



TRANSIT-ORIENTED DEVELOPMENT IN CHINA AND THE NETHERLANDS

公交导向的城市在中国与荷兰的发展
RESEARCH BY DESIGN ON QINGHE STATION BEIJING
北京清河火车站的设计性研究

Towards2050: Developing a Sino-Dutch approach for Sustainable Urbanization

迈向2050：中荷可持续城市发展工作营

目录

序言

由荷兰王国驻华大使贾高博撰写

前言

由“迈向2050”项目负责人Ton Venhoeven撰写

北京欢迎你

由北京市建筑设计研究院吴晨撰写

第一部分

中国与荷兰在流动性发展方面的经验

中国在流动性发展方面的经验

14 | 中国城镇化的未来
由清华大学吴唯佳撰写

15 | 在公交导向城市发展中融合城市流动性与土地利用
由世界银行Gerald Ollivier撰写

16 | 中国发展中的火车站区域所面临的挑战
由北京市建筑设计研究院李晖写

荷兰在流动性发展方面的经验

20 | 迈向整体性及适应性规划：荷兰规划措施制度发展概览
由荷兰基础设施与环境部Michel Duinmayer撰写

21 | 荷兰式的公交导向城市发展
由Deltametropolis Association协会Paul Gerretsen撰写

23 | 荷兰的公交导向城市发展：乌得勒支市中心车站项目
由乌得勒支市9City项目Albert Hutschemaekers撰写

25 | 公交导向城市发展与点对点方式的融资问题
由Fakton公司Robert van Ieperen撰写

智能化公交导向的发展

30 | 智慧健康微城市
由VenhoevenCS architecture+urbanism事务所Ton Venhoeven撰写

31 | 在中国发展与公交导向城市发展相关的智慧城市
由策展人、研究员杨磊撰写

第二部分

北京清河火车站的设计性研究

37 | 简介

39 | 联接北京

53 | 北京的京张“走廊”

65 | 清河站地区

75 | 北京北站地区

82 | “迈向2050”：项目以及2014年参与方

84 | 版权页

CONTENT

PREFACE

Aart Jacobi
(Ambassador of The Netherlands to China)

INTRODUCTION

Ton Venhoeven
(Curator *Towards2050*)

WELCOME TO BEIJING

Wu Chen
(Beijing Institute of Architectural Design)

PART 1

CHINESE AND DUTCH EXPERIENCES IN TOD

PERSPECTIVES ON THE CHINESE EXPERIENCE IN TOD

14 | THE FUTURE OF URBANIZATION IN CHINA

Wu Weijia (Tsinghua University)

15 | INTEGRATING URBAN MOBILITY AND LAND USE IN TRANSIT-ORIENTED DEVELOPMENT

Gerald Ollivier (World Bank)

16 | CHALLENGES IN DEVELOPING STATION AREAS IN CHINA

Li Hui
(Beijing Institute of Architectural Design)

PERSPECTIVES ON THE DUTCH EXPERIENCE IN TOD

20 | TOWARDS INTEGRATED AND ADAPTIVE PLANNING: A BRIEF OVERVIEW OF THE INSTITUTIONAL DEVELOPMENT OF THE DUTCH PLANNING PRACTICE

Michel Duinmayer (Ministry of
Infrastructure and the Environment)

21 | TRANSIT-ORIENTED DEVELOPMENT THE DUTCH WAY

Paul Gerretsen
(Deltametropolis Association)

23 | TRANSIT-ORIENTED DEVELOPMENT IN THE NETHERLANDS: THE CASE OF UTRECHT CENTRAL STATION

Albert Hutschemaekers (City of Utrecht)

25 | FINANCIAL ASPECTS OF TOD AND PPP

Robert van Ieperen (Fakton)

SMART TRANSIT-ORIENTED DEVELOPMENT

30 | SMART AND HEALTHY MICRO-CITIES

Ton Venhoeven
(VenhoevenCS architecture+urbanism)

31 | SMART CITIES AND TOD IN CHINA

Yang Lei (curator and researcher)

PART 2

RESEARCH BY DESIGN WORK WEEK ON QINGHE STATION, BEIJING

37 | INTRODUCTION

39 | THE BEIJING CONNECTION

53 | THE JINGZHANG CORRIDOR IN BEIJING

65 | QINGHE STATION AREA

75 | BEIJING NORTH STATION AREA

82 | TOWARDS2050 : PROGRAM AND PARTICIPANTS 2014

84 | COLOPHON

PREFACE

序言

Aart Jacobi

Ambassador of The Kingdom of The Netherlands

荷兰王国驻华大使

非常荣幸能够向大家推出《迈向2050:创立中荷合作的可持续性城市化方案》2014年度项目成果。本项目是中荷两国在城市化领域内的一项重要合作。

城市化并非新生现象，但在过去数十年间，全球都经历了城市化加速这一进程，中国也不例外。目前，52%的中国人口生活在城市当中，中国政府希望在未来数十年内将这一数值提升至70%左右。现有城市将扩大规模，同时会有新的城市不断涌现。这似乎是老生常谈，但实际上，坚持城市化的正确方向却是一条充满艰难险阻的道路。

城市化进程中机遇与风险并存。这个过程中，机遇良多，在实施新的建设中，可以参照其他国家的过往经验，避免他们曾经犯下的错误；可以利用最新的技术并从最新的观点中获益。然而，这个过程中也会是风险重重。规划中的错误会对一个城市造成挥之不去的长久影响；毕竟，基础设施一旦建成，就很难改变。

今年的《迈向2050》不仅关注城市本身，更多着眼于将火车站整体纳入到其周围的城市环境之中。过去的车站仅仅作作为中转之地出现，通常只是城市中某个孤立存在的实体设施。现在，一个成功的车站开发项目则是城市建设的有机组成部分，对于城市的宜居程度与生活质量起到了独特的作用。车站既是交通中转地，也是人们工作、居住、购物、锻炼、会友的场所；在此，三五好友可以相聚小酌或是欣赏一部电影大片。极具吸引力的多功能车站区域不仅可以优化流动性、可达性，有助于经济发展，同时也可以提升城市以及城区的可持续性、宜居程度以及健康水平。

在可持续的城市流动性与空间发展中，将融资与运营两方面涵盖在内的整体性基础设施与空间规划称为公交导向城市发展(TOD)，是一种卓越的跨学科规划与设计方式。中荷两国都在利用符合自身情况的空间规划应对城市化进程中的各种挑战。荷兰的整体性规划方法本身即属于合作模式的典范，源自荷兰人多年来对荷兰三角洲上空间及环境挑战的应对之策。中国的空间规划历史悠久，形成了独到的整体性空间规划方法。基于这一背景，中荷两国可以全面交换空间规划领域内的经验，互惠互利。由此诞生了“迈向2050”项目，旨在创立中荷合作的可持续性城市发展方案，惠及各方。

最后，成功的城市化需要多方参与者、政府、市民、学术界、设计师、工程师以及其他各领域专家通力合作。国际交流具有巨大的附加价值。因此，对于能够通过此类活动将中荷两国的各领域专家汇集一处，我倍感欣慰。他们可以相互启迪、相互激发，必将获得更好的成果。

关键是要通力合作，寻求城市规划的整体性方法，将生活质量与人类需求、宜居程度以及其他方方面面有机地结合起来。事实已经证明，将中荷两国各自的优势相结合，必将无往而不利。我们应该建立起一种创造性的合作伙伴关系，为了长远优化城市生活质量而共同努力。

最后，我要向参与本项目的所有组织，特别是北京市规划委员会、北京市建筑设计研究院、清华大学、世界银行以及荷兰创意产业基金会，表示感谢。我非常期待本项目所属的长期性年度合作得以顺利展开，为更多、更深层次的未来城市发展项目打下坚实的基础。

It is a great pleasure to introduce the outcome of the project *Towards 2050: Developing a Sino-Dutch Approach for Sustainable Urbanization*, 2014 edition. This project is a key endeavor in the collaboration on urbanization between the Netherlands and China.

Urbanization in itself is not a new phenomenon, but we do see that over the last few decades there is a marked acceleration in the world, and China is no exception. At present 52% of the population lives in cities and the government's aim is to see this grow to around 70% in the next decades. Existing cities will expand and new cities will be created. That may sound routine, but in reality it is devilishly difficult to urbanize in the right way.

In the process there are opportunities and risks. The opportunities are multiple; when building new we can look at the experience of other countries that went through similar processes and that way avoid mistakes. We can incorporate the latest technologies available and profit from the latest insights. But there are risks as well. Mistakes in planning will haunt a city for a long time, because infrastructure, once there, cannot easily be changed.

This year's edition of *Towards 2050* focuses not just on the city but more specifically on the integration of train stations in their urban environment. In the past, a station was merely a place of transit, often built as an isolated entity in the city. Nowadays, a successful station development is an integral part of the city fabric and has a unique function in defining liveability and quality of urban life. It is still a place for people to change from one form of transportation to the other, but a station area can also be a place for working, living, shopping, exercising and meeting friends for a meal or a movie. Attractive multifunctional station areas not only contribute to mobility, accessibility and the economy, but also to sustainability, liveability and health in cities and urban regions.

The concept of integrating infrastructure and spatial planning – including finance and operation – in sustainable urban mobility and spatial development is called Transit-Oriented Development (TOD). TOD is eminently a multidisciplinary way of planning and design. Both Chinese and Dutch look at this challenge with their own unique spatial planning approach.

The Dutch approach of integrated planning is a model of collaboration in itself, and is rooted in a long history of dealing with the specific spatial and environmental challenges of the Dutch Delta. China with its long history of spatial planning has developed its own integrated spatial planning approach. Against this background both countries can profit from a thorough exchange of ideas in spatial planning. As a result, *Towards2050* aims at developing a Sino-Dutch approach on sustainable urban development that is profitable for all.

In the end, successful urbanization requires the cooperation of multiple stakeholders, the government, citizens, academia, designers, engineers, and many others experts. International exchange can have great added value in this process. Therefore I am very pleased that through initiatives such as this, we bring together Chinese and Dutch experts from a variety of fields. They can inspire and trigger one another and thus achieve better final results.

Essential in this collaboration is to jointly explore a more holistic approach to the way our cities are planned, connecting all the key issues such as quality of life and human needs, liveability, and more. As has been proven, much can be gained from matching Chinese and Dutch expertise. We have to form collaborative creative partnerships and jointly work towards improving the quality of life in our cities for the long-term.

Let me conclude by expressing my appreciation to all the organizations involved in this project, in particular the Beijing Municipal Commission of Urban Planning, the Beijing Institute of Architectural Design, Tsinghua University, the World Bank and the Creative Industries Fund NL among many others. I very much look forward to the multi-annual collaboration that this project has instigated, providing a solid foundation for many more in-depth engagements and concrete projects for our future cities.

INTRODUCTION

简介

Ton Venhoeven

Curator, Towards2050: Developing a Sino-Dutch Approach for Sustainable Urbanization

《迈向2050: 创立中荷合作的可持续性城市化方案》负责人

Towards2050 Workweek 2013

迈向2050, 工作周方案



Sketch proposal Fengtai Railway Station, 2013

丰台火车站草模

“展望2050: 创立中荷合作的可持续性城市化方案”项目由荷兰创意产业基金于2013年7月首次倡导建立。

该项目旨在探讨荷兰的整体性规划方法对中国大都市地区在快速城市化进程中所面临的种种挑战能够做出怎样的贡献。通过开展针对具体空间规划问题的中荷“设计性研究”工作周, 探讨这一问题。

首个探索性工作周于2013年9月北京国际设计周期间举行。其目的非为开展全面性研究, 而在于为中荷两国专业人士搭建起一个思想交流的平台。在此次工作周期间, 两国专业人士在当地参与方北京市丰台区规划局的支持下, 对三个试点展开了研究。任务一为永定河沿岸棕色地带的重新开发利用, 二为大红门广场周边的内城改造, 三为丰台火车站及其周边区域的开发。

根据北京市规划委员会的要求, 今年的重点全部放在火车站和周边区域发展以及公交导向城市发展之上, 特别是清河站以及北京北站的开发。中国正在快速城市化、现代化以及机动化(中国城市汽车年增量已超过1600万辆), 火车站周边区域发展以及公交导向的城市发展已成为迫切需要解决的问题。火车站设计包括有序组织交通流量以及等候区域, 火车站周边区域发展指通过房地产开发捕获车站周边区域的土地价值增量, 而公交导向城市发展则涵盖了与非机动以及公共交通方案相关的各项事宜, 用以优化城市的可持续性、经济活力以及生活质量, 既包括火车站及周边区域的开发与设计, 同时也包括相关区域的开发与组织。公交导向城市发展要建立起与设计优良的公共交通网络及枢纽相关的良好使用区域、适于行人使用的社区以及车站周边区域。近年来, 公交导向城市发展已成为中国政府的首要重点。

工作周由一周延长至两周。第一周为清华大学主持的中荷“设计性研究”工作周, 由北京市建筑设计研究院吴晨、清华大学吴唯佳、中国建筑设计研究院崔凯、北京市城市规划设计研究院杜立群以及中国城市规划设计研究院张兵联合负责。

本周的工作小组由40余位中荷各领域专家组成, 包括来自各知名大学、设计研究院、政府组织和私人公司的建筑师、城市规划师、交通专家、城市经济学家以及项目经理人。附录中列出了所有参与者与参加组织的详细名单。本周的合作成果请参见第二部分“速写簿”。

第二周包括就中荷两国公交导向城市发展实践开展的各项研讨活动, 分别由北京市建筑设计研究院、世界银行、中华人民共和国交通部以及中国铁路总公司组织、主办。这一周中国围绕与公交导向城市发展相关问题和主题展开了大量讨论, 本出版物第一部分选取了少量内容予以刊登。

对于为了《迈向2050》成功出版辛勤工作的各主办机构, 我表示衷心的感谢。由《城市·环境·设计》杂志主办的智慧城市研讨会以及我们成功参与到北京国际设计周的各项活动之中, 虽然未在本出版物中提及, 但确实也在工作周的成果之列, 非常感谢荷兰驻华使馆给予的大力支持。

我也要向两周内参与工作的所有人员表示感谢, 感谢他们无私地分享自己的学识与专长。

最后, 我要向本出版物的各位作者致以谢意。我衷心希望本出版物能够有助于为中荷两国可持续性城市区域发展打造出共有的未来, 也为2015年的进一步合作打下基础。

Towards2050: Developing a Sino-Dutch Approach for Sustainable Urbanization is a multi-annual program initiated by the Creative Industries Fund NL in July 2013.

The goal of this initiative is to explore how the Dutch integrated planning approach can be of added value to the challenges Chinese metropolitan regions are facing in the process of rapid urbanization. This question is explored by means of Sino-Dutch ‘research by design’ work weeks on specific spatial planning challenges.

The first exploratory work week was organized during the Beijing Design Week in September 2013. The aim was not to perform a thorough study, but rather to create a platform for an exchange of ideas between Dutch and Chinese professionals. During this workweek, the participants collaborated successfully on three pilot cases in Beijing, provided by the local stakeholder, the Fengtai District Planning Bureau. One assignment was brownfield waterfront development along the Yongding river, the second was inner-city redevelopment around Dahongmen square, and the third was the development of Fengtai station and its surroundings.

At the request of the Beijing Municipal Commission of Urban Planning, this year’s focus was entirely on stations, station area development and transit-oriented development (TOD), with a special focus on Qinghe station and Beijing North station in Beijing. Station area development and TOD are urgent topics in China, which is rapidly urbanizing, modernizing and motorizing (Chinese cities see an increase of over 16 million cars a year). While station design is about organizing traffic flows and waiting areas in an orderly manner, and while station area development is about capturing land value increase in station areas by real estate development, TOD is about everything related to optimizing non-motorized and public transportation options to improve sustainability, economic vitality and

quality of life in the cities. It implies station and station area development and design, but also the development and organization of related neighborhoods. TOD means attractive, mixed use, walkable neighborhoods and station areas related to well-designed public transportation networks and hubs. TOD has become top priority for the Chinese government in recent years.

The work week in 2014 expanded from one to two weeks. The Sino-Dutch ‘research by design’ work week took place during the first week, hosted by Tsinghua University. This week was co-curated with Wu Chen (Beijing Institute of Architectural Design), Wu Weijia (Tsinghua University, School of Architecture), Cui Kai (China Architecture Design & Research Group), Du Liqun (Beijing Municipal Institute of City Planning & Design), and Zhang Bing (China Academy of Urban Planning & Design).

During this week, the team consisted of more than 40 Chinese and Dutch experts from various disciplines: architects, urban planners, traffic specialists, urban economists and project managers, from renowned universities, design institutes, government organizations and private companies. You can find all names and organizations in the appendix. The results of this collaborative effort can be found in Part Two; “RESEARCH BY DESIGN WORK WEEK ON QINGHE STATION, BEIJING”.

The second week consisted of seminars and workshops about transit-oriented development practices in China and The Netherlands. These events were respectively organized and hosted by the Beijing Institute for Architectural Design (BIAD), World Bank, Ministry of Transport of the People’s Republic of China, and China Railway Corporation. Part One of this publication contains a small selection of the many TOD related issues and themes discussed during this week.

I am very grateful to the hosting organizations for making this edition of *Towards2050* such a rewarding endeavor. Not featured in this publication, but certainly part of the success of the work weeks were the Smart City Seminar hosted by UED Magazine and our participation in the Beijing Design Week, kindly made possible by the Netherlands Embassy.

I would also like to thank all the participants of both work weeks, for sharing their knowledge and expertise so generously.

And finally I would like to thank the authors who have contributed to this publication. I sincerely hope this publication will help to develop and envision a shared future for sustainable urban regions in China and The Netherlands. And that it may be a foundation for further collaboration in 2015 and beyond.



Opening of the research by design workweek on Qinghe Station, 15 September 2014

photo: Kohsuke Uchino

2014年9月15日，清河火车站研究设计工作周开幕式

摄影: Kohsuke Uchino



Ms. Huang Yan, director of BMCUP and Dutch ambassador Jacobi during the 1st International Forum on Transit-Oriented Development, 22 September 2014

photo: Diao Meng Qi

2014年9月22日，黄艳女士（现北京市规划委员会主任）与荷兰大使 Jacobi在首届城市交通综合开发国际研讨会会面。

摄影: Diao Meng Qi

WELCOME TO BEIJING

北京欢迎你

Wu Chen

Design Principal and Deputy Chief
Architect, Beijing Institute of
Architectural Design (BIAD), Beijing,
P.R. China.

吴晨

北京市建筑设计研究院副总建筑师

2013年9月，BIAD成功协同荷兰方面完成首届中荷工作坊的开展，一年后，第二届中荷工作坊在清华大学建筑学院圆满结束，我感到无比欣慰。

BIAD继去年安排专业人员参与后，今年也安排了多领域的专家全程参与讨论。此次工作坊成果作为北京国际设计周的参与项目之一，围绕拟建中的清河站及周边地区的规划设计，探讨中国大都市在快速城市化进程中所面临的种种矛盾和挑战。

由北京市规划委等领导提出的清河站的选题直中城市要害，就是非常希望荷兰建筑师能够参与解答北京城市发展的最直接问题，不仅为中荷合作搭建了最基本的桥梁，而且是非常直接的桥梁。

近年来，中国城市化发展迅猛，市场前景广阔，但对于中荷两国城市规模，发展进程等方面的差异，荷兰设计师知之甚少。中荷联合设计工作坊恰好弥补了这些欠缺，此次工作坊中，来自荷兰方12名专家通过6整天无间歇的实地调研、沙龙讲座、交流讨论与联合设计，与来自中国16的名专家及学生交换意见，从经济、空间、交通、环境、文化政策等角度充分地进行了思想碰撞，在最短的时间内克服和超越了中荷两国不同的文化背景，对北京的城市建设、轨道交通等现状和未来规划有了非常深刻的了解和认识，而且还能够结合实际情况不断修正对现状的认识和对未来的设想。

通过与中方专家、学者的不断交流，荷兰设计师们更加熟悉了中国城市的发展背景、历史成因、基本国情以及未来市场，而这些都为其日后参与我国的实践项目奠定了基础、创造了条件。所以中荷联合设计工作坊此次工作坊的成功开展为荷兰设计师在日后进一步参与中国项目、将其先进的规划设计理念真正落实到我国的城市建设中，建立跨国跨界的设计圈工作模式搭建了互惠的桥梁。为时一周的工作坊不仅体现出荷兰参与中国设计的热情，而且更表达了我们对荷兰参与中国城市建设和设计的热烈欢迎。北京欢迎你们！中国欢迎你们！

In September 2013, BIAD successfully launched the first Sino-Dutch workshop in cooperation with The Netherlands. One year later, the second Sino-Dutch workshop was successfully completed in School of Architecture Tsinghua University. I feel very delighted.

After arranging professionals to take part in the workshop last year, BIAD arranged experts specializing in various fields to take part in the discussions this year. As part of the Beijing Design Week, the results of this workshop focused on the planning and design of the proposed Qinghe Station and its surrounding area and explored the numerous contradictions and challenges the Chinese metropolis faces under China's rapid urbanization rate.

Cityscape Beijing

photo: ahenobarbus (wikimedia)

北京城市远景

照片: ahenobarbus (维基共享资源)



Since the topic of Qinghe Station - put forward by leaders from Beijing Municipal Commission of Urban Planning - is very relevant to urban development, we expected that Dutch architects could take part in answering the most direct problems concerning the urban development of Beijing, thus building the most fundamental and also the most direct bridge for cooperation between China and the Netherlands.

In recent years, China's urbanization has developed very quickly with a broad market prospect. However, the Dutch designers have little knowledge on the differences between China and the Netherlands in terms of urban scale, development progress and so on. The joint Sino-Dutch design workshop has exactly made up for these insufficiencies. During this workshop, 12 experts from Netherlands exchanged ideas with 16 experts and students from China through field research, lectures, discussions, as well as joint design for six whole days. They fully exchanged their ideas concerning economy, space, traffic, environment and culture policy, overcame and surpassed the different cultural backgrounds of China and Netherlands within the shortest time. They began to have a very deep understanding and knowledge of Beijing's current situation, its development and future transportation planning, and they also proved to be capable of continuously revising their understanding of the current situation and their vision for the future based on the actual circumstances.

Through continuous communication with Chinese experts and scholars, Dutch designers became more familiar with development backgrounds, historical causes, fundamental realities, and future markets of Chinese cities, all of which laid a foundation and created favorable conditions for the involvement of such designers in actual projects of China. Therefore, the successful launch of this workshop built a mutual-benefiting bridge for Dutch designers to further take part in Chinese projects, truly apply their advanced planning and design concepts in the urban construction of China, and establish a cross-border and cross-boundary design circle work model in the future. The one-week workshop not only reflected the passion of Netherlands to take part in China's design industry but also expressed China's strong longing for Netherlands to be involved in China's urban construction. Welcome to Beijing and welcome to China!

Cityscape Rotterdam

photo: Mlefter (wikimedia)

鹿特丹城市远景

照片: Mlefter (维基共享资源)



中国与荷兰在流动性
发展方面的经验
**CHINESE AND DUTCH
EXPERIENCES IN TOD**



Beijing South Railway Station

北京南站



中国在流动性发展方
面的经验

**PERSPECTIVES ON THE
CHINESE EXPERIENCE
IN TOD**

THE FUTURE OF URBANIZATION IN CHINA

中国城镇化的未来

Wu Weijia

Professor, School of Architecture,
Tsinghua University, Beijing, P.R.
China

吴唯佳

清华大学建筑学院规划系教授

有史以来，中国一直处在农业社会，城镇化进程缓慢，到1970年代，城镇化率不足20%。1978年改革开放，城镇化速度加快，2011年城市人口达到50%，首次超过农村人口。过去30多年里，城市人口增长了五亿多，相当于欧盟28个国家的人口总数。目前中国城市人口超过七亿。与城镇化率处在20-50%时期的欧洲大陆相比，1978年以来的中国城镇化速度要快近三分之二。短时段快速城镇化，加大了能源和建筑材料的消耗强度，加剧了环境负担。有专家研究，要治理今天的严重雾霾，使之达标，需要减少60-70%的能源消耗。

今天的中国正处在城镇化转型时期。据估计，2035年中国人口将达到峰值，城镇化率65%，由此预计未来20年中国城镇化速度应该低于前三十年。城镇化速度的减缓，为治理环境污染提供了有利的条件。

另一方面，中国城镇化进程中，珠江口、长江口、海河口等沿海地区的城市快速发展，形成了以广州、深圳、香港为核心的珠三角、以上海为核心的长三角和以北京、天津为核心的京津冀等三个特大城市地区(mega city region)。这些特大城市人口都在一千万以上，其中上海、北京在两千万以上。随着中国经济与全球经济更加融合，沿海地区城市将有机会进一步发展，推动人口从中西部地区向沿海地区转移。中国也将进入更加急剧的重塑人口地理分布的进程。

中国城镇化进程与国家基础设施，特别是高速公路和高速铁路网络的快速建设密切相关。2008年以来的高速铁路网建设，覆盖了东部沿海地区多数大、中城市。随着高速铁路和高速公路网络的进一步完善，包括沿海地区的珠三角、长三角、京津冀等在十多个城镇群将会进一步兴起和发展，中国也将进入以特大城市地区人口聚集增长为特点的新的城镇化阶段。

For a very long time, China was a farming society with a slow process of urbanization. In the 1970s, the rate of urbanization was less than 20%. With the start of economic reform in 1978, the urbanization of China moved into the fast lane. By 2011, the urban population reached 50% and, for the first time, surpassed the rural population. Over the past 30 years, the urban population increased by more than 500 million, equivalent to the population of 28 EU countries. At present, China's urban population exceeds 700 million. Compared with the urbanization rate between 20-50% in continental Europe, China's urbanization rate is nearly two-thirds faster since 1978.

In this short period of rapid urbanization, the consumption of energy and resources has increased and intensified the environmental burden. Studies suggest that, to fight against today's severe haze and match the clean air standard, energy consumption needs to be reduced by 60%-70%.

Today, China is on the crossroads of urbanization. It is estimated that the population of China will reach its peak in 2035, with an urbanization rate of 65%. Therefore, it is expected that urbanization will slow down over the next 20 years, in comparison with the past 30 years. This slow down of the urbanization process will provide favorable conditions for the environmental pollution control.

On the other hand, China's urbanization process has seen cities booming in coastal areas such as the Pearl River mouth, the Yangtze River mouth, and the Haihe River mouth. It has led to the emergence of the 3 mega city regions, namely the Pearl River Delta (with core cities of Guangzhou, Shenzhen and Hongkong), the Yangtze River Delta (with core city of Shanghai), and the Beijing-Tianjin-Hebei region (with core cities of Beijing and Tianjin).

Each of these metropolises is breeding an urban population of more than 10 million, and populations in Shanghai and Beijing of over 20 million. With the Chinese economy and the global economy becoming more integrated, urban coastal areas will have the opportunity to further develop, encouraging migration from the central and western regions to the coastal areas. Consequently, China will enter a process of drastic geographical population re-distribution.

The urbanization process of China is closely related with the rapid construction of the national infrastructure, especially the express highways and high speed rail networks. The high speed rail network is expanding since 2008, covering most of the eastern coastal areas and the large and medium sized cities. Along with further development of high speed rail network and express highways, more than a dozen city clusters will rise and evolve, besides the Pearl River Delta, the Yangtze River Delta, and Beijing-Tianjin-Hebei region. Inevitably, China will enter a new era of urbanization featured by population growth accumulated in mega city regions.



In front of Beijing West Station

photo: VenhoevenCS

北京西站前

照片: VenhoevenCS



Distribution Map of Two-horizontal Three-vertical Urbanization Strategy

source: Part 5, Chapter 20, Section 1 of 12th Five-year Plan for National Socio-Economic Development

“两横三纵”城市化方案分布图

资料来源：国家社会经济发展的第十二个五年规划，第5部分，第20章，第一节。

INTEGRATING URBAN MOBILITY AND LAND USE IN TRANSIT-ORIENTED DEVELOPMENT

在公交导向城市发展中融合城市流动性与土地利用

中国的各大城市目前正以前所未有的姿态与其他一级城市彼此竞争，希望吸引到更多的人才、资本与公司落户，因此需要将自身建设成为充满活力的全球大都会，不断更新。当城市发展进入这一层面，包括公交导向城市发展(TOD)在内的周到严谨的城市设计在可持续增长、吸引就业以及社区发展中，变得至关重要。

公交导向城市发展意指，在交通中转走廊或车站步行可及的范围内，打造人行及骑行环境优良的紧凑型综合用途社区，从而实现土地利用与交通运输中转的功能一体化。此类城市形态具有密集性、可达性、多用性以及适应性等特点，已成功应用于纽约及东京等城市，将新的城市开发主要集中于大众运输系统步行可达范围内，减少驾车出行需求，鼓励大众使用绿色方式出行，使车站周边区域内的服务、工作以及生活更加便利可达。

应用公交导向城市发展能够全天候为商业、居民以及访客创造安全放心的可控环境。该环境具有包容性，而非排他性。建设此类以人为本的多功能社区须重点优化多模式交通方式以及区域内可达性，分割超大型街区，在车站周边区域建设具有吸引力的场所，并根据具体需要规划空间。

凭借上述规划原则，可以打造出灵活的办公区、安全的居住区、生机勃勃的商业环境以及舒适宜人的公共空间。中转车站周边区域为经由协调城市规划与交通运输计划展现当地潜力提供了最理想的环境。鉴于车站本身具有的功能，其必然是人员流动的焦点所在。通过与周围的社会及实体环境融为一体，车站不仅为所有使用者提供了良好的连接性与可达性，也可以推动周边区域经济活动的集群发展，可以作为展现街区发展良好的示范项目，从而展开对整个社区的进一步再开发；展现创新型创意枢纽项目对中国城市活力与经济繁荣所具有的立竿见影的影响力。

随着中国的地铁与铁路系统快速发展，此时正是将公交导向城市发展应用于中国的大好时机。2015年，中国的城市轨道交通总里程将达到3000公里，并在2020年时超过7000公里。2020年时，高速铁路及快速铁路网络将覆盖人口50万以上的中国所有主要城市。总而言之，截止到2020年时，中国将建造起4000余个地铁线路或高速铁路连接站点，成为21世纪中国经济中节能、碳高效流动性的核心支柱。通过将公交导向城市发展的低质本地可达性与高质流动性支柱相结合，中国城市将优化城市效能、增强城市集聚程度。此类车站周边区域的设计灵活性以及针对不同类型车站所采取的战略定制方案，将加快实现这一目标。

More than ever before, large cities in China now compete with other first tier cities for talent, capital and firms. This requires them to be dynamic, global cities, continuously reinventing themselves. At such level of development, meticulous urban design, including transit-oriented development (TOD), become essential to sustain growth, attract jobs and develop communities.

