

理性教育：

香港大学园境建筑学部基础课程 之香港生态足迹的背景分析

Teaching Rationale:

Contextualizing the Ecological Footprint in Hong Kong at
Division of Landscape Architecture, the University of Hong Kong

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摘要 / 城市的高度密集化发展需要从其腹地汲取资源来维持自身的日常运转，这些资源通过基础设施不断地出入城市的边界。从这个意义上讲，城市的生态足迹已远远超出其物理边界，而且城市越密集，其生态足迹与城市地域范围之间的对比就越明显。“香港生态足迹的背景分析”源于香港大学园境建筑学部开设的一门基础核心课程——ARCH1028可持续发展与建筑环境，该课程鼓励建筑环境专业的本科生对密集城市背景下的城市可持续性问题进行定义、探讨和思考。本文陈述了该课程的教学、学生研究和背景分析等方法，选择了5个城市赖以生存的决定性因素（能源、食物、人口、水和废弃物），对8个具有代表性的香港城市社区（金钟、鸭脷洲、红磡、九龙湾、旺角、沙田、天水围及油塘）进行了调查，并展示了所取得的部分成果。“香港生态足迹的背景分析”项目还入选了2013年深圳·香港城市建筑双城双年展。

关键词 / 生态足迹；可持续发展；可持续教育；城市环境

Abstract / The compacted and concentrated city area and its built environment draw upon an ever widening hinterland for its life support. These resources continuously pulse in and out of the city's physical boundary through constructed infrastructures. In this sense, the reach of the city is far beyond its physical location, moreover, the denser the city, the starker the contrast is between its built form and the geographical extent of its depending territory. "Contextualizing the Ecological Footprint in Hong Kong" is an educational research project in which first-year undergraduates of the built environment at the University of Hong Kong (ARCH1028 Sustainability and the Built Environment) were encouraged to define and explore issues of sustainability within dense urban settings, and to speculate on the concept of sustainable issues. This paper presents the teaching approach, student research and contextual analysis of five decisive factors that the city relies upon for its life support (energy, food, people, water and waste), across eight different urban neighborhoods (Admiralty, Ap Lei Chau, Hung Hom, Kowloon Bay, Mong Kok, Sha Tin, Tin Shui Wai and Yau Tong) in Hong Kong. "Contextualizing the Ecological Footprint in Hong Kong" also enrolled 2013 Bi-City Biennale of Urbanism \ Architecture (Hong Kong).

Key words / Ecological Footprint; Sustainable Development; Teaching Sustainability; Urban Context

1 “香港生态足迹的背景分析”的背景

香港，如同北京、纽约、东京等其他特大城市一样，需要不断地从其腹地（珠三角乃至更内陆的区域）汲取资源以维系自身的正常运转。从这个意义上讲，这些城市的生态足迹范围已远远超出它们的物理边界（图1）。作为一个高度密集化的综合体，城市可以被定义为一个内置的居住环境。它需要对人口、能源、食物、水、资源和由此产生的废弃物进行日常管理，通过基础设施（如高速公路、管线和码头等）不断进出城市的物理边界。而这些城市的周边区域，不断地为其生产和提供食品、制成品、原材料和工业材料等资源，以供其发展。而且通常城市越密集，其生态足迹与地域范围

1 The Background of “Contextualizing the Ecological Footprint in Hong Kong”

Hong Kong, like Beijing, New York, Tokyo and many other megacities, draws upon an ever widening hinterland (such as the Pearl River Delta or even further) for its life support. In this sense, the reach of the city is far beyond its physical location (Fig. 1). As a highly intensive complex, urban can be defined as a built-in living environment. The concentrated area of the city houses the daily management of people, energy, food, water, resources and resulting waste that continuously pulse in and out of the city's physical boundary through constructed infrastructures (such as

之间的对比就越明显。

“生态足迹”是指维持一项特定活动或一定数量人口所需的土地总面积。生态足迹的概念最早是由加拿大不列颠哥伦比亚大学的生态学家 廉·里斯和区域规划师马西斯·瓦克纳格尔于1992年提出的。生态足迹可以作为一个衡量城市的可持续性（或不可持续性）的指标，以及支持我们对“理想城市”的本质进行探讨的理论基础。根据可持续建 环境的基本原则，规划师、设计师和土地开发商能够更加全面地了解城市职能的本质及其所有的物质需求和功能，以及如何实现可持续发展。

2008年，香港的消费所需的生态足迹承载力是其陆地和海洋面积承载力的250倍^①。以食物为例，2009年香港进口食物的花费约为141亿美元（占其同年GDP的4.4%，世界排名第一）^②。与此同时，香港95%的食物供应依赖于进口，而在过去7年间，该地区进口食物的年平均增长率达15%。与物理边界相比，香港的食物生态足迹面积非常庞大。此外，2008年香港的人均生态足迹大约是中国内地的两倍。因此，对生态足迹的理解和研究对于香港和其他特大城市的可持续发展均具有重要的意义。

