

University Campus as Creative Hub Critical to City Internal Expansion

1. Introduction

In the US, there are more than 4,000 higher education institutions with 18 million students. The combined annual expenditures exceed \$370 billion in 2007, which is about 2.8% of the US' GDP, higher than the percentage of GDP spent on education at this level in any other G-8 countries, which ranged from 0.9% to 1.4% (US Department of Education, 2007). The economic impact of higher education in the US is greater than the GDP of all but 25 nations in the world (World Bank, 2008).

Universities are valuable assets of cities. They are places where innovative brain power and talent gather, and where advanced R&D capacity and interdisciplinary collaboration opportunities concentrate. Furthermore, they facilitate incubators for high-tech enterprises that have the capacity or potential to stimulate and enhance economic growth. Compared to the number of studies on the economic value and spillover benefits of higher education (Bank Boston, 1997; Henderson, 2001; Rosan, 2002), there are few discussions on the role of university campus in cities' inner development, though urban neighborhoods surrounding universities tend to feature high-tech clusters and a rich variety of places and active cultural life that are attractive and vibrant.

On the other hand, many universities around the world are now undertaking new constructions, moving from urban to suburban locations or opening up new suburban campuses to improve their facilities and expand their campuses, with the intention to gain national and international standing and attract more students and top faculty. This recent trend of suburban relocation of university campuses is weakening the critical contribution of universities and university campuses on economy, urban development and urban life of cities. The relocation of university campuses to suburban areas has an impact on inner city developments as severe as the commercial and industrial functions' suburban relocation has.

While in China, the fiscal spending on education in 2006 reached 634.8 billion yuan (87 billion US dollars), a record in terms of the percentage of GDP at 3.01% (Xinhuanet, 2008). Though there is no detailed data for expenditure at the higher education level, while according to statistics that 21.9% of the total education expenditure in 2005 was on higher education (Ji, 2006), the annual expenditure at higher education in China is about 20 billion US dollars (0.66% of China's GDP). It is quite low compared to the US and other developed nations. Furthermore, there are 20 million students in higher education institutions, more than any other nations in the world. However, a recent report in *Science*, titled "Chinese Universities: Gunning for Ivy League" (Xin and Normile 2008), reported the ambition of Chinese universities to become world-class educational institutions. Most Chinese universities are undertaking new constructions and expansion. Facing the shortage of funds, increasing number of students and growing value of the land of their urban locations, many Chinese universities chose to relocate their campus to suburban areas where the land cost is lower and sold the campus land inner city for capital to support future development. Opening new suburban campuses to expand the scale of university campuses is also a common strategy. The relocation and expansion of many Chinese universities are invading

agriculture land and consuming large quantity of energy and materials, which have resulted in huge negative environmental impact. Incurring these environmental costs is embarrassing for universities, since the notion of sustainability has been highly recognized in education and emphasized by curricula. With their multidisciplinary brainpower, universities, more than other institutions, are expected to be incubators and test beds for the drive toward sustainability.

2. University Campus as Test Bed under Sustainable Campus Initiative

Promoting integrated sustainable planning and design for campus is an important mission of universities, who are educating future professionals, leaders, consumers and tax payers. A university campus is a condensed setting, with buildings and infrastructure that support the day-to-day life of hundreds to thousands of students, faculty, and staff. Universities dedicated to playing a leading role in the effort towards sustainability can and should use the opportunity to influence generations with the responsible way to design, build and operate their buildings and laboratories. A sustainable campus is not only a university's response to global climate change by minimizing resources consumption and environmental impact, but also a collective effort of tremendous educational and demonstrative value through research and academic activities. Several leading universities in the US and Europe have already taken on the challenge. Sustainable campus initiatives have been launched by individual universities or on a regional or global scale to align the endeavor from multiple universities, e.g. the global sustainable campus initiative led by Zurich ETH. Sustainable campus is becoming the necessary agenda for world class universities around the world. University campuses are used as test beds to test new ideas from the synergic interdisciplinary research to improve the energy and environmental performance of universities, and to inform education. Among the endeavors, some Middle-East universities are taking more aggressively effort to reduce the footprint of campuses and aiming at zero emission. In this paper, we regard inner city development of university campus an important strategy of the sustainable campus effort.

In contrast, Chinese universities have developed and expanded rapidly in the past twenty years with significant environmental and social impact, despite increasing scholarly attention in China to issues of sustainability. How universities respond to the perceived need for rapid and large-scale expansion to attract the best talents is attracting increased attention both within China and outside. The Chinese Ministry of Education has already identified building sustainable university campuses as a critical part of China's commitment to sustainability. The Vice Minister of the Chinese Ministry of Education and former president of Tongji University, Dr. Qidi Wu, emphasized this issue during the first Symposium for Sustainable Campus Initiative in China in 2007, which the active involvement of Chinese universities is critical.

