

*Estimated
impact of
selected policy
reforms on
government
revenues*
Final report

*Infrastructure
Australia*

June 2017

Disclaimer

This Report has been prepared by PricewaterhouseCoopers Consulting (Australia) Pty Ltd (PwC) in our capacity as advisors to Infrastructure Australia in accordance with our engagement letter dated 1 May 2017 ('Agreement').

The information, statements, statistics and commentary (together the 'Information') contained in this Report have been prepared by PwC from publicly available material, discussions with industry experts and from material provided by Infrastructure Australia (IA). The information contained in this report also includes results of economic modelling undertaken by PwC using a computable general equilibrium model developed by the Victoria University Centre of Policy Studies. PwC has relied upon the accuracy, currency and completeness of the Information sourced in the public domain and that provided to it by Infrastructure Australia and takes no responsibility for the accuracy, currency, reliability or correctness of the Information and acknowledges that changes in circumstances after the time of publication may impact on the accuracy of the Information. The Information may change without notice and PwC is not in any way liable for the accuracy of any information used or relied upon by a third party.

Our report has been limited to estimating the economic impacts and government revenue from several policy reforms proposed by IA. The direct impacts applied in the modelling for each of the reforms have been collaboratively developed by IA and PwC. These impacts are based on findings of literature reviews, publicly available material and discussions with industry experts with ultimate direction on the magnitude of the direct shocks provided by IA. The broad nature of the modelling is such that the results are intended to be indicative only of possible outcomes under hypothetical scenarios.

For the purposes of the economic modelling a number of assumptions have been made about the valuation of publicly owned assets using multipliers of revenue of asset value suggested by IA. These assumptions do not constitute a professional assessment of these business valuations. Furthermore PwC has not independently validated or verified the information sourced or provided to it for the purpose of the Report and the content of this Report does not in any way constitute an audit or assurance of any of the Information contained herein.

Accordingly, whilst the statements made in this report are given in good faith, PwC accept no responsibility for any errors in the information sourced or provided by IA or other parties nor the effect of any such errors on our analysis, suggestions or report.

PwC has provided this advice solely for the benefit of IA and disclaims all liability and responsibility (including arising from its negligence) to any other parties for any loss, damage, cost or expense incurred or arising out of any person using or relying upon the Information.

Liability limited by a scheme approved under Professional Standards legislation.

Executive summary

In early 2016 Infrastructure Australia (IA) released their *Australian Infrastructure Plan* which recommended reforms to the energy, telecommunications, transport and water sectors to enhance Australia's productivity over the next 15 years and beyond. Subsequently, PwC modelled the economic impact of a number of these reform recommendations in a report for IA titled *Modelling of Potential Policy Reforms*.¹

IA is now preparing a research paper on the potential economic returns of its proposed policy reforms that would need to be driven by State and Territory Governments. This will provide advice on the practical next steps for implementation. IA's analysis focuses on these reforms because the Australian Government is thought to benefit through increased federal tax collections via personal income and company taxes, for example. Therefore, there is a view that a road block to reform is the political cost of reforms being borne by State and Territory governments while some of the benefits are captured by the Australian government. Hence IA is interested in understanding the potential revenue gained (through taxation) by the Australian and State and Territory Governments resulting from the proposed policy reforms. This would assist in making a case for a framework in which the Australian Government invests in state and territory infrastructure (above existing allocations), where they contribute to national productivity enhancement objectives.

Consistent with the approach in the previous PwC report (*Modelling of Potential Policy Reforms*), this analysis uses an economy-wide model to assess the potential taxation revenue gained as a result of the proposed reforms. Using a Computable General Equilibrium (CGE) model and PwC's forecast of economic growth out to 2047, we have estimated the deviation from the baseline revenue received by the Australian, State and Territory Governments as a result of the reforms. The modelling is intended to identify the broad scale of the potential impacts of the reforms; so the productivity savings that have been modelled on what might be possible (using assumptions based on literature reviews detailed here and in the previous PwC report). Given the actual form or timing of reform may differ from what is modelled here, the results reflect proxy productivity benefits that might be achieved in other ways.

