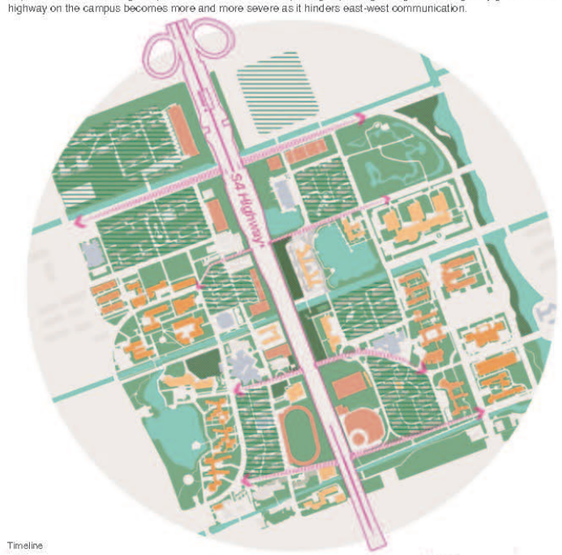
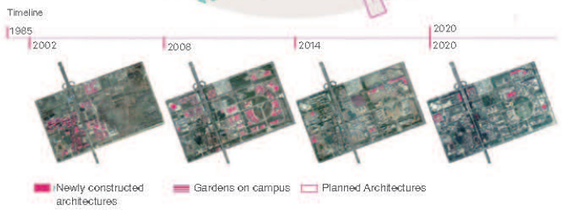
Background | S4 Highway - A Physical Block Splits Up the Campus of SJTU

The Project Mapping

At present, in the Minhang campus of SJTU, there are four passages passing through the S4 highway green corridor. These four underpasses connect the east and west areas. The impact of the S4 highway on the campus becomes more and more severe as it hinders east-west communication.





4 UNDERPASSES, HEAVY TRAFFIC, DENSE FUNCTIONAL BLOCKS

At present, in the Minhang campus of SJTU, there are **FOUR PASSAGES** passing through the S4 highway green corridor.

These four underpasses **CONNECT THE EAST AND WEST AREAS** of the campus and carry the east-west traffic of the campus. In descending order of traffic flow, they are Siyuan South Road, Nanyang South Road, Nanyang North Road, Siyuan North Road.

Siyuan South Road connects the most important east and west teaching building blocks of the campus. The traffic flow is extremely heavy, and it is a restricted road for cars. When students need to change classrooms between classes, pedestrians and non-motorized vehicles travel intensively, and motor vehicles are currently prohibited during breaks.

Space Fragmented

The division affects the accessibility an functional continuity of the spaces on both sides of the S4 expressway.

Water Accumulation in The Channel

The parts of Siyuan South Rd. and Siyuan North Rd. crossing S4 take the form of underpass tunnels, creating water catchment points.

Audiovisual Interference

The spatial permeability of the campus landscape and the relationship between scenaries are interrupted on both sides.

