

Building China's Sustainable Cities Future



China Sustainable Cities Program of the Energy Foundation
China Sustainable Transportation Center
Calthorpe Associates
Gehl Architects

The Sustainable Cities Program is one of the eight program areas of the China Sustainable Energy Program of the Energy Foundation. Our overarching goals are to reduce carbon emissions and air pollution in new and existing Chinese cities by supporting sustainable urbanization and transportation systems. We pursue these goals by working through an evolving set of targeted initiatives.

Our current initiatives are:

Pilots, in which we support planning and implementation of projects that demonstrate the benefits of incorporating sustainability principles, and promote the formulation and enactment of related policies at all levels of government regulation;

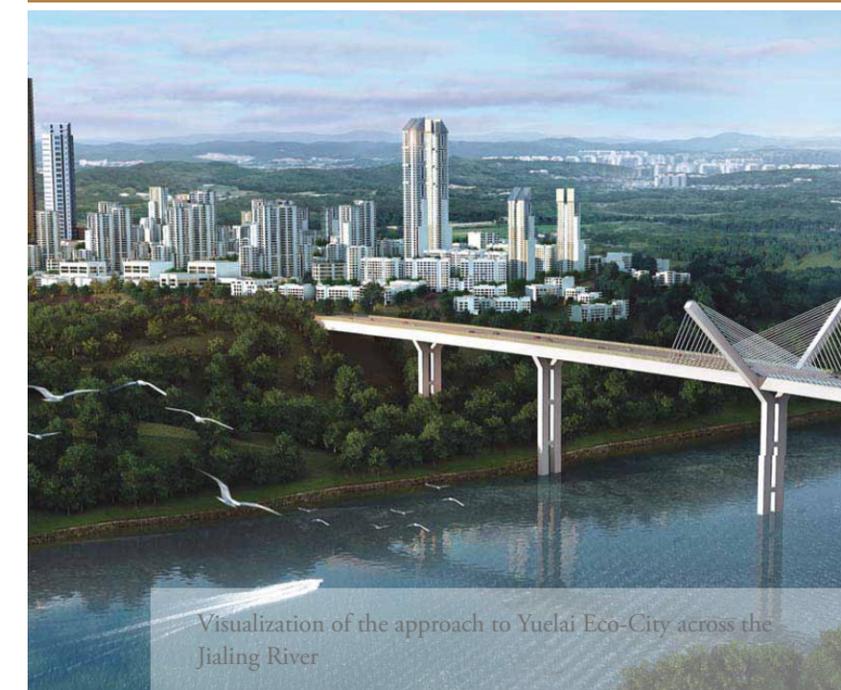
National Policy, in which we influence national and provincial urban planning and urban transportation policies through successful pilots and outreach to ensure they incorporate and enforce the sustainability principles we promote; and

Strategic Outreach and Capacity Building, which is designed to educate and inspire decision makers and build local capacity for sustainable urban planning and transportation.

We cooperate with a wide variety of cities, ministries and other stakeholders to maximize impact. In our pilot project engagements, we establish long-term strategic cooperation frameworks with cities that are from different regions, of different sizes, and have different economic and climatic characteristics. This allows us to demonstrate the viability of sustainability concepts and practices in a diversity of settings, and in turn gain traction for progressive new policies at the national level.



Public Bicycle in Hangzhou



Visualization of the approach to Yuelai Eco-City across the Jialing River

Pilots:

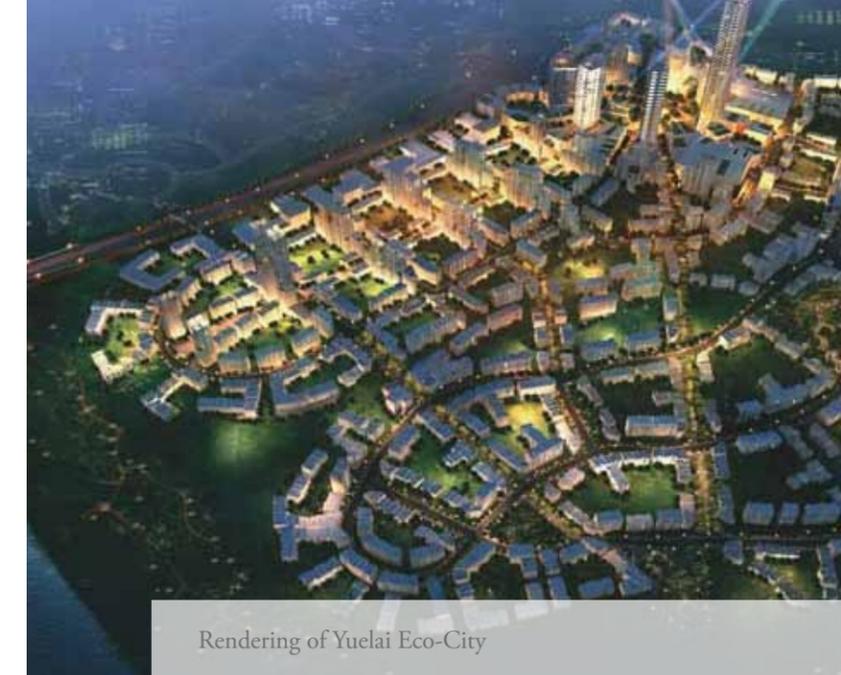
Pilots are crucial in terms of the proving of concepts and demonstrating the benefits of incorporating sustainability principles in urban development. They are designed to influence China's urbanization process by testing methodologies and providing design standards that can be replicated and scaled up by other Chinese cities, and are prerequisite for the development, formulation, and refinement of policy. In our Pilots initiative, we support sustainable urban development demonstration programs that exhibit sustainable development concepts, such as urban boundaries and form control, mixed land-use, compact development, a highly efficient and reliable public transportation system (especially Bus Rapid Transit systems) and Non-Motorized Modes (NMM). We also support the integration of public transport and land use plans to promote Transit-Oriented Development (TOD) and reduce automobile use.

I. Implement people-oriented low-carbon urban space planning principles in pilot cities

The China Sustainable Cities Program (CSCP) is committed to promoting China's sustainable urban planning and development by showcasing the principles of sustainable, people-oriented and low-carbon urban planning via pilot programs. This strategy has succeeded in providing a favorable reference for other Chinese cities' replication as well as serving as a solid foundation for the country to formulate relevant policies and compile relevant technical guidelines and standards.

CSCP has supported the pilot program of sustainable urban planning in Kunming Chenggong for three consecutive years. The municipal government has approved the "Regulatory Detailed Planning for the Core Zone of Chenggong New Town" developed by CSCP, Calthorpe Associates, and a local Kunming technical team, and the local government has begun the land transfer work based on these regulatory plans. This plan incorporates eight sustainability principles that we have developed in concert with Calthorpe Associates to guide sustainable urbanization. The Low-Carbon Pilot City Joint Office, initiated by the People's Government of Kunming City and the Energy Foundation and established by Kunming Planning Bureau, Management Committee of Chenggong New Area and the Energy Foundation, is up and running. To ensure the correct implementation of the plan, its responsibilities are to assimilate the design concepts of the regulatory plan and provide technical support for government departments, developers, and construction officials.

