THE DEVELOPMENT OF MULTIFUNCTIONAL AND MULTIMODAL MICROMOBILITY HUBS
LEARNINGS FROM AN EXCHANGE BETWEEN JAPAN AND GERMANY

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ABOUT THE SPEAKER

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Research Campus Mobility2Grid (M2G)

Mobility2Grid is an initiative between science and industry partners in Berlin focusing on solutions for a sustainable future city. We explore how to integrate electric vehicles with renewable energy sources to create a clean and efficient transportation and energy system.
RESEARCH CAMPUS MOBILITY2GRID (M2G)

- 36 partners from science and industry working on integrated solutions for mobility and energy solutions in urban areas
- launched in 2011 based on the Federal Government’s High-Tech Strategy
RECENT BACKLASH FOR FREE FLOATING MICRO MOBILITY

Rented e-scooters cleared from Paris streets on eve of ban

Electric scooter rental experiment in French capital ends after 5 years of controversy

A Tier worker removes an e-scooter from a street in Paris. Photograph: Antoey Paone/Reuters

Guardian, 31 Aug 2023
Hubs aim to be the cultivated reception hall for public transport.
WHY A STATION-BASED SYSTEM FOR LAST/FIRST MILE?

Optimized Station Locations: Station-based micro mobility can be optimized for location, different services balancing pick-ups and drop-offs to minimize the need for costly rebalancing operations, which enhances user satisfaction (Liu et al., 2015).

Lower Greenhouse Gas Emissions: Station-based systems have lower greenhouse gas emissions compared to dockless systems due to more efficient rebalancing and reduced need for vehicles to redistribute bikes.

Lower costs: Lower operational costs due to centralized management/maintenance = lower user fees.

Predictable Availability: These systems provide predictable bike and dock availability, which is essential for users relying on the service for daily commutes (Billhardt et al., 2021).

Strategic planning: Hubs can be strategically planned to integrate with public transportation networks or community planning.

Long-Term Infrastructure: Station-based systems involve significant initial investment in docking stations, which can be leveraged for long-term sustainability and reliability of the service.
ASIA-PACIFIC MOST SUCCESSFUL STATION-BASED SYSTEM: TAIPEI UBIKE

- Strategically distributed stations across the city, located near public transport hubs, tourist attractions, and residential areas
- User-friendly interface for renting bikes via smart cards or app
- Seamless Connectivity
- Affordability
- Well-Maintained Fleet
- Policy Support
TECHNOLOGICAL INTEGRATION AND REAL TIME OPEN DATA

Real-time data tracking and smart technology help manage bike distribution and availability effectively, minimizing the chances of empty or full stations.
KYOTO CASE: LUUP

- Dockless geofenced hub system with marked spots at PT stations and residential areas
- Growing users for (spontaneous) travel trips, including tourists
- Integration into residential areas and private housing compounds lead to improved accessibility
- Higher fees than YouBike
- However, spatial inequality of hubs
TAKE AWAYS

- MMH hubs typically involve higher initial infrastructure costs due to the need for docking stations. However, once established, these systems incur lower operational costs due to centralized management and maintenance (Soriguera & Jiménez-Meroño, 2020). This can translate to lower user fees.

- MMH should go along with improved cycling infrastructure (focus: secure corridors to transit / PT stations)

- LUUP example shows: Multifunctional / multimodal features can be added to existing structures in an organised form and without initial infrastructure costs (however: contract with land owner, acceptance of residents need to be considered).

- Especially in high-demand areas with dense commercial and public transport links, MMH lead to more predictable and concentrated usage patterns.

- Spatial inequality of hubs needs to be considered (occurs less in PPP bike systems, e.g. Youbike)
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