The Entrepreneur Rail Model: Funding urban rail through majority private investment in urban regeneration

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ABSTRACT

The 21st century has seen an unprecedented expansion of urban rail as a response to urban congestion, low carbon mobility and as a seed for urban regeneration. Many cities would like to do much more rail in their futures to create knowledge economy centres but cannot find the funding, including Australian cities that are the focus for this paper. Four approaches to funding are outlined from fully government to fully private with two in between. The Entrepreneur Rail Model suggests a majority private sector funding can facilitate the new markets for urban regeneration as well as providing integrated rail that government’s usually find difficult to fund. The process requires transit planning to be seen primarily as a land development tool rather than a transport system. This was the historical function of urban rail in the nineteenth and early twentieth century and signals a significant new 21st century rail market as well as the need for new procurement and governance systems for land assembly and transport planning that can ensure network integration, new assessment models and public good outcomes.

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1. Introduction

The 21st century has seen a simultaneous decline in automobile dependence, growth in urban rail and a rapid increase in urban regeneration with positive economic, social and environmental outcomes (Newman & Kenworthy, 1989, 1999 and 2015). However, the process has mostly been funded by governments and now the demand is far outstripping their ability to provide the capital and the on-going operations to fund the required expansion. Many governments across the world, particularly in rapidly growing cities in Asia, are seeking ways of bringing private sector funding into the provision of urban rail. A new model for funding urban rail using majority private investment has been adopted by the Federal Government in Australia. The Minister for Cities echoed the sentiments of many cities when he stated the new policy approach:

“It is clear that rapid growth in major capital cities can’t be accommodated with existing public funding models. All levels of government in Australia are facing budget constraints. While there are a number of major infrastructure projects underway or in planning, we are unlikely to be able to sustain this rate of investment in the long-term. If we are to provide the transport infrastructure that Australia’s cities will need in the future, we will have to find new ways of paying for its construction. One of the fairest ways to fund new infrastructure investment is for the beneficiaries of that infrastructure to contribute to the cost” (Hunt, 2016, sec 3.2).

Many other cities are going through a similar transition. This paper will set out the basis for such a new funding approach as proposed for Australian cities, and the potential for it to be applied to any city as well as the way to achieve the best land development, network integration and other public good outcomes.

2. Why cities want urban rail?

The dramatic decline in car use per capita that we have begun to see in the 21st century (Newman & Kenworthy, 2011) is paralleled by an unpredicted and unprecedented expansion in urban rail (Newman, Glazebrook, & Kenworthy, 2013). The reasons for these changes are still being discussed but are now seen to be mainstream urban economics. The value of urban rail to economic...
activity is based on a number of key overlapping factors. These are outlined in Newman and Kenworthy (2015) but are summarized in five key factors:

2.1. Time savings

Urban rail can now go faster than urban traffic and thus saves travel time (see Table 1). Traffic has been getting slower and slower as road capacity fills very quickly and most cities have now recognised that it is uneconomic in time and space to try to satisfy this. Urban rail can go around traffic and so the ratio of rail to traffic speeds everywhere (since the 1990s in Australia) have been increasing, and are now greater than 1 in all but North America.

2.2. Increased land values

As urban rail has been built, densities have begun to increase around such systems, as they provide the amenity that creates urban development opportunities. Land value increases around rail are universal. See Table 2 for some examples as well as the data from McIntosh’s studies in Perth which showed 42% increase in land value around the new Southern Rail above the other suburbs without rail (McIntosh, Newman, & Glazebrook, 2013).

Land value increases around rail occur because people want to live or work near them so they can have no car or one less car and because they want easy access to the jobs and services attracted to the area. Thus, there is a private value in rail projects that is not usually turned to advantage in building the rail system; those who own the land just receive wind-fall profits. However, governments do get some value flowing back to them through increased land-related taxation (see McIntosh, Trubka, & Newman, 2013, 2014).