TOD is defined as the functional integration of land use and transit, through the creation of compact, highly walkable and bike-able, mixed-use communities within walking distance of transit corridors or stations. TOD urban forms are dense, accessible, mixed-use and adaptive. It has been successfully applied by cities like

Gerald Ollivier
Senior Infrastructure Specialist,
World Bank, Beijing
Representative office, P.R. China

世界银行中国北京代表处基础设施高级专家



Pedestrian mall in Chongqing

photo: Chen Hualin (wikimedia)

重庆步行街

照片: Chen Hualin (维基共享资源)



high speed trains waiting at Kunshan South Railway Station

photo: Bergmann (wikimedia)

昆山南站，一辆高铁正在等待。

照片: Bergmann (维基共享资源)

New York or Tokyo to concentrate most of its new urban development within walking distance of the mass transit system, reducing the need for car transportation, encouraging the use of green transport, and creating high level of accessibility to services, jobs and amenities around stations.

The application of TOD principles can offer a managed environment that is safe and secure around the clock for businesses, residents and visitors. An environment that is always inclusive— never exclusive. To achieve this human-scaled and multi-functional community requires a focus on enhancing multimodal transport and local accessibility, breaking down superblocks, creating attractive places around stations, and tailoring space to specific opportunities.

Such principles will help create flexible offices, safe residential communities, vibrant commercial environment and welcoming public spaces. Areas around transit stations are the perfect environment to demonstrate local potentials brought by aligning urban planning and transportation plans. The station is, by its function, the focal point of movement. When embedded within social and physical fabric of the community, it not only provides good connectivity and accessibility for all, but also facilitates an agglomeration of economic activities around stations. It can become a demonstration project of good development of a block, leading to further redevelopment of the neighborhood. It can show how innovative and creative linkages can be created immediately to enhance the dynamism and economic vibrancy of Chinese cities.

With fast development of metro and rail system in China, the time is right to integrate TOD principles in China. The urban rail network will reach 3,000 km by 2015 and over 7,000 km by 2020. The high speed and express rail network is also expected to reach all major cities of more than 500,000 people by 2020. Overall, it means that by 2020, China expects to have over 4,000 stations interconnected by either metro lines or high speed rail, providing a core, energy and carbon efficient mobility backbone for its 21st century economy. By combining high quality local accessibility through TOD around stations and this high quality mobility backbone, Chinese cities will be able to improve their efficiency and increase urban agglomerations. Allowing for design flexibility around such stations and for the definition of strategic and tailored approach for different types of stations would accelerate the realization of such a vision.

CHALLENGES IN DEVELOPING STATION AREAS IN CHINA

车站周边的土地 开发在中国所面临的挑战

Li Hui

Chief Architect, Beijing Institute of Architectural Design (BIAD), Beijing, P.R. China

李晖

北京市建筑设计研究院副总建筑师

以公共交通为先导的城市开发模式，主要是以公共交通枢纽站点为中心，以400-800米（5-10分钟步行路程）为半径，高密度地安排工作、商业、文化娱乐、教育、居住等功能，以实现组团紧凑开发的集约发展模式。其中的公共交通主要是指地铁、轻轨等轨道交通及巴士干线，以及火车站、飞机场等城市对外交通设施。目前这种综合开发模式已在北、上、广、深四个中国特大型城市广泛开展，同时，全国已有几十个二三线城市开始开展研究这种建设模式。

目前中国城市交通综合开发前景很好，但是面临着诸多挑战。

首先，由于多种原因，相关部门对城市交通综合开发的总体认识不足。在传统的中国城市建设体系中，公共交通是由国家投资并管理的建设系统。在交通设施规划中仍以关注交通功能为主，出发点是缓解城市交通拥堵问题。对于交通发展关联的其他城市利益关注度不够。对于城市交通综合开发的必要性，社会各界没有完全达成共识。

其次，推进城市交通综合开发的要素尚不健全。在市场方面，由于还没有形成成熟模式，实施主体、资金来源在前期研究阶段，难以明确，产品与市场容易脱节，市场认可度不高。如果能让市场后期操作主体提前进入前期工作，可有效地解决问题。在政策方面，由于交通与开发建设系统不对接，综合开发没有适用的政策，需要政策创新，引导和保障。在技术方面，支撑不足。现有设计单位，多为单系统的设计专家，综合设计和协调能力有待提高，互相合作需要进一步加强。消防、

人防等关键技术问题亦有待创新突破。实施保障方面，地方管理机构协调配合的能力有待提高并需要全方位覆盖。

面对复杂的城市问题，我们必须充分认识到城市交通综合开发模式是我们主动遵循城市发展规律的方式，也是引领城市良性发展的契机。为了促进城市布局、空间结构进行合理的优化、调整和完善，使宝贵的土地资源得到更加合理的利用，向高效低碳、可持续的方向发展，我们需要集社会的智慧，通过持续的努力使社会各要素达成共识，通过顶层设计完善机制体制，推动技术进步，最终实现城市价值的提升。

To create a public transport based urban development model, i.e. transit-oriented development (TOD). It would require transforming public transport nodes into centers, each with a 400-800 meters (5-10 minute walk) radius. With high-density of business, culture/entertainment, education, housing and other functions, in order to achieve a compact, intensive, clustered development system. Here, the public transport mainly refers to subway, light rail, and bus, as well as railway stations, airports and other transportation facilities outside the city. TOD is currently carried out intensively in the four mega cities in China, namely Beijing, Shanghai, Guangzhou and Shenzhen, while the country at the same time has dozens of other second and third tier cities that are beginning to study this kind of urban structure.

At present, China has a comprehensive and promising future of urban transportation development but is still facing many challenges.

First of all, there is a lack of comprehensive knowledge from each city's relevant departments for the city's overall traffic development because in the traditional urban planning model public transport was funded and managed by the state. In transport infrastructure planning, the main concern is still how to ease urban traffic congestion problems. For other associated cities' transportation development benefits, there is too little interest and insufficient attention. On the necessity of comprehensive TOD, society at large and the TOD related community has yet to reach a consensus.

Secondly, elements to promote a comprehensive TOD are not perfect. Due to the market system not being mature yet, implementation of the main sources of funding in the early research stage is difficult to define, thus market acceptance is not high. If we can advance the latter part of the operations for the preparatory work, this can effectively solve the problem. On the policy side, because traffic research systems and construction systems are not coherent, there are no suitable policies to back up a comprehensive development, and the need for policy innovation, guidance, and insurance is most certain. On the technical side, there is inadequate support. Existing design firms are mostly single system design experts. Integrated design and coordination still needs to be improved and they need to further strengthen mutual cooperation. Key technical issues such as fire control and air defense shelters also need to see innovative breakthroughs. From the security side, local authorities should improve in terms of coordination ability and should have full coverage of all issues and aspects.

Faced with complex urban problems we must proactively integrate urban transport systems into our overall urban development, thus leading to a prosperous city growth. In order to advance the urban layout and spatial structure, a more rational use of valuable land resources and optimization is needed. It needs to go in a more efficient, low-carbon, sustainable direction. Ultimately we need to listen to the wisdom and needs of society and through sustained efforts reach a social consensus. We need to improve the design methodology of top design institutions - promoting technological progress, to eventually enhance the value of the city.



In front of Beijing North Station

photo: VenhoevenCS

北京北站前

摄影: VenhoevenCS



Pedestrian problems at Beijing North Station

photo: VenhoevenCS

在北京北站旁一个有问题的人行道。

摄影: VenhoevenCS



Official launch of the Transport Estate Research Center

photo: Diao Meng Qi

城市交通综合开发研究中心开幕式

摄影: Diao Meng Qi



South-West entrance to
Utrecht Central Station

乌特勒支中心火车站西南入口



荷兰在流动性发展方面的经验

**PERSPECTIVES ON THE
DUTCH EXPERIENCE IN
TOD**

A BRIEF OVERVIEW OF THE INSTITUTIONAL DEVELOPMENT OF THE DUTCH PLANNING PRACTICE

荷兰规划措施制度发展概览：迈向整体性及适应性规划

Michel Duinmayer

Senior Advisor Strategy, Ministry of Infrastructure and the Environment, The Hague, The Netherlands

基础设施与环境部高级策略顾问

鉴于荷兰地处三角洲之上，面临的各类土地利用问题情况复杂，分散式整体性空间规划在荷兰享有悠久的历史。国家级标准的空间与基础设施规划在19世纪即已出现，以在更大规模上应对各类问题。荷兰的规划政策发展一直以与时俱进著称，无论是政策内容还是制度性组织都不断改变，适应需要。近年来，这样的改变在数量和速度上都不断提升。

直到最近，荷兰的空间规划政策和基础设施规划政策还分由两个不同的部委管辖。二十世纪初叶，空间规划专注于城市扩展与住房条件改善。荷兰政府在20世纪下半叶出台了“空间规划政策文件”（包括了1958-2001年间的全部8份政策文件）。这些政策文件所依据的基础为国家机关、公共研究与知识机构对人口与经济发展、交通趋势、环境影响以及气候变化等方方面面的预测。各省、市政府出台的城镇规划必须符合这些政策文件的要求。荷兰首个“国家道路规划”诞生于1927年，最后一份在1984年出台。基础设施规划的政策发展主要随空间规划而动：20世纪下半叶，政策制定主要以经济发展为导向。

时间推进到20世纪末期，以中央政府指令为主的规划体系发生了改变，原因之一在于随着城市逐渐发展为综合性大都会，需要在不同层面平衡空间及环境发展与流动性和交通管理的关系。同时，日趋严重的交通拥堵需要国家、地区与地方政府增强协调。由此诞生了区域性交通与运输规划，将空间规划与基础设施和公共交通有机结合。此类规划一经中央政府审核批准，即可获得国家的财政支持。

2010年，原住房、空间规划与环境部和运输、公共设施与水资源管理部合并成为新的基础设施与环境部，有助于推动在荷兰已经非常普遍的空间发展、水资源管理、环境问题、流动性与可达性等跨学科实践。2008年之前，有关省级及区域性规划的国家政策仍然以国家机关的研究为基础制定。此类机构在2008年合并成为荷兰环境评估机构(PBL)。但在中央政府之外，亦有多家知识与研究机构进行或支持城市与区域发展领域内的研究。荷兰的制度规划已经发展成为由不同层级政府共同参与的跨学科政策领域。各级政府与各参与方可以自由使用战略政策分析与科学研究成果。这一政府与知识机构互动的管理结构促进了针对社会需求与发展的政策发展快速推进。

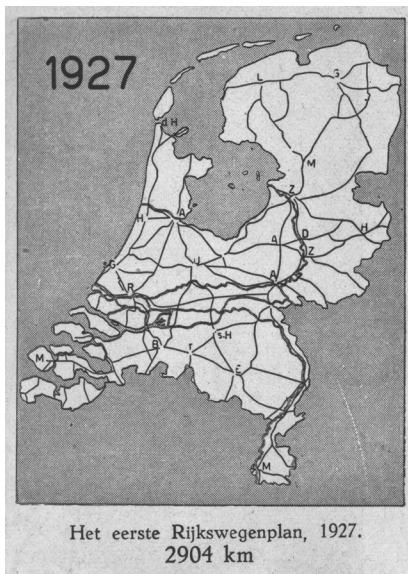
目前最重要的、也是极符合跨学科方法的政策问题，恰恰与不断推进的城市化密切相关。这一现象的主要特征为城市作为经济发展的推动力存在，但同时与生存环境质量的恶化相关，比如交通拥堵和污染。除使用新技术之外，创新的整体性规划概念有助于发现城市化相关问题的可持续性解决方案。微型城市与公交导向城市发展即为此类颇具前景的概念的典型代表，此类概念一经联合使用，甚至可以相得益彰。需要根据具体情况确定所使用的概念以及实施方法。只有对当地具体问题与挑战进行分析，同时参考参与方及利益方的意见，方可做出决策；当然，上述进程也必须对可能的各项规划方案进行可靠的研究及预测。在荷兰，我们采用前瞻性交叉研究法“设计性研究”来探讨、预测各可能性方案。此类初步空间设计不仅能够深入到各可能性解决方案及前景情况的内部，同时也能勾勒出融资可行性的脉络。

Due to its geographical position in the delta with complicated land-use issues, decentralized integrated spatial planning has a very long history in The Netherlands. Spatial and infrastructure planning at a national level started in the 19th century to be able to deal with issues at larger scales. Dutch planning policy development has always been characterized by a continuous adaptation to the needs of the time, in terms of policy content as well as institutional organization. In recent years both the number and speed of adaptations are accelerating.

Until fairly recent, spatial planning and infrastructure planning policies in the Netherlands were placed under two different ministries. Spatial planning in the early 20th century focused on urban expansion and improving housing conditions. In the second half of the 20th century the government issued Policy Documents on Spatial Planning (in total 8 Policy Documents between 1958-2001). These Policy Documents were based on trend prognoses made by National Agencies, public research and knowledge institutions investigating anything from demographic and economic development to traffic trends, environmental impacts and climate change. It was mandatory for the provincial and municipal authorities to conform their town and country planning to these policy documents.

The first 'Rijkswegenplan' (National Road Plan) was issued in 1927, the last in 1984. The policy development of infrastructure planning follows largely that of spatial planning: in the second half of the 20th century, policy is largely oriented towards economic development.

Towards the end of the 20th century, the planning system with centralized directives from the national government changed. One reason for this was the growth of cities into metropolitan agglomerations, which required a balancing of spatial and



The first national road plan in the Netherlands (1927)

荷兰第一个国家级火车路线计划，1927年

environmental development with mobility and traffic management at different scale levels. Also the increasing traffic congestion called for better coordination between national, regional and local authorities. This resulted into the creation of regional ‘Verkeer- en Vervoerplannen’ (Traffic and Transportation Plans) that incorporate spatial planning with infrastructure and public transportation. The national government reviews these plans and if approved, financially facilitates realization of these plans.

In 2010 the Ministry of Housing, Spatial Planning and the Environment and the Ministry of Transport, Public Works and Water Management merged into one organization, the Ministry of Infrastructure and the Environment. This facilitates the already common practice of the Dutch multidisciplinary approach to issues concerning spatial development, water management, environmental issues, mobility and accessibility. Until 2008 the national policy for reviewing the provincial and regional plans was based on the research done by the National Agencies. In that year these merged into PBL, Netherlands Environmental Assessment Agency. But also outside the national government there are several other knowledge and research institutions conducting and supporting studies in urban and regional development. The Dutch institutional planning practice has developed into a multidisciplinary policy field where different levels of governments work together. Governments and stakeholders can make use of the freely available strategic policy analyses and scientific studies. This governance structure of interaction between governments and knowledge institutions has resulted in faster policy development responding to the needs and developments in society.

The most important policy issue at this moment - and eminently suited for a multidisciplinary approach - is linked to ongoing urbanization. This phenomenon is characterized by the city as driving force of economic development, but it is also associated with harm to the quality of the living environment, for instance due to traffic congestion and pollution. In addition to the use of new technology, innovative integrated planning concepts can contribute in finding sustainable solutions to problems related to urbanization. Micro-cities and transit-oriented development are examples of promising concepts, concepts that even can reinforce each other when used jointly. Which planning concept to apply and how, depends mainly on the specific situation. The decision can only be made based on the analysis of the specific local issues and challenges, in consultation with stakeholders and interested parties, which also requires a reliable research and visualization of alternative planning solutions. In The Netherlands we use the prospectively, cross linking research method of ‘research by design’ to explore and visualize alternative possibilities. These preliminary spatial designs not only provide an insight into possible solutions and scenarios, but also generate ideas about financial feasibility.



Simplified topography of The Netherlands in North-Western Europe

source: Nota Ruimte

荷兰位于西北欧的简化版地形图

资料来源: Nota Ruimte

TOD: THE DUTCH WAY

荷兰式的公交导向城市发展

可持续可达性是在城市环境中追求更高生活质量的主要推动因素。公交导向城市发展(TOD)是打造日常及区域性宜人城市的中心理念。这一诞生于美国的概念在荷兰有了“荷兰式”的本土风格应用, 不仅用于新的城市开发, 也用于对现有网络及城市的改造。

放眼全球, 荷兰城市可谓规模微小。首都阿姆斯特丹是荷兰最大、最知名的城市, 其居民人数不足一百万, 横跨距离仅有15公里。但想要了解荷兰的都市发展, 则必须从不同规模的层面入手。荷兰的城市中心区兰斯台德横跨距离约为100公里, 居住人口逾千万。该区域内的各城市, 无论大小, 均通过路程有限但利用率相当高的汽车、火车(及轮船)基础设施网络相连接。这一联网城市区域内的居民人数不断增加, 以每日或者每周固定的模式往来生活。最近的一些研究显示, 甚至荷兰邻近国家的居民, 比如比利时人和德国人, 也在这一网络内定期往来。阿姆斯特丹、布鲁塞尔和

Paul Gerretsen
Director, Deltametropolis
Association, Rotterdam,
The Netherlands

Deltametropolis Association 协会主席

科隆合称为ABC，正在逐渐融合成为居民人口逾3000万的超大区域，形成自有的销售与工作市场。

尽管荷兰的城市化地区面积已经翻了四番，但在过去50年内，其火车基础设施网络的长度未见明显增长。该网络的利用率极高，现在，它更像是地铁或区域性快速铁路系统，而非国家铁路体系。在中心区域内，每2-5分钟就会有双向行驶的列车到达。收入增加，信息、通信和技术增强，交通模式增多，为我们对该地区的使用带来了结构性改变。城市结构已由单向通勤流的辐射型城市转变为规模更大的多城市中心的集群式网络城市。就经济发展角度出发，此类型城市更适合主要节点城市周边的都市区域，而非城市外围。最近，金融危机导致城市发展的受青睐类型发生根本性变化，由大型的绿色地带新开发项目转向现有城市中的公交导向城市发展。

目前，荷兰的政策重点为将流动性基础设施与土地利用规划更好地统一融合。其中之一为提升各流动性基础设施网络的利用率，更多关注使用频率、多向人口流动以及不同交通方式间的互动。微型层面的关注点则放在鼓励发展骑行及人行道上，以增加运输枢纽的周边区域面积；在较大规模上，关注提升城际运输速度。总之，可达性政策旨在提高网络利用率，使得人口流动更具可持续性，增强网络对于各类干扰的应变能力。土地利用方面侧重于对车站及其周边区域的再开发，旨在将车站周边区域建设成为新的城市活动中心，打造适应具体流动性混合与现有城市环境的平衡性功能区域。对车站及周边公共空间的再设计与开发是达成这一目标的重要工具。

荷兰式的公交导向城市发展采用了将节点、走廊与网络统筹规划的平衡性方法。除去对土地及空间的关注之外，此方法通常也包含了“联网城市”的开发与再开发战略与管理方法。

The stimulation of sustainable accessibility is key in pursuing a higher quality of life in urban environments. Transit-oriented development (TOD) is a central concept in creating both attractive cities that are accessible on the daily urban and regional scale as well. In the Netherlands, the concept (coined in the USA) has been used in 'the Dutch Way'. This means TOD is not only used for new developments, but also in transformation of use of existing networks and the existing city.

If compared globally, cities in the Netherlands are tiny. The largest, best known and capital city is Amsterdam, a city of less than a million inhabitants, only fifteen kilometers across. But to understand the metropolitan development in the Netherlands we have to consider different scale levels. The Dutch metropolitan heartland, the Randstad, is an area about 100 kilometers across with more than 10 million inhabitants. Within this area bigger and smaller cities are mutually connected via networks of limited but very efficiently used car, train (and shipping) infrastructure. This networked city is - to a growing number of its inhabitants - home for their daily or weekly living patterns. Recent studies have shown that there is even a relevant scale level beyond that, which includes parts of our neighboring countries Belgium and Germany as well. ABC an acronym for Amsterdam, Brussels, and Cologne is an emerging mega-region of over 30 million inhabitants and a sales and job market on its own.

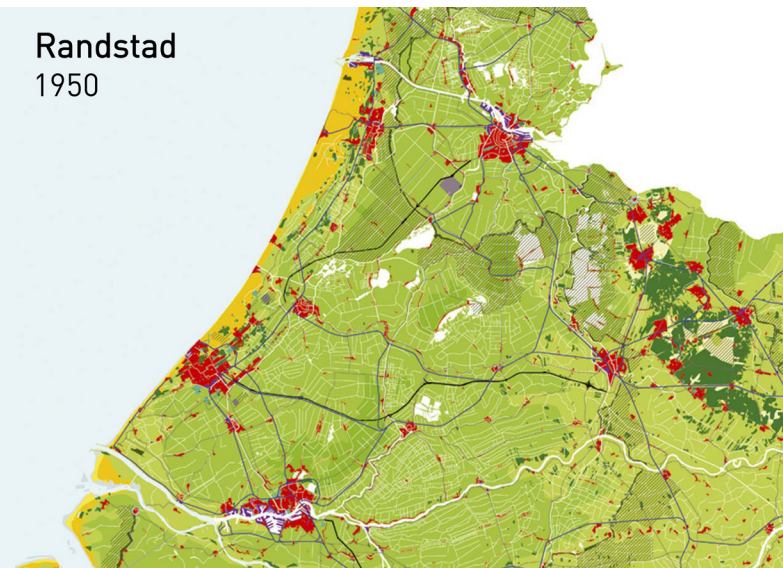
Urbanization in the Randstad in 1950 and 2010 (detail)

source: Hybrid Landscapes, Architectuur Biennale 2004, MUST Urbanism

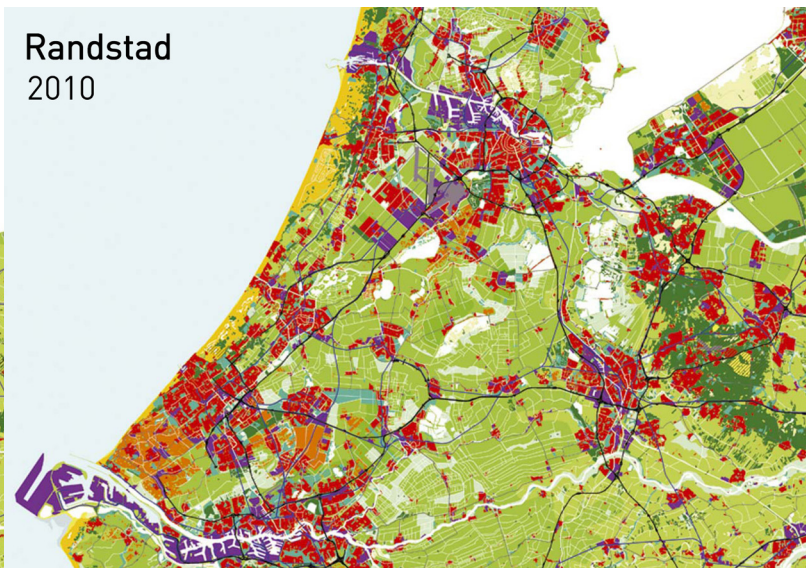
1950年和2010年，鹿特丹城市化发展(详细)

资料来源: 混合景观, 2004年建筑双年展, MUST Urbanism

Randstad
1950



Randstad
2010



While the urbanized area in the Netherlands has quadrupled, the network length of its train infrastructure has not grown significantly in the last 50 years. Increasingly the network is intensively used, today it functions more like a metro or regional express train system than a national train system. On most tracks in the core area, trains will use the tracks every two to five minutes in both directions. Growth of income, ICT and access to multiple modes of transportation have led to a structural change in the way we use this area. City structure have transformed from star shaped cities with one way commuter flows to almost one larger, clustered network city with multiple city centers. In terms of economic development this favors urban areas around major nodes over outskirts of cities. Recently, also due to the financial crisis, this has led to a radical shift in the preferred types of urban development, from large scale green-field developments to urban, TOD in existing cities.

Nowadays policy in the Netherlands is focused on a better integration of mobility infrastructure and land use planning. One part focusses on improved network usage of the different mobility infrastructures, with more attention for frequencies, multi-directional flows and the interaction between the different modes of transportation. At a micro-scale level focus is on stimulating bike and pedestrian routes, in part to increase the catchment area for transit hubs. At the larger scale focus is on increasing intercity speeds. In general accessibility policy is aimed at network usage that makes mobility more sustainable and networks more resilient towards disturbances. On the land-use side focus is on re-developing stations and stations areas. A general aim is to turn station areas into new urban centers of activity, focusing on a balanced mix of functions tailored to the specific mobility mix and the existing urban setting. Redesign and development of stations and the surrounding public space is an important tool to achieve this.

TOD 'the Dutch Way' is based on a balanced approach at the level of the node, the corridor and the network as a whole. Most often it also entails, apart from a view on the territorial and spatial aspects, a strategy and governance approach to develop and re-develop the "networked city".

THE CASE OF UTRECHT CENTRAL STATION

在公交导向城市发展中融合城市流动性与土地利用

乌得勒支市中心车站再开发项目包括新建火车站、重建已有的购物中心以及改造中世纪的运河河道。此外，还在该区域内额外建设了20万平米的办公区域、2000余座房屋以及若干文化设施，将这里打造成为颇具魅力的高密度地区。这一公交导向再开发区域并非新开发的绿色地带，绝大部分区域由此前已在此区域内展开核心活动的各家公司负责改造。所有参与方都须与近邻开展合作，方能继续推进其改造工程，只有切实涉及到自身商业活动利益的公司才会进行投资。因此，携手合作必不可少。

自项目开始之日起，城市就与项目参与方具有共同的目标：(1)提升城市与参与公司的品质；(2)与个体商业投资获得协同效益；(3)分担项目进程中对于相互依存性至关重要的共同责任。相互依存情况大量存在，因此需要特别注意合作中的软、硬方面。在理事会以及分项层面，都需要对此类合作予以明确的经常性关注。需要就相互知会进度延期或是投资困难等问题建立起统一的标准与价值体系。

规划发展的硬方面存在于三条平行的线路中：设计提案、对法律结果的直接考察以及对投资结果的计算。

此方法应用于两个层面之上：在主规划层面上表现为法律与投资框架，在具体项目层面上体现为详尽的商业案例；不仅在制定可靠的发展规划中必不可少，同时也必须用作风险控制的一大工具。

由于各参与方的性质各不相同，制定出符合所有各方的统一性合同必将非常复杂，甚至是根本无法达成。因此，我们转而选择制定参与方之间的双边合同，而城市以协调人的身份出现。以此，城市负责在不同的合同之间做出必须的调整，主要涉及建筑项目用地的再分配、开发项目分配、投资补偿以及规划情况。

Albert Hutschemaekers
Managing Director, Project
Organization Station Area, City of
Utrecht, The Netherlands

乌得勒支车站地区组织项目执行董事

Utrecht Central Station area under construction

正在施工的乌特勒支中心火车站

在每一开发阶段末尾均以协议作为阶段性束结，是非常重要的缔约元素。此类协议由各参与方同时签字，将双边开发合同涵盖在内。由此，所有参与方均可得到保证，即市政府所做出的调整协议对所有参与者均透明公开，同时具有约束力。

车站区域项目总投资约为30亿欧元，其中的70%为参与方的私人投资，其余部分为用于新建音乐厅等公共交通与文化设施的政府投资。在本项目中，市政府对各参与方异常重视，许诺由该区域所获得的收益将直接投资于区域之内。此类收益包括土地出售交易收入或土地出租的价值延拓。此方法需要辅以积极的投资策略。

在各参与方的共同努力下，乌得勒支市已启动了相互调适的建设流，以达成乌得勒支市中心的流动性目标，改善生活品质，增强经济活力。



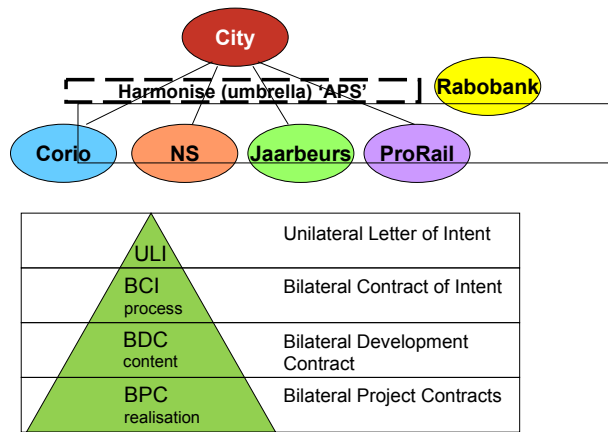
Utrecht Central Station

source: Benthem Crouwel Architects

乌特勒支中心火车站

资料来源: Benthem Crouwel Architects





Bilateral & modular



Contracting partners in Utrecht Station area development

在乌特勒支火车站地区发展的项目合作伙伴

The redevelopment of the Utrecht Central Station Area includes building a new railway station, rebuilding of an existing shopping mall, and reconstruction of the medieval canal-structure. Next to this, 200,000 m² office buildings, more than 2,000 houses and several cultural facilities are added to the area to create an attractive high density area. This transit-oriented redevelopment location is not a greenfield development, the largest positions are taken by companies that already perform their core activities here. None of these parties can continue their development without their neighbor's cooperation, and the companies will only invest if it is in the interest of their own business activities. So creating alliances was necessary.

From the start, the shared aims have been: 1) extra quality for the city and the company, 2) synergy with individual business investment, and 3) a shared responsibility for progress, as this has been essential for managing the interdependencies. The large number of interdependencies requires special attention to the soft and the hard sides of collaboration. On both a board level and a project level, attention is paid explicitly and regularly to this collaboration. Attempts are made to develop a common pattern of standards and values on such issues as informing one another about delays and financial setbacks.

The hard side of plan development has taken place along three parallel routes: design proposals, direct check for legal consequences and calculating the financial consequences.

This approach is used at two levels: at master plan level as a legal and financial framework and at project level as a detailed business case. This method is not only necessary to create a solid development plan but must also be used as an instrument for risk control.

Because all partners are widely different in character, creating generic contracts between all of them would therefore be very complex and probably impossible. For this reason we have opted for bilateral contracts between the partners and the city as a coordinator. In this role, the city is responsible for the necessary adjustments between the various contracts. This mainly concerns the redistribution of land positions for the benefit of building projects, distribution of development programs, financial compensation and planning situations.

Concluding each development phase with an agreement is an important contracting element. These agreements will be signed with all parties simultaneously, up to and including the Bilateral Development Contract. As a result, all parties have the certainty that the adjustment agreements made by the municipality are transparent for everybody and will lead to commitments simultaneously.

The total investment in the Station Area is approximately EUR 3 billion. About 70% of this are private investments by partners and the rest are investments by the governments in public transport and cultural facilities, such as a new concert hall. In this matter, the partners set great store by the municipality's promise that revenues from the area would be invested directly in the area itself. These revenues concerned income from land transactions as a consequence of sale or value development in the event of land leased out. This approach requires an active financial strategy.