3. Inner City Urban Development with Sustainable Campus

Campus expansion through suburban green field development and uncontrolled new construction is not sustainable. It is important to recognize the value of universities' city campus, especially when it comes to time of campus redevelopment. The "city internal expansion" of university campuses has demonstrated great success than suburban expansion.

3.1 Campus redevelopment as catalyst for inner city development: Case of Pittsburgh

Since 1970, Pittsburgh gradually transformed itself from an industrial city to a post-industrial city. However, in the global era, the city is losing businesses as well as losing population especially young graduates from the outstanding universities, such as Carnegie Mellon University and University of Pittsburgh, who could have contributed to the city or region's economy significantly. The local industries didn't benefit as much as they should from the leading researches in robotic, artificial intelligence and biotechnology in the universities, and were not able to achieve the status of the traditional industries in the history.

A city's magnetism is related to many performance aspects, from economic situation to social conditions, from physical environment to cultural atmosphere (Yang & Hua, 2004). As one of the strategies to improve competitiveness, many efforts were being made to improve the city's physical environment, to make it more efficient and more attractive. In Pittsburgh, there are mega-projects proposed recently, such as the landmark buildings to improve the city image, highway and mass transit systems to improve city efficient and public parks to improve urban environment. There are also new or retrofit projects of office buildings, residential buildings and cultural facilities. The existence and redevelopment of universities urban campuses also played an important role in improving the city's physical environment, and the related economic, social and cultural environment. It should also be pointed out that urban physical environment should fit the taste of creative people, who are vital to the global competition between cities, for the reason that the competition between cities is decided by the gain of creative people (Florida, 2004). And universities' urban campus can contribute to this aspect of the urban environment.

In Pittsburgh downtown, there are several universities, e.g., Point Park University, Duquesne University and in Oakland, which is only 5 miles from downtown, there are Pittsburgh University and Carnegie Mellon University which is a world class research university. Pittsburgh's urban sprawl in the last decade is driving population and industries out of city to suburban area. While in recent years, collaborative efforts are established among universities, city government, local communities and Pittsburgh-based foundations to redevelopment the inner city, especially the neighborhoods around university campuses to create attractive atmosphere for both local residents and tourists.

The campus development plan of Point Park University (PPU) in downtown Pittsburgh is a good example among the efforts in inner city redevelopment to provide cultural and civil atmosphere to attract young talents. In 2008, PPU unveiled an ambitious \$210 million plan to overhaul its Downtown Pittsburgh campus. "Our vision is to be one of America's most dynamic private universities. We have the opportunity to create an urban campus that pulls everything together using Wood Street as a significant artery," stated PPU's president Paul Hennigan, "Cutting-edge universities are paying attention to their environs and working with communities and cities" (Baron, 2008). Facing the financial crisis in mid-1990s when Pittsburgh's economy had not recovered from the collapse of its steel industry, PPU sold its assets to Duquesne University to avoid bankruptcy. As many downtown business moved out of the city to suburban areas, PPU struggled to stay in. After recovered from financial difficulties, in the current campus plan, PPU has been acquiring more buildings in downtown Pittsburgh and the cultural district to meet the increasing enrollment. Now, PPU sees the wonderful opportunity to integrate the city cultural district assets with its world-class

performing arts education. PPU is taking the leading role in creating a university district downtown together with the cultural district that is attractive to both locals and tourists.

3.2 Brownfield development for university and research institute campuses

Facing the need of campus expansion of universities and its pressure on sustainability, inner city brownfield development is an alternative for universities and for cities to fight sprawl. Successful cases include Pittsburgh, US, which has recognized the importance of adjacency between main university campus and new R&D institutes through urban brownfield redevelopment efforts; and the robotic city development of Osaka, Japan, as a successful urban redevelopment collaboration case between city government and universities by locating major research centers in downtown brownfield areas.

3.2.1 Carnegie Mellon Robotic School

Carnegie Mellon University (CMU) is located in an urban neighborhood, Oakland, close to downtown Pittsburgh. CMU campus is too small to meet the increasing need for development of its world-leading robotic research and IT research. Instead of building new campus in suburban green field of Pittsburgh, which requires low land cost and tax incentives, CMU is intentionally seeking for possibilities to use adjacent abandoned brownfield to build its new research centers, in Hazelwood district, which was a former industrial site. CMU's Field Robotics Center is currently the first occupant on the site. The Robotics Center was housed in a renovated locomotive roundhouse, along with a recent CMU spin-off company (GTECH Strategies Inc.). Portions of the heavily contaminated land are used as a testing site for robotic soil remediation research and automated vehicular navigation. These are only a few initial steps of urban brownfield redevelopment to fulfill university campus expansion needs.