Negative Interface

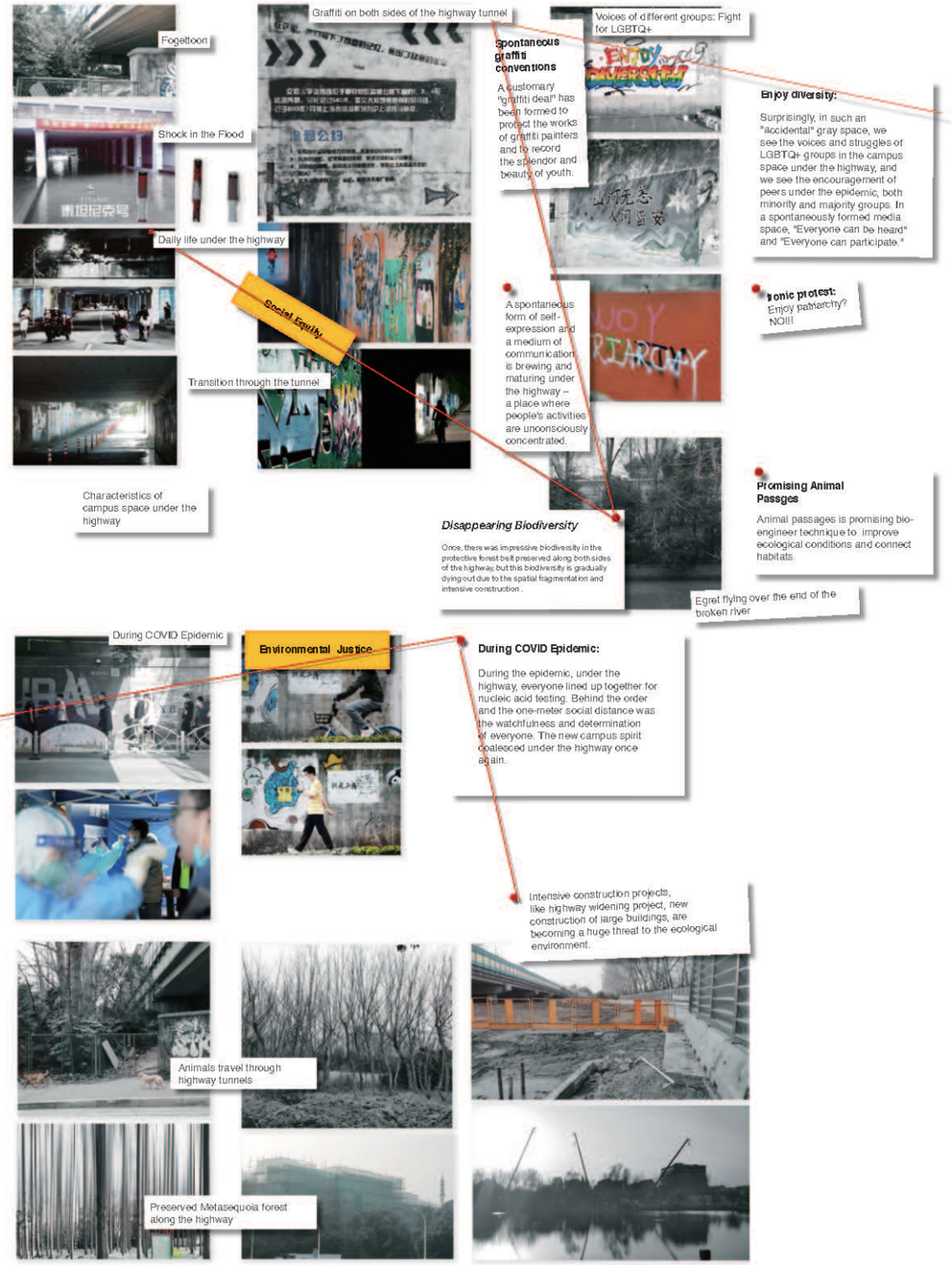
The area surrounding S4 are mostly sports fields, vacant land, shelterbelts, and back of buildings. Except for sports fields, these intersections are rarely visited and extensively managed.

a.The status of the surrounding area conditions

b.Traffic and blocks conditions of S4 highway through SJTU campus

Background | Identificaition of Issues in Environmental Justice and Social Equity

The S4 high-speed crossing of the Minhang campus of SJTU has brought serious negative effects such as spatial fragmentation, audio-visual interference, negative interfaces, and water accumulation in the passage. In addition, it also caused problems such as hidden traffic hazards and environmental pollution he east and the west. The shadow of the S4 highway has caused traffic contradictions, cultural fragmentation, and forgotten and daunting spaces on the campus.



Country /City	China\Shanghai
University / School	Shanghai Jiaotong University
Academic year	2021-2022
Title of the project	CAMPUS FIGHT! A GUIDEBOOK FOR CAMPUS TRANSFORMATION
Authors	Yuxuan Cai, Jiani Lai, Zheng Yin, Yuhui Yang, Chenyuan Zhang, Mingze Chen, Yufan Xu, Chenye Yang, Yue Chen, Le Zhang, Jiayuan Wu, Mianzhi Wu

TECHNICAL DOSSIER

Title of the project CAMPUS FIGHT! A GUIDEBOOK FOR CAMPUS TRANSFORMATION

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Title of the course Lndsacape Architecture Studio

Academic year 2021-2022

Teaching Staff Teaching Fellow: Xiwei Shen

Department / Section / Program of belonging School of Design/Landscape Architecture