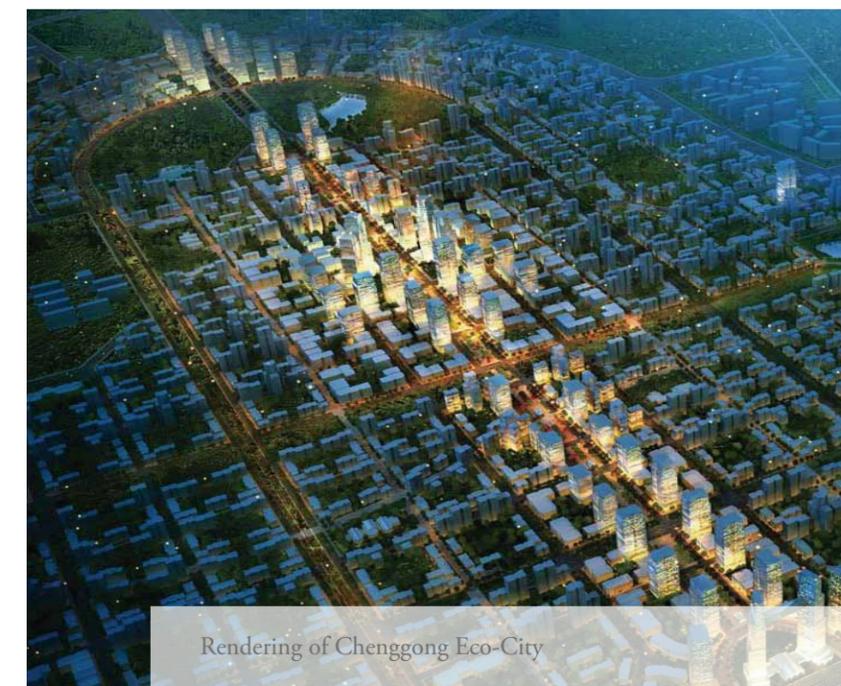
In 2011, CSCP started collaborating with the Chongqing Municipal Government and supporting the Chongqing Yuelai Eco-City Planning project – a project with a core zone of 3.43 sq km. As in Chenggong, the municipal government has also approved the "Regulatory Detailed Planning for the Core Zone of Yuelai Eco-City". Aiming at a public transit-oriented development mode, the regulatory plan emphasizes pedestrians, bicycles, and public transit, the construction of pedestrian-friendly streets and small-size blocks, as well as readily accessible parks and footpaths. Inspired by the Yuelai project, the Chongqing government is cooperating with CSCP and Calthorpe Associates to develop a TOD master plan for the larger Liangjiang New Area, a project that occupies over 300 sq km.



Rendering of Yuelai Eco-City

The Kunming and Chongqing demonstration projects have received the praise of the central government. Both projects have been selected as national green neighborhood pilot projects by the Ministry of Housing and Urban-Rural Development (MOHURD) and will receive central government subsidies for implementation. Both projects have also inspired replication in other Chinese cities. Already, the China Sustainable Transportation Center (a CSCP affiliate) and Peter Calthorpe have been invited by Changsha and Zhuhai to develop similar plans.

Please refer to the attached "selected China projects" for details of each project.



Rendering of Chenggong Eco-City

II. Promote Urban Public Transport Development

CSCP's work in the field of urban public transport includes: 1) Promoting high-efficiency and high-quality urban public transport systems, especially BRT systems; 2) Improving urban travel, optimizing the public transit network, and improving the operating efficiency and service standard of public transport; and 3) Facilitating the development of Transportation Demand Management (TDM) policy.

In 2003, CSCP signed a strategic cooperation framework with the city of Jinan to assist it with the planning, design, and implementation of advanced international high capacity bus rapid transit (BRT) system concepts. Jinan now has six corridors of BRT with a total length of 76KM in operation. Though we have scaled down our financial and technical support in this area, the city continues to expand the network. The system now carries about 10% of the passengers who use public transit at an average speed of 19km per hour, which is 4km faster than traditional buses.

To increase the efficiency of the entire public transit system, we supported a team of Brazilian experts to work with local technical teams in Jinan and Chongqing to build public transportation models that evaluate new bus lanes, compare operation plans, and perform bus lane optimization. Both cities were selected as pilots in a national demonstration project called "Transit Metropolis", and will serve as demonstrations of high quality public transit systems in the next five years.

We have also been working on TDM policies with a variety of cities, most prominently Beijing, Shenzhen, and Kunming. Beijing has adopted a set of policies such as limiting car ownership, limiting daily car use, and hiking up parking fees. Recently, after the inauguration of its new leaders, Beijing released "Transport Development and Construction Planning in the 12th Five Year Period", an important document specifying that Beijing will start to research congestion charging policies and related implementation measures and bring attention to construction of a congestion charging management system as well as congestion charging monitoring and evaluation systems. In Kunming, CSCP worked with the Kunming Urban Transport Institute in launching studies on Kunming's parking development policies. Based on an analysis of the Kunming parking plan and management conditions, the project will explore the relationship between the capacity of parking facilities, public transit service, and land use functions in order to refine Kunming's parking development strategy and objectives.



BRT Corridor in Beijing



BRT Corridor in Jinan

III. Promote the Development of Green Transportation Systems

To promote urban walking and bicycle transportation systems, MOHURD implemented the national "Demonstration Program of Urban Walking and Bicycle Transportation System" last year. By the end of 2011, the first batch of demonstration cities, including Chongqing, Hangzhou, Changshu, Kunshan, Kunming, and Jinan, all completed the construction of demonstration segments or areas and formulated city construction manuals, special planning, and related incentive policies. This year, the set of pilots expanded to 12 cities to include a wider variety of geographic, economic, and social conditions.

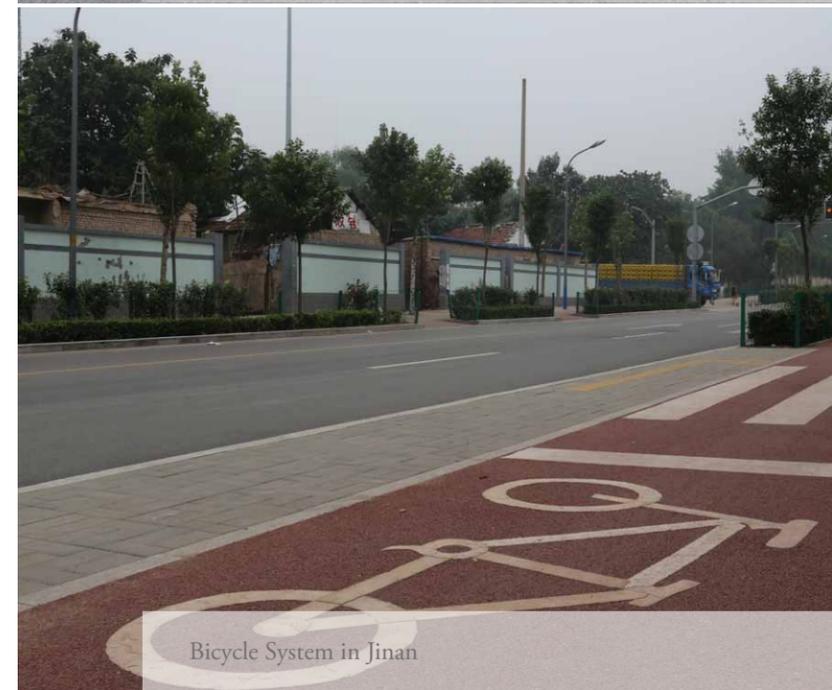
Within this area of activity, CSCP supported the development of walking and biking systems in Kunming and Chongqing. In 2011, CSCP supported the construction of such a system along Kunming's Huanhu East Road. This year, CSCP supported the renovation and construction of a NMT system in the north part of Kunming's Panlong River. In Chongqing, CSCP invited world-renowned design teams Gehl Architects and Nelson\Nygaard Consulting Associates to work with a local technical team on the construction of a walking system in the Yuzhong Peninsula and a biking system in the North New Area.



Walkway in Chongqing Yuzhong Peninsula



Public Bicycle in Hangzhou



Bicycle System in Jinan

National Policy:

In this initiative we support the integration of sustainable development concepts into laws, regulations, and policies at the national level to achieve nationwide promotion of sustainable urban planning and construction, and sustainable urban transportation systems.

I. Sustainable Urban Planning and Construction

In one key area of work, we support research on the development of low-carbon eco-cities. This work provides guidance to China's decision-makers on eco-city policy by generating insights into the development dynamics of low-carbon eco cities around the world, reviewing low-carbon eco city development practices in China, and identifying China's development trends and challenges going forward.

