PRODUCTIVE LANDSCAPE:
REVITALIZING A POST-INDUSTRIAL DISTRICT WITH SLOW ECONOMY

BY
XIN WU

THESIS
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Adviser:
Professor Margaret Elen Deming
ABSTRACT

Increasingly, the productive use of land is being demanded by developing cities because of the continuous influx of businesses and population. Meanwhile, because of the relocation of many industries to outlying districts, for the same reason, post-industrial sites near the centers of growing cities are emerging as a highly valuable land resource. The integration of “productivity” into post-industrial sites is important to the practice of landscape architecture professionals. In some developing cities, like Guangzhou China, reprogramming post-industrial sites for new productive purposes can be problematic because of contradictory conditions: theses large cities are aging but also still expanding. In addition, Guangzhou requires productive landscape design that suits the city’s needs to expand both its cultural and economic values. This thesis proposes urban landscape design for the site of the former Guangzhou Iron and Steel Factory. Proposed design focuses first on the preservation of cultural value, and the integration of economic productivity that is most appropriate to these cultural activities. This can be a feasible action because there are precedential landscape projects with the similar goal that have been built, such as Landscape Park at Duisburg-Nord in Germany and the Highline in New York. But in the other hand it is theoretical because this kind of reprogramming and integration has not yet been fully implemented in developing cities like Guangzhou. This thesis should provide an example for how potential reprogramming might be approached from a cultural and historical perspective, for other post-industrial site in older and yet still developing cities.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PROJECT INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>BACKGROUND</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2.1 Design in Post-Industrial Sites</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2.2 Post-Industrial Era in Developing Countries</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2.3 Post-Industrial City Guangzhou, China</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2.4 Productive Landscape in Post-Industrial District in Guangzhou</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>THEORETICAL FRAMEWORK</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>3.1 Literature Review in Post-Industrial Landscape</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>3.2 Slow Economy and Productive Landscape</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>3.3 Design Framework and Principle</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>URBAN DESIGN RESEARCH AND METHOD</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>4.1 New Economic Zone Circulation Analysis – Finding Opportunities</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>4.2 Spatial Analysis of Urban Texture</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>DESIGN SOLUTIONS</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>5.1 Solutions</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>5.2 Master Plan</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>5.3 Design Details</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>5.4 Feasibility</td>
<td>55</td>
</tr>
<tr>
<td>6</td>
<td>CONCLUSIONS</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>LITERATURE CITED</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>IMAGES CITED</td>
<td>60</td>
</tr>
</tbody>
</table>
Chapter 1  PROJECT INTRODUCTION

The task of my thesis is to reprogram a post-industrial site in Guangzhou City, China, with three main purposes: ‘reuse’, ‘produce’ and ‘remember’. This site was originally occupied by the Guangzhou Iron and Steel Factory. The factory, together with most other industries in that area, is being relocated because of an economic zone development plan being put forward by the local government. To avoid urban vacancy and prepare for the potential shortage of land in a fast growing city, the best approach is to re-use the site. In particular, to re-use the site for productive purpose will make the greatest benefit from the land and introduce appropriate functions that fully realize the interconnections with the surroundings. Finally, to remember may help to protect the fading of traditional culture from the site, and to regenerate new cultural connections.

The difficulties in this task lie in the unique condition of an old but still-growing city. First, the fixed old urban form conflicts with the needs for new urban development. Second, the city’s traditional role and occupations in production have been underestimated, compared to the service industries and large corporations that are now gentrifying the original precincts of many small businesses that represent the character of the old city. The reasons for this underestimation largely come from the development of technology and the pursuit for efficiency and quantity in contemporary productions. Third, securing land for residences and services for immigrants who are seeking to work in the downtown area is an essential consideration for any land vacancies. Typically, vacancies within the city would always be considered for urban parks because the developed city downtown requires better quality living environment. However, in this
case, the need for more land around the city accelerates the ever-expanding city edge, resulting in a vicious loop, and worsening the circulation within the city.

Confronting these difficulties, there are many opportunities to fulfill the three purposes (reuse, produce, remember). First, we can reuse the site with mixed uses, create a job hub in the site that corresponds with the economic zone development plan, and relieve the circulation tension as more and more immigrants are seeking for job opportunities. Second, introduce the concept of ‘slow economy’ into the potential productive landscape that would be designed in the site. ‘Slow economy’ obtains the value of traditional production in the city – flower, fish, bird, and tea production in free markets at the scale of villages. It will make use of the land within a dense populated zone, in a way that may be more conductive towards landscape and open space, rather than buildings and density. Third, provide connections not only physically, but also culturally, to bring together producers and consumers. In this case, this would include both original dwellers and the new working class.

The purpose of this thesis is to seek a new solution for this post-industrial site that is different from the precedents in western and developed cities, because of the distinct local conditions and different stages of development. And this new solution may be a useful reference for other aging cities that are now or will soon be undergoing a similar situation.
Chapter 2  BACKGROUND

2.1  Design in Post-Industrial Sites

Dealing with post-industrial sites is a continuous issue in both practical and academic sectors. Post-industrial parks became popular and entertaining since the end of the twentieth century when Landscape Park Duisburg-Nord (Figure 2.1) was under construction. The project brought up new thinking in designing a post-industrial site where preservation and entertainment and collaborate well together. Projects as such became landscape architecture projects because they concern the revision of outdoor environment as well as their response to human activities.

Figure 2.1 The night view at Landscape park Duisburg-Nord, Germany Condoros 2009

The term ‘post-industrial landscape’ is understood by most people to refer to landscape projects in abandoned post-industrial sites. These landscape design projects
can vary widely, depending on the type of the site – whether is a whole factory or a piece of abandoned object remained from the industry era; and the location of the site – whether it is located in rural areas or in the downtown of a city.

Another notable project designed by James Corner – the High Line (Figure 2.2) in New York City in Manhattan – is a strong example of post-industrial landscape project that differs from Landscape Park Duisburg-Nord. It is located in an area around an elevated railway track that was redeveloped into a new form of urban park in a dense district in lower Manhattan, New York (Highline, 2010). The former preserved a whole structure that stands out in the city, while the latter is designed to integrate into the urban public space. They both have important value in the field of landscape architecture.

