

Introducing Integrated Eco-Mobility to the new Asian Urban Model
Filling systemic transit convenience gaps
A case in Chongqing's high-density Jiangbei Centre

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REAL CORP 2012

RE-MIXING THE CITY
TOWARDS SUSTAINABILITY AND RESILIENCE?



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FILLING “TRANSIT CONVENIENCE GAPS” POSSIBILITIES FOR ECO-MOBILITY WITH “IR-RESISTABLE” CONVENIENCE

Systemic gaps in transit – infrastructure, vehicles, operations– economics, last mile problem

- Very high densities characterize many transforming and new centres in Asia & China.
- Transportation often single-most critical concern of planning approving authorities.
- Challenges:
 - Allocating the right mix of uses,
 - good economic models for real estate development and property ownership to achieve economic sustainability,
 - creating robust urban morphologies, roadway- and public space typologies that balance multiple modes of transport in the public realm effectively,
 - horizontal cooperation and coordination to achieve compactness and livability.
- Transit often conceived as system rather than service for citizens/provision of mobility
- **Convenience by filling „transit convenience gaps“ that exist systemically due to: physical patterns, transport technology, scale of vehicles, operations economics.**

FILLING “TRANSIT CONVENIENCE GAPS” POSSIBILITIES FOR ECO-MOBILITY WITH “IR-RESISTABLE” CONVENIENCE

Infrastructure, HST, MRT, BRT, wide roads... – Housing Market

- China is fortunate of having leadership that understands importance of infrastructure
- CQ: system of highways, ring roads, arterial roads constructed over past 15 years.
- Three LRT/MRT lines are in operation and several more are planned.
- Chongqing’s topography of steep valleys and hills up from the Rivers as well as a hard rock geology presents an additional challenge to development and connectivity.
- However: systemic service gaps. Between lines and between stations

FILLING “TRANSIT CONVENIENCE GAPS” POSSIBILITIES FOR ECO-MOBILITY WITH “IR-RESISTABLE” CONVENIENCE

Three transit convenience gaps to be filled - also in Chongqing

1. MRT/LRT lines station distances are too far apart from each other to make it
2. The inconvenience between bus-service and taxis or private vehicles.
3. The gap between walking and bicycle riding or cars and taxis

FILLING “TRANSIT CONVENIENCE GAPS” POSSIBILITIES FOR ECO-MOBILITY WITH “IR-RESISTABLE” CONVENIENCE

High density, segretated uses, gated compounds, superblocks

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CHONGQING: MAJOR AGGLOMERATION IN WESTERN CHINA AT UPPER REACHES OF THE YANGTZE RIVER

Dramatic topography: challenge for transportation /Opportunity?



Chongqing location, view of peninsula of confluence of Yangtze and Jialin. Source: various

TOPOGRAPHY AS OPPORTUNITY FOR CREATIVE TRANSPORTATION CREATES IDENTITY

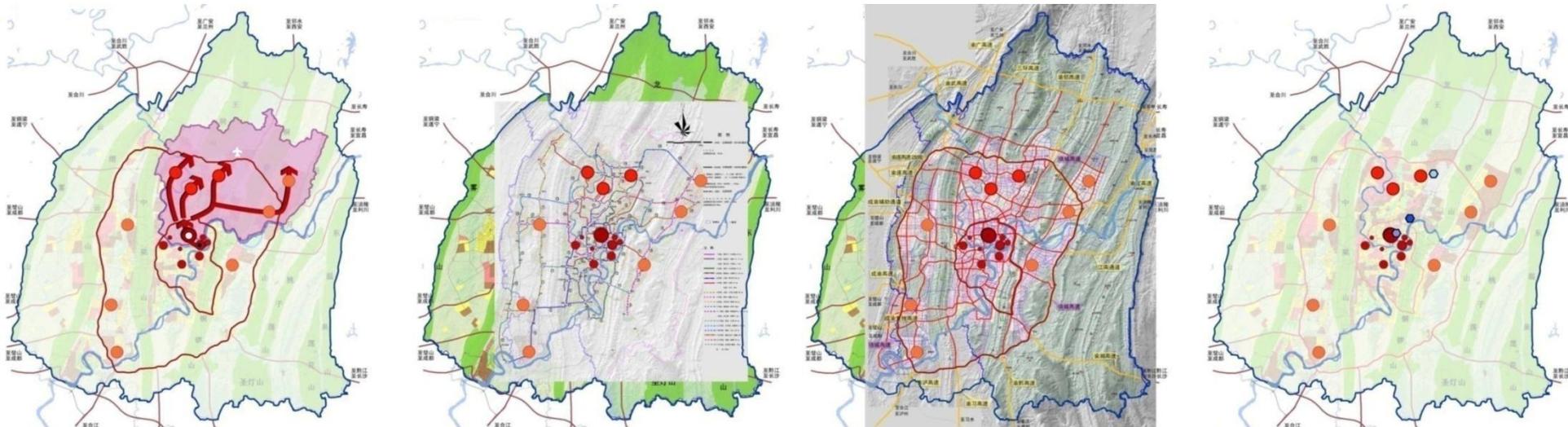


Chongqing's topography-specific solutions to mobility. Source: various

CHONGQING AND “TWO RIVERS” NATIONAL LEVEL SPECIAL DEVELOPMENT ZONE: DEVELOPMENT TREND NORTHWARDS – JIANGBEI MOST CENTRAL

Urbanization Pattern in Chongqing

1. Core city redevelopment of historic areas: high-density mixed-use and single-use
2. New districts and industrial development: functional separation, system of super-blocks and overly wide roads primarily north into the “Two Rivers” zone.