University / School Shanghai Jiaotong University

Written statement, short description of the project in English, no more than 250 words

Like Janette Sadik-Khan's Street-fight, CAMPUS-FIGHT is our ambitious re-imagining of the linear campus space under the S4 Highway in order to mitigate the environmental crisis and promote students' engagement and empowerment on campus, thus improving environment justice and social equity on campus. It began as a bottom-up spontaneous campus movement by community members, then gradually grew to a team led by landscape students in combinationl with architecture and interaction design students. In order to transform the campus under the highway into a place that maintains social equity and environmental justice. A guidebook, participatory planning platform, and toolkit for a healthy environment were gradually proposed, becoming the cornerstone of public engagement design on campus. This project will be a useful reference for other schools in similar situations.

For further information

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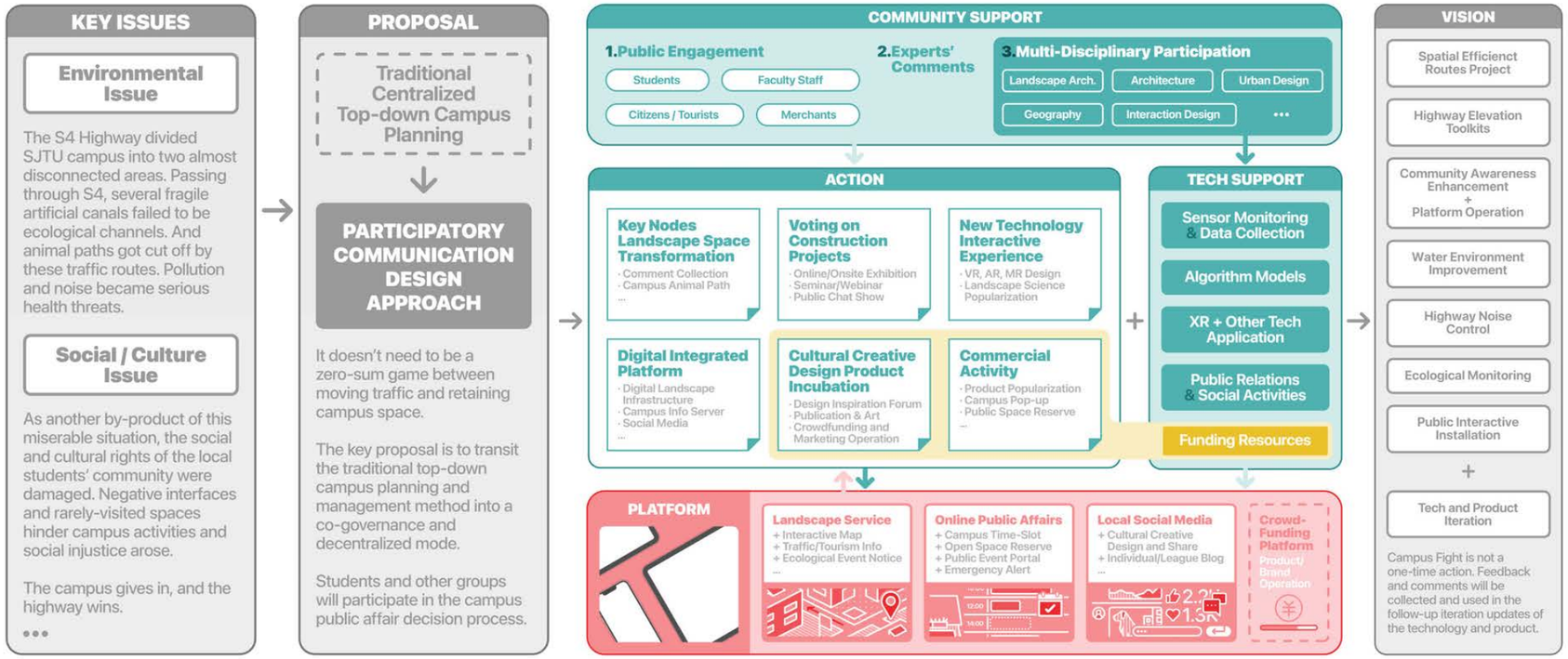
Barcelona **November 2023**

