UNSW SYDNEY

City Futures Research Centre

High Speed Rail Value Uplift

Preliminary Investigation Report

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This report was peer reviewed by Professor Robert Freestone, UNSW and James Abbott, Abbott Advisory. However, any opinions expressed in this report are those of the authors and any errors also remain the responsibility of the authors.

The study was undertaken in the interest of furthering discourse on the merits of a high-speed rail link in Australia in consultation with a network of business leaders committed to infrastructure progress.

Preface

That Fast, or High Speed, Rail would be a practical and effective transport spine to the city regions of the East Coast of Australia has been demonstrated by numerous studies. With the passenger capacity of more than two Pacific Highways but in less space than half of one, built to withstand the future impact of climate change and, as the Japanese have shown for half a century, utterly reliable and safe, High Speed Rail has become the mode of choice in over 20 countries in the developed world. Powered by green energy, its carbon footprint in operation is negligible.

But High Speed Rail is much, much more than a transport system connecting state capitals and replacing carbon-hungry air travel, it offers the chance to develop thriving liveable cities all along its routes. This is a world where new jobs, industries, even sports, organised leisure, shopping, healthcare and education, are concentrated in centres of excellence. These grow where people can actually get to them quickly and reliably. Regional Australia is so often held back by lack of connectivity which means people shift to the big cities, young and old alike. High Speed Rail can overcome the "connectivity deficit." As examples abound around the world, well connected regional cities grow economically strong, attracting people for their better lifestyle – living, working, playing in affordable places of their choice.

Above all, High Speed Rail connects people – overcoming the legacy of being "left behind". With places 100km apart being within 30 minutes travel, they merge economically and socially, stronger together than left apart. Even places 300km away from a state capital have easy, reliable, safe access to all the major activities and facilities capitals have.

This UNSW City Futures Research Centre study reinforces other recent work on the economic and social impact of High Speed or Fast Rail would have on Eastern Australia, focussing on one measure of prosperity being the uplift in land value. It makes modest assumptions based on solid review of effects elsewhere; indeed a whole of Government policy on encouraging development of regional cities as great places to live through investment in centres of healthcare, education, advanced manufacturing and tourism, to name a few, would have a multiplying effect.

The study demonstrates the power a practical mechanism of taxpayers sharing the benefits of land value increase, which High Speed Rail drives, would have on the ability to finance that network, reducing the call on taxpayer-funded investment needed for other essential services.

High Speed Rail can breathe new life into East Coast Australian cities and regions, driving prosperity and social equity for decades to come. It would be a gift from us to our future generations. And this study indicates the potential for achieving it. It's time to get on with High Speed Rail.

Prof Andrew McNaughton

Chairman at Network Rail (High Speed) Limited

Executive Summary

This report is a preliminary investigation into the potential for land value uplift associated with the development of a high-speed rail (HSR) network on the east coast of Australia. It provides a basic understanding of the ability of a value capture mechanism to offset the cost of constructing the network, either partially or in full.

The analysis in this report is based on an alignment proposed in the HSR Phase 2 report prepared for the Australian Department of Infrastructure and Transport in 2013, with two HSR lines running from Melbourne to Sydney, and Sydney to Brisbane, with spur lines to Canberra and the Gold Coast. The suggested timing in the report indicated that if detailed planning progressed immediately (from its publication in 2013), that the Melbourne to Sydney line could be operational in 2040 and the Sydney to Brisbane line in 2058. The total cost of development would be $114b in 2012 dollars. Value capture policies only had limited consideration as a funding option to help finance HSR development costs.

In this study we consider two sources of value uplift in our analysis: (i) infrastructure-related value uplift, which accrues to existing properties as a result of improved accessibility; and (ii) planning-related value uplift, which accrues to land which is expected to be rezoned to residential uses to facilitate population growth around the stations. Given this is a preliminary investigation we outline several limitations in terms of both scope and methodology that are detailed below.

To analyse infrastructure-related value uplift, a review of the literature on HSR driven value uplift was conducted and a value range of uplift coefficients between 10% and 14% was identified. A preliminary population growth catchment area surrounding each station was identified and an uplift coefficient applied to the average price of a detached dwelling in these areas. The value was then multiplied by the number of dwellings in the catchment to produce a preliminary estimate of value uplift for existing dwellings, shown below in Table 1. This produced a total value uplift of $25 billion.

TABLE 1: INFRASTRUCTURE RELATED VALUE UPLIFT (COEFFICIENT-BASED)

HSR Stop	Dwellings	Existing dwel. price	Coefficient	New dwel. price	Value Uplift ($m)
Gold Coast	56,542	$797,000	14%	$908,580	$6,309
Casino	5,073	$375,000	14%	$427,500	$266
Grafton	7,760	$365,000	10%	$401,500	$283
Coffs Harbour	25,489	$672,500	12%	$753,200	$2,057
Port Macquarie	27,877	$690,000	12%	$772,800	$2,308
Taree	16,575	$465,000	12%	$520,800	$925
Newcastle	38,794	$636,500	14%	$725,610	$3,457
Central Coast	34,820	$805,000	14%	$917,700	$3,924
Southern Highlands	15,955	$970,000	14%	$1,105,800	$2,167
Wagga Wagga	19,274	$417,500	10%	$459,250	$805
Albury Wodonga	38,435	$401,250	10%	$441,375	$1,542
Shepparton	20,109	$350,000	14%	$399,000	$985
				Total	**$25,029**

To analyse planning-related uplift, we have used a residual land value (RLV) approach to assess the value of agricultural land converted to land for low density housing to accommodate population growth. Achievable sales prices for new detached dwellings around each station were estimated by examining the sale prices of dwellings located a comparable travel time from the CBD of each major city by rail (in conjunction with the coefficient-based uplift shown above). Development costs were subtracted from the achievable sales value to identify a RLV per dwelling, which was converted to a per hectare basis so that an increase in value compared to existing rural land values can be estimated. This is shown below in Table 2.

TABLE 2: PLANNING-RELATED VALUE UPLIFT PER HECTARE AND PER DWELLING

HSR Stop	RLV per hectare	Existing rural land value (per hectare)	Value uplift per hectare	Value uplift per lot/dwelling
Gold Coast	$3,284,994	$300,000	$2,984,994	$218,502
Casino	$769,016	$38,818	$730,197	$53,450
Grafton	$153,685	$37,321	$116,364	$8,518
Coffs Harbour	$4,597,916	$103,855	$4,494,061	$328,965
Port Macquarie	$4,505,008	$47,469	$4,457,539	$326,292
Taree	$5,206,433	$58,824	$5,147,610	$376,805
Newcastle	$6,785,678	$231,827	$6,553,851	$479,742
Central Coast	$7,993,291	$129,938	$7,863,353	$575,597
Southern Highlands	$7,946,837	$298,359	$7,648,478	$559,869
Wagga Wagga	$4,690,824	$56,529	$4,634,295	$339,230
Albury Wodonga	$880,165	$65,063	$815,102	$59,665
Shepparton	$2,157,033	$65,000	$2,092,033	$153,137

The results indicate that the land surrounding a number of stations may experience substantial increases in land value compared to existing rural land values. Areas where the revenue assumptions were drawn from Sydney land values (Coffs Harbour to Wagga Wagga) performed particularly strongly, while conversely areas where assumed sales prices were taken from Brisbane and Melbourne (all other stations) did not perform as well, probably because of greater land availability on the urban fringe of these cities (compared to Sydney, where development land at comparable travel times from the CBD is scarcer).

