1. Transport and space and social equity impacts
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UNDERSTANDING THE LINKAGES BETWEEN TRANSPORT AND SPACE AND SOCIAL EQUITY IMPACTS

> Bleak, dark, and piercing cold, it was a night for the well-housed and fed to draw round the bright fire, and thank God they were at home; and for the homeless starving wretch to lay him down and die. Many hunger-worn outcasts close their eyes in our bare streets at such times, who, let their crimes have been what they may, can hardly open them in a more bitter world.
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> Charles Dickens (1837) *Oliver Twist*, p.174.

In the 1800s, in Victorian England, Charles Dickens famously highlighted the problems of poverty, of the large inequity in living standards across the population, of the weaknesses of human behaviour – and of the role of government institutions in protecting the status quo and ignoring the disadvantaged. These may be distant times, when there was little protection against the harshness of life circumstance. But, look around in our cities and we see increasing inequity, in income, activities and life opportunities. A focus on supporting economic growth, the financialisation of development, and overlooking of distributional issues, has led to very unequal lifestyles. We seem not to have progressed far in society – with significantly unequal participation in activities across many cities globally.

Social equity has been the focus of research in geography, development studies and economics for decades, and in recent years has been given greater consideration in transport and city planning. Research considers how transport systems facilitate access to activities, in a differential manner by population group. Hence, the availability of transport systems is closely linked to social inequity.

Transport systems and infrastructure investment can lead to inequitable travel behaviours, with certain socio-demographic groups using particular parts of the transport system and accessing particular activities and opportunities. Transport planning has conventionally focused on providing for increased levels of mobility, initially in terms of highway capacity for the private car, but increasingly with infrastructure for public transport, walking and cycling. A problem has been that the appraisal and evaluation of projects has focused on metrics of mobility, such as vehicle kilometres travelled and time savings. This has led to investment in projects that enhance levels of mobility – and there has been relatively limited consideration given to other important policy objectives, such as transport's contribution to spatial and social goals.

In terms of definitions, there is much confusion and conflation of key concepts in the literature, but we understand the following terms, in this edited book, as below:

- Transport: 'to transfer or convey from one place to another' (transitive verb); or 'an act or process of transporting' (noun).

- Space: 'a continuous area or expanse which is free, available, or unoccupied' or 'an area of land' (noun).
- Social equity: the quality of 'being fair and impartial' (noun), including fair access to activities, opportunities, livelihood, education, income and resources, as facilitated, in this case, through transport.
- Social justice: the fair relation between the individual and society, including 'a fair distribution of activities and opportunities within a society' (noun).
- Disadvantaged groups: a group 'in unfavourable circumstances' (adjective), including by income, age, gender, ethnicity; and by area and temporally.

(Merriam Webster Online Dictionary, 2018)

There are interpretations of horizontal equity, where individuals and groups should be treated the same in the distribution of resources, benefits and costs; and vertical equity, where disadvantaged groups are favoured in order to compensate for inequity, i.e. through progressive policy interventions.

Transport is not the only contributor to social equity, indeed unlikely to be the most important factor, but it can play a significant role in facilitating access to activities. Different transport systems, including modes, extent of networks, running times and cost of access, all contribute to differential travel experiences and impacts by socio-demographic groups, spatially and temporally. The objective, in policy terms, is that transport governance and investments can be better understood and shaped to contribute more positively to social equity.

There is, of course, a problem in empirical terms in understanding what level of social (in)equity is appropriate in different contexts and how this might be measured. The concept of social equity can be interpreted and understood in different ways, is relational, spatially and temporally, hence there can be no agreed overall threshold across contexts.

The aim of this book is to explore these issues and the differential impacts, relating transport to social equity. We use international case studies to explore the spatial and social equity impacts associated with transport systems, city planning and infrastructure investments.

Contributions are made in 21 chapters, from 42 leading and newly emerging researchers, each addressing the issues from a particular angle or viewpoint. This publication brings together, in one volume, wide-ranging evidence from the field, and in doing so fills a major gap in the literature. The book draws on competing viewpoints to highlight the range and dimensions of the debate, the complexity and tensions, and the progression in argument over time. The volume will serve as a guide for undergraduates and graduate students, researchers and academics wishing to find a comprehensive reference to research on transport, space and equity impacts. We hope too that the debate will reach a wider audience, including consultants, policy makers and wider practitioners. In this way the book can gain a wider reach, including achieving some influence on practice.

There is an increasing understanding that transport can be more than a derived demand – that transport has distributional impacts, indeed the journey itself can be useful, and increasingly so, as travel can be used in useful ways, including to access work, leisure and other activities, and to participate in life. Equity impacts associated with transport investment are very different relative to context and there are no general rules to be found in terms of the expected impacts of infrastructure investment – there are many

factors involved. The 'static' intervention of infrastructure is inserted into a complex and dynamic context, hence empirically this is a difficult research area to conceptualise and test empirically. Appropriate urban planning, infrastructure, pricing, education and training, and wider factors, need to be considered to ensure that socially and spatially-equitable impacts are realised.