Chongqing's development planning. Source: Stefan Rau over Chongqing UPDI maps.

HIGH DENSITY DEVELOPMENT PROPOSAL AND TRANSPORTATION CHALLENGES & GAPS

Complementary mix of uses with a high density; FAR: 9

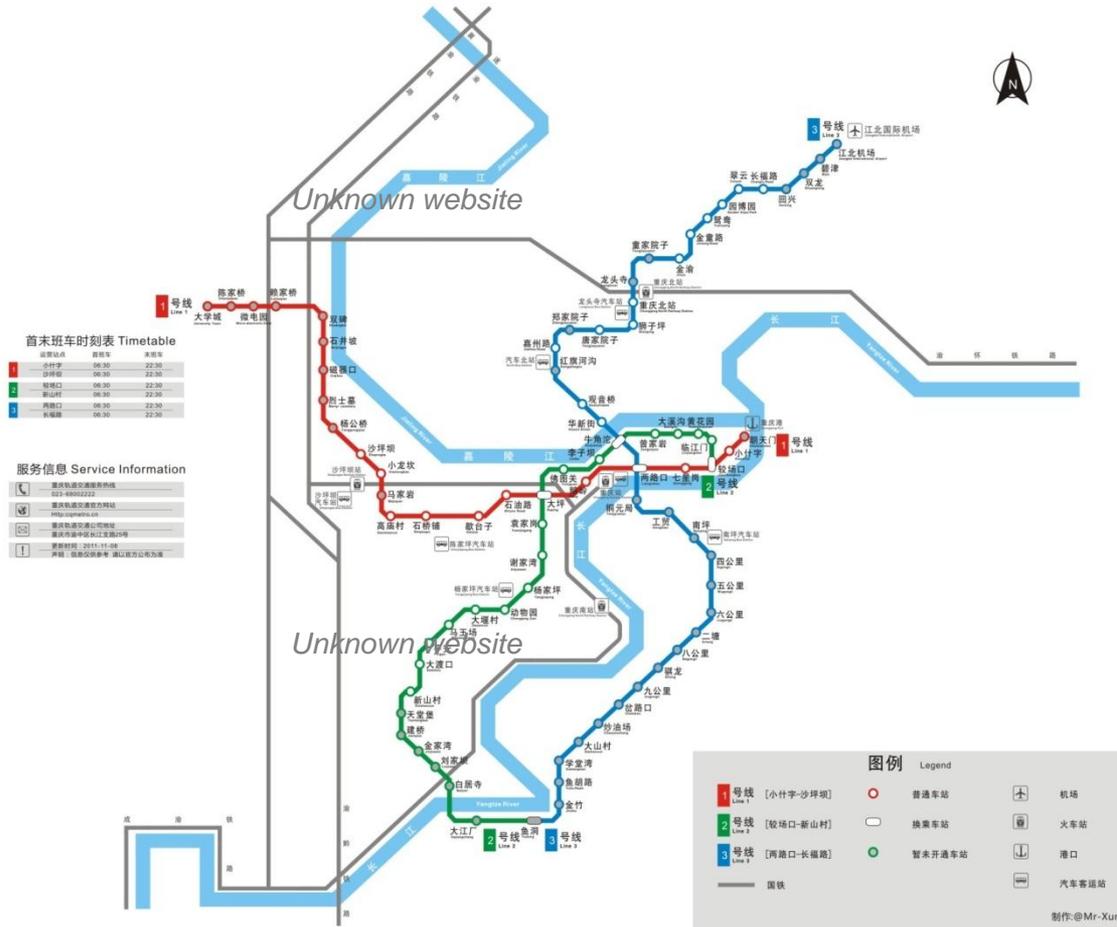
- New Jiangbei CBD continues to be refined and developed.
- Authors propose program, land use, building types, open space, transportation
- For five hectares with dense context developed over last 15 years
- High density because: Central location, proximity to green, lack of urban functions
- However: access to / from micro-location needs to improve, management of circulation in and around the site.
- In-progress meetings with district planning department and city planning department
- Proposed density and mix of uses discussed to ensure compactness.
- **Biggest concern of the local officials: vehicular accessibility and parking**