To illustrate these results shown in Table 2 at scale, we prepared three hypothetical ‘what if’ scenarios, which indicate what the value uplift would be if a specific amount of growth in population and dwellings occurred. These scenarios are illustrative and have not been based upon comprehensive analysis of the capacity for additional growth around each station. These scenarios are shown below in Table 3. In summary, from our estimates of infrastructure-related value uplift combined with our ‘what if’ scenarios for planning-related value uplift, there could be potential value uplift in the vicinity of $48 billion to $140 billion. Therefore, we put forth there is substantial opportunity to fund HSR through value uplift.

TABLE 3: POPULATION INCREASE SCENARIOS BY STATION

HSR Stop	Population ('000s)			Dwellings ('000s)			Value uplift ($m)		
	High	Med.	Low	High	Med.	Low	High	Med.	Low
Gold Coast	100	50	20	30	15	6	$6,622	$3,311	$1,324
Casino	150	75	30	45	23	9	$2,430	$1,215	$486
Grafton	50	25	10	15	8	3	$129	$65	$26
Coffs Harbour	100	50	20	30	15	6	$9,970	$4,985	$1,994
Port Macquarie	50	25	10	15	8	3	$4,944	$2,472	$989
Taree	50	25	10	15	8	3	$5,710	$2,855	$1,142
Newcastle	100	50	20	30	15	6	$14,539	$7,269	$2,908
Central Coast	150	75	30	45	23	9	$26,166	$13,083	$5,233
Sthn. Highlands	150	75	30	45	23	9	$25,451	$12,725	$5,090
Wagga Wagga	100	50	20	30	15	6	$10,281	$5,140	$2,056
Albury Wodonga	100	50	20	30	15	6	$1,808	$904	$362
Shepparton	150	75	30	45	23	9	$6,961	$3,481	$1,392
Total	**1,250**	**625**	**250**	**379**	**189**	**76**	**$115,010**	**$57,505**	**$23,002**
Total inclusive of $25bn uplift to existing dwellings shown in Table 1 above							***$140,039***	***$82,534***	***$48,031***

Totals may not add due to rounding

It is important to note, that the scope of this preliminary investigation only considers the value uplift at HSR stations outside of major cities and is applied to residential land uses only. As a result, value uplift from non-residential land uses and metropolitan stations would be in addition to any estimates herein. Furthermore, a number of heuristic approaches have been used to produce these estimates of value uplift, which have resulted in a series of methodological limitations which may result in the value uplift being under- or over-estimated. We would also note that our analysis is at a single point in time, using current market values, which may change significantly by the time the project is delivered. However, on the whole, we expect that the values provided herein represent a conservative approach to estimation and that the total value uplift would be higher than the preliminary and indicative results shown above.

The implementation of a value capture system, which would allow for some of this value uplift to be directed towards funding the HSR project, is a complex task. This necessitates careful consideration of the fairness and efficiency of any such taxation arrangements which might be implemented to capturing the value associated with the HSR network (Infrastructure Australia 2016, Terrill & Emslie 2017).

In light of the fact that our analysis has identified significant potential for value uplift, we strongly recommend that further detailed work be conducted to:

- Understand the capacity for urban growth in proximity to the HSR stations through an integrated land use transport approach.
- Understand the capacity of the HSR system to support commuter travel.
- Improve upon preliminary methods used herein and expand the analysis of value uplift to non-residential land use and to metropolitan stations.
- Understand the pros and cons of implementing different value capture mechanisms, including producing estimates of their financial performance.
- Determine the appropriate governance arrangements to oversee implementation of a value uplift mechanism.

The ability to apply a value capture policy to use this uplift to fund development of the HSR project is dependent on achieving a series of specific outcomes. Four key considerations for policymakers have been summarised below, with additional detail provided later in this report:

1. Announcement of project details should not occur ahead of announcement of a fully developed value capture mechanism (including maps of the area to which it applies and its applicable rates) to avoid losing value uplift to land speculation.
2. The successful implementation of any value capture mechanism requires cooperation between state/territory and federal governments.
3. Political sensitivities around the implementation of a value capture mechanism need to be carefully managed.
4. Detailed land use planning needs to be integrated with transport planning for the delivery of the HSR network.
5. The interconnections between value capture, settlement planning and research are of national significance as highlighted in the report of the House of Representatives Standing Committee on Infrastructure, Transport and Cities into the Australian Government's role in the development of cities (Parliament of the Commonwealth of Australia 2018).

Contents

1. Project background and our approach

This report is a preliminary investigation into the potential for land value uplift resulting from the development of a high speed rail (HSR) network on the east coast of Australia to understand how value capture policies could help fund the development of the network. The report will calculate an estimate of the total value uplift attributable to the development of HSR infrastructure and rezoning for new residential land.

The Australian Department of Infrastructure and Transport commissioned two reports into the feasibility of a HSR network, with the Phase 1 report delivered in 2011 and Phase 2 delivered in 2013. Our report utilises information on station locations, travel times, and construction staging from the Phase 2 report, produced in 2013. Figure 1 shows the preferred network alignment, taken from the Phase 2 report.

FIGURE 1: PREFERRED HSR ALIGNMENT AND STATIONS

The suggested timing in the report indicated that if detailed planning progressed immediately (from its publication in 2013), that the Melbourne to Sydney line could be operational in 2040 and the Sydney to Brisbane line in 2058. The preferred alignment contains four major city stops, twelve regional stops, and four city-periphery stops (two for Sydney, one for Melbourne/Brisbane, not shown in Figure 1). The Phase 2 report yielded an estimate for the total cost of the HSR development of $114 billion (2012 dollars). Crucially, the report expected government to fund the majority of the upfront capital costs. The report stated the need for an expected Return on Investment (ROI) of 15% to attract private investment, which represents an ambitious target for HSR. Even in the most optimistic private investment scenario, the government would still be required to front 86% ($96 billion) of upfront capital costs. Value capture policies had only limited consideration as a funding option to help finance HSR construction costs.

However, value capture is a proven financial mechanism used in rail projects abroad. Point in case, the Crossrail project in the UK, where the Greater London Authority implemented a Business Rate Supplement (BRS). This value capture mechanism is expected to generate £4.1 billion, contributing substantially to the total cost of the whole project £14.8 billion (Medda; 2012).

In this report we consider two sources of value uplift arising from HSR development in regional towns:

- **Infrastructure-related value uplift**: Uplift for existing residential properties in regional towns associated with the accessibility improvements facilitated through HSR. This has been calculated by applying a value uplift coefficient, based on the international literature, on the total value of existing residential dwellings within the catchment area of proposed regional HSR stops.
- **Planning-related value uplift:** Uplift for current agricultural land expected to be rezoned to residential land to accommodate for the increased population demands surrounding regional HSR stops. The residual land value (RLV) per new dwelling was calculated by subtracting the development costs from the expected new dwelling values for each regional area. The assumed RLV for each area was then multiplied by population growth assumptions to obtain a figure for total planning-related uplift.

As this is a preliminary investigation, we have limited the scope of our analysis to only the non-metropolitan stops outside of the four capital cities and only value uplift for residential land uses. Further detailed work is required to produce estimates of non-residential land uses and for metropolitan locations. A number of heuristic approaches have been taken in the interests of producing initial estimates of value uplift ahead of this detailed work being completed.

The report begins by surveying the relevant international literature investigating the impacts of HSR stations on residential land value. It will then summarise the method and results for the infrastructure-related and planning-related value uplift calculations. It concludes with a discussion of both the limitations of this analysis and directions for future work.