2.3. Agglomeration economies in activity centres

Density in activity centres is strongly related to urban productivity. This case is strongly made by Harvard Professor Ed Glaeser (2011) in ‘The Triumph of the City’, and has been measured in many cities, including Melbourne (See Fig. 1). This phenomenon of agglomeration economies is caused by the clustering of urban activities and jobs that require face-to-face interactions for the creativity and innovation related to urban productivity gains, particularly in the knowledge economy sector.

2.4. Land development efficiencies

By focussing urban activity rather than scattering it, there are significant economic efficiency gains (Newton, Newman, Glackin, & Bilsborough, 2009), large reductions in per capita traffic fatalities rates, parking facility cost savings, and improved mobility for non-drivers, which reduces drivers’ chauffeuring burdens, increased economic opportunity for disadvantaged groups, and increased tax revenue per hectare (see Litman, 2017; TOD, 2016).

2.5. Environmental gains due to reduced automobile dependence

There are many environmental issues exacerbated by low density urban development and improved by increasing density in activity centres around rail stations. Fig. 2 shows how transport fuel decreases exponentially with increasing density and thus reducing all the other issues connected to high automobile dependence such as greenhouse gases, air pollution, and traffic-related accidents. There is therefore a multi-pronged rationale for why planners want a more polycentric city, where urban activity is better focused and linked into a quality transit system. Whatever the reasons there is a new policy interest in finding ways to facilitate urban regeneration as well as urban rail. This paper proposes a new model for how to do the two policies together through a new approach to funding urban rail.

3. Approaches to funding urban rail

There are a range of potential options for funding and delivering public transport infrastructure, with differing degrees of private sector involvement:

- Full public sector capital;
- Some private and substantial public capital;
- Substantial private and some public capital; and
- Totally private capital

Most transport infrastructure (both road and rail) in the latter half of the 20th century and still today is delivered under the first model – full public sector capital – although detailed design and construction work is contracted out under public oversight. All four mechanisms are likely to be used in 21st century transport infrastructure but the latter two seem best able to deliver urban regeneration as well as urban rail in a world where government capital for transport is constrained. The reason for this is explained in terms of land value creation.

3.1. Full public sector capital

In this model, public transport infrastructure is delivered wholly by public sector funding as a largely welfare-based approach though with productivity benefits as the justification. The public sector performs all network and regional planning and oversees the detailed design work that is performed by private sector engineers. The public sector also oversees construction that is usually contracted out.

As most national, state and city governments’ finances are constrained and there are other growing demands on public
budgets especially health and education, it is likely that new sources of funding will be required to deliver significantly more new transit infrastructure. One way to do this is by recycling assets, for example in Sydney three new rail lines are being built by the New South Wales government using full public sector capital from the proceeds of selling the Port of Botany.

There is a range of potential mechanisms for raising revenue from the increase in land values created by public transport infrastructure, which are collectively known as value capture. This hypothecates government revenue that has been generated by the increase in land value flowing through to rates and taxes at all three levels of government. The US uses this approach and recently the UK has started to do this also. One recent Australian example of this is the Gold Coast Light Rail, which was partially funded by a levy on all Gold Coast properties though many people live nowhere near the railway so it’s a very blunt value capture instrument rather than targeting the main beneficiaries of the railway. Similar blunt funding is done through sales taxes in American cities.

Despite being described as an alternative funding mechanism value capture is still generally a full public sector capital mechanism for funding urban rail (McIntosh, Trubka, Kenworthy, & Newman, 2014, 2015). Perhaps the biggest failing in this model is that there is no guarantee that urban regeneration will occur and that the density of activity around the train stations will be facilitated. There are often reactions from local communities and local governments after the rail is delivered to any increases in density near stations. As well transport planners frequently use the highly attractive and

### Table 2

<table>
<thead>
<tr>
<th>Land Value Uplift Resulting From LRT Investment</th>
<th>Uplift</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego, USA LRT</td>
<td>3.8%–17.3%</td>
<td>Cervero and Duncan (2002)</td>
</tr>
<tr>
<td>Missouri, USA St Louis Metrolink LRT</td>
<td>32%</td>
<td>Garrett (2004)</td>
</tr>
<tr>
<td>England, UK Tyne &amp; Wear Light rail</td>
<td>17.1%</td>
<td>Du and Mulley (2007)</td>
</tr>
<tr>
<td>Buffalo, NY, USA LRT</td>
<td>2%–5%</td>
<td>Hess and Almeida (2007)</td>
</tr>
<tr>
<td>Phoenix, USA Phoenix Light Rail</td>
<td>25%</td>
<td>Golub, Guhathakurta and Sollapuram (2012)</td>
</tr>
</tbody>
</table>

Source: McIntosh et al. (2014).