Beyond this introduction, this book is structured into five further parts:

PART II TRANSPORT AND SPATIAL IMPACTS

Part II contains six chapters, and examines spatial impacts concerned with transport, including how public transport investments are associated with changes in socio-economics; city and neighbourhood development and regeneration; and development value.

Robbin Deboosere, Geneviève Boisjoly and Ahmed El-Geneidy consider the impact of improved accessibility on employment opportunities in the Greater Toronto and Hamilton region, using the concept of competitive job accessibility, defined as the number of accessible jobs by number of workers who can access them. Increases in transit accessibility for low and medium income neighbourhoods are associated with higher increases in income, yet lower increases in income for the higher income areas. This is perhaps explained by the migration of higher income groups out to the car-dependent suburbs, and reflective of the continuing flight to the suburbs in this context.

Jan Scheurer and Carey Curtis examine socio-spatial equity and transit investment in Melbourne. Following inner-urban gentrification trends over several decades, Australia's larger cities show a strong pattern for socio-economically disadvantaged groups to reside at the urban fringe, where they are also transport-disadvantaged. Spatial data compares socio-economic disadvantage against indicators of public transport accessibility to illustrate how current public transport investment programmes in Melbourne could be modified and expanded to address spatial inequalities. It is argued that a greater geographical reach of high-quality public transport and of opportunities for low-car living must coincide with dedicated housing affordability programmes if a reversal of social-spatial disparities is to occur.

Lixun Liu explores the case of Chongqing, asking what factors influence people choosing rail transit and how these vary over space. Geographically weighted regression is used to show differences in travel between old and new neighbourhoods. Longer commuting distance is associated with reduced use of transit, particularly in the old city neighbourhood. Here, the wealthy established residents tend to use the car and migrants tend to use the bus. However, it is important to understand the role of the planning strategy and the development planned around the transit investment – this is critical to the developmental benefits that follow the transit investment.

Qiyan Wu, Anthony Perl, Jingwei Sun, Taotao Deng and Haoyu Hu explore the development of the high-speed rail (HSR) network in China and the associated impact on accessibility, mode choice and spatial structure. Cities that gain intercity connections through HSR have higher accessibility enhancements, such as Huzhou. Daily commuting catchments have increased, thus more cities are absorbed within the commuting catchments of the major cities such as Shanghai and Beijing. The city region expands to the scale of the supercity, representing a new scale of urban development and interaction.

Emilia Smeds considers journeys to school in relation to social practices and the dimensions of material, meaning and competency. This is viewed as a more complete framework for assessing social change than psychological theories which concentrate on attitudes at the individual level. Two schools are analysed, using interviews, in Ealing, West London. The prevalence for driving to school is based on a range of issues, including lack of suitable walking and cycling facilities, space-time constraints on parents' mobility, poor public transport provision, availability of school choice, and negative meanings such as fear of traffic. Hence the difficulties in moving people away from the use of the private car for journeys to school – they are much more fundamental than changing individual behaviours and very often involve deeper, structural issues.

Imogen Thompson examines the link between transport investment and housing development and value, using hedonic modelling of connectivity to the Jubilee Line Extension and the East London Line in London, and associated house sale values. House prices increase with improved public transport connectivity, particularly where they were previously low. There also seems to be a distance component, with housing located 320–640 metres from the station gaining greatest price uplift.

PART III TRANSPORT AND SOCIAL EQUITY IMPACTS

Part III contains six chapters, and examines social equity impacts associated with transport, including spatial restructuring and social dynamics, access to healthcare, the travel of working women, children and young people, and the potential for innovations in reducing inequality.

Eran Feitelson puts forward an approach to examining the equity implications of public transport, discussing the attributes of different transport systems, the types of trips made and attributes of travellers – and hence summarises the likely equity implications. There are important impacts on accessibility and life prospects. The hyper-mobile benefit most from travel, and these use air and high speed rail in particular. The most obviously progressive mode is the use of the bus (alongside walking), which is subsidised by taxpayers and, in the main, serves lower income groups.

Kristian Bothe and Christine Benna Skytt-Larsen examine Metro investment and socio-spatial impacts in Copenhagen, suggesting that residents within the catchment of the Metro have higher levels of education, lower unemployment rates and higher mean incomes than the reference group beyond. However, the largest differences are between neighbourhoods within transit catchment, reflecting the different socio-economic characteristics of each area. Amagerbro and Ørestad, for example, experience large increases in mean incomes. Much of the change in social composition of the station catchments is driven by differences between the stayers, in-movers and out-movers relative to the conditions before the Metro investment. Impacts of the Metro hence reflect a combination of the Metro investment, the local context, provision of urban amenities, type of housing provision and supporting urban policies.

Neil Stephen Lopez and Jose Bienvenido Manuel Biona assess cumulative accessibility to healthcare services in Metro Manila, using Google Maps. Access to health car provision differs by mode and travel budget, particularly under 100 Philippines Pesos (PhP). Almost half of zones do not have access to a healthcare facility by private car for a travel budget

of 100 PhP. Public transport has advantages over private modes at lower travel budgets; and the private car becomes more advantageous at higher budgets. The peripheral areas have high costs of accessing healthcare, and this is where public transport access is often very limited.