2 “香港生态足迹的背景分析”的教学体系

“香港生态足迹的背景分析”源于香港大学园境建 学部开设的一门基础核心课程——ARCH1028 可持续发展和建 环境。该课程鼓励建 学院中5个专业（即建 学、建 保护、景观设计、测量学和城市设计）的一年级本科生对密集化城市背景下的城市可持续性问题进行定义、探讨和思考。本课程涉及建 学院所有专业的学科内容，目的是启发学生思考如何建设未来的生活环境，从而为城市找到一种可持续的平衡。

2.1 学院基础核心课程的定义

香港大学建 学院的基础核心课程是学术引导的重要组成部分，以促进从中学基础教育到大学专业教育的过渡。该课程旨在为香港大学建 学院的本科生提供共性的学科基础和学习经验，从而引导学生了解并研究与专业紧密相关的学科领域。这些课程专注于所有的建 学院本科生都应该熟练掌握的建 学科的基础知识与核心技能。



- 20世纪五六十年代曼 顿计划上方的圆顶（蒙太奇影像），该屋顶跨度为2km，并可以不依靠汽车——R·巴克明斯特·富勒（摘自《你的私人天空：R·巴克明斯特·富勒》）。
- “香港生态足迹的背景分析”研究的小组汇报。
 - Dome over Manhattan Project, 1950 and 1960, (photographic montage). The would have spanned two miles and, among other things, would have
 - Group report of "Contextualizing the Ecological Footprint in Hong Kong" study.allowed for the elimination of automobile traffic — R. Buckminster Fuller (Your Private Sky: R. Buckminster Fuller)

2.2 挑战和方法论

景观设计学在可持续发展和建 环境的教育方面面临着各种挑战。城市自身的复杂性和城市问题的盘根错节，使得学生或是从业者都无法全面地了解可持续性发展和建成环境问题：自上而下的教育方式推崇广泛适应性，但缺乏灵活性和相关性；自下而上的教育方式因学生个体能力的局限，而无法表达出实质性的差异。因此在教学与研究实践中，我们要求学生将“香港生态足迹的背景分析”研究限定在某一场地的特定问题上，而非整个城市。

2.3 教学设置

除每周2课时的讲座与1课时的课外辅导外，教学团队针对“香港生态足迹的背景分析”研究设置了一门

① 数据来源于《香港生态足迹报告2008：超越我们的生活方式》，2008年出版。

② 数据来源于《联合国粮食和农业组织全球报告》，2010年2月出版。

expressways, pipelines and terminals). Sites physically and politically removed from the city continuously produce and provide food, manufactured goods, raw and industrialized materials, and fuel for its development. The denser the city, the starker the contrast is between its built form and the geographical extent of its depending territory.

An “ecological footprint” is a measure of the total land area needed to sustain a specific activity or population. The term was a concept first presented by William Rees (Canadian ecologist) and Mathis Wackernagel (Regional Planner) of the University of British Columbia in 1992. Ecological footprint can be used as a metric for comparing the sustainability (or unsustainability) of cities, and a concept through which we can begin to discuss the nature of the Ideal City. Fundamental to the principle of a sustainable built environment, is the need for planners, designers and developers to understand the full nature of the city and all its material needs and functions, and how they might sustainably be met.

In 2008, Hong Kong’s consumption required more than 250 times the biological capacity of its land and sea area^①. Citing food as an example, Hong Kong spent around 14.1 billion USD (4.4% of its GDP, No.1 worldwide) on food imports^②. At the same time, 95% of the food supply in Hong Kong is imported, and the territory has experienced a 15% food average volatility growth rate during the past seven years. The food footprint of Hong Kong is very large, compared with its physical boundaries. Moreover, Hong Kong’s per capita ecological footprint in 2008 was two times that of the mainland of China. Therefore, understanding and researching the concept of ecological footprint is very important to the sustainable development in HK and other megacities.

2 Teaching System of “Contextualizing the Ecological Footprint in Hong Kong”

“Contextualizing the Ecological Footprint in Hong Kong”comes from a faculty foundation course — ARCH1028 Sustainability and the Built Environment — set up by Faculty of Architecture at the University of Hong

Kong. The course is required for all first-year undergraduates of the Faculty (architecture, conservation, landscape architecture, survey and urban design) and encourages them to define and explore issues of sustainability within dense urban settings, and to speculate on concepts of sustainable issues. The course relates to curricula of all Faculty of Architecture disciplines and is intended to inspire thinking about ways we should construct our living environments in future, in order to find a sustainable balance.

2.1 The definition of the faculty foundation course

The architecture faculty foundation course is an essential part of the academic induction to facilitate the transition from secondary school to university education. The course aims to provide a common disciplinary foundation and learning experience for the undergraduates, and to guide them towards research fields that are closely related with their professional interests. These courses focus on the basic knowledge and core skills of the architecture discipline, which shall be mastered by undergraduates in Faculty of Architecture.