![Fig. 1. Job density and labor productivity.](source)


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Y = 4.1585x - 59417
R² = 0.3983

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contested spaces around stations as park and ride for cars. Thus, this full public sector approach, if dominated by transit planners, may not facilitate the productivity benefits of transit-oriented development.

3.2. Some private and substantial public capital

This approach seeks help from private sources through land development, but primarily raises government capital through a mixture of sources such as parking levies, tolls on associated private traffic, developer contributions, an increase in registration fees or some other form of tax hypothecated to the rail project. This could include a new levy on the land value uplift associated with a new project, especially if it is targeted to the landowners around new stations.

A successful example of this approach is London Crossrail. Crossrail is an underground heavy rail project joining up major parts of the city, with substantial contributions from developers and the Business Rate Supplement, an increment on the rates paid by London businesses. Of the £14.8 billion funding for Crossrail, £4.1 billion is sourced from London businesses through various mechanisms, including the BRS. Financial contributions from key private investors include a £70 million contribution from the operator of Heathrow Airport, which Crossrail will serve, and £150 million from Canary Wharf Holdings, a developer, towards the cost of the new station at Canary Wharf. Canary Wharf Holdings will also design and build the station.

This mechanism is providing some new urban regeneration value through private investment but in general the value is achieved in linking the city to achieve major agglomeration benefits (BCR went from 1.5 to 3 after including agglomeration economies) and these therefore justify major public investment through value capture.

3.3. Substantial private and some public capital

In this model, substantial private capital can be supplemented by some government capital. Government’s expected land value based tax flow-on could be hypothecated to cover their contribution. This approach would have government playing a key role in ensuring that the rail project is still generating all the capital required though only some would be from public sources at the three levels of government.

At the network level, this model can combine wholly private lines with publicly-funded ones where there is a compelling argument for the project to be built. Such reasons could include providing an improved service to a particular community, or for a particular major event, or to enable major urban productivity advances in a particular corridor.

The Portland tram built to the Pearl District was funded substantially by private sources to unlock urban regeneration potential, as was the Vancouver Canada line and its Olympic Station that was privately funded along with the Vancouver City Council to develop land around the station.
In February 2016, the Edmonton Valley Line was awarded to a consortium based around Bechtel and Bombardier to build a C$1.8 b LRT over 13 km. The private sector contractor is responsible for designing, building, financing, operating and maintaining the new Light Rail Transit project over a 30-year period. While the ultimate source of funding for the Valley Line is public, financing and associated risk is the responsibility of the private partner, the TransEd consortium. TransEd is required to raise the capital for project construction, gaining a return from the 30 years of concession payments.

This is perhaps one of the first lines in a car-based city to have created urban rail down a whole new corridor using ‘substantial private funding’. The role of land development in the Edmonton project is not clear.

3.4. Totally private capital

A fully funded private urban rail will only happen if there is substantial TOD-based urban regeneration at its heart. In this approach government’s role would be kept to in-kind activity to ensure land assembly and land acquisition, zoning and other transport planning integration is fully covered, perhaps with assistance in the risk management side of the procurement process. The fully private approach depends on sufficient land being available to generate the capital and on-going operations; the land development thus must be fully integrated with the rail building and operations to generate the necessary private investment. It would mean that the project could be off balance sheet and hence would help with government credit ratings. This we have called the Entrepreneur Rail Model (Newman, Davies-Slate, Green, & Jones, 2016) and along with the ‘substantial private funding’ approach will be the focus of this paper.

