


Viewpoint

Reflecting on an Integrated Approach for Transport and Spatial Planning as a Pathway to Sustainable Urbanization

Juhyun Lee 

Faculty of Spatial Sciences, University of Groningen, 9700 AV Groningen, The Netherlands; juhyun.lee@rug.nl

Received: 4 November 2020; Accepted: 4 December 2020; Published: 7 December 2020



Abstract: An integrated approach to transport and spatial development has been promoted over the past decades not only in North America and Europe but also in rapidly growing cities in Asia as a means to achieve sustainable urbanization. Some fundamental issues are yet to be discussed. To what extent does land use and transport integration (LUTI) meet its goals including triggering sustainable land use and enhancing environmental quality? What are the key barriers and opportunities to achieving broader social outcomes such as wellbeing of local populations? This paper critically reflects on LUTI planning and practice in rapidly developing cities with focus on ongoing challenges and opportunities to facilitating sustainable urban development. It points out that without establishing institutional harmonization between spatial and transport planning, LUTI policies are hardly implemented, thus rarely resulting in effective and sustainable land use. Moreover, enhancing the social outcomes by an integrated planning approach requires development control that facilitates various actors to embed quality criteria in development around nodes. Balancing development incentives and restrictive measures for development is critical. Finally, to facilitate sustainable outcomes across varied localities in cities, bottom-up and top-down planning approaches need to be reconciled through the strategic and operational phase of transport projects.

Keywords: sustainable urban development; rapid urbanization; land use transport integration; multi-level planning; sustainable urbanization

1. Introduction

An integrated approach to transport and spatial development such as land use transport integration (LUTI) has been promoted over the past decades as a means to achieve sustainable urban development, not only in North America and Europe but also in rapidly developing cities in Asia [1,2]. In megacities such as Hong Kong and Seoul, urban planning policies aim to achieve compact urban forms around transport nodes in order to trigger effective and sustainable land use as well as reduce environmental externalities [3]. A LUTI approach is considered key to realize Sustainable Development Goals (SDGs) due to its potential contributions to reducing greenhouse gas (SDG13) and improving the wellbeing of urban populations (SDG11) [4]. In practice, policy debates and academic discussions in those rapidly growing cities tend to focus mainly on the economic effects of densification strategy (e.g., Transit Oriented Development) or how to achieve immediate benefits from such strategy [5,6].

Some fundamental issues are yet to be discussed. What are the actual outcomes from LUTI implementation? To what extent does densification-focused planning policy achieve its ultimate goals such as facilitating effective land use and enhancing environmental quality? What are the key barriers and opportunities to achieving broader social outcomes such as enhanced quality of life of local populations? To ensure sustainable urban development, critical reflection on the outcomes and

the processes of land use and transport integration in practice is necessary, especially for those who consider LUTI policies along with huge investment in public transport infrastructure.

This paper critically reviews an integrated approach for transport and spatial planning in rapidly growing cities with a focus on barriers and opportunities to achieving sustainable urban development. It reflects on how urban planning practice and policy options might better address problems and issues arising from land use transport integration. It uses the author's experiences as a researcher, practitioner, and someone engaged in urban policy and planning in recently developed countries but also draws on a range of sources to illuminate critical components for an integrated planning approach.

2. Implementation of an Integrated Approach for Land Use and Transport Planning

In many rapidly developing cities, land use transport integration strategies—e.g., facilitating high-density commercial development at nodes and establishing public transport system—have been promoted in the official urban development plan [7–9]. In practice, it is not always feasible to implement such strategy when policy-makers and planners have to focus on dealing with various urgent issues arising from rapid urbanization (e.g., extreme congestion and lack of housing). Priorities are usually given to improving connections to the Central Business District (CBD) or providing adequate housing immediately in response to fast growing urban population and economy. In the context of limited time and resources, transport planners and spatial planners work in silos, rather than collaborating for an integrated approach. For example, spatial planning policy in rapidly growing cities takes a “land (housing) development first, transport development later” approach in order to accommodate continuously increasing migration flows to urban areas [10]. Large-scale housing development in peripheral areas is often planned without public transportation development. In the case of transport planning, attention is mainly given to enhancing accessibility to the commercial centers and reducing congestion, rather than providing sufficient transport networks to wider areas such as new satellite cities. The local population in the area suffer from limited accessibility to jobs and services for a while [11]. These experiences clearly demonstrate that urgency-driven, disintegrated urban development practice unavoidably creates negative social and environmental costs over time—e.g., socio-economic disparity between center and periphery, and poor local mobility and increasing traffic congestion.