Of the five proposed policy reform packages included in this report, four were recommended in IA's *Australian Infrastructure Plan* and analysed in PwC's previous report: energy sector privatisation and competition reforms; metropolitan water privatisation; road user pricing; and public transport franchising. In addition, IA has requested analysis on a switch from stamp duty to land tax to be included in this report – a recommendation IA put forward in another recent report: *Capturing value*.² The reforms modelled in this report are summarised in Table 1 below and detailed in Chapter 2.

Table 1: Summary of direct impacts applied by sector

Sector	Sub-sector	Estimated Direct Impact
Energy	Generation privatisation	Between 1.5% and 1.8% capital productivity improvement.
	Networks privatisation	15% operating cost saving to the electricity supply sector.
	Retail pricing competition	11% reduction in NSW gas prices, 7% reduction in QLD electricity prices and 13% reductions in WA electricity prices.
Metropolitan water	Metropolitan water utilities privatisation	10% productivity gain.
Transport	Heavy vehicles user pricing	10% productivity improvement to road transport sector.

¹ PwC, *Modelling of Potential Policy Reforms*, http://infrastructureaustralia.gov.au/policy-publications/publications/files/Modelling_of_potential_policy_reforms_report_by_PWC.pdf, February 2016.

² Infrastructure Australia, *Capturing Value: Advice on making value capture work in Australia*, December 2016.

Sector	Sub-sector	Estimated Direct Impact
	Rest of fleet user pricing	15% reduction in the cost of congestion delays to various service sectors using roads.
	Public transport franchising	Rail: 5% initial operational saving scaling up to 32.5%. Bus: 10% initial operational saving scaling up to 35%.
Energy and water	Government owners financial saving	In addition to the above, there is also an estimated 0.15% borrowing cost saving leading to a capital productivity gain for new government investments.
Land use industries	Stamp duty reform	Average 3% total capital productivity gain across the economy (higher in ownership of dwellings and high land use industries).

Applying these assumptions in a concurrent implementation of all reforms results in an estimated gross domestic product (GDP) increase of \$46.0 billion in 2031 and \$66.0 billion in 2047, accounting for approximately 1.9 per cent of GDP in both periods. Total tax revenue received by the Australian, State and Territory Governments is estimated to increase above baseline by \$10.0 billion in 2031 and \$19.0 billion in 2047 as a result of the reforms (see Table 2).

Table 2: Impact of concurrent reforms on real GDP and tax revenue in 2031 and 2047

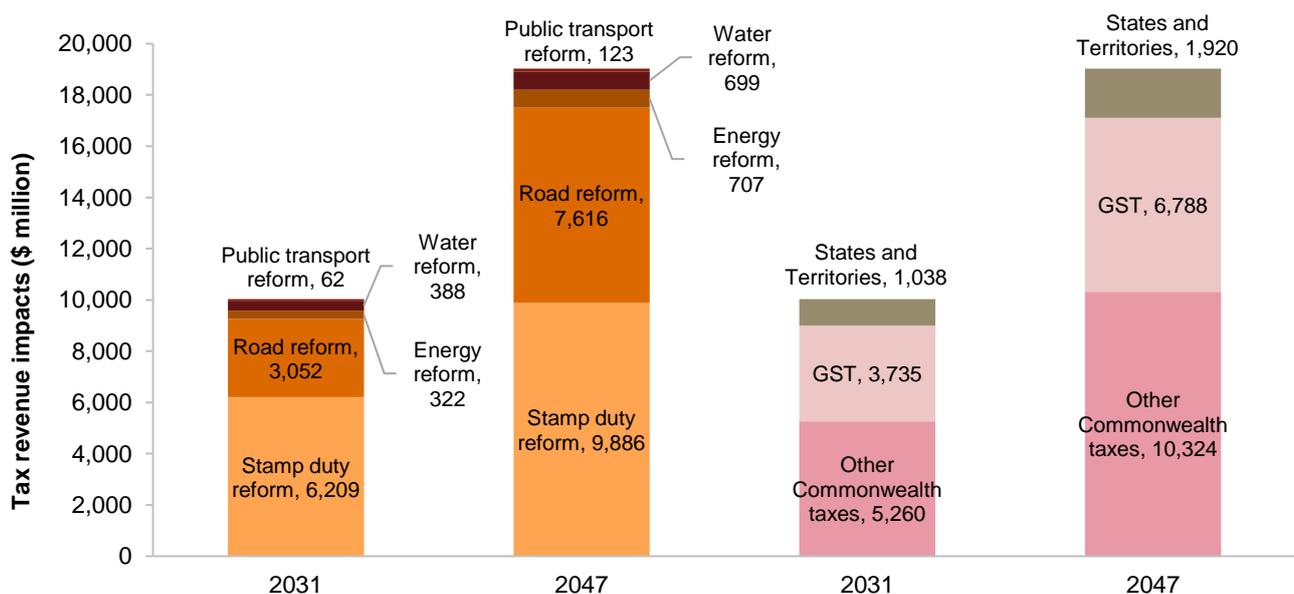
Indicator	2031	2047
Increase in GDP above baseline (\$m)	46,006	66,021
Increase in tax revenue above baseline (\$m)	10,033	19,032

