

CITY-WIDE STRATEGIES FOR INTEGRATION OF SURFACE TRANSPORT MODES IN LARGE CITIES

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ABSTRACT

This paper asks the question “What makes a large city successful?” and then explores some of the dimensions of success that relate to surface transport. Based on four case studies of city-wide strategies to balance the urban transport share reviewed by Technical Committee TCB.3 Improved Mobility in Urban Areas, themes of integration of surface transport modes are discussed.

Integration occurs at the institutional level, and whatever form this takes, the relationships between different players in the land use and transport sector are critical in this. Published strategy becomes a common reference point for integrated approaches. Integration is experienced by the end user quite differently, however, and the paper concludes that the true test of an integrated system is one that passes both the public perceptions test and the institutional connectedness test.

1. SUCCESSFUL CITIES

1.1. Measures of success

What makes a large city successful? In recent decades analysts, academics and corporations have tried to measure various aspects of cities, to allow comparisons on a variety of characteristics. It is fascinating to review these global city indices, and they give us insights into what is considered “success” by those trying to measure it. The Urban Land Institute (ULI) has undertaken a comparison of many of the indices that are currently used. In this work, ULI cites the “broadly accepted” success factors as:

- Connectivity and space to grow
- Quality of life and place (urban design)
- Skills of the labour force
- Innovation and creativity
- Entrepreneurship
- Industrial structure
- Transparency of business environment
- City branding and identity

In the ULI’s comparison of 30 global city indices, it concluded that while the “big four” global cities of London, Paris, Tokyo and New York still performed best among the indicators overall, they did not compare favourably on all indicators, particularly on quality of life indicators, that tended to be dominated by cities in Scandinavia, Switzerland, Canada and Australia/New Zealand. [1]

As an Australian living in Melbourne, it is always headline news when Melbourne does well in one of the indices – the Economic Intelligence Unit’s Liveability Rating is the main one,

where Melbourne was in previous years rated number one and has stayed in the top three since. Interestingly, Melburnians don't really hear about the other indices and I daresay the same is true for other cities. One would hardly expect to see The Financial Times make a big deal of Vancouver being rated number one in the Liveability Rating, when London does not score highly, due to traffic congestion and higher crime rates.

1.2. Road authority role

What role do road authorities have in contributing to the "success" of a city? Of the factors listed above, the spatial ones (connectivity and space to grow, quality of life and place) have the greatest connection, with the potential for road authority activities to also affect branding (e.g. through building iconic bridges). However, there is no "stand alone" measure to which road authorities can lay claim. In part, this is because the end user generally doesn't rate the "road network" as such. The end user would be more likely to think in terms of the overall ability to get around easily, and the amenity of doing so, as well as a general feeling of liking the place they are in, as they use public spaces that inevitably include roads.

So if the end user thinks in terms of an overall perception, this gives road, public transport and planning authorities the impetus to work towards an overall integrated outcome for the transport system and the city. Interestingly, although this sounds simple, it has not traditionally been achieved. Some cities, however, have taken a deliberately integrated approach to setting plans and implementing them.

Technical Committee B.3 has been looking at Improved Mobility in Urban Areas. The first working group from this committee has had the challenge of reviewing integration of modes – balancing mode share to reduce congestion and improve mobility. This has been done by looking at case studies. These case studies have analysed both city-wide strategies, that featured multiple types of improvements occurring together, and more focused strategies, such as introducing a new facility or feature and seeking to bring about improvements in mobility that way.

This special session on large cities has been structured in two parts, aligning with our working group's approach. The first part looks at city-wide strategies, while the second part looks at implementation of individual strategies to tackling the need for greater accessibility and mobility.

The four city-wide strategies reviewed by Technical Committee B.3 working group 1 were Zurich, Ile de France, Seoul and Santiago. While the theme of integration is common to each of them, it is different for each city. We will be looking at these examples later in this paper. But first, we spend some time thinking about the component parts.

