China is now experiencing large scale of urbanization, resulting in local urban environmental challenges. For example water shortage, deteriorating air quality and traffic problem. Rapid urbanization also contributes to global environmental challenges like climate change.

In order to address these challenges, eco-district or eco-city becomes a way to mitigate such problems and preserve valuable resources. Eco-city is a concept that emerged near the end of 1980s. The general goal of it is to reduce waste, carbon footprint and achieve economic efficiency.

More than 200 eco-city projects have been launched in China in recent years. In this paper, Sino-Singapore Tianjin Eco-City (SSTEC) and Shenzhen Bay Eco-city B-Tech Project were chosen as the example to demonstrate the development of eco-city in China.

The paper will present some planning principles that differentiate eco-cities from regular cities and the challenges that eco-cities development may encounter. Finally, potential eco-district in Los Angeles will be introduced.

In China, normal cities have their own planning method according to their population size, geographic location and planning goals. Take Kunming as an example. The government aims control the population size not to exceed the capacity of clean water and land to avoid the loss of natural resources. For the urban planning, there are mainly three kinds of zones in Kunming: areas that are suitable for construction, areas for limited construction and the areas that are prohibited for construction.

The development of these areas will be guided by their own planning principles. For instance, for areas that are suitable for construction, the government would encourage various kind of land use but prohibit some polluting projects. However, unlike eco-city projects, there is no a general goal of being green or sustainable for a regular city.

SSTEC & Shenzhen Bay Eco-city B-Tech Project
The SSTEC project is a joint project between China and Singapore government, it has started in 2008 and expected to be finished by 2020. The estimated population in the city would be 350,000. The objectives of the project are to tackle climate change, save resources and energy, protect the environment and achieve social harmony. SSTEC promotes integrating land use and urban transport to minimize the use of private cars and to provide job opportunities and affordable housing.

The Shenzhen Bay Eco-City B-Tech Project was started in 2011 and expected to be completed within 4 years. By the time of completion, the city will have a population of 100,000. It aims to activate and improve a 24-hour social network in the region and solve urban issues like inefficient land use, traffic jam and lack of bicycle and pedestrians friendly space.

The Transit-Oriented Development (TOD) principles were adopted in the SSTEC. The overall city form can fully support TOD as 100% of the population will be living within 400m of some kind of public transportation, for example bus or light rail. The regional transport linkages will be fully established, particularly through the planned regional metro and other public transport connections.

Also, the concept of Eco-cell is the basis of the whole eco-city. Eco-cell is the basic building blocks of the city, each about 400m by 400m large with approximately 8000 residents. Four Eco-cells make an Eco-Community. Several Eco-Communities make an Eco-district. There will be 5 Eco-districts in the whole city.

Each district is planned with amenities, commercial, recreational areas to serve the needs of residents there. This kind of mixed used community would provide residents with easy access to various facilities within 300-500m walking distance, which helps to reinforce walking and the bicycle use to achieve the goal of increasing trips via green transports.
In order to guide the development of the project, a set of Key Performance Indicators (KPIs) were used. There are 22 quantitative indicators and 4 qualitative indicators. Those indicators can be categorized into 3 areas: create a good natural environment, establish good lifestyle habits and develop a dynamic and efficient economy. Some KPIs that are worth to point out: Proportion of green trips: 90%, Proportion of green building: 100%, renewable energy use: 20%.

As for the Shenzhen Bay Eco-City B-Tech Project, multi-layer city design was adopted. The city will be separated into three levels vertically. At the first level, it will be mainly for commercial use. There will be streets and alleys with shops
and restaurants, forming a 24-hour dynamic street. At the second level, the rooftop of the first level's buildings will be linked up. On this level, there will be office towers and also the ground of transport like light rail, cycle paths or pedestrian walkway. Lastly, the third level will be for public use. Green rooftop and public recreation area will be set up there.

This kind of design would help the city to solve the problem of land shortage, lack of green area by utilizing space efficiently.

Meeting the targets set by the master plan and KPIs would be a very ideal situation and helps to achieve the goal of establishing an eco-city. However, there are some obstacles and risks that may hinder the completion of the project.

Till the end of 2013, there are only 6000 residents in the Tianjin eco-city. Due to the small numbers of residents in the city, businesses are not attracted to develop there as the potential of making money is small. Therefore, only about 1000 companies were registered there. The amount of residents and companies is obviously not enough to support the whole eco-city's development.

Inconvenient access to the eco-city is one of the problems. Since the city is located at the east of Tianjin on the coast, it would be difficult for people to access there from downtown Tianjin (about 40km away) or from the Binhai New Area. As a result, not many people chose to move into the eco-city.

As for the problem within the city, the implementation of eco-cell may impose some risks to the goal of high proportion green trips. The eco-cell in Tianjin eco-city is relatively a large block which may impede the creation of a walk-able community, especially when the blocks are separated further by large roads. It would be hard to achieve the goal of 300-500 walking distance to different destinations.
Public transport would be a very essential part in reaching the goal of 90% green trips since it is estimated that only about 30% of trips will be conducted by walking and cycling. Public transportation infrastructure therefore becomes a foundation of high proportion of green trips. However, the eco-city itself is targeting at people with higher income, who usually use private cars instead of public transport. A conflict may then occur and the number of green trips may not be as high as expected.

In Shenzhen Bay Eco-City, challenges are also significant, especially the opposition from the residents in the area. The actual land use has changed dramatically compared with the original plan. Places that are supposed to be recreational had changed to commercial area, lead to a great reduction in green area. Residents doubt that the “Eco-City” project is actually undermining the existing natural environment. They also claimed that it is unreasonable to make the area a commercial center while there are already enough businesses around. The eco-city project is overdeveloping the area and destroying the peaceful environment that the residents could have enjoyed.

These challenges have to be overcome to make sure that the project can be implemented successfully. Continuous measurement of performance would be useful to see if the development of the eco-city is on the right pace and right track.

One potential eco-district in Los Angeles is the Little Tokyo. The community is having a vision of becoming a “sustainable cultural eco district” which aims to meet environmental, equity and community goals. The neighborhood would promote resource efficiency, greenhouse gas reductions and preserving the traditions there.

Among the two planning principles that have mentioned before, transit-oriented development seems to be a more suitable one for Little Tokyo. As there is a new “Little Tokyo/Arts District” regional connector station in the area, and the location of it provides an opportunity for TOD.

The station is located at an intersection with multiple publicly-owned parcels, for example the First Street north and the “Mangrove” site, west and east of Alameda respectively. These sites present an opportunity to transform surface parking lots and reclaim a lost urban fabric of storefronts, residences, streets, and personal stories. The proposed development program balances community priorities for new open space, new housing and commercial space. In short term, development will be mostly around the station and expand as time goes by.
Although transit-oriented development has the potential to be used there, some parking strategies are still needed to meet citizens' driving routines as most of the people in the city still rely on private cars rather than public transport. It may have to take years to make the vision comes true.

References:


