A detailed architectural rendering of the Golden Cross Sky Ring in Beijing, China. The image shows a massive, curved, glass-enclosed bridge structure that spans multiple levels and turns sharply. The bridge is set against a backdrop of modern skyscrapers and a city skyline at night. The sky is dark, and the city lights are visible in the distance. The bridge itself has a grid-like pattern on its exterior. In the foreground, there are several small green trees and some people walking on the ground level. The overall scene is futuristic and modern.

Golden Cross Sky Ring

Beijing, China

ADRIAN SMITH + GORDON GILL
ARCHITECTURE

Golden Cross Sky Ring

Beijing, China

The Golden Cross Sky Ring was designed to create a new urban gateway through one of Beijing's busiest intersections, as well as form a new vision for the CBD district. The Sky Ring design is further proposed as the prototypical pedestrian link at the four major intersections in downtown Beijing.

SERVICES
Architecture

CLIENT
Yintai Beijing, Metro Land Corporation

FUNCTION
Infrastructure
FACTS
18,000 sm

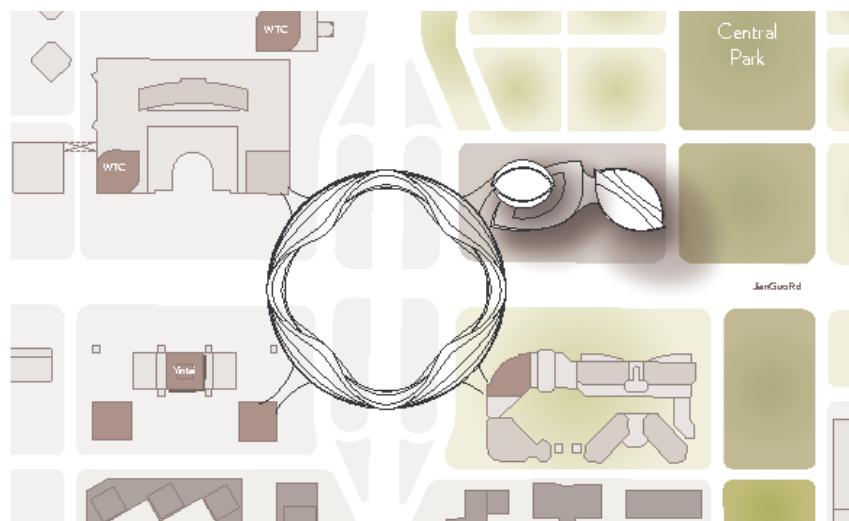
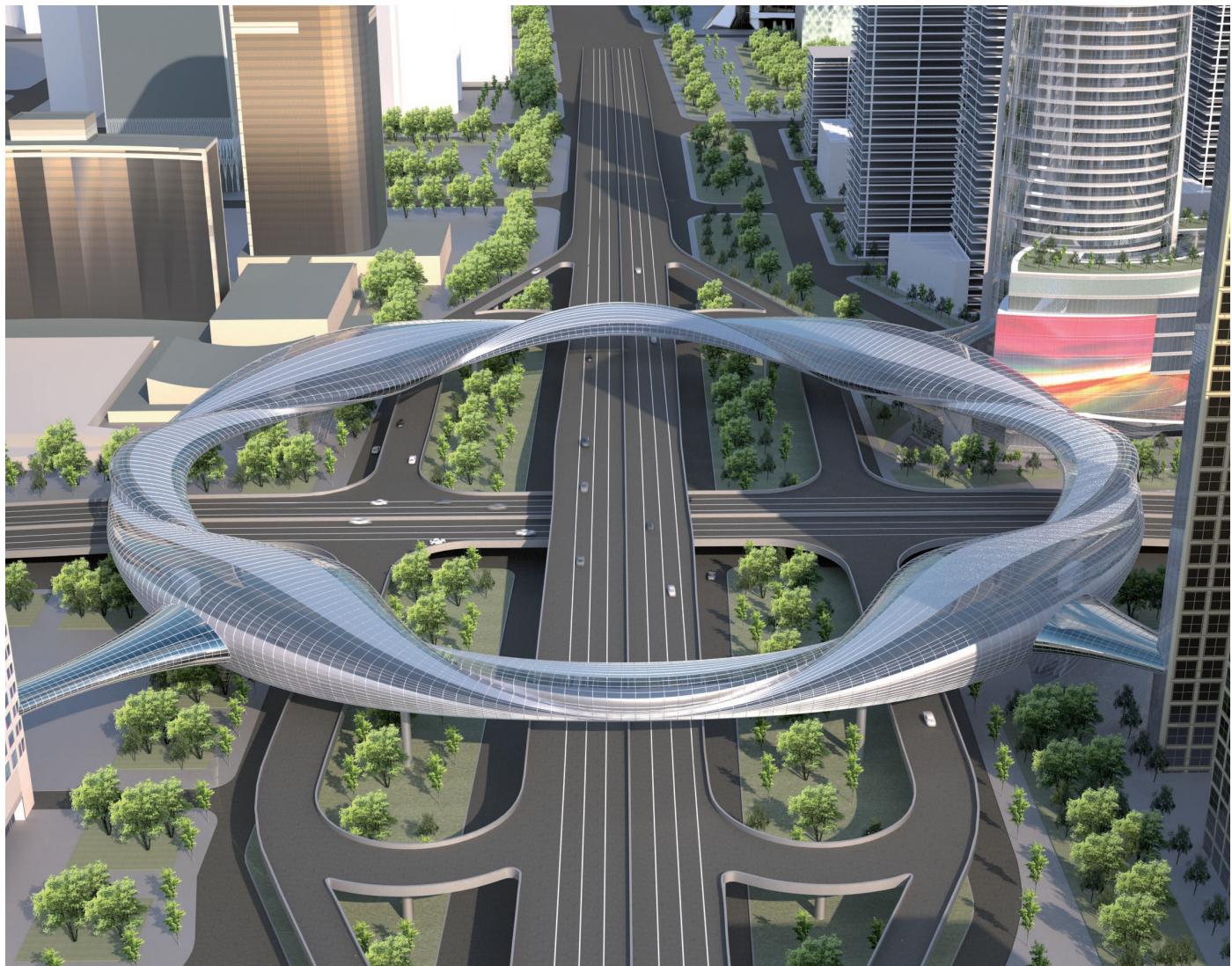
Beijing continues expanding its massive urban structure through a system of wide-ring roads. Although there has been attempts to improve the quality of the streetscape, traffic is still a major problem because of the continued increase in the amount of cars. Huge urban nodes at intersections are not pedestrian friendly and the development of below grade subway lines further complicate the pedestrian circulation pattern with confusing exits around the street intersections. It has become obvious that pedestrian safety and comfort should be improved.