The Hong Kong MTRC is a government-majority business enterprise that makes substantial profits and invests new capital based on land development. The MTRC is required to operate on commercial principles, and is listed on the Hong Kong Stock Exchange, with a significant portion of private ownership; the intention is that it behaves as a private company, albeit with government oversight. In this way, it can be seen as a totally private rail model as there is no cash contribution from government though its risk management is assisted by government backing.

Probably the only place where this totally private model happens regularly is in Japan where the rail system is fully privately run and a substantial part of any profit and capital for new lines is obtained through land development (Suzuki et al., 2015). A market for urban rail has been well established in Japan for many decades and it does suggest that it may work in other cities that are now reaching the stage where a market process can work.

A project in Florida called the Brightline High Speed Rail Project is perhaps the first fully private rail and TOD-based project in North America. The company is in the fortunate situation of owning a whole rail corridor through its freight business but has now created an integrated approach to building a series of TOD’s between Orlando and Miami; this has attracted a major source of finance from a US hedge fund. This funding, together with the fare box returns, will enable a fast urban rail service along the South East Florida urban conglomeration. The system will begin in 2017. The need for cross connections of light rail is now being investigated to provide a truly integrated urban-TOD rail system.

Regional transport network planning was required in the Bright Line project and would need to change everywhere under this model of public transport delivery, as private capital would be attracted to corridors where there are development opportunities, rather than following public sector transport planning criteria, however the two are generally the same as land development is primarily a private sector function. If land is zoned for high density activity centres it does not mean it will happen unless the amenity is there to unlock the private investment. Thus, the public role needs to be how to facilitate this amenity and a new urban rail line can do that. The value of land around stations is created when such partnerships are created.

Transit network integration can still be a required part of any private rail project and would be needed for both public and private benefit in achieving new activity centres around rail stations. This transit-land use integration is not easily achieved but whenever land-related benefits are being sought the private financing will ensure it is fully integrated or the consortia involved would not achieve their necessary returns. Of course there is a risk for government if they do not ensure through the PPP process that all the necessary public good outcomes in terms of quality design, integration of services, fares and affordable housing, are clear.

All four mechanisms need to be assessed for any urban rail project to add to a city’s reduced automobile dependence and hence to help create more enduring productivity gains (Newman & Kenworthy, 2015). Without this growth in rail and associated land development any city will just continue sprawling or adding to its congestion problems.

The various funding mechanisms that underlie the four models above are outlined in Fig. 3 emphasising the difference between value creation, value capture and general tax approaches.

4. Land value creation: the Entrepreneur Rail Model

The Entrepreneur Rail Model is a proposal developed to plan and deliver urban rail infrastructure on commercial principles – funded by land development and built, owned, operated and financed by the private sector. It is based around the notion of land value creation.

This model is designed to produce public good through delivering necessary rail infrastructure, as well as achieving urban regeneration goals and equitably distributing the economic value generated by quality rail infrastructure. However, it is an entrepreneur’s approach to rail as it is based on finding a new market for the combination of urban rail and land development. It cannot be done simply by government planners as land development is mostly a private enterprise activity. This was in fact the historic process of how tram and train lines were originally built. The model is displayed graphically in Fig. 4.

Proponents need to provide an estimate of private capital to be contributed by combining land redevelopment potential and patronage potential for capital and on-going costs, then (and only then) produce transit numbers and detailed routes and urban regeneration plans.

This is instead of the conventional business-as-usual approach.
(see Fig. 5) of predicting the number of people who could use a railway line based on present land use and the best potential transit route based on the least resistance and least costs; then, after finding government funding, seek how land development may be facilitated. Generally, this last step is not successful as the route is not determined to optimise land development but to optimise the route for transport planning.

The importance of reversing the order is because it guarantees transit and land use integration through the necessity of delivering a return to the source of the financing. This return could not be generated from the separate building of a rail line by itself or by the separate development of urban regeneration without the increased amenity provided by a rail spine to the land involved. Rail infrastructure generates significant positive externalities through increased land values and improved business productivity and thus...
the model seeks to find the best partnerships that can enable integration of the rail and land development functions in urban economic development.