To facilitate effective and sustainable land use by LUTI, there should be integration of spatial and transport planning processes from the strategic planning stage to the operational stage of urban development projects. In the case of mega urban transport projects (e.g., metro lines or bus rapid transits), spatial planners and transport planners must interact to translate macro-scale urban development goals (e.g., facilitating polycentric development) into integrated plans with clear targets. They need to co-establish a city-wide master plan, priorities, and evaluation criteria for projects with the aim of macro- and micro-scale integration—i.e., well-balanced transportation connecting activities across a city and carefully integrated land development into transport nodes. They also need to consider keeping a balance in the ratio between land use for transport development and other purposes (e.g., commercial buildings, housing). What appears to be fundamental for implementing the integrated processes is establishing institutional harmonization between spatial planning and transport planning [12,13]. Without institutional arrangements for land use and transport integration, an attempt at an integrated approach often ends up causing delay in the overall planning process and consequent cost overruns. A top priority in LUTI strategy should be removing institutional ambiguity regarding roles and responsibilities of actors in operating an integrated plan and creating a joint decision-making process that facilitates exchange of idea and knowledge between actors. Such a joint process should contribute to identifying creative solutions for effective land use around nodes especially when cities are at the rapidly developing stage. Overall, without building institutional clarity and harmonization, a LUTI strategy is unlikely to contribute to sustainable urban development even if there are strong wills of national or city governments.

3. Enhancing Social Outcomes from Land Use and Transport Integration

One of neglected issues in the discussion on an integrated approach is ‘if’ and ‘how’ outcomes from integration between urban transport and spatial development meet the needs and interests of local population. Notably, in many cities, LUTI policies focus on maximizing economic benefits from densification at nodes, rather than enhancing life opportunities of local population [14]. Broader social outcomes from LUTI such as greater accessibility for all are rarely considered as policy-makers and planners tend to believe that the extension of transport network and densification strategy would naturally lead to increasing accessibility to socio-economic activities across the city [15]. However, in reality, due to the limited demands for development in peripheral areas and increasingly concentrated development in the commercial center of a city, LUTI policy hardly results in fair distribution of accessibility to opportunities among varied localities. Spatial development at nodes (e.g., mixed or commercial developments) in peripheral areas is relatively limited while people living in the center benefit from an increasing number of jobs and services as well as greater access to the transport system. The differential distribution of benefits is noted not only between neighborhoods but also within neighborhoods. In many localities, spillover effects of development around nodes are much less clear than expected [16]. Once local socio-economic hubs are created at a transport node, disparity between a node and the rest of a catchment area appears to increase rather than decrease [12].

High-density oriented LUTI policies could create negative impacts on the quality of living environments over time [17]. Primary focus of land development projects at nodes is on increasing density of land use in order to maximize the profitability of the projects. Impacts on local environs and other factors that directly affect accessibility and quality of life at the local level are rarely considered. LUTI practices often result in limited types of land use as well as compromised quality of local environment. Public amenities and services that are located in proximity to nodes gradually disappear while main roads are commercialized [18]. Local communities experience increase in traveling time to access some daily activities due to the relocation of public facilities and increasing local congestion. Despite such a limited level of social outcomes from an integrated approach, facilitating compact urban forms at nodes is still strongly promoted by policy-makers in rapidly developing cities as a panacea for sustainable urbanization [19].

Achieving positive social outcomes from LUTI strategy requires a more integrated planning approach: utilizing development control tools that encourage various actors to enhance the quality of development around nodes. Current discussion on LUTI tends to focus on integration during transport development [20]. To ensure greater accessibility and quality of life across a city, an integrated approach should be utilized not only during the transport planning stage but also through the subsequent stages (e.g., appraisal and monitoring of land development that takes place after a transport project starts operation). What appears to be most critical is to clarify rules in spatial planning policy regarding the responsibility of actors in embedding quality criteria in development plans and design. Some important criteria include integrating public open space and pedestrian paths into private land, having pedestrian-friendly land use and design at ground level, and contributing to widening pedestrian paths. Increasingly, megacities in recently developed countries use the varied forms of development control—e.g., developers’ contribution and planning obligation—as keys for creating societal benefits out of development around nodes [3]. Developers are required to think carefully about ways to meet the specific needs of localities while ensuring the profitability of their projects. Successful negotiation between private and public sectors regarding the scope and design of development projects result in (re)development of essential public facilities and spaces as well as enhanced local environmental quality.