2. WHAT IS THERE TO INTEGRATE?

2.1. Components of a transport system

Before we look at how surface modes of transport might be better integrated, it is useful to consider their component parts. At the broadest level, the transport system can be considered as having two component parts: infrastructure and users.

2.1.1 Infrastructure

Infrastructure includes all of the physical assets and facilities of transport systems, namely:

- Roads belonging to a national/state authority
- Private roads
- Roads belonging to a local authority
- Rail/light rail belonging to rail authority
- Car park providers
- Points of access from land uses onto each of these types of infrastructure (e.g. driveways, intersections, railway stations, bus stops)

2.1.2 Users

Users of the transport system have been divided into two groups – professional and personal. This is done as they take different approaches to using the network.

Professional users of the road network are cost conscious, service oriented and with their significant experience of the network, provide unique insights into, and themselves influence greatly, the system's success. The stakes of getting transport right are quite high for this group – it's their job, after all! Professional users include:

- Operators of public transport services (can be several)
- Taxi operators
- Freight and logistics companies

Personal users of the road network make decisions based on a very different set of factors, and these factors are heavily influenced by their perceptions, which may or may not be an accurate representation of reality. For example, the choice of mode may be influenced by cost factors that don't count the standing costs of a private car. Route choice is made based on previous experience, or knowledge of alternative routes should something go wrong. For personal users, transport is a means to an end. Personal users include:

- Passengers of various public transport services
- Motorists and their passengers
- Cyclists
- Pedestrians
- Motorcyclists and scooter riders

Of course, passengers of public transport services are somewhat connected to the operators of those services. However, they are represented separately because the decisions made by the providers of the service are independent of the decisions made by the users of the service.

2.2. Road user perceptions of integration

To users of the road system, the better integrated the system, the less it will be noticed. Users notice boundaries and barriers, for example, a road user would notice a physical discontinuity in the transport system, they would notice a discontinuity in payment systems (for example for different ticket types, different toll collection systems), and they would notice poorly coordinated (thus discontinuous) public transport systems. A road user would not necessarily notice that planning for land use and transport systems is not integrated, and they would not necessarily notice if different public transport operators are not working towards the same set of system objectives.

Road authorities are quite used to the concept of seamless road networks – for example, it is unusual, except for toll roads, for motorists driving a car to be aware at what point they have left the local road network and joined the arterial road network, even though they are managed by different organisations. Members of the public can be excused for not

knowing which authority to complain to about potholes, for example, on a certain road because the authorities have done a good job of making the two road types work together in a seamless system.

On the whole, if we were to ask road users about integration, we would come back to the more general indicators of city success that were outlined in section 0, as city road users are simply people living in a city. Taking a more complex view of integration requires a “behind the scenes” look at integration of strategy, of legal frameworks, of overall city goals. Behind the scenes, we see the role of integration in that transport systems, their technology, the planning for them, improvement of them and their administration.

2.3. Building integration into strategy

In two of the city-wide strategies that were reviewed by Technical Committee B.3, working group 1, a set of principles/challenges was articulated. They were for the Zurich Mobility Strategy and the Commuting Plan for Ile de France, the Greater Paris region.

Table 1 outlines the principles of the Zurich strategy and the challenges of Ile de France, broadly aligned with one another.

Table 1 - Comparison of Zurich and Ile de France transport strategy principles/challenges