2. HSR value uplift in the literature

Summary of HSR literature

While HSR was adopted in the 1990s and early 2000s in a range of developed European and Asian countries, the study of its impact only really began in the early 2000s. Earlier literature exploring the impact of HSR on existing property prices produced mixed results for large and small cities.

In large cities, a heterogeneous effect was present, dependent on the level of pre-existing accessibility. In cities with significant existing transport infrastructure, such as Paris, properties surrounding the newly introduced HSR station experienced slower price growth than the rest of Paris in the years immediately after construction (Gargiulo & de Ciutiis, 2010). Similarly, property prices surrounding stations in Rome and Milan both fell after the introduction of HSR (Gargiulo & de Ciutiis, 2010). However, in areas with poorer accessibility, where HSR stations have been accompanied by other retail and commercial infrastructure, a positive effect on housing prices has been documented. Examples include the HS1 station in Camden (London) and the TGV in Lyon (Cascetta et al., 2010; Pagliara et al., 2012; Gariulo & de Ciutiis, 2010). In all these cases, it is hard to isolate the specific HSR effect, as there are numerous other confounding circumstances. Overall, in large cities, it is difficult to determine whether HSR is a positive or negative signal for property prices. Therefore, we have opted not to include value uplift in major cities in this report.

In small and regional cities on the other hand, the literature is more comprehensive in attributing a positive impact of HSR stations on property prices. Given smaller cities generally have far less pre-existing transport infrastructure than large cities, HSR represents a more significant improvement to accessibility (Hensher et al., 2012). Furthermore, the development of HSR lines to regional areas sends very strong growth signals, attracting investment and stimulating property prices (Hensher et al., 2012). Hence, it makes sense that HSR would have a more pronounced value uplift for smaller cities. This is corroborated by evidence from Nantes and Lyon in France, Turin in Italy, and Hsinchu and Jiayi in Taiwan of property price improvements in the immediate vicinity of HSR stops (Gargiulo & de Ciutiis, 2010; Andersson et al., 2012). Therefore, the focus of our value uplift work for this report will be on regional HSR stops, where the evidence is for a more concrete link to property price improvements.

Impacts of HSR on residential property valuation

Recent HSR studies have attempted to value the uplift attributed to the development of HSR stations through regression and Difference-in-Difference (DiD) analyses. In studies spanning China, Taiwan, and Japan, a statistically significant positive relationship between HSR and property prices has been established, and the magnitude of HSR coefficients tends to fall in a similar range (Low & Lee, 2020; Geng et al., 2015; Kunimi & Seya, 2021).

Among regression approaches, Wang et al. (2018) associated a *13.9%* property price increase associated with the existence of a HSR stop in Chinese cities. Similarly, Liu et al's (2021) regression results indicate that an increase by one standard deviation in their specific accessibility indices translated to a *10.3%* to *11.2%* housing price increase. For DiD studies, Zhou et al. (2017) find that adding an HSR station to Chinese cities is expected to increase

property prices by *10.2%* to *11.9%*. Wang et al. (2019) document a coefficient of *12%* for small/medium-sized cities, while Liu et al. (2021) find that when average travel time decreases by one unit (100 min), housing prices will be *10.2* to *10.8%* higher compared to cities without HSR access.

Overall, the range of coefficients for the improvement of city property prices when a HSR station is developed range between *10* to *14*%. This delineates the base range of value uplift coefficients for our residential value uplift calculations.

In general, there is an acceptance that regional areas close to major cities experience greater HSR-related uplift, due to greater commuter potential. Kunimi & Seya (2021) found that the HSR impact was greater for cities closer to Tokyo, while Liu et al. (2021) found more significant property price increases for closer-in regional cities than far-regional areas. Therefore, we will apply a range of HSR uplift coefficients for regional stops, dependent on their accessibility to major cities.

Finally, while most HSR property price studies conducted on a city-wide scale neglect the heterogeneous impact of proximity to the station, there is some evidence that areas closer to stations experience greater value uplift. Geng et al. (2015) found the most significant property price impacts between *0.48* to *1.34km* in China, while Kunimi & Seya (2021) identified an approximate *2.5km* ring within which statistically significant HSR coefficients emerged in Japan. Ultimately, while there is no consensus on the exact HSR uplift catchment area, we will only consider suburbs in close proximity to the HSR as experiencing infrastructure-related value uplift.

3. Infrastructure related value uplift

Application of value coefficients from the literature

To calculate the infrastructure-related value uplift for residential approach, a simple coefficient was applied to the existing residential land value within the HSR uplift catchment area. The formula was as follows:

$$Value\_Uplift_i = Total\_Residential\_Value_i * Uplift\_Coefficient_i,$$

Here, i is the HSR regional stop, $Total\_Residential\_Value_i$ represents the total value of all residential properties within the uplift catchment area of a stop, and $Uplift\_Coefficient_i$ is the value uplift coefficient applied to a stop based on its location and accessibility to the nearest major city.

To determine the uplift catchment area around each stop, assumed stop locations in each regional area were selected based on the proposed corridor alignment in Chapter 4 of the IA Phase 2 report (Figure 1). Thereafter, SA2 areas in proximity to the station were selected to represent a catchment of dwellings which would experience value uplift. Appendix A provides a detailed table of the station locations and SA2s included for each regional stop, while Appendix B provides visual examples of the HSR uplift catchment areas for the Central Coast and Newcastle.

Within these catchment areas, the total number of dwellings was calculated using the 2016 ABS census data for total private dwellings. Population growth rates between 2016-2020 for

each regional area were calculated using the 2016 census and 2020 Estimated Resident Population figures from the ABS. The 2016 figures for total dwellings were then inflated to 2020 figures using the population growth rates in each regional area between 2016-2020. Median house prices within each area were calculated using data from the *Australian Property Monitors (APM)* company, who compile residential sales data monthly. Total residential value was therefore calculated as:

$$Total\_Residential\_Value_i = Total\_Dwellings_i * Median\_House\_Price_i$$

As mentioned previously, the value uplift coefficient ranged between 10% to 14%, dependent on the stop's geography and accessibility to a major city. The following typology of stops was created:

$$Stop\_Classification_i = \begin{cases} Short - Distance, & if\ travel\ time < 1\ hour \\ Regional - Coastal, & if\ travel\ time > 1\ hour\ and\ coastal \\ Regional - Rural, & if\ travel\ time > 1\ hour\ and\ non - coastal \end{cases}$$

The travel times to nearest cities for all regional stops, taken from the Phase 2 travel times and interpolated for stops without a travel time figure, are shown in Appendix C. The uplift coefficient for Short-Distance stops was assumed to be higher, based on studies finding more significant HSR impact for urban centres closer to major cities (e.g., Kunimi & Seya, 2021). Properties in Regional-Coastal areas were expected to have a slightly higher coefficient than Regional-Rural areas, based on the greater desirability of coastal living, as reflected in their higher housing prices (see Table 1). Hence, the following uplift coefficients were assigned:

$$Uplift\_Coefficient_i = \begin{cases} 14\%, & if\ Stop\_Classification_i = Short - Distance \\ 12\%, & if\ Stop\_Classification_i = Regional - Coastal \\ 10\%, & if\ Stop\_Classification_i = Regional - Rural \end{cases}$$

The finalised calculations for total value uplift in each regional area are summarised below in Table 3. The total value uplift for existing dwellings attributed to the introduction of regional HSR stops is approximately $25b.