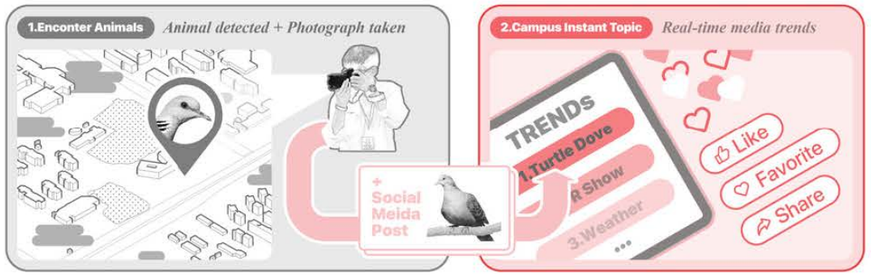
SCHOOL PRIZE

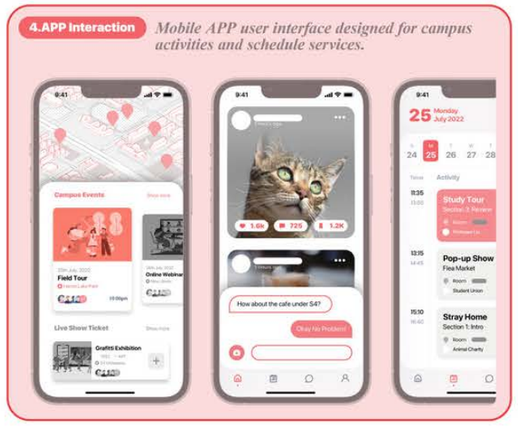


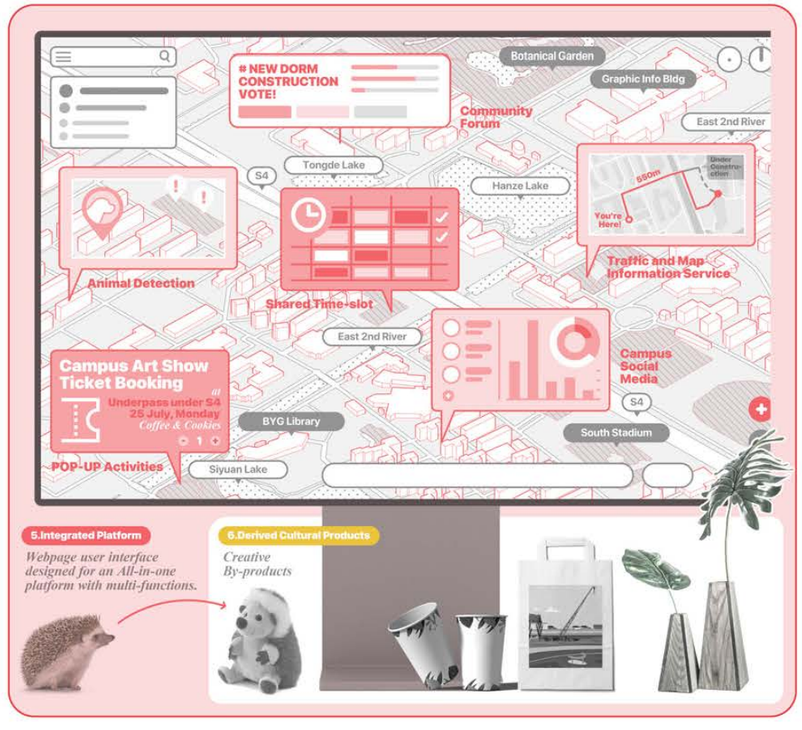
Public Engagement to Restore the Campus Culture | Social Media Concept

An integrated multi-functional platform (mobile APP + web page) is designed and established to connect different groups in the campus. Important event notices, environmental alerts and public forum topics will be delivered to everyone who engaged.

And university hubs and interactive map services will keep us in touch. Moreover, great ideas of cultural creative design will be generated, as one by-product type in this project.







A Participatory Communication Design: Re-Wilding the Campus With Environmental and Social Equity Concentration

S4 challenges the traditional top-down campus planning model and the more closed campus community culture, relying on data technology tools, spatial governance, and community-based social governance to propose a more open and natural smart community model.

It connects schools, student groups and social groups through apps embedded as a campus communication social infrastructure. Facilitate communication between different groups and enable public groups to understand the basic services to the campus landscape system and participate in social multi-governance.