The origin of these projects is the emergence of post-industrial sites. They appeared when most of the developed countries began to undergo the industrial transition in the mid-twentieth century – the decentralized stage of industrial
development (Waldheim 2006). The transition resulted from the replacement of aging industries, partly because of urban development pressures in the areas where the industries sat, and partly because technological development demanded upgrades from the aging industries. Under these circumstances, without leaving the abandoned industrial land next to a valuable urban district unused, government or urban developer would not hesitate to call for plans to re-function these sites.

While reusing or re-functioning post-industrial sites is absolutely necessary, the continued popularity of dealing with the problem by building urban parks reveals a complicated phenomenon in the design world. In some cases, this phenomenon provides benefits to the society by making an effort to revitalize the land and re-purpose the sites for recreational purposes. In other cases, this strategy might not be an efficient proposal due to the type of vacant land, its conditions, and the urban and social context of the post-industrial sites.

Post-industrial sites not only exist in post-industrial cities, there are plenty of them emerging in densely populated cities, even in growing cities. This is because industry in these cities is undergoing a shift, as manufacturing industries gradually move out of city downtowns, at the same time that other services and businesses are moving into it.
2.2 Post-Industrial Era in Developing Countries

Economically, while developed countries have already made great strides and reached their saturation before development in other countries was fully established, most of the developing countries are now expanding rapidly and always in need of new development plans and opportunities. But building post-industrial landscape parks is not always the first option in developing countries. For example, in China, a developer will usually take real-estate development into their first consideration, because of the enormous profit to be gained, as well as the pressing need for housing.

Urban development in China is seen as the urbanism of ambition (Campanella 2008). The country is willing and able to fulfill many new and ambitious projects. Chinese cities, as well as other developing and growing cities, are willing to be experimental fields because the opportunities are enormous. Their ability to recover from a failed project is also very high because of their growing economy and population. Given these experimental projects, landscape architects will have more chance to discover a refined way of dealing with post-industrial sites, other than the traditional ways of reclaiming vacant land. If the post-industrial site is situated in the heart area of a city, which is most of the cases in developing cities, the problem becomes quite complicated. Single-function public parks may no longer be the answer to the problem because they are not sufficient to fit the needs for the condensed land use and economic development. Reprogramming, rather than redesign, should be a better solution to these post-industrial sites. In developing countries, dealing with post-industrial landscape is really about dealing with lively new industries, since production activity continues and economic growth is still an essential criteria in the city’s development plan.
2.3 Post-Industrial City Guangzhou, China

2.3.1 Location

![Figure 2.3 Location of Guangzhou City in the Map of China](image)

The post-industrial district that is the subject of my study is located in Guangzhou City in Southern China, the Capital of Canton (Figure 2.3). Guangzhou is a city with a sub-tropical climate, which makes growing of perennial plants possible and profitable. The agricultural products are rich in this city especially for flower productions. There are famous nicknames for Guangzhou – the Flower City and the Wheat City – because of the abundant production of these goods. Guangzhou is also a port city: economic growth in China was largely dependent on coastal city ports in the old times (Tourism Administration, 2011). The location is beneficent to trading, industry development, military, and tourism.
2.3.2 New Economic Zone and Industry Relocation

Guangzhou is a city officially with over 10 million citizens and now still growing in both its population and economy (Statistical report, 2009). The solid area is the entire Guangzhou City and it connects the Pearl River Delta (Figure 2.4). It is close to the two famous cities that were once colonized – Hong Kong and Macau. The common ground of these cities is the pursuit of thriving economic growth.

Figure 2.4 Guangzhou and the adjacent cities
Currently, the local government has initiated a development plan for an economic zone on the west side of the city. The zone is located in the marginal area of the municipal city border, and will establish strong connections between Guangzhou and its adjacent city Foshan. The economic development plan causes relocation of the whole industrial hub that originated in the western part of Guangzhou. It provides great opportunities for urban development, both economical and environmental, and the pursuit of a higher quality of life. But this plan will also generate a giant vacancy in the city culture.

Figure 2.5 Property line of New Guangzhou Economic Zone
Base map: Google Earth
The industrial hub is located in the southern part of the economic zone dominated by the Iron and Steel Factory. (Figure 2.5) The factory covers 340 acres, and has a history of more than 60 years. It is still under operation until 2015 when the relocation and upgrade are planned to be completed. By then, this industrial site will be an empty shell, still possessing the entire infrastructure of machinery but without any productivity.

Figure 2.6 Recent site photos of Iron and Steel Factory
Xiazi Zhang, 2010

The situation of the site still maintains part of its manufacturing process and municipal infrastructure. Recent site photos taken in 2010 (Figure 2.6) show on-site piping and raised channel structures that interweave amongst the factory buildings and old apartment buildings. Some old warehouses have already been destroyed because they are not in use. The whole factory site is in an in-between condition—it is still productive but is preparing for its entire relocation.
2.3.3 History and “Slow Economy

Figure 2.7 History outline of Guangzhou
Guangzhou is a city with long history of mostly light industrial development in the early times. (Figure 2.7) It is well known for its international trade for hundreds of years. This dates back to the fifteenth century when the Xi Guan Business center in Guangzhou, led the cultural exchange between East and West (Twitchett 1978). The west side of Guangzhou is the oldest part of the city, and the clusters of villages in that area indicate the origins of various urban enclaves long before the Ming Dynasty (around 1400). By the middle of the 18\textsuperscript{th} century, Guangzhou had emerged as one of the world’s great trading ports under the Thirteen Traders, or Thirteen Factories (term differed by translation); the world’s wealthiest people dwelled there (Garrett 2002). Because of this, the tradition of trading for pleasure -- for instance, flowers, birds and fish for appreciation, tea art, and potted plants that were produced locally. happened in this area. This indicates a type of light and leisurely commerce that I call “slow economy” for the purpose of this study.