A key lesson learned from the cities that explicitly use development control for LUTI (e.g., Seoul and Hong Kong) is that balancing development incentives and restrictive measures is essential for the successful operation of an integrated approach. In practice, too much restriction or too few incentives discourage spatial development around nodes, limiting necessary changes, especially in peripheral areas (i.e., areas with limited locational advantages). Too little control over the responsibilities in

integrating development around nodes and ensuring the quality of land development may easily create a situation in which developers just consider maximizing profitability of their projects. What matters the most is that rather than applying a static approach to controlling land use, incentives and social outcomes from each development have to be discussed and adjusted among various stakeholders through a transparent decision-making and planning process. Establishing an institutional process that facilitates negotiation on the reasonable levels of incentives and social contribution is critical.

4. Multi-Level Planning to Achieve Sustainable Outcomes from an Integrated Approach

In many cities, approaches to integrating transport and spatial planning give little attention to the varied interests and conditions of different localities across a city. One-size-fits-all approaches of current transport and land use integration seem to fail in enhancing life opportunities across varied urban areas [21]. Different localities have different opportunities and priorities, and there should be context-specific strategies in order to maximize benefits from integrated development. For example, in CBD areas—i.e., areas with high market demands for land development—priorities should be given to maintaining a high quality and a wide range of development in the catchment area and mitigating negative impacts of rapid commercialization on neighborhoods. In peripheral areas, priorities include dealing with spatial disparity between areas in proximity to a node and residential areas, and improving local mobility and connectivity to nodes, rather than just focusing on increasing density at node.

It is important to note that in rapidly developing cities that apply a rather top-down approach to urban planning, achieving positive consequences of LUTI across a city appears to be dependent on the extent to which local actors are allowed to make decisions according to priorities at localities. This suggests that local authorities and communities need to play a key role in deciding incentive levels and desired outcomes for development along transport corridors. A significant lesson learned from the implementation of LUTI policies is that if local authorities are given a reasonable level of responsibility as well as decision-making authority, their accountability and capacity to facilitate desirable outcomes can be enhanced [22]. They become proactive in ensuring the quality of development in order to facilitate positive outcomes from an integrated approach, rather than relying heavily on the central government or metropolitan government. Implementing such a localized approach requires gradual changes to be made to existing static planning rules that do not allow for context-specific approaches to development at the local level.

Fundamentally, achieving long-term positive outcomes across a city requires a multi-level planning process, rather than primarily addressing a localized planning. For integration of transport and land use, it is crucial that policy-makers and planners in rapidly growing cities consider reconciling top-down and bottom-up approaches through the different stages of urban transport development projects. At the initial stage, policy makers need to take leadership in promoting public transport development and LUTI policy as catalysts for sustainable urbanization, while planners focus on ensuring the quality and feasibility of plans. At the operational stage, local authorities need to be given sufficient responsibilities in controlling the quality of project deliverables—e.g., accessibility, mobility, and environmental quality—by considering the needs of the neighborhood. Implementing such a multi-level approach cannot be achieved without alignment of goals between layers of government and balanced responsibilities of actors at the different levels. The metropolitan government's responsibilities include setting up a strategic direction for LUTI across a city and screening the quality of development according to macro-level goals of urban policy (e.g., polycentric development, fair distribution of accessibility across a city). Local governments' roles include establishing a strategy for local development according to varied local interests, and evaluating the quality and feasibility of development proposals according to the strategy. Local communities should be proactively involved in identifying specific challenges and opportunities in enhancing the quality of life of their neighborhoods.

5. Towards an Integrated Approach for Sustainable Urbanization

This paper addressed the fact that an integrated approach to urban transport development such as LUTI policies in rapidly developing cities does not always guarantee sustainable land use nor the socio-economic wellbeing of local populations across a city. Barriers and opportunities to achieving sustainable urbanization by an integrated approach should be learned and improved, rather than neglected in the context of urgency-driven planning and limited resources. Neglecting “lessons learned” will lead to increasing cost and to compromising effectiveness of an integrated approach. Furthermore, huge investment in urban transport development should contribute to facilitating broader social outcomes such as enhanced accessibility and quality of life for all. Social responsibilities of public authorities, private landowners, developers, and residents should be promoted in order to ensure that social (public) goals of transport infrastructure projects are delivered. The roles, responsibilities, commitments, and capacities of all the actors should be defined and enhanced. All in all, integration between transport and spatial development across territorial levels can create sustainable benefits only when capable actors proactively identify key opportunities and barriers for their cities and neighborhoods.

