 per cent) as the only sport they practice (Figure 10). The total amount of students (out of those who answered yes) playing a team sport (ie. soccer, basketball, volleyball) is a low 20 per cent (in the context of the entire sample of 70 students, this drops to 14 per cent). Sixty-seven per cent can swim, while 29 per cent can dance. Thirty-three per cent play at least one musical instrument, with piano as the most played while 64 per cent can sing. Fifty-six per cent can draw and/or paint and 66 per cent said they like reading with favourite genres ranging from fantasy novels to scientific and economic reports.

![Figure 10: Visualization of responses on a few closed questions in regards to activities/interests.](image)

There were three open-ended questions in the questionnaires relating to habit, need, and entertainment. The responses are visualized in Figures 11, 12, and 13.

![Figure 11: Visualization of responses on student habits](image)
4.2.2 Exploration
In order to work out what to put in such a space, this student group used one of the lawn areas on campus, to create an experimental space. They encouraged volunteers to trial their space and worked through a long questionnaire to identify what they would like to be in such a space.

Here they discovered a city within a city, a small pocket of the population with particular lifestyles, habits, needs and most importantly, the means, to become the next leading class of Vietnam. One of them stated,

“For the first time I scraped beneath the surface of how people really spend their time in a specific space and most of all, who those individuals really are. I was able to grasp the character and the voice of each single person (and the Vietnamese mindset as a whole).”

The student group now aims to create an interactive space at the university to encourage environmental sustainability, and in doing so, avoid the need for students to travel much at all.
William H. Whyte, the celebrated American urbanist and organizational analyst stated ‘What attracts people most, it would appear, is other people’ (Whyte 1980). The RMIT HCMC Campus apparently shows a general unavailability of spaces that people can enjoy and comfortably spend their time in (Figure 14). Categorizing the data collected to inform a clear brief is therefore of foremost importance. The following seven points delineate the design intention conceived after filtering the information gathered on campus.

![Figure 14: RMIT HCMC campus](image)

1. **Seating:** ‘People tend to sit where there are places to sit’ (Whyte 1980). In the open-ended question ‘What do you think/feel/imagine about the RMIT HCMC campus life when you read the word “need”?’ The responses shows an interest for seating areas. The design objective is to provide simple, brightly coloured seats between 500 and 600 millimetre in height. Some seats must also be single for privacy and relaxation, some in groups for socializing and study activities.

2. **Shelter:** Shelter will be essential for the design. The data collected from the sample show a preference for cool, air-conditioned spaces. An outdoor space therefore needs to be well protected from the sun for it to be used by the student population. The lack of sheltered space (except for the cafeteria area) presently results into unused grounds and lawns.

3. **Rest:** The seating area must also accommodate for resting and/or sleeping. Any bed-like structure needs to be stored to avoid damage during the rainy season.

4. **Activities:** The space created within and around the designed structure (landscape) has to inform an open and creative use of the university grounds. It must allow for many different types of social as well as study-based gatherings. The structure must have power points (appropriately sealed in case of rain) to facilitate the charging of laptops and/or any other kind of electrical device.

5. **Environment:** The design must include environmentally friendly characteristics that promote recycling, water conservation and organic produce to improve students’ understanding of the issue.
6. **Colour Palette/Materials:** Colours should reflect RMIT advertising and marketing materials (i.e. white, red). In this case the data collected helps making a final decision as white and red appear to be two of the favourite colours among students. Materials should include weatherproof, environmentally friendly plastics and possibly timber.

7. **Interaction:** The structure (design) needs to be highly interactive and must appear as a ‘box of tricks.’

### 4.2.3 Experimentation

This student group decided to recruit a group of 15–20 volunteers and conduct three experiments:

- **Experiment 1:** Place mats in groups of three under trees and in full sun, scatter remaining mats under trees and in full sun and ask volunteers to choose their favourite position (more than one person can choose the same mat)
- **Experiment 2:** Place all mats in the centre of the lawn two metres apart from one another and ask volunteers to choose their favourite position (more than one person can choose the same mat)
- **Experiment 3:** Place all mats in groups of four (half in shade, half in full sun). Ask volunteers to choose their favourite position (more than one person can choose the same mat)

They also shot a video of each of the experiments and after all three experiments, the student group asked each volunteer what their preferred spot was and why, and what spot they’d prefer to sleep, have lunch, talk with friends or relax in.

The explorations and experiments informed the proposed design outcome ([Figure 15](#)).

![Figure 15: Proposed design—reconfigurable garden bed, seating arrangement and water fountain.](image)

### 4.2.4 Evaluation

The student team noted that their data (and solutions) was much better than what they would have collected if they had collected information through passive observation. From a design
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perspective, they found the built form not to be as relevant as the function and purpose of the conceived space.