If built under the old model—a welfare model—then investors come in and take windfall profits from the land around stations thereby capturing much of the economic value.

It is an unearned transfer of wealth, from ordinary taxpayers to a fortunate few land owners. As well, the opportunity to link land development into rail stations is an afterthought. It is therefore rare and difficult. By contrast, in the Entrepreneur Rail Model activity centre development can be built into the project, and indeed it is imperative.

The Entrepreneur Rail Model would diminish the public financial burden of providing rail infrastructure and services and enables finance from groups like superannuation funds to provide the investment. It would also radically change how our cities are planned and shaped. Currently, cities are mostly built to central government plans—for land use and activity centres, transport networks, water and power, among others. Under the Entrepreneur Rail Model a city’s rail network would instead be shaped much more by the value of urban regeneration and land value creation in the urban economy.

Cooperation between National, State and Local Governments will need to be developed to make this model work but most of all new ways of working with the private sector in planning a rail line will be required. Only in this way will the true agglomeration benefits, amenity and accessibility gains associated with this land value creation be obtained across the whole city. There is evidence that this value creation is not just shifting land value increases from one area to another but is creating value for the whole urban economy that would not have been created without such investment (Sharma & Newman, 2017).

This paper sets out the concepts behind such a funding model, supporting the benefits of private sector involvement in urban rail, and proposes a procurement process and governance system to enable this to happen.

4.1 How can the ERM be procured and governed for the public good?

Delivery is proposed through a DFBOOM - Design Finance Build Own Operate Maintain - model. If sufficient land for redevelopment can be made available through government land assembly, it should be possible to fund a rail line entirely with private capital. As suggested before, other levels of government funding can also be used but where possible it is best to use a market-based approach through the land value creation process if a fully integrated set of land use outcomes are desired.

The Entrepreneur Rail Model cannot work without an active and engaged government at all levels. In particular, several functions need to be creatively applied by government if both private and public goals are to be achieved in urban rail and in urban regeneration. These are:

- Land acquisition and assembly;
- Zoning land use changes, so as not to prohibit re-development;
- Urban design and building standards;
- Network coherency and integration;
- New assessment tools;
- New institutional arrangements; and
- New risk management approaches.

These are explained in more detail below in terms of the new roles for town planners and transport planners as well as new governance.

4.1.1 New roles for town planners

4.1.1.1 Land acquisition and assembly. In order to link together land development opportunities along a potential rail corridor it may be necessary for government to compulsorily acquire some land parcels to enable the station precincts to be large enough for transit-oriented developments (TODs) to be built, as well as some land for the rail lines.

Land assembly is also needed to enable development to occur. Private sector proposals can suggest how best to do land assembly to make the most out of a site.

The process of purchasing land for government purposes has various mechanisms across cities and nations. In Australia, this process has been mostly used to enable road construction, rather than rail, though examples are now emerging as cities begin building new rail lines such as the light rail in the Gold Coast and Sydney and other examples given earlier.

The recent trends in urban transport and land use (Newman & Kenworthy, 2015) would suggest that there is a growing market for rail as opposed to road projects and hence governments should be facilitating this market rather than just roads. Such a mechanism would be well suited to long-term strategic land assembly for the purposes of rail-based redevelopment in the Entrepreneur Rail Model. Redevelopment authorities generally have such power and as redevelopment opportunities and rail projects are clearly a major agenda for most cities, it is not hard to see how they can be part of the implementation of a rail and TOD-based metropolitan plan. It is just a matter of having such agencies integrated more fully into the transport planning process.

4.1.1.2 Zoning. The Entrepreneur Rail Model relies on land use change to capture the potential benefits of rail infrastructure. Land use zoning restrictions are often hard to overcome as low-rise and low density development is seen to be the only desirable urban form in many parts of Anglo-Saxon cities (see Newman, 2014). However, community support for increased zoning at proposed activity centres will be considerably enhanced by having a rail service as part of the positive benefits. Government’s role in relation to zoning is to ensure that projects are not prevented from going ahead due to land use planning restrictions and will need to engage the public in detailed design discussions as well as showing the advantages of the new rail line and activity centre. In some cities like Vancouver a portion of the land investment is returned to local communities so that local value increases are fine-tuned to provide local benefit (Newman & Kenworthy, 1999).