2.2 Challenge and methodologies

Landscape architecture faces all kinds of challenges in the education of sustainable development and built environment. The city is hugely complex and its issues are so interwoven that it is impossible for students or practitioners to fully comprehend sustainable development and built environment issues. Top-down developmental approaches tend to be widely adaptable but lack in flexibility and relevance, whereas in bottom-up developmental approaches, the individual are unable to make a substantive difference due to the limits of individual ability. Therefore, in the practice of teaching and research, we directed that “Contextualizing the Ecological Footprint in Hong Kong” research be limited to the specific issue of the site, rather than the entirety of the city.

2.3 Teaching structure

In addition to two-class period for lectures and one

① The data is from Hong Kong Ecological Footprint Report 2008: Living Beyond Our Means, 2008.

② The data is from The United Nations Food and Agriculture Organization Global Report, February 2010.

为期6周、每周1课时的辅导课程。课程中由辅导老师对同一场地的5组不同议题的学生小组工作提出批判性建议。该课程通过鼓励学生学习 加绘图法的基本原理、讨论场地调研与数据分析的阶段性成果，以训练学生的协同工作和语言表达能力。

学期末，教学团队根据议题将40个小组的研究成果分为5组进行汇报（图2），使相同议题下针对不同场地开展研究的小组有机会听取他人的研究思路，并进行相互讨论。此外，还邀请其他领域的专家对各组学生探索问题的角度和逻辑提出批判性意见，以帮助学生形成建立可靠论据的习惯。

3 “香港生态足迹的背景分析”的研究过程

课程将建 学院168名一年级本科生分为40个小组，每个小组分别选取1个议题（共5个议题），对位于香港的一处指定场地（共8处）进行现场调查、测量、数据收集，从而详尽地了解与“生态足迹”相关的城市环境中的物理边界，最终通过 加绘图和论文的形式准确地表达物理边界和生态足迹之间的关系。

3.1 研究议题

教学团队选取了决定城市生态足迹范围的5个因素

作为研究议题：能源、食物、人口、废弃物和水。每个小组需要选择相对应的一种议题颜色（黄色、橙色、绿色、红色和蓝色）并使用不同粗细和深浅的线型来进行图分析，以上要求有助于培养学生言简意赅的表达能力。

3.2 研究场地

研究场地包括金钟、鸭脷洲、红磡、九龙湾、旺角、沙田、天水围和油塘，每个场地的尺寸均为1 500m × 1 200m（图3）。教学团队还从城市和文化背景的角度来说明场地的研究价值和特殊性。例如，鸭脷洲是位于香港岛南端的一个岛屿，几乎可被视为一个独立的社区。鸭脷洲凭借其1.4km²的面积容纳了超过86 000的人口，是世界上人口密度最高的岛屿。此外，鸭脷洲在明代地图上被标记为“香港村”，被公认为是香港名称的起源。

