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Partnerships for Private Transit Investment – The History and Practice of Private Transit Infrastructure with a Case Study in Perth, Australia

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Abstract: Urban transit planning is going through a transition to greater private investment in many parts of the world and is now on the agenda in Australia. After showing examples of private investment in transit globally the paper focuses on historical case studies of private rail investment in Western Australia. These case studies mirror the historical experience in rapidly growing railway cities in Europe, North America and Asia (particularly Japan), and also the land grant railways that facilitated settlement in North America. The Western Australian experience is noteworthy for the small but rapidly growing populations of the settlements involved, suggesting that growth, rather than size, is the key to successfully raising funding for railways through land development. The paper shows through the history of transport, with particular reference to Perth, that the practice of private infrastructure provision can provide lessons for how to enable this again. It suggests that new partnerships with private transport investment as set out in the Federal Government City Deal process, should create many more opportunities to improve the future of cities through once again integrating transit, land development and private finance.

Keywords: Entrepreneur Rail Model; value capture; city deals; private railways; transit-oriented development; Western Australia; tramways; land grants; future cities; urban planning.

1. Introduction

After decades of strong government control of urban public transport infrastructure, transit planning is going through a transition to greater private investment in many parts of the world [1]. This is based on demand for a rapid transit system that can overcome traffic problems [2]. The process for doing this through private investment is obviously one that requires a partnership between all levels of government and the private sector and these are increasingly being labelled City Deals [3,4]. The focus on bringing private investment into transit funding is now on the agenda in Australia as it is required by City Deals from the Federal Government [5,6]. This paper sets out to show how this global process is happening, how it could indeed follow the historical process that first set up transit systems using private investment, and how historical case studies from Western Australia suggest two means to enable the new transition. It concludes by suggesting that the City Deal governance process may be able to mimic the historic integration of transit, land development and private finance so eagerly sought after by cities.

1.1. New Investment in Urban Transit

Rail transport is going through a renaissance globally, in what [6] call "The Second Rail Age", with a concomitant peaking and then decline in car use per capita [7]. This rail revival has involved new rail investment in the dense cities of Europe, the Middle East and Asia, but also in the more car-dependent cities of the United States, Canada and Australia [2]. The reason for this renaissance is the

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demand for better accessibility in cities where traffic speeds are no longer competitive with fast transit that can go under, over or around the traffic [2]. Cities are now having to respond to this increasing demand by trying to find alternative funding sources and private participation, with a number of new models emerging.

In southern Florida, the Brightline, a privately funded and financed regional railway, recently began operation. This project has drawn substantial funding from transit-oriented developments around its stations [8]. This privately delivered model is favoured by the state administration, as a means to deliver infrastructure without a financial burden or financial risk to the public sector. In announcing an extension of rail between Tampa and Orlando, the Governor of Florida stated that "Through private investment, we ensure that this major project has zero financial risk to Florida taxpayers", and made an unfavourable comparison with the California High-Speed Rail project, which was Federally funded. The Florida Department of Transportation is to run an open procurement process for the right to lease government-owned land along the corridor, rather than offering any funding support [9].

Figure 1. Miami Brightline. Source: All Aboard Florida, Brightline

In Montreal, the provincial pension fund the Caisse de dépôt et placement du Québec, has an elevated light rail line, with substantial funding from its funds. As well as the obvious public benefits of improved transit and economic development, the Caisse sees this as an opportunity for a long-term investment in "tangible assets that generate stable, predictable returns" [10]

In Australia, the Consolidated Land and Rail Australia (CLARA) group, a private group planning a high speed rail line between Sydney and Melbourne, building new cities along the route as the source of capital funding. This project was a private initiative, but responded to traditional public procurement models not being able to deliver the line, despite many high speed rail proposals having been made in Australia for decades [11].

In London, the £14.8 billion Crossrail project has sourced funding from a variety of sources, including the Greater London Authority, Department for Transport and the private sector [12]. The UK Government's contribution had been capped at one third of the total cost, so alternative sources of funding were required for the project to proceed [13].

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Figure 2. Proposed CLARA line. Source: Consolidated Land and Rail Australia Pty Ltd

Private funding is not that unusual in transport as toll roads are a common form of alternative funding; Regan et al. identify eight toll road projects implemented since 2003 in Australia alone [14]. However, railway capital funding has not been easily able to achieve sufficient return just from tolls (fares). The new approach has been a rediscovery of the insight that funding for rail is more likely to be raised from the increase in land values. The mechanisms for doing this have been found to vary across the globe either through various forms of additional levies or taxes [15-19], business improvement districts or special improvement districts [19-21] or transit-oriented development by the rail provider. The latter can involve joint development, in which a public transit agency's land assets are leased to a private partner [22-24] or more privately-led initiatives, such as the Japanese railway conglomerates, or London's Metropolitan Railway [25].