HIGH DENSITY DEVELOPMENT PROPOSAL AND TRANSPORTATION CHALLENGES & GAPS

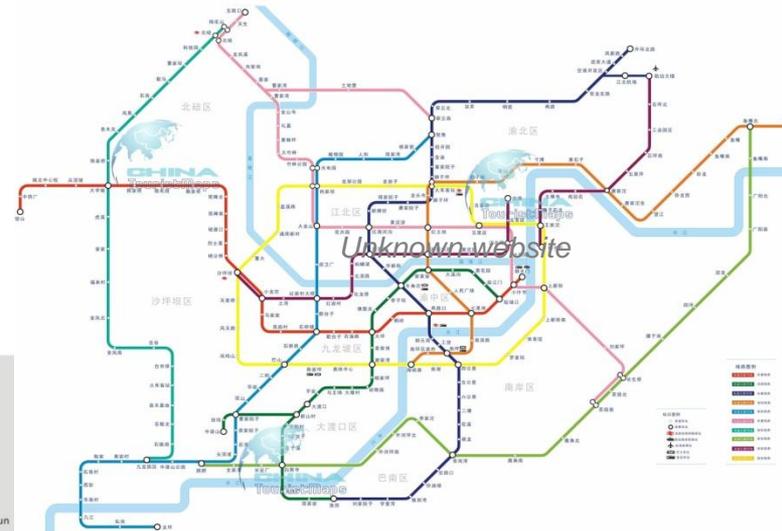


Location of study area. Source: Stefan Rau over Google Maps/Earth.