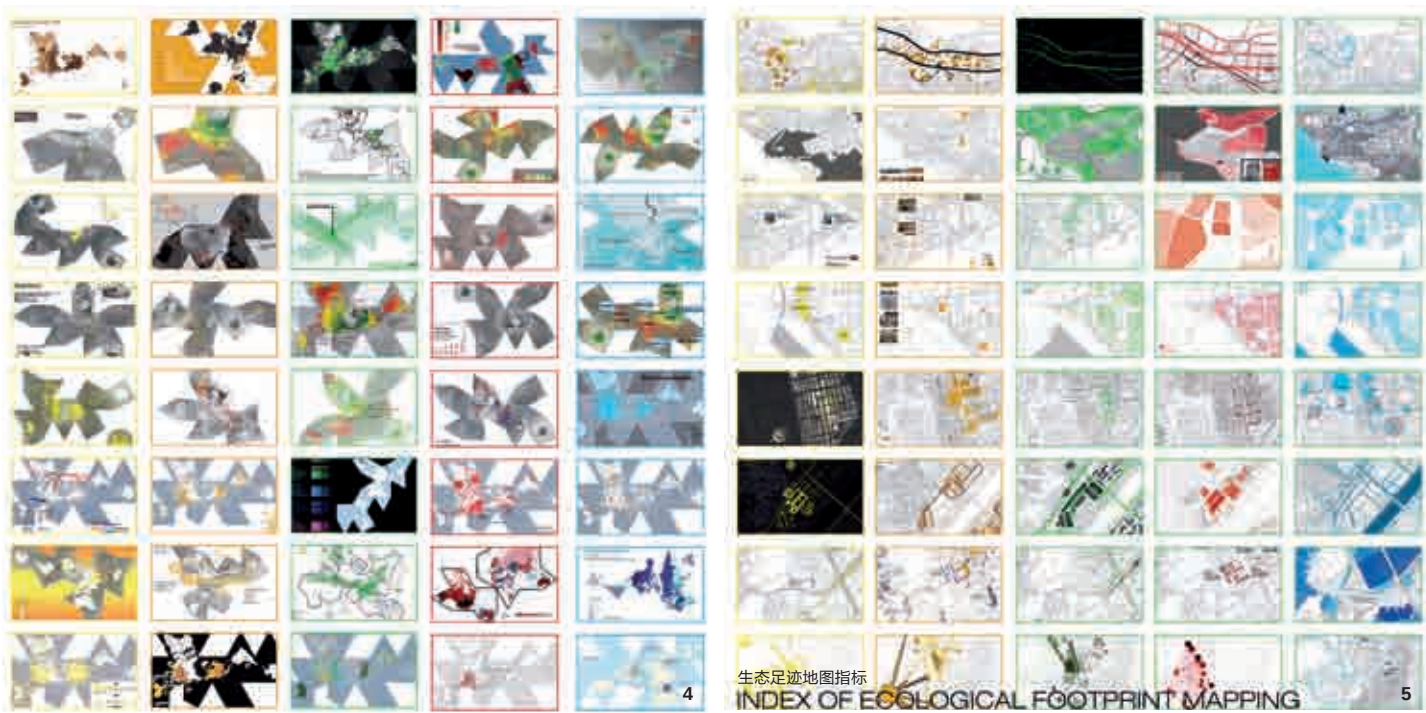
3.3 研究成果

每个小组的研究成果包括针对一个议题完成两种不同尺度的 图分析，即全球尺度的“戴马克松地图”③（图4）和场地尺度的“生态足迹地图”（图5）。

虽然研究项目的场地、议题和表达方式具有相似性，但由于各个小组的兴趣和研究方法千差万别，所以

③ 由建 师巴克明斯特·富勒绘制的戴马克松地图是对于其20世纪40年代进行的全球资源分布研究的一种回应。该地图能够减少墨卡托投影地图中常常出现的陆地地块失真现象。戴马克松地图拥有14个板块，这些板块能够被重新排布。

3. 项目的研究场地为 8个具有代表性的香港城市社区。
4. 40个子研究课题的戴马克松地图
5. 40个子研究课题的生态足迹地图
3. The study sites are eight representative urban neighbourhoods in Hong Kong.
4. Dymaxion Map
5. Ecological Footprint Map



tutorial class period per week, the teaching team set a guidance curriculum that lasted 6 weeks and one class period a week for “Contextualizing the Ecological Footprint in Hong Kong”. During the course, tutors provided critical suggestions to students’ group work for five different topics relating to the same site. The course aimed to hone students’ teamwork and language abilities by encouraging them to learn the basic principles of mapping overlaps and discussion of initial results of site surveys and data analysis.

At the end of the term, based on the topic, the 40 groups were divided into five topic groups to make presentations (Fig. 2). As a result, different groups researching the subject at different sites had an opportunity to learn and discuss each other’s research ideas. Outside professionals were invited to critically respond to students’ research perspective and logic to help develop a habit of establishing rational arguments.

3 Research Process for “Contextualizing the Ecological Footprint in Hong Kong”

The 168 first-year undergraduates were divided into

40 groups to investigate eight sites and five topics in Hong Kong. Students were asked to develop a detailed understanding of the physical boundary of the built environment in relationship to the concept of an “ecological footprint” through on-site investigation, survey, and data collection. Finally, the students were asked to accurately express the relationships between the physical and ecological footprint through mapping and thesis.

3.1 Study topics

Five factors that determine the size of a city’s ecological footprint were selected as the study topics: energy, food, people, waste and water. Each group was required to present their research in one theme color (yellow, orange, green, red, and blue), and to use lines of different thickness and concentration to complete mapping analysis. The above requirements helped students use concise and accurate language.

3.2 Study sites

The study sites were Admiralty, Ap Lei Chau, Hung

这些项目的研究过程与成果也不尽相同。在此，我们针对每个议题选取了一个小组方案来进一步展示“香港生态足迹的背景分析”的研究成果。

郑德熙、关朗然、彭天睿、严劭敏（2013），旺角能源足迹：电子广告牌的能源消耗

该能源足迹项目展示了旺角地区不同类型的电子广告牌的位置，不同深浅的黄色用于表明广告牌在该区内的密度，电子广告牌主要集中在西洋菜街南与弥敦道（图6）。与此同时，在沿广东道及深圳路周围的街市区域则很少出现广告牌。

从全球范围来看，戴马克松地图显示了2013年世界各地的能源消耗情况（图7）。地图上不同的颜色代表不同的人均能源消耗模式和人均单位油当量，最浅和最深的颜色分别对应最高和最低的能源消耗。如图所示，浅色区域大多出现在发达国家，特别是在北半球和北极附近的国家。

