

Public Transport as a Common Pool Resource

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Few public transport debates come to terms with the questions of what constitutes public transport, of what is it for, and exactly how it differs from private transport, individual transport, and collective transport. For some engaged in these debates, public transport is supported because of its contribution to net social welfare or to welfare of segments of society; public transport is therefore held as being in the public interest. Although this proposition is most certainly true as a generalization, it reduces the understanding of public transport to essentially an expression of social values and suffers from being considered as purely subjective when tackling questions such as when and where public transport is to be preferred over its alternatives. Classical economics has traditionally explained the role of public transport as being necessary because free markets cannot be efficient and effective in providing a transport system. Public transport is necessarily provided by states because of the market failures arising from transport being a collective good, having costs and benefits that can't be captured by markets (i.e., externalities), and because of the problems of monopoly and associated potential abuse of market power. This view can be broadened by considering whether public transport is a common pool resource. This paper discusses these issues and identifies criteria that define public transport. A number of policy implications are discussed and it addresses the issues of why collective modes do not necessarily constitute public transport and why private transport cannot fully substitute for public transport.

1 Introduction

This paper aims to examine public transport as a common pool resource (CPR), as a way to provide a clearer understanding and definition of public transport.¹ There are several possible implications for transport policy and planning practitioners arising from a clearer understanding of the character of public transport. Australian public transport is the focus here, but much of the material and many of the concepts identified are drawn from international sources and can be applied universally.

Understanding what constitutes public transport can assist in understanding the respective roles of public transport and private transport and resolve some of the confusion that arises from efforts to use private transport modes to address public transport problems. A clearer understanding of public transport can assist in understanding the respective roles for public and private involvement, and identify the essential government role. This understanding can contribute to the dialogue and deliberations over reforms in public transport, especially those prompted by neo-liberal objectives, such as which aspects of a transport system should be provided by private firms and which should be state responsibilities.

¹ Whether or not the term 'collective transport' supports this view is discussed in Appendix I.

2 How is ‘public transport’ usually understood?

For the most part, ‘public transport’ is a common term dating back, at least, to the provision by states, private owners, and corporations of modes of motorized transport that could be enjoyed by the broader populace as these became available during the middle and latter part of the Industrial Revolution. As a result, public transport was broadly taken to mean transport services made available to the general public. (Various non-motorized public transport options existed prior to this, of course, but are not typically providing mass transport and are not usually considered as public transport.) During the development of urban and regional transport, and when states began to assume a major role in organizing modern transport systems involving motorized transport in the late nineteenth century, the idea of public transport becomes strongly associated with transport services provided or controlled by governments at the local, regional, state, inter-state, and national scales. Of course, the role of central authorities and states in providing for roads and other transport infrastructure dates back to antiquity, while the idea of ownership by the state is associated with the rise of the modern state (i.e., post-Westphalian). Such state intervention has come to assume many forms, ranging from government entities, public corporations, government coordination bodies, mixtures of public and private enterprises, public management of state-let contracts and franchises, to varying extents of regulation of private operators.

But merely acknowledging that public transport implies some aspect of state involvement doesn’t take us very far in trying to understand the differences between public and private transport in existing transport systems and of the implications of these differences. Further, although such a general approach may be sufficient for everyday usage, it doesn’t provide much guidance on more sophisticated questions, such as:

- Why do we have public transport?
- Who does public transport belong to?
- Who controls public transport?
- Who is allowed to benefit from public transport?
- What is the difference between private and public transport? Is there one?

In considering these sorts of fundamental questions, we turn firstly to some of the common approaches to understanding what constitutes public transport.

2.1 Market-based perspectives

If transport services are cast in terms of markets, then the discipline of economics offers a typology that provides some initial guidance on these questions. As markets, there are three different conditions that public transport can be fitted to:

- *Closed markets:* Where the provision of transport services is controlled – ultimately by the state – so as to ensure that either a public monopoly or private firm(s) enjoy exclusive rights
- *Open markets:* Where there are no barriers to who can offer transport services, and
- *Regulated markets:* Where limited competition is permitted.

This approach shifts the understanding of the transport system away from whether the state or firm is the service provider and focuses on the issue of the way transport as a market is constituted.