TABLE 4: INFRASTRUCTURE RELATED VALUE UPLIFT (COEFFICIENT-BASED)

HSR Stop	Dwellings	Existing dwel. price	Classification	Coefficient	New dwel. price	Value Uplift ($m)
Gold Coast	56,542	$797,000	Short-Distance	14%	$908,580	$6,309
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Shepparton	20,109	$350,000	Short-Distance	14%	$399,000	$985
					Total	**$25,029**

The following are some key caveats that should be noted when considering the magnitude of the figure of $25b:

- ***Overvalued =>*** Median house price is for detached dwellings. This neglects apartment buildings, which are generally cheaper and may make up a sizeable proportion of market share in some of the larger cities such as the Gold Coast and Newcastle.
- ***Undervalued =>*** The value uplift estimate only considers residential buildings. This ignores the uplift of commercial land in the vicinity of HSR stations.
- ***Undervalued =>*** The value only considers existing dwellings. When newer housing stock is added, this will contribute to a higher overall number of dwellings and likely a higher median house price.
- ***Undervalued =>*** The coefficient applied to small regional towns likely understates impact. The coefficient range of 10 to 14% is taken from Chinese and Japanese cities with significant pre-existing infrastructure and services. This may be applicable for the larger cities such as the Gold Coast, Central Coast, and Newcastle. However, for smaller cities with far less infrastructure such as Casino and Grafton, the development that will accompany the HSR stations will likely stimulate far more property price growth than the assumed 10 to 14% range. This limitation provided the primary motivation for the substitution approach to find the value of new dwellings.

4. Planning-related value uplift

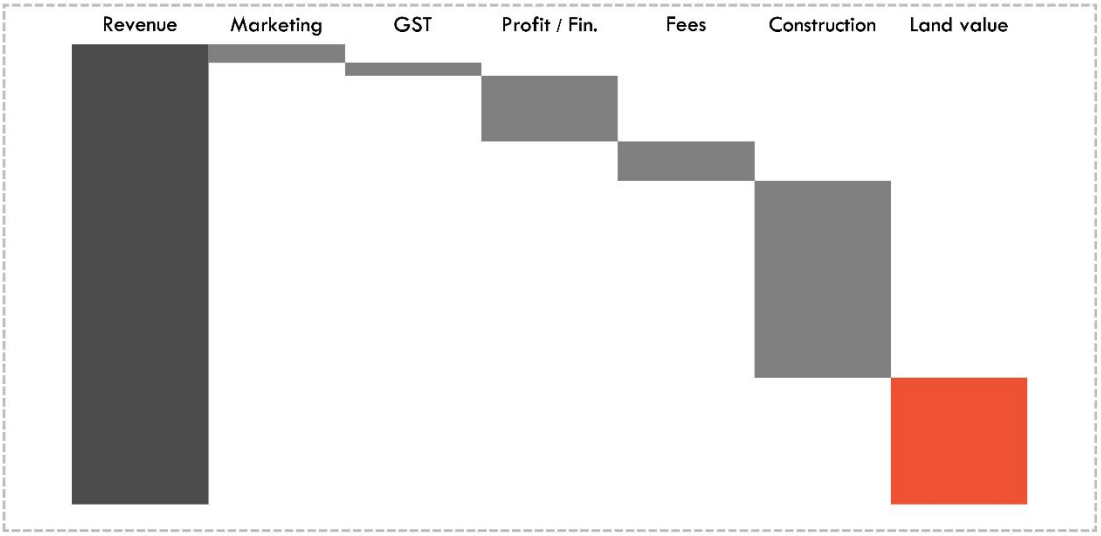
Overview of the residual land value process

We have taken a residual land value (RLV) approach to value the land which will be used for new residential developments around the HSR stations. In this approach, the value of land for development is determined by the residual amount which remains after development costs (including a developer's profit margin) are taken away from the achievable market sales values for the newly completed buildings. This is expressed using the following equation.

$$Land\ value = \ Market\ value\ of\ new\ dwellings\ - (Development\ costs + Profit)$$

Figure 2, taken from Murray (2020, p. 4), presents a diagrammatic view of this equation, broken down by some broad groupings of cost elements, each of which are taken away from the anticipated revenues until the residual amount is found for the land value.

FIGURE 2: EXAMPLE OF RESIDUAL LAND VALUATION FOR SITE DEVELOMPENT



Built form assumptions

As preparing detailed land use assumptions was beyond the scope of this preliminary analysis, it is assumed that all dwellings are built as detached houses, reflective of the predominant style of development on the urban fringes of Australia's major cities. While we are assuming that this will be the main form of new housing built around most of the rural HSR stations, in practice a transit-oriented development (TOD) would result in a mix of dwelling types and sizes being built, along with a mix of commercial, retail, educational, health, and other non-residential land uses.

Our development costs and revenues have been assumed to align broadly with 4 bedroom dwellings, with a size of 200m^2 building area and an average of approximately 400m^2 lot area. When accounting for infrastructure (e.g. roads, local open space) to be provided as part of a subdivision, a dwelling density of 13.66 dwellings/hectare is assumed.

Development revenue assumptions

Revenue assumptions for new dwellings were based upon anticipated market values after completion of the HSR project, drawing upon the estimated increase in values which were obtained by applying a coefficient to existing dwellings values (shown in Table 3 above), as well as an alternative method which involved substituting land values from existing areas of major cities based on their travel time by rail to the city centre stations on the HSR route in Brisbane, Sydney and Melbourne. This was completed to address the fact that the application of a coefficient originally taken from Asian cities with considerable extant infrastructure and employment opportunities to small regional towns within Australia was considered likely to underestimate increases in value in these locations. Furthermore, newly constructed dwellings typically command a higher price than existing dwellings which have experienced depreciation resulting from ageing of their structure and fittings.

Therefore, new land dwellings were taken from comparable suburbs in the nearest major city that were a similar time away from the CBD by traditional train routes as each regional stop is anticipated to be by HSR. For example, Casino is estimated to become 50 mins from Brisbane by HSR, therefore its new dwelling prices were compared to Brisbane suburbs 50 mins from the CBD by train. Suburb selection sought to exclude areas with abnormally high

dwelling prices, resulting from factors such as luxury housing stock (e.g. Canterbury, VIC), as well as where prices began to increase further from the city due to lifestyle and scenic factors (e.g. Helensburgh, NSW) or the proximity to distinct urban centres (e.g. Wollongong, Geelong). Appendix D summarises the suburbs that corresponded to different public transport travel times in each of the major cities.

Dwelling prices were taken by searching for 'new land and house' packages in the relevant suburbs on *RealEstate.com*. Where possible, houses close to 200m^2 in building area and 400m^2 in land area were sought. To standardise for building size, the price/sqm of building was averaged between all new builds in each suburb, and the average price/sqm was then averaged between comparable substitution suburbs for each regional stop (e.g., Casino price/sqm averaged the three 'Brisbane 50 min' suburbs).

The average price for a new dwelling, assumed to be 200m^2, was calculated as:

$$Price\_New\_Dwelling_i = price/sqm_i * 200$$

Some variations to this approach were used in cases where inadequate data were available. For stops which were identified as being either 30 or 40 minutes from Sydney, there were no sales of new house and land packages identified, due to the unavailability of land for new subdivisions in these areas. In these cases, the average price of existing dwellings was obtained. As the substituted value of existing dwellings in Newcastle was lower than in Taree (one stop further away from Sydney), the average between the value of the two adjacent stops (Taree and Central Coast) was used. For the Gold Coast, the value which resulted from the application of the uplift coefficient ($908,580) was used as it was higher than the substitution value of new dwellings ($744,000), reflective of the high existing amenity, infrastructure and employment opportunities in this location. The values for Richmond (ninety minutes from Sydney) were lowered to match the values for stations eighty minutes from Sydney as the price of new dwellings in this location was higher.