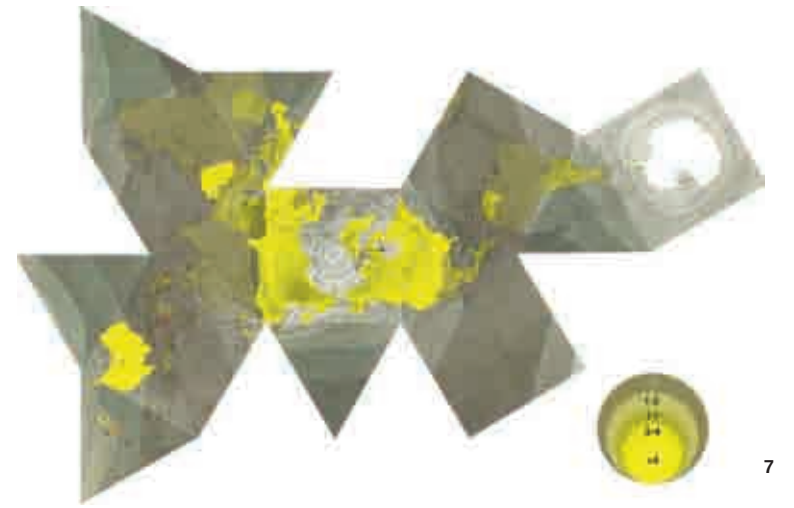
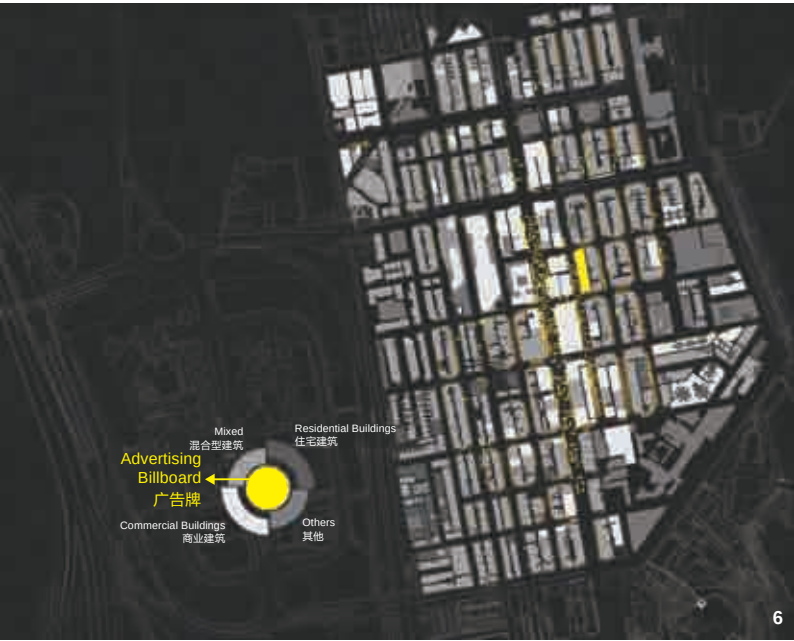
范明嘉（音译）、林楚燕、罗慧贤、李梅磬（2013），沙田食物研究：食物交换

食物是与人们生活息息相关的、重要的日常问题，其来源一般分为进口和自产自销两种。根据该组学生的初步研究，由于沙田区域内的耕地十分有限，该地区的食物主要依赖于进口。因此，他们将研究重心放在人们日常所需的食物来源之上。

该组学生对从超市和菜市场——沙田地区的两种主要的食物配送方式——所收集的数据进行了分析，并采用图示的方式进行表达。沙田全区域尺度的图显示出场地范围内各大超市和菜市场的位置，不同粗细的线条分别代表超市供货链和菜市场的食物运输路线（图8）。

陈乐铭、张嘉伟、谢浩然、蔡师培、李健豪（2013），油塘人口研究：消费足迹背后的生态足迹

在香港，购买商品和务已经成为日常生活的一部分。在本组的研究场地油塘，消费场所非常密集，主要集中在三个区域，其中较奢华的商品则集中在新开的购物中心。根据该组学生的观察，该区域的消费密度非常高，在高峰时段每5分钟约有300人进出商场。另一方面，调查还发现油塘区内的大部分本地居民在消费时主



要依靠地铁出行。为展示以上调查结果，该组学生对消费场所的位置、消费人群的流线和土地租金等情况进行了记录，采用图的方式展示出不同社会人群之间的消费关系（图9）。

本项目中，小组成员分别对消费者和生产者在每一笔消费中所涉及到的物理边界和生态足迹进行了对比。作为消费者，我们往往会过滤掉生产带来的生态足迹影响，但事实上，高消费会对环境产生影响。可持续发展需要理性和合理的消费，而这一切应从我们每一个消费者做起。

- 旺角地区不同类型的电子广告牌分布图
- 戴马克松地图所显示的世界能源消耗分布地图，不同的颜色代表人均能源消费量（吨/人）。
- 沙田地区各大超市和菜市场的位置分布和食物来源
- The distribution diagram of different types of advertisement billboards in Mong Kok.
- The Dymaxion Map shows the distribution of energy consumption around the world. Different colours in the map symbolize various energy consumption patterns per capita in the unit of tons oil equivalent per capita.
- The locations of the major supermarkets and wet markets and the routes of food delivery in Sha Tin.