Eda Beyazit and Ceyda Sungur explore gendered mobilities in the periphery of Istanbul, within a capitalist-based and patriarchal society. Higher paid work in central areas is often not possible for females due to the lengthy journeys from suburban areas, cost of travel and household responsibilities; whereas males are able to choose higher paid jobs from a wider geographical area across the city. Poorly educated females are particularly disadvantaged in the poor periphery, experiencing higher levels of walking to work and use of company shuttle services, often to lower paid employment.

Janet Stanley, John Stanley and Brendan Gleeson examine transport and social equity impacts from the perspective of children and young people. They examine the theoretical contributions from authors such as Rawls and Sen, the use of needs identification in transport planning, and the importance of transport for children and young people in helping them to participate in activities and social interaction. They suggest that the needs of children and other groups in society should be better catered for, instead of solely focusing on improving the journey to work for commuters.

Karen Lucas, Nihan Akyelken and Janet Stanley put forward the livelihoods approach as a method for assessing the social impacts of transport projects in relation to the Sustainable Development Goals. A number of criteria are developed, including issues of social progress, distribution and justice, to help consider the requirements of different populations and areas into which projects might be introduced. Case study material is used from South Africa and Brazil.

Perhaps the next stage here is to think what benchmarks might be achieved? Beyond encouraging progress against key criteria, we should also think what we should be aiming for in terms of our 'future' state?

PART IV EMERGING APPROACHES TO SOCIO-SPATIAL EQUITY ANALYSIS

Part IV contains seven chapters, and examines emerging approaches to socio-spatial equity analysis, including capabilities-based approaches, behavioural interventions, motility and multi-actor appraisal.

David Banister, Yannick Cornet, Moshe Givoni and Glenn Lyons critique the commodification of travel time savings in transport planning and project appraisal. They ask for less focus on travel time and, instead, that consideration should be given to the door-to-door journey, the experience of travel and type of activities at the destination. A case study of High Speed Rail is used to discuss the issues. The concept of reasonable travel time is developed, reflecting a difference between useful and non-useful travel.

Mengqiu Cao, Yongping Zhang, Yuerong Zhang, Shengxiao Li and Robin Hickman apply different social equity measures, including the Capability Approach, Gini coefficient, Atkinson index, Palma ratio, Pietra ratio, Schutz coefficient and Theil index, in relation to transport and social equity in the neighbourhood of Tuqiao, Beijing. This is a migrant-rich, low income neighbourhood, adjacent to the East Sixth Ring Road and

Batong Subway Line One extension. Gender, age, hukou, incumbent population, personal income and car ownership are related to travel and travel experience.

Beatriz Mella Lira discusses the use of the Capability Approach in relation to transport and social equity. The concepts of capabilities and functionings are used to help consider the things a persons may value doing and being, including the activities that they are able to perform. A list of social indicators is developed, including life, bodily health, bodily integrity, sense and emotion. The lower the levels and higher the gap between the current and expected achievement of opportunities are seen as reflective of social inequity, with transport viewed as a facilitator in the development of fairer societies.

Geert te Boveldt, Imre Keseru and Cathy Macharis discuss the use of greater participatory approaches in transport appraisal, specifically through the application of Competence-based Multi Criteria Analysis (COMCA). This allows the use of multi-actor viewpoints where different actors have varied roles, tasks or levels of responsibility. The Brussels North–South railway corridor is used as a case study, with project options rated against a do-nothing alternative.

Matt Higgins discusses the potential of behavioural economics, and particularly the Mindspace framework, for use in consultation processes around transport projects. The Walthamstow Village Mini-Holland cycle scheme in London is used to explore the potential for framing projects in a way that might reduce public opposition. The role of the messenger, incentives and salience are seen as particularly important in project development and in limiting any public controversy that might follow.

Rebecca Shliselberg and Moshe Givoni discuss the concept of motility as an emerging objective for transport policy. Motility is defined as the capacity to engage in travel, including the elements of spatial and social mobility. Semi-structured interviews are used to discuss personal narratives and a survey to understand cognitive processes in travel, experience and activity participation.

Finally, Florencia Rodriguez Touron examines the concept of motility and the linkage to eudaimonic well-being, using a case study of Buenos Aires. Telephone surveys and interviews are used to assess motility (using factors such as transport availability, access to activities, personal safety and travel cost) and well-being is hence (in terms of human flourishment), across different communes in the city. The findings reveal that increases in the motility scale are significantly associated with increases in well-being.

PART V CONCLUSIONS

Part V contains the final chapter, bringing the edited collection to a close, synthesising the wide field, and providing reflections on the implications for research and practice. It discusses the rich literature, puts forward the current 'state-of-the-art' in our understanding, and asks 'What next?' in terms of the emerging issues for future research and practice.

There are some very interesting contributions here – we hope you enjoy the read!

REFERENCE

Dickens, C. (1837) *Oliver Twist*, London, Vintage Books [Republished 2013].