The substitution values for the price for new dwellings in each of the regional stops are summarised in Table 4.

TABLE 5: UTILISED REALISATION (SALES) VALUES

HSR Stop	Utilised value	Utilised method
Gold Coast	$908,580	Value uplift coefficient
Casino	$648,000	Substitution (new dwellings)
Grafton	$606,000	Substitution (new dwellings)
Coffs Harbour	$1,078,000	Substitution (new dwellings)
Port Macquarie	$1,078,000	Substitution (new dwellings)
Taree	$1,160,000	Substitution (new dwellings)
Newcastle	$1,297,500	Average of adjacent stops
Central Coast	$1,435,000	Substitution (existing dwellings)
Southern Highlands	$1,435,000	Substitution (existing dwellings)
Wagga Wagga	$1,078,000	Substitution (new dwellings)
Albury Wodonga	$650,000	Substitution (new dwellings)
Shepparton	$790,000	Substitution (new dwellings)

Some important caveats to mention with these results are:

- The new dwelling prices reflect 200m^2 detached dwellings and do not consider the full range of dwelling densities which are likely to be delivered.
- The values of stops closer to Sydney are far higher than Brisbane or Melbourne stops, due to the inflated Sydney housing market. Improved accessibility to more than one major city location, as well as accessibility to Canberra or other regional stops, has not been considered.
- Beneficial and detrimental locational impacts in proximity to new HSR stations (e.g. the desirability of lifestyle factors in certain locations) have not been considered.

Development cost assumptions

Development costs were adapted based on a mixture of published construction cost information and generalised industry assumptions. The construction cost of a new dwelling (including the net cost of internal subdivision infrastructure such as local roads, parks and drainage – but excluding external infrastructure delivered by government) was assumed to be $340,000, although an adjustment factor was applied to reflect variation in construction costs between areas. Table 5 shows the development cost assumptions used for this analysis.

TABLE 6: UTILISED DEVELOPMENT COST ASSUMPTIONS

Assumption	Value	Unit/Application
Base construction cost (incl. subdivision works)	$341,188	per dwelling/lot
Locational cost adjustment	0% - 8%	of base construction cost
Professional fees	6.75%	of adjusted construction cost
Contingency allowance	2.5%	of adj. const. cost & prof. fees
Estate/site management, certification, and misc. costs	$7,000	per dwelling/lot
Design and construct costs		*sum of the above costs*
Sales and marketing costs	5.5%	of gross realisation (sales) values
GST input tax credits	10%	of design and construct costs
GST liability on sales	1/11th	of gross realisation values, less input tax credits
Land tax	1.5%	of assumed acquisition values
Planning application fee	0.08%	of design and construct costs
Local infrastructure contributions	$20,000	per dwelling/lot
Project finance	4%	of development costs, including land acquisition but excluding profit.
Margin for profit and risk	20%	of all development costs, including land acquisition
Land acquisition		*sales values (excl. GST) minus development costs*

1. Some of the other cost elements use the land acquisition value to determine their value, so as such an iterative calculation process is used to determine the residual value

RLV results and value uplift

The results of the RLV analysis for each stop are shown in Table 6, both on a per dwelling and per hectare basis. Aside from the locational construction cost adjustment factor, variation in the development costs between each station is driven partly by the fact that certain cost elements (sales and marketing costs, GST) are linked to achievable sales values, which means that development costs are higher in areas with higher sales values.

TABLE 7: RLV RESULTS BY HSR STATION

HSR Stop	Development costs	Sales values (less GST liability)	RLV per lot/dwelling	RLV per hectare
Gold Coast	$628,550	$869,011	$240,462	$3,284,994
Casino	$575,515	$631,807	$56,292	$769,016
Grafton	$584,011	$595,261	$11,250	$153,685
Coffs Harbour	$689,261	$1,025,828	$336,567	$4,597,916
Port Macquarie	$696,808	$1,026,575	$329,767	$4,505,008
Taree	$720,833	$1,101,944	$381,111	$5,206,433
Newcastle	$728,376	$1,225,087	$496,712	$6,785,678
Central Coast	$766,108	$1,351,217	$585,109	$7,993,291
Southern Highlands	$769,882	$1,351,590	$581,708	$7,946,837
Wagga Wagga	$681,713	$1,025,081	$343,368	$4,690,824
Albury Wodonga	$568,462	$632,890	$64,428	$880,165
Shepparton	$603,038	$760,933	$157,895	$2,157,033

To identify the uplift associated with new residential development, the existing value of rural land was subtracted from the residual land value results. Existing rural land values were identified using land valuations produced by the NSW Valuer General on an unimproved capital value basis, as of 1 July 2021. Values were taken from selected rural land use zones only (RU1, RU2, and RU4). Appendix E shows the suburbs which were used to identify rural land values. As the Gold Coast and Shepparton are both outside of NSW, they were assumed to have values of $300k and $65k per hectare respectively. The rural land values and the resultant value uplift per hectare and per dwelling are shown in Table 7 .

TABLE 8: PLANNING-RELATED VALUE UPLIFT PER HECTARE AND PER DWELLING

HSR Stop	Existing rural land value (per hectare)	Value uplift per hectare	Value uplift per lot/dwelling	Ratio of RLV to existing value
Gold Coast	$300,000	$2,984,994	$218,502	10.95
Casino	$38,818	$730,197	$53,450	19.81
Grafton	$37,321	$116,364	$8,518	4.12
Coffs Harbour	$103,855	$4,494,061	$328,965	44.27
Port Macquarie	$47,469	$4,457,539	$326,292	94.90
Taree	$58,824	$5,147,610	$376,805	88.51
Newcastle	$231,827	$6,553,851	$479,742	29.27
Central Coast	$129,938	$7,863,353	$575,597	61.52
Southern Highlands	$298,359	$7,648,478	$559,869	26.64
Wagga Wagga	$56,529	$4,634,295	$339,230	82.98
Albury Wodonga	$65,063	$815,102	$59,665	13.53
Shepparton	$65,000	$2,092,033	$153,137	33.19

Value uplift associated with new residential development is indicated as being substantial in proximity to a majority of the stations. Stations which have their revenue assumptions associated drawn from substation land values in Sydney (stations between Coffs Harbour and Wagga Wagga) display the highest level of value uplift as a result of their assumed ability to achieve higher sales values.

While the value of residential land uses around Grafton is four times higher than the existing rural land values, indicating that development of residential properties would be financially feasible under the current set of assumptions, the value uplift potential is particularly low in this location and would only contribute marginally to funds raised through a value capture mechanism. In light of the variation across the proposed HSR line, the achievable value uplift should be considered as a factor within the land use planning process associated with the new HSR stations, although the maximisation of potential value capture revenues will need to be balanced against the achievement of other strategic objectives and environmental constraints.

The remaining stations which do not source their revenue assumptions from Sydney values (Gold Coast, Casino, Albury Wodonga, and Shepparton) also indicate lower potential for value growth. It is worth noting that Melbourne and Brisbane have more land availability at these distances from their respective CBDs when compared to Sydney, due to geographical constraints and the centrality of their CBDs in their metropolitan footprints. As these cities expand over time, this may result in land at these distances (50-70 minutes from the CBDs) becoming scarcer and more valuable, increasing the value uplift potential associated with these HSR stations.

While we have limited consideration of substitution values to 90 minutes from a particular city, it is likely that the positive effect on land values will extend further than that distance. Improved accessibility to Canberra and to multiple urban centres has also not been considered, which can be assumed to result in further increases in potential residential land values.