PLANNED MRT/LRT SYSTEM: TWO SYSTEMIC GAPS: LINES TOO FAR & STATION DISTANCES TOO GREAT

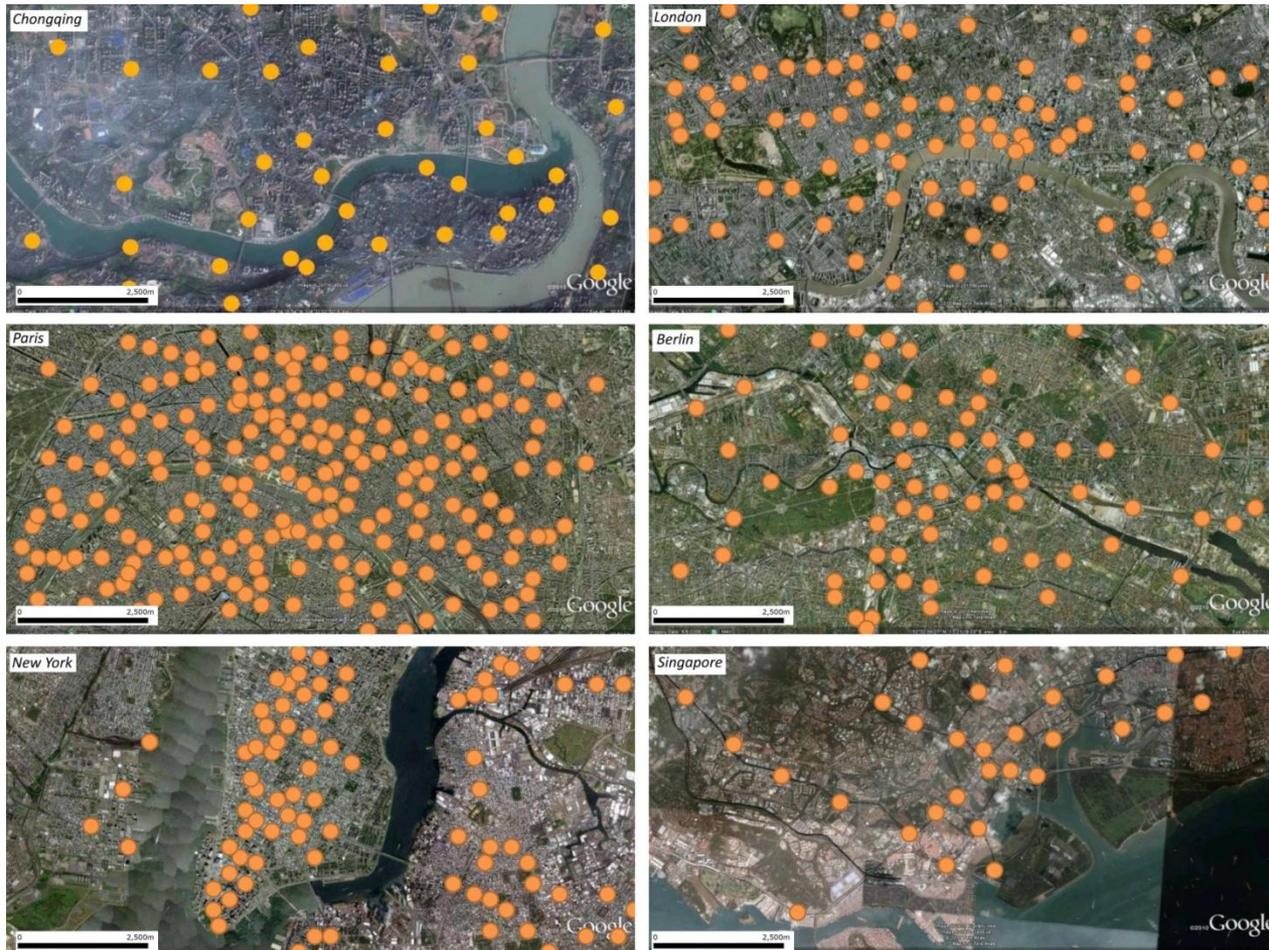


Subway 2011



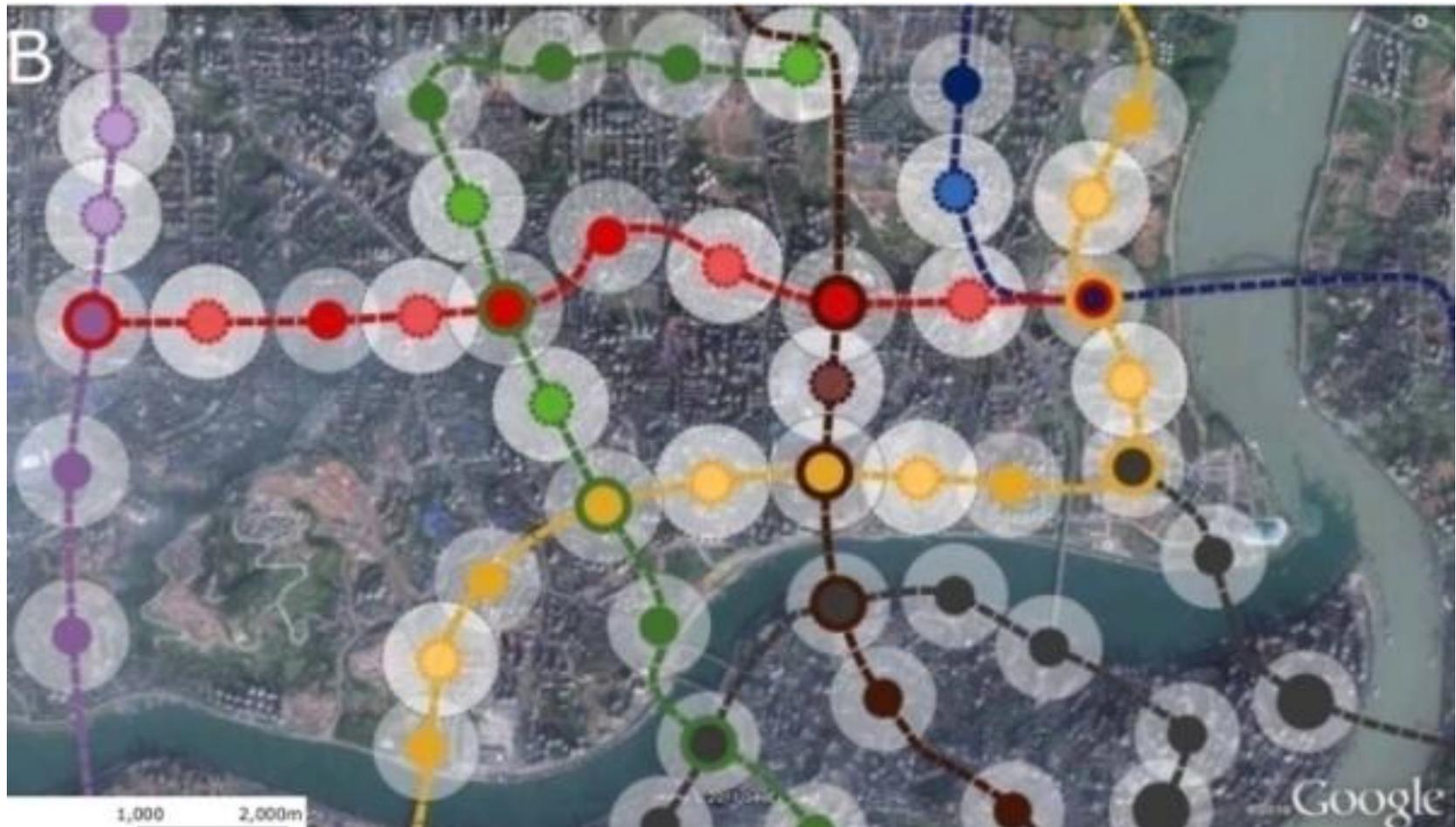
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PLANNED MRT/LRT SYSTEM: TWO SYSTEMIC GAPS: LINES TOO FAR & STATION DISTANCES TOO GREAT