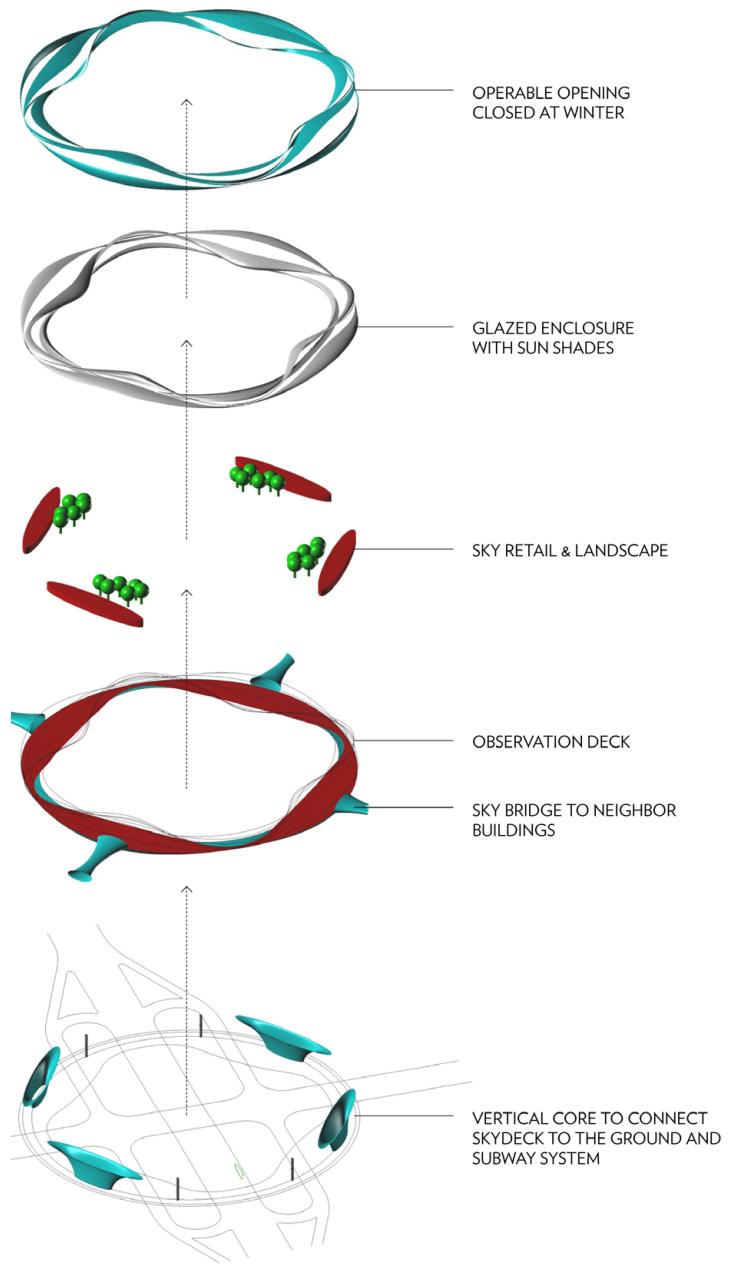
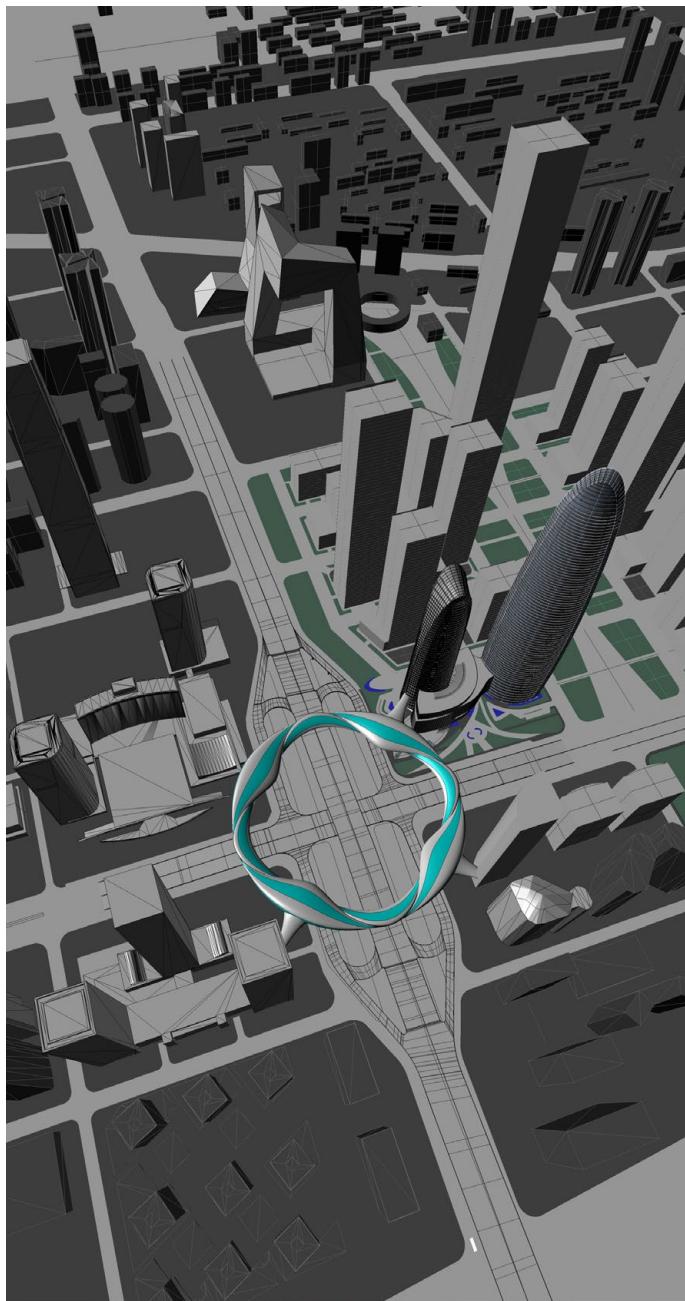
The Golden Cross, which can be found at the intersection of the East Third Ring Road and ChangAn Ave (also the city's eastwest central axis) is famously known as the gateway to Beijing CBD area. Much of the busy intersection is occupied with luxury mixed-use developments that include offices, hotels, and residences. It is considered an important destination for business, shopping and viewing the streetscape of famous ChangAn Ave.