Population growth scenarios

To demonstrate the potential value uplift resulting from new residential development, three hypothetical population growth scenarios have been prepared. It should be noted that these growth scenarios are illustrative only and have not been based on modelling of land capacity or demand. This should be undertaken as part of a more detailed land use planning process for the areas around each station.

A high, medium, and low population scenario have been prepared to demonstrate a broad range of hypothetical outcomes. The assumed amount of people living in proximity to each station location varies across these scenarios, while the occupancy rate (people per dwelling) and dwelling density remain constant at 3.3 and 13.66 respectively, to be consistent with our previous assumptions that all dwellings are constructed as low-density, detached houses.

In each scenario, the distribution of population between HSR stations was adjusted to one of three levels based on proximity to nearby major cities. Stations closest to major cities were allocated more population, as were stations which were equally distant between two major cities (Coffs Harbour and Wagga Wagga). The assumed population, dwellings and the land area required by developers is shown in Table 8 .

TABLE 9: POPULATION INCREASE SCENARIOS BY STATION

HSR Stop	Population ('000s)			Dwellings ('000s)			Land area (hectares)		
	High	Med.	Low	High	Med.	Low	High	Med.	Low
Gold Coast	100	50	20	30	15	6	2,218	1,109	444
Casino	150	75	30	45	23	9	3,328	1,664	666
Grafton	50	25	10	15	8	3	1,109	555	222
Coffs Harbour	100	50	20	30	15	6	2,218	1,109	444
Port Macquarie	50	25	10	15	8	3	1,109	555	222
Taree	50	25	10	15	8	3	1,109	555	222
Newcastle	100	50	20	30	15	6	2,218	1,109	444
Central Coast	150	75	30	45	23	9	3,328	1,664	666
Sthn. Highlands	150	75	30	45	23	9	3,328	1,664	666
Wagga Wagga	100	50	20	30	15	6	2,218	1,109	444
Albury Wodonga	100	50	20	30	15	6	2,218	1,109	444
Shepparton	150	75	30	45	23	9	3,328	1,664	666
Total	**1,250**	**625**	**250**	**379**	**189**	**76**	**27,730**	**13,865**	**5,546**

Totals may not add due to rounding

These figures represent an increase on existing population in each of these locations. To provide a sense of scale to the increase, urban areas which have a comparable number of residents are listed below (Australian Bureau of Statistics 2020):

- Increase of 100,000 people – Bendigo (102k), Albury-Wodonga (96k)
- Increase of 75,000 people – Coffs Harbour (73k), Melton (75k), Rockhampton (80K)
- Increase of 50,000 people – Port Macquarie (49k), Mildura-Wentworth (52k)
- Increase of 45,000 people – Tamworth (43k), Gladstone-Tannum Sands (45k)
- Increase of 30,000 people – Nelson Bay (28k), Lismore (28k), Mt Gambier (30k)
- Increase of 25,000 people – Goulburn (24k), Armidale (24k), Taree (26k)
- Increase of 23,000 people – Bacchus Marsh (24k), Gisborne-Macedon (23k)
- Increase of 20,000 people – Griffith (20k), Wangaratta (19k), Grafton (19k)
- Increase of 15,000 people – Emerald (14k), Kempsey (15k), Sale (15k)
- Increase of 10,000 people – Kingaroy (10k), Portland (11k)

These assumptions translate to the value uplift shown below in Table 9.

TABLE 10: PLANNING-RELATED VALUE UPLIFT BY POPULATION SCENARIO

HSR Stop	High ($m)	Medium ($m)	Low ($m)	% of total
Gold Coast	$6,622	$3,311	$1,324	5.8%
Casino	$2,430	$1,215	$486	2.1%
Grafton	$129	$65	$26	0.1%
Coffs Harbour	$9,970	$4,985	$1,994	8.7%
Port Macquarie	$4,944	$2,472	$989	4.3%
Taree	$5,710	$2,855	$1,142	5.0%
Newcastle	$14,539	$7,269	$2,908	12.6%
Central Coast	$26,166	$13,083	$5,233	22.8%
Southern Highlands	$25,451	$12,725	$5,090	22.1%
Wagga Wagga	$10,281	$5,140	$2,056	8.9%

HSR Stop	High ($m)	Medium ($m)	Low ($m)	% of total
Albury Wodonga	$1,808	$904	$362	1.6%
Shepparton	$6,961	$3,481	$1,392	6.1%
Total	**$115,010**	**$57,505**	**$23,002**	5.8%

Totals may not add due to rounding. Percentage column is the same for all three scenarios.

The bulk of value uplift in these hypothetical 'what if?' population scenarios is driven largely by growth in areas in proximity to the major cities, particularly Sydney, given their higher assumed populations and dwelling sales prices. Smaller regional centres contributed less of the total, however most of them still produce total uplift amounts which would be considered large sums of money outside of such a large and expensive infrastructure program.

It should be noted that the value uplift obtained from new developments, as illustrated in the scenarios in Table 9, is distinct from (and in addition to) the estimated $25b value uplift which accrues to existing dwellings, shown in Table 3.

5. Discussion/conclusions

The initial estimates of value uplift for residential land attributable to the development of twelve regional HSR stops provides an initial gauge of the magnitude of potential value capture to help finance the development costs of the HRS. However, with the emphasis on providing a quick and practical value uplift estimate, there are some key limitations to these calculations that should be noted when considering the magnitude of the estimates.

Firstly, the report only considered residential uplift for regional HSR stops. Hence, there are *scope limitations* that will likely undervalue the total HSR-related value uplift:

- The work only considers regional stops, as the consideration of value impacts within major cities requires more complicated analysis beyond the scope of this preliminary investigative work.
- Non-residential land value uplift was also omitted due to the greater complexity in modelling the impacts of improved accessibility and any secondary economic impacts.

There are also several *methodological limitations* stemming from the heuristic-based approach used. These limitations are expected to have a mixed effect, in that some factors may increase or decrease total value estimates. As a result it is important to emphasise that these estimates are preliminary and should be revised as a result of future work. Some limitations include:

- The value uplift coefficient applied to estimate infrastructure-related value uplift is taken from studies based on HSR in large Chinese and Japanese cities. The actual impact on land values may be different in small Australian towns, where there is significantly less pre-existing accessibility and infrastructure.
- Additionally, the cost of delivering the infrastructure required to support population growth in these areas has not been considered, although it should be noted that this population growth would largely occur elsewhere without the HSR network and would incur delivery costs in those locations. While this may result in higher cost in

some cases (e.g. not being able to use spare capacity in existing infrastructure), it may also allow savings in other cases (e.g. through cheaper land acquisition compared to urban areas).

- All land values are based on prices for detached dwellings. This does not consider the potential for medium- or high-density developments near HSR stops.
- All land and property values are taken at existing market prices; future developments to house prices have not been considered. Given the long timeframe involved in delivering the HSR network, market conditions may have significantly changed by the time that any value capture mechanisms are generating significant revenues.
- Likewise, assumptions on construction costs are based on current values and may increase or decrease relative to achievable revenues.
- Population growth assumptions are deliberately rudimentary, due to the huge degree of uncertainty in population trends, particularly pertaining to regional migration contingent on major infrastructure development. There is significant scope to construct more technical and specific population assumptions based on demand drivers for each regional HSR stop.
- Assumptions on population and dwelling growth and capacity are based on hypothetical 'what if?' scenarios only and have not been based on detailed analysis of what can be accommodated around each station. As a result, the outcomes of these scenarios should not be treated as forecasts or predictions. Detailed land use planning is required to gain a better understanding of the capacity for HSR to support population growth in these areas.