TivoliVredenburg, music palace for classic, pop, jazz and world music

可以演奏古典、流行、爵士和世界各地音乐的音乐宫殿, TivoliVredenburg

With the help of the partners the city has managed to set a mutually adjusted construction flow in motion that is aimed at meeting mobility objectives, improving quality of life and achieving economic vitality in the city centre of Utrecht.

FINANCIAL ASPECTS OF TOD AND PPP

公交导向城市发展与点对点方式的融资问题

Robert van Ieperen
Partner and Chief Commercial
Officer, Fakton, Rotterdam,
The Netherlands

Fakton公司合伙人兼首席商务官

未来20年内，中国将有至少三亿人成为新的城市居民，这就要求使用新的规划与发展方法，建设更加宜居、更加智慧的城市，在东、西部间更好地进行财富分配。发展高速铁路是达成这一宏伟目标的重要战略工具之一。将高铁发展、多模式交通枢纽以及多用途宜居微型城市完美结合在一起，需要在此类节点区域及周边地区应用新战略规划、智能型商业模式以及各参与方间的不同互动模式，部分原因在于此类项目中相当一部分投资来自公共私人合作伙伴关系中的私人部门。

在目前的全球经济条件下，越来越难于找到复杂整体性区域开发的风险资本。各个城市在全球范围内彼此竞争，因此亟需了解能够在何种条件下，获得何种类型的城市开发投资资本。在各个层面均享有良好的基础设施连接的城市，具有巨大的经济增长潜力；同时，若此类机遇得以有效管理，则可以创造出健康的环境条件。在复杂的公交导向城市（再）发展项目中，需要使用竞争力强的投资策略以及牢固的伙伴关系，方可获得此类机遇。而构建潜在的发展项目并对其施以投资规范，极大有利于创造出所需的策略与伙伴关系。

实现经济与空间发展的宏伟目标需要四大基本驱动力之间的完美互动：资本、知识与数据、经久稳定的制度框架、所有相关参与方之间的有效合作。在规划的初步阶段，需要对经济流以及经济概念与增长的潜力进行分析。通过城市、城市设计师与投资专家之间的合作，可以优化空间规划的多用途性与功能强度。之后，需要构建投资模型，将城市模型转化为多种商业案例与投资工具，用以评估城市的不同经济情况、风险及回报。在后期阶段，运用此投资工具说服、争取资本参与方的项目投资。此工具旨在将战略投资因素纳入到规划与设计进程之中，以便各项目具有长期可管理性以及投资可行性。

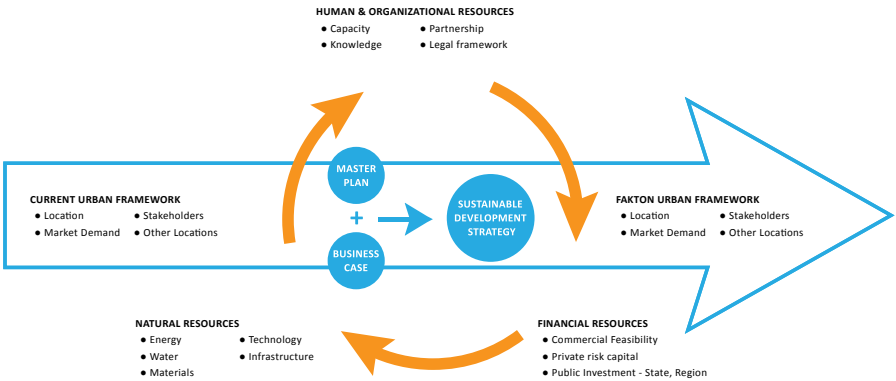
为开发出针对中国的投资工具，可将现有的中国标准与荷兰在公交导向城市发展方面的经验融合成为中荷解决方案，弥合在资本、知识与技能、合作与立法领域内不同类型的差距。这些差距一旦得以弥合，则会为不同参与方创造出新的创新空间，在多种商业案例中发掘出更多资源。在公交导向城市发展等复杂发展项目中，这样的创新能够激发出更好的机遇，在基础设施、能源、废弃物、水以及信息、通信和技术领域内应用新技术与新解决方案。

然而，市场对于公交导向城市发展项目新的跨学科风险，并不能够时刻处于从容应对的状态。因此，公共管理须为新的投资提供连接、支持与保障，需要给予新投资指导以及清晰可靠的策略。

合同形式必须标准化，同时保证市场数据与交易的透明度。所有参与者必须置于同一清晰的组织框架之内。

Define business cases for the entire cycle

对整个商业模型在运行周期的定义



In China, 300 million or more people will become new urban citizens in the next two decades. This requires new planning and development approaches, more liveable and smarter cities and a better distribution of wealth between East and Western China. Developing high speed rail is an important strategic tool in this ambition. The combination of high speed ambitions, multimodal transportation hubs and liveable mixed use micro-cities around these nodes will also demand new strategies, intelligent business cases and a different interaction between the many parties. This is partly because a large part of the needed investments is expected to come from the private sector in Public Private Partnerships.

In the current global economic climate, it is increasingly difficult to find enough risk capital for complex and integrated area developments. Cities compete on an international scale and it is important to understand under which conditions and for which type of urban development investment capital becomes available. Cities that have excellent infrastructural connections on all scales, offer huge potential for economic growth and if these opportunities are managed well they create conditions for a healthy environment at the same time. In complex transit-oriented (re)development projects competitive financial strategies and strong partnerships are needed to harvest these opportunities. The creation of such strategies and partnerships can be greatly supported by structuring and financially modelling potential development projects.

Ambitions for economic and spatial development require the perfect interaction between four fundamental drivers: capital, knowledge and data, a durable institutional framework and effective collaboration between all parties involved. In the initial planning stages economic flows and the potential for economic concepts and growth need to be analysed. In a collaboration between city, urban designers and financial experts the mix and density of functions of a spatial plan can be optimized. After this a financial model must be constructed that translates the urban model into a multiple business case and a financial tool that enables the city to assess different economic scenarios and risk and return profiles. In a later stage this financial tool is used to convince and commit investments from capital partners as well. The aim of this tool is to embed strategic financial ingredients in the planning and design process in such a way that projects become manageable and financially feasible over a long period of time.

To develop a tailor-made financial tool for China, current Chinese standards and Dutch TOD experience can be converted into a Sino-Dutch approach that will close different types of gaps in capital, knowledge and skills, collaboration and legislation. Once these gaps are closed, this will create new room for innovation with various parties that generate extra resources in the multiple business case. In complex developments like TOD such innovation is likely to improve opportunities for the application of new technologies and solutions in infrastructure, energy, waste, water and ICT.

Markets are not always ready to confront the risks that are involved in the new multidisciplinary nature of TOD developments. Therefore the public administration must connect, support and provide certainties for new investments. It will have to provide guidance and a clear durable strategy.

Standardization of contract forms and transparency in market data and transactions is needed. All participants should be confronted with a clear organizational framework.

Multiple public and private business cases are only feasible if equity parties are willing to invest and banks are willing to finance. Many complex projects fail due to the lack of knowledge of economics and capital markets. If carefully managed, all challenges can be met, with successful urbanization as a result.



Zuidas station area, Amsterdam

阿姆斯特丹南站地区

A photograph of a modern urban landscape featuring several tall glass skyscrapers. The buildings are reflected in each other and the surrounding environment. In the foreground, there are bare trees and a paved plaza. A blue sign with white text is visible on the right side of the image.

智能化公交导向的发展 SMART TRANSIT-ORIENTED DEVELOPMENT

SMART AND HEALTHY MICRO-CITIES

智慧健康微城市

Ton Venhoeven

Principal architect and urban planner,
VenhoevenCS architecture+urbanism,
Amsterdam, The Netherlands

VenhoevenCS architecture+urbanism
所长、创始人

公交导向城市发展不仅需要容纳人口流动，满足交通枢纽的空间要求，适应智能公共私人商业案例的发展，在设计车站以及周边区域发展战略与空间规划时，我们还需要应对很多其他问题，比如如何刺激所期冀的经济发展，如何解决环境问题，如何安置数量不断增长的城市居民，如何改善城市生活质量，如何优化非机动车以及低碳交通方式的利用率。

智慧城市被视为上述问题的通用答案，但需要适当的城市硬件，才能够实现智能技术在城市中的有效应用。城市智能需要空间布局、流动性及其他基础设施、公共便利设施、功能区划以及灵活使用等方面之间设计优良的相互作用。比如，智能电网中的能源交换允许地方及社区级别上的生产与消费用电交换，以分摊生产或消费中的用电高峰。不过，为有效达成这一目标，需要在同一社区内安置不同类型的能源使用者与生产者，最好包括各类型的住户与商业。若没有混合类型的用户存在，即社区内仅有商业或仅有住宅，则用户生产或使用电能的时间段完全一致，由此，智能电网无法产生出积极效果。若附近亦无符合要求的混合类型社区，则电能收益会在交通损失中反复流失。再比如，利用某种应用软件从可能的交通方式中选择碳排放最低的方式出行，首先需要具有可供选择的各种交通方式，比如安全且招人喜爱的步行道和自行车道、高效的公共交通及枢纽、无交通拥堵的道路，以及对于行人和骑行者都安全的零排放汽车，等等。如果已具备可供选择的交通方式，则智能技术可用于优化利用率。

去除掉一切不必要的交通，这一原则适用于各城市及大型城市中的所有活动与服务。若能成功实施，则可以发展出颇具吸引力的微型智慧城市，其自给自足程度远远高于现今的单一功能办公园区和住宅区域。通过互联网，城市供给的大部分工作可分散至各级别完成，大大减少（大型）城市的交通负担。比如，目前的废物与资源管理已经实现了地方级的有效处理。同样的方法亦可用于水管理、食品生产与消费、设计与制造、教育与医疗服务，不一而足。与此同时，社会由大规模工业生产向知识经济转变，实现多用途社区发展，由此，不再需要通往中央生产设施的交通运输。此类社区能够发展为对其他地区大规模工业供给依赖程度降低的微型城市，所需机动交通量减少，可成为对各年龄段人群都具有吸引力的可持续发展经济活力区。

具有吸引力的步行及骑行运动，以及步行和骑行即可到达的基本便利设施，不仅有利于改善环境，对于人们的身体和心理健康也有积极意义。积极老龄化概念指通过改善对居民日常互动公共空间的利用，提升人口的健康。这一做法不仅改善了人口的健康状况和生活质量，而且在全球范围内节省了爆炸性增长的医疗支出；高龄人口群体中的情况与此相似。若能够发展此类宜于行人的微型城市，同时将其与核心区域中设计良好的公共交通枢纽相结合，则可以从交通占地中恢复大量的城市公共空间。但必须实施能够增进此类机会的城市规划，以加强智能技术的潜力，方可达成此种宏伟目标。

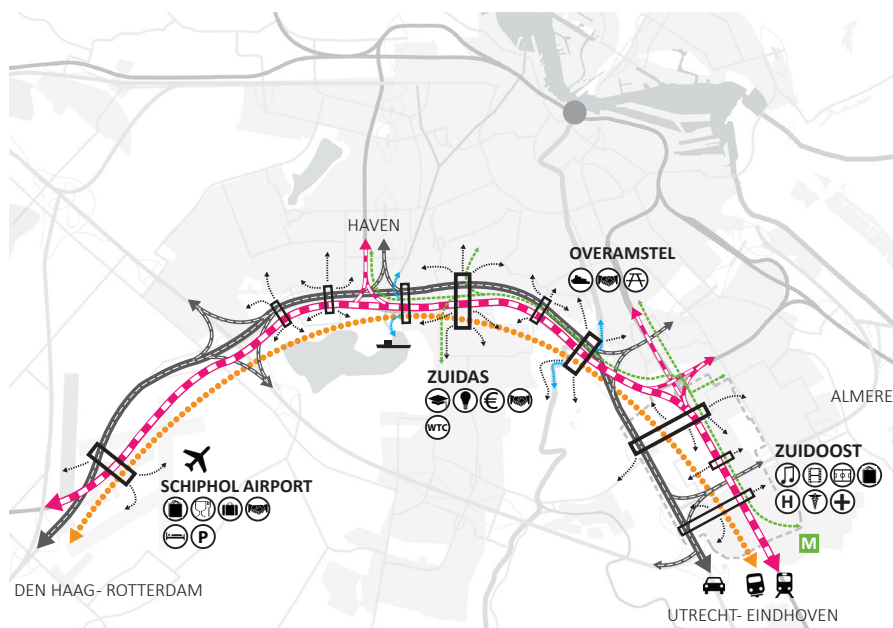
Transit-oriented development is not just about accommodating mobility flows, spatial requirements of hubs and the development of intelligent public private business cases. When designing strategies and spatial plans for stations and station area developments, we have to deal with many other issues as well, such as how to stimulate the desired economic development, how to tackle environmental issues, where to accommodate the growing numbers of city dwellers, how to improve the quality of life in cities, how to optimize the use of non-motorized and low-carbon transportation options.

Interaction between infrastructure and city as
basis for Smart Cities

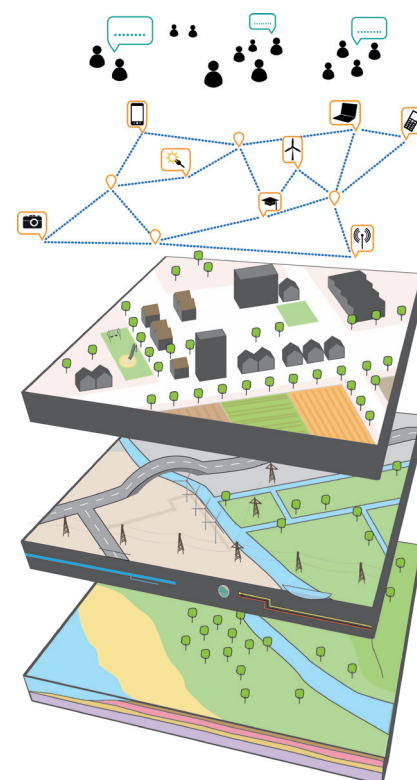
source: Smart Cities NL, 2014

智能化城市的基础是城市基础设施与城市之间的互动。

资料来源: Smart Cities NL, 2014



Smart cities are seen as generic answers to the above mentioned issues, but for smart technology to be effective in cities, proper city hardware is needed. Smartness in the case of cities requires a well-designed interplay between spatial layout, mobility and other infrastructure, public amenities, functional zoning and flexible usage. For example energy exchange in a smart grid allows for an exchange of production and consumption of electric power at the local and neighborhood level, to even-out peaks in production or consumption. Yet to be effective it requires the proximity of a range of different energy users and producers, preferably a combination of different types of households and businesses in the same neighborhood. Without such a mix, with just businesses or just housing, everybody produces or uses electricity at the same time and smart grids don't generate their positive effects. If the required mix cannot be found nearby, electricity gains back and forth get lost in transportation losses. In smart mobility, another example, choosing the lowest carbon option between alternative transportation options with the help of an app, requires the presence of alternative options in the first place, such as safe and attractive walkways and bicycle lanes, efficient public transportation and hubs and roads without traffic jams and cars without emissions that are safe for pedestrians and cyclists as well. If these are in place, smart technology can be used to optimize usage.



Interplay between smart infrastructure and urban hardware

source: Smart Cities NL, 2014

智能化城市的基础是城市基础设施与城市之间的互动。

资料来源: Smart Cities NL, 2014

Public agricultural market, Seattle

photo: Joe Mabel

露天的公共农产品市场，西雅图

照片: Joe Mabel

Getting rid of unnecessary transportation is a principle that can be applied to all kinds of activities and services of cities and mega cities. If successfully applied this can result in the development of attractive smart micro-cities that are much more self-sufficient than today's mono-functional office parks and housing areas. With the help of the internet, much of a city's supply and demand can be matched on a decentralized level, which would take away a large chunk of a (mega) city's traffic load. For example, today, waste and resource management can be dealt with in an efficient way at the local level. The same goes for water management, food production and consumption, design and manufacturing, education and health services, to name but a few. At the same time, society's transition from large scale industrial production to a knowledge based economy allows for the development of mixed use neighborhoods, which would make commuting to central production facilities obsolete. Such neighborhoods can develop into micro-cities that are less dependent on large scale industrial supply elsewhere. They generate less motorized traffic and can develop into attractive, sustainable and economically vital places for all ages.

Attractive pedestrian and bicycle movement and the presence of basic amenities at walking and cycling distance, are not only beneficial to improve the environment, they have very positive effects on physical and mental health of people as well. Active ageing is a concept to improve a population's health by improving the use of public space for daily interaction between citizens. This not only improves people's health and quality of life but also saves on worldwide exploding healthcare costs, even at higher ages. If such pedestrian friendly micro-cities are developed and combined with well-designed and attractive public transportation hubs at their core, a lot of public space in the city can be regained over traffic. But to achieve these promising ideals, the potential of smart technology must be reinforced by urban planning that facilitates these opportunities.

SMART CITIES AND TOD IN CHINA

中国的智慧城市与公交导向城市发展

Yang Lei

Curator and researcher of Smart City and Urban Future, Beijing, P.R. China

杨磊

中国北京智慧城市与城市未来策展人、研究员

过去五年内，智慧城市在全球范围风靡。中国政府也在2012年正式采纳并试点推广此类城市建设。当年，中国的城市化率突破50%，并有望在2030年上升至70%。中国的智慧城市诞生于中国的新城市化运动之中，并与此密切相连。在这场运动中，政府倡导密集型（资源利用）、智能型（智能方法）绿色低碳的城市发展。

智慧城市的核心在于运用智能技术驱动的数据与信息系统，将城市功能一体化，以更好地规划、发展、运营、管理城市，主要应对复杂的城市挑战与问题，创造更宜居的可持续发展城市。

信息资产与共享的优化型城市功能是促使不同城市部门参与到智慧城市建设中的原动力，而公交导向城市发展项目则是智慧城市发展的具体完美商业案例，在智慧流动部门尤其如此，可将流动性与区域发展协同起来。

智慧城市与公交导向城市发展区域如何相互促进？两者在城市发展的资源（土地、空间）密集利用方面具有相同特质，而智慧城市能够优化水、能源以及道路等城市网络。智能技术将多用途与多模式获取推向下一层级。智能管理与城市居民创造出开放、有创意、可参与的混合型城市文化，确保公交导向城市发展区域更具长期可持续性。考虑到公交导向城市发展区域的高密度与情况复杂的多种活动，同时需要考虑如何优化安全、紧急事态以及危机管理，赋予公交导向城市发展区域更强的适应性；这也是智慧城市发展的一个部分。最后，通过智慧建模实现的智慧城市规划以及基于情景的模拟研究，能够将城市规划升级到更具活力和适应性的层面之上。

智慧城市与公交导向城市发展共同构成了城市未来综合性战略。智慧城市构建起来的数据信息构架与公交导向城市发展环境相得益彰，二者均将公交导向城市发展项目全生命周期内的不同利益组织与参与方联结在一起。智能管理与智能居民方法是公交导向城市发展项目具有持续活力的关键。信息架构是中国智慧城市发展中公交导向城市发展项目的新维度。

智慧城市与公交导向城市发展都是整体性城市发展的一部分，前者作为横向一体性元素，而后者为纵向一体性元素。鉴于公交导向城市发展的本质是城市资源与活动的融合者，则其将智慧城市区域内的所有复杂情况包含在内，因此是智慧城市发展的最敏锐的测试指标。城市流动性质量是国际城市竞争力的一大指标，因此，某一城市在该领域内的表现在城市发展导向中至关重要。以公交导向城市发展为基础的智慧城市发展将成为主要因素，而中国此时已经站在了这场变革的门槛上。

Smart City, the global hype in the last 5 years, has been adopted and piloted by the Chinese government since 2012, at a moment when the urbanization rate in China exceeded 50% with a foreseeable future of 70% by 2030. The smart city development in China was born and closely attached to the context of a new urbanization movement in China, in which the government calls for an intensive (use of resources), intelligent (smart approach), green and low carbon way of urban development.

The core of smart city is applying smart technology powered data and information systems to integrate all urban performances to better plan, develop, operate and manage the city, addressing complex urban challenges and issues to deliver a more livable and sustainable city.

Information assets and shared improved urban performances are the motivation for different city departments to join the smart city game, while TOD projects can be the perfect business case for the elaboration of smart city development -

especially in the smart mobility sector - in the light of how to synergize mobility development with area development.

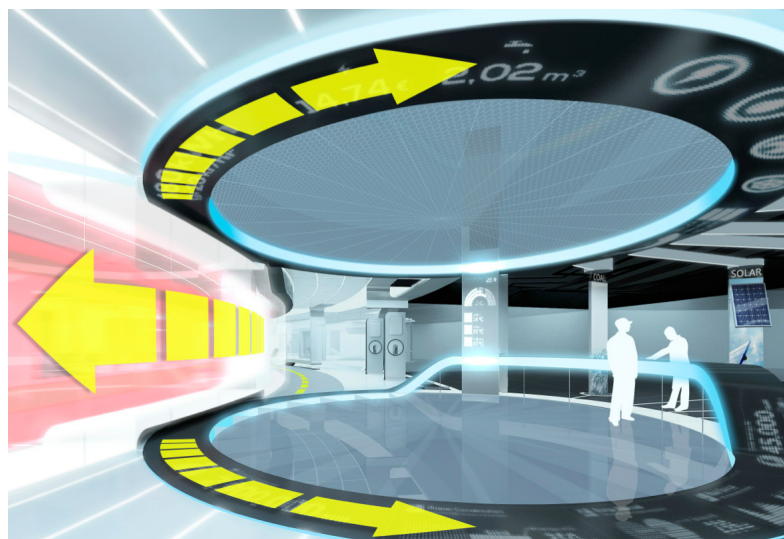
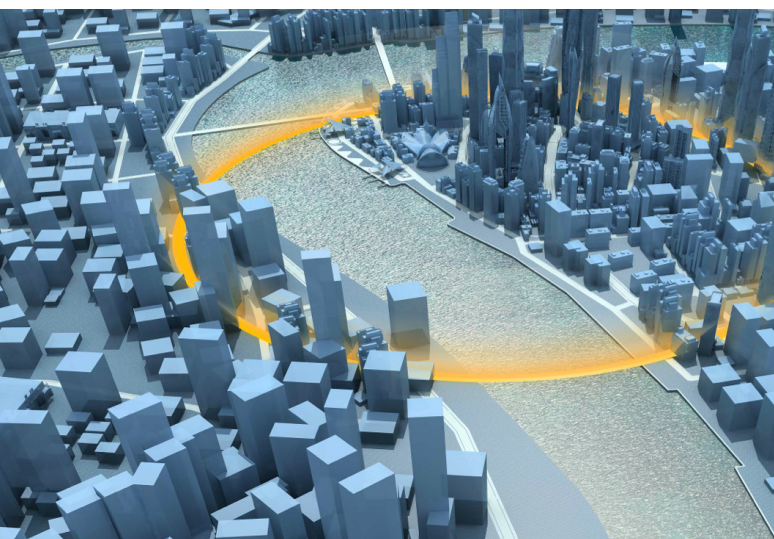
How can smart city enhance the quality of a TOD area and vice versa? Both share the common attributes of quality in urban development in terms of intensive use of resources (land, space) while smart city enhances the urban networks of water, energy and roads. Smart technology can push the performance of mixed use and multi-modal access to the next level. Smart governance and citizens can enable an open, creative and participatory mixed urban culture to make TOD areas more sustainable in the long run. Given the high density and multiple and complex activities in TOD areas, we also need to think about how to enhance safety, emergency and crisis management to make TOD areas more resilient, which is part of the smart city scope. Last but not least, smart urban planning via smart modelling and scenario based simulation studies can step up urban planning to become more dynamic and adaptive.

Smart city and TOD together form a comprehensive strategy for the urban future. The data based information architecture that smart city builds complements the TOD built environment and both are connectors for different interest groups and stakeholders across the life cycle of TOD projects. The smart governance and smart citizen approach are the backbones for ongoing vitality of TOD projects. Information architecture could be the new dimension in TOD projects in connection with smart city development in China.

Smart city and TOD are both about integrated urban development, smart city can be seen as horizontal integration while TOD can be seen as vertical integration. Given the nature of TOD as urban resources and activities integrator, it combines all complexities in the smart city area and thus becomes the extreme tester for any smart city development. Quality of urban mobility will be the indicator of competitiveness of a global city, thus performance in this realm will be critical in steering of urban development. TOD based smart city development will be the lead and China is right on the door front where this is happening.

Smart City Innovation Centre, September 2014,
CMoDA, Beijing

智能化城市创新中心,
2014年9月, CMoDA, 北京



北京清河火车站的设计
设计性研究
**RESEARCH BY DESIGN
WORK WEEK ON QINGHE
STATION, BEIJING**



清华
建筑

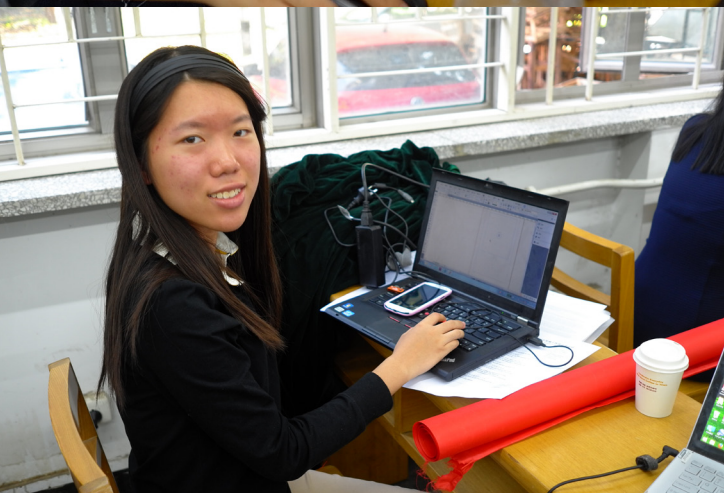
1946-
清华大学建筑学院
SCHOOL OF ARCHITECTURE
TSINGHUA UNIVERSITY

迈向2050： 中荷可持续发展工作周

Towards 2050: Developing a Sino-Dutch
Approach towards Sustainable Urbanisation

活动简介 Introduction

This is a project proposal for the next step of the multiannual program Towards 2050, developing a Sino-Dutch Approach for Sustainable Urbanisation, initiated by the Creative Industries Funds NL in July 2013. The goal of the initiative is to explore how the Dutch integrated planning approach can be of added value to the challenges Chinese metropolitan regions are facing in the process of rapid urbanisation. This question is explored by means of Sino-Dutch 'research by design' and to develop specific spatial planning challenges.



INTRODUCTION

简介

今年“迈向2050”工作周的任务由北京市规划委员会负责制定。本次案例研究为：为连接北京市清河地区与河北省张家口市的新京张高铁走廊沿线进行公交导向城市发展规划。新京张高铁计划于2022年通车运行。

尽管工作周成果看似与设计方案相近，工作周却并非为清河新高铁车站建设进行总体规划或深度研究，而是采用设计性研究方法探讨清河站的发展潜力，并附带探讨北京北站的潜力。

设计性研究在荷兰为常用方法之一，借以预测抽象选择或政策可能性的不同空间情况，通过图纸、地图、模型、图解以及信息图等手段，展现未来环境的可能情况。该方法有助于增进规划师、决策者、设计师以及参与方、用户和市民之间的交流沟通。

因此，工作周成果是一种用以定义项目摘要、范围以及本车站未来规划与建设的有力工具。

This year's assignment for the *Towards2050* work week is kindly provided by the Beijing Municipal Commission of Urban Planning. The case study is transit-oriented development (TOD) along the corridor of the new Jingzhang high speed railway, which connects the Qinghe area in Beijing with the city of Zhangjiakou in Hebei province. The Jingzhang high speed line is scheduled to be operating in 2022.

Although the results of the work week may look like a design, the work week is not about making a master plan or an in depth research for the construction of the new high speed railway terminal for Qinghe. Rather, the work week uses Research by Design as a method to explore the development potential for Qinghe station – and in its slipstream also the potential for Beijing North Station.

Research by Design is a tool often used in The Netherlands. It visualises the different spatial scenarios for abstract choices or possibilities in policy. By drawings, maps, models, diagrams and infographics, a possible future environment can be imagined. This helps communication between planners, policy makers, designers and of course communication with stakeholders, users and citizens.

Thus, these results are a tool to define the project brief, the scope and the opportunities for the future planning and construction of this station.

Ton Venhoeven

Curator, *Towards2050: Developing a Sino-Dutch Approach for Sustainable Urbanization*

《迈向2050：创立中荷合作的可持续性城市化方案》负责人

我们在进行城市交通枢纽设计的过程中发现，与不同的相关政府部门及企业沟通交流并非易事。

大家似乎首要关注的都是自身利益，而非公共便利，而且大部分情况下，对于技术方案抱保守态度。因此，我认为在城市政府内建立新的合作体系，改善现有状况，十分必要。向建筑师开放专业领域亦十分重要。建立一套更为有效、安全、方便、舒适、宜人的公共交通系统，是北京市的宏伟目标之一，我们要为此共同努力！

非常感谢各位为清河站所做的努力。

When we were involved in the design of transportation hubs in cities, we found it is not easy to communicate with so many different and relevant government offices and companies.

They always seem to be concerned with their own profit first, instead of in public convenience. Also most of them are conservative when dealing with technical solutions. Therefore, I think establishing a new cooperation system in city government is necessary to improve this situation. And opening the professional field to architects is very important as well. Building a more efficient, safe, convenient, comfortable and more beautiful public transportation system should be a very important ambition for the city of Beijing, and we should aim for this together!

Thanks a lot for what you have done for Qinghe station.

