

Virtual Design World Cup 2018 The 8th student BIM & VR design contest **Team: YinYang**



INTRODUCTION

After researching, Yin yang realised that Shanghai - a rising incubator for clean-energy startups - are experiencing two big problems: overpopulation and air pollution/ airpocae. Taking advantages from startup blooming phenomenon, we decided to keep most state-of-the-art infrastructure and focusing on technology solution. Because smart city, where sensor technology and big data are used to enhance the shareability of infrastructure, are the most desirable solution to address overpopulation problems of this well-developed city. Regarding sustainable planning, Yin yang build several rooftop parks functioned as a green lung that can "eat smog" for this city therefore improve the air quality.



DESIGN CONCEPT

Located in a culturally rich city, Pudong is a modern and vibrant district with rapid growth in demographic which are putting a significant pressure on transportation system and the environment. The design concept is based on a well-known philosophy in Chinese culture (Yin yang) which describes how seemingly opposing forces can combine to create a balanced and stronger whole. In this plan, we create a harmonious blend of traditional and modern, in which the crowding population can share agreen living space and enjoy the intelligent transportation system.



1 Fast charging electric bus system









(2) Intelligent sensor street lamp system



PLANNING



A SENSING CITY

Intelligent sensor street lamp system

Street lights are doing more than ever in today's smart cities. With digital networks and embedded sensors, they collect and transmit information that help cities monitor and respond to any circumstance, from traffic and air quality to crowds and noise. They can detect traffic congestion and track available parking spaces. Those very same networks can remotely control LED lights to turn on and off, flash, dim and more, offering cities a chance to maximize low-energy lighting benefits while also improving pedestrian and bicyclist safety. A key success factor is that the data must be accessible – in an "open" data store – where it can be tapped into by city officials and citizens alike. That feature might enthusiastic support for the startups blooming phenomenon n Pudong.



Real-time data collected from the sensor system is processed immediately and reach to each individual, hence simplify the navigating process



Vehicle flow analysis



Accident Arlert



Parking Guide



Electric bus is one of many solutions for improved and sustainable urban mobility. The fast-charging system can provide enough charging in ten minutes for a bus with a 100kWh battery to travel about 30 miles.

E-buses lane is installed in the main road and served most morbidity demand in Pudong downtown. The electricity for these buses is generated exclusively from renewable energy sources. Not only being the eco-friendly means of transportation, using only a tenth of the energy of a standard diesel bus, this performance translate into fuel savings of as much as \$200,000 over the full lifetime of the vehicle.





function as a natural air-conditioner. Interestingly, the yin yang architecture, which formed by a pair of building facing each other, can preserve the culture value inside a high-tech city





Electric bike-sharing service

The electric sharing-bike service is served for inner mobility. This service is convenient, cheap and eco-friendly, but a large number of rental sometimes create clutter in street and pedestrian zone. Yin yang tackles the problem of parking disorder with a covered parking for bicycles that, on the opposite side, serves as a bench for pedestrians. The green parking will be an aesthetical facilities in downtown

ROOFTOP GREENERY

Yin yang idea is brought into architectural design of green living area.



Plan view



A green space is built on the top of each residential building and



Roof-connecting bridges link two green space together in order to increase the accessibility of rooftop greenery. Thanks to the linkage, Yin building citizens can share the public eco-zone with Yang building citizens. In evacuation case, the bridge can act like an extra emergency exit for people who live in the upper part.



The main function of rooftop greenery is provide thermal insulation, noise shield and improve indoor air quality when purify and filter the surrounding air. In addition, green roofs make the most of unused space within the increasing density of overcrowded cities. Rooftops can be developed into social and recreational spaces, used for urban agriculture. Yin yang design allow a circulation flow and ensure natural shading between two building.

Smart Car Parking

Sensors embedded in the ground, or cameras mounted on light poles or building structures, determine whether the parking spaces are occupied or available. This data is routed wirelessly to a gateway, and relayed to a central cloud-based smart parking platform. It is aggregated with data from other sensors to create a real time parking map. Drivers use this map on their mobile phone to find parking faster and easier instead of blindly driving around searching.