The next section looks at how private funding of rail projects has happened in history and could apply to places like Australian cities once again. Australia is somewhat lagging in developing more entrepreneurial rail building models compared with other parts of the world, but this paper shows there are historical models of railway development which were previously not well documented and which could help Australian cities to be more confident in their rediscovery. These case studies add to the literature on privately developed railways, integrated with land development, and provide further evidence of the effectiveness of this model.

Infrastructure planning and delivery in Western Australia is not averse to private investment, except in urban transport, both in roads and public transport. Perth Airport is run by a private company financed mostly by superannuation funds, including being 30% owned by a subsidiary of the Australian Government's Future Fund [26]. The mining community are structured to provide their own rail and road systems without government investment, including railways and roads. Government instead performs a regulatory function, through regulating third party access to railways and rail safety. There also is increasing involvement of private investment in health and education. But in urban areas, including the capital city, there is no private investment in transport, just private involvement in the construction of the road and rail systems, under government supervision. This is being challenged by the Federal Government's new involvement in Australian cities through City Deals.

2. Global entrepreneurial rail history

Linking land development with railways is almost as old as the technology itself. A brief overview of railway history in Britain, North America and Asia will set the scene before further pursuing the Australian and Perth rail stories.

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2.1. Britain

In Britain, a period of rapid railway expansion took place during the 1840s, after several technological developments during the 1830s and 40s. This peaked in a speculative frenzy called the "Railway Mania" [27]. This ended in a crash in the late 40s and early 50s, however the resultant spread of railways around the country resulted in exponential growth in passenger numbers (see Figure 3) followed by a downturn until its recent privatisation which has taken rail into a new period of substantial growth.

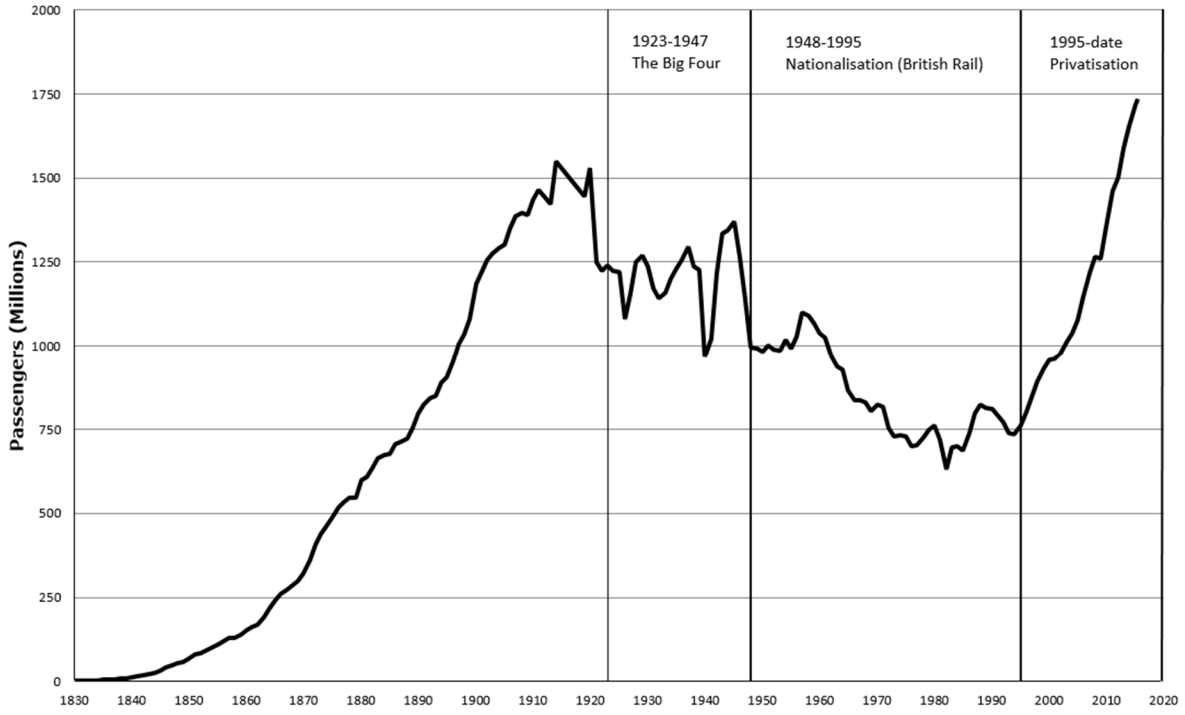

Figure 3. Railway passenger numbers in the U.K., 1829-2016. Source: Wikipedia Commons.

The effects of railways on real estate has always been a major part of its rationale and the cause of its financial attractiveness. This was quickly realised in the 19th century and was particularly prominent in development of the London Underground, with a much of what became the London Underground being built as joint railway and suburban development projects.

The Metropolitan Railway began as a public-private partnership, with the City of London purchasing USD 307,120 worth of shares in the company, with the company concurrently purchasing land of USD 274,872. A railway was opened in 1863, built with these funds, to high ridership. Over time, the Met consolidated a number of other railway companies, as well as acquiring bus and tram operators, and integrated these services with its railway business [28].