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.

The Australian Government is the largest beneficiary of the reforms (see Figure 1) receiving an estimated \$9.0 billion tax revenue in 2031 and \$17.1 billion in 2047 (including GST collections). The net present value (NPV) of tax revenue received by the Australian Government alone is \$85.9 billion over the 30 year period.

Our sensitivity analysis to test the downside risk to government taxation revenue (by making significant reduction to key assumptions for the road reform and stamp duty reform packages) shows that, the combined results are 25 per cent lower than those above. This demonstrates that there are still substantial gains to be realised even when applying more conservative estimates of the potential reform gains.

Figure 1: Tax revenue impact in 2031 and 2047 by type of reform and level of government



Source: PwC analysis

Contents

1	Introduction	1
2	Model assumptions and approach	2
3	Model results	8

1 Introduction

In February 2016, Infrastructure Australia (IA) presented its *Australian Infrastructure Plan* to the Australian Government, detailing the economic impact of proposed policy reforms through changes to gross domestic product (GDP), GDP per capita and GDP per household. As an input into the *Australian Infrastructure Plan*, PwC prepared a report for IA entitled *Modelling of Potential Policy Reforms* ('PwC's previous report').³ IA is now preparing advice on the practical next steps for governments to implement these reforms. Specifically, IA is currently developing a research paper on the potential economic returns of five proposed policy reform packages to make a case for the Australian Government to implement an Infrastructure Reform Incentives framework. Hence IA is interested in understanding the potential revenue gained (through taxation) by the Australian Government, States and Territories resulting from the proposed policy reforms.

PwC was engaged to undertake this analysis using economy-wide economic modelling. These impacts have been modelled for each reform package individually and for the cumulative impact of all five reform packages being implemented concurrently. This analysis has been undertaken by employing assumptions that are necessarily high-level and so the results of the analysis should be viewed as indicative of the possible scale of impact on the Australian economy. This initial assessment of the potential taxation revenue gained as a result of the proposed reforms is intended to identify the broad scale impacts; not to be a cost benefit analysis (for example we have not included the transaction costs involved in the sale of publicly owned energy and metropolitan water assets).

PwC's modelling relies on assumptions made about the direct impacts of the reforms. For example, assumptions are required, informed by a range of data sources, regarding by how much the costs of congestion can be reduced by undertaking transport sector reforms. We assisted IA by researching possible direct impacts of the reforms and then discussed the scale of impacts possible, with IA deciding on the appropriate assumption for the purposes of this modelling exercise. These direct impacts have been estimated as the productivity benefits that could be possible from such reforms but given the actual form or timing of reform may differ from what is modelled here, the results reflect proxy productivity benefits that might be achieved in other ways.⁴

Our modelling approach uses a Computable General Equilibrium (CGE) model, specifically the Victoria University's Centre of Policy Studies dynamic CGE model. The CGE model is based on Australian Bureau of Statistics (ABS) input-output data which details the various income and expenditure components that comprise Australia's GDP. Using this model and PwC's forecasts of economic growth and out to 2047 which are encapsulated in our Intergenerational Fiscal and Economic Model (IFEM), we can estimate the deviation in revenue received by the Australian, State and Territory Governments from a baseline as a result of the reforms. An overview of the CGE and IFEM models can be found in the Appendices in PwC's previous report.