Public Engagement to Restore the Campus Culture | Social Media Implementation

Community members of different backgrounds can participate in different stages of campus community transformation through different paths of the platform.

Explore

Explore the S4 campus with a mobile APP.

Culture

The posters on the wall constitute the cultural atmosphere. In addition, the questionnaires are regularly used for feedback.

Device

Teachers and students interact with installations on site to complete the S4 campus plan.

Use

Students use cultural and creative products designed, including cultural shirts, canvas bags, etc.

Study Tour

The surrounding primary school students come to the school for study tours and experience the cultural atmosphere

Benefit

Transmitting the concept of animal protection helps maintain the harmonious development of campus ecology.

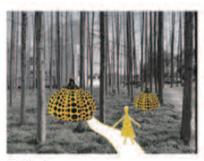
To improve the artistic and cultural atmosphere on campus, the steps of exploring campus culture, transforming artistic symbols and designing visual effects are generally followed.
In this design, the campus is transformed according to the logic of enhancing the attraction, art and culture education, and personal expression & revolution. Finally, we'll achieve the purpose of enhancing the campus cultural atmosphere and forming new cultural phenomena.

As a small community, the campus has too many nodes worth lighting up, such as an intersection, a bus stop, an unbeautiful wall, a small piece of wall... There are many ways to change.The first method is to place art sculptures in crowded corner gardens, on the side of streets, or in any less welcoming corner. In addition, open wall painting and poster Posting on the not beautiful interface can not only improve the visual appeal, but also encourage personalized expression of teachers and students. Finally, in order to upgrade the cultural atmosphere of the whole school, the creativity of teachers and students is also crucial, so providing some places to encourage performance art and comminication are also a small strategy.

VR projection enhance the attraction

Talent show/ performance

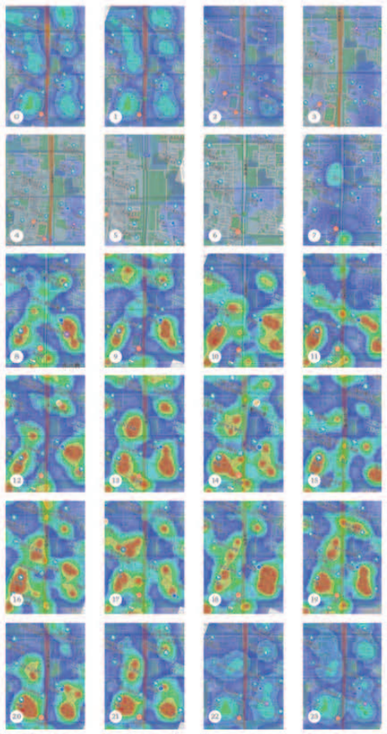
Connect the road more paths



Art devices

Access to the Public Resource | Refine Traffic System + Highway Elevation

Based on the 24h overlay of the heat map, combined with the distribution of various facilities on the campus, 5 categories of the gathering points were screened out, which are used as important connection nodes of the routes, connecting the population gathering points of the east and west districts.

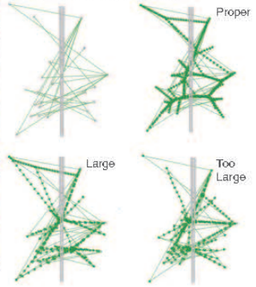


24h Heat Map

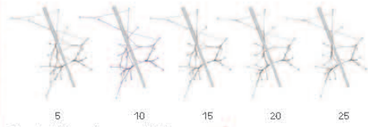
Gathering Point on Campus along the Highway: 10 was selected as gravity parameter value for route optimization.

- dormitory
- teaching building
- campus entrance
- library
- canteen
- other
- gathering points connection
- assisted road

Wool-thread Model Optimazation:

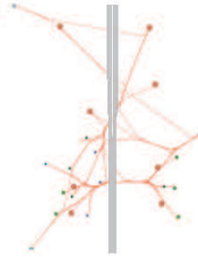


Gravitational Parameter Value



The calculation results was modified to avoid existing buildings and combine with existing road networks.

10 was selected as gravity parameter value for route optimization.