2.2. North America

In the United States, land grant railways were used as a means to settle and develop the interior and west of the country, and link the two coasts by rail. The US Federal Government operated a land grant system between 1855 and 1871, giving millions of acres of land in the west to railway companies. Private railway companies built an extensive network across the country, providing access to farms and connecting cities [29]. There was a period of reorganisation of the industry, with J.P. Morgan, a New York financier, playing a prominent role. He both raised funds in Europe, and helped the railway companies reorganise and thereby operate more efficiently.

In addition to long distance railways enabled with Federal land grants, street cars were introduced into many American cities by private operators, expanding them beyond the range of the old walking city. Warner gives a detailed account of the development of Boston from around 1850 onwards, during which streetcars were introduced, initially horse-drawn, and the metropolis

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expanded from the core walking city of approximately two and a half miles in radius [30]. These street cars were often built as a device for marketing land on the outskirts of the old walking-based city [31].

In Canada, the Canadian Pacific Railway was built in the early 1880s to link the then populated eastern part of the country with the under-developed west. Challenging terrain and the great distances involved almost bankrupted the Canadian Pacific Railway Company, but was ultimately completed in 1885, after construction commencing in 1882.

The Company was involved in a range of related businesses, including land sales and settlement from September 1881, before construction was even complete. The Company was involved in a range of other businesses over the years [32]. The Canadian Government had granted the Company 25 million acres (100,000 km^2) in western Canada, and it was sold to settlers, whom it actively recruited [33]. The Company campaigned to attract settlers to the area, advertising in various countries. The settlers were often sold a package that included the land, sometimes ready-made farms, and transport by the company. Under this railway-led immigration scheme, the population of Canada increased by one third in the first decade of the 20th Century, from 5.3 million people to 7.2 million people [34].

Canadian Pacific is still in business operating railways, and offers land along its network for lease [35].

Figure 4. Canadian Pacific Railway Promotional Flier. Source: Wikipedia Commons

With the advent of the motor car and bus the big era of railway development went into hiatus but is now beginning to come back in what call the Second Rail Revolution [2]. As can be seen in Figure 3 the demand for rail in the UK has now much exceeded historical levels and it is clearly attracting considerable private investment since its private owners have had to meet this growing demand. However, the use of such investment to build new rail lines is only just beginning again in the UK as with the Cross Rail project and in North America with projects like Brightline.

2.3. Asia

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While the practice of entrepreneurial rail building mostly ended in Europe and America during the period after the Second World War, several Asian countries have continued the practice in developing their rapidly-expanding cities. In Japan, the railway network is a complex mix of public, private and privatised railways. Several companies have used railways to enable new town developments on the outskirts of the major cities, with a large number of lines branching off the Yamanote Line to the west of Tokyo, and a number of such lines having been built in the Kansai region. This model was pioneered in the early 20th Century by the Hankyu Railway Company, Osaka. Hankyu struggled to profit on railway fares alone, and so began building housing estates and later office towers along their railways [36].

The land into which Tokyu expanded was often broken up into a large number of farming lots, creating a complication to land assembly. The solution that evolved to deal with this issue is known as land readjustment. Under this model, land owners would contribute their land to the development project, and in return would receive a smaller portion of land back, but with services added and a new railway connection. The original land owners were also placed on a committee that oversaw the urban design outcomes that occurred as part of the new developments. Interestingly, one of the pioneering companies was Tokyu Corporation, originally a town planning firm, and whose founder was inspired by Ebeneezer Howard's vision of a series of garden cities for the working population. It was Tokyu's reputation as an ethical business that enabled it to gain the trust of the farmers when seeking to redevelop their land.

In Hong Kong, the Mass Transit Railway Corporation (MTR) is a semi-public, semi-private organisation, being listed on the Hong Kong Stock Exchange, but majority owned by the government [37] . The MTR receives land from the Hong Kong Government at pre-rail prices, and then builds the railway infrastructure and develops the land in partnership with private developers. This model is known as Rail + Property. Property rental and management is a large part of the MTR's business, accounting for more of the company's operating profits than its heavily-patronised transport operations [36]. Property-related businesses operating in Hong Kong accounted for 57% of total operating profit on average between 2012 and 2016.