Cui Kai

Vice President and Chief Architect,
China Architecture Design &
Research Group, Beijing, P.R. China

崔凯

中国建筑设计研究院副院长、首席建筑师





联接北京 THE BEIJING CONNECTION

JINGZHANG RAILWAY IN HISTORY

京张铁路

京张铁路建于1909年，是中国铁路发展历史上第一条由中国人自己设计、修筑的铁路，对于中国人民具有相当重要的意义。担任京张铁路设计师的是伟大的工程师詹天佑先生。当时，由于地形复杂、设备短缺，整个工程可谓规模巨大、困难重重。詹天佑选择了最为经济合理的线路，铁路起点站设在丰台火车站。

京张铁路是京包铁路的一部分，主要用作煤炭运输。自上世纪60年代开始，北京北站成为京张铁路的起点站。但在丰沙铁路和东北铁路环建成之后，北京北站的作用明显削弱。

目前，每天有22列火车由北京开往张家口，但仅有3列由北京北站发车。乘客仅前往北京北站乘坐S2线（开往延庆的市郊铁路线）。

S2线为观光线路，在市区与市郊之间运送旅客，使用京张铁路轨道，票价非常便宜，仅为6元，且可使用北京市公交卡刷卡乘车。游客可在北京北站乘坐S2线前往八达岭（长城）、昌平（十三陵）和延庆（自然风景区），欣赏京郊美景。

京张铁路在105年前可称得上是创新之路。现在，我们也要面对当下的挑战：建设京张高速铁路。修筑京张高铁是北京申办2022年冬季奥运会的承诺之一，由此，张家口与北京之间的路程时间将缩短为一小时。这条高速铁路将对京津冀的一体化发展做出巨大贡献，并对张家口的长期发展以及京西北的功能优化产生巨大影响。

In the Chinese railway development history, Jingzhang Railway is the first railway designed and built by Chinese in 1909, and it is very meaningful to Chinese people. The designer was the great engineer Mr. Zhan Tianyou. In that time it was a huge and difficult project because of the complex terrain and lack of equipment. Mr. Zhan chose the most economical and reasonable line and the starting station was Fengtai Station.

Jingzhang Railway is part of Beijing-Baotou Railway Line and the main function was coal transport. In the 1960s, Beijing North Station became the starting station of this line. But after the construction of Feng-Sha Railway and Northeast Railway Ring, the North Station's function was visibly weak.

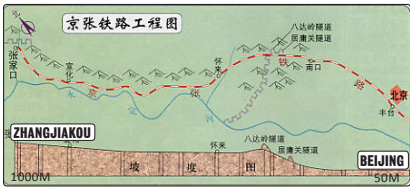
Nowadays 22 trains start from Beijing to Zhangjiakou per day, but only 3 start from Beijing North Station. People come to Beijing North Station just for the S2 (the suburban railway line to Yanqing).

The S2 line was designed for tourism and commuting traffic of people in the suburban area, and it used Jingzhang Railway line. The ticket price is very cheap (6 yuan) and passengers can use transportation IC card. Tourists can take the S2 line from Beijing North Station to Badaling (the Great Wall), Changping (imperial mausoleums) and Yanqing (nature viewing) for different kinds of sceneries.

105 years ago, Jingzhang Railway Line was the line of innovation. Today we have the challenges of our time: the Jingzhang high speed railway. Building this high speed railway was the promise of Beijing's bid for the 2022 Winter Olympic Games, it shortens the distance between Zhangjiakou and Beijing to a one hour trip. This high speed railway can make a significant contribution to the integration of Beijing, Tianjin and Heibei province and in the long term it can have great influence on Zhangjiakou's development and the functional optimization of northwestern Beijing.

An Yue
Urban Planner, China Academy of
Urban Planning & Design, Beijing,
P.R. China

安悦
中国城市规划设计研究院城市设计师



Engineer: Mr. Zhan Tianyou

工程师: 詹天佑 先生

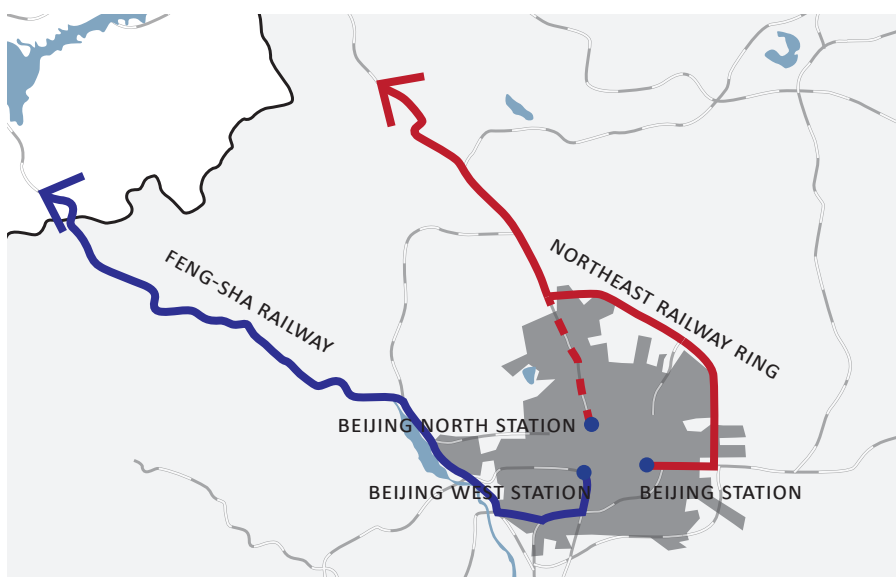


图3 京张铁路基本走向比较图



Jing-Zhang Railway is a part of Beijing-Baotou Railway Line (coal transport).

京张铁路是京包铁路的一部分。(煤炭运输)



In the 1960s, Beijing North Station became the starting station. But after the construction of Feng-Sha Railway and Northeast Railway Ring, North Station's function was weak.

在60年代，北京北站变成了起点站。但随着丰沙铁路和东北铁路环线的建成，北京西站的功能被削弱了。

22 trains from Beijing to Zhangjiakou per day, only 3 start from Beijing North Station.

在每天有22趟次列车往返北京到张家口，其中只有3次始发于北京北站。



Now people come to Beijing North Station for S2 (suburban railway to Yanqing).

如今，人们去北京北站则是为了搭乘S2线。(通向清河的市郊轨道交通)

S2 used Jing-Zhang Railway line, main function is for tourism and commuting traffic of people in suburban area.

北京市郊铁路S2线使用京张铁路轨道，主要功能是运输游客及居住在郊区的人们。



TOURIST DESTINATIONS ALONG THE S2 LINE

Clockwise from top left: Ming Tombs, Changping; The Great Wall, Badaling (photo: Inaba Tomoaki); Guyaju Caves, Yanqing; Longqing Gorge, Yanqing (photo: Andrew Fong); Beautiful scenery, Yanqing (photo: Jamesj8246); Tourist map of Yanqing

在北京S2线周围的旅游目的地。

顺时针，由左上起: 明十三陵，昌平；长城，八达岭（照片: Inaba Tomoaki）；古崖居洞穴，延庆（照片: Andrew Fong）；美景，延庆（照片: Jamesj8246）；延庆旅行地图

Time table tourist line
Ticket price: 6 yuan; transportation IC card;
3.5 - 4.5 hours a train.

S2线时刻表:

票价: 6元; 公交IC卡可用, 每3.5 - 4.5小时一班。

S2 TOURIST LINE

S2线最新时刻表（2014年9月5日）修正版								
北京北→延庆								
车次	北京北	清华园	清 河	昌 平	南 口	八达岭	延庆	备注
S201√	6:12	6:17	→	→	6:49	7:31	7:49	1、“—”为不停站； 2、“√”为每天都开行； 3、“*”为周一、周五、六、日、节假日开行； 4、“*”为周二至周四开行。 北京北站电话： 51866223
S205★	8:34	→	8:44-45	→	9:05-06	9:47-50	10:05	
S209√	10:57	11:02	11:10	→	11:31	12:13	12:31	
S211★	12:42	→	12:52	→	13:19	14:01	14:19	
S213●	13:14	13:19-20	→	→	→	14:25-28	14:43	北京北站电话： 51866223 延庆微信:xiaduyanqing
S217√	15:24	15:30-31	15:37-38	15:52-53	16:00-01	16:43-46	17:01	
S219★	17:11	→	17:21-28	→	17:48-49	18:30-33	18:48	
S221●	17:41	17:46	17:54	→	18:15	18:57	19:15	
S225√	19:11	19:16-19:17	19:24-25	→	19:45-46	20:26	20:40	北京北→沙城
北京北→沙城								
车次	北京北	清华园	南口	青龙桥西	八达岭	康庄	沙城	周一、周五、六、日、节假日开行
S287●	7:58	8:03-04	8:38-39	9:10-12	9:20-23	9:37-40	10:16	

UPCOMING EVENTS IN BEIJING AREA

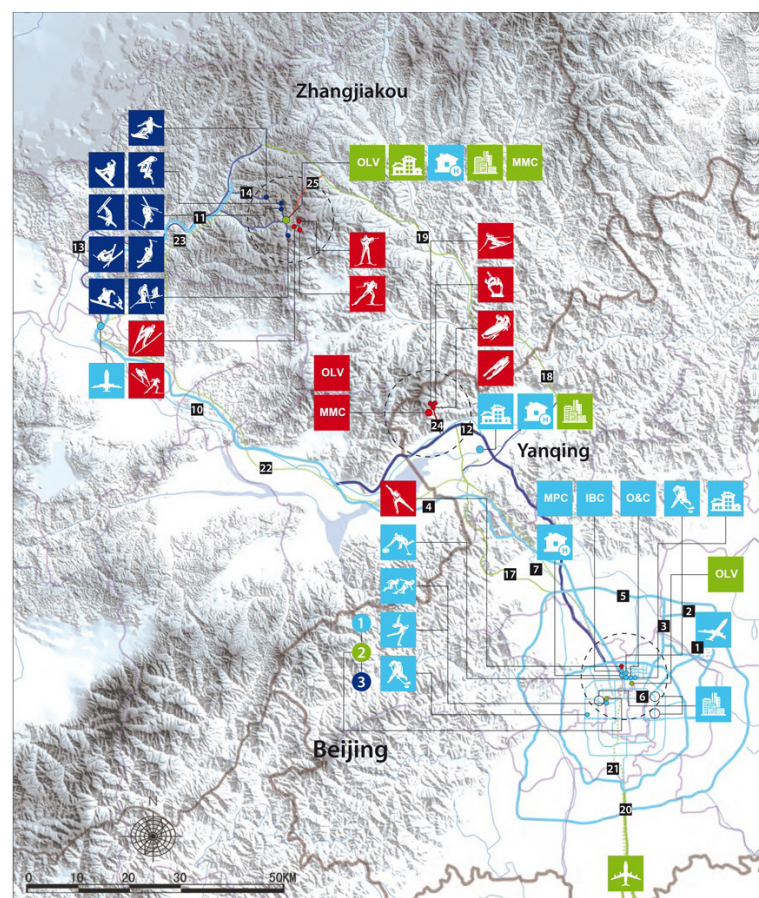
即将举行在北京举行的盛会

HORTICULTURE EXPO BEIJING 2019

GREEN LIVING, BEAUTIFUL HOME

2019年北京园艺博览会

“绿色生活, 美丽生活。”



The promise of Beijing's bid for 2022 Winter Olympic Games

北京承诺申办2022年冬奥会



Introduction of the high speed railway

Length: 174km (the whole line);

Designed speed: 200-350km/h;

Travel time between the 2 cities:
from 4 hours to less than 1 hour.

京张高铁基本数据:

长度: 174公里 (全线)

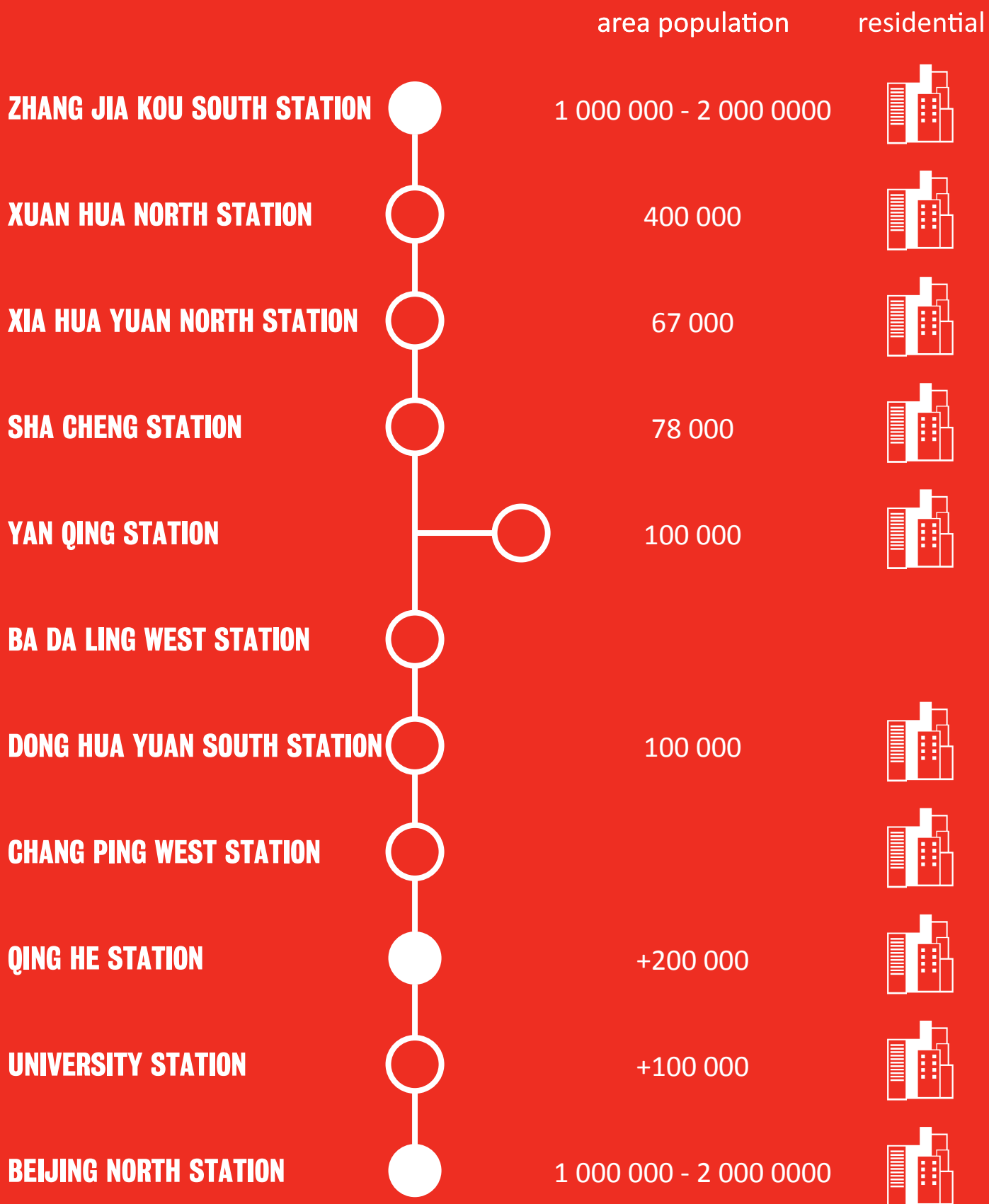
设计速度: 200-350公里/小时

两地间路程时间: 由4小时缩短为1小时

Zhangjiakou to Beijing: one hour trip

张家口到北京需要1小时车程。

变革的过程



如何让火车穿越北京的狭窄区域？
如何才能捕捉到城市和地区新增价值？

LINE OF INNOVATION

commerce

villages

industry

special program

landscape



Winter Olympics



Great Wall



High Tech



University



Beijing Centre

HOW TO GET THE TRAIN THROUGH A NARROW PART OF BEIJING?
HOW TO CAPTURE ADDED VALUE FOR CITY AND REGION?



What does Qinghe station mean to Beijing?

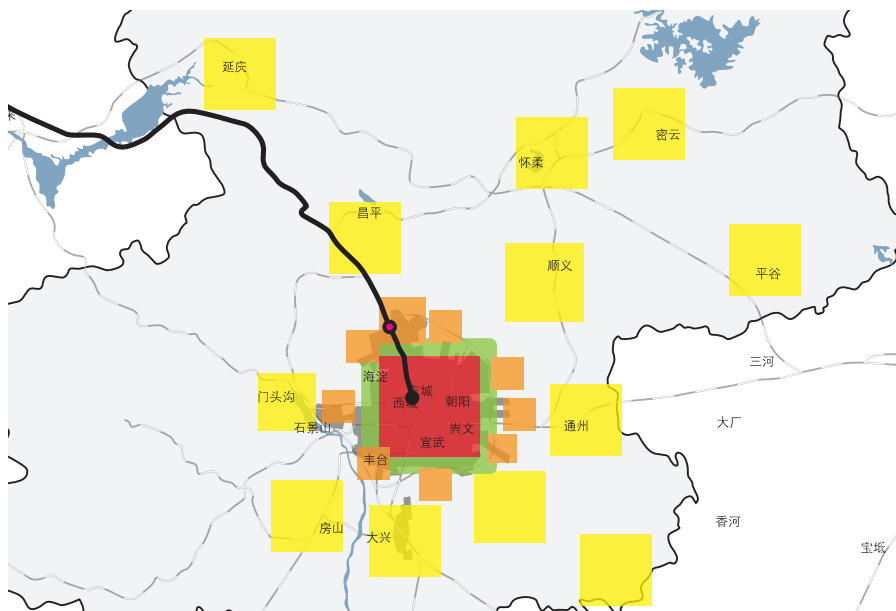
Look at the big scale, what is the structure of Beijing?

Qinghe station is just a small part of the railway system

清河站对北京意味着什么？

从大尺度来看，北京城的结构框架是什么？

清河站仅仅只是北京轨道交通系统的很小的一部分。



Proposal:

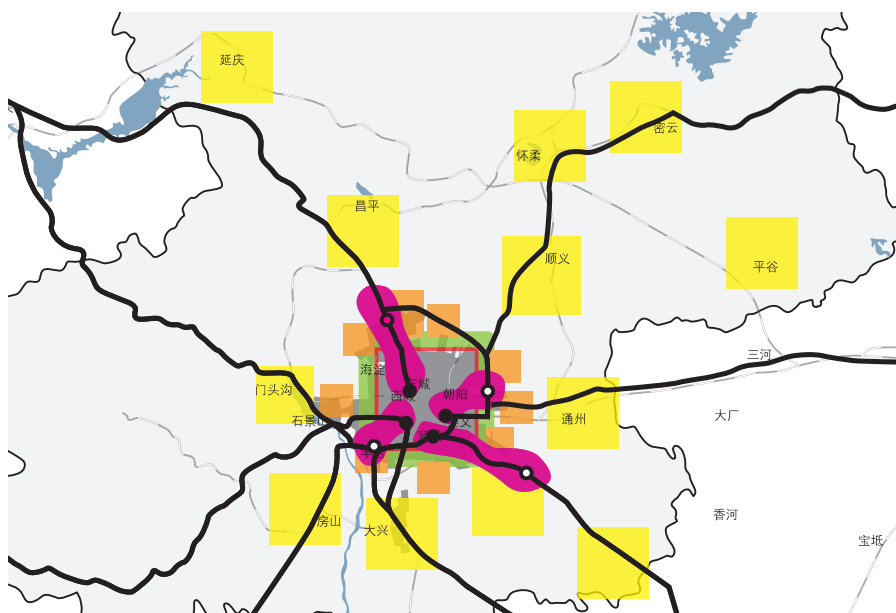
4 different terminals, new high speed railway system connecting to other cities in China

Second stations are being planned to share the overload of the terminal station, they work as four different groups

解决方案:

四个不同的站台由新的高铁系统连接着全国各地其他的城市。

附属的2级站台分担着主站台过量的人群，它们一起作为四个不同的小组而存在着。



Proposal:

Qinghe station and Beijing North form one group

Qinghe station is not an end terminal, but a stop station that shares the flows.

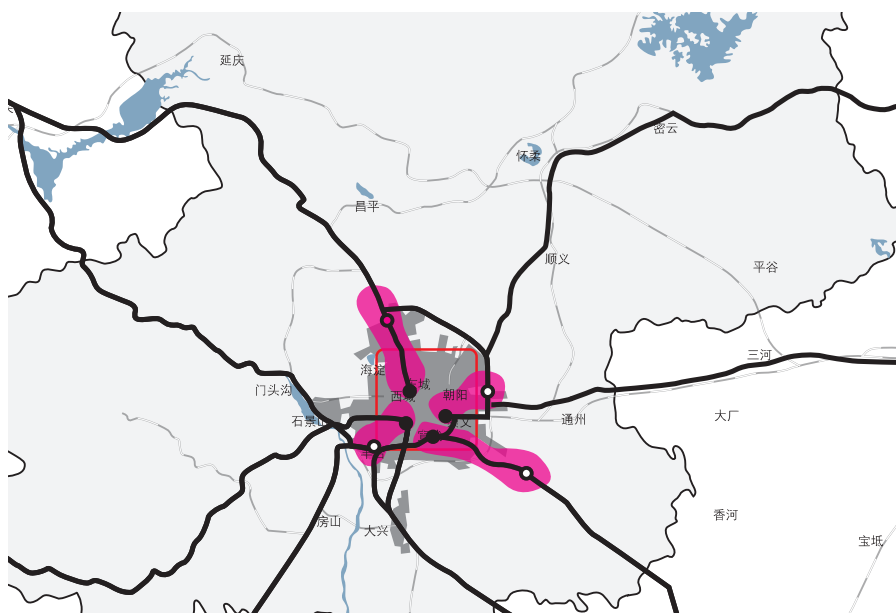
Qinghe station is not independent, it is a part of the city's transport system. But how does it work?

解决方案:

清河站与北京北站在同一组内。

清河站并不是终点站，而是做为一个中转站来分担人流。

清河站不是独立存在的，他作为城市交通系统的一部分是如何运作的呢？



CONNECTION TO THE BEIJING AGGLOMERATION 与北京的连接

清河站对于北京的意义何在？我们需要在更大的范围内去寻求这一问题的答案。首先要看一下北京城的结构。城市核心的部分称为城市中心，然后是环绕周边的绿化保护带，再外围是服务城市中心的边缘带。这些都属于住宅与工业区域。更远的部分为相对独立的新城镇。清河站即位于城市中心西北部的清河边缘带内。

目前，北京的中心区域内有四个火车站，通过高铁网络与国内的其他城市相连。由于人口不断膨胀，需要规划建设新的车站，以分担现有车站的客流压力，由此将形成四个不同的群组。

实际上，清河站并非真正的终点站，而只是分流北京北站旅客流量的中转站。因此，清河站不只是孤立的车站，而是北京交通系统的有机部分。这一系统的未来前景如何？

What does Qinghe station mean to Beijing? To answer this question we should look at a bigger scale. First, we should look at the structure of Beijing city. The core of the city we called the center-city, the space around the center-city is the green protection area, and beyond that is the edge-group which services the center-city. These are residential and industrial areas. Further away are the new towns which are relatively independent. Qinghe station is in the Qinghe edge group, in the northwestern part of the center-city.

Nowadays there are four different terminal stations in the center-city, which connect to other cities in China by the high speed railway system. Because of the pressure of the growing population, new stations are being planned to share the overload of these terminal stations, they work as four different groups.

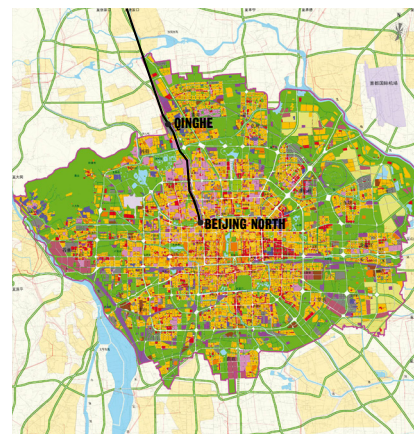
In fact, Qinghe station is not a real terminal, but a transit station sharing the flow of passengers with Beijing North station. So Qinghe station is not just a solitary station, but an integral part of the city's transport system. How will this system work in the future?

He Junqiao

Urban Planner, Beijing Municipal
Institute of City planning and Design
(BICP), Beijing, P.R. China

贺君巧

北京市城市规划设计研究院-霍姆代尔城市
规划师



Jingzhang railway line in Beijing

北京段的京张铁路线

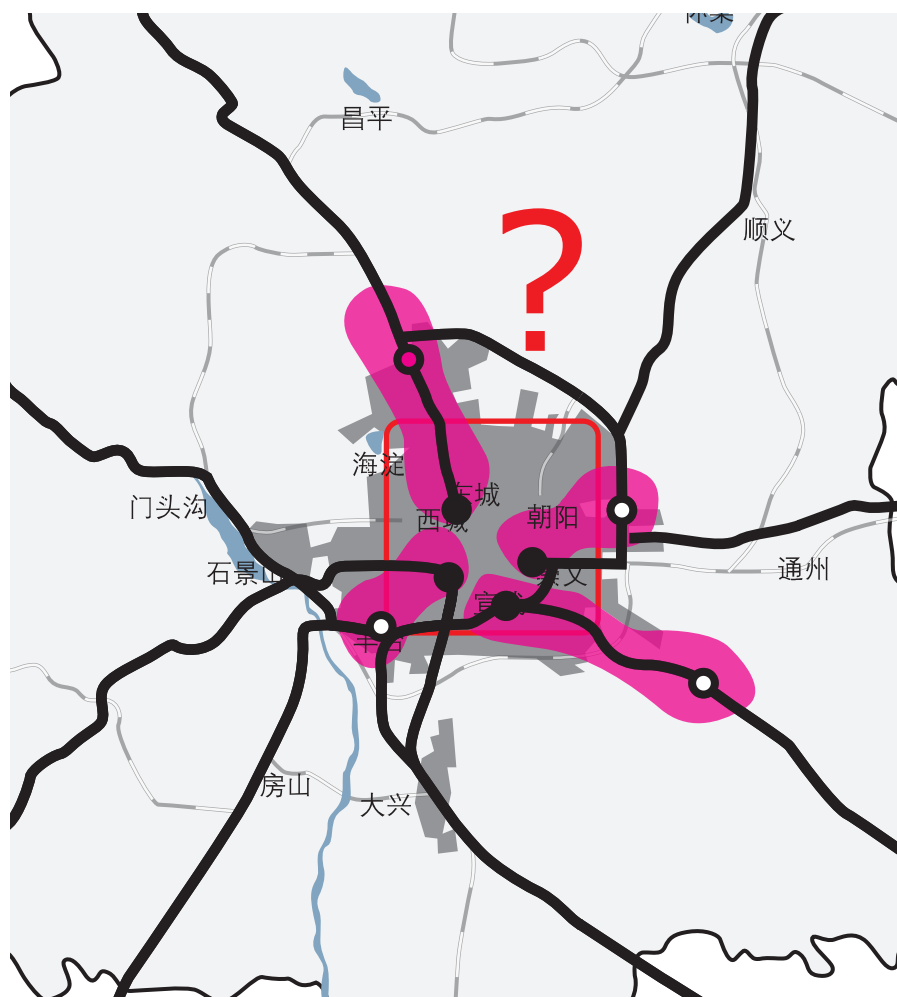


Passenger flow at Beijing West Station during
Chunyun period.

photo: Charlie Fong

在春运时，北京西站的旅客人流。

照片: Charlie Fong



How to connect the stations to the Beijing
agglomeration and each other?

怎样才能将交通站点与其他交通站点和北京
人口聚集地相连接？

IMPROVEMENTS FOR THE NETWORK

网络的改进

Miriam Ram
Urban Planner, Deltametropolis
Association, Rotterdam,
The Netherlands

Deltametropolis Association城市设计师



Peak rush hour

photo: Michael Coghlan (Flickr)

高峰时段

摄影: Michael Coghlan (Flickr)



Waiting at Beijing Station

photo: Su--May (Flickr)

在北京站内等待

摄影: Su--May (Flickr)

目前，北京与国内其他城市通过高铁相连，北京市内的各高铁火车站之间由地铁连接。这一地铁系统不仅已达到客流饱和（尤其是高峰时段），而且北京城市规模过大，日常通勤仅依靠单一地铁系统非常困难。乘坐地铁由市内某处前往另一处，经停车站太多，换乘太过频繁。很典型的一个例子就是由北京乘坐高铁前往天津，全程仅需30分钟左右，但在两个市内前往高铁车站的路程则要超过一个小时。

鉴于此，我们建议在国家高速铁路与本地地铁系统之间建立、运营具有一定规模和速度的额外的公共交通体系。

可将现有的国家铁路轨道升级，用于这一新的高利用率轨道系统。这一类似于地区快速铁路网的新快速运输网络应与现有的某些地铁站以及所有高铁站高效连接，由此可以实现在不同的高速交通网络间便捷转换。新的网络中还将新建一条环线线路，连接市内四个高铁火车站以及某些重要区域，如国贸中央商务区 and 机场快线。

当公共交通体系能够以一体化的智能系统开始运行，辅以不同速度的交通方式和顺畅的换乘，乘客在这一体系内就会享有更多的空间，能够乘坐公共交通更加便利地到达某些区域。由此产生了车站周边区域额外的空间发展与公交导向城市发展的新机遇。

At this moment, the high speed train stations connecting Beijing to other cities in China are linked to the city of Beijing by metro. Not only has this metro system reached its capacity in terms of passengers (especially in rush hours), also the city of Beijing is just too large to depend only on a metro system for daily commuting; there are too many stops and too many transfers travelling from A to B within Beijing. Exemplary is the trip from Beijing to Tianjin; the trip itself by high speed train will take around thirty minutes, but it will take you over an hour to travel to and from the station in the two cities.

Considering this, we propose to develop an additional public transport system which will operate on a scale and speed between the national high speed rail and the local metro system.

The existing tracks of the national trains can be upgraded to accommodate this new, high frequency train system. The new rapid train should be very well connected with some of the existing metro stations and all of the high speed stations. This makes it possible to easily transfer between the different speed-networks. A new ring line is part of the new network. This connects the four different high speed stations with each other and with some important destinations in Beijing like the Central Business District (Guomao) and the airport line.

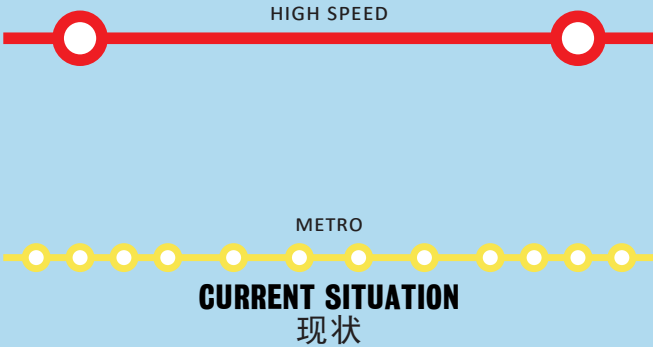
When the public transport system starts working as an integrated smart system, with additional speeds and smooth transfers, there is more space for travelers in the system. Some places will become much better accessible by public transportation. This creates opportunities for additional spatial development and TOD around these stations.