This report sets out the findings of this latest analysis. Of the five proposed policy reform packages included in this report, four were analysed in PwC's previous report, with new analysis on stamp duty reform included in this report. Therefore, there is substantial overlap in the explanation of these reforms and the associated research into the potential impacts these may have on the economy. The current report should be read in conjunction with the previous report and cross references are made where necessary to avoid duplication. The remainder of this report is structured as follows:

- Chapter 2 – Explains the modelling approach with reference to how PwC's previous report has been updated and modified.
- Chapter 3 – Summarises the results of analysis undertaken for each of the reforms individually and in total.

³ PwC, *Modelling of Potential Policy Reforms*, February 2016.

⁴ There are different ways in which these productivity benefits might be delivered, for example, the previous PwC report (page 17) sets out how efficiencies may be achieved through public-private partnerships or through digital solutions. Similarly, the 2017 PwC report *Potential cost savings from rail and bus franchising: technical report* (page 4), notes the possibility of operational savings being achieved through competitive sourcing of certain business inputs.

2 Model assumptions and approach

This chapter, building off the modelling approach adopted in our 2016 report, sets out the modelling approach that has been undertaken with details of the baseline assumptions and impacts on the relevant sectors as a result of the proposed reforms.

2.1 Baseline

The baseline model for the economy used in this analysis is formulated from long run projections of productivity, population and participation rates developed by PwC in IFEM. IFEM includes recent data on the Australian economy and population. These assumptions about the long run fundamental drivers of the economy are combined with the latest State, Territory and Australian Government budget forecasts to estimate the size of the economy and government revenue out to 2050.⁵

Projections that have been specifically modelled and were incorporated into the baseline model are:

- Vehicle registration revenue projections to 2050 were taken from the Commonwealth Scientific and Industrial Research Organisation (CSIRO).⁶ Growth rates observed in the total light and heavy vehicle baseline scenario figures were applied to the budget forward estimates to extrapolate vehicle registration revenue per state/territory in the baseline model. IA prefers the baseline scenario relative to the low or high scenario due to the uncertainty in demand for vehicle registration to 2050.
- Fuel excise revenue projections to 2050 were also taken from the CSIRO.⁷ Growth rates observed in the total light and heavy vehicle low scenario projections were applied to the budget forward estimates to extrapolate fuel excise revenue to the Australian Government in the baseline model. For simplicity, the same growth rate was applied to both petrol and diesel projections. Low scenario projections include the greatest uptake of electric vehicles. IA considers this to be the most likely scenario relative to the baseline or high scenario as the low scenario is still generally regarded as conservative given the movement on these issues since the CSIRO released these projections in 2015.

The baseline projections for taxation revenue to the Australian Government are shown in Figure 2. Australian Government taxation revenue is projected to be \$803 billion in 2031 and \$1,701 billion in 2047. It should be noted that tax revenue is generally expressed nominally and so it can show large long term growth. When expressed as a percentage of nominal GDP, this projection is relatively steady between 23-24 per cent in the long run. This is broadly in line with historical averages and other long term projections, such as presented in the Australian Government's *Intergenerational Report*.⁸