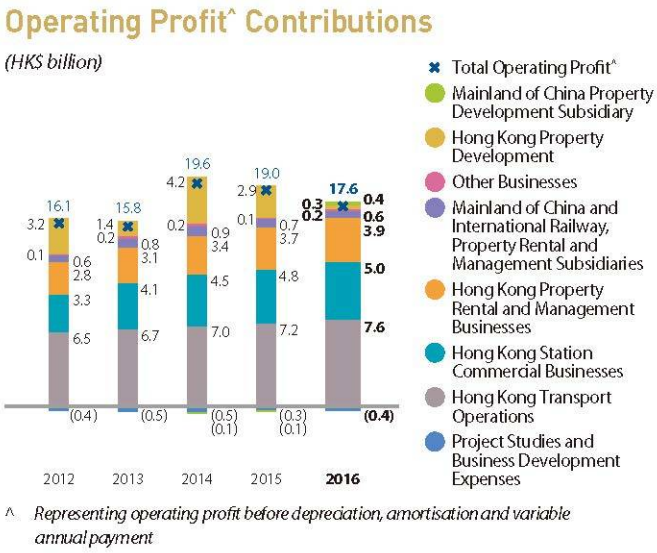

Figure 5. Hong Kong MTR Corporation Operating Profit. Source: MTR Corporation [38].

In Singapore, transport and land use planning is much more centrally controlled, although there is still considerable private involvement and a core function of returning money to government through land development. The Singapore Government, through the Land Transport Authority (LTA), owns the entire railway network [39], but contracts out operation of different sections of the

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network to two companies: Singapore MRT (SMRT) and SBS Transit [40]. Bus operations are also contracted out, under a contracting model begun in 2016, with the LTA owning all the buses, collecting all the fare revenue, and then leasing the buses to operating companies [41]. SMRT has previously been partly privately-owned, similar to Hong Kong MTRC, but is now 100% owned by Temasek, the Singapore Government's investment company [42]. Responsibility for planning, designing and building the network lies with the Land Transport Authority, a statutory authority under the Minister for Transport [43].

Large scale land development is undertaken by two public organisations: the Housing and Development Board and the Urban Redevelopment Authority. They earn revenue from rental payments, car parking, sales and interest [44].

2.4. Australia

Rail building in Australia began in the middle of the Nineteenth Century, and was a mix of private and government schemes, depending on the colony. The first railway track in New South Wales began construction in 1849, built by the Sydney Railway Company. This ran for 22 km between Sydney and Parramatta, and opened in 1855. In Victoria, the Melbourne and Hobson's Bay Railway Company opened a line between what is now Flinders Street Station and the Port of Melbourne in 1854. In Queensland and South Australia, the respective governments began railway construction. In Tasmania, the Launceston and Western Railway Company opened a line between Launceston and Deloraine in 1868 [45]. In Western Australia the Department of Works and Railways was formed in 1877, and Western Australia Government Railways built the Geraldton to Northampton railway in 1879. This was followed by railways connecting Perth to Fremantle and Guildford in 1881 [46].

Western Australia's rail history provides two case studies of entrepreneurial rail building: the privately-built tramway network and the land grant railways running from near Perth, the state capital and principal city, to the regional centres of Albany and Geraldton.

3. Historical case studies from Western Australia

Western Australia had a history of entrepreneurial rail building in the late nineteenth and early twentieth centuries, and these historical examples provide some insights into how rail infrastructure might be procured today without resort to public funding.

The case studies presented in this paper are:

- The Perth Electric Tramways Limited, a British company that laid down the core of the extensive tramway network in the capital city, Perth, which was later nationalised.
- The land grant railways – two railways were developed in Western Australia with grants of undeveloped land that the government was unable to bring under development on its own. This model was essentially the same as the American railways and the Canadian Pacific.

All of these lines were funded and financed from private money, with land development as the ultimate source of funding.

3.1. Perth Electric Tramways Limited

Perth once had an extensive tramway network (see Figure 6), much of it built by a private company, the Perth Electric Tramways Limited. The system was nationalised in 1913 (Tramways Purchase Act 1912), and progressively closed down in the 1950s and 60s [47] (pp. 153-61). The system has now been largely forgotten, with it no longer being common knowledge that Perth even ever had a substantial tramway network.

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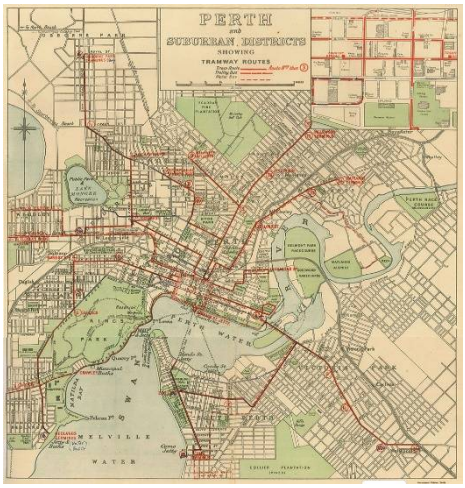

Figure 6. Inner Perth Tramway Map. Source: Battye Library

The individual lines were built under a well-established regulatory framework. This involved the tramway company and relevant local authority reaching an agreement on the new route, and then seeking an order from the state government, ending by being ratified by Parliament.