Zurich – principles	Ile de France – challenges
<ul style="list-style-type: none"> Overall culture of mobility 	<ul style="list-style-type: none"> accessibility for all of the community, including those with disabilities;
<ul style="list-style-type: none"> supply (instead of demand) oriented mobility planning; 	<ul style="list-style-type: none"> finding ways to discourage the use of the private car
<ul style="list-style-type: none"> adjustment of urban growth and mobility development; co-existence instead of separation mobility management complementary to infrastructure; 	<ul style="list-style-type: none"> defining policy on urban forms, infrastructure and public spaces;
<ul style="list-style-type: none"> optimising overall traffic management; promoting cross-links between transport modes and cities; considering passenger transport capacity 	<ul style="list-style-type: none"> informing people about the actual costs and other information about travel choices, to encourage the best possible commuting decisions; ensuring public transport keeps up with demand and can supply all possible trips
<ul style="list-style-type: none"> promoting and operating a city of short trips; 	<ul style="list-style-type: none"> enhancing the status of walking in the transport chain; encouraging greater use of bicycles for many more short distance trips;
	<ul style="list-style-type: none"> adapting to and finding an appropriate role for powered two-wheelers;
	<ul style="list-style-type: none"> optimising the mode used for freight transport;
	<ul style="list-style-type: none"> mobilising all participants in delivering on the plan, including funding responsibility;

So what are the features of integration as outlined in the above case studies? The following integration themes are noted:

- the idea of short trips, by definition, means that either the origin or the destination, or both, must change. This implies **land use and transport integration**. It may also imply cultural and behavioural change whereby people use the nearest services, rather than travel longer distances.

- The idea of co-existence, instead of separation influences urban form. Developing systems that allow, for example, lower speed operating environments, make for co-existence of pedestrians and cyclists with public transport. This implies **physically integrated systems** – something also achieved by promoting cross-links between modes.
- The idea of the “**push and pull**” of **discouraging private car usage while encouraging other modes** is also clearly an integrated approach. The approach still seeks to provide accessibility for all of the community, and importantly takes account of the capacity and connectivity of public transport services. The discouragement of car use and the encouragement of use of other modes ultimately move in the same direction.
- The need for **institutional cooperation** is an integration theme, this is discussed further in the following section.

3. INTEGRATED ADMINISTRATIONS

Although it is not necessarily obvious to a person standing in the middle of a city how the city’s administrative structures work, it is these very “hidden” aspects of the organisation of cities that can have the greatest influence over how well integrated their surface transport modes actually are.

3.1. Institutional arrangements – case study cities

In the case studies that our working group investigated, the whole city strategies (Zurich, Ile de France, Seoul and Santiago) [2] had different institutional arrangements.

In the greater Paris area, **Ile de France**, the development of an urban commuter plan has as one of its ten “challenges”, mobilising all participants in delivering on the plan, including funding responsibility. The need to mobilise relevant authorities is outlined up front, as the plan is being developed.

Zurich’s Mobility Strategy is implemented by the Department of Transport and Infrastructure, however it is fully backed by the City of Zurich, and a reference for all decisions influencing urban form and the transport system’s day to day operations. All aim towards the Strategy’s mobility strategy’s eight principles.

In **Seoul**, the integration of technology, and bringing together bus operations and traffic operations has brought extraordinary results for road operations. The integration of these two aspects of the transport system has been actual and complete. The operation of the buses, the management of parking controls on bus lanes, and even the use of bus information to inform traffic travel time estimation are undertaken in a fully integrated control centre.

In **Santiago**, the bus system was completely overhauled in 2007 to create “Transantiago”. This is also a common fare system for the public transport network. While the bus system has experienced teething problems, especially in early days, it is gradually being improved [3]. Also in Santiago, the highway authority is now working more closely together with the urban development authority, to see transfer of infrastructure development skills, and closer integration of the planning for concession roads and the remaining transport network. However this has generally been achieved with relatively minor institutional change in the authorities and private companies involved in system provision.

A general observation that it doesn't matter so much whether organisations are actually joined together, but more how they work together that counts. If planning authorities, public transport authorities and road authorities all refer back to a single master plan, and appropriate governance arrangements are in place, a fully integrated organisation is not required. On the other hand, sometimes the only way to bring in cultural change is to introduce new institutional arrangements.