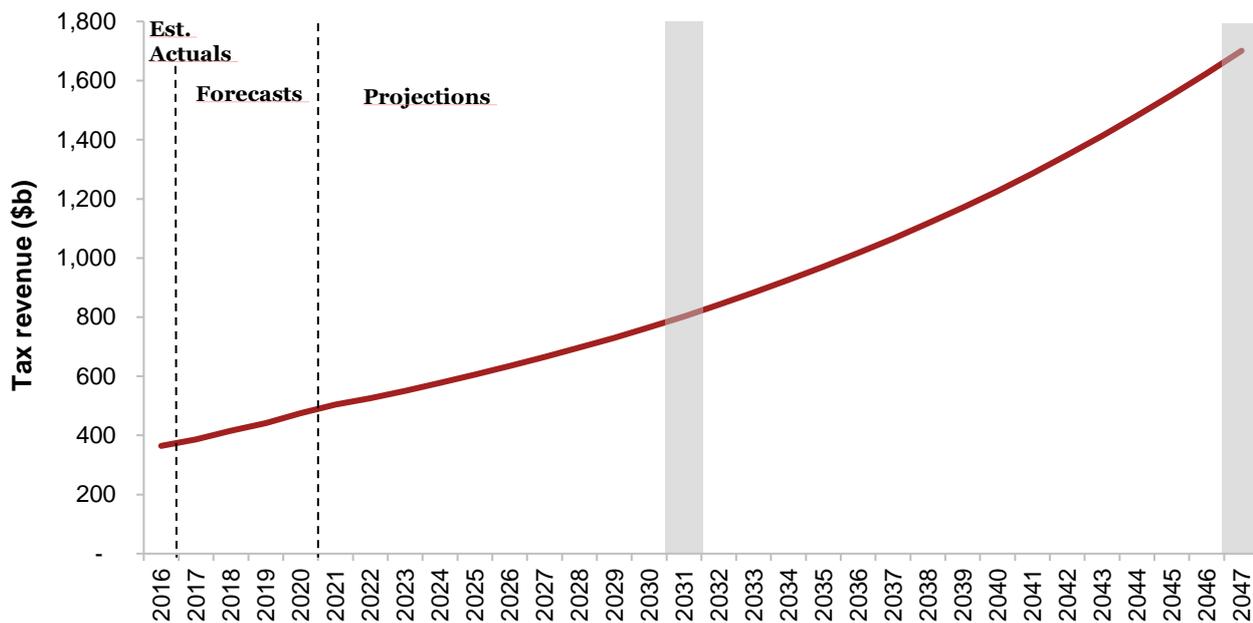
⁵ At the time of writing, the budgets for FY2017-18 were available for the Victorian, Northern Territory and Australian Governments.

⁶ CSIRO, *Projecting future road transport revenues 2015-2050 Report for the National Transport Commission*, Paul W. Graham and Luke J. Reedman, May 2015, page 35.

⁷ Ibid.

⁸ Australian Government, *2015 Intergenerational Report: Australia in 2055*, March 2015.

Figure 2: Baseline Australian Government taxation revenue projections (nominal)



Source: Australian Government Budget 2017-18 and PwC's IFEM.

2.2 Policy reforms and their estimated direct impacts

2.2.1 Reforms referenced in the previous report

A number of reforms in the water, energy, road and public transport sectors were analysed in PwC's previous report and are modelled again to determine their impacts to State, Territory and Australian Government revenue. These are as follows:

- energy reform: transferring remaining publicly-owned electricity generation, network and retail businesses to private ownership (refer to sections 2.1.1 and 2.1.2 of PwC's previous report)
- metropolitan water reform: transferring state-owned metropolitan water utility businesses to private ownership to deliver more cost-effective, customer-responsive services (refer to section 2.3 of PwC's previous report)
- road reform: comprehensive heavy and light vehicle road charging to replace current inefficient registration and usage charges, and incorporation of corporatised regulated asset base delivery model (refer to sections 2.4.1 and 2.4.2 of PwC's previous report)
- public transport franchising: adopting a default option of exposing public transport services to contestable supply through franchising, to enhance service quality and value for money (refer to section 2.4.3 of PwC's previous report).

While the reforms proposed are the same, some elements used in the modelling of the direct impacts of these reforms have been updated to take account of any new information or changes in circumstances since the last report was prepared.⁹ This is summarised in the following table:

⁹ Consistent with the previous report, we note that Snowy Hydro has been included in the calculation of this impact for the energy sector using government ownership percentages. While there is speculation about the potential sale of the Commonwealth stake in this asset no outcomes have been finalised and it is not within the scope of this report to comment or make assumptions on what these outcomes may be. Therefore, no change has been made from the previous approach.