3.2.2 Osaka Umeda development

In the inner city of Osaka, the Umeda area is the largest transportation terminal of Western Japan, currently serving some 2.5 million passengers daily via seven railway stations. It is a typical downtown area and business district of Osaka. However, the adjacent Umeda freight station occupying a 24-ha area, has made the inner city of Osaka a dispatched urban area. With the restructuring of the Kokutetsu in 1987, it was the national policy to relocate the Umeda Freight Station and vacate and sell the lot, opening channels to brownfield development. In the Osaka Kitaumeda Master Development Plan, five principles have been identified (Inoue, 2006):

1. *Build a world class gateway.*
2. *Develop the area for excitement and interaction.*
3. *Create a center for intellectual creativity activities (the knowledge-capital).*
4. *Develop the area as a coordinated effort between public and private sectors.*
5. *Create an environment plush with greenery and water resources.*

It is a core project in the creation of a "Greater Umeda" and is having a major impact on the development of nearby areas. It is envisioned as a new center for leading the rebirth of not only Osaka but the Kansai as a whole.

The idea of entertainment axis is crucial to the first stage of development as the link of existing city center of Osaka JR station to the new development area. For the first stage of development, the concept of "Knowledge Capital" was introduced to create a new urban

center for intellectual and creative activities with the R&D center of IT technologies and robotics. There will be spaces of “transformation of information” as the showrooms for transfer of new information, “Creation” as the studios for collaboration among different fields, “Exhibition” as the Grand Bazaar for new product showcase and trading, and “Interaction” as the labs for the creation of new industries. Currently, there are 27 research institutions involved in Robotic-related IT technologies in the big Osaka region, Kansai, which will use the “Knowledge Capital” as their downtown labs (Robert Technology Osaka, 2003). The brownfield development featuring the cluster of research institutes is an important move made by Osaka for the long term goal to develop its robotic industry.

4. Discussion

Universities do more than merely education. As knowledge creation hubs, they could stimulate local industry, especially high-tech industries; and have the potential to contribute to the attraction and retention of brainpower, or in other words, the group of talented people who really matter for cities’ economic strength. Their value as economic engines has been recognized by many cities. On the other hand, the examples of universities and research institutes in Pittsburgh and Osaka demonstrated another aspect of universities’ spillover value in cities’ inner development and sustainability. The critical value of universities inner city campus to the internal expansion of cities needs to be recognized.

4.1 University campus as a stage in city

A University campus in inner city can share with the city the functions of culture, R&D, business and even recreation to provide an integrated and vibrant city-university neighborhood. It can become a stage in city constantly with lots of activities going on, which is attractive to both locals and visitors. The interwoven campus with city life could bring to city the magnetism to attract and retain talents who are interested in the unique cultural and innovative atmosphere. The Osaka case showed that the research institutes’ inner city development can give the city new identity and image, sometimes even more effective and stimulating than new stadium and industrial park, which are believed by many to make cities more attractive to both people and industry.

4.2 Rediscover universities’ spillover value in inner city

The spillover value of universities not only lies in the fact that they often house high-tech incubators that could possibly provide “fuel” to cities’ and regions’ economic development. The physical campuses in inner cities are providing both the space and the atmosphere for a highly interactive urban environment in and around those campuses. In certain sense, it is also a cost-effective way to improve the city neighborhoods around the campuses both economically and environmentally, by keeping universities in inner city and having city neighborhoods interact with campuses. It is the intension of this paper to open a new line of policy agenda discussion about the role of universities in urban redevelopment and urban expansion.

4.3 Implications for Chinese university campus development

Based on the cases presented, it is necessary to rethinking the moves of suburban relocation and uncontrolled expansion of Chinese universities, for the aforesaid reasons. In addition, from sustainable development point of view, the implication of promoting universities’ inner city development is significant for land use conservation, energy and

materials conservation and the overall environmental impact of university campuses, considering the huge amount of universities in China, and the dramatic speed of relocation and expansion of their campuses. For achieving the sustainable campus goal and the broader effort toward a low carbon society, the internal expansion alternative is worthy of getting serious consideration.

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Xiaodi Yang, Ying Hua, University Campus as Creative Hub Critical to City Internal Expansion
44th ISOCARP Congress 2008

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