However, if the pressing question is where does the dividing line between public and private transport lie in practice, then understanding the market conditions are of limited assistance because of the real world complexity and variety of these markets. In effect, there are few realms of truly open markets in mixed economies around the world; even for elements that are recognized as being highly privatized and without barriers to entry, such as private car ownership and use of public roads, in practice, there is much regulation. As a rule, open markets only exist in the absence of effective governance. At the other end of the scale, while mass transport services might broadly equate with conditions of a closed market – and natural

monopolies – there are clearly many transport services considered to be public transport that are not entirely closed.

Clearly, a confounding feature of this issue is the sorts of public and private roles in the ownership, financing, funding, planning, managing, and operating arrangements that exist in modern transport systems. With many states adopting neo-liberal policy reforms, a new array of financial and other relationships between states and corporations have developed, overturning many of the established demarcations between the public and the private. Resolving the sorts of questions posed above, therefore, requires a deeper understanding of what constitutes the transport market.

2.2 Mode-based perspectives

In common practice, public transport serves to describe a group of particular modes, typically buses, ferries, light rail, subways, commuter rail, and regional or inter-urban rail. For instance, the International Association of Public Transport (UITP) is a peak organization for public transport authorities, operators, policy bodies, and research organizations, with 3100 members in 90 nations. This peak body acts for officially sanctioned public transport providers, as evidenced by their claim that they cover all modes of public transport – namely, metro, bus, light rail, regional rail, suburban rail, and water transport. Public transport operators belonging to this and other international bodies tend to be those with larger operations, are part of the regulated system, and do not include those at the ‘informal’ end of the continuum.

Here, the limitations of this approach are obvious, namely that there is no uniform relationship between modes and the role of governments; even within one urban transport system there can be a multitude of arrangements and variations of the state’s role for a single mode. Many cities’ bus services, for example, are a mixture of public and private operators; in developing nations, there may be a high proportion of bus services provided by informal operators.

Mode-based definitions are of high convenience, but this comes at the price of being of little use for addressing the problems in which we are interested. For those working with transport systems with substantial informal transport services, mode-based approaches to defining public transport do not seem to give any guidance as to how to understand informal services or whether all forms of mass transport are indeed, public transport.

2.3 Vehicle and system ownership-based perspectives

Another common approach, often used implicitly, is to consider public transport as occurring when a service is owned by a government entity, and private transport being that which is privately owned. Even if it is conceived that such an approach works more easily at the broadest of scales or when considering individual vehicles, the complexity of current transport systems defies such an easy categorization.

One practical limitation of this approach is that much depends on the understanding of ownership; for example, state transport authorities may lease rolling stock or corporations might provide transport services under contractual agreements with governments. A further complicating factor is that in Australia and around much of the world, the vehicles for rail-based urban modes are typically state-owned, but the road-based modes can be in either state or private ownership, or a mix of both, in which state ownership can take the form of statutory corporations and other forms of state-owned enterprises. Within one transport system, therefore, there can be contrasting arrangements. In these sorts of circumstances, ownership is not so clear-cut and therefore, the meaning of public transport is not clear or consistent.

2.4 'Politics as practiced' and legal perspectives

Government officials and those elected or appointed to government bodies express a definition of public transport through the workings of the public policy process. In effect, these decision makers define public policy through the decisions they make, based on the governments' views of their official responsibilities. Clearly, such a definition ultimately rests on the relevant bodies of law, for governments can only legally exert influence over that which the law determines is within their official domain. It may be, however, that government responsibility is not necessarily wholly defined or constrained by existing law, and governments can change laws and alter the scope of their authority and obligations. Politically, governments will also respond to the expectations of the electorate, reflecting something of community outlooks on the issue.

Under this approach to understanding public transport there is scope for a dynamic element, whereby the governments' understanding of what constitutes public transport can alter over time and there may be periods of deliberate or accidental ambiguity over this understanding. However, the problem of accepting that 'public transport means whatever the government says' is that primacy is given to political activity and entirely localized circumstances, which seemingly takes us further away from gaining insights into the issue that might add to more generalized lessons. Another problem is that public policy may not always seek to control all within the legal domain and that policy inactivity can also define fields of influence. Further, it is contestable that the understanding of public transport is totally fluid and entirely the output of local political activity. Such an outlook limits the ability to address a number of important concepts as it depends on analysing public processes and this may not tell us what thinking lies behind the views of the dominant stakeholders.