Problems:

- Overload of people coming and going to high speed station
- All the metro lines are too full
- Transfer does cost a lot of time
- Travelling through the city costs a lot of time

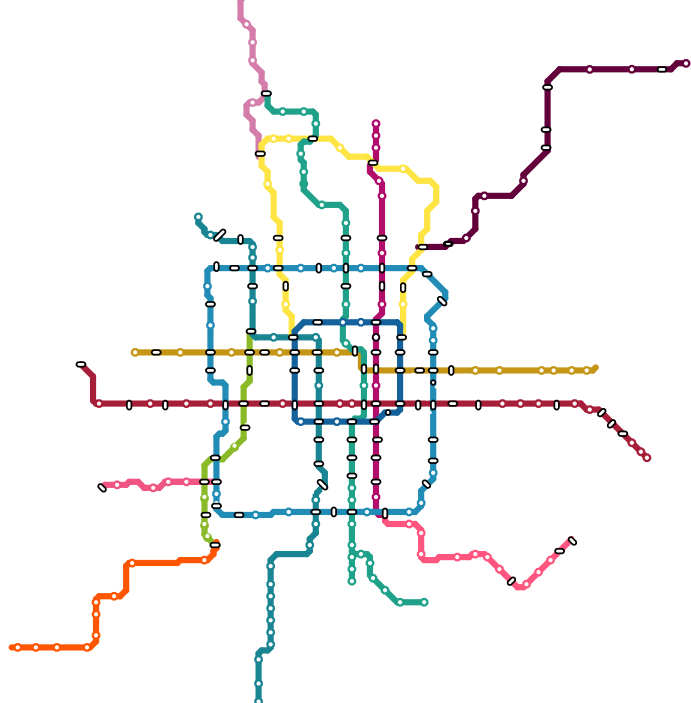
问题:

- 超负荷的人群进入高铁站
- 所有的地铁线都太过拥挤
- 中转过程花费大量的时间
- 游览整个城市花费大量时间



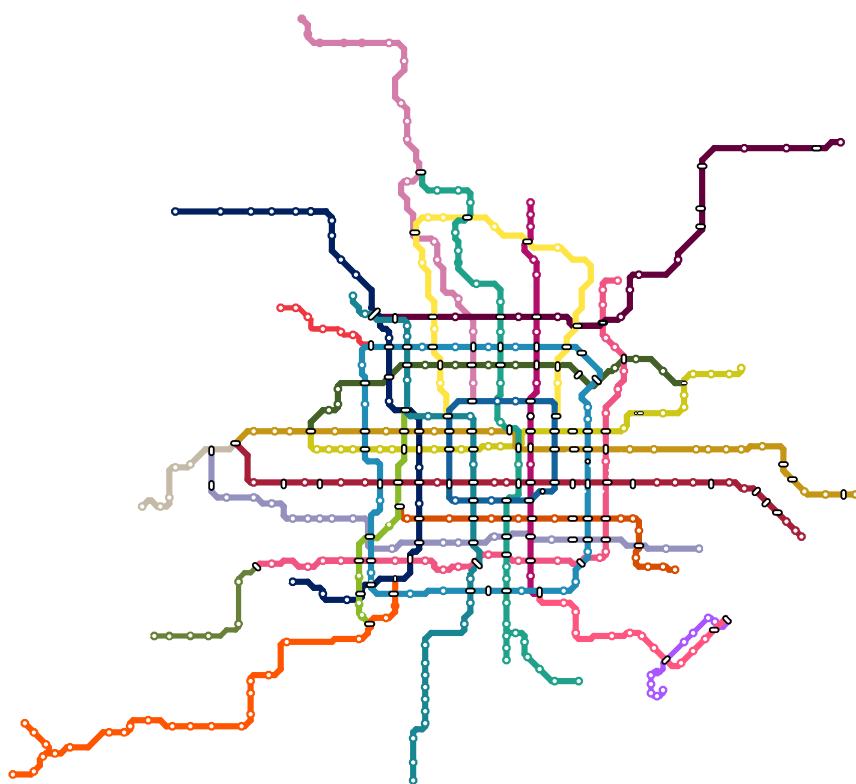
Existing metro system

现有的地铁系统



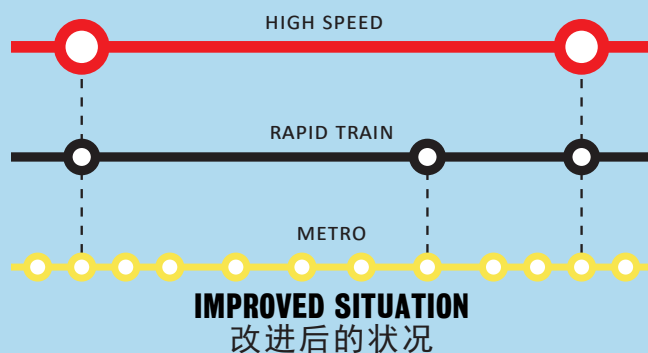
Metro system in 2020

2020年地铁系统



Beijing metro station

北京的某地铁站

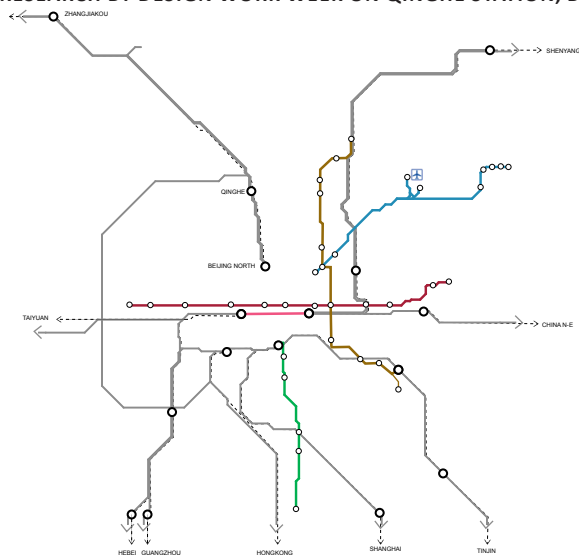


Proposal:

Integration of networks on different scales and different levels of speed. Develop a new regional fast network: rapid train

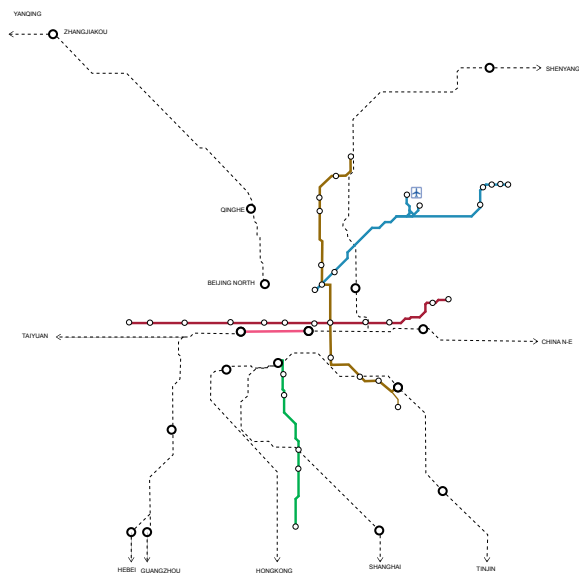
解决方案:

从不同的尺度和速度层级来整合交通网络。发展地区性的快速网络 - 快速列车。



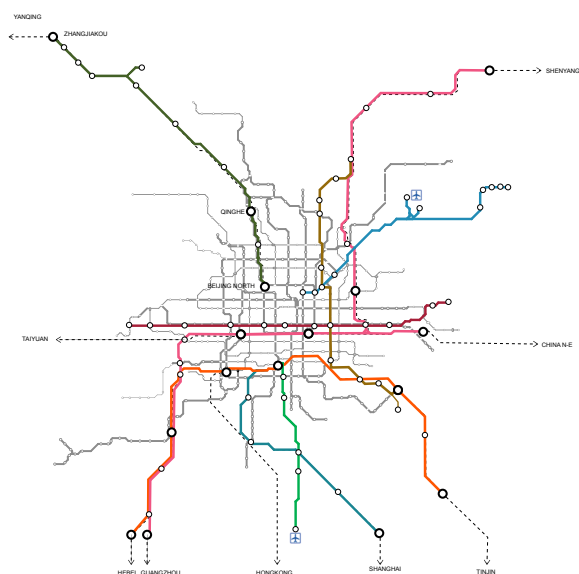
Currently planned rapid lines

现有计划中的快速线路



Proposal to upgrade existing old railway lines

计划中升级现有的旧铁路线

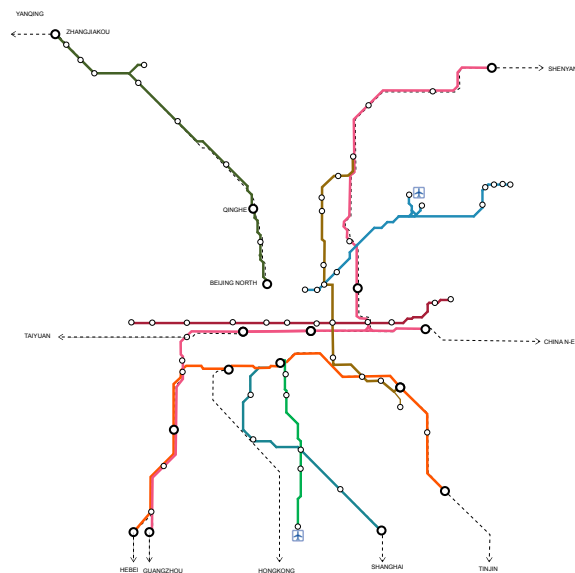


This network should be well connected to existing metro stations

而这些交通网络都应与现有的地铁站系统建立良好的联系

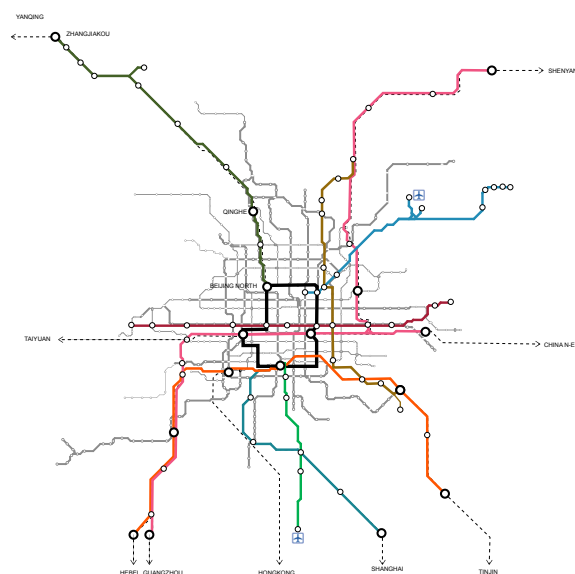
PROPOSED STRATEGY TO DEVELOP AN ADDITIONAL RAPID TRAIN NETWORK

建议发展额外快速城际铁路网络的构架



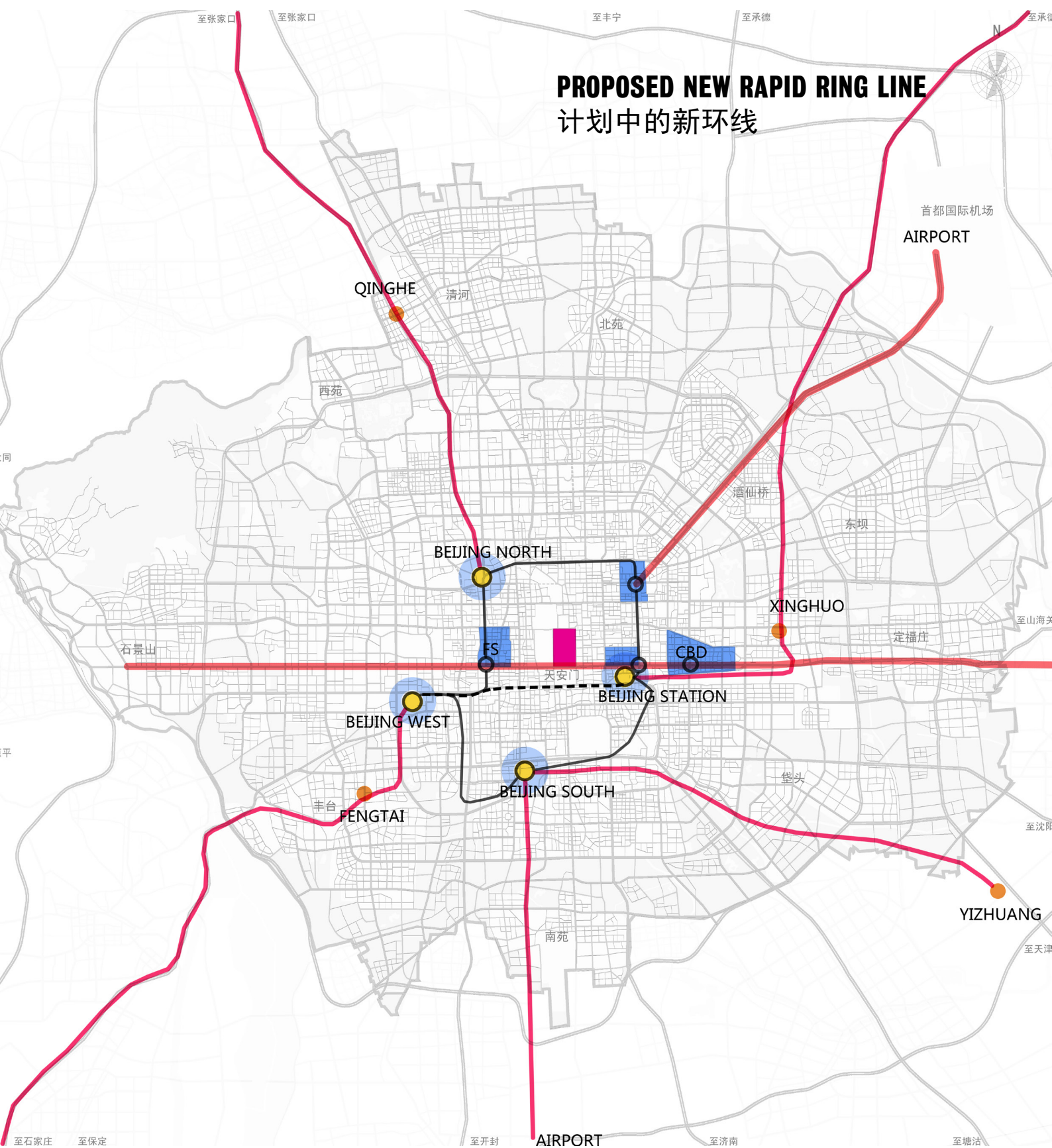
Proposed rapid lines & high frequency network

拟定的高速高频率交通网络



Proposal to connect rapid lines by a new rapid ring line

通过建立新的快速环线来将这些站点相连接



High speed train stations connected by the proposed rapid ring line

高铁站被计划中的环线所连接

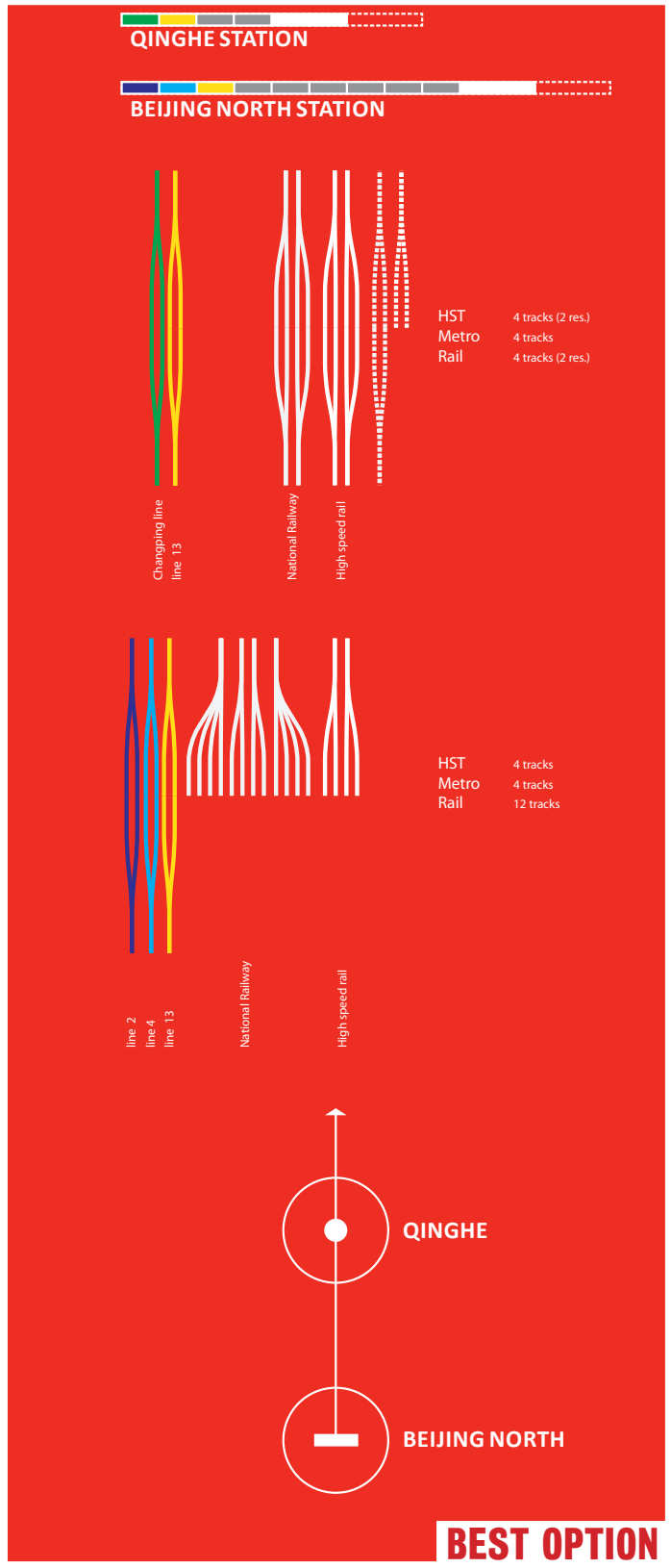
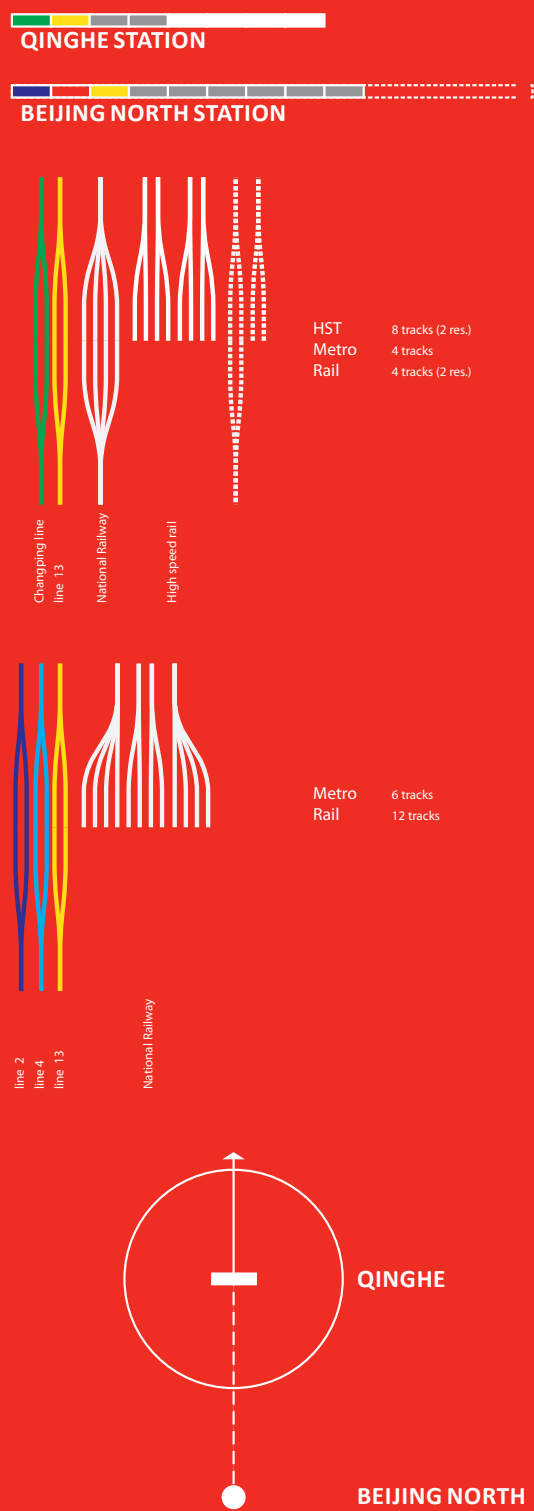


联系电话: 82867112
或 82867110



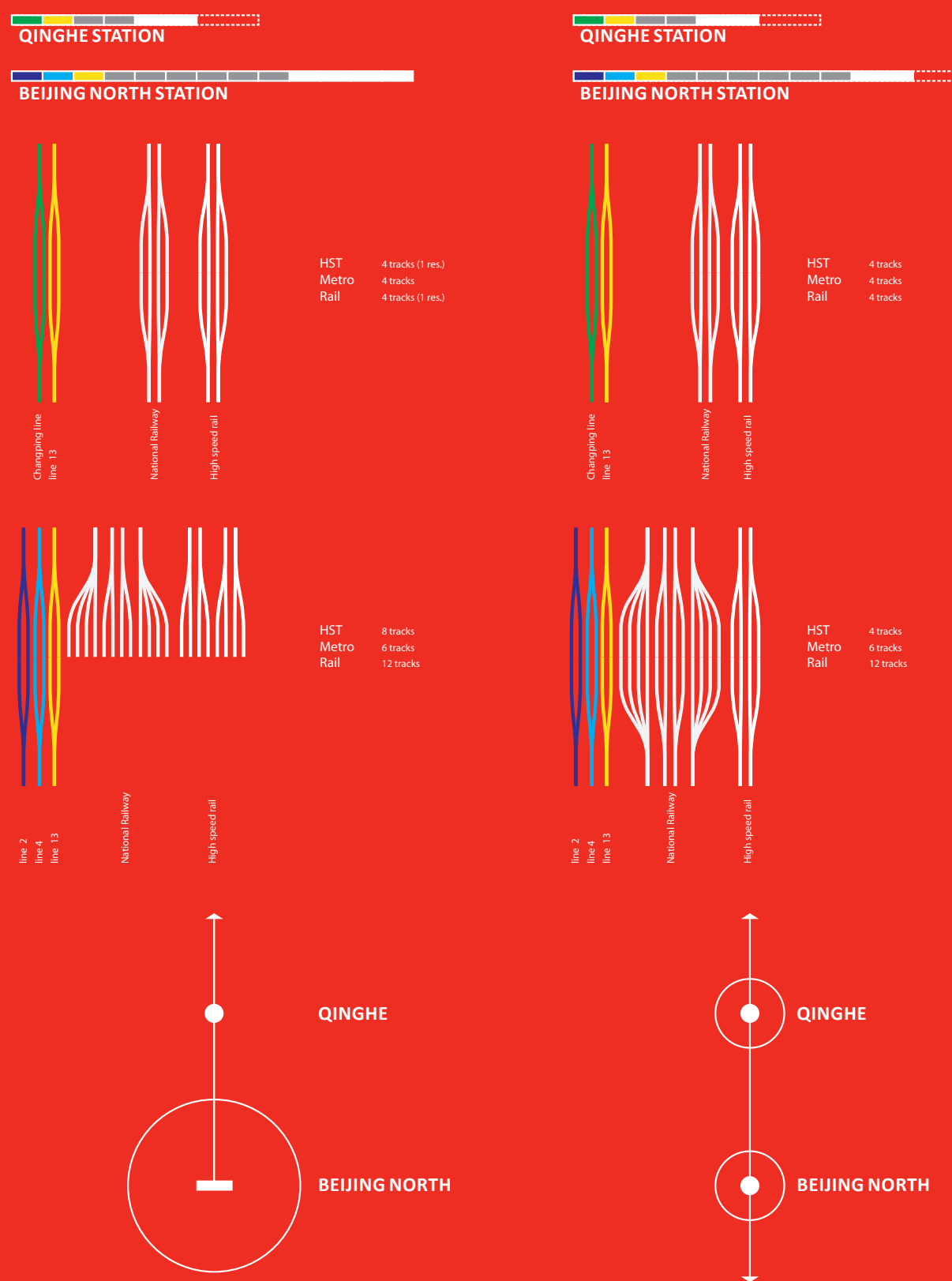
北京的京张“走廊” JINGZHANG CORRIDOR IN BEIJING

如何让列车在城市的狭窄部分穿梭？



在北京清河站与北京北站之间的轨道交通，就是在一定的可用空间中，最为紧凑的解决方案。同时，这些措施也为弹性交通网络，优化交通连接和交通导向发展提供了良好的条件。

HOW TO GET THE TRAIN THROUGH A NARROW PART OF THE CITY?



An even distribution of trains between Qinghe and Beijing North stations is the most compact solution in the available amount of space. It also creates optimal conditions for a resilient mobility network, optimal connectivity and transit-oriented development.

POTENTIAL DEVELOPMENT AROUND CORRIDOR

“走廊”周围的潜在发展

Thijs van Spaandonk

Urban Planner,

VenhoevenCS architecture+urbanism,
Amsterdam, The Netherlands

VenhoevenCS architecture+urbanism
城市规划设计师

清河地区位于北京西北部，是城市中心区的九大周边功能区域之一，在环北京绿化带内。张家口高铁直穿清河而过，清河站恰恰位于该高铁线的中间位置。

这里是北京高校及高新企业重要扩展区域之一。清河的其他部分为北京的郊外住宅区。尽管清河地区内有各类功能性区域，但这些有计划建设的功能区域被基础设施分离开来。

由于清河站的郊区住宅区功能，公共交通客流量也仅为单向运动，即早晨为由清河站前往北京市中心区域，晚上为反向客流运送。

在不久的将来，在清河地区有可能增加新的线路或是将已有线路延伸至此。若能精心规划，清河站就能够成为所有线路相互之间以及与新的高铁线路的汇合点。

除优化清河地区的公共交通系统之外，我们还建议强化清河地区现有的单一功能区域，打造居住、工作、教育与休闲的多用途区域。清河地区的其他车站可用作前往周边风景区的进入站点。

北京北部区域与北京其他地域有良好的交通联系，但是在高峰时段，承载旅客的空间却十分有限。第一个方法，可以在高峰时段通过创造一个“城市公交走廊”来吸收超载的旅客数量。另一个措施，则是通过快速环线列车来增加北京地铁系统的承载能力和运行运行速度，如同在书中48页所描述的。通过这些措施，可以建立新的步行通道网络来连接车站及周边地区和新型的多功能发展。

Qinghe area is located in the North West of Beijing, one of the nine peripheral functional areas of the central city, inside the green belt surrounding Beijing. The Zhangjiakou high speed railway line will go straight through the area, finding Qinghe Station right in the middle of it.

It is one of the important expansion areas of Beijing for University campuses and high tech companies. Other parts of Qinghe serve as a dormitory town for Beijing. Although different functional zones are to be found within Qinghe area, these different programmatic zones are separated by infrastructure.

Because of the dormitory-town function of Qinghe station, also the passenger load on public transportation is directed only one-way; from Qinghe Station to the inner-city of Beijing in the morning, back in the evening.

In the near future, some possible new lines will be added or existing lines will be extended in Qinghe area. If well planned, Qinghe station can become the node where all these lines are connected to each other and to the new high speed railway line.

Together with optimizing the public transportation system in Qinghe Area, we propose to densify the existing mono-functional zones within Qinghe Area, to create mixed-used areas for housing, working, education and leisure. Some other stations in the Qinghe Area can be used as entry-points towards the surrounding landscape and touristic locations.

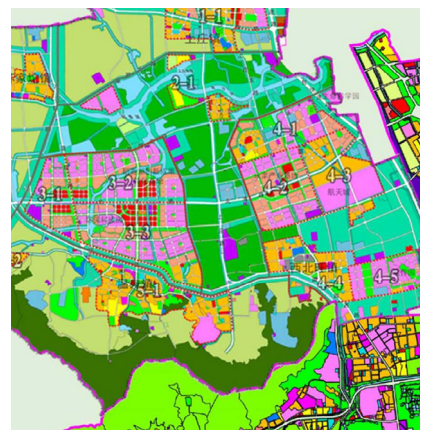
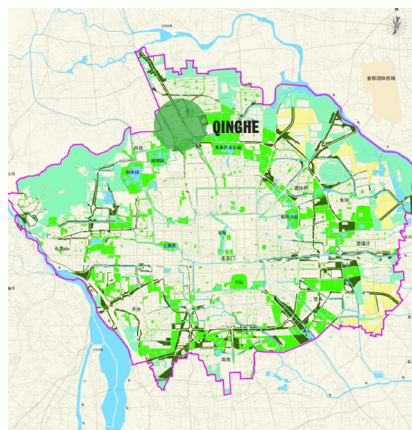
Beijing North area has good connections to other parts of Beijing, but at peak hours there is limited space to accommodate travellers. The first measure could be to create an 'urban transit foyer' that can absorb the overload of passengers during rush hour. Another measure would be the construction of a rapid ring line train that would create extra capacity and speed in the Beijing metro system as described on page 48. With these measures in place, new pedestrian networks can be developed to connect the station to surrounding areas and new mixed use developments.