At the time of nationalisation in 1913, the Perth Electric Tramways Limited was running a substantial network, including lines used to enable real estate development on the then urban fringe. This model was strikingly similar to that used by the Japanese railways, and was roughly contemporaneous with the establishment of the Hankyu railway company in Osaka. This model's success in Perth is particularly noteworthy given the relatively small size of the settlement at the time, albeit growing very rapidly, from approximately 71,000 people in 1901 to 111,000 people in 1911 [48], an annualised growth rate of 4.7%.

3.1.1. The Tramway Regulatory Framework

Tramways in Western Australia were built under a regulatory framework laid out in the Tramways Act 1885 [49]. This Act was modelled on the United Kingdom's Tramway Act, and also mirrored the Acts in force in the neighbouring colonies (that is, the rest of Australia, and possibly New Zealand) [50].

This Act created the regulatory framework for private or municipally-led tramways. A potential private promoter or a local council could apply to the Commissioner of Railways (a political rather than bureaucratic role) for the authority to build a particular tramway. This authority was known as a provisional order, and the Commissioner had extensive powers to mandate various design and operational standards (for example, track width, track slab material, minimum service frequencies, maximum travel speeds, and others). This provisional order required a further Act of Parliament to come into effect, and was sometimes amended by Parliament.

The Commissioner retained significant powers over the tramway, including the right to vary a section of its alignment, and to force the tramway operator to pay for a bridge over a railway track, if the government decided to build a railway that crossed the tramway in the future.

The Government also took a bond from the promoter, as a guarantee that work would progress, and there were tight construction timelines included in the provisional orders, within which construction was required to be commenced and completed.

There were protections for the local communities from tramway development, with consent generally required by local authorities, and tramways were not to be built within 10 feet of the foot path, if one third of the property owners abutting this section dissented. These protections would have required significant negotiation by the promoter with local stakeholders, which is also a feature of Japanese railways and the associated land assembly and redevelopment.

The first tramway was opened in 1899 [47].

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Well-preserved records survive for two integrated tramway and real estate developments: the Nedlands Park and Osborne Park tramway estates.

3.1.2. Nedlands Park Tramway Estate

As noted above, streetcars were privately developed in many American cities, and this process became closely linked with real estate development. The beginnings of a similar process also occurred in Perth, with the Nedlands Park Tramway Estate the most prominent example.

The Nedlands Park Tramway Estate was built on approximately 240 acres of land, which was subdivided into 800 lots [51]. The site was on the boundary of two municipalities, and there was a complicated arrangement with the two local authorities in question. The terms included the following:

- The two authorities would receive 3% of the gross profits of the tramway operation between them, in lieu of rates payments and in return for the right to use the roadway.
- The developers were to build a public jetty on the river foreshore at the end of the tramway, as well as public baths. The jetty was to be handed over to the one of these municipalities, who would also have the option to purchase the baths at any time. The baths were to be ceded to the municipality at the end of three years regardless.
- A substantial area of river foreshore land was ceded to the two authorities, to be maintained in perpetuity as a reserve for the local community (this foreshore reserve was used as a selling point in marketing the estate).
- The two authorities had responsibility for building and maintaining various roads, and maintaining the foreshore.

While the development obviously was expected to be profitable for the promoter, there was also a benefit to the public finances due to an increased property tax base. The Claremont Roads Board strongly favoured the development, and estimated that it would increase their property rates revenue in the area, due to raised land values and an increase in building activity [52] (p. 974). Although the agreement granted considerable concessions to the local authorities, they spent a substantial sum on works in the area, particularly on upgrades to the foreshore.

The proposal was politically contentious, with the opposition party claiming the line should not be built by private enterprise. The reasons given for opposing the plan were that the revenue should be retained by government, if the tramway was profitable, and also that a private tramway should not be allowed to compete with the government railway. The record of parliamentary debates also shows there was concern that the promoters would gain the right to build a tramway as a means to sell the land, and then not proceed with construction [52] (p. 1700).

The Nedlands Park Tramway Act 1907 was passed despite opposition, with a number of conditions imposed on the promoters, including:

- Construction on the tramway was to commence within nine months of the bill being passed, and to be completed within nine months.
- There was to be a minimum service level of nine cars per direction per day.
- Maximum fare levels were set.
- There were certain construction standards, including the materials used and gauge of the tracks – which were the same as on the existing tramway network, 3′ 6″.
- The promoter was required to pay a deposit of £1,000 into the Colonial Treasury, a substantial sum at the time. If the promoter did not meet minimum service levels over the course of the following 10 years, or failed to complete the tramway on time, then this deposit would be forfeited [54].