2.5 Institutional perspectives

Institutional features can be used to distinguish between public and private transport systems at the city scale (Glover, 2007). Three broad criteria can be identified: governance through public policy mechanisms; financial structures based in public agencies; and a primary objective of the system operators being the provision of a transport service. For the first of these criteria, the role of public policy and the associated use of public institutions are central to guide the activities of a public transport system; in this way, public transport is one of the direct functions of government. Private transport services are also subject to all manner of public policy and regulation, but crucially, while the chain of accountability for public transport ends with the government, for private transport accountability ends with those owning the corporation – which could be private or through shareholders and boards. Essentially, the distinguishing feature here is that governance is either a public (i.e., government) affair or a private one (i.e., corporate).

Following from the first criterion is the second, in which public transport has its financial structures based in public agencies, while private transport does not. This criterion differs from definitions of public transport based on asset ownership, which may be a helpful guide, but does not necessarily tell us about the financial system in place and the role of public institutions. Here we focus on the role of public institutions and control over the flow of capital through the enterprise; basically, if the transport operations don't involve public institutions for this function, then the system offers private transport.

In turn, the third criterion continues the theme of examining the extent to which public institutions are engaged in the provision of transport services, by considering the strategic orientation of the enterprise. Provision of a transport service is the goal that distinguishes public transport from private transport. Because private transport has as its goal individual/household or corporate goals, the provision of a transport function is, in a sense, a means to an end. In the case of individuals and households, what is sought is not the transport

experience, but access to desired services. Corporations providing transport services obviously need to provide these services, but this also is a means to an end, namely that of pursuing corporate objectives of profits, returns on investment, and such things as market share. For such corporations, if there are greater gains by rationalizing or reducing transport services, if circumstances allowed, then this would be what owners and investors would expect to occur. Public transport operators might also have corporate goals, such as cost reduction, but ultimately their strategic goal is to provide transport services, not to furnish profits; the public service obligation trumps their corporate aspirations.

Here, the limitations of this approach are obvious, for while a study of institutions can be used to define public transport, they don't offer guidance as to the rationale behind their development or whether the final forms of the institutions came to accurately reflect the original intentions.

Overall, each of these aforementioned perspectives offers particular insights into our understanding of public transport and of the different ways it is understood, both in theory and in practice. However, when considered in light of the questions posed in this paper, none of these perspectives offers the range of answers being sought. In response, our attention is turned to an alternative approach.

3 Transport as a common good

3.1 Circumstances that gave rise to state intervention in public transport

A common feature to the perspectives of public transport outlined above is that they usually do not consider the features of the transport system as constituting a resource in itself, but tend to view public transport as a service, looking at organizations, governance, infrastructure, vehicles, and the associated social, economic, and environmental issues. At the most simple level, the transport system constitutes a single item of infrastructure, albeit one with considerable complexity. Viewed in this way, we can reconsider how public transport can be understood.

Before explaining how to consider transport systems as a particular type of resource, it may be useful to begin within with a brief historical account of the general circumstances that gave rise to state intervention in the provision of mass transport in cities since the Industrial Revolution and the advent of motorized transport.

Dissemination of the newly discovered technologies for motorized mobility was surprisingly rapid. As Vuchic states (2007: 8): 'The benefits from railroads were so great that, following their introduction in the western countries around 1830 to 1840, construction of their networks proceeded rapidly; by the end of the nineteenth century, virtually all European and North American cities depended on railroad services for their economic functioning and growth.' As befits the burgeoning of this new industry, there was a multiplicity of new firms, close competition within urban markets, and the provision of new mobility services and travel choices for city-dwellers. However, set against the benefits offered by motorized mass mobility were considerable problems.

Often, there was a proliferation of private railway and tramway – and later, bus – services and owners competing for the same customers within the same markets. Frequently, this resulted in a duplication of services between companies on popular routes, but little interest in unprofitable destinations or even off-peak journeys. Fares varied greatly within cities between operators and services, with some operators able to set exorbitant rates. As for the transport operators, there was considerable financial uncertainty; companies were unstable and bankruptcies and ensuing disruptions occurred – and governments were often called upon to save failing firms. Governments were also coming to the realization that such unstable and

inefficient markets were limiting the opportunities to capitalize on the economic development potential of mass urban transport (e.g., Vuchic, 2005).