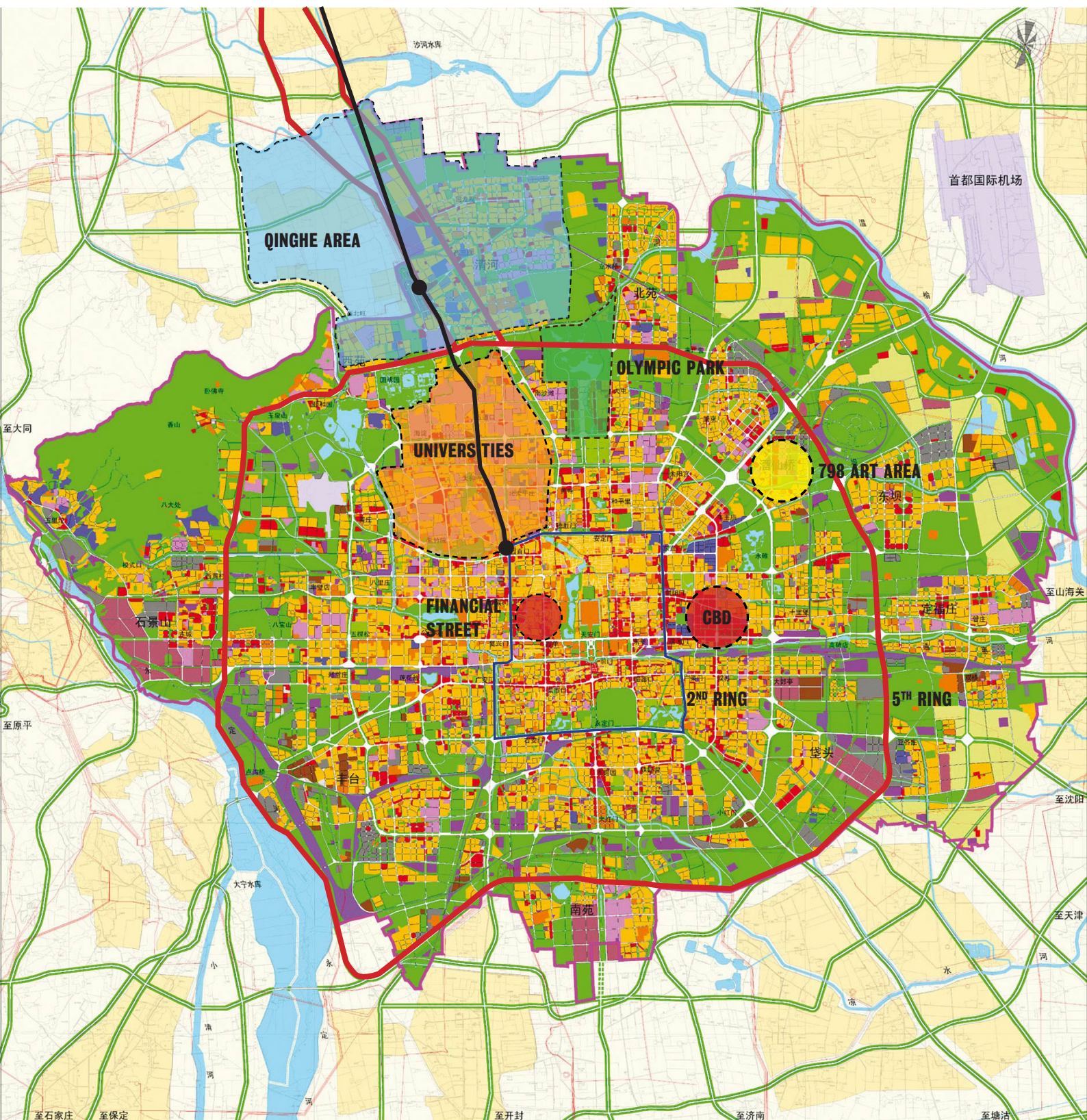
Left: Green spaces

Right: Universities and high-tech companies

左: 绿化区域

右: 大学及高新科技公司



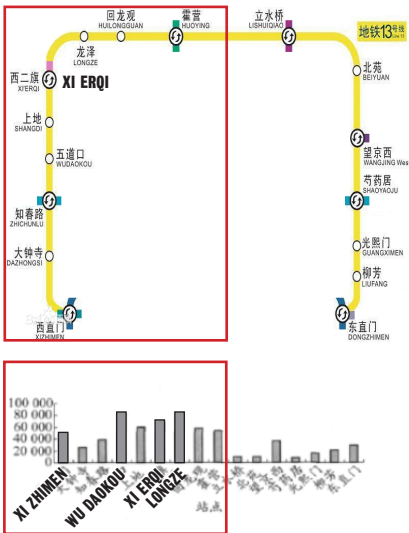


Beijing Masterplan 2004 - 2020 Jingzhang corridor, fifth ring road and main destinations

2004年到2020年，北京市总规划图：京张走廊，第五条环线，以及周边主要景点。

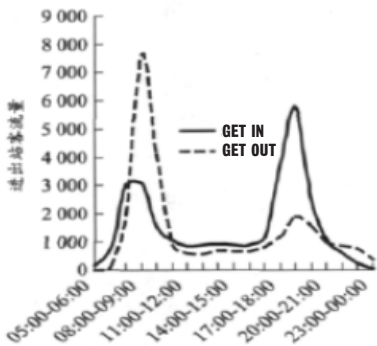
Hui Longguan is a very famous large residential area, a typical “sleeping town” in Beijing.

北京回龙观是非常著名的大型居住区，是北京典型的“沉睡地区”。



Line 13 passenger flow

第13号线的人流量

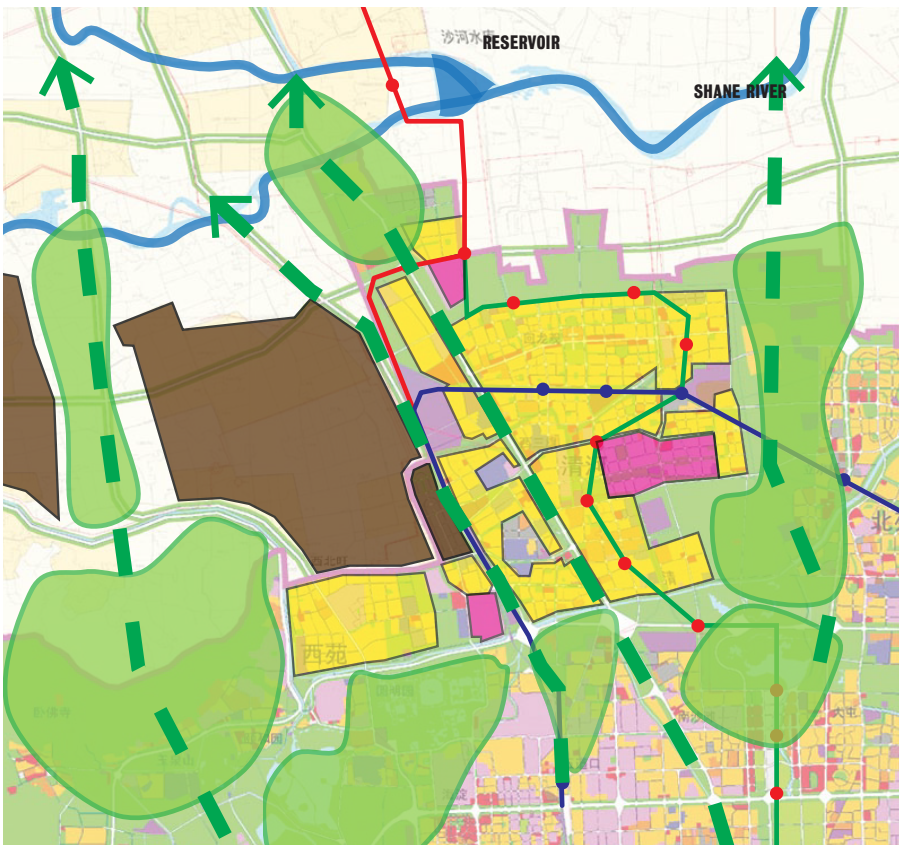
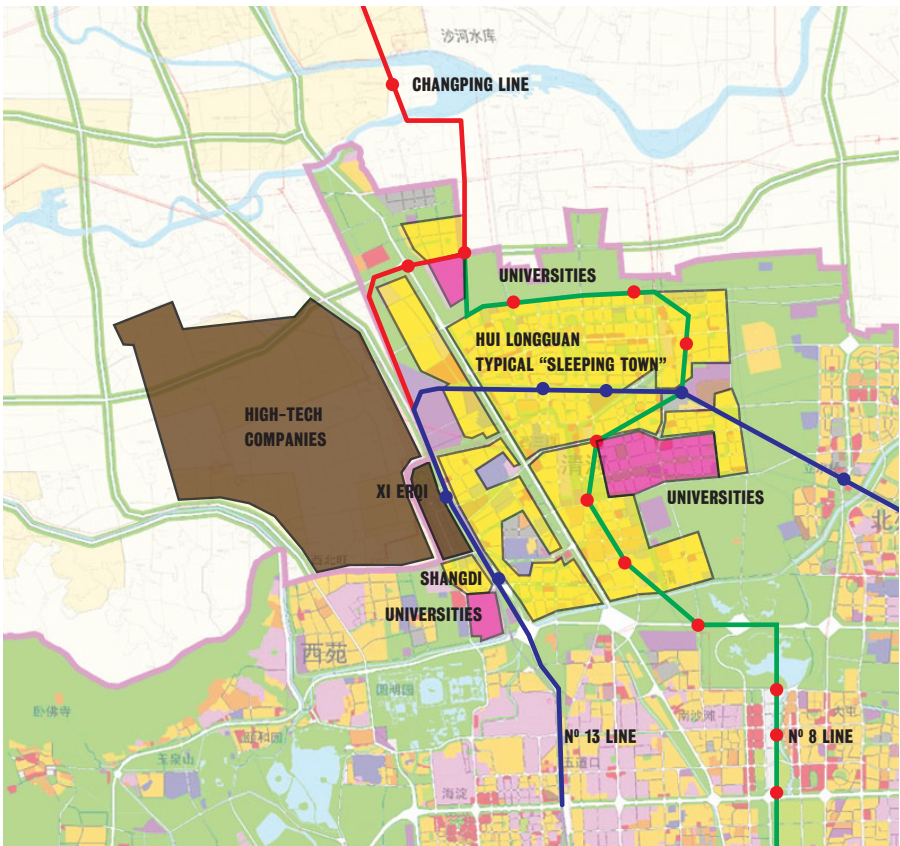


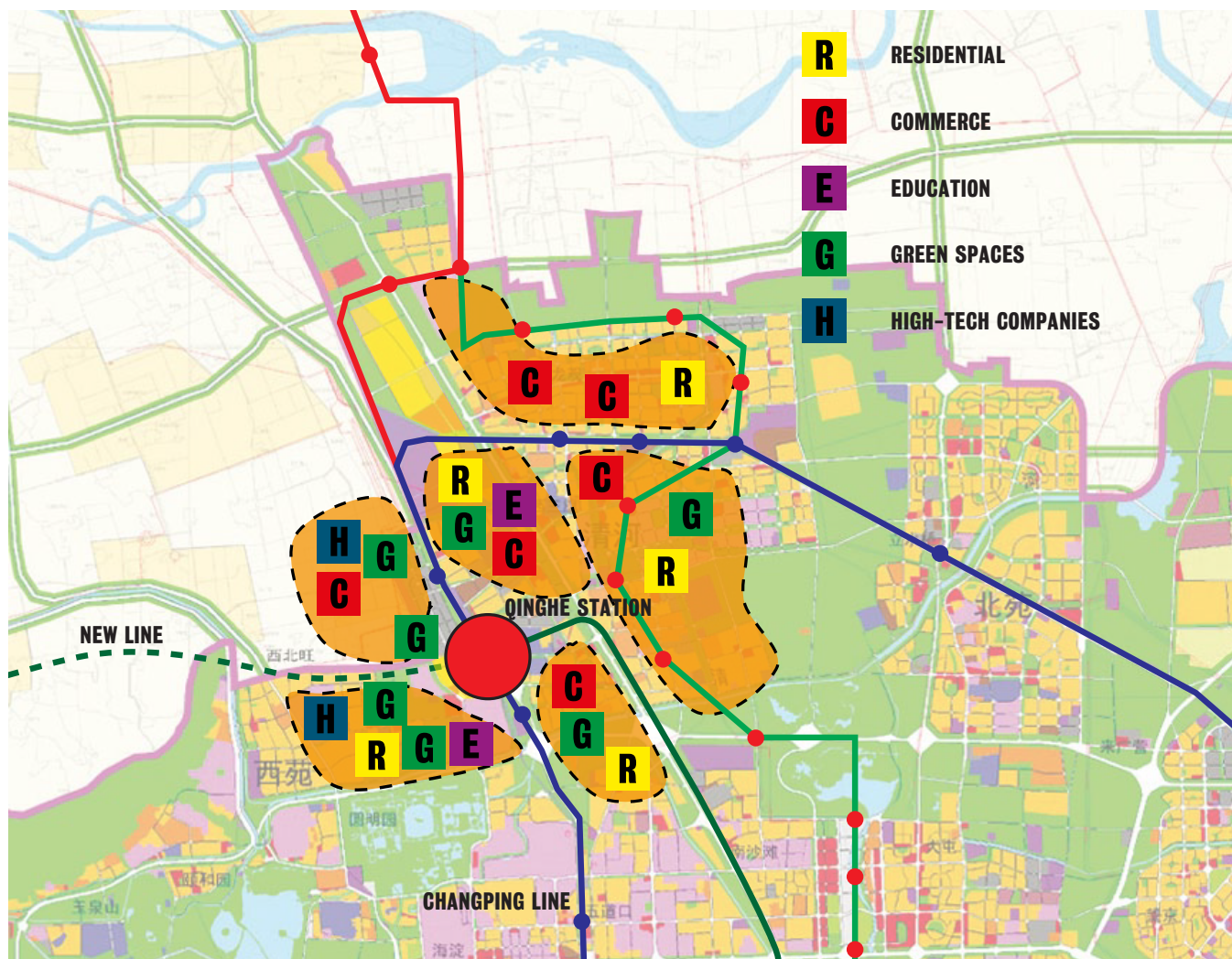
Passenger flow in Xi Erqi station

北京西二旗站的人流量

Proposal to improve green spaces in Qinghe area

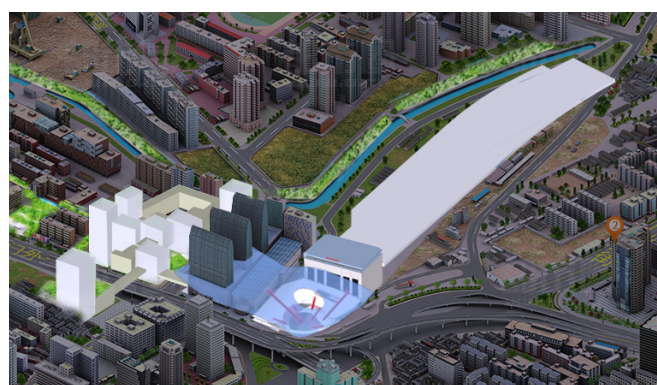
该方案将加强清河周边的绿化地带





Proposed mixed use development of Qinghe area

北京清河地区的混合使用发展方案



Proposed mixed use development at Beijing North Station

北京北站混合使用方案

DEVELOPMENT POTENTIAL OF THE CORRIDOR

发展潜在的“走廊”

Joek Kruiderink

Financial Consultant, Fakton,
Rotterdam, The Netherlands

Fakton公司城市经济学家、金融顾问

每一个房地产及地区开发项目都必须关注房地产价值链的运作方式。最后，每一个计划好的开发项目都必须具有投资可行性，如此方能成为现实。

每个开发项目都包括土地所有方、开发方和投资方。某些情况下，会由同一家公司同时承担上述角色。比如，一家开发商可以是投资方（而非由银行或其他投资者投资），并将该开发项目纳入其资产组合之内。

最终，土地价值取决于开发商向投资者出售新建房屋所获得的收益，以及投资者出租房屋所获得的收益。收益越高，土地价值越高。由此，土地价值取决于供求关系。

在大面积的开发项目中，土地价值需要补偿基础设施和公共空间布局等支出。成本越高，所需用以补偿此类开支的土地收益收入越高。在绿色地带的新开发项目中，获取额外土地价值也相对容易。

由于北京城市规模不断扩张，这一价值获取模式长期发挥着作用。然而，鉴于北京目前的城市规模，就环境观点来看，继续扩张的可持续性正在逐渐降低。同时，出于用户的角度，北京的通勤时间太过漫长。

北京目前面临的挑战为加速公共交通体系建设，同时紧缩现有的城市规模。然而，达成这一目标并非易事。从投资角度来看，内城开发所需成本，远远高于绿色地带的新开发项目。对已有地区的获取成本远远高于传统开发项目中对未开发绿色地带的获取成本。

也就是说，获得与此前相等的土地收益的现有城市压缩系数，数值相当高（系数介于3和4之间）。最好的方式是提高地铁站和火车站周边区域的利用率。车站周边的房地产价格会上升，而此类区域之外的房地产价格则维持不变，甚至下跌。随着高铁建成，且地铁和快速客运列车交通运量得到提升，清河站与北京北站之间的公共交通走廊沿线必将迎来房地产价格的上涨。

For every real estate and area development it is important to be aware of how the real estate value chain works. In the end, every planned development needs to be financially feasible to make it happen.

Every development involves a land owner, a developer and an investor. Sometimes these roles are combined within the same company. For example, a developer can be the one that also invests (instead of a bank or other investors) and takes it into his portfolio.

































In the end, land value will be determined by the amount of money the developer can earn by selling a new building to an investor and the amount of money the investor can earn by renting out the building. The more one can earn, the higher the land value. In that way the land value depends on supply and demand.

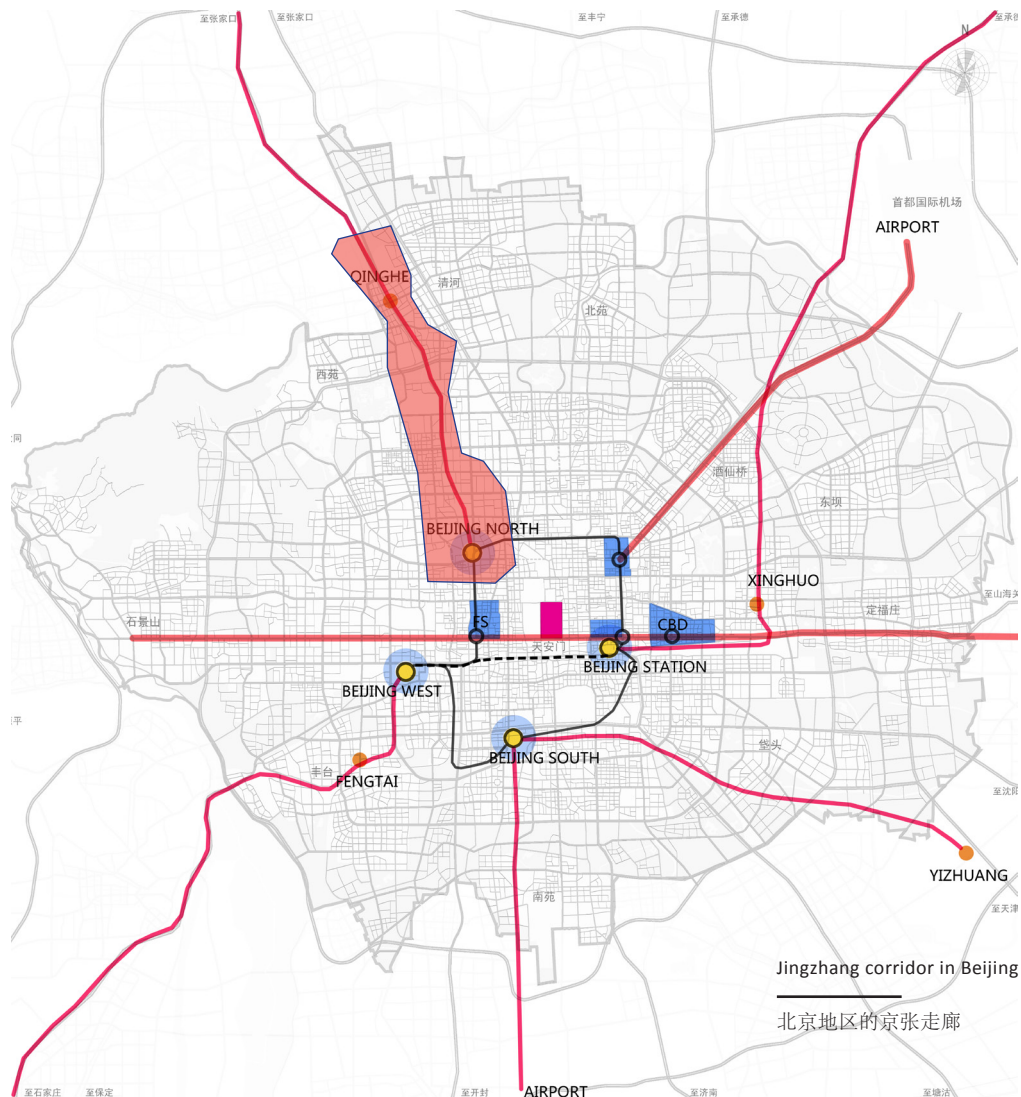
For large area developments land value is needed to compensate for the expenses such as infrastructure and the layout of public space. The higher the costs, the more income of land revenues is needed to compensate these. The creation of additional land value is relatively easy in a greenfield situation.

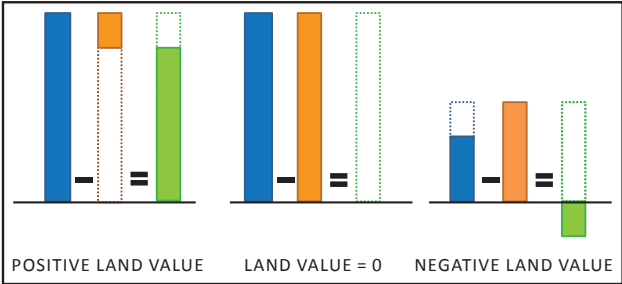
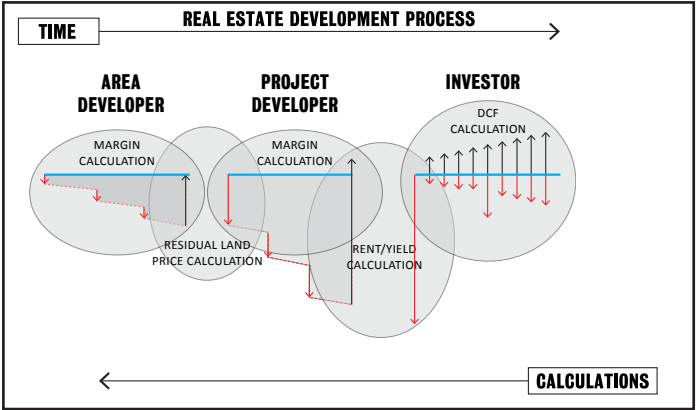
In Beijing this earning model has worked for a long time as the city could be expanded. Now that the city has become as large as it is, expansion becomes less durable from an environmental point of view. Also from a user's point of view commuting takes too much time.

The challenge Beijing is standing for is to speed up the public transportation system and at the same time to densify the existing city. However, this is not very easy. Inner-city development from a financial point of view is much more challenging than green field development. Acquisition costs of existing built areas are much higher than the acquisition of greenfield areas in traditional development.

This means that the densification factor of the existing city needs to be rather high (factor 3 to 4) to earn the same amount of land revenues as before. The best way to achieve this is to densify in station areas around metro and train stations. Real estate prices around these stations will rise while real estate prices outside these areas will stabilize or even decrease. Along a public transportation corridor such as between Qinghe station and Beijing North station this can probably be seen in the future if the high speed line is in place and metro and rapid commuters trains bring more transportation capacity.

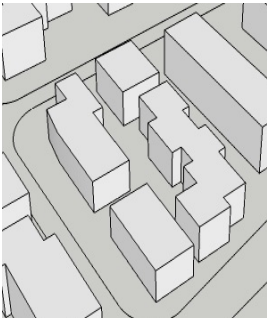
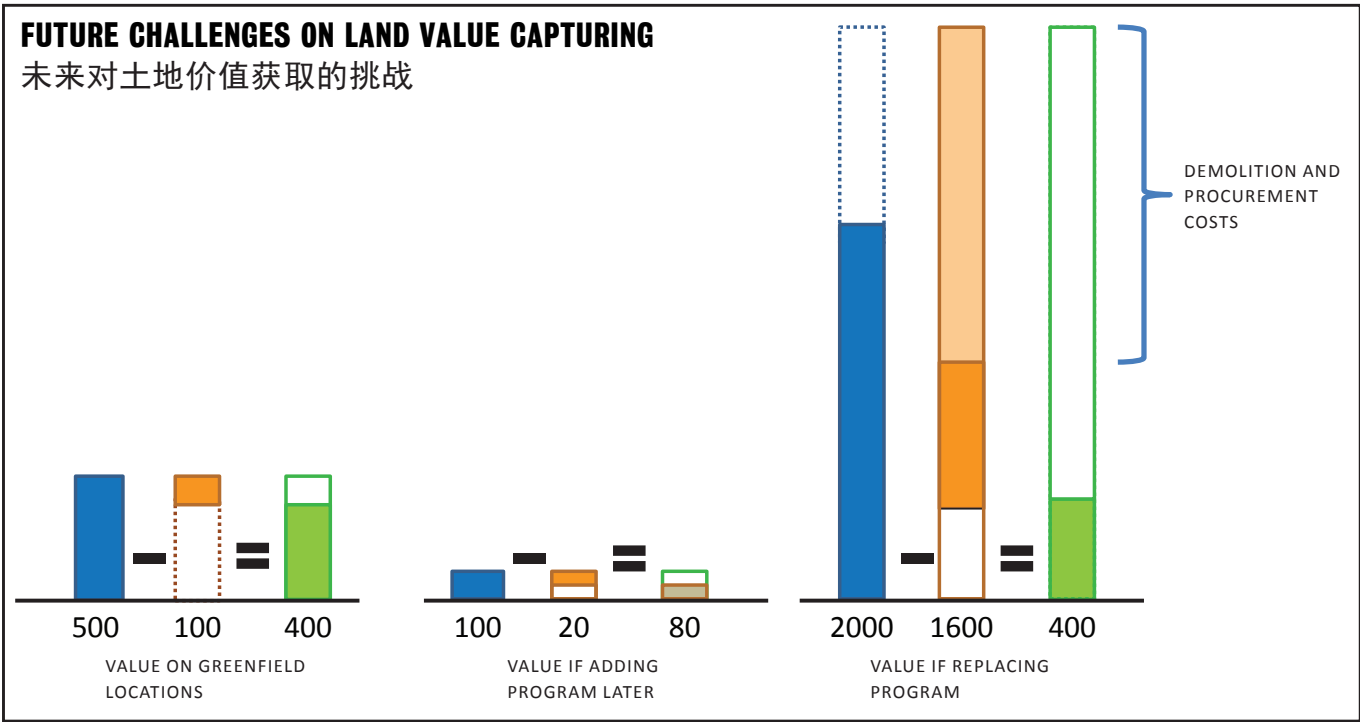
		area population	residential	commerce	villages	industry	special program	landscape
ZHANG JIA KOU SOUTH STATION	●	1 000 000 - 2 000 0000					 Winter Olympics	
XUAN HUA NORTH STATION	○	400 000						
XIA HUA YUAN NORTH STATION	○	67 000						
SHA CHENG STATION	○	78 000						
YAN QING STATION	○	100 000						
BA DA LING WEST STATION	○						 Great Wall	
DONG HUA YUAN SOUTH STATION	○	100 000						
CHANG PING WEST STATION	○							
QING HE STATION	●	+200 000					 High Tech	
UNIVERSITY STATION	○	+100 000					 University	
BEIJING NORTH STATION	●	1 000 000 - 2 000 0000					 Beijing Centre	



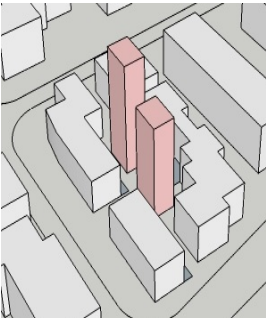


Residual land value calculation
居住用地价值计算

Real estate value chain
房地产价值链



Greenfield development
low density, high profit
绿化带发展
低密度，较高收益



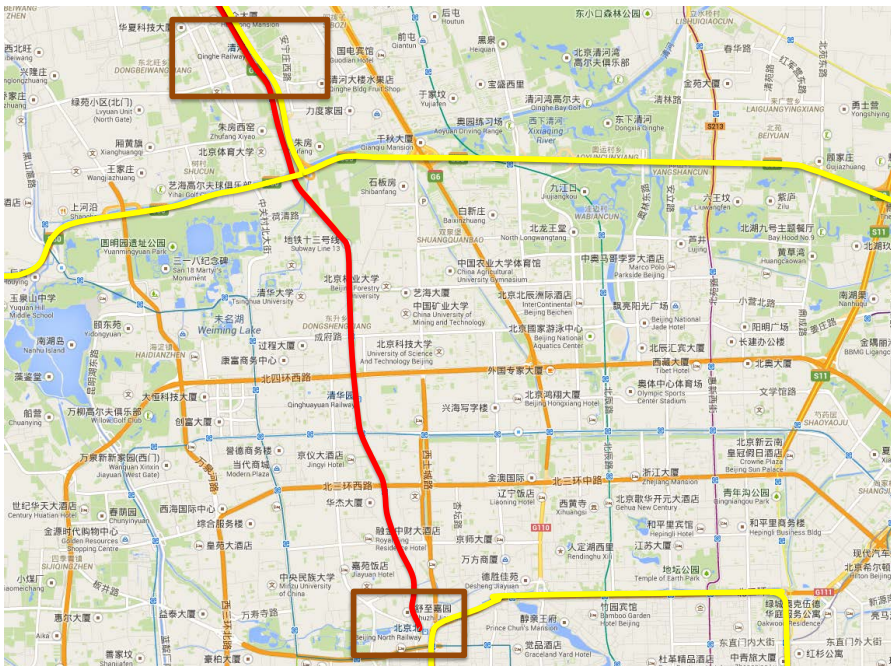
Additional development
medium density, low profit
额外建筑发展
中度密集程度，低收益。



Redevelopment
high density required for profit
重新开发
高密度，并且被要求有高收益。

Redevelopment requires 3 to 5 times more program for equal profit
重新发展将包含相较之前3到5倍的功能项目，并且造成相同的产出。

CITY RENEWAL: MUCH MORE EXPENSIVE THAN GREENFIELD DEVELOPMENT
城市重新开发：要远比开发绿地要昂贵许多

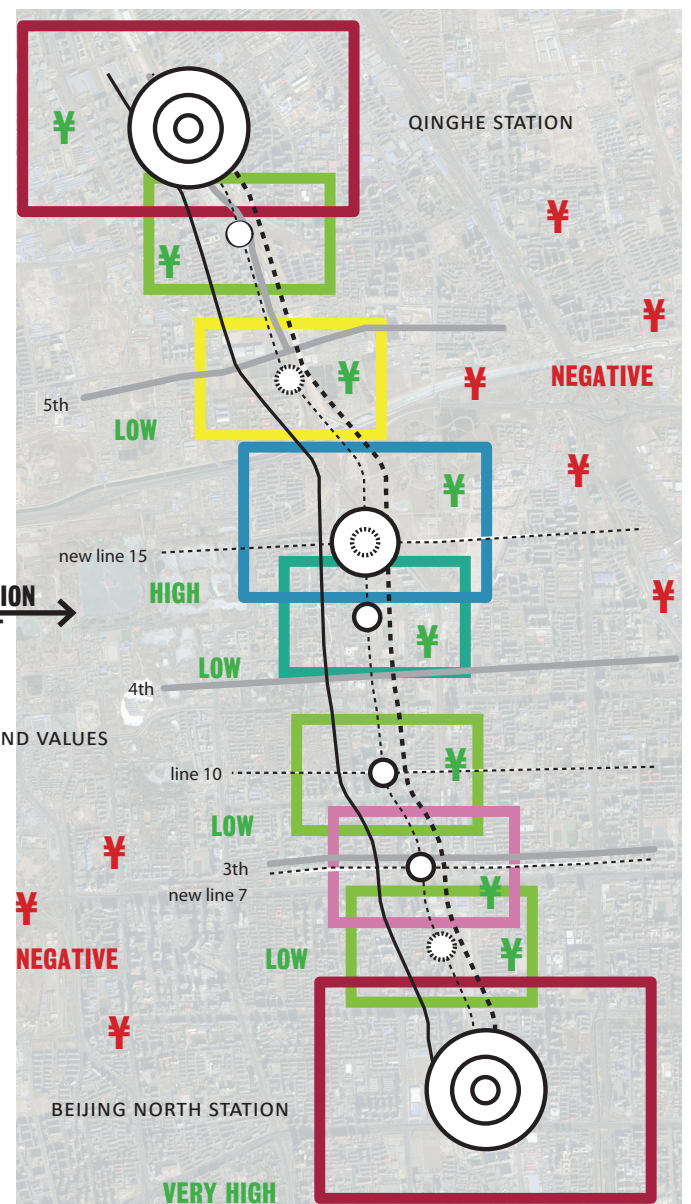
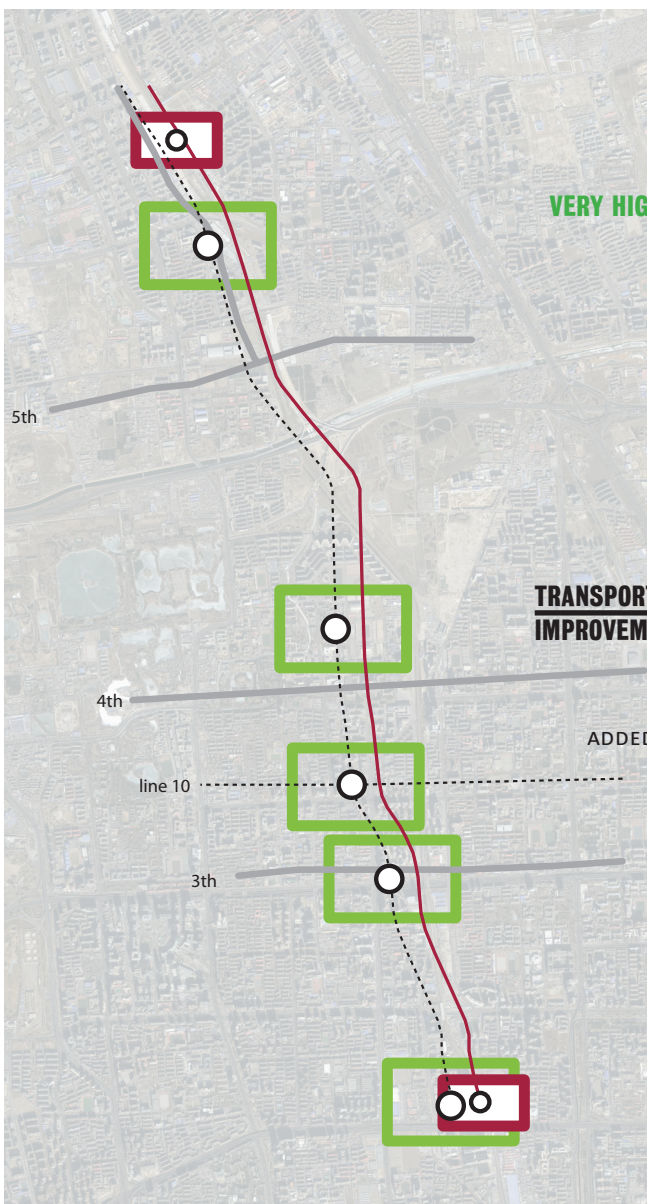


How to get the train through a narrow part of the city?