3.2. A framework for achieving integration

Preparation of a master plan, as mentioned in the previous paragraph, requires a high level of cooperation to exist, if it is to pick up all of the transport system and land use factors influencing mobility in a city. A master plan, or "blueprint" is something of an ambitious target for some cities, starting off a low base of cooperation, coordination and integration. Therefore, the idea of a framework is presented below. Even without the actual details of what the ultimate shape of a city might be, and how it might function, having a framework assists with moving forward, a step at a time, towards that end.

In the previous chapter, the components of a transport system (infrastructure and users) were introduced. For the purposes of a framework, we need to "zoom out" a little more, and also pick up the context of the transport system within the city. The transport system is something of a "means to an end", with the "end" (or end-game) being people, living in places, working, studying and "doing life" in other places that happen to be (normally) in that same city, and the "things" (or goods) that are required to sustain the city's livelihood. We also pick up separately the "modes" – or the "means of moving".

The Integrated Transport Framework (Figure 1) is essentially a way of showing the relationship between people, places and goods, and the modes and networks that support mobility. It can be represented as follows:

- The end-game (who/what are we moving and where to and from?).
- The modes (the way the users/goods move, modes both publicly provided and privately used).
- The networks (the infrastructure elements that the modes use in order to achieve the end-game)

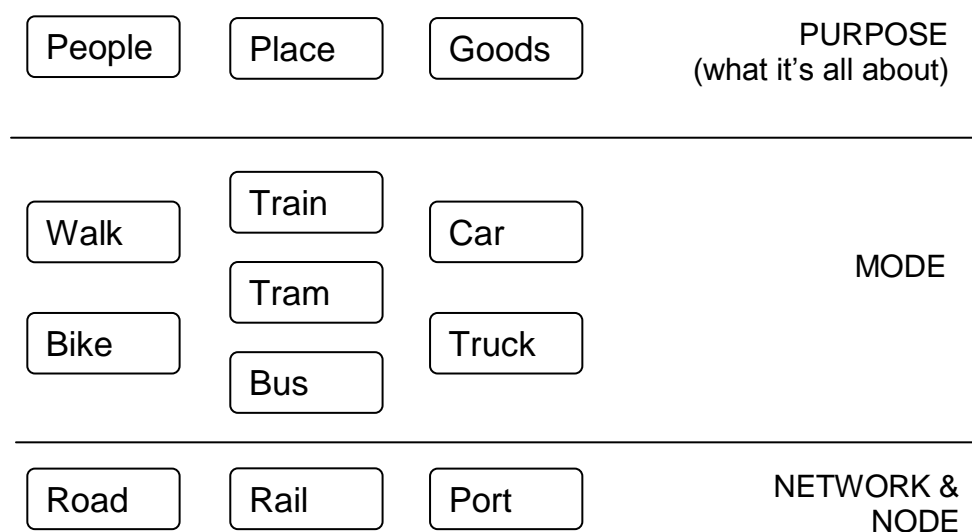


Figure 1 – Relationship between people, places and goods, and the modes and networks that support mobility. (Source: Department of Transport, Victoria Australia, Unpublished).

This is a helpful diagram for situations where there are multiple agencies, private companies and departments delivering on different components of the transport system. The institutional interfaces need not be barriers if the points of connection between them are understood.

For example, in the context of a whole transport system, one agency may focus on freight movement, both road and rail, and planning for ports and intermodal terminals. A private company may hold concessions for operation of private roads, while the operation of rail may be horizontally integrated with the infrastructure provider separated from service providers. Passenger rail may use much of the same infrastructure as freight rail, while the ultimate destinations of passengers and freight may be entirely different land uses.

Using the diagram above, it is possible to have a freight strategy, useful for consulting with the freight industry and planning for future economic growth and productivity improvements. However, because of the multiple overlaps between different parties, and the shared use of infrastructure, it will be important for any freight strategy to recognise these conflicts, document how they are to be managed, and ensure the right governance arrangements are in place to see them through.

The relevant parts of the framework to this illustrated are shown in Figure 2.