In 1839, the First Opium War destroyed most of the Thirteen Traders, and in 1842, five more other international trading ports opened, ending the distinction of Guangzhou economy. For the next century, the city suffered a slow economic decline until the establishment of People’s Republic of China, in 1949. At this time, many cities introduced a great deal of heavy industries to revitalize and modernize the Chinese economy. Guangzhou was one of the cities. But even though heavy industry once played an important role in revitalizing the city, it is not the greatest strength in Guangzhou’s contemporary economic structure. Although this episode of heavy industry was so vivid in city culture, the spirit of “slow economy” remains as the true and characteristic basis
of the city right up until today. Nowadays, the service industries and businesses dominate economic development in this city.

‘Slow economy’ in my thesis refers to the production of flowers, potted plants, birds, fish and insects. This idea reflects the city’s culture, in a way that can take best advantage of local resources and the local work force in a new way. In most cases, the products of a slow economy are meant for appreciation and enjoyment of life. Slow economy was once stated in a different way, but with similar meaning, by a respected economist E. F. Schumacher (1975). He believed that single-minded concentration on output and technology was dehumanizing. He proposed the idea of decentralizing the efficient assembly line in order to bring back the meaningful and priceless nature. Schumacher’s ideas made many scholars want to look back to where the smaller-scale production originally came from, and how people once were better able to enjoy the processes of producing and trading.

Why does slow economy matter to a city that is now growing briskly? This question may be reframed: can a city maintain two different characters? In situations like aging cities, I would say yes. Because of the ‘age’ of the city, in some districts, Guangzhou somehow became a city that is suitable for elderly people. Most of the elders have been born and raised in Guangzhou, and have settled in the city for decades. But their settlements are mainly concentrated in the old downtown areas, close to the old industries. By contrast, young and vigorous citizens, half of whom are immigrants, are settling in the newer downtown of the city. The life styles of these two city towns are very different. Old and young, slow and fast, production-based and service-based economy; these are all happening in the same city. After the Guangzhou metro first went
into operation in 1999, the boundaries between urban villages became clearer and the physical connections between the old town and new town became stronger. But the cultural connection is gradually fading away. Neither of the two features of the city is dispensable. Because of the trend towards development, the ‘old’ side will vanish more quickly; it is more vulnerable to change. However, if reasonable protection for the ‘old’ value is provided, it will help the city to preserve and form its character. Most importantly, in order to keep the sense of identity of Guangzhou citizens, guidelines and framework for the city development must be developed.
2.3.4 Sense of Identity and Culture Value

There are four conditions that are rooted in the west of Guangzhou. Traditional trades and local business, old village clusters, slow economy, and heavy industry. These four conditions have become the sense of orientation and identity for people and their ancestors who have resided in this area for generations, if not centuries.

Slow economy is especially important to the culture is because it is a unique and famous asset in the whole country. Early in the seventeenth century, Guangzhou was already famous for its flower production due to the suitable climate in the south China, and the name ‘flower city’ remains until today (Garret 2002). Because once it had the only international trade port and dominated the economy, Guangzhou was a rich city.
People only worried about their leisure-time consumption. Appreciating birds and raising decorative potted plants became classy and popular activities in the heyday of these wealthy communities. The traditions such as raising birds in the backyard and on the balcony, and cultivating potted plants, still can be seen everywhere around the villages of the old city. Events such as spring festivals, where the whole street may be blocked for flower markets each year, are still famous traditions in Guangzhou. These give Guangzhou citizens a sense of identity that they have never been reluctant about. So it is important to note, there is less of this culture about mass production and assembly lines. Those are foreign to the nature and origin of Guangzhou. So I define these older activities and pastimes as ‘slow economy’, whose character stands in opposition to large corporations and businesses.
2.4 Productive Landscape in Post-Industrial District in Guangzhou

As mentioned above, the largest old industrial hub is located in a district that is planned to be a new economic zone next to new city downtown, beside the Pearl River waterfront. This plan indicates that this old industrial hub is taking up valuable land that has high potential to redevelop into another core urban district. Guangzhou is a growing city that has endless needs for businesses, residences and commercial centers. In this case, once the announcement has been made to relocate the old industry, deciding the proper usage of the land will become a huge issue to the residents and leaders of Guangzhou city.

Post-industrial sites or any other abandoned land original from other uses in Guangzhou are usually redeveloped into two categories (Campanella 2008) – the first category is large urban parks. They are usually developed as theme parks or museums, designed with preservation of factories or other industries that had taken place in the location.

The second category is real estate development – this development usually serves for the influx of population or relocates population for other purposes. It usually develops where post-industrial sites are not completely vacant, but have left behind old housing fabric for the people who served those now-abandoned industries.

Urban renewal is always an option in redeveloping the city. The government would consider the entire site for commercial and residential uses if that is what makes the most profit to the city. But as mentioned above, the protection of culture and history of the old industry hub also calls for serious consideration. In the condition of
Guangzhou city, it can be a good chance to test other potential solutions for industrial sites in developing cities. In fact, cleaning up part of the industrial land for developers and leaving the core industry part preserved for museum/public space may be the ultimate ‘framework solution’ in theory. But how to implement the integration dynamically remains an important problem.

Productive landscape should be thought of as an integration of production and landscape design. Productive landscape in this context is not only about economy and profit, but also about how the integration of space can generate multi-purpose program in dense urban fabric. Because of the density and growing population of potential immigrants to this new economic zone, land use efficiency is the primary aim for reusing the old industrial hub. This thesis explores whether this land can provide future employment, at the same time that it supports a new community that prolongs the traditional living style and engages people from all classes. And of course, this still has to incorporate with history and culture issues that make the sense of identity in the city.
Chapter 3  THEORETICAL FRAMEWORK

3.1  Literature Review in Post-Industrial Landscape

I favor the term ‘productive’ because it indicates a positive incremental change. Alan Berger used this term in his publication *Drosscape: Wasting Land in Urban America* (Berger 2006). Considering the abandonment of urban manufacturing sites, he defined ‘drosscape’ as “the productive integration and reuse of waste landscape throughout the urban world.” (Preface) In North America, manufacturing sites usually occupy a massive amount of land, and so the call for ‘productive’ redevelopment is necessary to address the enormous area. In Asian cities, manufacturing sites may not span large areas, but they are nearly always located in the heart of a dense community because ‘convenience’ may have led the early history of urban development. So these old manufacturing sites take up the most accessible and highly valued land in the city, bringing awareness of ‘productivity’ to the foreground in inevitable redevelopment proposals.