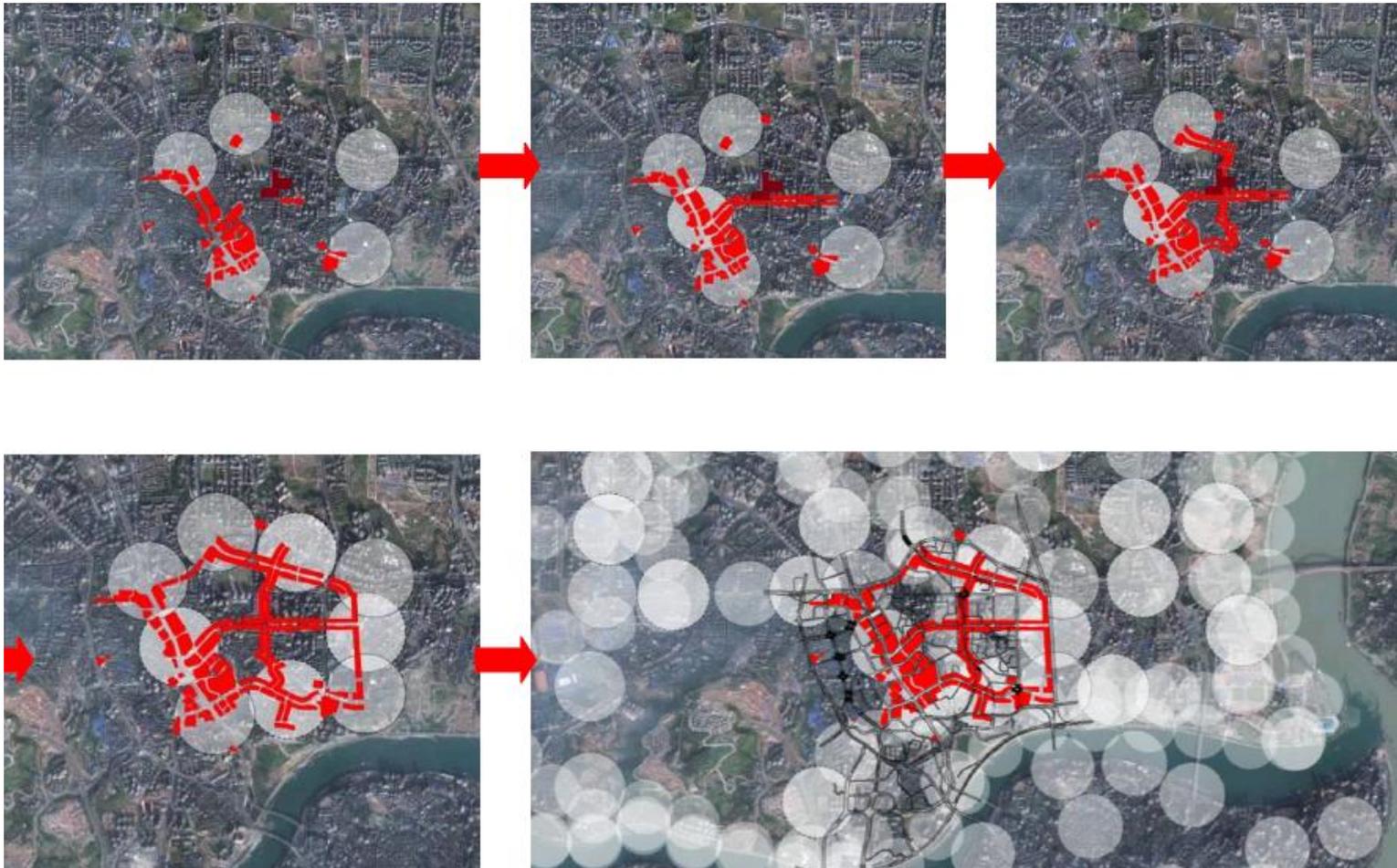
Comparing subway station density of six cities. Source: Stefan Rau over Google Maps.