This year, The Ministry of Finance (MOF) and MOHURD jointly issued "Opinions on Promoting Green Buildings Development in China", which for the first time sets out clear measures from the central government on the promotion of green neighborhoods. Financing will support the construction of green neighborhoods (communities) and guide the scaled development of green buildings. Full-fledged green and ecologically conscious neighborhoods will be granted an RMB50 million subsidy to be used for the incremental costs of constructing green buildings and eco-plans, as well as the costs of the future evaluation, identification, and energy efficiency assessment of green buildings.

We are also supporting MOHURD's Standardization Committee for Urban-Rural Planning to refine existing urban planning standards and specifications, and going forward will provide technical assistance to MOHURD on the development and revision of national and industrial standards in the domain of urban-rural planning.

We support the China Urban Public Transportation Association in conducting studies on the layout of urban metro lines, setup of stations and their relation to surrounding land. These studies will guide urban metro planning and construction, and promote TOD in local cities.

II. Sustainable Urban Transportation Systems

CSCP has supported MOHURD's National Biking and Pedestrian Demonstration Program for over two years. This year, in order to expand the scale and influence of the demonstration project, MOHURD selected six cities to join the second phase of the project, and it plans to increase the total number of cities to 30 by 2013. Based on the summary of project results, MOHURD, MOF, and the National Development and Reform Commission (NDRC) jointly issued the "Guidance on Development of Urban Walking and Biking Traffic System", which requires local authorities to move forward with the construction of walking and biking systems, improve dwelling environments in cities and promote sustainable city development. By 2015, the conditions for walking and biking transport in cities need be improved significantly, and it is mandated that there be an ever-increasing share of walking and biking mode share. In cities with a population of more than 10 million, the

mode share of walking and biking must exceed 45%, and in other cities the mode share must be no less than 50% -70%.

This year, China's State Council approved the "National Guidance on Implementation of Strategy on Urban Public Transport Priority Development". The guidance will require related government agencies, such as the Ministry of Transportation (MOT) and NDRC, to develop a series of implementation policies and mechanisms including subsidy mechanisms, public transit evaluation systems, service level standardization, and green transportation infrastructure prioritizing. To buttress these efforts from the national government, CSCP intensified its support for public transit, including related research on comprehensive public transport evaluation indicator systems, public transport financial/subsidy policies, and related implementation mechanism for the 12th FYP.

At the end of 2011, MOT issued a notice that a national demonstration project - "Transport Metropolis" - will be carried out during the 12th FYP Period. At present, the first batch of 14 cities has been selected. These pilot cities will demonstrate high quality public transit systems with a minimum mode share of public transit of 50%.



Quancheng Plaza in Jinan



Street in Changshu

Strategic Outreach and Capacity Building:

In this initiative we work to improve the technical strength of practitioners in the fields of urban planning and urban transportation, educate decision-makers in crafting policy in the above two areas, and improve public awareness regarding sustainable urban planning and green transportation. We also collaborate with like-minded organizations to promote sustainable urbanization throughout China.

We support leading international experts and their teams, including Calthorpe Associates and Gehl Architects, to work with our local partners on project implementation, train them on our sustainability principles, and strengthen their implementation capacity.

To further publicize and promote our sustainability concepts, we have also worked with Calthorpe Associates on a design manual for low-carbon urban development, and with the Kunming and Chongqing governments on Low-Carbon City Practice case studies. Both of these documents will serve as materials for future training and capacity building activities.

As a part of our outreach and capacity-building efforts, we worked jointly with Urban Planning Society of China to establish an University Alliance with seven top Chinese Universities including Tsinghua University, Tongji University, and Chongqing University, among others. This allows us to leverage university resources to cultivate students, new teachers, and local practitioners to provide China with the next generation of talent that will be called on to implement sustainable urban planning and traffic concepts going forward.

Finally, to improve public awareness, since 2007 we have continuously supported MOHURD in its China Car-Free day event campaign, helping to bring China onboard the global campaign to reduce car use.

SELECTED CHINA PROJECTS

CALTHORPE ASSOCIATES

URBAN DESIGNERS. PLANNERS. ARCHITECTS
www.calthorpe.com

China Sustainable Cities Program
THE ENERGY FOUNDATION
www.ef.org

CHENGGONG NEW TOWN

KUNMING, CHINA

CLIENT: The Energy Foundation & China Sustainable Cities Program (San Francisco, CA & Beijing, China)
 TYPE: New Town Master Plan
 SCALE: Central District = 1,100 hectares (2,720 acres); Lakefront District = 5,240 hectares (12,940 acres)
 SUMMARY: Concept New Town Plan for 1.5 million; Master Plan for Central District with detailed design and Development Standards
 YEAR: 2010 - 2011 | Construction Ongoing



View of the Central District

Chenggong is being planned as the future administrative and employment center for the Greater Kunming region; a new 'Gateway to South East Asia'. In recognition of the ecological wealth of the region, growth around the Dianchi Lake has been planned as a series of 'Low-Carbon Cities'. As the first of these cities to be built, Chenggong will set a precedent for future growth in the region. The new town will have a population of 1.5 million people.

A robust transit network has been planned for the new town, comprising of BRT and an underground Metro as well as a High Speed Rail hub that will have an estimated daily capacity of 200,000 passengers. Another key development is the Yunnan University at the heart of the new town, with 150,000 students and 20,000 teachers.

The proposed master plan for Chenggong capitalizes on the substantial infrastructure investments being made, and aims to direct the growth of the new town following design principles developed in the context of China's unique urban conditions.



Illustrative Plan of the Central District

CHENGGONG NEW TOWN

KUNMING, CHINA

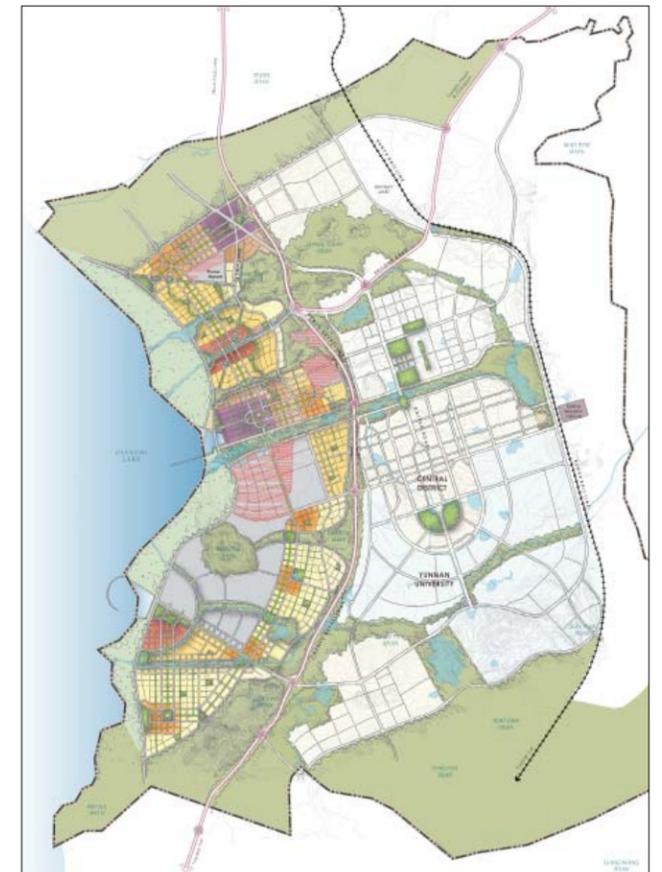
The main elements of the design concept are:

- **Create compact, transit-served communities with a healthy balance of housing and jobs.** Though the Central District will be the main regional employment hub, it will be supported by auxiliary growth centers to promote balanced growth, facilitated by a comprehensive transit network. By consolidating growth based on transit and employment opportunities, the planned population can be accommodated without resorting to sprawl.

- **Focus density around transit and create a hierarchy of mixed-use 'centers'.** The new town will have a mix of Urban, Town and Village Centers that will vary in density and the proportion of residential, commercial and other uses; determined by location and ease of access, both by car and transit.

- **Maintain human-scaled streets and blocks.** To recreate the intimate scale of streets and spaces found in traditional cities the superblock has been deconstructed into smaller blocks with a finer grid of narrower streets. The alternate 'Urban Network' proposed (opposed to the superblock grid) provides tangible benefits for the pedestrian, and improves efficiency for both transit systems as well as the private automobile.