Regarding economic development of vacant lands, especially post-industrial sites, Alan W. Evans (2004) pointed out that, from the landowner’s point of view, vacant land that has once been productive and developed, should be redeveloped because the economic value can be largely exploited during the process of redevelopment – reducing the cost of clearance and construction, and increasing the rent availability. Lavea Brachman (2004) also stated that economic concerns have been a barrier to brownfield redevelopment in the eyes of the government and investors. Although these statements
have been made in the context of a developed country (USA), the economic concerns of developing countries are similar. To reduce the cost of clearance and construction, can mean smart preservation and reutilization of existing features on site. Increasing rental availability may require a creative programming process to introduce culturally themed activities and infrastructure, in order to provide predictable value for renters.

In searching for the meaning of a post-industrial site and to generate potential for design ideas, I reviewed literature about cultural value and citizens’ psychological needs. Carla I. Corbin (2003) makes an interesting observation of the difference between vacancy and emptiness, between familiarity and invisibility, a between methods of reprogramming and reevaluation. All of these issues have stimulated my understanding of the issues underlying vacant sites and therefore my design process. I consider the post-industrial site I am looking into vacant instead of empty because of its cultural value and its potential for revitalization. I also now understand that, once it is gone, local familiarity with the site will induce a giant trauma in the residents’ life. Therefore, I am convinces that reprogramming through adaptive reuse could be a solid strategy in rescuing a valuable site from destruction.

In reviewing projects done by Peter Latz and Partners, Udo Weilacher (2008) explained that dealing with ‘bad places’ is a matter of turning the ‘bad place’ into a place where people want to stay, not simply with the methods of decorating and prettifying, but to develop a syntax of landscape that allows people to stay with ease. In my understanding, syntax of landscape that Weilacher has been describing about in his book refers certain rules and principles, or preferable design methods to construct landscape in urban public places. ‘Bad places’ is an informal term used by Peter Latz to
refer to damaged landscapes, both in physical meaning and sometimes indicating bad morality, but overall, an unwelcoming place. ‘Unwelcoming’ is a perfect adjective for many post-industrial sites. The aging structures, machinery, and the dusty atmosphere, though interesting, often generate antipathy in people’s living environment. However, if we can agree that parts of the scene of industry should be preserved, amicability will be an important factor in the design concept.
3.2 Slow Economy and Productive Landscape

Land use efficiency calls for increasing amounts of productive landscape. Regarding the Guangzhou Iron and Steel Factory, the economic zone development, the flood of people migrating to the cities, and the urgency for improvement in living conditions have been essential drivers for efficient land use. Meanwhile, the development of economic zone caused a series of industrial relocations to the outskirts of Guangzhou, which has created a potential vacant district on which to develop mixed land uses.

What is more interesting is that land use efficiency also requires certain arrangement of time and space to make the land run efficiently. For this thesis, one
important theory of productive landscape derives from the concept of “slow economy”, in order to best preserve the sense of historical and cultural identity in the Iron and Steel Factory of Guangzhou City in a way that local resources and local work force can be optimally exploited. The concept of slow economy has been anticipated in a different way but with similar meaning, in the 1970s, by the respected economist E. F. Schumacher. He believed that single-minded concentration on industrial output and technology was dehumanizing. He proposed the idea of decentralizing the efficient assembly line and bringing back the meaningful and priceless nature (Schumacher, 1975). This suggests there may be some synergy in introducing slow economy and encouraging the local production on site and preserving historical and natural features of the site at the same time.
3.3 Design Framework and Principle

Figure 3.2 Design Framework and Principle
3.3.1 Preservation of Old Industry

To begin the reprogramming process for Guangzhou Iron and Steel Factory, there are three main aspects to consider – the old industry, slow economy, and the surrounding villages. For the old industry, I look into three ‘principles’ that inform my design of the site – productivity, community, and structure. One of the main reasons to relocate and upgrade the old iron and steel industry is because of its current productivity is low. But even after the industry is removed, the design principle of ‘productivity’ can and should in some way remain on the site. That means, in the very same site, no matter whether the production is still metal or not, productive activity is still on going. In this sense the site is kept alive.

Community, my second principle, always exists within a certain context. Because the establishment of the iron and steel industry supported a large population of workers and managers, a social infrastructure has been built to serve people in the name of this industry. Elementary schools and high schools, apartment buildings, hospitals are built in the surrounding area. But once the industry moves away, what roles remain for these institutions and infrastructure? Depending on whether they are still functioning properly or not, these schools and hospitals might not be moved to relocate along with the industry. But since many people nearby, but still outside of the industrial community, are using these services – attending schools or receiving medical help in the hospital, the removal of these facilities would have a negative effect on the surrounding communities.
In order to fill in the social void that will result from the removal of the old industrial community, a new kind of community should be developed in the same place. This community doesn’t have to be an exact replacement, but should absorb the same values that any community would normally possess – people that gather around regularly with similar purposes.

By structure, my third principle, I consider the remaining old facilities and machinery left on site after the relocation of the Iron and Steel Factory. For reconstruction purposes, it is usually necessary to remove these structures if transportation is affordable. But as has been shown in several recent projects, reusing these older structures may be a better choice. Some structures will be more valuable if they remain in place, rather than being dumped far away, sitting and waiting for recycle opportunities.