4.1.1.3 Urban design and building standards. A high quality public realm and enduring urban design are vital to ensuring public acceptance of rail-based redevelopment. Such high quality is
usually in the immediate commercial interests of developers as well as redevelopment agencies who are experienced in ensuring there are detailed design guidelines that cover all the issues such as density, diversity of housing type and mixed use, reduced parking requirements and improved walking and cycling conditions. These should include a proportion of social housing, to ensure access to such quality living is not just for the wealthy.

4.1.2. New roles for transport planners

4.1.2.1. Network coherency and integration. There is the potential for multiple private sector organisations or consortia to be involved in rail development under the Entrepreneur Rail Model. It is vital that these different lines, and any legacy publicly-owned infrastructure, are effectively integrated into a single network. This can be done at the procurement stage.

Ensuring network coherency and integration would involve:

- Ensuring an integrated ticketing system. This would require a process for sharing revenue between lines when passengers transfer;
- Regulating fares, ideally by a statutory or judicial body, rather than through a political process; and
- Potentially facilitating negotiations between different proponents whose lines should interconnect, or otherwise interact with each other. Also, ensuring that these interchanges run smoothly and are well maintained.

Since integration already occurs in most urban transit systems between different private sector operated services, it should not be too difficult to manage as long as it is clearly specified from the start. Transit operations will need to be well connected between services. Many cities have several different operators required to integrate with each other across the whole bus and train system. There is no evidence that city transit systems have suffered from their interchanges running poorly. Also, ensuring that these interchanges run smoothly and are well maintained.

4.1.2.2. New assessment tools. The emphasis on conventional transport systems is on time savings at the start of system operations as the central factor in a benefit cost ratio (BCR). Some new assessment tools now include agglomeration economies as in the UK and which has tentatively begun in Australia including an Urban Regeneration Agglomeration factor (Newman & Kenworthy, 2015). Hong Kong and Tokyo’s bus and rail lines are all examples of private integration required through regulation and they are among the best in the world in terms of service provision and patronage outcomes.

I. Accessibility benefits - Time savings at the start and over the next 30 years as the land development created by the rail project come into being providing new access advantages for people who are living and working and visiting the corridor;
II. Agglomeration benefits - economies that can be gained by the new density and mix of land uses that are facilitated by the project. Such elasticities are estimated in many cities such as those developed by Trubka (2012) on Australian cities;
III. Amenity benefits – economies associated with the whole package of quality design creating walkable urban areas; and
IV. Avoidable costs and benefits that are associated with any urban regeneration replacing development that is car-based on the urban fringe. There will be a need to replace or renew urban infrastructure in any urban regeneration project and this may be included in the costs covered by the private investors. If governments are assisting in this because of their energy, water, waste systems the costs will also have to include the costs of doing the same development on the urban fringe which over many decades have been subsidized by governments. Such headworks and substations in the Australian urban system amount to over $100,000 per new dwelling in the outer fringe developments compared to urban regeneration (Trubka, Newman, & Bilsborough, 2010a, b, c).

4.1.3. New governance arrangements

4.1.3.1. New institutional arrangements. The importance of enabling private sector investment in both a new rail line as well as the associated urban regeneration is the critical step in unleashing an Entrepreneur Rail project. This is not usually an integrated part of government thus there needs to be a new governance instrument. Without this the rail lines will not happen and the activity centres will not be built.

It is important that a government bidding process is controlled by a central agency, preferably Treasury, as the process is designed to ensure private sector funds are attracted to achieve public-good goals as well as the necessary profitability of the private investors like Superannuation Funds. It also has powers to extract information from other government agencies if required. Treasury would ensure consortia are evaluated by financial criteria, land development criteria and transit criteria, in an integrated way. This cannot be done by a transit agency as their emphasis on choosing the routes in detail first does not optimise land development opportunities so the rail frequently does not get built as no other funding can be found. A transit agency’s primary task in our model is to ensure transit system compatibility with any new rail lines and to ensure they do not prevent the land development-based approach from happening.