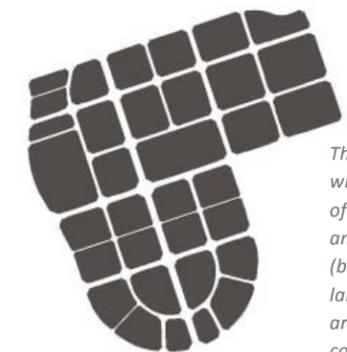
- **Enrich the natural landscape, riparian network and natural landmarks.** A comprehensive open space system will connect prominent green belts, parks and playgrounds; often linked through auto-free streets to create a safe and enjoyable circulation system for pedestrian and bike traffic. All existing waterways have been preserved, and civic amenities have been located in proximity to parks and plazas.



Overall New Town Concept Plan



View along the reconfigured Caiyun Road: an 80 m arterial forming the main north-south spine of the Central District. It was converted into a one-way couplet flanking a linear public park.



The proposed plan with a denser grid of narrower streets and smaller blocks (below) yields a larger buildable area (BUA) compared to the Superblock Plan



CHENGGONG NEW TOWN

KUNMING, CHINA



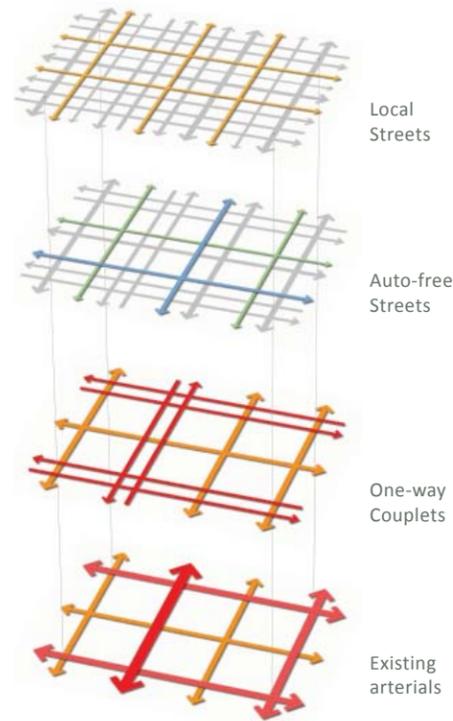
A range of block types was developed for residential and commercial land use categories; along with a set of illustrated urban design and land use standards.



Open spaces vary in scale from large public greens to small neighborhood parks, playgrounds and plazas, as well as private and semi-private internal courtyards within the blocks



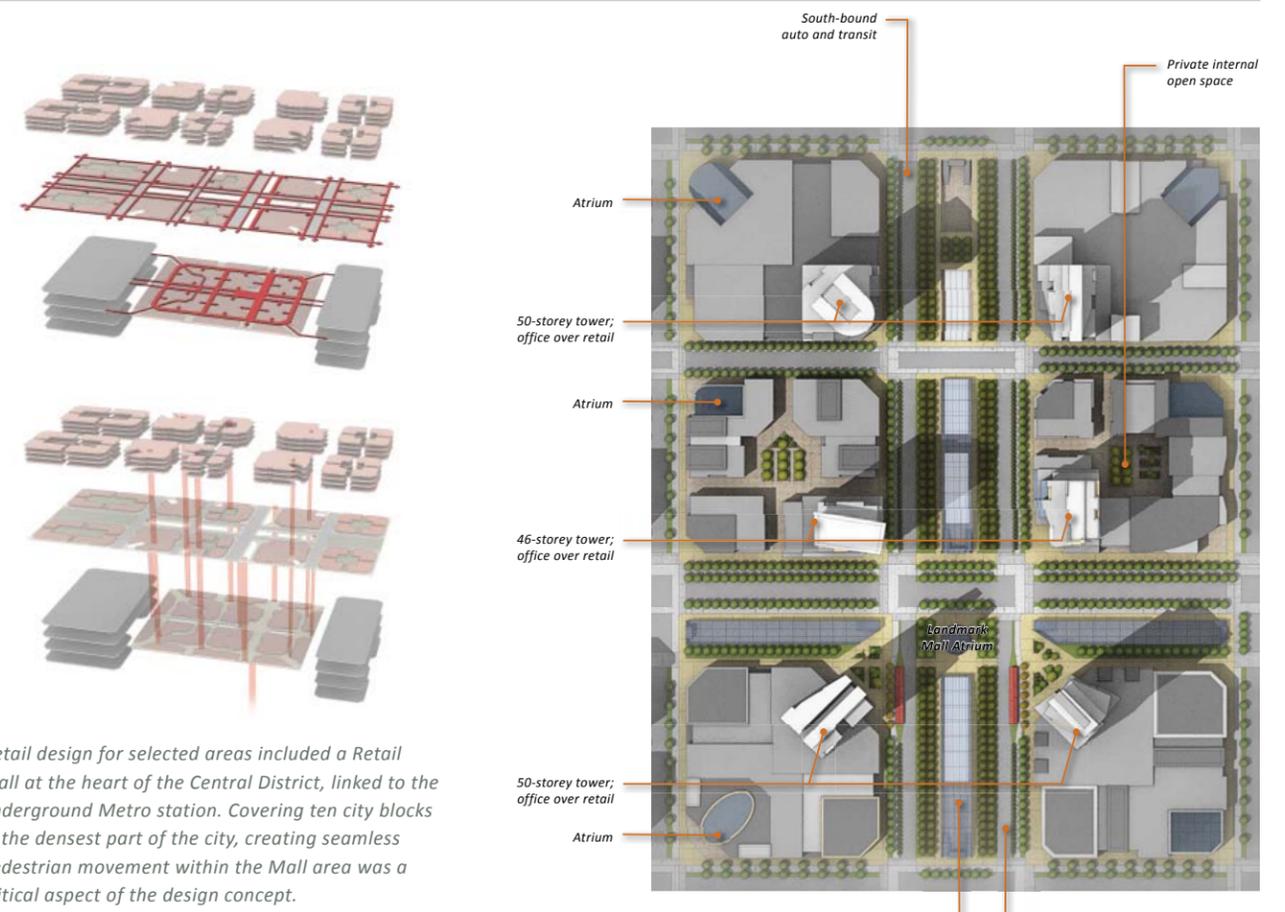
A key aspect of the design was to 'deconstruct' the Superblock grid into an Urban grid with pedestrian-friendly streets, and human-scaled blocks. Existing arterials that would have acted as barriers within the city were reconfigured to a pedestrian scale. The diagram below illustrates this transformation process.



The design places an open space or civic amenity within a five minute walk from every home in the Central District

CHENGGONG NEW TOWN

KUNMING, CHINA



Detail design for selected areas included a Retail Mall at the heart of the Central District, linked to the underground Metro station. Covering ten city blocks in the densest part of the city, creating seamless pedestrian movement within the Mall area was a critical aspect of the design concept.



View of the 'Ellipse Plaza', a high-density node at the entry to the Central District

YUELAI ECO CITY

CHONGQING, CHINA

CLIENT: Chongqing Planning Bureau (Chongqing, China) & The Energy Foundation (San Francisco, CA & Beijing, China)
 TYPE: New Town Master Plan
 SCALE: Overall site = 1,031 hectares (2,548 acres); Phase One = 343 hectares (847 acres)
 SUMMARY: Concept New Town Plan; Master Plan for Yuelai District with detailed design and Development Standards
 YEAR: 2011



View of Phase One

Yuelai Eco-City is a 1,000+ hectare urban development district in northern Chongqing, China. The site is situated within the lush hills and valleys along the winding Jialing River, a few kilometers upstream from its junction with the Yangtze. Served by three proposed Metro Line 6 stations, and sited between Chongqing's upcoming International Exposition and Horticultural Exposition Centers, the development is poised to become a major population center in the region. In addition, Chongqing leadership have targeted this site to become a regional leader in sustainably conscious development.