The team felt that their solution tackled environmental, as well as cultural issues, by creating a social environment, which was both interactive and instructive. They write of their space, that,

‘It is not meant to push for a drastic change in students’ understanding of the essence of environmentalism, yet it aims to provide a space which can nurture and inform a more thoughtful and social approach to the issue.’

They were also aware of the other team’s solutions and felt that their solution would not be as successful if implemented independently. However, it was felt that it still created a starting point, a background of initiatives, a community development.

4.3 Case study 3: Electric motorbike hire scheme: Bicycle and pedestrian data— sources, needs and gaps

This project explored the feasibility of starting an electric bike hire scheme at the RMIT Vietnam campus. The chief concerns were: the state of transit in Vietnam and Ho Chi Minh City; the impacts of the current transit environment; the predominance of the motorcycle as the mode of transport for students at RMIT Vietnam, and the consequent effects of emissions, pollution and traffic congestion on RMIT students and the greater community at large.

4.3.1 Co-Creation

This student team identified the potential of pedestrian and bicycle transport to provide mobility, reduce congestion, improve environmental quality, and to promote public health. They set about addressing the issues concerning these forms of transport to improve conditions for pedestrian and bicycle travel required data, such as travel and facility characteristics, crash and safety information, and user preferences.

At the Vietnam campus there is a total of 6,572 students, equating to approximately 3,000 motorcycles on campus at a given time. Therefore, the total trips made to RMIT’s campus by motorcycle could be as high as 5,000 per day. Given that, carbon dioxide emissions per kilometer are around 0.0528 kilograms, accumulative emissions from RMIT related transit trips, are quite high.

Cognizant of RMIT’s corporate commitment to sustainability and increasing the university’s green credentials, the move towards an electric bike hire scheme will allow the university to show that it is acting decisively on climate change—that it is engaging with the civic reality of the local community in Saigon, and building relationships with south-east Asian corporations and firms.

4.3.2 Exploration

The group also set about finding what data had already been collected, and identified many deficiencies and limitations in existing sources for this data.

As an initial step towards enhancing bicycle and pedestrian data quality and filling data gaps, the Bureau of Transportation Statistics (BTS) has undertaken this assessment of bicycle and pedestrian data needs. The study has the following research objectives:
Firstly, provide an inventory of existing sources of bicycle and pedestrian-related data, including the extent, quality, and limitations of these sources; Secondly, identify and prioritize areas in which additional or improved data are needed; and Thirdly, identify and recommend opportunities for improving the quality of bicycle and pedestrian data.

4.3.3 Experimentation
The following methods were used to identify existing sources of bicycle and pedestrian data, data needs and priorities, and opportunities for improving data collection:

- Interviews and discussions with key people involved with pedestrian and/or bicycle issues at a national level;
- An email questionnaire sent to numerous individuals and groups, including national, state, and local pedestrian and bicycle planners, advocates, and researchers;
- Various written sources of information, both published and unpublished;
- Experience gained from previous pedestrian and bicycle projects undertaken by the authors of the report.

Since GDP per capita in HCMC is US$2,180, and the average per month income is US$75 (UNDP 2010), the purchase of an electric motorcycle (outright at US$700) is beyond the budget of a typical Saigon citizen. However, Volkswagen has recently launched their prototype of an electric bike. Further, they are exploring a rental scheme of their own, to be launched first in a Chinese city. Such an initiative could be adopted in commercial partnership with RMIT Vietnam to allow students to hire their very own electric bike, at a subsidized weekly rental rate of around US$5, commensurate with the running costs of the petrol motorcycle.

4.3.4 Evaluation
The group concluded that the data is missing and lacking in detail and cannot support initiatives. They also identified many challenges in providing a safe environment for pushbike and motorbike riding. Despite this, they are confident that the data shows these to be the most effective forms of transport for the students.

Conclusion
The paper presents a pedagogical model and examples based on the living lab method for exploring urban wicked problems on transport and sustainability issues. The investigation was performed by students from RMIT Melbourne and RMIT Vietnam in one intensive week in Ho Chi Minh City. Prior to the immersive intensive experience in Ho Chi Minh City as the living lab, students from Melbourne performed parallel qualitative observations on the issues of transport, transit, and tourism in Melbourne to gain insights into the issues. However, since the two cities provide very contrasting social, economic, and cultural contexts, the lessons learnt from Melbourne are not necessarily transferrable to Ho Chi Minh. The living lab method, however, can be applied as a pedagogy model for tackling specific urban problems regardless. The co-creation, exploration, experimentation, and evaluation stages in the living lab process proposed by Pallot (2009) was explored as a way to progress from ideation to finalizing a design proposal for the wicked problems explored by students.
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Figure 16: Ho Chi Minh traffic.
Source: Tuoitre News

References