如何让列车通过北京的狭窄区域?

Jingzhang corridor between Qinghe Station and Beijing North Station

京张走廊在清河站于北京北站之间



Transportation improvement creates development potential along the corridor

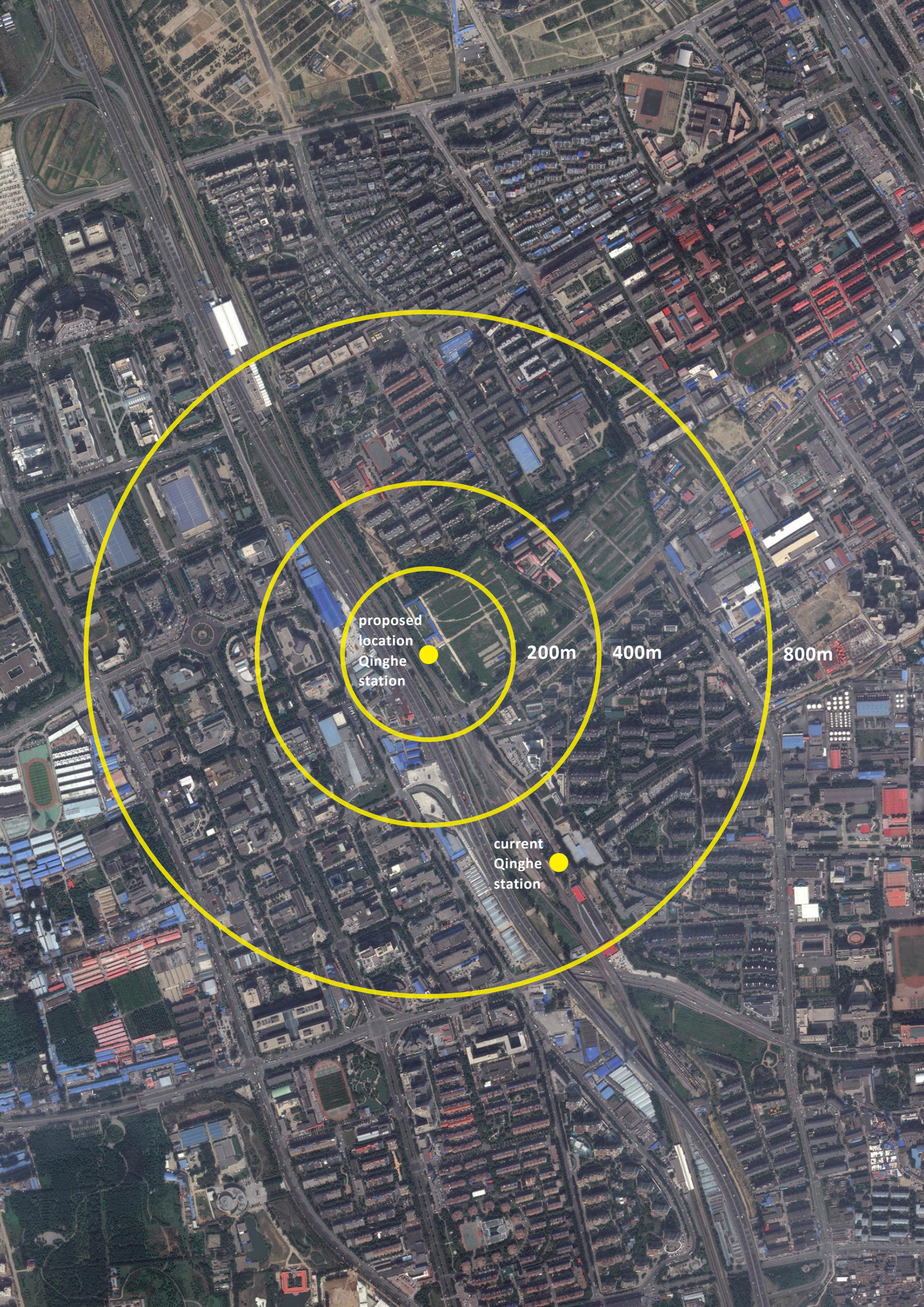
交通枢纽的升级将带来走廊周边潜在性发展





清河站地区 QINGHE STATION AREA





proposed
location
Qinghe
station

200m

400m

800m

current
Qinghe
station

AREA DEVELOPMENT AROUND QINGHE STATION

清河站周边地区的发展

John Breen

Project manager and urban designer
Urhahn Urban Design, Amsterdam,
The Netherlands

Urhahn Urban Design 项目经理、城市设计师



Site visit Qinghe Station during work week

photo: VenhoevenCS

在工作周中对北京清河站进行实地考察

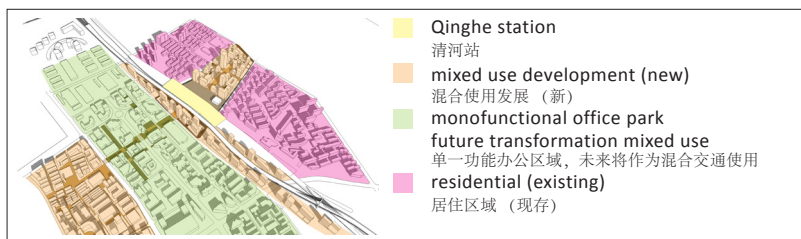
摄影: VenhoevenCS

各种交通方式（公共、私人、机动车、步行、骑行等）的可达性，对于功能优化的交通节点至关重要。因此，必须防止铁路线与车站成为轨道两侧的新障碍。为旅客和居民打造一个具有吸引力的高密度多用途区域，不仅能够为车站区域的非机动车连接性创造更多机会，同时有助于吸收更多旅客，缓解公共交通系统内的高峰客流。

打造安全舒适的公共空间，具有活力的车站区域需要建设起至少一个规划有序的建筑群落，最好涵盖各种功能的建筑，包括住宅、商业、文化与休闲以及工作区域。此类多样性项目能够保证该区域的全天候使用，同时减少高峰时段的旅客流量。

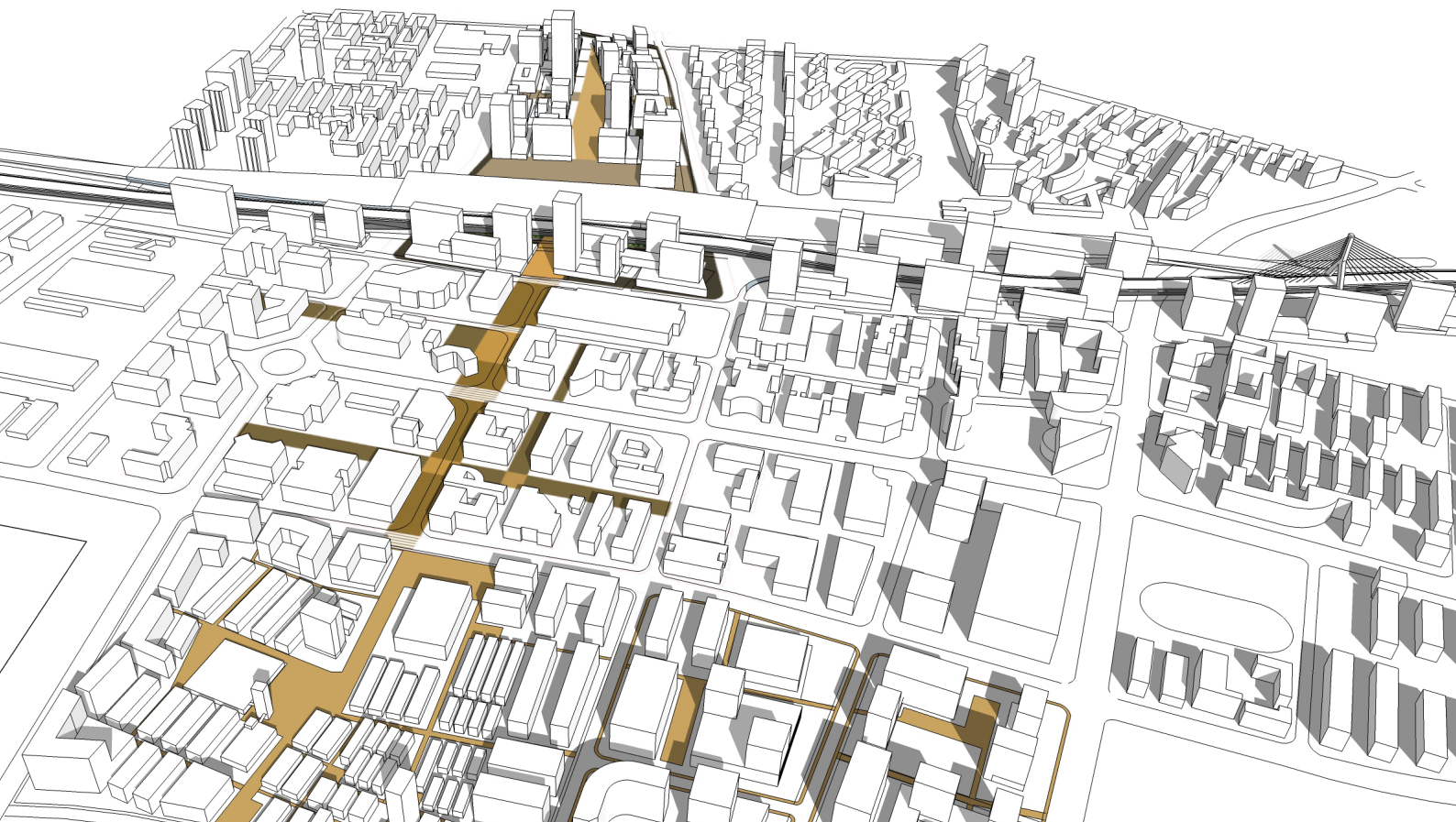
Accessibility by all forms of transport (public, private, cars, pedestrians, cyclists etc.) is vital for an optimally functioning transportation node. Therefore it is important to prevent the railway line and the station from becoming new boundaries between both sides of the railway. Creating an attractive, high density, mixed use area for travellers and inhabitants not only generates more opportunities for non-motorized connectivity in the station area, it also helps to prevent peaks in public transportation system by creating an attractive buffer that can absorb travellers like a sponge.

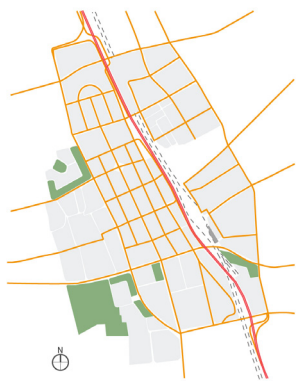
To create safe and attractive public spaces, the aspired vivid environment of the station area needs to be accommodated by at least an intensive programming of the building plinths. It is preferred to have a mix of functions at the building scale, with a mix of housing, commercial, cultural and leisure programme and places for work. This diversity in programme will contribute to an all-day use of the area and diminishing of the peak in commuter flows.



Pedestrian boulevard connects station to the surrounding area

步行林荫道将车站周边的地区相联系起来





CURRENT 现有区域情况

CAR NETWORK
汽车交通网络

BUS NETWORK
巴士交通网络

BIKE NETWORK
自行车交通网络

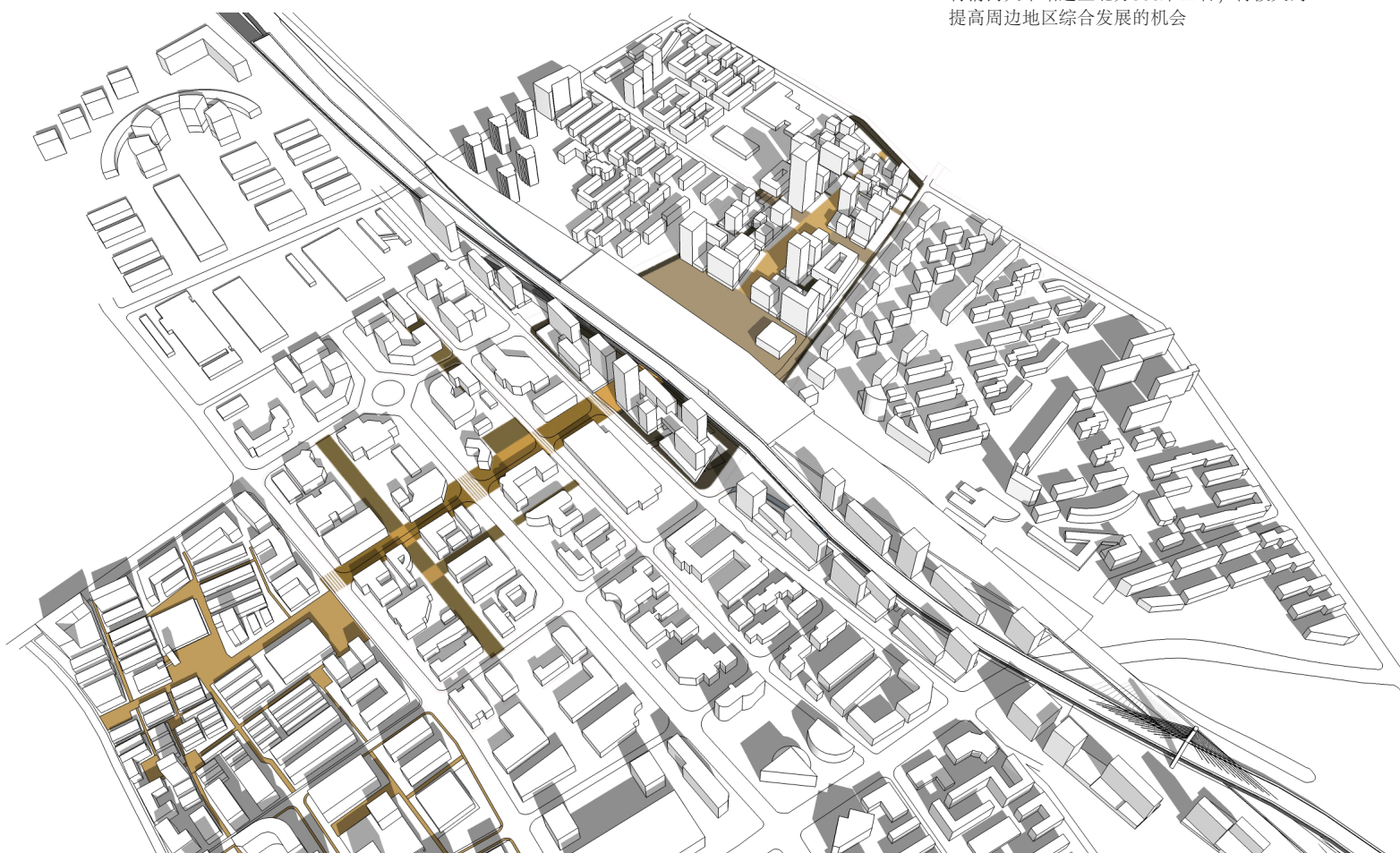
PEDESTRIAN NETWORK
步行交通网络



PROPOSED 解决方案

Moving Qinghe station some 500m to the North greatly improves opportunities for an integrated development

将清河火车站迁至北方500米左右，将极大的提高周边地区综合发展的机会



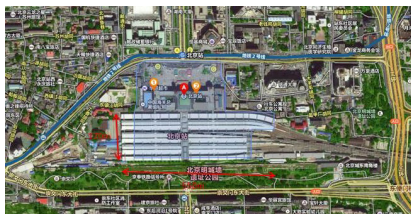
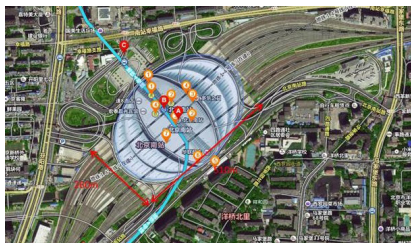
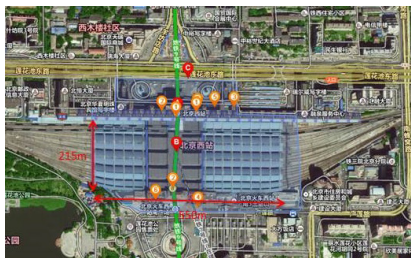
QINGHE HIGH SPEED RAILWAY STATION

清河高铁站

Marten Wassmann

Partner architect, Benthem Crouwel Architects, Amsterdam, The Netherlands

Benthem Crouwel Architects联合建筑设计师



Work week analyses of Beijing Railway Stations

2014年工作周结果
北京火车站分析

现有的清河火车站有可能成为北京最主要的火车站之一。车站位于北京北至张家口铁路线上，周围的的城市空间颇具潜力，在未来有待开发利用。目前，该地区存在三种主要交通方式。现有的高速公路和地铁线均以高架形式穿越该地区。此类道路中尚无出口、枢纽、公车站或轨道交通车站。国家铁路服务的列车目前在清河站以平面方式停靠。未来的交通设施扩展包括增加的昌平地铁轨道、国家铁路的主副轨道以及高铁连接。

我们建议继续保持路面上完全没有主要交通线路或轨道出现。在车站周边仅允许区域性交通存在，用于物流或卸客设施。可将高架或地下交通枢纽融入交通体系之内，将车站本身建设成为区域都市发展的一部分。清河站将不再是区域内运输中转的障碍，而会将轨道两侧的城市发展融为一体，成为清河城市生活的中心。

Today's local railway station Qinghe in Beijing has the potential to become one of the major railway stations of the capital, situated on the track between Beijing North and the city of Zhangjiakou.

The station's location is surrounded urban space that has dormant qualities yet to be investigated and utilized in the future. Today, there are three mayor means of transport crossing the area. The existing motorway and Subway line pass the location on elevated position. There are no exits, junctions or stops at the stations for these means of traffic. The National Railway services stop at grade, today, at Qinghe station. Future extension of transport facilities include additional tracks for the Changping subway line, the National Railway's main track and by-passes, and likewise for the high speed railway connection.

Our suggestion is to keep the ground level completely free of any major traffic routes or tracks. Only local traffic should be allowed into the station's vicinity, for logistic purposes, or passenger drop off facilities, only. By introducing elevated or underground traffic systems, the station building itself can become part of the urban fabric. The station will no longer hinder inter-district transit, but spark integrated urban development on both sides of the track, and thus become the epicentre of urban life at Qinghe.



Proposal:

Top: Master plan with central pedestrian boulevard

Below: Station layout with elevated and underground tracks, public ground level

解决方案:

上: 规划总图中的中心步行林荫道

下: 方案中的火车站具有多层次结构

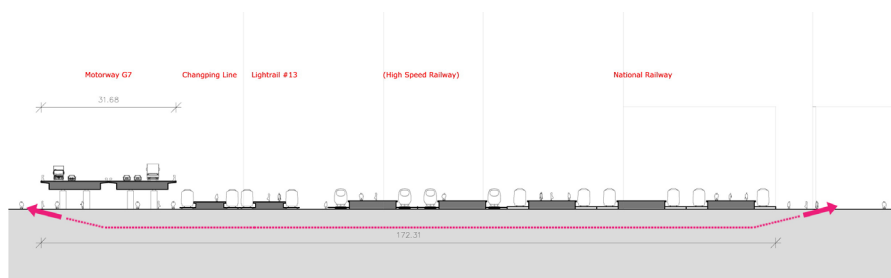
OPTIONS FOR QINGHE RAILWAY STATION



Stage 1: Situation 2014

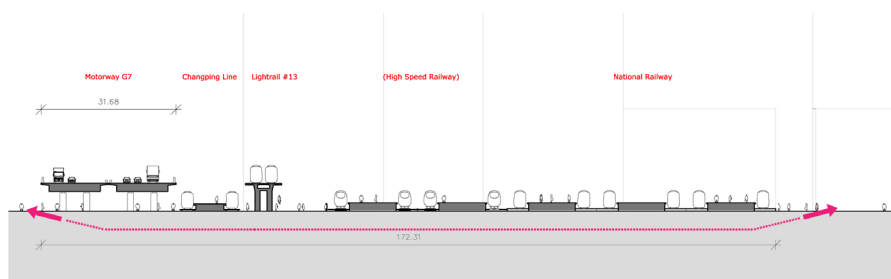
2014年工作周结果

第一阶段: 2014年情景



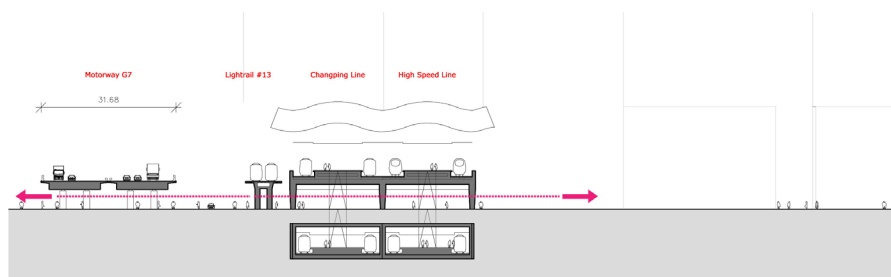
Recommended model in pre-workshop study, 2013

2013年, 在工作周前的推荐模型



Comparative model in pre-workshop study, 2013

2013年, 在工作周前的比较模型

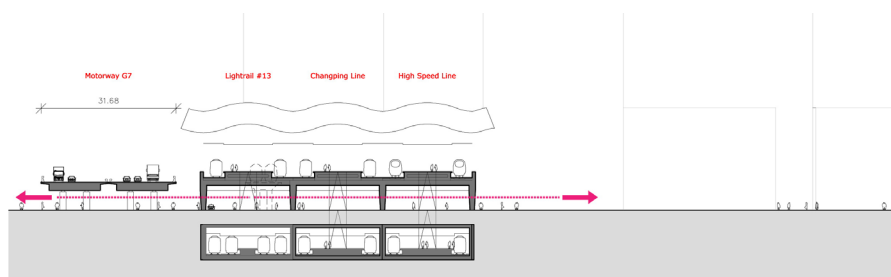


Proposal

Stage 2: Build station nucleus

解决方案

第二阶段: 建立车站核心

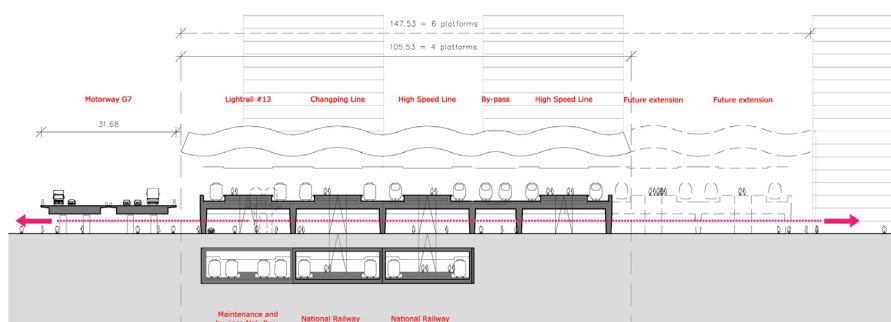


Proposal

Stage 3: Build lightrail stop and maintenance tracks, add national railway by-pass