The future vision for Yuelai Eco-City is one that places a special emphasis on sustainable transportation, infrastructure and energy-efficient uses. In doing so, the term 'Eco-City' will take on a greater meaning, and in reality, a model community for all of China to emulate.

The previous plan for Yuelai Township suffers from many typical planning problems: large single-use areas, pedestrian-unfriendly superblocks, and a lack of co-ordination with Metro stations. The plan re-organizes the site into walkable, mixed-use transit centers in and among the rolling topography. In this way residents, workers and visitors alike can enjoy the benefits of a car-free environment. A dedicated electric bus



Overall Illustrative Land Use Plan

YUELAI ECO CITY

CHONGQING, CHINA



The Ellipse Gateway is the functional core of the Phase One plan



Pedestrian priority and transit access influence every aspect of the plan

system operating along an auto-free street will transport people longer distances between the Metro stations, and ultimately feed a network of neighborhood parks and civic facilities. Proposed transit adjacency was a key variable determining the landuse makeup and supplementary transportation systems within Yuelai. High densities and mixed uses surround the Metro Stations, and a surface-level network of dedicated bus-only streets connect neighborhoods throughout the city. Local bus lines will connect neighborhoods that are not serviced by the metro system, thereby providing a continuous system of transit connectivity. Hillside escalators will facilitate steep connections between neighborhoods and open space amenities, and a robust system of non-motorized travel will be dedicated within major street ROW's. Chongqing's traditional hillside building typologies were adapted to line hillside pedestrian streets, mirroring the tradition of short hillside retail corridors found in historic Chongqing.

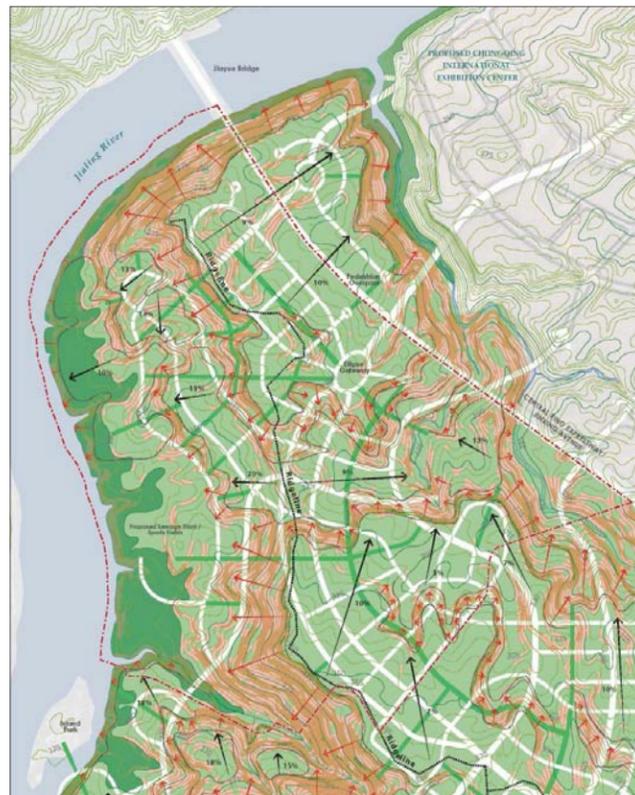
An extensive trail system will connect the hillside community parks, riparian areas, and the waterfront. The waterfront area, most of which resides in the floodplain, will be developed as a system of linear parks. Some of the larger open spaces (including a new sewage treatment plant) will contain regional sports fields, and other smaller areas will be for strolling along the river.



Counterintuitively, the proposed plan (below) yields a larger buildable area (BUA) compared to the current Superblock Plan (above). This is achieved because the proposed plan's more connective street network has narrower streets, resulting overall in less paved street area than the predominant development pattern. 'Small block' zoning used throughout the plan creates more walkable blocks and allows a greater land use mix in a smaller area.

YUELAI ECO CITY

CHONGQING, CHINA



Comprehensive grading analysis was done to create an efficient circulation network and maximise developable land without extensive modification of the site's natural terrain. The design locates key landmarks at higher elevation, with buildings stepping down the slopes. The open space network uses a variety of parks, trails and auto-free streets and connects to the riverfront.



Visualization of the approach to Yuelai Eco-City across the Jialing River

YUELAI ECO CITY

CHONGQING, CHINA



A key design challenge was to create a comfortable and well-connected circulation network for pedestrians and bicyclists. Working within the constraints of the natural terrain, a system of auto-free streets connects key destinations on the site, further enhanced by an electric shuttle bus route along one of the main auto-free streets. By making it safe and enjoyable to walk or bike, the plan not only creates a sense of community, but also achieves one of the main goals of 'Five Chongqing' - to reduce auto-dependence, and thus carbon emissions.



View of Yuelai Eco-City: the plan works with the natural terrain to create walkable streets and small blocks.

ZHUHAI NORTH TOD

ZHUHAI, CHINA

CLIENT: Zhuhai City Government (Zhuhai, China) & The Energy Foundation (San Francisco, CA & Beijing, China)
 TYPE: New Town Master Plan
 SCALE: 2,791 hectares (6,894 acres)
 SUMMARY: Concept New Town Plan; Master Plan for North TOD Area with detailed design and Development Standards
 YEAR: 2012



Open Space Plan

The North TOD study area is located in Zhuhai's Tangjiawan District, 15 kilometers north of the developed core of the city, just south of the city of Zhongshan, and 115 kilometers south of Guangzhou. Situated between forested mountains to the west and south, and the Pearl River Estuary to the east, the area includes a major intercity rail station and is connected by many important existing and planned transportation and transit corridors. The North TOD plan maximizes the potential of these transit connections, which are a component of favorable provincial and national government policies to stage Zhuhai as a key development core of the next generation.

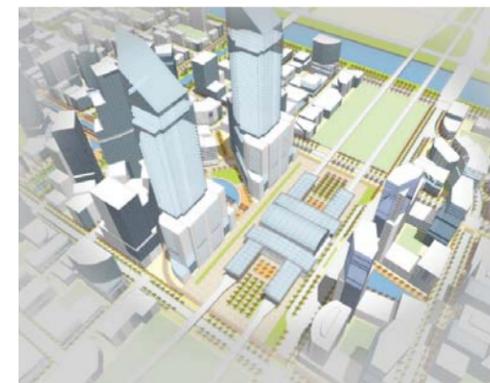
Clustering destinations near regional and local transit facilities – including a streetcar line along the spine of the site – is one of eight 'Design Themes' guiding the site design. The result is a plan that harmonizes the development of new communities with the unique local setting, character, and history of the site. The Design Themes expand upon the core Design Principles that strategically address growth issues facing Chinese cities. The Zhuhai North TOD plan's eight themes are described here in the context of the plan's features and goals.



View of the TOD Core Area

ZHUHAI NORTH TOD

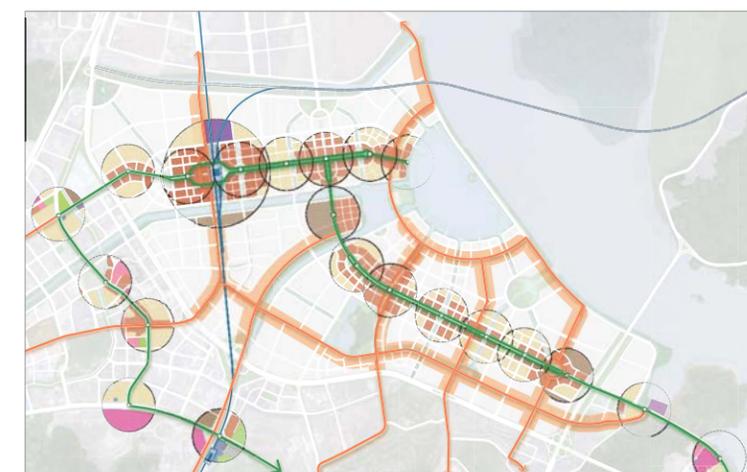
ZHUHAI, CHINA



Views of the core area in the Beiwei district show the complementary interaction between development form and the network of streets, greenways, and canals that structure the plan.