Notwithstanding these limitations, the calculations provide an indication of the significant magnitude of potential value uplift associated with the development of an east-coast HSR network. *Value Capture (VC)* is a method of capturing "a portion of these benefits from public infrastructure developments that flow to the value of the land" (Infrastructure Australia, 2016) to help finance the infrastructure development. Infrastructure Australia's (2016) report on VC identified five predominant mechanisms to capture value uplift:

- ***Betterment levies****:* capture a portion of estimated value uplift on land within catchment area of infrastructure development
- ***Developer charges****:* payments by a property developer to contribute to shared infrastructure/services in vicinity of development
- ***Leveraging government land****:* government sells or leases land rights around infrastructure development to fund construction and capture value uplift
- ***Taxes on property transactions****:* taxes levied at point of property transaction as a portion of sale price, charged to buyer or seller
- ***Taxes on land value****:*

  a) ***Taxes on land value (existing)****:* recurring levy on land or property owners to pay for service delivery

  b) ***Broad-based land tax (possible)****:* streamlining charging processes, phasing out other charges (e.g., stamp duty). It should be noted that NSW (where the vast majority of stations are located) is currently undertaking reform process to allow buyers to choose to pay a broad-based land tax instead of stamp duty.

Research into the potential use of VC systems in Australia, such as work published by the Grattan Institute (Terrill & Emslie 2017), has identified that implementing a value capture system is a complex task. Careful consideration needs to be given to the fairness and efficiency of VC approaches when developing a system and should evaluate whether a single standardised approach to VC should be implemented rather than implementing bespoke, project-specific VC systems.

It is noted that some VC mechanisms can have distortive market and economic impacts. For example, taxes on property transactions can be inefficient because value uplift is uncaptured if properties do not change hands, or if properties are outside of the VC catchment area. Ultimately, the Infrastructure Australia (2016) report recommended a broad-based land tax as the most effective mechanism for promoting funding capacity, fairness, and economic efficiency. However, it is important to consider all available options as they will deliver differing amounts of revenue at differing points in time. It is possible that more than one value capture mechanism is implemented, to allow for a combination of their relative strengths and weaknesses to be used.

6. Key considerations

While our preliminary investigation has identified significant potential for value uplift, the ability to channel this uplift into funding the HSR project via a VC mechanism is dependent on achieving a series of outcomes in terms of project management and governance. We have summarised some of the most important considerations below:

1. Announcement of project details should not occur ahead of announcement of a fully developed value capture mechanism (including maps of the area to which it applies and its applicable rates) to avoid losing value uplift to land speculation.

Speculation on future development potential can occur very early in a project timeline, including at the initial announcement when very few details are available. Given the information from the Phase 2 report is in the public domain, there is a very real risk of this occurring around the alignment indicated in this report. If this speculation bids up land prices ahead of implementation of a value capture mechanism, it can result in substantial portions of this value uplift accruing to existing land holders, developers, and speculative investors. This limits the suite of value capture mechanisms which are available to government, reduces their effectiveness, and exacerbates distortionary effects of others.

While a value capture mechanism does not necessarily need to be legislated at the time of project announcement, it does need to be clearly defined and communicated in a way that allows market transactions of land to price in the additional cost ahead of time. This will require a full analysis of value capture options to be completed ahead of project announcement.

2. *The successful implementation of any value capture mechanism requires cooperation between state/territory and federal governments.*

State and territory governments are currently responsible for most of the government charges and taxes levied on development and land values, and accordingly it is anticipated that they will be responsible for the administration of a value capture mechanism for the HSR project. Systems for and rates of government charges differ substantially between the four state and territory governments and agreement would be required to implement a unified approach. Further to this, they are responsible for land use planning around stations and the delivery/operation of infrastructure required to support this growth, so agreements would also be required in these areas.

3. *Political sensitivities around the implementation of a value capture mechanism need to be carefully managed.*

Even for existing mechanisms, there are significant public misconceptions around who is ultimately impacted by developer charges and property taxes (e.g. the notion that infrastructure charges levied on development are directly transferred into higher house prices). While the specific impacts vary based on what kind of value capture mechanism is implemented, in most cases the impact results in a *reduced increase* in property values (often described as a windfall gain) for existing land holders, opposed to what it would otherwise be without the value capture mechanism. Developers who operate on a largely speculative basis will also see reduced opportunities for these windfall gains. Recent implementation of a betterment levy in Victoria has seen strong opposition from developer lobby groups and it is considered likely that there would be similar opposition to value capture mechanisms implemented for HSR.

There is a strong potential for misinformation around impacts of a value capture mechanism to occur if not managed correctly. Clear communication around who is impacted by a value capture mechanism and how they are impacted is critical to obtaining community support, as is the communication of public benefits from such mechanisms.

4. *Detailed land use planning needs to be integrated with transport planning for the delivery of the HSR network.*

Potential value uplift can be strongly influenced by land use planning around stations. Decisions around the location of each station should incorporate detailed consideration of the capacity for and strategic merits of development around the station locations. Not only will this be influenced by locational opportunities and constraints in terms of the surrounding environment, the decisions made around land use will interact with planning for operational elements of the HSR system, particularly in understanding the system's capacity to balance commuter demand from new development with longer-distance business and leisure trips. Protecting the HSR corridor from encroaching development is also important for minimising project costs.

5. *The interconnections between value capture, settlement planning and research are of national significance as highlighted in the report of the House of Representatives Standing Committee on Infrastructure, Transport and Cities into the Australian Government's role in the development of cities (Parliament of the Commonwealth of Australia 2018).*

Finally, we make reference to the Australian Government's (2020) response to the House of Representatives Standing Committee on Infrastructure, Transport and Cities report: *Building Up & Moving Out*. There were several recommendations that that were *noted* by the government around value capture – recommendations 29 and 37; others *supported in principle* around a national settlement plan (recommendations 1-5) and a national cities research institute (recommendation 23). Based on the findings from this report – with value uplift between $48 billion to $140 billion, from our estimates of infrastructure-related value uplift and our 'what if' scenarios for planning-related value uplift – we put forth there is substantial opportunity to fund HSR through value uplift.

In conclusion, we recommend that further consideration be given to (i) use of value uplift financial instruments, (ii) formulation of a national settlement plan and (iii) the formation of a national cities institute to conduct multi-year research to assist with the data analytics, integrated land use transport modelling and scenario planning required to ensure the maximum benefits realisation of a HSR across Australia. Such initiatives would assist the nation in meeting its net zero target and go a long way to ensuring liveable, sustainable, productive, and resilient cities are planned along the HSR East Coast Corridor.