Funding: This research was funded by University of Groningen.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Bertolini, L. Integrating mobility and urban development agendas: A manifesto. *disP Plan. Rev.* **2012**, *48*, 16–26. [CrossRef]
2. Sung, H.; Choi, C. The link between metropolitan planning and transit-oriented development: An examination of the Rosario Plan in 1980 for Seoul, South Korea. *Land-Use Policy* **2017**, *63*, 514–522. [CrossRef]
3. ADBI. *Transit-Oriented Development Policies and Station Area Development in Asian Cities*; Asian Development Bank Institute: Manila, Philippines, 2019. Available online: <https://www.adb.org/sites/default/files/publication/502516/adbi-wp947.pdf> (accessed on 20 May 2020).
4. Berawi, M.; Saroji, G.; Iskandar, F.; Ibrahim, B.; Miraj, P.; Sari, M. Optimising land use allocation of transit-oriented development (TOD) to generate maximum ridership. *Sustainability* **2020**, *12*, 3798. [CrossRef]
5. Basheer, M.; Boelens, L.; Bijl, R. Bus Rapid Transit System: A Study of Sustainable Land-Use Transformation, Urban Density and Economic Impacts. *Sustainability* **2020**, *12*, 3376. [CrossRef]
6. Mathur, S. An evaluative framework for examining the use of land value capture to fund public transportation projects. *Land Use Policy* **2019**, *86*, 357–364. [CrossRef]
7. BPPD. Regional Plan for Jakarta Region 2013–2017. *Badan Perencanaan Pembangunan Daerah*. 2013. Available online: https://www.bappenas.go.id/files/rpjmd_dan_rkpd_provinsi/DKI%20Jakarta/RPJMD%20DKI%20Jakarta%202013-2017.pdf (accessed on 1 June 2020).
8. HKPD. *Planning and Urban Design for a Liveable High-Density City*; Hong Kong Planning Department: HongKong, China, 2016. Available online: https://www.hk2030plus.hk/document/Planning%20and%20Urban%20Design%20for%20a%20Liveable%20High-Density%20City_Eng.pdf (accessed on 20 May 2020).
9. SMG. *Seoul Plan 2030*; Seoul Metropolitan Government: Seoul, Korea, 2014.
10. Sung, H.; Oh, J. Transit-oriented development in a high-density city: Identifying its association with transit ridership in Seoul, Korea. *Cities* **2011**, *28*, 70–82. [CrossRef]
11. Tuan, V.; Son, D. Accessibility to public transport systems in developing countries—An empirical study in Ho Chi Minh City, Vietnam. *J. East. Asia Soc. Transp. Stud.* **2015**, *11*, 1240–1258.
12. Lee, J.; Arts, J.; Vanclay, F. Examining the social outcomes from urban transport infra-structure: Long-term consequences of spatial changes and varied interests at multiple levels. *Sustainability* **2020**, *12*, 5907. [CrossRef]
13. Yang, W.; Veeneman, W.; Jong, M.; Song, J. Integrated transport management: Lessons from a Chinese city. *Res. Transp. Econ.* **2020**, *83*, 100918. [CrossRef]

14. World Bank. *Transit-Oriented Development Implementation and Resources*; World Bank: Washington, DC, USA, 2018; Available online: <http://documents1.worldbank.org/curated/en/261041545071842767/pdf/TOD-Implementation-Resources-and-Tools.pdf> (accessed on 1 July 2020).
15. Jeong, I.L.; Lee, B.; Kim, H. *Improving Fairness of Infrastructure Development Policy for the Fair Society*; Korea Research Institute of Human Settlement: Anyang, Korea, 2011.
16. Ahlfeldt, M.; Pietrostefani, E. *The Compact City in Empirical Research: A Quantitative Literature Review SERC Discussion Paper 215*; Spatial Economics Research Centre, LSE: London, UK, 2018; Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3102361 (accessed on 8 August 2020).
17. Jenks, M. *Compact City*; Wiley: Hoboken, NJ, USA, 2019. Available online: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118568446> (accessed on 6 April 2020).
18. UN-Habitat. *Planning Sustainable Cities. UN-Habitat Practices and Perspectives*; UN-Habitat: Nairobi, Kenya, 2019. Available online: <https://unhabitat.org/sites/default/files/download-managerfiles/Planning%20Sustainable%20Cities%20UN-HABITAT%20Practices%20and%20Perspectives.pdf> (accessed on 8 August 2020).
19. Bamwesigye, D.; Hlavackova, P. Analysis of sustainable transport for smart Cities. *Sustainability* **2019**, *11*, 2140. [CrossRef]
20. ARUP. Transformative Rail. 2020. Available online: <https://www.arup.com/perspectives/transformative-rail> (accessed on 8 August 2020).
21. Neuman, M. The compact city fallacy. *J. Plan. Educ. Res.* **2005**, *25*, 11–26. [CrossRef]
22. Ren, T.; Dorina, P.; Lenferink, S.; Bertolini, L.; Stead, D.; Krabben, E. Is transit-oriented development (TOD) an internationally transferable policy concept? *Reg. Stud.* **2018**, *52*, 1201–1213.

Publisher’s Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2020 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).