PROPOSAL ADDED MRT/LRT STATIONS AND ADJUSTED COMMERCIAL STREETS SYSTEM



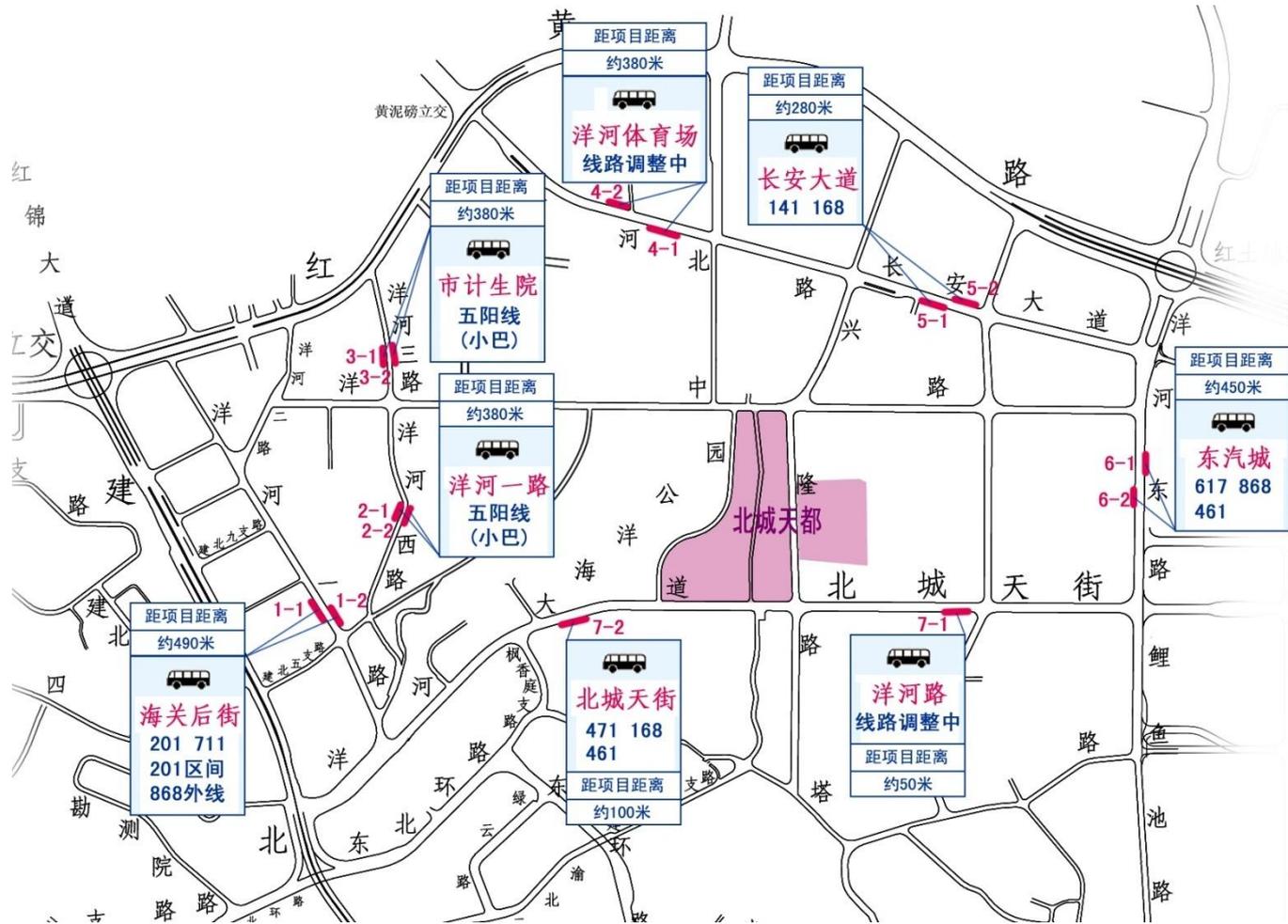
Proposed added stations on planned lines. Source: Stefan Rau over Google Earth.

PROPOSAL ADDED MRT/LRT STATIONS AND ADJUSTED COMMERCIAL STREETS SYSTEM



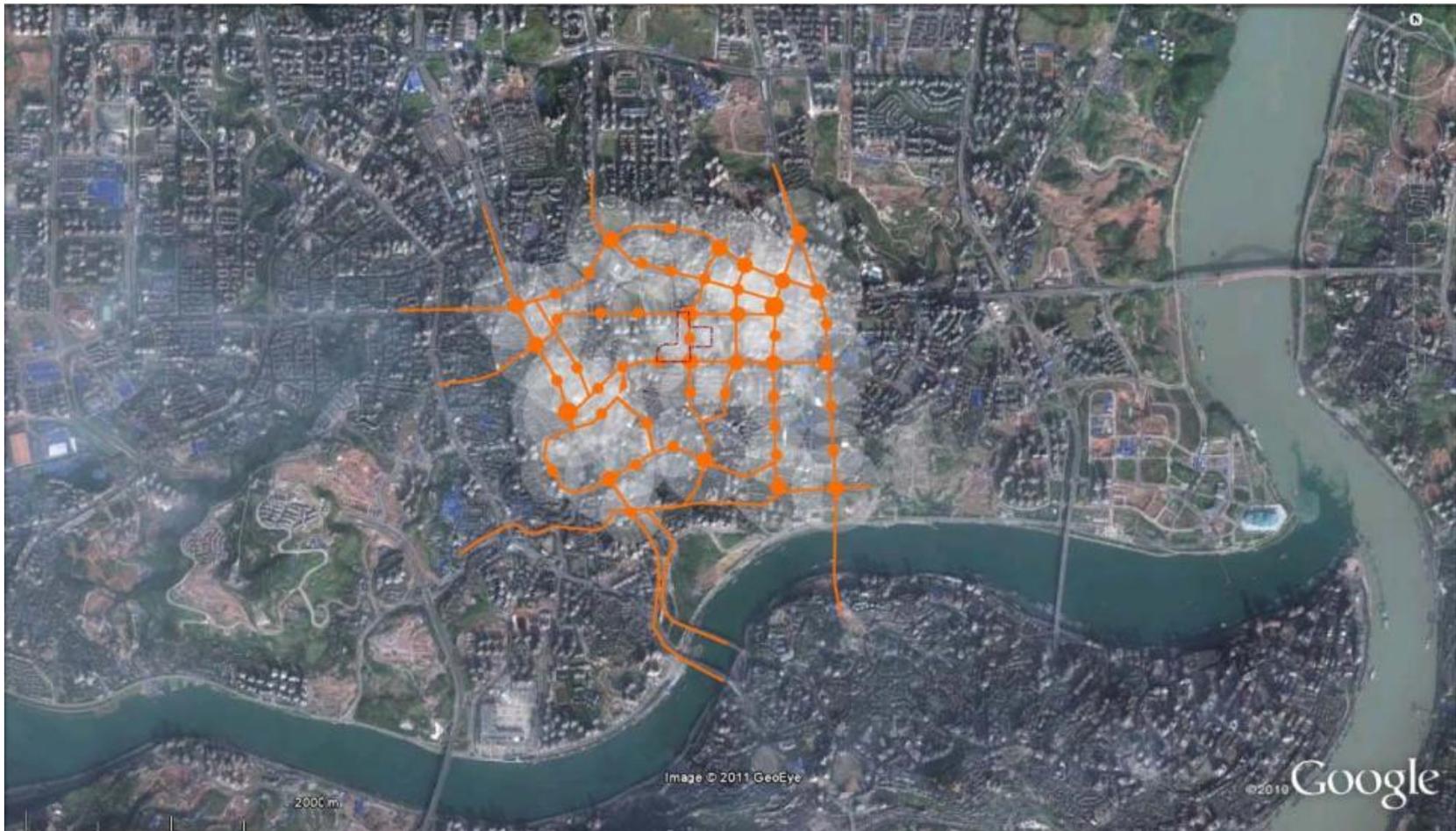
Proposed Commercial Streets system. Source: Stefan Rau over Google Earth.