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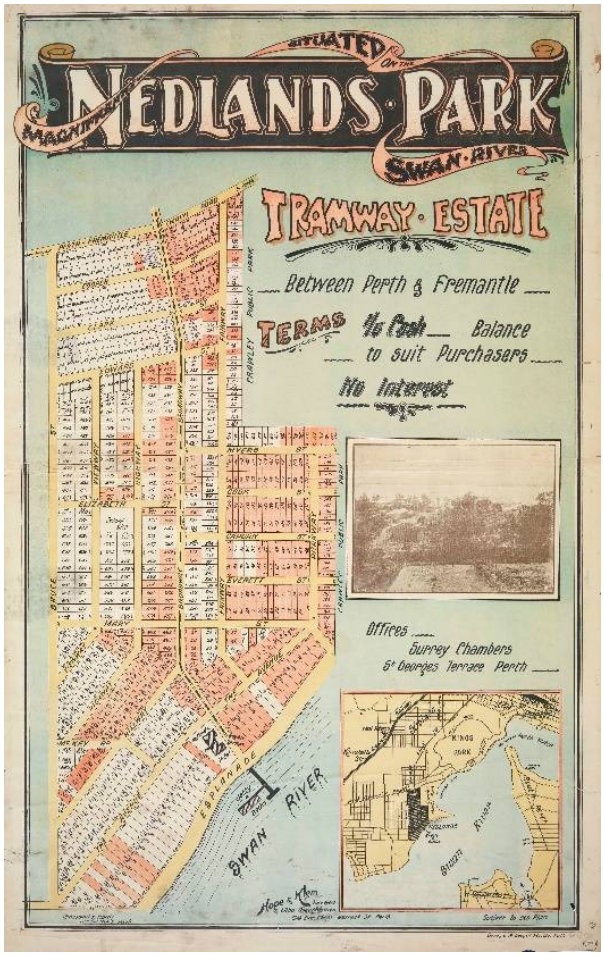

Figure 7. Nedlands Park Tramway Estate Map. Source: Battye Library

The tramway was completed in 1908, shortly followed by the public baths and hotel. These facilities were all advertised in the estate's promotional material – see Figure 7. Similar to the department stores and amusement parks built along the Japanese private railways, these facilities were intended to draw visitors to the leisure area at the end of the line, while also acting as an advertisement to potential buyers of the land. These attractions at the end of the tram line would also have generated additional patronage, beyond that of the workers commuting to the central city.

Although the development was completed, the city's entire tramway network was nationalised under the Tramways Purchase Act 1913, when the opposition Labor Party won powers.

3.1.3. The Osborne Park Development

The Osborne Park line was built by Town Properties of West Australia Ltd, to promote sales of their 7,000 acre land holdings on the northern outskirts of Perth [54]. This was prompted by the company having had difficulty selling its lots, as they were felt to be too isolated from the city [55]. The company gained authority to build the line through the North Perth and Perth Road Board Districts Tramways Act 1902 [56].

The line was an extension, running from the end of a line in an existing tramway suburb, and terminating outside a hotel and tavern built by the company [47] (p. 47.). This totalled 2.5 miles of new track (4 kilometres).

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Figure 8. Osborne Park Estate Map. Source: Battye Library

As was usual for tramway legislation in Western Australia, the local authority had options to purchase the tramway, in the case of the Osborne Park line, after 21 years from the date that the company was required to have completed construction under the Act. If this option was not exercised, another option was available after 28 years, and after 35 years the line would have reverted to the local authority anyway, free of charge.

3.2. Great Southern and Midland Land Grant Railways

Similar to the United States and Canada, government land grants were provided to a private railway company in Western Australia, to promote government strategic objectives. In the case of Western Australia, there were two objectives: to open up undeveloped land for agriculture and town-building, and to connect Perth with a deep water port in the town of Albany, over 400 kilometres away. One of these railways, the Great Southern Railway, connected Perth and Albany, while a second land grant railway, the Midland Railway, connected Perth to the port town of Geraldton, a similar distance to the north (see Figure 9).

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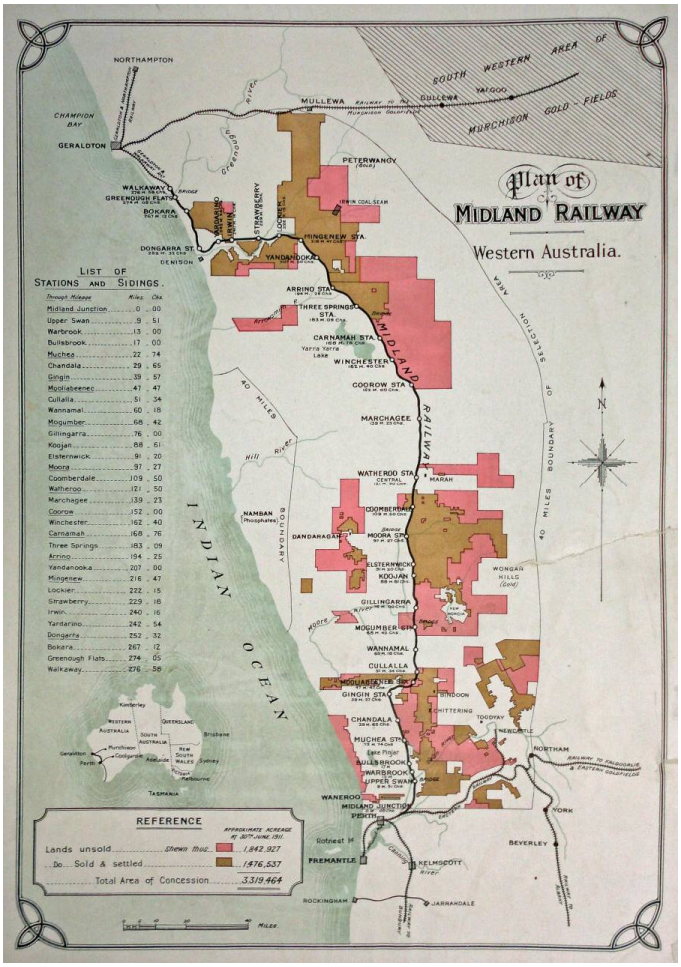