Greenways and canals radiate from the Crescent Harbor into each area of the site



Development is oriented to transit facilities

1 UNIFY SITE WITH A LANDMARK HARBOR AND TRANSIT BOULEVARD

A grand Crescent Harbor unifies the site's three distinct districts. Surrounded by high-rise residential and commercial buildings, the harbor will become a landmark for the whole city.

A unifying Transit Boulevard will sweep around the crescent and inland to connect to the intercity rail station. This auto-free boulevard will feature a canal, bike, pedestrian, and transit ways, lined by multi-use buildings with shops and cafés.

2 ORIENT DEVELOPMENT TO TRANSIT FACILITIES

Three types of transit – intercity, streetcar (light rail) and bus rapid transit (BRT) – create a variety of station types. Development is coordinated and scaled around each, from high-density development and regional retail at the most urban stations (where the streetcar meets the intercity rail station), to higher-density employment and walkable local destinations at the transfer points between BRT and local bus lines. Plazas and parks reinforce the public space along the transit boulevard.

ZHUHAI NORTH TOD

ZHUHAI, CHINA

3 CREATE A NETWORK OF GREEN STREETS, LINEAR PARKS AND LOVERS' ROAD

Greenways radiate from the Crescent Harbor and run across the transit boulevard, providing open spaces and paths for pedestrians and bikers.

Auto-free local streets run provide further connectivity to commercial and recreational areas. And, the tradition of Zhuhai's Lovers' Road extends into the site, running along the bay and dramatically across the Crescent Harbor.



Green streets, linear parks, and Lovers' Road link are interspersed throughout the site

4 CONNECT TO SURROUNDING USES AND COMMUNITIES

Connections are vital. The streetcar line runs along the ferry harbor, up the transit boulevard to the intercity station, through employment areas, and to the Beijing Normal University. BRT lines connect directly to the neighborhoods and centers to the south. A greenway aligns with open space and leads to the mountains to the south to provide access to recreation and trails.

5 CREATE WALKABLE AND HUMAN-SCALED NEIGHBORHOODS

Truly livable neighborhoods are key to the success of the project. Design strategies include bringing local destinations close to home, creating comfortable, interesting local streets, laying out small blocks, and lining sidewalks with small shops, cafés, and services.

All this is accomplished by a fine-grain network of streets that mixes two-lane local streets, auto-free roads, one-way couplets, and the transit boulevard. Small setbacks and courtyards within blocks reinforce the active, human-scaled streets.



The transit boulevard features a canal and bike, pedestrian, and transit ways, lined by multi-use buildings with shops and cafés. With consistent treatments and features, this memorable street will unify the identity of North TOD.

ZHUHAI NORTH TOD

ZHUHAI, CHINA



Aerial View of the North TOD Concept Plan

6 BALANCE USES AND DENSITIES

Jobs and local residential population in the site balance at a ratio of 0.5, creating an equal number of in and out commuters at peak hours. All basic needs and destinations are close to homes and transit. Retail is distributed along the transit boulevard, and parks, cultural facilities, and schools are easily accessible.

7 DEVELOP A SERIES OF UNIQUE PUBLIC DESTINATIONS

The plan features a range of distinctive public places: the Crescent Harbor, a levee parkway along its perimeter, and a small island park at the center of the harbor. A large island where the two canals meet the harbor will be home to major cultural facilities. Three major parks, each unique in its features add to the list of destinations: Poem Mountain Park, Gateway Park, and a 'Keyhole' park that connects directly to the bay and Lovers' Road.

8 DEPLOY STATE-OF-THE-ART ECOLOGICAL SYSTEMS

Reducing auto-dependence and its energy, carbon, and air quality impacts is foremost in the ecological design for Zhuhai. Complementary environmental strategies include climate-responsive building design that reduces energy and electrical demands, renewable energy and cogeneration technologies, and water recycling systems.



Grey water system



Solar energy



Cogeneration

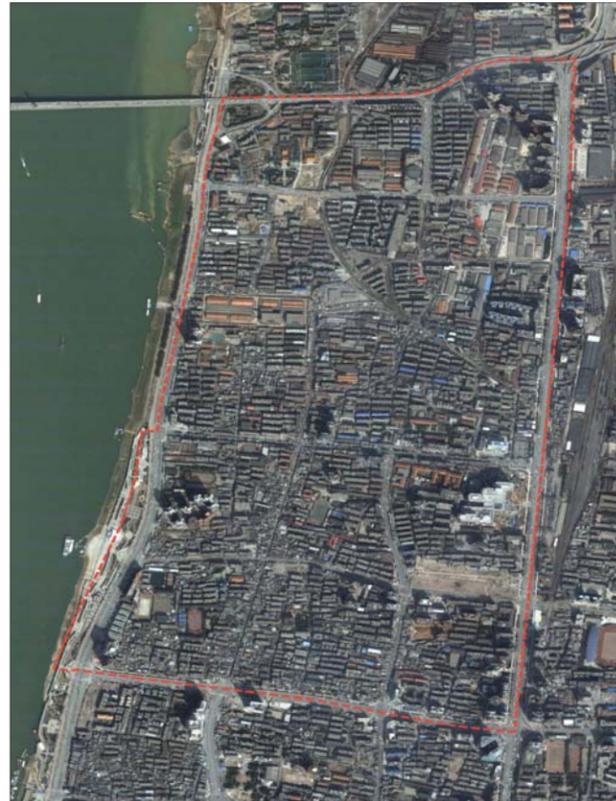
NORTH HUANGXING ROAD

CHANGSHA, CHINA

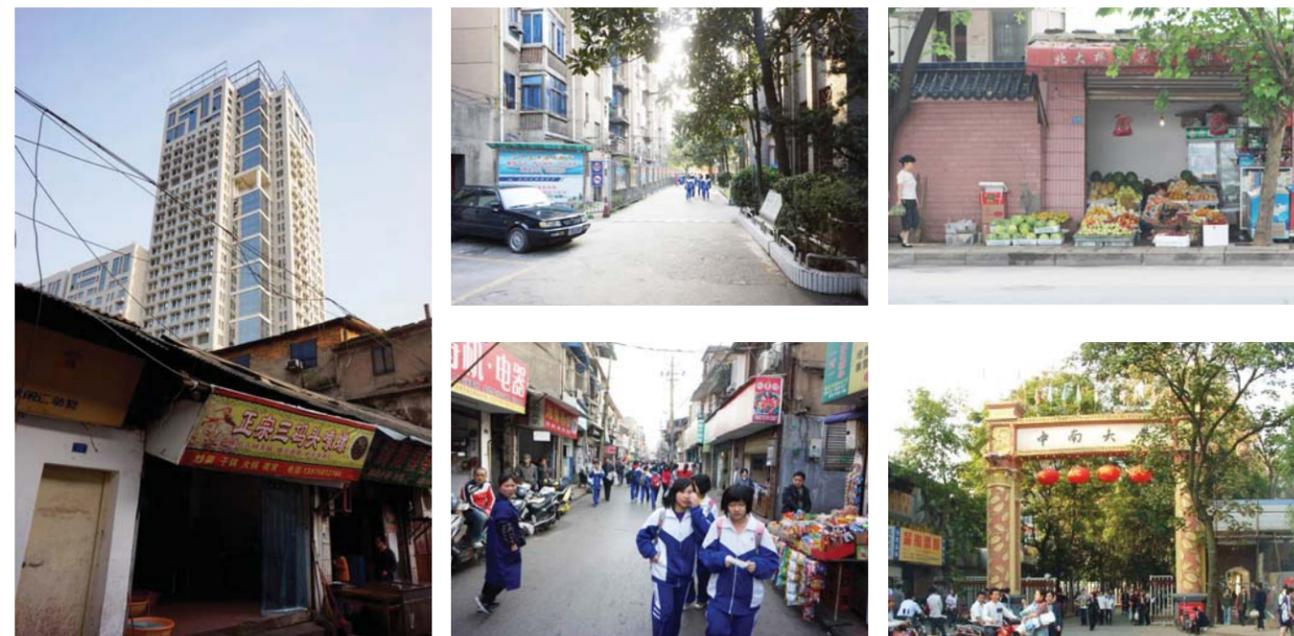
CLIENT: Changsha Planning Bureau (Changsha, China) & The Energy Foundation (San Francisco, CA & Beijing, China)
 TYPE: Downtown Redevelopment Plan; Urban Renewal
 SCALE: 330 hectares (815 acres)
 SUMMARY: Concept Plan (two options) for the urban renewal of downtown site with schematic 'Shopping Street' design
 YEAR: 2012

The North Huangxing Road Redevelopment Area presents a universal design challenge for Chinese cities; how to improve housing and livability without destroying the existing sense of community, local economy and its human-scale walkability. Clearly the housing is substandard and needs redevelopment. In addition three new metro stations will enhance access to the site. But too often redevelopment destroys the human scale and sense of community that binds urban neighborhoods together.