Around the world, particularly in the more economically developed nations, the latter nineteenth century was also the period where centralized governments became fully engaged in large-scale, urban public works and provision of infrastructure for the growing industrial cities. In all likelihood, such state interventions had much to do with the increased capacities of state and federal governments, and their ability to undertake public works investments. Urban transport problems and the failures to maximize the potential benefits of mass transport opportunities could be ascribed to the failings of the mass transport market and the overarching solution was, of course, government intervention. Along a spectrum of state initiatives were forms of regulation and oversight at one end and full state ownership of public transport operations at the other. Additionally, increased government regulation created conditions that favoured greater concentration of ownership among private firms.

Classically, economics recognizes three broad types of market failure evident in the free market conditions that characterized the early days of public transport and which prompted state intervention: collective goods, externalities, and natural monopolies. To operate a mass transport system across the city invariably means that there will be areas of higher and lower demand and if firms are allowed to select their own service territories it will be impossible to provide a universal service (a *collective goods* problem). In such conditions, the government intervenes to ensure that the entire market is served. One motivation for the government to act is that it seeks a mass transport system that can contribute to economic growth, and bring benefits to employers, businesses, and the wider community.

Governments also acted to create public transport because of the costs and inconvenience to the wider public of the corporate failures of the early train and tramway companies, and the requests from these firms for state financial assistance, which would otherwise continue in such highly competitive markets (an *externality* problem). Additionally, by assuming control over mass transport, governments could undertake service extension and system planning to reap the benefits of operating a coordinated transport system, something that competing firms would not undertake.

By creating public transport systems, governments recognized that the problems of allowing private firm a monopoly in a particular market, such as excessive fares and unreasonable services (a *monopoly* problem), and that an obvious way to addressing the problems of a private monopoly was to create a public monopoly – or regulate competition. Problems of monopolistic behaviour by firms arise largely because public transport often constitutes a natural monopoly, particularly when considered at the urban scale, but where high costs and exclusive ownership act as a barrier to potential competing firms, monopolies can exist for local service operations – particularly for fixed rail services.

3.2 *Common pool resources*

As public transport exhibits these particular problems when services are provided by free markets, this tells us that these services are probably a particular kind of resource. And that resource is a common pool resource (CPR) (e.g., Ostrom, 1990), meaning that there is a good or service that is shared and in common use – these are also known as ‘common goods’ or, simply, ‘commons’. (Table 1 in Appendix II provides a typology of economic goods.) As Dolsak and Ostrom (2003) state, there is much confusion about this term and they offer that CPRs have two characteristics of interest; first, that these goods or services are diminished by consumption or use, and second, that it is difficult to prevent additional users of the good or service, i.e., the free rider problem. As they write of free riders (2003: 7–8): ‘... they may be able to gain benefits without contributing to the cost of providing, maintaining and regulating the resource involved.’

CPRs are usually associated with – renewable – natural resources and ecosystem services, such as the uses of forests, grazing lands, watercourses and groundwater, and fisheries. These benefits should not be considered solely in materialistic terms, as CPRs are usually the foundation of traditional indigenous peoples' lives and provide such non-material services in spiritual, aesthetic, and cultural realms. As Ostrom (1990) explains, without appropriate management, over-exploitation results in the loss or diminution of CPRs.

Urban systems, large socio-technical systems, and other large scale systems have been subject to less inquiry in terms of their CPR character than studies of shared natural resources and natural resource services, especially at the community scale. However, in her seminal work, Ostrom (1990) states that such things as bridges, computer access, and the like are also CPRs. A point of interest here is, of course, the rise of the Internet that in turn has prompted recent investigation into its features as a CPR. Within the broader social studies of science inquiries, Lewis Mumford in the 1960s popularized the term 'mega-machines' and offered that such coordinated enterprises as building the Egyptian pyramids constituted a vast socio-technical machine (Mumford, 1967). In a similar vein, more recently some CPR scholars have depicted large infrastructure as CPR, including – as above – the Internet, electricity grids, and road and rail systems.

3.3 Public transport in the CPR context

It is only a small step, therefore, to offer that urban transport systems as a whole can be viewed as CPRs, rather than just seeing various infrastructure components as CPRs. In this paper we are concerned with public transport as a CPR, rather than entire urban transport systems. Certainly, those seeking greater efficiency, effectiveness, and reduced social and environmental costs of urban mobility have promoted such system-wide approaches featuring integrated transport services, network planning, and the like. Much urban and transport planning considers these transport systems in their entirety. To describe urban transport systems, it is necessary to consider an array of its components, including roads, rails, waterways, and walking and cycling paths, its systems of controls and information technologies, and the other attributes that enable the system to function. This does not imply that there are only public benefits from transport services for, as Frischmann (2005) points out, there can be both private goods and non-market goods produced by infrastructure such as transport infrastructure.