解决方案

第3阶段: 建立轻轨站并且对轨道进行维护, 同时增加额外的国家级铁轨。



Proposal

Stage 5: Future extensions

解决方案

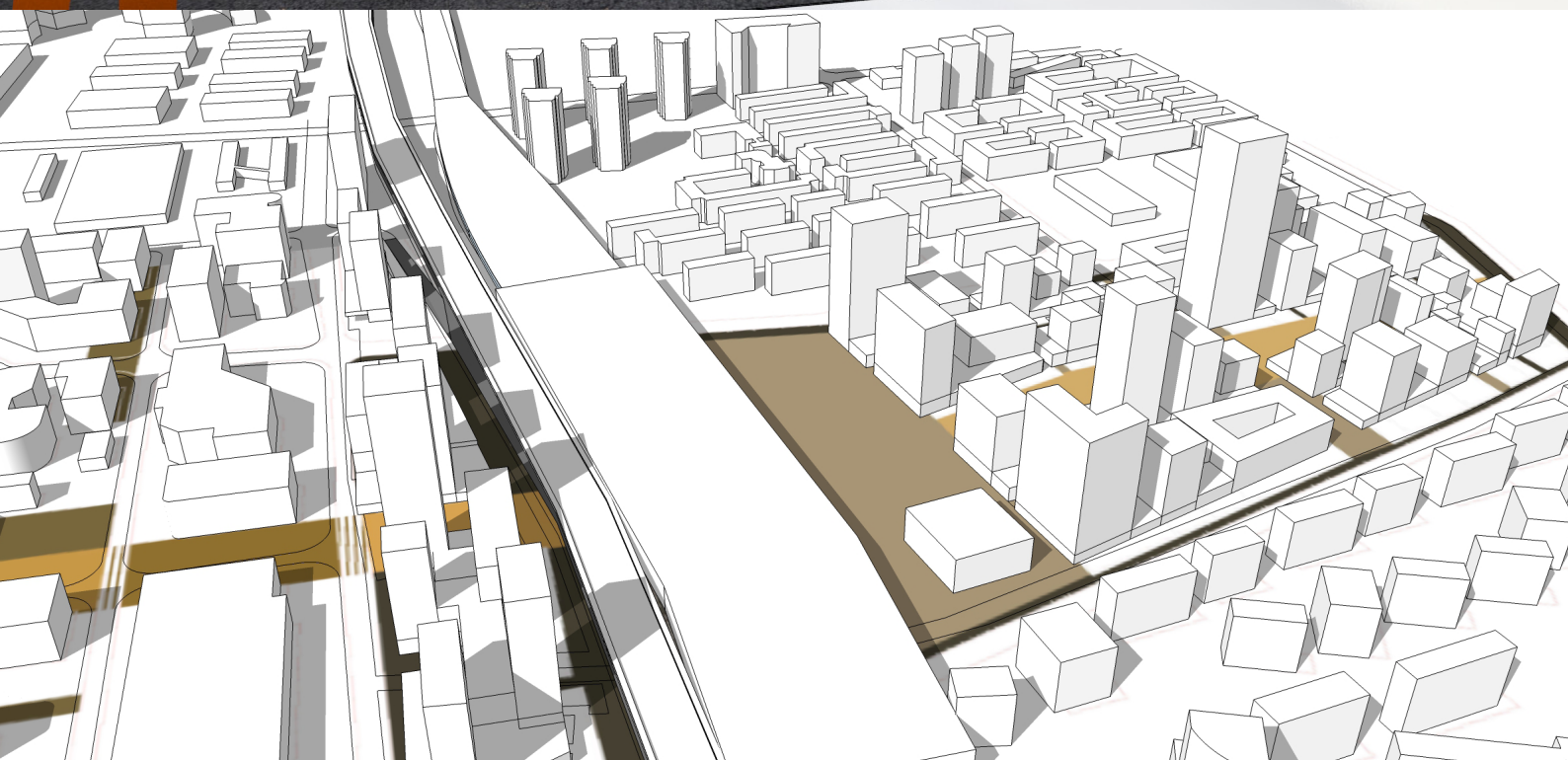
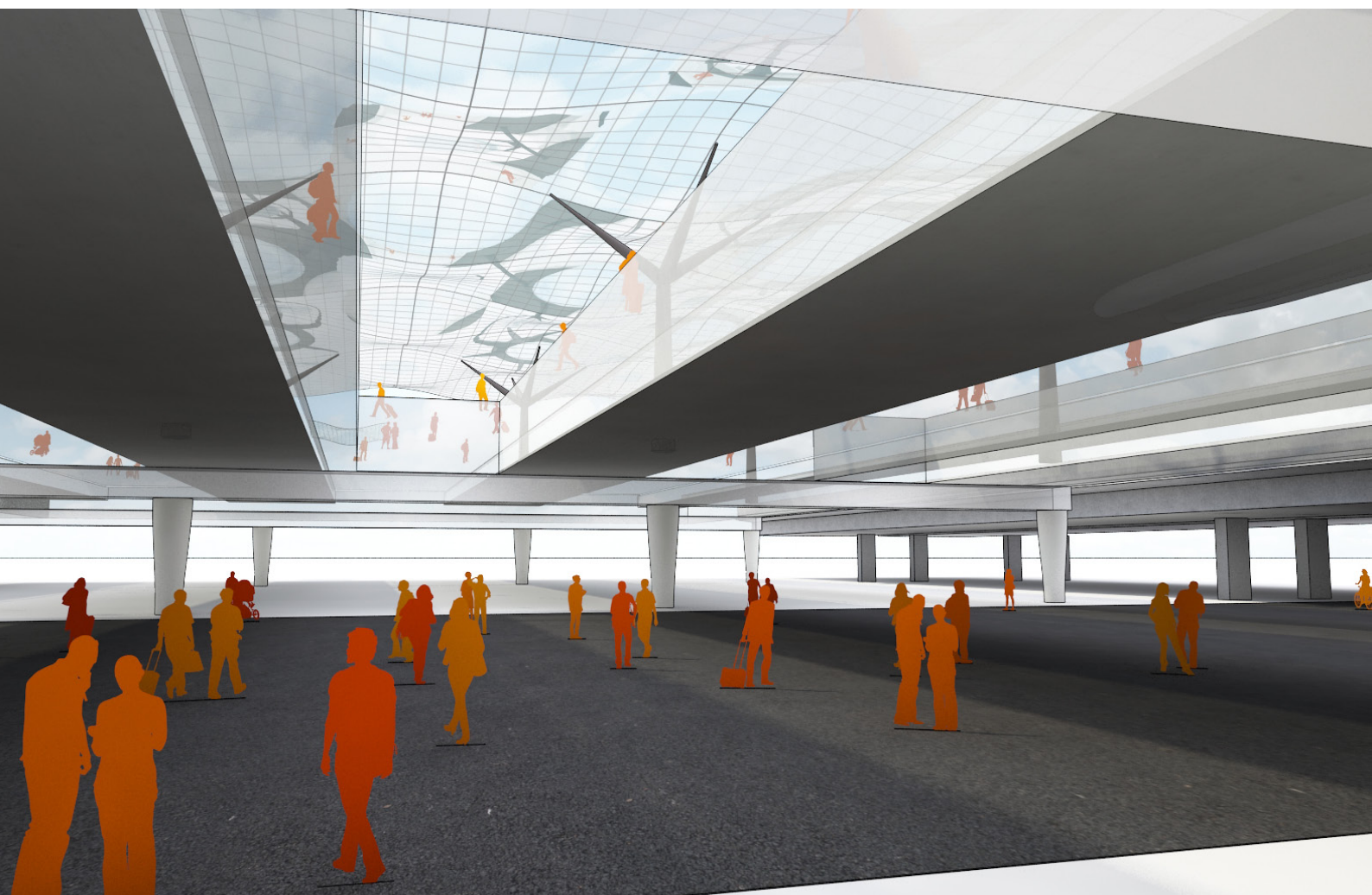
第5阶段: 未来扩建部分

Top: Square reserved for extension of the elevated railway tracks

上：广场将保留高架铁路的延伸部分

Below: Qinghe Station sketch design passageway view

下：清河站初步设计中的通道视角

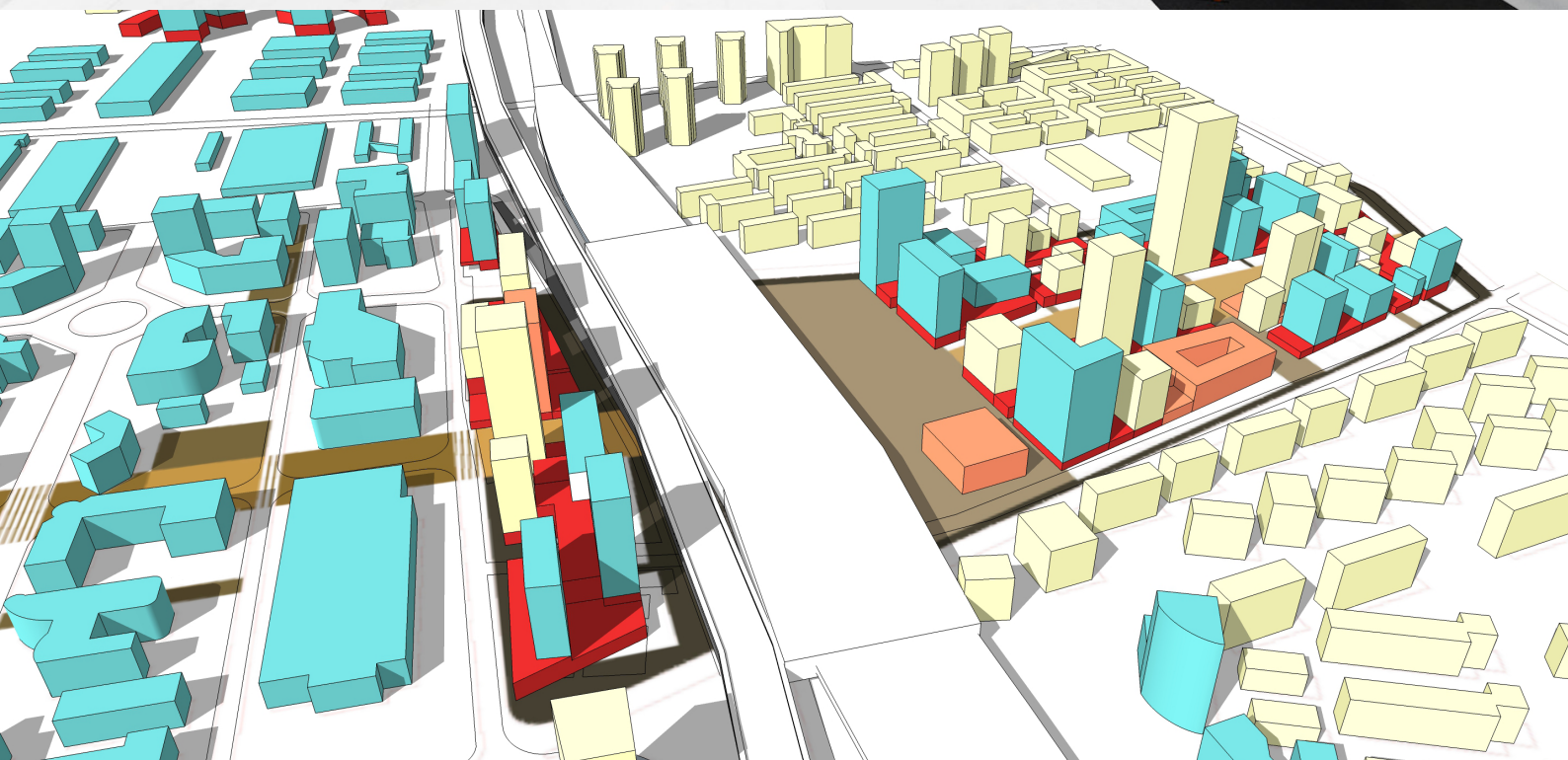


Top: Multifunctional buildings with commercial and public functions, housing, office space, sports facilities, education, culture and hotels

上：该区域的多功能建筑包含商业、公共功能、居住、办公、健身、教育、文化和酒店功能。

Below: Qinghe Station sketch design platform view

下：清河站初步设计中的站台视角







北京北站地区
BEIJING NORTH
STATION AREA





SITUATION AND POTENTIAL

现状与潜力

René Kuiken

Principal urban designer,
René Kuiken Urbanism,
Amsterdam, The Netherlands

René Kuiken Urbanism 城市设计师、所长



Beijing North Railway Station

photo: whatleydude (Flickr)

北京北站

照片: whatleydude (Flickr)

北京北站的发展潜力巨大，其空间充裕，与市中心直接相连，紧邻二环路，是新建高速铁路的理想站点。当然，其紧邻环路的地理位置同时也是一大挑战。北京北站周围的基础设施过多且拥挤，缺乏与市中心“舒适的”无缝连接。

北京北站现将主入口迁至西侧的购物中心之内，则站前广场可改造成为颇具吸引力的周边地区城市中心。西侧部分的密集化工程相对容易。周围的空地与附近的北京动物园可通过高架过街桥相连接。北京北站周围的潜在发展项目将打造一个高密度的活力城市区域，适于行人与骑行者使用，同时拥有居住、工作、休闲等多种功能。

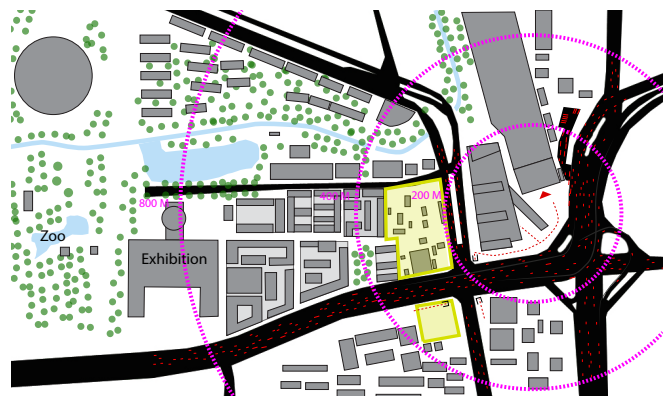
Beijing North is a station with a lot of development potential. Sufficient space combined with a direct connection to the city centre and the second ring road makes it a strategically located terminal station for the new high speed line. However, its position adjacent to the ring road is also the main challenge. Beijing North station is surrounded by heavy and congested infrastructure and lacks a 'pleasant' and seamless connection with the city.

With a relocation of the main entrance to the West, through the existing shopping mall, the current square can transform into an attractive city centre for the area around. The west side is an area which can be densified relatively easy. Surrounding vacant plots and the nearby Zoo can be connected with elevated pedestrian bridges. All these potential developments around Beijing North Station will create a dense vivid urban area, well connected for pedestrians and cyclists and with a mix of housing, working and leisure programme.



Existing situation

现有状况

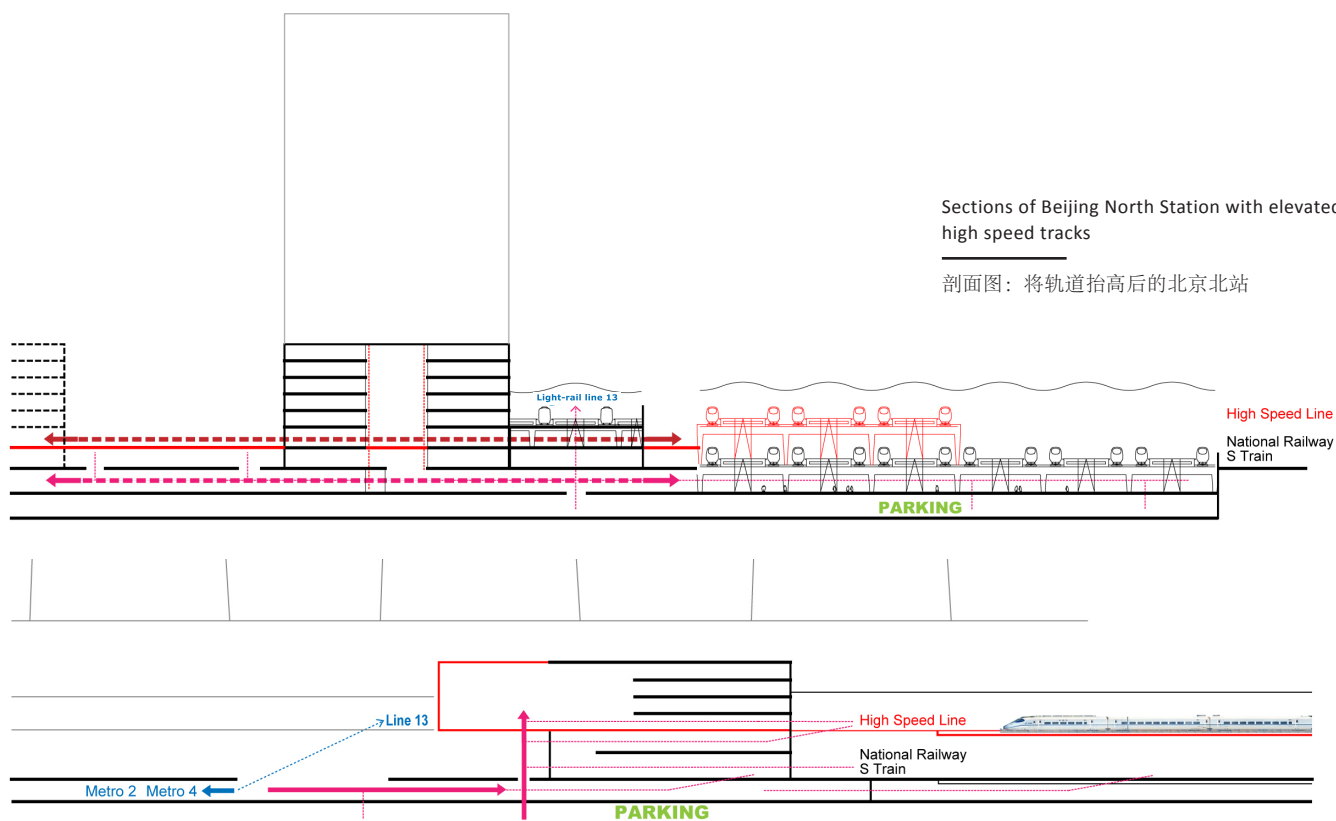


Potential development areas close by

临近的潜力发展地区

Sections of Beijing North Station with elevated high speed tracks

剖面图：将轨道抬高后的北京北站



Proposed relocation entrance to the west

将入口重新定义为朝向西面



Proposed development

方案中的发展方向

THE URBAN TRANSIT FOYER

都市交通的门厅

Adam Visser

Principal and co-founder, GROUP A,
Rotterdam, The Netherlands

GROUP A 所长、联合创始人

高铁列车将停靠车站的一层，与现有的13号线同层，在现在的国家铁路线上一层。为在现有的车站中容纳高铁线路，需要在现有的10条轨道上方额外修筑六条铁轨以及配套站台。

不同轨道线路间的无缝连接是真正的交通枢纽的重要基础。该枢纽将铁路列车与新的公共汽车站、地铁2号线和13号线、规划中的快速铁路线以及自行车和汽车停车场连接起来。

我们建议使用城市中转大厅实现这一无缝连接。多层次室内广场将旅行与购物融为一体。这一中心点将所有轨道线路连接起来，并可通往上层的办公与住宅区域以及周围的更大区域。

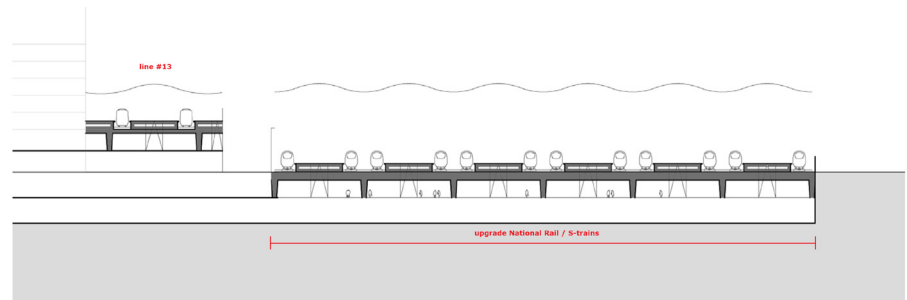
The high speed line will enter the station building on the first level, above the tracks of the existing National Railway Line and at the same level as light rail line 13. To accommodate the high speed line in the existing station building, an additional six tracks and platforms must be constructed above the existing twelve tracks of the station.

A seamless connection between the different lines is the essential basis of a real transport hub. The hub connects the trains with a new bus station, metro lines 2 and 13, the proposed fast metro line and parking for bicycles and cars.

In order to facilitate this connection, we introduce the urban transit foyer. A multilayered covered square where the combination of travelling and shopping is integrated. This center point will connect all different lines and give access to the offices and dwellings above and the larger surrounding area.

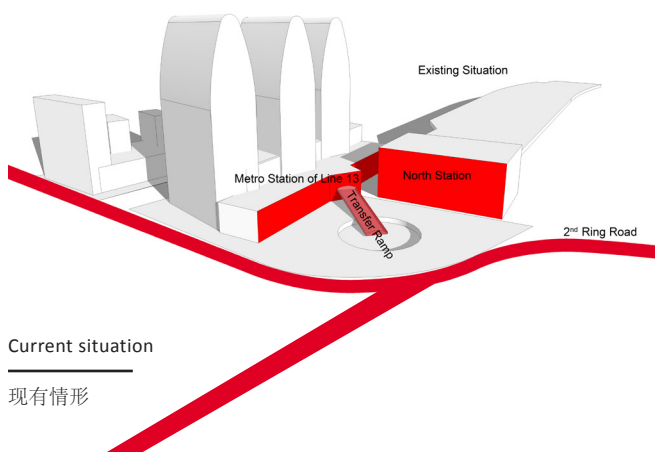
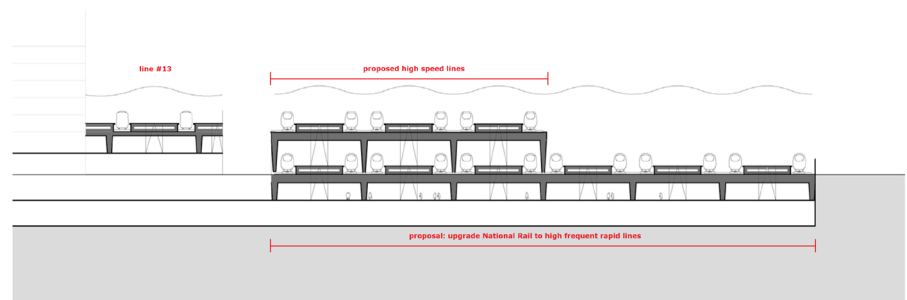
North Station, current situation

北京北站，现状



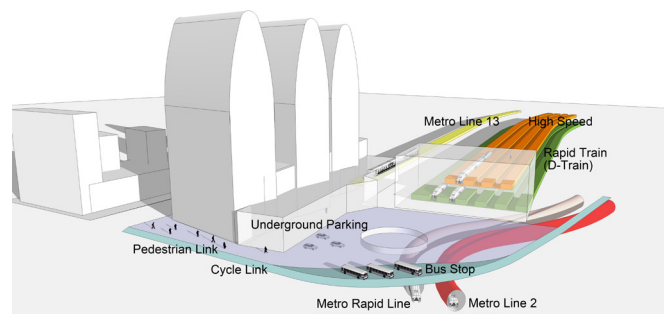
North Station, proposed section with high speed lines

北京北站，在剖面中加入高速铁路线



Current situation

现有情形



Situation with proposed metro rapid line, underground parking and seamless connectivity

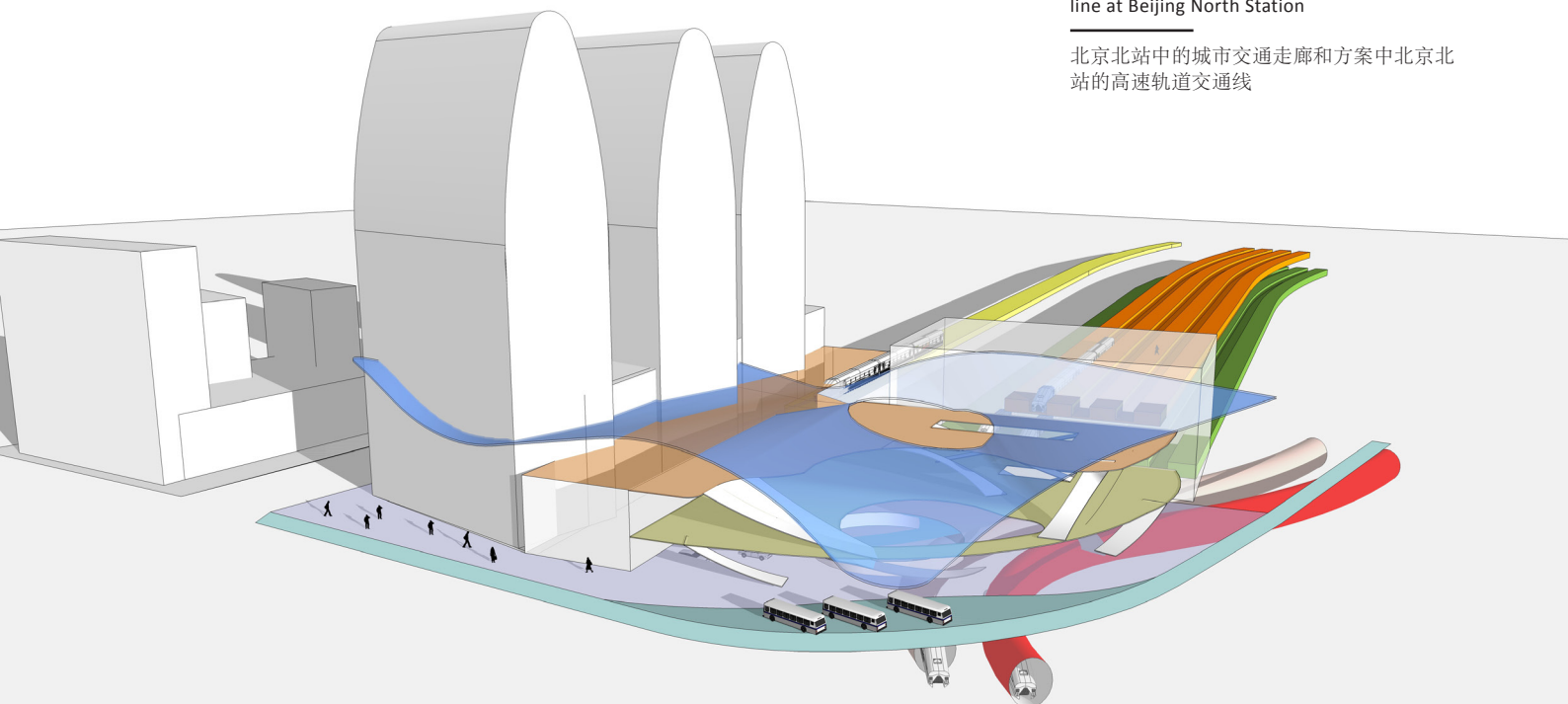
方案中的高速地铁线，地下停车场和各种无缝连接

Urban Transit Foyer



Urban transit foyer and proposed metro rapid line at Beijing North Station

北京北站中的城市交通走廊和方案中北京北站的高速轨道交通线



TOWARDS2050: PROGRAMME AND PARTICIPANTS 2014

WEEK 1: 14–19 SEPTEMBER: RESEARCH BY DESIGN ON QINGHE STATION & BEIJING NORTH STATION

Assignment

Research by design for future development at Qinghe Station and its surrounding area

Sunday 14 September	Briefings and site visits
Monday 15 September	Briefings, site visit, workshop
Tuesday 16 September	Research by design workshop, visiting critics
Wednesday 17 September	Research by design workshop
Thursday 18 September	Research by design workshop

Public event:

Friday 19 September	Presentation of results & network party
---------------------	---

Commissioned by

Creative Industries Fund NL, Rotterdam
Beijing Municipal Commission of Urban Planning, Beijing

Curators

Wu Weijia, Tsinghua University, School of Architecture, Beijing
Wu Chen, Beijing Institute of Architectural Design, Beijing
Cui Kai, China Architecture Design & Research Group, Beijing
Du Liquan, Beijing Municipal Institute of City Planning & Design, Beijing
Zhang Bing, China Academy of Urban Planning & Design, Beijing
Ton Venhoeven, VenhoevenCS architecture+urbanism, Amsterdam

Project coordinators

Huang He, Tsinghua University, School of Architecture, Beijing
Chen Yulin, Tsinghua University, School of Architecture, Beijing
Martijn de Geus, Tsinghua University, School of Architecture, Beijing
Thijs van Spaandonk, VenhoevenCS architecture+urbanism, Amsterdam
Liu Gang, The Pin Projects, Beijing (on behalf of VenhoevenCS)

Participants

Dai Tianxing and Ren Yue (China Architecture Design & Research Institute), An Yue and Ni Jian (China Academy of Urban Planning & Design), He Junqiao and Song Jing (BICP-Homedale), Zhao Wenning, Liang Yingya, Sun Yuan, Yang Xu, Zhang Yizhang, Lu Di, and Li Shihui (Tsinghua University), Qiu Jie and Li Minhui (University College London), Yang Lei (independent researcher), Wang Liang, Zhen Tian, Li Jing, Lu Wenjun, and Liu Gang (BIAD), Mark Dekker, Xun Huang and Ye Zhang (KCAP), John Breen (Urhahn Urban Design), Michel Duinmayer (Ministry of Infrastructure and the Environment), Eric Frijters (Fabric), Joek Kruiderink (Fakton), René Kuiken (René Kuiken Urbanism), Miriam Ram (Deltametropolis Association), Thijs van Spaandonk (VenhoevenCS architecture+urbanism), Brechtje Spreeuwiers (MLA+), Adam Visser (GROUP A), Marten Wassmann (Bentham Crouwel Architects), and Heleen Wijtmans (City of Utrecht).

The 2014 edition of *Towards2050* is supported by:

Creative Industry Fund NL
VenhoevenCS architecture+urbanism
Ministry of Infrastructure and the Environment, The Netherlands
City of Utrecht
CSR Netherlands
Beijing Institute of Architectural Design
World Bank, Beijing Office
Tsinghua University, School of Architecture
Ministry of Education, Culture and Science, The Netherlands
Embassy of the Kingdom of the Netherlands, Beijing
Fakton
TNO

Towards2050 is endorsed by:

DutchCulture
Royal Institute of Dutch Architects

creative industries fund NL



WEEK 2: 22-27 SEPTEMBER: SEMINARS AND WORKSHOPS ON TOD

Monday 22 September and Tuesday 23 September

1st International Forum on Transit-Oriented Development

Hosted by: Beijing Institute for Architectural Design and the Embassy of the Kingdom of the Netherlands, Beijing

Partner: Towards2050

Participants: Wang Wei (BMCUP), Wanghao (CAUPD), Gerald Ollivier (World Bank), Wataru Tanaka (Nikken Sekkei), Li Hui (BIAD), Mr. Zhao (MVA Systra Group), Nie Dahua (BGMEDRI), Ton Venhoeven and Thijs van Spaandonk (VenhoevenCS architecture+urbanism), Michel Duinmayer (Ministry of Infrastructure and the Environment), René Kuiken (René Kuiken Urbanism), Adam Visser (GROUP A), Marten Wassmann (Bentham Crouwel Architects), Brechtje Spreeuwers (MLA+), Robert van Ieperen (Fakton), Wart Mandersloot (TNO), Paul Gerretsen (Deltametropolis Association), Albert Hutschemaekers (City of Utrecht), and Ton Dassen (PBL).

Wednesday 24 September

Workshop Integrated Land Use Development and Transport Planning Around Metro and Rail Stations

Hosted by: World Bank and the Ministry of Transportation

Partner: Towards2050

Participants: Representatives of the Ministry of Transportation, the Ministry of Land and Resources and the Ministry of Housing and Urban and Rural Development, Paul Procee and Gerald Ollivier (World Bank), Li Hui (BIAD), Ton Venhoeven (VenhoevenCS architecture+urbanism), Michel Duinmayer (Ministry of Infrastructure and the Environment), Robert van Ieperen (Fakton), Wart Mandersloot (TNO), Paul Gerretsen (Deltametropolis Association), and Albert Hutschemaekers (City of Utrecht).

Thursday 25 September

Workshop Land Development Around Railway Stations

Hosted by: World Bank and the China Railway Corporation

Participants: Representatives of China Railway Corporation, Gerald Ollivier (World Bank), Ton Venhoeven (VenhoevenCS architecture+urbanism), Robert van Ieperen (Fakton), Paul Gerretsen (Deltametropolis Association), and Albert Hutschemaekers (City of Utrecht).

Thursday 25 September

Smart City Seminar UED Magazine

Hosted by: UED Magazine

Partner: Towards2050

Participants: Yang Lei (CMoDA), Ton Venhoeven (VenhoevenCS architecture+urbanism), Wart Mandersloot (TNO), and Ton Dassen (Netherlands Environmental Assessment Agency)

Thursday 25 September - Saturday 27 September

HLN Events as part of the Beijing Design Week



Compiled and edited by: Ton Venhoeven, Helga Lasschuijt and Thijs van Spaandonk (VenhoevenCS architecture+urbanism)

Graphic design and imaging: James Heus (VenhoevenCS architecture+urbanism)

Translations: The Pin Projects and Li Gubai (VenhoevenCS architecture+urbanism)

ISBN / EAN 978-90-823040-0-8

Published by: VenhoevenCS architecture+urbanism, Amsterdam

All rights reserved. Copyright of the texts in Part 1 belong to the respective authors. Copyright of the texts and images in Part 2 belong to the participants of the Research by Design Workweek on Qinghe Station Beijing. For permissions, please contact VenhoevenCS architecture+urbanism. Every effort has been made to trace copyright holders and to obtain their permission for the use of copyright material. We would be grateful if notified of any corrections that should be incorporated in future reprints of this booklet.

info@venhoevencs.nl
www.venhoevencs.nl

Hoogte Kadijk 143F14
NL-1018 BH Amsterdam
T +31 20 6228210

This publication has been made possible with financial contributions by Creative Industries Fund NL, the Embassy of the Kingdom of The Netherlands in Beijing and VenhoevenCS architecture+urbanism.

Revised first edition, December 2014

**creative industries
fund NL**



Kingdom of the Netherlands

VenhoevenCS
architecture+urbanism