Connection based on the Algorithm calculation results:

In the optimization calculation, through the adjustment of multiple gravitational parameter values, combined with the existing road network of the Minhang campus of SJTU, the appropriate gravitational parameter value is selected.

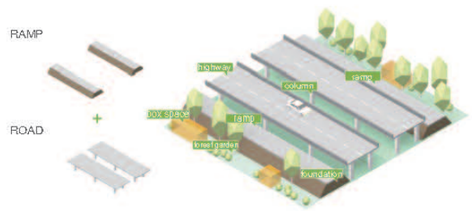
new connection OVER the highway

new connection UNDER the highway

New connection itegrated with the existing road:

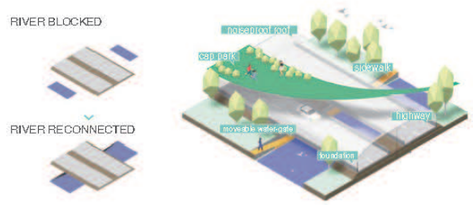
Due to the limitations of the established road network, building, and site, the calculation results cannot be used directly, and should be modified to avoid existing buildings and combine with existing road networks.

Reduce Slope And Set Plant Barrier

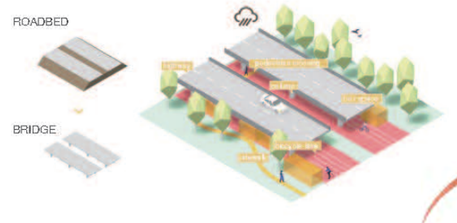


Widen Underpasses To Diversify Traffic Flow

Connect River, Add Pedestrian Access



Introduce New Traffic Flows With "Box Space"



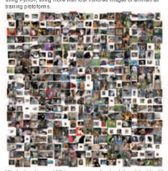
Build Sustainable and Healthy Environment

Data Collection of Wildlife Behaviors

The device we designed is equipped with motion sensors and cameras to capture the presence of creatures on the site. Image segmentation and animal type monitoring is then based on computer recognition technology. The installation also has a good interactive display to show the results and allow teachers and students to observe the data.

Classification Model Training

We built a computational model for animal detection and recognition using Python, using more than four hundred images of animals as training platforms.



Install The Motion Sensors And Cameras

Using a mobile sensing camera, we preset the parameters and placed the device in the animal migration corridor to capture and collect the images.

Device Rendering

Motion sensor camera in different scenarios

Educational display screen

Based on data analysis, we show the frequency, species, and images of wild animals to students and teachers through campus displays, and describe them with designed science posters.

We trained over 400 images as a basic dataset to identify basic animal types.

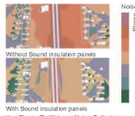
Segmentation And Object Detection

Through testing, it is able to identify and categorize animal species based on image segmentation and intelligent detection algorithms.

Noise Reduction Strategies and Ecological Wildlife Habitat Preservation

Noise Pollution

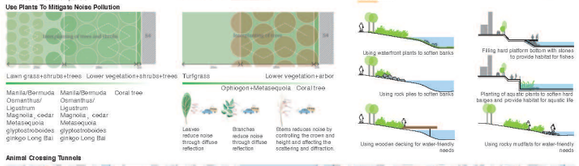
The noise pollution caused by traffic on S4 affects the daily life of teachers and students in the school, and the forest belt on both sides of the highway can effectively alleviate the noise problem.



Principle Of Noise Reduction

According to the noise simulation and monitoring on both sides of S4, the noise distribution within a range of 56m on both sides of S4 is shown in the figure, which is divided into 7 types.

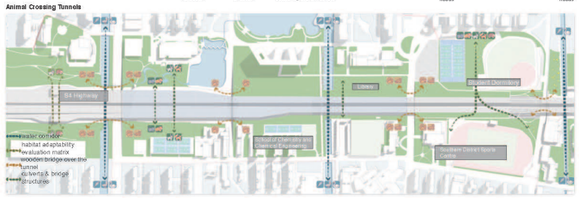
Use Plants To Mitigate Noise Pollution



Providing Habitat For Aquatic Life

Habitat Adaptability Evaluation Matrix

Animal Crossing Tunnels



Reinforcing Existing Culverts

A survey of the original biological corridors revealed that there are three main types of corridors in existence, water corridors for aquatic animals, culverts for small animals and viaducts with bridge structures for terrestrial animals to cross.