To complete this argument that public transport is a CPR it can be held against the two common criteria for identifying CPR. First, public transport is subject to capacity restraints and to crowding, meaning that users are in competition for a limited resource. In simple terms, users of a service can be added until a limit is reached, such as the capacity of a carriage, bus, or ferry; at this point any potential additional users are in competition with others. This is not unique to CPRs as private goods are also subject to capacity limits, and therefore crowding. But this condition in combination with the second denotes a CPR.

And the second criterion is that that it is difficult to restrict use of the service. Private goods, by way of contrast, can be readily controlled, but CPRs are 'non-exclusive'. Motorcars are private goods, for example, while roads are available for all – in a general sense. It might be argued that the fare system restricts use of public transport, but fares are not used as a means to ration the use of services, per se. Although price signals may be used as a demand management tool, invariably this approach is used sparingly lest the public service obligations of the operators be violated. For those who are willing to pay the fare, there is no rationing of access to the services. Monitoring of individual access to public transport is difficult, as is knowing who is using which services. Further, there is a political or social dimension because public transport services are expected, often as directed by legislation, to provide universal service. In combination, these elements make it difficult to restrict access to public transport in the places where it is provided.

Künneke and Finger address the CPR problem for large infrastructure and offer the following rationale (2009: 5–6):

Infrastructures can be perceived as non excludable resources, for at least three reasons. First, infrastructures might be spread through a huge geographical area with difficult to monitor access points, like for instance public road systems. Second, even if the access could be technically monitored, there might be politically motivated universal service obligations, since infrastructures provide essential services like drinking water, energy or means of communication. Third, once the users have entered the network, it might be difficult or even impossible to precisely determine the services they appropriate from the network.

Public transport, even cast narrowly as a collection of infrastructure, seemingly satisfies these conditions fairly readily. There has been considerable interest in the European Union in the question of sharing the international rail infrastructure, such as conducted by the Max Planck Institute for Research on Collective Goods in Bonn. Locally, there has been little scholarship in this field, although Wills-Johnson explores the case for treating Australian railway infrastructure as a CPR, concluding (2010: 9) ‘... that using elements of CPR governance to inform economic regulation of access regime might be successful and might assist in reducing the scope, cost, and complexity of regulatory regimes’.

Returning to the earlier proposition that public transport in free markets suffered from an array of market failures, these can be similarly cast as manifestations of public transport as a CPR. As Ostrom (1990) described, there are three broad types of institutions that can protect common goods: government, private property, and common property ownership. We will return to this issue below.

4 Implications of public transport as a CPR

4.1 Pertinent features of CPRs

Additional to the general CPR features of public transport, there are several other specific attributes of interest. Public transport systems comprise a network, although the operations are usually organized according to the modes concerned. Under the influence of neo-liberalism – which was becoming pronounced around the world beginning sometime in the 1980s – the more centralized and state-controlled systems were subject to various forms of market reform. In many respects, these reforms had the effect of diffusing the responsibilities for these systems between a greater array of stakeholders and decision makers. Property rights become more complicated and less clear in these circumstances, and the issues of who makes CPR allocation decisions are no longer contained within the responsibilities of state agencies.

Over time, as cities and the transport task became greater in scale and scope, the capacities for these systems to be controlled by a single authority or entity were reduced. In this way, the institutional capacity for resource monitoring and allocation is outstripped by the growth of the system. As technical systems, the challenges of control and management increase with the scale of the system, and as institutional systems, increasing scope increases the number of jurisdictions, agency interests, and territories covered by the system. Successful modal integration in cities is clearly possible, as shown by many Northern European cities, and integrated land use and transport planning is also evident around the world; however, achieving such outcomes becomes more difficult as the transport system expands. These developments add to the CPR problems identified above.