BUS LINES & BUS STOP DISTANCES TOO FAR APART



Bus routes and stops density. Source: TYLIN.

BUS LINES & BUS STOP DISTANCES TOO FAR APART



Proposed bus routes and stops density. Source: Stefan Rau over Google Maps/Earth.

HIGH DENSITY DEVELOPMENT AND ALREADY SOME GOOD SOLUTIONS FOR PEDESTRIAN CIRCULATION



Site Photos. Source: Stefan Rau and Wang Dan

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION

Strategically filling transit convenience gaps

- Accessibility, urban livability, community life, environmental quality, public health, safety and security in public spaces, eco-efficiency and low-carbon economy all directly related to urban transport and vice versa.
- **Filling gaps:**
 - **intermediate sized vehicles and innovative new vehicles.**
 - **creative models for shared ownership and mobility services, management and operations models**
 - **information on mobility choices and ordering capabilities on mobile phones**

Pedestrian
 Segways, E-bikes...
 Minibuses
 Electric Buses,
 BRT
 LRT / MRT
 Taxis
 Car-sharing/ rental / pooling
 private vehicles
 Shared parking
 Personal goods delivery



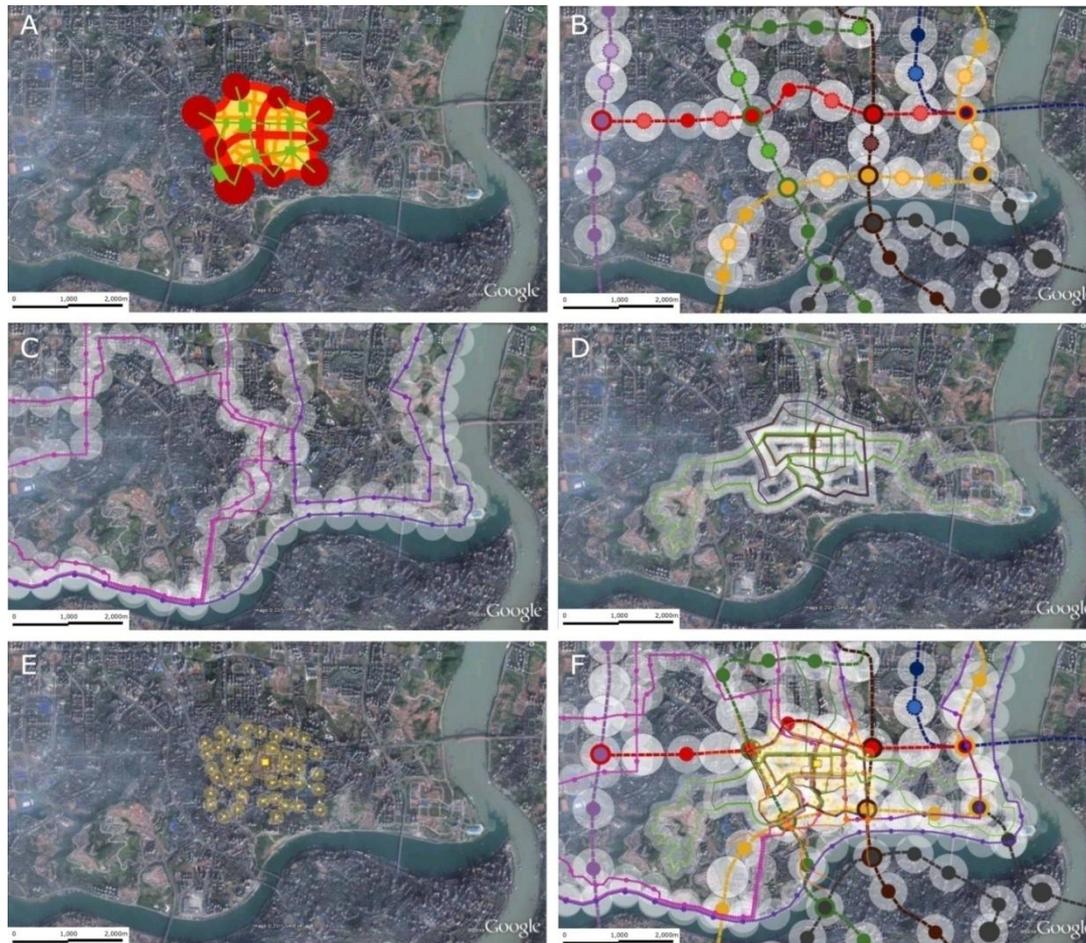
Proposed multiple modes of integrated transport. Various sources for icons.