Hom, Kowloon Bay, Mong Kok, Sha Tin, Tim Shui WAI, and Yau Tong (each site was of equivalent in land are, approx. 1 500 m × 1 200 m, Fig. 3). The teaching team also investigated the urban and cultural contexts of the selected sites in Hong Kong to illustrate why they were valuable and important to be studied. For example, Ap Lei Chau is a quintessential urban island, located just of the southwestern edge of Hong Kong Island, almost like an independent community. With an area of just 1.4 km2 and a population of over 86,000, it is the most densely populated island in the world. In the Ming Dynasty map, Ap Lei Chau was marked as “Hong Kong Village” — this is widely considered to be the origin of the name Hong Kong.

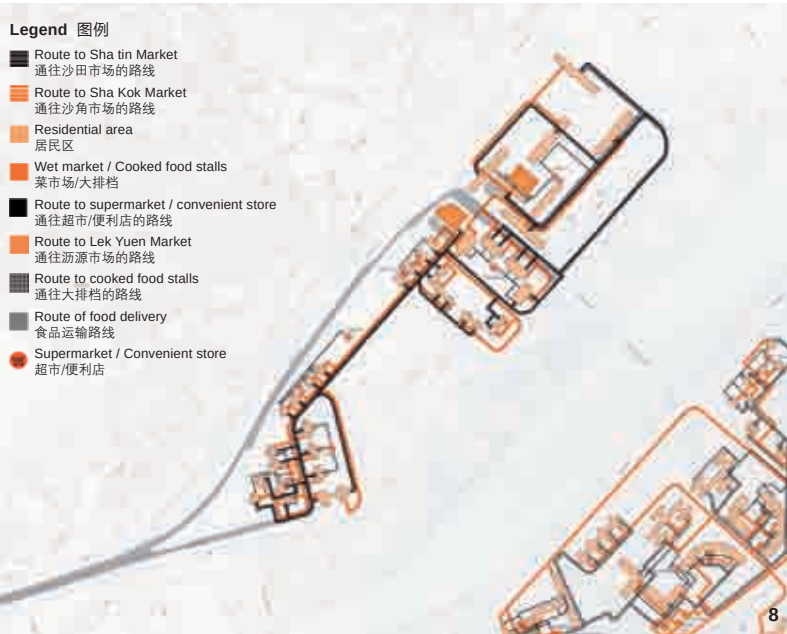
3.3 Study outputs

The study outputs of each topic group included mapping analysis of two different scales: the first at global scale — the Dymaxion Map® (Fig. 4) and the second at site scale — the Ecological Footprint Map (Fig. 5).

Although the student groups shared similar sites, topics, and presentation formats, the projects were still based on the varying interests and approaches of each group, and the research procedures and outputs are unique for each group. The following examples (one from each topic) provide some insight into the study outputs of this project.

Ivan Cheng, Tom Kwan, Jonathan Pang, Natalie Yim (2013), Energy in Mong Kok: how much does advertisement cost?

This project shows the location of different types of advertisement billboards in Mong Kok. The concentration of yellow demonstrates the density of billboards within



the district, mostly concentrated along commercial streets in Sai Yeung Choi Street South and Nathan Road (Fig. 6). Meanwhile, advertising boards are rarely seen around wet markets located along Canton Road and Shenzhen Road.

From a global perspective, the dymaxion map explains the distribution of energy consumption around the world in 2013 (Fig.7). Different colors in the map symbolize various energy consumption patterns per capita in tons of oil equivalent per capita units. The brightest color represents highest energy consumption while the darkest color equals to the lowest energy consumption. As shown in the map, the brightest areas are mostly in developed countries, especially concentrated in the northern hemisphere, as well as countries that are close to North Pole.

Mingjia Fan, Cho Yin Lam, Wai Yin Law, Meiqing Li (2013), Food in Sha Tin: food commute

Food is an essential daily issue that everyone is concerned about, the source of which is either imported or self-sustained. According to their research, since the farmland of the territory is quite limited, food has to be imported. Therefore, they emphasized the origins of food

③ Drawn by architect Buckminster Fuller, the Dymaxion World Map was made in response to Fuller's research on global resource distribution in the 1940s. This map reduces the distortion of landmasses, which are common in the traditional Mercator Projection maps. The Dymaxion Map has 14 parts, which can be rearranged.

陈小鸥、何泳婕、吴劭枫、夏成惟（2013），旺角废弃物研究：市政废弃物

市废弃物的研究始于追踪旺角区内的固体废弃物，特别是行人丢弃的废弃物。本组学生将区内垃圾箱的位置标记在图上，其中部分位置纪录了人们丢弃垃圾的频率与次数（图10）。据观察，区内行人产生的废弃物分布与旺角的地形和某些特征密切相关。例如，位于街边小食亭附近的垃圾箱内的废物收集速度明显较高。此外，该小组还对普通垃圾箱和可回收垃圾箱中的废弃物数据进行了对比，并指出在人们产生的废弃物总量中，可回收垃圾占垃圾总量的比例很低。这反映了一种街头小吃文化以及随之而来的对不可回收餐具的使用。而提高垃圾的回收率可以确保降低生态足迹水平。