Figure 9. Map of Midland Railway, Western Australia. Source: Carnamah Historical Society

Under the land grant system, the colonial government granted the companies 12,000 acres of crown land for every mile of track constructed (approximately 3,000 hectares per kilometre). This land was undeveloped, and the companies sold the land on in small parcels as town site lots, as undeveloped parcels, and as ready-made farms, the latter being particularly prevalent on the Midland Railway. The Great Southern Railway resulted from an agreement between the Governor and the West Australian Land Company in 1884, and the Midland Railway in 1886 [57].

This system addressed two issues facing the Government at that time: the desire to develop the colony and expand its population, but with the railways being beyond the Government's limited financial means at the time [58] (p.933). The land grant system achieved both of these goals, with the companies both raising private capital in London, and advertising the land to potential immigrants across the British Empire (see Figure 10). The companies also provided finance to their purchasers.

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Figure 10. Midland Railway advertisement for farmland. Source: Carnamah Historical Society

The Midland Railway Company remained in private operation until the 1960s, but the Great Southern Line was nationalised in 1896, only 12 years after the original agreement was entered into. The justifications for the acquisition was that land development was proceeding fast enough, as well that the railway should be publicly owned on principal. Many of the farmers who bought into the Midland Railway farmland struggled to make the necessary payments, as the farmland was not of the high quality stated in the company's advertising material. Eventually, the company had to write down the value of the land in scheme by 40%, in order for the individual farmers to be able to meet their obligations.

The Government agreed to pay £1,100,000 for the tracks and remaining land. The Premier estimated that the company would expect to make approximately £75,000 in revenue that year, of which costs would consume 51% [58] (p. 934). This implies a margin of £36,750, before taxes (and taxes were comparatively low at that time), or a 3.3% return, if this government offer was considered the market value of the enterprise. This was close to the government interest rate at the time of 3%.

4. Reinventing entrepreneurial infrastructure

Clark and Moonen[3] note that Australian cities are lagging behind in terms of infrastructure, particularly transport infrastructure, and link this to a relatively undeveloped public transport system. Specifically, they state that "As the metropolitan century unfolds, Australian cities continue to attract population growth that surpasses the capacity of their infrastructure systems." The necessary solution is "high-capacity public transport that underpins and supports superb urban amenities with high quality, medium density living", and note that all of the cities that are celebrated today followed this path. Almost all of these cities' railway networks were built by commercially-focused organisations

In addition to the existing models in Asia, there are emerging examples in the west of development-backed railway building in the cities of North America (Brightline), Europe (Crossrail) and Australia (CLARA) as outlined above. There is also a large body of evidence that railways still raise land values in sprawling, car-dependent cities [59-62], suggesting that motorisation is not an insuperable barrier to substantial development-sourced funding.

3.1. Lessons from the Western Australian History

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The Western Australia tramways present a potential case study of how a small but rapidly growing area could finance rail development through real estate. It also suggests a possible regulatory framework for private rail developers, with some of its key features being:

- The requirement for government approval, first through the responsible minister, and then by the legislature.
- Control of building standards and track gauges, to ensure standardisation and integration between the lines of different proponents.
- Prescribed construction timelines and a cash bond, to ensure the promoter delivers the promised infrastructure, and in a timely manner.
- Protections of the rights of adjacent property owners.
- Powers for government agencies to modify or otherwise interfere with the rail infrastructure, if required for some public purpose.
- A strong local government involvement, early on in the process.

Land grant railways demonstrate how publicly-owned land can be used to deliver strategic government objectives, which are beyond the resources of the government. Many governments around the world, both national and sub-national, own substantial parcels of land in and around their cities, which can be used in this way.

As an alternative to granting strategically-located parcels of urban land, long-term leases, or the sale of development rights, are a common mechanism to retain ultimate government control, while providing land to the development industry. This has been done effectively in Hong Kong (MTR), Portland, Oregon (a light rail extension to the airport) and Washington DC (Washington Metro's joint development program). Florida has also begun to offer public land for lease for rail extensions, as noted above, and there are no doubt countless such examples worldwide.