Planning agencies should also only be there to ensure land assembly, zoning and building design are compatible with overall goals for the city, rather than picking the most appropriate development strategies and markets for urban regeneration. The delivery process will require the powers of a redevelopment agency to provide government’s role in land acquisition, zoning and land assembly to unlock the latent value in land development around the stations. Only by enabling such partnerships is land value created.

It is therefore suggested that two new government roles are established. The first is something like a Transit Investment and Land Development Unit established in Treasury to oversee the bidding process for Entrepreneur Rail projects. State and City Governments should not need to have well developed plans for corridors otherwise opportunities can be missed by not seeking market-based judgements on where the best redevelopment could happen. Thus a Transit Investment and Land Development Unit can immediately call for bids from consortia to establish a private rail system based on development of activity centres along a particular corridor. The three criteria by which these could be evaluated would consist of:

1. Financial - the project should aim to be self-sufficient in capital and operating expenses based on land development, fares and other means such as advertising;
2. Land - the project should aim to utilize government land provided as part of the bidding process as well as private land that will need to be built into development partnerships or purchased as part of the project’s financing. Land acquisition, zoning and assembly will be assisted by government to achieve
required activity centre goals as well as sufficient funding outcomes to enable the rail line to be built.

3. Transit - the project should provide a high-quality transit service that is linked into the rest of the system and generates its own patronage from the land development activity centres. The quality of the system should be high enough to unleash the potential for development of the activity centres.

After a private sector consortium has been chosen to lead the planning and delivery of the urban rail infrastructure and the development of available government and private lands, there will need to be another coordinating government entity. We are suggesting the formation of a new Entrepreneur Rail Delivery Agency to facilitate the planning and delivery process. The delivery agency would be similar to development corporations and authorities that have been created in many cities over the last two decades for undertaking the planning and development of urban renewal projects. It would generally not need new legislation to establish and could be made part of a current redevelopment authority.

The development authority model is a tested method for delivering redevelopment through public private partnerships and thus is likely to apply to the Entrepreneur Rail Model. Thus, sufficient powers are likely to be available to help unleash the new governance instrument inherent in the Entrepreneur Rail Model.

The potential for privatising present rail lines in order to create better TOD options would also be possible in the future under this model.

The potential mechanisms for managing an Entrepreneur Rail Model are summarized in Fig. 6.

4.2. Risk management

The final part of enabling the Entrepreneur Rail process would be to assist with risk management. As governance systems and private company systems are attempting to create a new approach to how urban rail can be built without government capital and operational funding, it is necessary to help provide a level of risk management. There are various ways that can be done but perhaps a key mechanism would be to reduce the number of consortia down to two key bidders and then fund them for the detailed planning phase where they need to create the land development opportunities and integrated plans involving multiple stakeholders. Such a risk management mechanism could be lifted when the governance systems are established and are providing confidence for all concerned. Such assistance could also be applied to a community engagement process that ensures value is shared in the project (Jillella & Newman, 2015).

Fig. 6. Entrepreneur rail model potential delivery framework.
5. Conclusions

Urban rail projects across the world are now being owned and operated by private consortia (e.g., in Australia the new light rail in the Gold Coast, Canberra and Sydney as well as Melbourne trams and trains). This is not unusual. What is unusual about the Entrepreneur Rail Model is how land development becomes the cornerstone of its funding, how the integration of private land development entrepreneurial skill unlocks access to private capital and creates land value. The power of this model is that the unlocking of private development in new activity centres could not occur unless it was completely integrated with the amenity-creating, value-creating power of a new urban rail service. Finding ways to enable this model through government is a challenge as transport planners have been trained to see transit as a welfare model where they control the whole process. This will need to change as there is now a growing market for integrated urban rail and urban regeneration which cannot be done without involving the private sector. Various models for creating value through partnerships between transit, land development and finance, are likely to emerge but some of the key principles outlined here are likely to be needed to enable full public and private gains from the new markets for urban rail and urban regeneration.

References