For example, the original rail track at the Guangzhou Iron and Steel Factory was originally used for transporting material around the whole site and the end product to the port. Since the rail is strong enough for heavy goods transportation, it can also hold passenger trains or trolleys, even at a slightly different gauge. Designing a new transportation loop out of the old rail all through the old industrial area provides an opportunity for people or visitors to access any point of the site easily. It also enhances the value of this site as commercial, business, or public spaces functions. In addition, old machines such as furnaces, stoves and tanks, if not being reused for other purposes, can be preserved for on-site industrial museums. These structures are valuable because they existed and functioned in their origin city for a long time. Other built facilities such as warehouses can be turned into galleries if the quality of the structure itself is good.
enough, and the style of the structure may be attractive to many artists. Otherwise, renovation or additions to the original structure to form a better functioning space may also be feasible because most of the old material on site would be reused. Other unique structures of the Guangzhou Iron and Steel Factory, for instance, gas pipes and raised water channels, may also be explored for other uses.

### 3.3.2 Integration of Slow Economy

To design for a **slow economy**, I obeyed three supporting principles: identity, productivity and connection. Sense of identity, as I have indicated before, refers to personal connections that people generate toward the traditional activities that occur in an area for a long period. In the Guangzhou Iron and Steel Factory, these activities include flower market, tea market, bird/insects/fish market, and potted plant production, to name a few. Proposals for adaptive re-use of the post-industrial site should incorporate these markets, as well as the production processes for the goods and creatures being traded, so that the site will seem untouched in its original landscape forms. The landscape form should contain the above-mentioned old-industry structures to be reused for productions. This attitude stands in contrast to the new modern box buildings that would typically replace the industrial landscape.

Productivity is central to the purpose of whole landscape project. In this project, production takes place within the site, and distribution through the free market also happens in and around the site. Productivity requires a certain amount of land to make use of the existing structure, and overlapping a living system onto those structures
means generating new and unpredictable spaces. In a sense, the landscape produces spaces for all kinds of work to occur. Productivity requires a certain amount of labor, so the landscape can provide job opportunities. These jobs include cultivating flowers and plants, raising birds and fish, and selling these fresh products in free markets. Free markets often take place in between the site and villages; they are an extension of the original alley market sale. The markets would also bring together people from different classes and areas of the city. For example, if many of the people involved in the free market sales are from the old town center, and the people who come to the well-arranged free markets are from upper working class, with spare time to engage in these leisure activities, then the free markets would provide social connections between different classes of citizens.

This brings us to the principle of connection. Slow economy enhances both cultural and physical connections. Cultural connections may include the social connections described above, occurring in the free markets. Originally, people who live in and around the west Guangzhou area, let’s say, ‘the old’, tend to keep to themselves and have their own culture – they use the same free markets as in the old days; they have grow vegetables and sell to their neighbors, they raise birds and fishes in their spare time. Meanwhile, citizens in the downtown area, ‘the young’, have a totally different culture – they spend most of their time inside air-conditioned buildings and undergrounds, they watch televisions and serf online, and they shop at super markets where food come from assembling line. The implement of slow economy would give chances for ‘the young’ from downtown to go into west side of the city willingly, and for ‘the old’ to present their culture or even production processes to a larger public.
Physical connections that benefit from slow economy is because the latter creates a new active hub that calls for traffic connections. Slow economy can provide certain amount of job opportunities, and places for local production processes can be open public. More over, the designed post-industrial landscape becomes a large ‘playground’ for people to get together and spend their leisure time, therefore connections from the post-industrial site, or in other words, the accessibility of this site become much higher.

3.3.3 Enhancement in the Quality of the Village

The villages in and around the Guangzhou Iron and Steel Factory originated from pre-industrial city forms; that is to say, they existed long before the industries were built and then were swallowed up by population growth and development. These villages may be analyzed according to three dimensions – building structure, villagers or inhabitants of the villages, and the layout of the buildings. The quality and value of these three dimensions inform aspects of my design decision-making, especially when considering the preservation of local culture in this place. Many villages are located just outside the boundaries of the iron and steel factory; they are of essential value when thinking about the connectivity of the productive landscape project on site.

Addressing the villages’ problems with the intention of relating the project to the larger rules of Guangzhou economic zone – for instance, making pedestrian improvements, or renewing better standard apartments, or even using the land for other purposes – can be very difficult to handle. Because of its age and continuity, the culture
inside these villages reflects the historical value of the place, but many of their physical elements, such as buildings and streets are of such poor quality they cannot meet minimum standards of contemporary living conditions. Also, as the city develops, the original inhabitants of the village are gradually moving out of these sub-standard two-story houses as soon as they are financially able to do so. Meanwhile, because of the cheap rent, many new immigrants and rural migrants choose these same homes to start their life in the growing city.
Chapter 4  URBAN DESIGN RESEARCH AND METHOD

4.1  New Economic Zone Circulation Analysis – Finding Opportunities

![Figure 4.1 A Quick Look of Guangzhou City](image)

In order to discover opportunities for reprogramming the Iron and Steel Factory, analysis of the position and circulation of the larger district – the Economic Zone – is necessary.

Figure 4.1 shows the relation of the new economic zone and three city centers. The trend of city development originally marched from the center to the east and south sides of the city. Progress towards the west of the city has remained urbanistically ‘undeveloped’; the urban texture of the land seems disorganized as a whole region, but has its own smaller cycles scattered among the land. This disorganization may be a
valuable asset in term of culture, but to handle intense growth pressures, the situation also needs control and organization. The establishment of an economic zone is an approach intended to develop general organization that may capture the theme of the post-industrial site and its surrounding villages. This approach may be risky to the culture because it will be a huge step from ‘undeveloped’ status to mandatory ‘developed’ status, skipping the spontaneous ‘developing’ stage. However, in spite of the risk, the economic zone has its positive potential and there is some social urgency for its development.