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION

Strategically filling transit convenience gaps: Modal Diversity

- **MRT/LRT additional stops** inbetween planned and existing stations
- **Improved bus routing & added electric Minibus** service with on-demand stations and service flexibility, personal cargo delivery
- **Renting/Sharing/Pooling** a variety of vehicle types: hassle-free mobility
- **Slow-moving individual mobility assistants:** Electric bicycles, segways and a new generation of assisted electrical slow moving individual mobility devices will fill a gap where one feels walking is just a little too far
- **Pedestrian-friendly environments,** fine-meshed path networks, safety and security: safety and security. Walking needs to be a most safe and pleasant experience
- **Inter-modal transit stations** and **eco-mobility centers** and **eco-mobility-stations** in every residential community, even every residential block and high-rise buildings

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION



Proposed Eco-Mobility system. Source: Stefan Rau over Google Earth.

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION



Proposed modes of transportation with convenient exchanges. Source: various

PROPOSAL FOR ECO-MOBILITY CHOICES

CAR SHARING, POOLING, RENTAL OF VEHICLE



PROPOSAL FOR ECO-MOBILITY CHOICES IMPROVING THE PEDESTRIAN NETWORK



Proposed improvements linking to pedestrian systems. Source: various

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION

Intermodal exchange at stations, eco-mobility centers and -stations:

- Airport, HSR, Rail stations, Long distance bus stations: exchange to various local transit
- Attractive, safe and convenient inter-modal transfer stations at all subway stops buses, minibuses, rented/shared vehicles and slow-moving individual mobility assistants.
- In every residential compound and all major residential, office, commercial and service buildings inside and outside space with variety of vehicles, storage space
- Supplemental services like lounge, conference room, wifi, concierge, convenience retail and small services.
- Comprehensive eco-mobility centers: many choices of transportation modes/vehicles
- Eco-mobility stations: Roofs or niches or rooms with vehicle or devices storage

PROPOSAL FOR ECO-MOBILITY CHOICES AND MULTI-MODAL PUBLIC TRANSPORTATION

***Strategically filling the transit convenience gaps
Interactive, real-time mobility choices information and ordering
system for mobile phones:***

- Creativity on design, pricing, fare integration,
- real-time mobile information on mobility choices,
- mobile orders of vehicles and customization of service
- GPS tracking of all modes of transportation and en-route vehicles and information on time, route details, energy use and carbon footprint for each specific mobility choice will give every individual all options for an intelligent, custom-tailored mobility choice at each situation.

HIGH DENSITY MIXED USE PROPOSAL WITH PEDESTRIAN FRIENDLY PUBLIC SPACES



Proposed modes of transportation with convenient exchanges. Source: Authors

CONCLUSIONS: FILLING THE CONVENIENCE GAPS

Strategic importance as gaps seem to be systemic not only in centres in China or Asia. To achieve **ecologically-efficient mobility** three strategies suggested.

1. Rapid transit intra-district / inter-district transport filling inconvenience gap in MRT/LRT network. **Electric run BRT** is the system of choice with flexibility and low-cost and streetcar a long-term solution.
2. Convenience gap in bus-service and between bus and taxis or private vehicles be filled by **electric minibuses/vans** and **electric-car, e-bikes, bikes and other vehicles sharing**. PPP encouraged.
3. Convenience gap between walking and bicycle riding or cars / taxis be filled with **individual mobility assistants** like Segways, e-bikes, smart-wheels etc.

Due to high densities of residents, jobs and shoppers in new Asian centres, viability for these intermediate public and semi-public mobility solutions are most certain.

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