Other dynamic forces – such as social and technological changes – also influence the public transport system, and the types of demands – and expectations – made of these systems also change. This usually adds to the sorts of services expected of the systems, although the

demands for traditional services may decline. At a certain point, the way that the system is managed is required to respond and change. For example, something as simple as change of rail gauge on a rural service can mean that new freight business can access an urban market, creating the need to share facilities with commuter rail, and necessitating new management and governance arrangements. Another example is that integrated ticketing systems shared by multiple operators require institutions, procedures, and agreements to allocate revenue between the participants, and so on. As a result, the set of those with an interest in the CPR expands and there are implications for the allocations of the CPR.

4.2 Public transport CPR and the challenge of integration

Making urban public transport systems operate effectively remains a central concern for all major stakeholders in these systems; integration of the various components across different scales is a particular problem (Vuchic, 2005). This problem can be understood as arising from the CPR character of the systems.

Künneke and Finger (2009) identify four ‘essential functions’ needed in order to assure infrastructure CPR functioning under circumstances that produce overuse (i.e., unsustainable use or crowding): System management; Capacity management; Interconnection; and Interoperability. System management concerns short-term network coordination, a function that becomes challenged under liberalization as responsibilities for serving public service and commercial activities are split, yet, as Künneke and Finger (2009) note, the cooperation between the parties is necessary to ensure the functioning of the system. As the authors state (Künneke and Finger, 2009: 9): ‘With growing fragmentation of the technical systems because of unbundling, outsourcing, and the like, there is therefore a growing need to coordinate all operations and actors involved.’ Capacity management refers to allocation of network resources amongst competing demands – as either users or appliances. Künneke and Finger (2009) distinguish between strategic, tactical, and operational allocations.² By ‘interconnection’, the authors mean the physical linkages within the system and they use the example of containerized freight transport that allows for intermodal transfers; neglect of these infrastructure interconnections will disrupt the system causing loss of efficiency, reliability, economic benefits, and other costs. Interoperability is a term the authors use to describe the ability of the system’s components to interact effectively; as they state (2009: 12), it ‘... ensures that the elements of the network are combinable. In other words, interoperability defines the technical and institutional conditions under which infrastructure networks can be utilized.’ Examples are rail lines suitable for the rolling stock, air navigation systems that provide effective guidance, and so on. Critically, for these CPRs, interoperability sets the conditions for resource users – both for market entry and exit – using technical standards, regulatory controls, and other institutional tools.

Building on these CPR features, the issue of creating networked and integrated public transport systems across different modes and service providers is cast as a CPR problem. Integration is a complex problem that can be resolved at scales ranging from the coordination of services – such as coordinated timetabling between the services of intersecting modes or integrated ticketing – to the integration across the urban transport system – such as providing road-based or road-sharing public transport modes with priority in competition for road space – to include coordination between transport and land use planning – such as in the form of transit-oriented-development. At each of these different scales there are different types of CPRs and different stakeholders are engaged.

4.3 Distinguishing between private and public transport

² These categories are commonplace in business and management literature and, while the origins are not clear, it is thought that they might have been invented by the military as a way of applying a command system across differing scales of responsibilities.

If we accept that public transport is a CPR, then one feature of immediate interest is that, under neo-liberalism, governments returned to the original problems of free markets in urban transport and reconsidered the respective roles of states and corporations. Governments who followed the neo-liberal ideologies did not, by and large, return to free market conditions for supplying urban transport. Based on the preceding propositions about CPRs in public transport, the rationale for avoiding laissez faire approaches was that these would only lead to a return of the extreme sorts of market failures that plagued the early phase of motorized mass transit – an unwelcome outcome for elected democratic governments. Instead, governments responded with a great variety of public policy to locate or create niches in which corporations can be used to provide public transport goods and services while allowing governments to continue to prevent or curtail the sorts of market failures to which CPRs are unavoidably prone.

Accordingly, there are no simple and universal responses for the role of government and the market-based approaches used are as varied as the public transport systems around the world. Governments have exhibited an array of motivations in following neo-liberal approaches to public transport, but two themes stand out, that of seeking to reduce costs – particularly operating costs relating to labour – and an interest in using competitive markets to promote innovation. Particular interest has been given to the issues pertaining to contracts and franchises, covering competitive tendering, settings for contracts, establishing benchmarks and performance standards, and performance monitoring of the operators. There is a range of matters that would, in the respective public and private roles in providing public transport services, often be classified as operational tasks.