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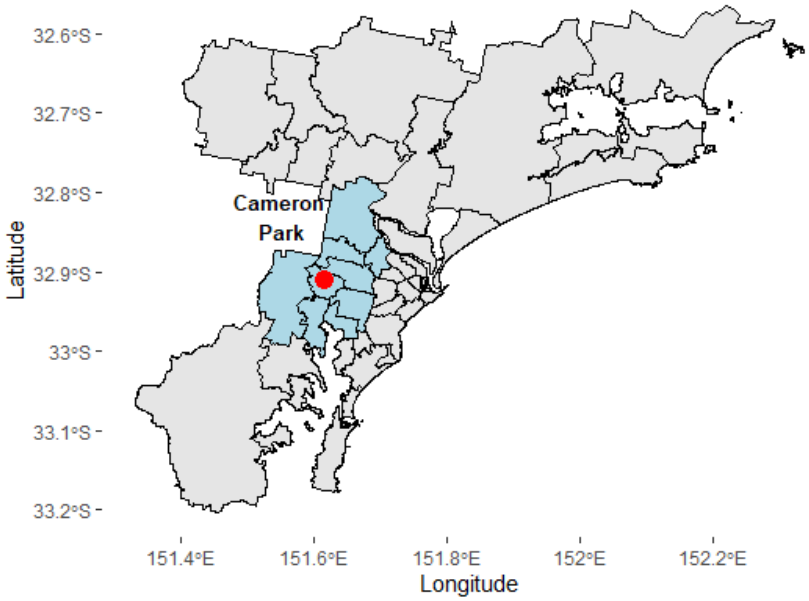
8. Appendices

Appendix A. HSR uplift catchment area SA2 selection

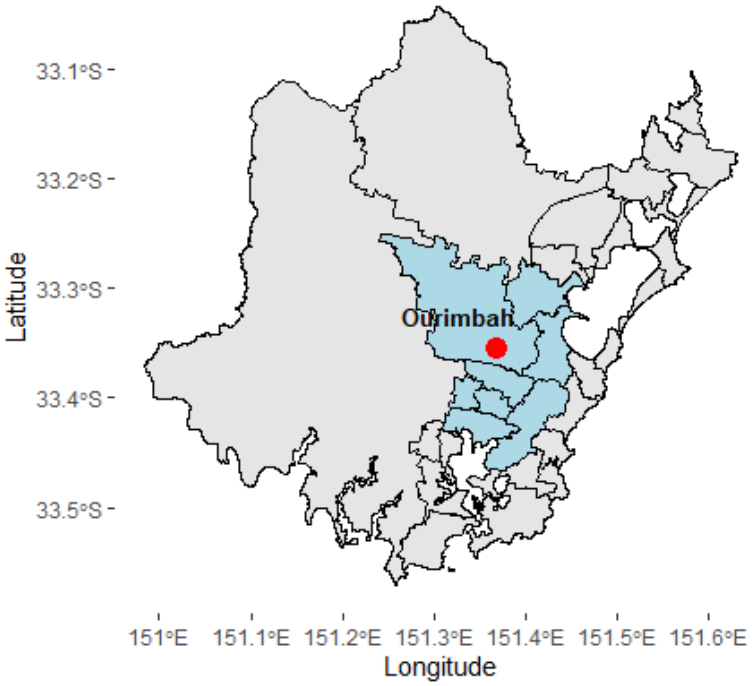
HSR Stop	Stop Location	SA2								SA3
Gold Coast	**Robina**	Carrara	Highland Park	Worongary - Tallai	Mudgeeraba - Bonogin	Reedy Creek - Andrews	Burleigh Waters	Mermaid Waters		Robina
Casino	**Casino**	Casino								
Grafton	**Grafton**	Grafton								
Coffs Harbour	**Coffs Harbour West**	Korora - Emerald Beach	Coramba - Nana Glen - Bucca	Coffs Harbour - North	Coffs Harbour - South	Sawtell - Boambee				
Port Macquarie	**Port Macquarie West**	Wauchope	Port Macquarie - West	Port Macquarie - East						
Taree	**Taree**	Wingham	Taree	Old Bar - Manning Point - Red Head						
Newcastle	**Cameron park**	West Wallsend - Barnsley - Killingworth	Edgeworth - Cameron Park	Bolton Point - Teralba	Maryland - Fletcher - Minmi	Glendale - Cardiff - Hillsborough	Warners Bay - Boolaroo	Beresfield - Hexham	Shortland - Jesmond	
Central Coast	**Ourimbah**	Ourimbah - Fountaindale	Tuggerah - Kangy Angy	Chittaway Bay - Tumbi Umbi	Niagara Park - Lisarow	Narara	Wyoming	Erina - Green Point	Gosford - Springfield	
Southern Highlands	**Mittagong**	Mittagong	Bowral	Moss Vale - Berrima	Hill Top - Colo Vale					
Wagga Wagga	**Wagga Wagga East**	Wagga Wagga - North	Wagga Wagga - North	Wagga Wagga - South	Wagga Wagga - West					
Albury Wodonga	**West Albury**	West Wodonga	Wodonga	Albury - South	Albury - North	Lavington	Albury - East			
Shepparton	**Shepparton West**	Mooroopna	Shepparton - North	Shepparton - South						

Appendix B. Visualisation of HSR uplift catchment areas

a) Newcastle



b) Central Coast



Appendix C. HSR travel times to major cities

The Phase 2 report were provided travel times between the following cities (travel times for all other stations were interpolated) based on their relative distance:

- Coffs Harbour
- Newcastle
- Central Coast
- Southern Highlands
- Albury Wodonga

		Major City		
		Brisbane	**Sydney**	**Melbourne**
Regional HSR Stop	**Gold Coast**	0h 28m (79km)		
	Casino	0h 47m (160km)	2h 22m (637km)	
	Grafton	1h 0m (258km)	2h 0m (539km)	
	Coffs Harbour	1h 11m (332km)	1h 50m (465km)	
	Port Macquarie	1h 43m (467km)	1h 24m (343km)	
	Taree	2h 0m (540km)	1h 8m (270km)	
	Newcastle	2h 28m (662km)	0h 39m (134km)	
	Central Coast	2h 43m (714km)	0h 29m (83km)	
	Southern Highlands		0h 29m (98km)	2h 29m (727km)
	Wagga Wagga		1h 32m (420km)	1h 32m (404km)
	Albury - Wodonga		1h 55m (540km)	1h 9m (284km)
	Shepparton		2h 31m (680km)	0h 39m (144km)

Indicates < 1 hour: Short-Distance

Indicates time sourced from Phase 2 report

Appendix D. Suburb selection for substitution values method

Major City	Direction	Time (Public Transport Link)						
		30 mins	40 mins	50 mins	60 mins	70 mins	80 mins	90 mins
Melbourne	North	Glenroy	Jacana	Meadow Heights	Roxburgh park	Craigieburn	Donnybrook	
	West (South)	Altona	Laverton	Werribee	Lara	Geelong		
Sydney	West	Campsie	Bankstown	Chester Hill	Fairfield	Cabramatta		
	West (North)	Lidcombe	Auburn	Granville	Blacktown	Riverstone	Vineyard	Richmond
	West (South)	Kingsgrove	Revesby	Holsworthy	Liverpool	Campbelltown		
Brisbane	North	Northgate	Geebung	Bald Hills	Lawnton	Morayfield		
	South	Salisbury	Coopers Plains	Kuraby	Meadowbank	Loganholme		
	West (South)	Oxley	Wacol	Redbank	Riverview	Ipswich		

Appendix E. HSR rural land value catchment area suburb selection

HSR Stop	Stop Location	Suburb				
Gold Coast	Robina					
Casino	Casino	Casino				
Grafton	Grafton	Alumy Creek	Carrs Creek	Grafton	Great Marlow	
Coffs Harbour	Coffs Harbour West	Boambee	Coramba	Karangi	Upper Orara	
Port Macquarie	Port Macquarie West	Blackmans Point	Fernbank Creek	Lake Innes	Sancrox	Thrumster
Taree	Taree	Taree				
Newcastle	Cameron park	Barnsley	Holmesville	Killingworth	Wakefield	West Wallsend
Central Coast	Ourimbah	Calga	Narara	Peats Ridge	Somersby	
Southern Highlands	Mittagong	Aylmerton	Colo Vale	Mittagong	Moss Vale	Werai
Wagga Wagga	Wagga Wagga East	Forest Hill	Gregadoo	Gumly Gumly		
Albury Wodonga	West Albury	Splitters Creek	Thurgoona	West Albury		
Shepparton	Shepparton West					