WATER CORRIDOR

Widening of waterways to facilitate the free passage of fish and other aquatic animals

CULVERTS

Increasing culverts to facilitate east-west communication between the various green space areas

BRIDGE STRUCTURES

Widening of waterways to facilitate the free passage of fish and other aquatic animals

Making Devices to Help Small Mammals Cross Tunnels

The s4 motorway and the tunnels that pass under it divide the green space into numerous plots, and by using wooden planks and roof greenways to create biological pathways for small mammals such as squirrels and weasels, the patchy green space is connected and facilitates biological exchange.

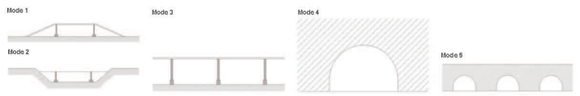
WOODEN BRIDGE OVER THE TUNNEL

Installation of small plank bridges above the tunnel along the s4 motorway with appropriate climbing plants to provide paths for small mammals that can climb trees to cross the tunnel and facilitate movement between areas.

HABITAT ADAPTABILITY EVALUATION MATRIX

The roof of the original toll booth is used to create a green roof garden space that connects the green space on both sides of s4, which is blocked by the traffic congested road, and provides a way for small animals to communicate.

ANIMAL CHANNEL MODES



Public Engagement to Restore the Campus Culture

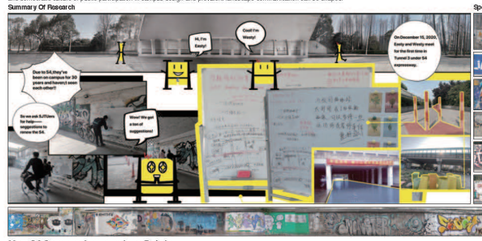
Campus Community Practice: the Process of Data Collection

A combination of online platforms and on-the-ground management invites members of diverse backgrounds to form management teams to participate in maintaining the space's assets and the bonds between communities. By gathering feedback from different sources to update our management and design plans, we will meet the interests of different groups in the campus community.

Campus Community Practice : The Result

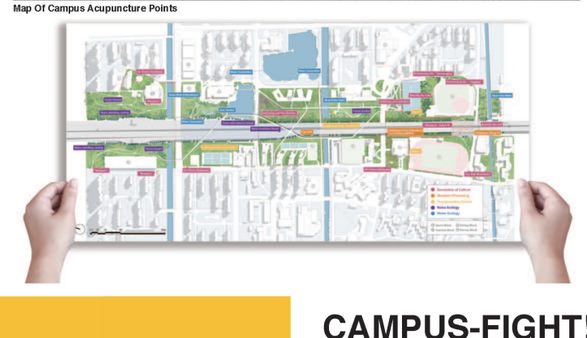
The "accidental" gray space under the highway becomes a key area to communicate, which contrasts significantly with other industrial-park-style campus non-places. The project sees the encouragement of peers during the epidemic, the inquiry to reconstruct the "Splitted Campus" and their dreamed campus. These voices reflect the strong willingness from students to participate and improve their living environment. In summary, "Everyone wants to be heard" and "Everyone wants to participate." Rather than only paint the graffiti under the gray space under the highway, the project expects that an equal and democratic culture of public participation in campus design and prevalent landscape communication can be shaped.

Summary Of Research



Spontaneous Wall Painting

Map Of Campus Acupuncture Points



Communication Toolkits

Videos, Books, Matrix Platform Exhibition

VIDEOS

Through several video platforms such as youtube, bilibili, etc., we released the video clips of different stages of this activity and collected feedback.

ISSUU

Publish guidebooks and detailed plans through online publishing platforms such as issuu.

WECHAT

Through wechat, China's largest self-publishing platform, we create official event accounts, regularly publish event information and provide consulting services to community members.

Network Media

Build different communication and participation channels to lead the public to participate in this movement and encourage all members to express their diverse needs.