However, there appears to be considerable less variation in the handling of the so-called ‘strategic’ functions of public transport. These higher levels strategic functions include research and analysis of the transport system, monitoring overall system performance, setting overarching objectives for the system, transport system planning, engaging with key political, business, and community stakeholders in strategic issues, setting broad goals for service provision, managing and overseeing the system’s financial operations, and being publically accountable for the transport system. By and large, governments usually retain control over these strategic functions regardless of the extent to which private companies are engaged in the transport system. From a CPR perspective, these strategic functions align with governmental responsibilities for preventing market failures. It follows that there is no exact division in practice between the realms of public and private transport, rather, it is a dynamic relationship and the outcomes in any jurisdiction will be highly conditioned by local circumstances. Notwithstanding these empirical variations, there is a clear division in theory and this is broadly reflected in the role for governments in addressing the CPR issues facing public transport systems.

Considering public transport as a CPR informs us on specific questions as to the identity of public transport, and informal transport can be used to illustrate this point. At the outset, it needs to be stated that informal urban transport often provides mobility services where they are otherwise absent (notably for the poor), offer on-demand services for those without other mobility options, and create entrepreneurial and employment opportunities in economies where these are often quite limited (Cevero, 2000). Further, it plays an important economic role in the developing world’s cities and settlements for moving labour, materials, and finished goods (Cevero, 2000). Certainly, informal transport provides for mass mobility in many cities and could be considered a form of public transport by some definitions.

In light of public transport comprising the responses of government to the market failures in free markets for urban mobility, informal transport is a manifestation of particular types of market failure, such as the inability of the public sector to provide mass transport services. Generally, cities with a significant informal transport sector are moving towards greater formalization, or are at least aspiring to do so. Whether this is necessarily always a good idea

is not a matter we can address here, suffice to observe that many commentators on the issue caution that in many instances there are likely to be excessive social costs if access to informal transport is curtailed (Cevero and Golub, 2007). But, as Cevero and Golub (2007) observe, informal transport services pose a number of challenges to the transport system – such as dangerous services, road congestion, and highly polluting vehicles. Yet, informal transport also illustrates that private property does constitute one of the approaches to the market failures in CPR; the problem with informal transport is that it creates another set of market failures of its own.

5 Conclusion

Arguably, it is urban public transport as a CPR that provides the basic contours of its contemporary politics and public policy challenges, but these challenges are the most recent articulation of long-standing and fundamental CPR issues. Through the history of public transport we have witnessed the materialization of various market failures in the free market era, followed by government intervention, which in its strongest form assumes monopolistic service provision, and in its weakest, regulation of private firms providing mobility services. Nations, such as Australia and New Zealand, that have adopted neo-liberalism in public policy, have generally withdrawn governments as direct transport service providers and allowed the entry of corporations in a range of roles and functions, as part of general downwards shift in state involvement in urban transport. Such a dynamic is entirely consistent with the responses to CPRs, with the options of private property or government control marking a continuum along which state policy has moved back and forth.

Using the CPR concept offers a comprehensive rationale for identifying public transport and offers an explanation of its ownership at odds with a number of prevailing and conventional explanations. State ownership and control of the public transport system is necessary in order to protect the resource itself, but the development of public transport has resulted in neo-liberal reforms which have seen service provision increasingly provided by corporations. Public transport services can be defined, therefore, as those where governments act to resolve CPR problems.

Neo-liberal reforms, in their ideal state, seek to reduce the role of governments in public policy by the greatest extent possible, and this has occurred with varying degrees of success in Australia and around the world, but the CPR character of public transport sets a limit on the extent to which the role of government can be reduced. For a range of reasons, there are a number of things that governments have to do in order to secure the wider public interest – incorporating social, economic, and environmental goals – and which cannot be left to market forces. These issues include the problem of the impossibility of all transport infrastructure being privately owned and broader public service – and environmental protection – obligations being met, of the difficulty of extracting from transport system users compensation for the costs they impose on others, and of the difficulty that much of public transport constitutes a natural monopoly.