戴马克松地图显示了废弃物在全球范围内的流动。香港在垃圾的进出口贸易中扮演着转运站的角色。可回收垃圾通过香港进行转运，然而香港本身却不是可回收垃圾的收集站点。由此可见，减少垃圾是减小生态足迹的一种有效的方式。

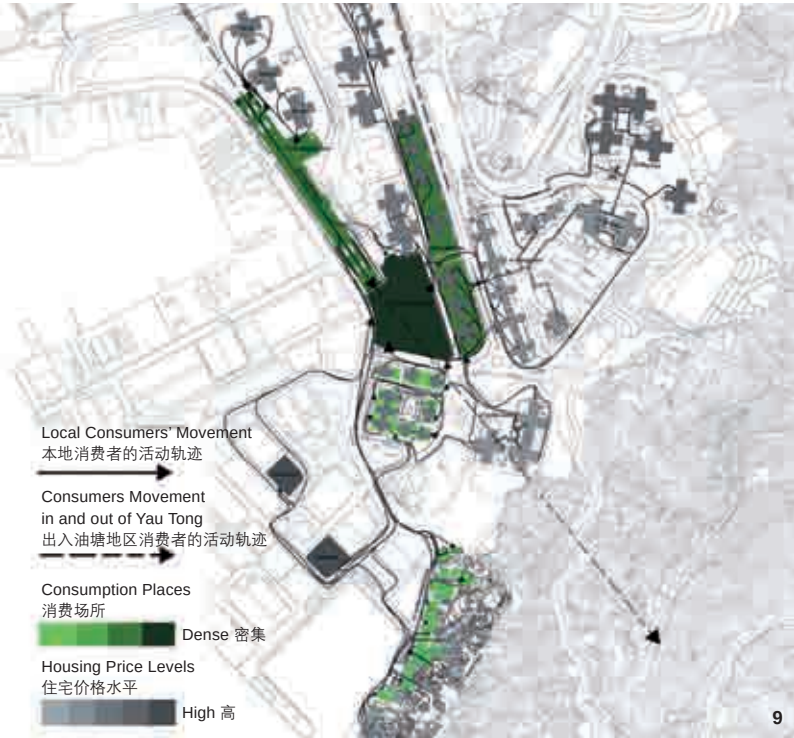
郑嘉欣、何经纶、吴燕瑜、杨希（2013），旺角用水研究：公共与私有厕所的布设对比

厕所消耗了城市日常生活中的大量水资源，该组学生的研究旨在对旺角区内可达的公共厕所进行探讨。通过对由政府管理的公共厕所和由私营企业管理的位于大型商场内的地面层厕所的使用频率与用水量进行比较，发现虽然公共厕所的数量远超出商场内地面层厕所的数量，但是地面层厕所的日平均使用频率远远大于公共厕所的使用频率。

4 结语

城市“生态足迹”研究由40个子研究课题组成，集中地介绍了城市环境的可持续发展。本研究通过场地调研、信息收集处理和图像表达等方式向学生传达正确的研究方法和过程，鼓励他们反复地观察和讨论，采用简明的图形设计将研究结果进行表达。

香港大学园境建筑学部仍在不断探索和完善建筑学院的基础核心课程。在过去的两年内，建筑学院的一年级本科生获得了学习与专业紧密相关的学科知识和专业技能的机会。该课程鼓励学生们不断思考有关城市环境和可持续发展的问题，培养他们的独立思考和团队合作



能力。学生们可以将上述收获带入接下来3年的本科学习，乃至未来的职业发展中去。

一本展示香港生态足迹研究成果的学生课程出版物——《香港生态足迹的背景分析》（图11）已于2013年7月出版。此外，该项目入选了“2013年深圳·香港城市\建双城双年展”，通过展览将教学理念和学生成果与专业人士和大众进行交流（图12）。LAF

致谢

本文的图片引用了香港大学园境建筑学部开设的建筑学院本科生一年级基础核心课程（ARCH1028建筑环境的可持续发展）中的成果。该课程2012年秋季由彭文辉和张谦协调，彭文辉和洛瑞·吉布斯讲授，并得到了马克西姆·狄克丁、齐帆和安德鲁·托兰的协助。

- 9. 油塘地区的消费场所分布、消费人群流线和土地租金示意图
- 10. 旺角地区垃圾箱分布图和垃圾回收情况
- 11. 《香港生态足迹的背景分析》出版物
- 9. The diagram of consumption places, consumer flows and levels of land rent in Yau Tong.
- 10. The distribution of rubbish bins and garbage collection in Mong Kok.
- 11. The publication of Contextualizing the Ecological Footprint in Hong Kong

for daily supply of people.

Their analysis of the data is shown by mappings collected through observation and interview of two major types of food distribution in Sha Tin — supermarkets and wet markets. The Sha Tin scale map indicates the major supermarkets and wet markets on site. Lines of different patterns show the routes of food delivery to supermarket chains and wet markets, respectively (Fig. 8).