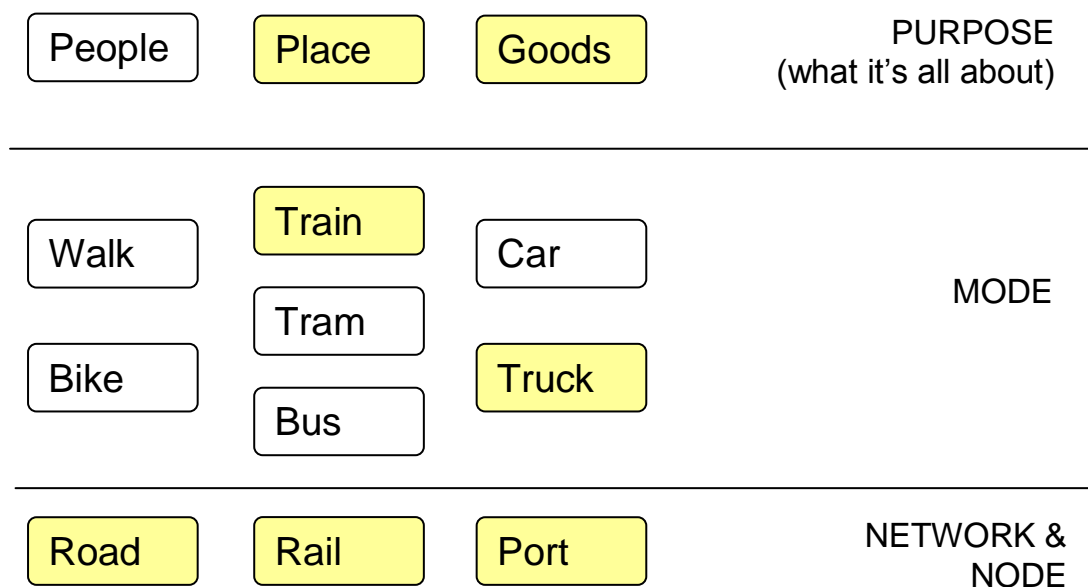


Figure 2 – Integrated Transport Framework – Freight Example

In another example, if the bus operator in a city wanted to develop a bus services strategy, it is very difficult to do this unless regard is had to the role of the different modes (including private ones) in moving people, and in how the road network is to be operated. This framework (see Figure 3) identifies the mandatory links that need to be considered for a bus strategy to be appropriately integrated.