**Figure 4.2** Traffic Flow in West Guangzhou
At the scale of the whole economic zone, the recent condition is that people commute across this district to the downtown area to work everyday without stopping (Figure 4.2). The purple area will be a business center within the economic zone, which is now partly been built by city planners, in order to concentrate new job opportunities. In this case the heavy daily commute from southwest to northeast can be partly detoured. So if there is going to be job opportunities and other theme activities in the former steel industry site, it would be possible that some working class could change their daily destinations to this new hub, thus concentrate some portion of the population from the southwest of the city that commutes eastbound each day.
Figure 4.3: Section Analysis of West Guangzhou and Industrial Area
In a section analysis cutting through the industrial hub and across the Pearl River (Figure 4.3), the spatial connection of the factory and its surroundings become clearer with the three means of transportation – streets (and water vehicles on the river), highway and the subways. So even the site seems to separate from the downtown by Pearl River, it never is isolated. Vertically, the connections are reflected by the overlapping of industrial sites, villages, subway stations with commercial areas, public green open space along the Pearl River, and residential areas. The vertical connections create great opportunity in the thinking of reprogramming. For example, job opportunity can be created in the overlapping of subway commercials and village accommodation. People live in Guangzhou city know the benefit of having a home near their workplace and not having a car. The overlapping of the post-industrial site and the village accommodation would also have the same effect as above if there are job opportunities onsite, for instance, workforce for manufacturing processes and managements. It is also a good place for free markets, where the sellers and buyers are close to home and work, and also transportation hubs. The overlapping of the post-industrial site and green space makes it what is now called post-industrial landscape that provides public spaces, squares, parks, museums, galleries, and all other places for people to spend their leisure time on. These opportunities I see in this section analysis give me a firm reason to reprogram and revitalize this post-industrial site with this many functions but systematically.
4.2 Spatial Analysis of Urban Texture

To seek for the coherence of the connections, I did a spatial analysis on the pattern of the urban texture (Figure 4.4). In deciphering the aerial photo of both side of Pearl River, I see there the clusters of older villages stands out as urban texture because their differences in layout and building sizes. Figure 4.5 shows the different texture of an old village and an open industrial storage site that are right next to the west bank of the river, separated by a main highway. Figure 4.6 shows the distinction of two kinds of living habitat that built in different eras within the west side of the bank that close to the Iron and Steel Factory. Figure 4.7 shows a difference between old villages and farms, which is located right to the south of the Iron and Steel Factory in west of the rive. These observations led me to express my perspective of the whole site on an unevenly concentrated grid.

Figure 4.4 Grid Spatial Analysis
Figure 4.5 Aerial Photo of an Old Village and the Adjacent Open Industrial Storage Site

Figure 4.6 Aerial Photo of an Old Village next to a Developed Residential Area

Figure 4.7 Aerial Photo of Old Villages
Source of Figure 4.5, 4.6, 4.7: Google Earth
The tightly concentrated areas in Figure 4.4 are old villages and industrial machinery of Iron and Steel Factory. Besides the dense texture visually, these are the areas that are most likely to be reprogrammed in a larger plan. Because first, they are in worse condition that require careful reconstruction; second, they are the places to concentrate people because there are free markets ongoing each day; third, they are the concentration of the very original culture that was once the a big reflection of Guangzhou city. In this context, these are the possible places to be mostly renovated and reprogrammed. Once these concentrated areas are made into hubs for public activities, the places adjacent to the hubs would be connected by stream of people, making less isolated spots in the area.

Because the main traffic is from southwest to northeast according to previous analysis, connections will become more distinct if the vertical lines of the grid are removed (Figure 4.8).
The immediate impression of this figure after the removal of vertical lines is the connection of both sides of the riverbanks. If the programs and activities in the concentrated areas are successfully conducted, for example, tow sites in both sides of the riverbanks, then possible connections through the river are needed as people would commute between these two places, therefore it will be wise to introduce water vehicles between these two points. For another example, in finding a best place to situate a free market, the best way is to find possible pedestrian streams. The space between Iron and Steel Factory and its adjacent village to the northeast is a good opportunity to establish a free market once the factory has been reprogrammed and the villages reconstructed. In the contrast of concentrations, there are areas of expansion. These expansions are necessary in the city because there are the spaces to release the tension of a large and busy city. In my opinion, the expansions can be public parks, quiet residential areas, schools, and other institutions.

My design in the next chapter largely focuses on the reprogramming in concentrated areas – the Iron and Steel Factory and its adjacent villages. The choice of free market locations and the design of traffic lines are mainly depending on this analysis.
Chapter 5  DESIGN SOLUTIONS

5.1  Solutions

Given the results of research and urban analysis, and better understanding for the background of the site, several problems and opportunities for design become clear. Let’s summarize the important opportunities of this factory. First, it is located in the heart of the city’s new economic zone development plan; second, it is surrounded by five villages, affording a great opportunity to accommodate workers who want to work in the heart of the city; third, this location offers a chance for the city to develop residential areas that reflect historic community values; and fourth, the site is a transportation hub that spans two subway stations to be completed soon, offering substantial support for the accessibility of the site.

There are also problems and challenges to design. First, the vacancy resulting from industrial abandonment will create a giant void in the city’s culture, and it is likely that complete urban renewal will cost the place a loss of identity and social attachment. Because the factory has been a fixture in the area, and in family life, for over half a century, many facilities such as schools and clinics are named after the factory. Two or three generations have grown up with these names engraved in their imagination. Having once taken the factory for granted, when it’s gone, there will be a hollow to be filled in every person’s heart. Compensation for this emotional void does not necessarily require complete preservation or exact replacement, however, some of the machines and the layout of the area can help to preserve industrial culture and memory. Second, as
already mentioned, there is a contradiction between maintaining the site as an historical landmark and needing the space for either economic or environmental development. To solve this contradiction, the best way is to integrate both approaches. The original, pre-industrial culture of the district – production for slow economy – is the program I have chosen to fill in the vacancy after industry. The remaining factory structures can be partly saved and reused for new purposes. Inviting traditional, pre-industrial markets, such as fish market, bird and insect market, and flower markets, into a new landscape of partially preserved post-industrial sites, will create a job hub as well as contemporary facilities such as lab, studios, museums, and plazas. This strategy will simultaneously redevelop the land and enhance the quality and activities of urban life.