Lok Ming Chan, Ka Wai Cheung, Ho Yin Tse, Sze Pui Tsoi, Kin Ho Lee (2013), People in Yau Tong: ecological footprint behind consumption footprint

It has become our daily habit to purchase goods and services in Hong Kong. In Yau Tong, the consumption places are quite focused, mainly located in three areas, where the more luxurious products are sold in the newly opened shopping center. According to the students’ observations, approximately 300 people go in and out of this mall every five minutes during peak hours, which demonstrated the high density of consumption. On the other hand, they noted that a considerable portion of local residents go out of Yau Tong, mainly by MTR, to consume. In order to present these observations, they decided to highlight the consumption places, consumer flow and rent prices on the local map and diagram to show consumption relation among different social classes (Fig. 9).

Through this project, this group also explored the difference between a consumer’s and a producer’s role in every expenditure, which relates to their physical boundary and ecological footprint. As consumers, we tend to filter out the ecological impacts of production, while in fact it is our high consumption that brings about impacts on the environment. Sustainability requires rational and reasonable consumption — all of which starts with us.

Xiaou Chen, Teresina Ho, Siu Fung Ng, Cheng Wei Xia (2013), Waste in Mong Kok: municipal waste

This project tracked Mong Kok’s solid waste, specifically the trash disposed by pedestrians in the area. Rubbish bins were identified and mapped, with some having



- Legend 图例
- Waste collection 废弃物收集
 - Rubbish bin 垃圾箱
 - Rubbish bin with rate of waste disposal calculated 垃圾箱以及废弃物处理率
 - Refuse collection point 垃圾收集站
 - Recycle bin 可回收垃圾箱
 - Areas where wastes go to the same refuse collection point 废弃物垃圾收集站
- Rate of waste disposal 废弃物处理率
 - High (>2.7 pcs / min) 高 (>2.7 /分钟)
 - Average (1.4~2.7 pcs / min) 中 (1.4 2.7 /分钟)
 - Low (<1.4 pcs / min) 低 (<1.4 /分钟)
- Relative pedestrian flow 相对人流
 - High 高
 - Average 平均值
 - Below average 低于平均值
 - Low 低
- Others 其他
 - Food kiosks 小吃店
 - Refer to diagram for detailed information 详细信息请参考图片
 - Spots with pedestrian flow calculated* 人流量计算点
 - = 10 people / min =10人/分钟
 - * number of pedestrians passing by a fixed circular spot of 1.5 m diameter per minute 1.5m直径范围内每分钟路过某一指定地点的行人数量



the rate and time of people throwing rubbish (Fig. 10). It was observed that the distribution of trash closely related to the topography and characteristics of Mong Kok. For example, the speed of waste collection near the food kiosk was significantly high. From the map and the other diagrams, they compared the data on trash bins and recycling bins, and noted the small volume of waste recycling compared with the total volume of waste produced. This reflected the culture of street snacking with unrecyclable utensils. Efficiency in recycling waste is needed to maintain a low ecological footprint.

The world map shows the flow of waste on a global scale. Hong Kong plays a role as the transitional point which imports and exports large amount of waste. Recyclable waste is transported through Hong Kong, but the territory itself is not an active location for recycling. Reduction of waste seems to be a significant way to reduce our ecological footprint.

Katy Cheng, Joshua Ho, Ethel Ng, Hilary Yeung (2013), Water in Mong Kok: toilet placement — public vs. private

This project investigated publicly accessible toilets in Mong Kok which account for a significant volume of the water consumed in the district. By comparing the usage of public toilets, managed by the government, and ground level toilets located in major malls, managed by private companies, the relationship of toilet usage and water consumption was observed. Although the number of public toilets is greater than those toilets in the mall, the daily usage of toilets in the malls was much greater.

4 Summary

The Urban Ecological Footprint study composed 40 such pieces of research, which collectively give an introduction of sustainable development in the urban environment. This study taught students formal methods and procedures of research through site investigation, information collection, and image expression. Students were encouraged to observe and discuss repeatedly, and to use concise graphic design to

represent their research outputs.

The Division of Landscape Architecture continues to explore and perfect the faculty foundation course. Over the past two years, the first-year undergraduates have had the opportunity to learn subject knowledge and professional skills that are closely related with their professional interests. The course encouraged students to continue to think about questions of the urban environment and sustainable development, as well as cultivating their abilities for independent thinking and teamwork. Students will bring these new skills into the next three years of their undergraduate study and hopefully into future career development.

An in-class publication — *Contextualizing the Ecological Footprint in Hong Kong* (published July 2013) summarized the course content and showcased the best student coursework and final projects (Fig. 11). A further component of the course was to bring the work to both professional and public audiences via an exhibition at the “2013 Bi-City Biennale of Urbanism \ Architecture (Hong Kong)” (Fig. 12). **LAF**

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12. 这一研究在“2013年深港城市\建筑双城双年展”上的展出情况。
12. The exhibition of this study in “2013 Bi-City Biennale of Urbanism \ Architecture (Hong Kong)”.