Importantly, neo-liberal reforms such as privatization can resolve some of the problems of CPRs, but can paradoxically enhance the market failures of other aspects of the public transport system. One of the reasons this occurs is because casting public transport as CPR brings forward a whole-of-system perspective; privatization is invariably directed at particular components of this system, thereby producing a more complex system. Issues requiring a broader perspective – most notably those associated with system management, capacity management, interconnection, and interoperability – become more difficult as the system grows and takes more diverse forms, such as privatized services. Accordingly, protecting the broader public interest in systems with privatized components requires a greater effort of governance (e.g., McGuire, 1989). And largely, around the world, we can find clear signs of this effect; public transport systems with the greatest extent of integration are those where governments play a major role, have suitable institutions in place, hold private service

providers accountable, and so forth (e.g., Cervero, 1998; Glover, 2007). One implication of privatization is, therefore, is that the task of governance is increased, as is the scale of the challenges of effective governance. Privatization of components of urban public transport and a weakening of public sector governance will result in degradation of the public transport CPR. In this sense, what has emerged from the neo-liberal era is a clearer picture of the essential functions of governments in protecting the broader interests of the community, economy, and environment, and of the public transport system itself.

Finally, it is interesting to return to Ostrom's three solutions for CPR management: private property, governments, and community ownership. Of these, our current urban transport systems are a mixture of public institutions and private service providers, which in varying degrees, is how things have been for a century. This begs the question: Is there a place for community ownership in contemporary urban public transport? It's a particularly interesting proposition in light of the failures of large urban public transport systems to provide adequate services to the outer reaches of our now vast Australian major cities. Perhaps the evolutionary development of providing urban mobility in Australia has not yet concluded.

Appendix I

Does the collective transport concept denote a public transport CPR?

A number of authors refer to 'collective transport' – rather than to public transport – primarily, it seems, as a way to emphasize the difference between modes for individual transport and shared transport. Collective is used as the antonym to individual. Collective transport appears to be used to describe modes and services; there does not appear to be any reference to a 'collective transport system'.

Specific definitions of collective transport are hard to come by, although the term appears to have been in common usage at least since the 1980s. Nijkamp's (2004) *Transport Systems and Policy*, for instance, refers to collective transport, and usefully, to 'collective modes', although these are not formally defined. Banister (2005: 63) calls for switching to 'collective modes of transport (e.g., public transport)'. McManus's (2005: 6) use of 'modes of public transport and privately operated collective transport' also implies inter-changeability of the terms. Polèse and Stren's (2000) *The Social Sustainability of Cities* refers to 'collective means of transportation', but again without formal definition. Reports by the European Conference of Ministers of Transport and by the OECD on transport refer to collective transport. One of the available definitions of collective transport comes from Rodrigue et al. (2009: 225):

Collective transportation (public transit). The purpose of collective transportation is to provide publicly accessible mobility over specific parts of a city. Its efficiency is based upon transporting large numbers of people and achieving economies of scale. It includes modes such as tramways, buses, trains, subways and ferryboats.

Linguistically, a 'collective' refers to a good or service undertaken or owned by a group and more generally, to a cooperative enterprise. Referring to transport in this way may be a little misleading, as what is meant may be something more like a 'transport collective'. Reference to collective modes is less all-embracing, but conceptually does seem to a little clearer. Because public transport 'collects' passengers, there may be an association between this function and the moniker of collective that adds to the appeal of the term.

A possible source of inspiration for the term collective transport is the economic concept of 'collective goods'. As discussed in this paper, collective goods are shared between users, but a major consideration is whether these shared goods can be controlled – excludable collective goods are 'club goods', and non-excludable collective goods are CPRs (see Appendix II).

Even if applied only to transport infrastructure, we can see that additional users do subtract from the total services available (Ostrom, 1990). Accordingly, by this definition, public transport is more accurately depicted as a CPR.

Another possible source of the concept is political science, where collectivism covers an array of ideologies – such as socialism and fascism – in which political activity expresses a group interest prior to the interests of individuals. In this sense it could be argued that collective transport is the opposite of individual transport, but these explanations are based around social understandings of the world, rather than being primarily resource-based. As such, they tell us something about society – positively or normatively – but don't suggest that the character of the resource itself is influential. These are complicated responses to a simple inquiry, but lead us to a conclusion that the term 'collective transport' does not imply or evoke the concept that public transport is a CPR; rather, collective transport has become an alternative expression for public transport without making the identity of public transport any clearer. Potentially, however, collective transport could be a highly valuable term were it to be defined and applied with greater precision.

Appendix II

Table 1 Typology of economic goods

	Exclusive	Non-exclusive
Rival	Private goods	Common pool resources
Non-rival	Club goods	Public goods

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