The two design schemes developed for this 330 hectare downtown site allow major redevelopment of housing blocks while enhancing the community with new parks, preserving the human-scale, walkable environment and rebuilding auto-free shopping streets that preserve affordable small shops and local businesses. At the heart of the community is a pedestrian-oriented shopping street - a key meeting place that will be demolished for a 40 meter arterial planned through the center of the district. It needs to be improved but not eliminated. Both design concept options rebuild the shopping streets and retain their small store scale and walkability. Some of the shops would be integrated into the ground floor of new residential buildings. Others could be built as simple low-cost single story 'market hall' type buildings.



Site context



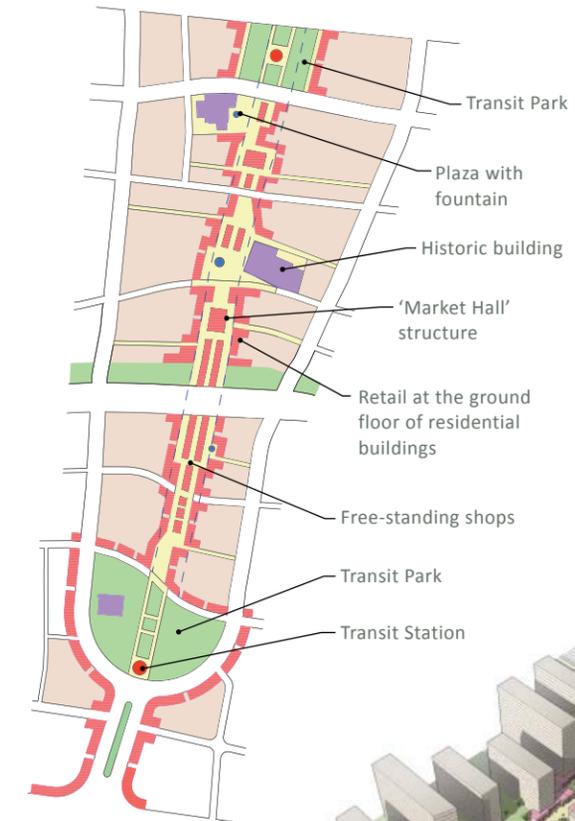
Site photos

NORTH HUANGXING ROAD

CHANGSHA, CHINA



Shopping street (Design Option 1) with a central spine of shops and 'Market Hall' structures (above); and plazas featuring fountains and historic buildings (below)



Shopping streets are a key feature of both design concepts.

The shopping street in Design Option 1 runs north-south along North Huangxing Road. A couplet of one-way streets diverts traffic on either side of North Huangxing Road, thus helping to preserve the historic pedestrian street with its human-scale shops and walkable environment.

Design Option 2 has shopping streets in the east-west direction leading from the riverfront to the three transit station areas.



Overview and massing of the North Huangxing Road shopping street.



The northern shopping street (Design Option 2): a typical auto-free street lined with shops and plazas connecting each of the three transit stations.

HUANGXING CONVENTION CENTER SITE

CHANGSHA, CHINA

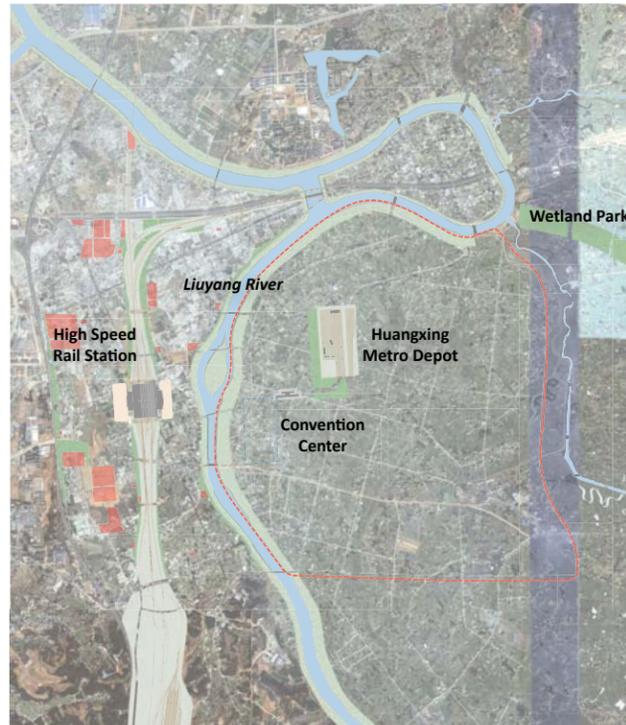
CLIENT: Changsha Planning Bureau (Changsha, China) & The Energy Foundation (San Francisco, CA & Beijing, China)
 TYPE: TOD New Town Concept Plan
 SCALE: 1,800 hectares (4,446 acres)
 SUMMARY: Concept Plan for transit-oriented new town at a high-speed rail site
 YEAR: 2012

The Huangxing site consists of 1800 hectares of land to the east of the Liuyang river adjacent to Changsha's new High-Speed Rail Station. The site is largely undeveloped but is planned as a major growth area. Bounded by the river to the west, a Wetlands Park and restoration area to the east and two expressways to the north and south, there are three metro line extensions planned through the site and a new High-Speed Rail Station just west of the site. Key to the development is the location of the city's new Convention Center facility with its ancillary uses directly across the river from the High-Speed Rail Station.

The plan for the site exhibits some key design concepts that respond to challenges and strategies that are universal to many new growth areas throughout China. These are to develop an



The Convention Center District has a total area of 230 hectares, slightly more than the city's program. The 68 hectare Convention Center site will enable flexibility for the architecture and provide latitude for changes over time. The mixed-use area surrounding the convention facility is configured into human-scale blocks and a walkable street network. The ratio of uses in these blocks can be easily adjusted as the use and program for the area evolve.



Site context and existing conditions

overall circulation system that enhances pedestrian and bike mobility without compromising traffic flow; focus density and mixed-use at the planned metro stations; and create a network of greenways and linear parks that tie the site together and link to the site's natural features. In addition, a key catalyst specific to this site is to develop a Convention Center District that integrates the riverfront, provides multi-modal site access, a walkable urban street network and complimentary land uses.

The site plan establishes the following key design themes:

1. Locate the Convention Center and its ancillary uses along the riverfront serviced by two metro lines at its center. This Convention Center District would place the facility between a riverfront park and a formal grand elliptical arrival park. The Convention Center facility would feature organic forms on its riverfront side and a more formal, urban character inland. The surrounding mixed-use area would be developed with small, human-scaled blocks and walkable streets as well as an auto free north/south spine.

DESIGN CONCEPT: OPTION 2

Option 2 provides a series of east/west shopping streets leading from the riverfront to each of the three transit station areas. These auto-free streets lined with small shops and punctuated with parks and plazas utilize streets already in the city's planned circulation system. Therefore no additional right-of-way will be required to develop this scheme.