Three levels of elevated roads pass through the intersection as a way of organizing the local and express traffic from all directions. It currently takes ten minutes for a pedestrian to pass across the wide streets, navigating through heavy vehicular traffic. The proposed Sky Ring will act as a pedestrian link that will allow circulation over the Golden Cross intersection as well as connect buildings above the street level. The Sky Ring will also open to street level and will connect to the subway through four vertical cores that will coordinate with existing subway exits.

Beyond the basic circulation functions, the form was inspired by the Chinese culture's respect of integrated universal forces and the admiration to the sun light halo. The Sky Ring is visioned as an urban space with relaxing gardens, a variety of retail stores and observation decks that will create a new vibrant icon for the CBD district and Beijing. The facade will have an operable skylight system, which will open in the summer to allow natural ventilation and will close in the winter to provide protection.

As a prototype the ring can be scaled to fit to different urban scopes. All systems and assemblies can easily be duplicated at any size.





The proposed structural system for the Sky Ring is a composite structural steel braced system. The roof of the bridge will consist of a light structural steel system. The sky ring includes retail space around circulation cores (four thus) which also brace the structure of the bridge.

Each core will consist of concentrically braced walls which will provide gravity support and which also stabilize the bridge. Between the cores over Third Ring Road additional reinforced columns will provide gravity support and also will laterally stabilize the bridge. Bridge spans between columns and cores will be achieved by utilization of a series of arched

trusses (top surface flat and soffit arched), one truss centered on the support points and two on the sides of the bridge (three truss lines total).

Initially a series of surface analysis were performed to optimize the shape and to confirm the optimal location of structure to support the bridge. The walking surface and skin surfaces will be diagonalized ultimately to ensure a stiff torsion box to resist the twisting induced due to the curved plan of the bridge. Additionally, this diagonalization will ensure that the bridge is stiff for horizontal vibration which often governs light long-spanning pedestrian bridge design.