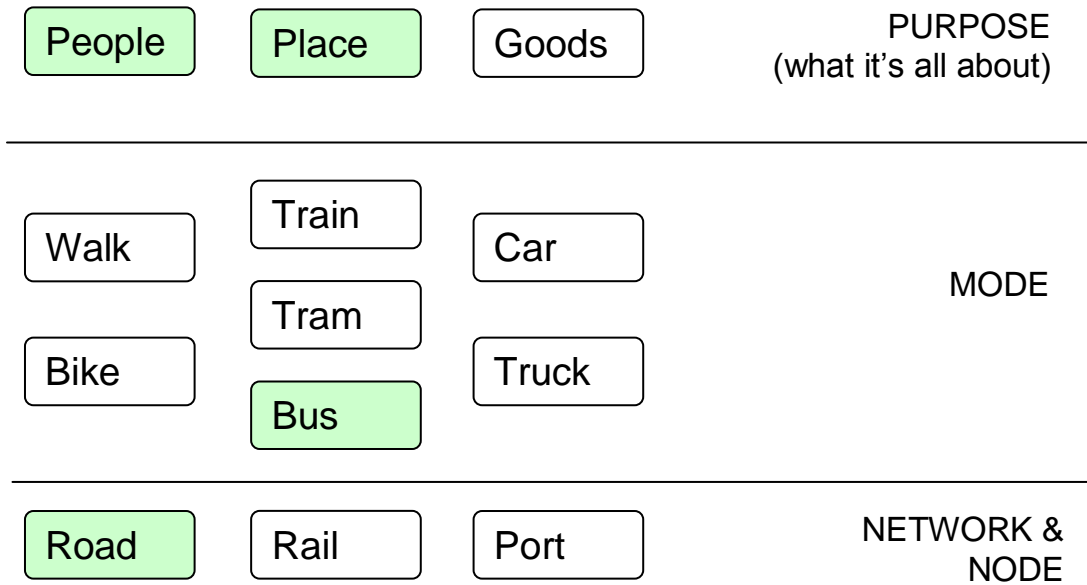


Figure 3 – Integrated Transport Framework – Bus Strategy Example

3.3. Old-fashioned communication

It's one thing to identify the stakeholders you need to work with when setting forth to make improvements to the transport system and its level of integration. It's another to them make it happen.

Communication, building working relationships, and overcoming long-held cultural differences between organisations are really important aspects of achieving integration in large cities. In some cultures, this can be enforced, in many it can only be achieved if it is nurtured.

In Victoria, Australia, a combination of these two approaches was introduced in 2010, with legislation passed called the Transport Integration Act [4]. This requires various parties to have regard to the overall transport system vision, and six transport system objectives when setting objectives for an individual project, program or plan; and to have regard to seven decision-making principles when making decisions affecting the transport system.

As well as transport authorities, the Act applies to parties known as “interface bodies”, who might be making decisions about land use. The Act states: “Where an interface body is making a decision which is “likely to have a significant impact on the transport system”, the decision maker must have regard to the vision, objectives and principles.”

“Having regard” to objectives or principles doesn't mean the decision has to change as a result. But it needs to be demonstrated that consideration has been given, and this creates a mandate for communication to occur between agencies as the city is developed.

3.4. Agreement on objectives

The more times different agencies talk to one another about interfaces between the decisions they make, and the need for integration, the more obvious it becomes that it is important to agree how to make decisions for operating the transport system. This is one

of the findings of the Zurich Mobility Strategy – Ten years on, which is being presented later in this session [5]. The challenge remains in Zurich just how to decide between widening the footpath or building a bicycle lane – the specifics of what should be implemented where.

A paper also submitted to this Congress, Lethco et al [6], outlines the approaches taken in Brooklyn, New York, Portland and Charlotte in the USA; and London in the UK to street network management that integrates and articulates prioritisation of the needs of different road users to different routes in the street network. The Network Operating Plan approach in Melbourne, Australia, being presented later in this session achieves a similar outcome [7].

4. THE TEST FOR INTEGRATION

The bottom line for integrated surface transport in a city is that both at the global strategy-setting level, and at the lower-end day-to-day operational level, the connections are obvious, not only to professionals in the field, but by end users.

At the high level, it should show up with improved outcomes in some of the “City Indices” mentioned in section 1. At the lower level, some of the tests might be those shown below.

Test for Integration: You know a city’s modes are integrated when:

- People’s perceptions of the best way to travel are increasingly accurate
- People don’t talk about discontinuities in service coordination
- People don’t talk about the physical barriers of changing from one mode to another
- A bus company knows who to ring in the road authority when they encounter an issue on the road
- The expectations of how the road will be managed are consistent and there is a reference point for when competing demands need to be managed
- Land use development in growth areas isn’t repeating the problems of past decades
- A land use development decision is made with reference to the transport infrastructure that exists
- Transport decisions are made with reference to the land use that exists

Achieving genuine integration of surface modes in large cities will inevitably involve a large number of parties. Road authorities must play a role in these discussions. In some places, they will lead, in others, they may be an equal partner. In some, road authorities may go “kicking and screaming” into the era of integration. And in a small number of cities, decision-makers may find that the best way to achieve integration is to assimilate the different functions into a single body, structured in a fully integrated way to leave nothing to chance.

I am very interested in hearing about some of the largest cities on earth – how Mexico City, where we sit today, is tackling its transport challenge, how Beijing and how Montreal have tackled theirs.

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