Furthermore, the twin advantages of central location and transportation access make accommodation for workers possible. This simultaneously supports the development of the new job hub, tourism facilities, and institutional facilities. The convenience of transportation in this site provides an opportunity to attract more and more visitors and consumers as time goes by. The markets, museums or galleries do not need to take care of or engage in the transportation development in order to facilitate themselves. Also, because of the industrial background, some institutes, schools and colleges may make use of this place. For example, many of the courses in Guangdong University of Technology are closely related to the history of industries, production of industries and the skills of productive technology. This will be the best place to establish institutional laboratories and studios for learning and research purposes.

Creating local job opportunities, establishing more free markets, attracting consumers around the whole city, facilitating learning and research processes: all of
these objectives can be part of the reprogramming strategy for this post-industrial site in order to establish a new network of productivity.
5.2 Master Plan

Figure 5.1 Master Plan
The master plan (*Figure 5.1*) indicates the location of all the important productive programs and utilization of preserved parts of the old industry. It describes the locations both spatially and graphically, and includes: theme galleries and museums, studios, and laboratories; programs for slow economy such as ponds for fish production, bird hubs for raising birds, beds for flower and potted plant production; newly developed village housing, free market open spaces, and extended farmland.

*Figure 5.2* 798 Post-Industrial Art Zone in Beijing
Feng 2009

Preserved warehouses and partly-preserved machines and structures are to be made into galleries and studios. Because of the hollowness of inner space of the warehouses or large building structures, once no longer filled, they will provide great exhibition areas. Also, these spaces are easy to manipulate because of their ambiguous
spatial definition. Notable examples, such as the 798 Art Zone in Beijing (Figure 5.2), China, is a post-industrial field for avant-garde artist that, at the beginning, was a military factory in built in Bauhaus style. The factory ceased as a result of an economic reform in the 1980s. Meanwhile avant-garde art was not supported by the government, so the vacant factory became their cheap rental art field. (Huang, 2004) The factory eventually developed into a huge systematic art gallery nowadays and hosted many notable exhibitions.

Some structures, such as the main furnaces for the steel manufacturing process, are objects that are difficult and unnecessary to repurpose, because the definition of these objects is clear and their shape is restricted to its original function. For this reason, these stoves will become an icon or landmark in this site, best preserved for cultural memorization. In additional, these technical structures are great examples for scholars and researchers in this field.

According to this logic, those programs for “slow economies” should be located mainly in places originally used for temporary buildings and warehouses that are no longer distinctive or qualified to be reused. The farmland at the northeast corner of the site, originally owned by the villagers, may also be extended because the temporary warehouses and material fields that are located south of it can be relocated. Villages maybe rearranged in a way that the main cultural hallmark – the alleys in between the concentrated village building – may be best preserved. This is to enhance spatial quality of the daily spontaneous free market activities within the village culture. Large open spaces in this site, functioning as urban parks, are paved and arranged according to the texture and rhythm of the newly planned villages.
The land use development plan (Figure 5.3) shows that the site is categorized into several groups according to the degree of preservation. The blue color maps the areas in which all the original buildings and machinery structures are preserved. The yellow color shows the areas where the original structures are partly preserved and re-structured into other uses, such as open plazas in preserved tanks; newly built galleries that connect with old warehouses; upper level structures – pipes and channels – that can be reused as planting beds, raised walkways, and irrigation pipes. The red color covers the areas where most existing structures would be demolished and renewed. These areas were originally temporary buildings or open storage yards. The purple color indicates areas suitable for commercial development, addressing the need for larger indoor shopping centers and hotels for visitors from outside this region.
The plan for the proposed water system and green coverage (*Figure 5.4*) is important to understanding how the raised structures might be used. The light green lines show the original position of the raised piping system and the raised rail channel. The same lines indicate special upper-level vegetation coverage. That means the green coverage exactly traces the original raised structures, and combines preservation with re-utilization. In this way, the spatial relationship between the ground level green coverage and the upper green coverage could potentially demonstrate an unprecedented environment-friendly precedent for the whole city.

The blue color in the plan suggests a loop channel system of water that surrounds the entire site. The introduction of the water system is possible because the site is near the Pearl River, and many canals, connecting to the river, already exist for irrigation purposes. The proposed water system reflects the traditional value of Chinese landscape that water is an important element in garden designs. For centuries we have known
people appreciate having activities near water and tend to gather around lakes and rivers. Besides amenity, the water loop plays an important part for the convenience in productive function: irrigation for flowerbeds, orchards, lawns, and water exchange for fish-raising ponds.

Figure 5.5 Roads, Streets, and Rails Plan

The transportation plan (Figure 5.5) shows the existing and proposed transportation elements for the site. The orange lines, which comprise the original railway system (once is used to transport material and products on site), are now re-purposed for small trolleys. The trolleys may transport visitors and consumers for touring the site and for entertainment. New tracks are proposed as an extension of the existing rails. The purpose is to have a continuous transportation line to direct visitors to the port on the Pearl River, so that a larger population of visitors from across the river can access this site, in addition to using highway and subways.
Figure 5.6 Master Plan Loop Analysis
On-site transportation, free markets, open spaces, and programs for slow economy are well-knit in a compact way. The analysis on the bird’s eye view of the master plan (Figure 5.6) shows the spatial relationships between every constituent element. Two visitor centers are located on the east-west axis where trolleys pass by frequently. The products from the programs for slow economy are transported to both the north free market and south free market by newly developed streets on site. Fish-raising ponds are located adjacent to the water systems. Consumers of flower and potted plants always need assistance in transportation, so the flowerbeds are located next to the main streets. This will encourage large sales of wholesale stock to the furthest part of the city, in addition to a smaller individual sales taking place in the free markets. The main free markets should be located in the open spaces in front of the village housing clusters. Spontaneous free markets taking place in the alleys in the villages will thus have direct connections to the larger free markets.
5.3 Design Details