The Western Australian case studies, and other global case studies, suggest that population growth, rather than size or current level of development, is the key to delivering rail through land development.

3.2. Can City Deals Mimic Historical Rail Governance?

Historical rail governance models match Newman et al.'s definition of the Entrepreneur Rail Model, raising the question of whether current thinking on PPPs and other policy innovations can be used to mimic these historical models. The obvious candidates to examine are City Deals, which are generally delivered as a partnership between different tiers of government, and facilitate greater private sector involvements. There is some justification for public sector support of the Entrepreneur Rail Model, and even in the early days of railway building, government support was not unknown, such as Japan's Light Rail Subsidy Law of 1911, which provided a subsidy of up to 5% of construction costs (limit later raised), depending on profitability [63].

Such support may be necessary to compensate for the effects of motorisation in undermining efficient transit provision, which has been encouraged by government policy in most countries, if only indirectly. Effectively all developed countries show high rates of motor vehicle ownership, and there are a range of implicit subsidies to driving. Examples of these implicit subsidies include publicly funded, un-tolled highways, mandatory off street parking as a development condition and designed to meet peak parking demand [64], land use controls that restrict density and separate land uses, rendering walking and transit less practical and taxes levied on the existing city being used to fund infrastructure construction in new suburban developments. It is uncertain whether a completely unsubsidised Entrepreneur Rail Model is possible given the historical automobile urban fabric resulting from the Twentieth Century period of motorisation and ongoing indirect government support for motorisation.

There are several ways in which a City Deal arrangement could support an Entrepreneur Rail Model:

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- Demonstration of government commitment: explicit government support can give investors confidence about political and regulatory risk. This is often given as one of the explanations for rail projects increasing land values.
- Regulatory and compliance burden: one potential role of government is to simplify or otherwise manage its own regulatory approvals processes for a project, including land use planning approvals. In some jurisdictions, approvals can be time-consuming and can create uncertainty. This is a concern raised by the Australian property industry [65].
- Risk: A joint railway and large scale real estate development is a large project, representing a substantial risk for a private company. In particular, this model requires a large upfront capital for development costs and to build the infrastructure. The returns come later, as the developments go to market, and final sales are uncertain. Government can provide financing guarantees to lower the cost of finance for potentially high-risk undertakings.

Several roles suggest themselves for different tiers of government in Australian cities:

- Land assembly for redevelopment: this role could be filled by state and local government. In Western Australia, a state government mechanism already exists for acquiring land for long-term strategy infrastructure planning. This is the Metropolitan Region Improvement Fund, which uses revenues from an increment on the State's land tax to fund land voluntary acquisition for public purposes [66].
- Concessional finance or underwriting: for large projects, this role might be filled by the national government, whose larger financial resources allow it to better absorb this risk. Concessional finance was provided to the Tsukuba Express project in Japan [67].
- Community and stakeholder engagement: this role can be undertaken by the relevant local governments, and the project proponent, as has been done by the CLARA consortium in Australia.
- Regulatory co-ordination: all tiers of government have regulatory functions. Simplifying this process can result from a partnership between different levels of government. City Deals are particularly suited to this function.

City Deals are one potential mechanism for government support of an entrepreneurial rail project, and they are currently on the political agenda in Australia. These City Deals are predicated on collaboration between the different tiers of government, and "aim to integrate transport, housing and land use policies" (Department of the Prime Minister and Cabinet) .

Several agreements have already been signed, including the Perth City Deal, which is intended to deliver the METRONET railway and transit-oriented development project. The MOU covers a wide range of domains of action, but specifies cooperation with local government, communities and the private sector.

5. Conclusions

The early railway building history in Western Australia provides two new case studies of privately-funded railways, integrated with land development. This adds to the body of evidence from Europe, North America and Asia.

These new case studies are particularly notable for the small population of the settlements involved, combined with their isolation from other major population centres. However, similar to Victorian-era London and the mid-Twentieth Century Japanese cities, rapid population growth and economic development was taking place. This suggests that urban growth, rather than absolute size, is more important for the economics of integrated railway and real estate development.

Similar to the land grant railways in North America, the Western Australian land grant railways are a demonstrated model for partnering with the private sector to achieve government's strategic objectives, particularly when those objectives are beyond the capacity of government to achieve with its own resources. The tramways are another example of urban rail public transport co-developing with and being funded by expanding development.

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These provide potential governance/procurement models for increasing private involvement in contemporary cities. The City Deal process as suggested by the Australian Federal Government is largely following the governance process created for the original tramway and railway system in Australia and could once again enable a boom in integrated transit, land use and finance.

However, the historic systems were built prior to motorisation, and the question remains as to what extent this would compromise the economics of a similar model in a contemporary city. Numerous recent studies from car dependent cities have shown that land values still respond strongly to railways. These studies have tested the effects of the presence of a transit station, with there having been little, if any, study to date of how this effect is influenced by its position in the network, or the quality or scale of that network.

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