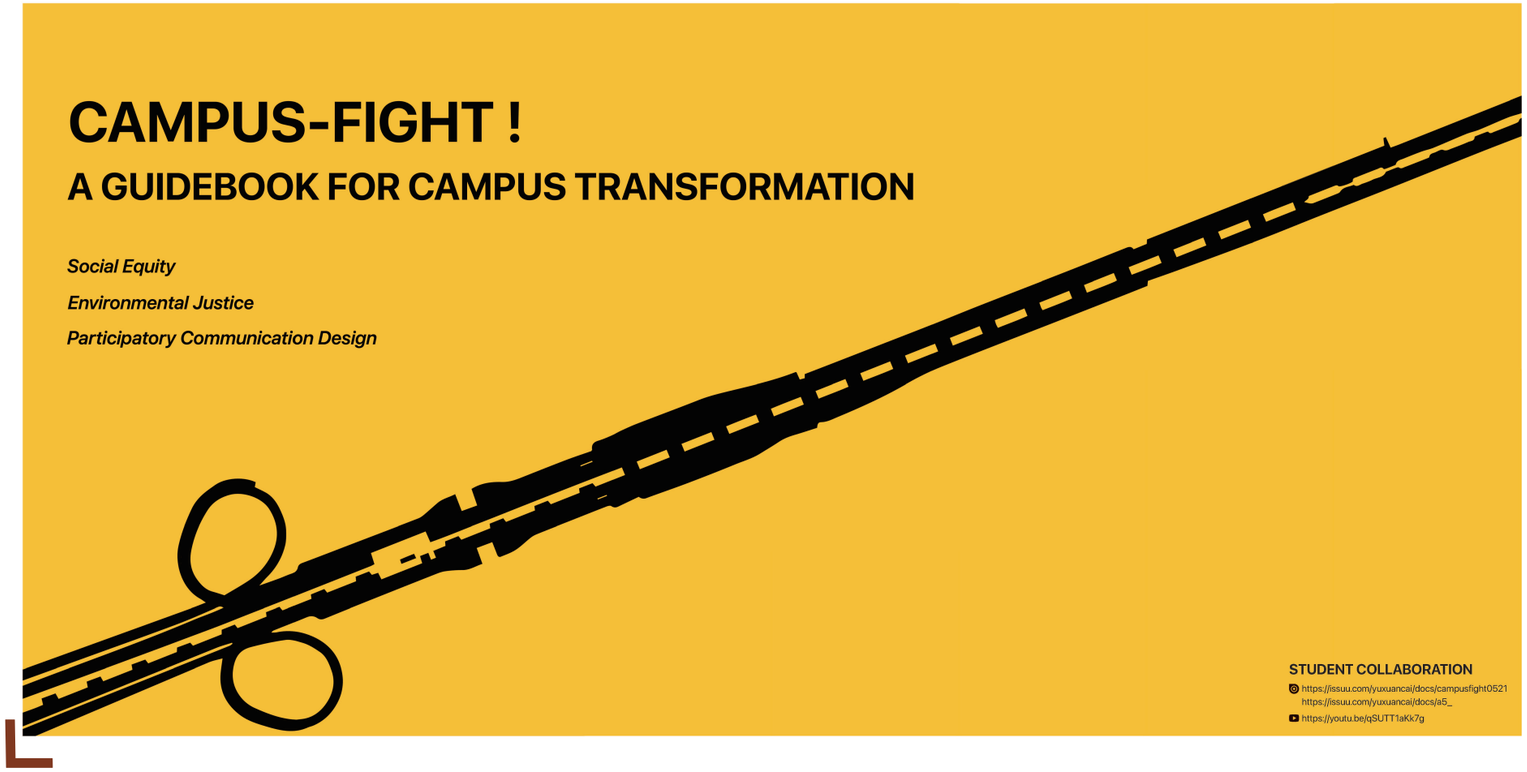
Books

Campus-Fight! Guidebook For A Campus Transformation

An offline media platform as a living archive of campus transformation. This guidebook will be distributed to all faculties and student organizations to help and guide them in their work when sufficient funds are available.

Record of Public Communication Workshop

Through the video talks about the origins of the project, the high frequency of use of the site, our approaches to transform the space under the S4, and students' opinions about the S4 and the whole project. And encourage everyone to participate in this activity.



CAMPUS-FIGHT!

A Guidebook For Campus Transformation.

WEBSITE LINK: https://issuu.com/yuxuancai/docs/campusfight0521
VIDEO LINK:https: //youtu.be/qSUTT1aKk7g

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