The perspective above (Figure 5.7) is a central bird’s eye view of a three-dimensional model of the redeveloped post-industrial site. The image illustrates some of the detailed spatial design and the dynamics of the double-level landscape. The green tubes in the model represent the raised channels remaining on site that are now changed into planting bridges or walkways. Old structures, together with new buildings, support the channels. The red lines indicate the part where people can gain access between levels from the ground floor elevation. Shown in the center is a cluster of preserved machinery for an on-site museum. This will be a landmark on this site that also will be notable to the whole city region. The upper level square, fish farms, studio clusters, and other designed elements such as vine lattice, are shown vividly in this perspective.
Figure 5.8 shows various scenarios in which people are walking under and above the upper layer of vegetation. The image on the left occurs close to the visitor center in the heart of the site. It shows the relationship between preserved rail tracks and pedestrians. The scenario on the right shows the scale of the raised walkway. The safety of the walkway must be considered when the project develops further into site design construction details. But this abstract illustration can well describe the spatial relationship between people and the reutilized structures.
The scenario on the left in figure 5.9 shows one of the bird hubs on the ground level. It not only is a place to raise and sell birds, but also available for demonstration and entertainment. Visitors can appreciate the colorful clusters of different species of birds all at once. Some of the larger bird hubs establish a vivid attraction for this site and so the trolleys should stop right in front. The scenario on the right shows a comparatively large fish farm. There are transparent fish tanks where people can admire and decide which species of fish they want to take home to their family aquarium.

The bird’s eye view of the flowerbeds (Figure 5.10) shows the spatial relation of the irrigation system and the existing piping. The system spans the whole flowerbed plan, and the irrigation time and volume is controllable. The area located at the further end (without the irrigation system) is provided for cultivating potted plants. Potted plants need to be taken care of individually so they will not be automatically irrigated.
Figure 5.11 shows the details of the flower planting arrangement and the dimension of each planting bed. It is a place for visual and sensory appreciation, especially in the flowering season. Fortunately, the climate of Guangzhou city promotes year-round flowering for many species.
5.4 Feasibility

This is clearly an idealistic project that would depend on many contingent factors and forms of support to ever be realized. However, it is perfectly pragmatic and feasible on a variety of levels, first, in the ways that the old machinery is preserved and old building and warehouses are reused. It is also feasible because the free market and the technique of local production for slow economy already exist in the vernacular social customs this part of the city. But there will also be technical and structural challenges to the integration of the machinery structure and the local production process, and solving these challenges will cost much design thought and capital investment. This is the case, first, because there is no precedent for this type of design and reprogramming model – making the cost estimation extremely difficult. The second design problem is that meeting the structural standards and requirements of reutilization may turn out to be costly according to existing conditions. Third, compared to urban renewal of the site, realizing a return on capital investment, not to mention a profit, may be much slower. All this makes the decision of whether to implement this plan politically, creatively and economically difficult. However, I would argue that above all, the potential benefits of this productive landscape design project could shape the future vision of what most people – both leaders and residents – want to accomplish. It will be valuable in both practical and academic sectors.
Chapter 6 CONCLUSIONS

To adopt this design approach to reprogramming the Guangzhou Iron and Steel Factory, and attempt to revitalize a post-industrial site with slow economy, would be an innovative, courageous, and adventurous strategy for municipal leaders in the developing world. As available sites are developed, and development pressure mount, the strategy of reclaiming post-industrial sites is becoming increasingly common in urban development plans worldwide. While the developed world has begun to protect their industrial history as antique and a rich culture (e.g. Gasworks Park, Seattle Washington in USA, or Emscher Park at Duisburg Nord in Germany), a fast-developing city would fall into the dilemma of considering whether these “antiques” are burdens or treasures?

As the provincial capital of Canton, the most thrifty and diverse province in China, Guangzhou City has a profound understanding of this dilemma. In struggling to find a solution, and a rationale for not tearing down the whole site, my design approach depends upon the most complete amalgamation of the values of both culture and economy. But in reality, the expanding city needs much more immediate economic returns. Ironically, it should also be noted that immediate economic returns could be generated in both the destroying and renewing processes. Different sectors would compete vigorously to secure such work contracts: I can benefit from destroying it and you can benefit from rebuilding it. As such, this “win-win” scenario becomes a very dangerous stage for the fate of cultural heritage of older cities in the developing world.
The incremental changes I proposed in this design approach present an alternative point of view for municipal leaders and developers. I believe that the destruction of older urban districts is not inevitable; rather, it has resulted from simply not having a better, well-reasoned alternative plan.

My thesis may present a challenge for designers, planners, and scholars to investigate and project forward new possibilities, and potentially to explore more sustainable plans, for the benefit of an intangible heritage and for the social life of the residents. Local production activities that reveal the original culture, protect original urban texture and landscape, provide connections to local villages and downtowns, create job opportunities for local people and incoming immigrants, and shape new green public space with multiple purposes, all of these ideas have been discussed and blueprinted in my thesis.

While it may seem perfect in theory, with the current political and economical situation in Guangzhou, the goal of this thesis is ambitious in reality. Construction details still remain to be discussed and developed, as symbolic reutilizations of obsolete machinery has never been tested in this way. Similarly, the mitigation of contamination treatments has not yet been considered, thus putting the feasibility of green production further into question. Finally, the profit that could be generated from slow economy, museums, galleries, and visitor centers has not yet been calculated in any detail, so it may be hard to determine whether this design provides a positive value to the city’s development plan.
Nevertheless, the greatest progressive movements and the most innovative practices come from a well-advanced theory and a long discussed plan. The design I propose today could bring up valuable discussions for alternative, more beneficial strategies for dealing with post-industrial sites in developing cities. If more and more developing cities would approach this similar dilemma more creatively, finding new ways to relocate their primary manufacturing industries and allow other, post-industrial land uses to strengthen their economy as well as living standards, the implications of “the complete amalgamation of culture and economy” would slowly be revealed. In this sense, my thesis does not present a solution for a single site in Guangzhou, rather it projects a potential and precedential theoretical case study for later plans that are needed to pursue stronger and wiser solutions.
LITERATURE CITED


IMAGES CITED

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Condoros, Andrel. 2009.

Feng, Charlie. 2009.