- This approach serves to provide replacement sites for the shops, local economy and critical services that currently exist in the North Huangxing Road alignment. So in this design the new north/south arterial road can be constructed as planned. No additional one-way streets would be needed as in Option 1.
- The design and pedestrian-friendly qualities of this major north/south arterial should be developed. Likewise, enhancements to the riverside boulevard can be made to enhance the pedestrian environment and support crossings at critical locations.
- The added benefit of Option 2 is that the river and waterfront park is connected along the auto-free streets to the interior of the neighborhoods as well as the transit centers. In addition, these special streets would connect a necklace of neighborhood parks to the transit stations and the riverfront. All of the park areas are shown on sites designated for redevelopment. Finally each transit stop will feature an urban plaza to create identity and focus for these key sites.



The east-west shopping streets (Design Option 2) create a vital pedestrian link between the riverfront park and the open spaces in the interior neighborhoods.

NORTH HUANGXING ROAD

CHANGSHA, CHINA



Design Concept: Option 2



NORTH HUANGXING ROAD

CHANGSHA, CHINA



DESIGN CONCEPT: OPTION 1

The central feature is to preserve and rebuild the human-scale shopping street currently located in the proposed North Huangxin Road arterial right-of-way. This would help to create a more walkable, mixed-use community and at the same time preserve the established local economy and affordable shopping. We believe that the large 40 meter arterial planned through the center of this area could destroy its historic character and community identity.

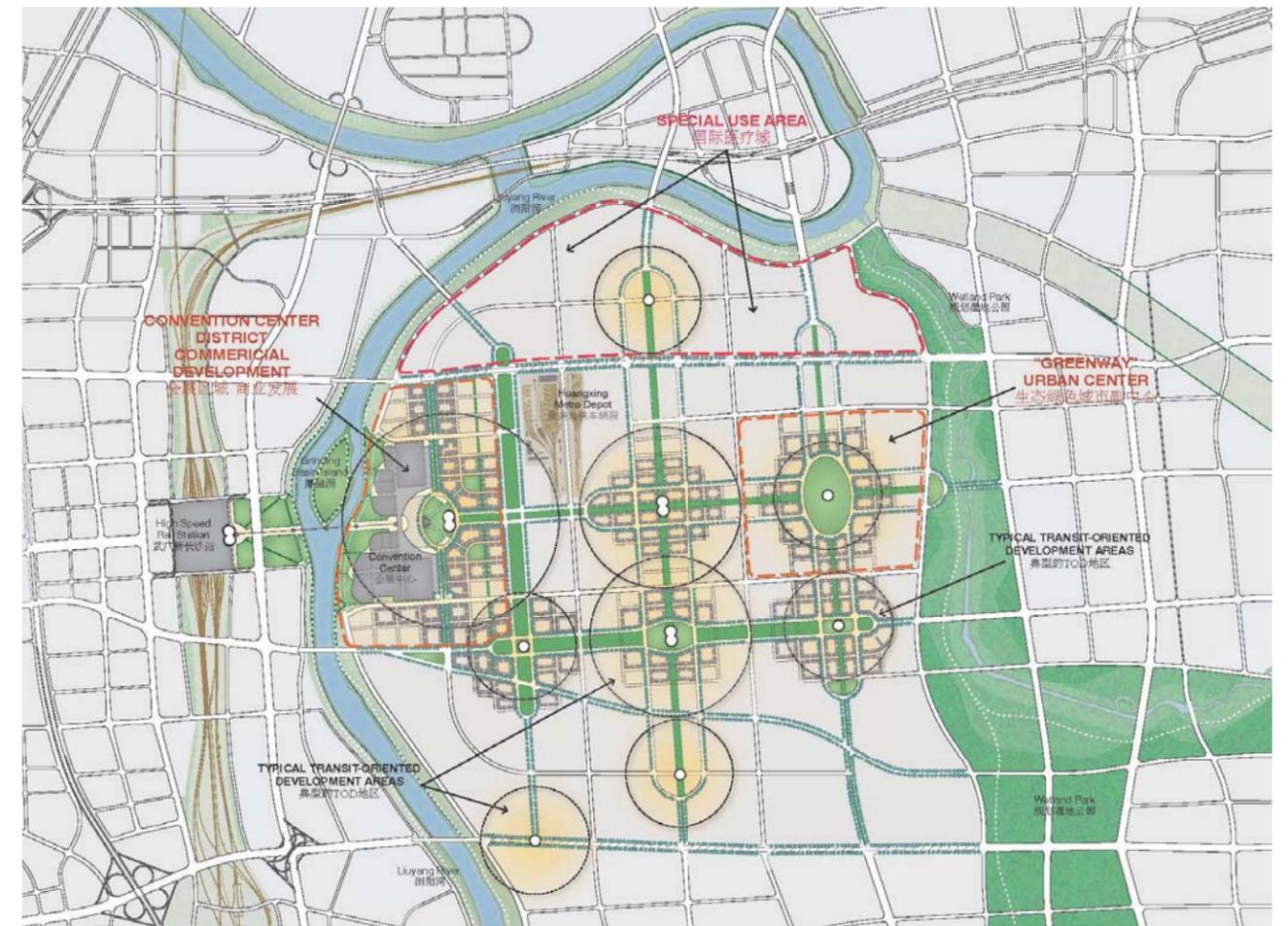
- Through traffic will be diverted onto two one-way streets on either side of North Huangxing Road and the central area rebuilt as an auto-free shopping street. A park would be located at each metro station and the shopping street would connect the three new station areas.
- The planned 40 meter right-of-way can be redeveloped with human scaled buildings, small parks and plazas with shopping on the ground floor. Detailed studies and planning can add variations and identity to this feature.
- Two linear parks running east/west to the riverfront park will further integrate the community with the city. This treatment of an auto-free shopping street, parks, and greenways will create a unique community and demonstrate a new direction for urban renewal in the city.



Design Concept: Option 1

HUANGXING CONVENTION CENTER SITE

CHANGSHA, CHINA



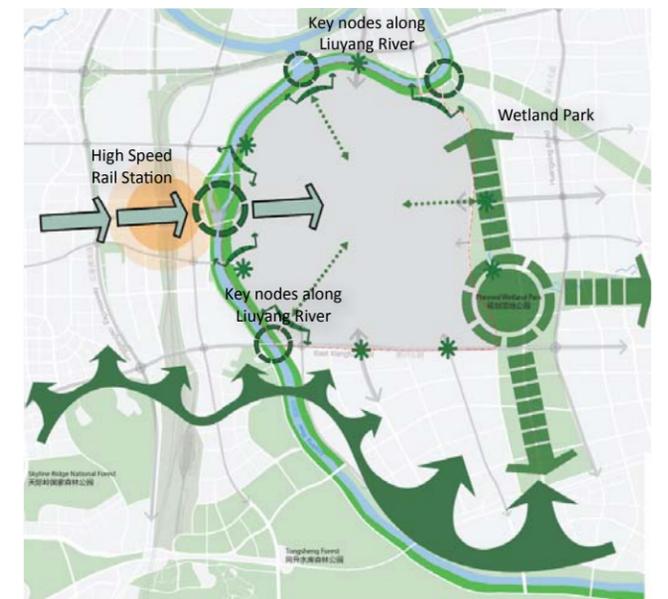
Concept Plan

2. Develop a central green axis connecting the High-Speed Rail site to the Convention Center District and then westward along a greenway to several Transit Oriented Development (TOD) areas and the Wetlands Park and restoration area.

3. Develop a series of TODs each centered on a metro station that will provide a mix of uses in a walkable street network. Each of these areas would feature a small central park at the transit stop surrounded by retail shops and cafes as well as high-density commercial uses.

4. Develop an overall street network employing one-way couplets to accommodate major through traffic without creating barriers to pedestrian and bike movement.

5. Locate a series of greenways and auto-free streets that connect the TOD centers, the riverfront and the Convention Center District. This green network will provide for local parks and recreation areas as well as a trail and bike system to access all of the destinations within the larger area.



The riverfront, a large natural forest to the south and a wide green buffer and wetland park to the east provide key green elements and a favorable micro-climate to the site. Key nodes along Liuyang River with exciting views can be developed as parks and gateways to the site. The high speed rail station is also on an open space corridor that connects the region and city to the site.