Table 3: Summary of direct impacts applied by sector

Sector	Sub-sector	Estimated direct impact	Timing	Change from previous report
Energy*	Generation privatisation	Between 1.5% and 1.8% capital productivity improvement.	From 2019, productivity gains build up over 5 years. Applied to government-owned generators in NSW, VIC, SA, QLD and TAS.	Pushed forward two years from 2017 to allow for implementation.
	Networks privatisation	15% operating cost saving to the electricity supply sector.	From 2019, productivity gains build up over 5 years. Applied to government-owned networks in, NSW, QLD, WA, TAS and ACT.	Pushed forward two years from 2017 to allow for implementation.
	Retail pricing competition	11% reduction in NSW gas prices, 7% reduction in QLD electricity prices and 13% reduction in WA electricity prices.	Direct impacts for NSW gas and QLD electricity are phased in from 2017 as these states are already seeing an increasing proportion of market contracts, ¹⁰ and 2019 for WA electricity. All direct impacts build over 5 years.	Pushed forward two years from 2017 for WA, but for NSW and QLD this impact has been modelled from 2017 because there is already a transition to market contracts underway. The size of the reduction in energy prices has been increased to reflect the most recent market offer discounts. In the previous report price reductions were 5% in NSW and QLD and 10.5% in WA.
Metropolitan water*	Metropolitan water utilities privatisation	10% productivity gain.	From 2021, productivity gains build up over 10 years.	Pushed forward from 2017. Implementation no longer staggered by jurisdiction but are implemented together.
Transport	Heavy vehicles user pricing	10% productivity improvement to road transport sector.	From 2021, productivity gains build up over 5 years.	No change.
	Rest of fleet user pricing	15% reduction in the cost of congestion delays to various service sectors using roads.	From 2028, productivity gains build up over 2 years.	No change.
	Public transport franchising	Rail: 5% initial operational saving scaling up to 32.5%. Bus: 10% initial operational saving scaling up to 35%.	Rail: Applicable to NSW, QLD, WA and SA for train services. Applicable from 2017, scaling up over 15 years (2017-31). Bus: Applicable to NSW, QLD, VIC, TAS and ACT for bus services. Applicable from 2017, scaling up over 17 years (2017-33).	Implementation no longer staggered by jurisdiction but are all implemented together. Operational savings were previously 20-35% after 13 years for rail and 15 years for bus. The updated productivity improvement assumptions and approach are taken from the 'high' scenario in PwC's recent transport franchising report commissioned by IA. ¹¹ Previous analysis was limited to NSW, QLD, WA and VIC but current assumptions also include impacts to SA, TAS and ACT.
Energy and water	Government owners financial saving	*In addition to the above, there is also a 0.15% borrowing cost saving arising from an injection to government income from the sale of selected publically owned assets leading to a capital productivity gain for new government investment.	Starting from the first year assets are sold: 2019 for energy assets and 2021 for water assets.	Pushed forward from 2017.

¹⁰ Australian Energy Regulator, *QLD – small customer contract types*, www.aer.gov.au/retail-markets/retail-statistics/queensland-small-customer-contract-types, accessed 22 June 2017. Australian Energy Regulator, *NSW – small customer contract types*, www.aer.gov.au/retail-markets/retail-statistics/nsw-small-customer-contract-types, accessed 22 June 2017.

¹¹ PwC, *Potential cost savings from rail and bus franchising: technical report*, April 2017, page 9.

2.2.2 Stamp duty reform

An additional reform that was not included in the IA *Infrastructure Plan* or PwC's previous report but was raised as part of IA's recent *Capturing Value* report is the adoption of a broad based land tax with the phasing out of stamp duties. Although State and Territory Governments collect stamp duties for a variety of transactions including conveyances, insurance and motor vehicles, for the purpose of a switch to land tax, we have focused on conveyances alone for this analysis.

Previous studies, including those by the Treasury and IA,¹² acknowledge that stamp duties can be inefficient and have significant economic costs. Conversely, it has been established that a broad based land tax has a low economic cost and, unlike stamp duties, does not have a distortive effect on land use. Specifically, stamp duty is considered inequitable and inefficient because it:

- is a large, but volatile government revenue source. Stamp duties are significantly affected by movements in property prices and the number of properties sold, with revenue on conveyances fluctuating year to year
- discourages people from buying property that best suits their needs. Since stamp duty is triggered by the sale of a property, people may avoid buying or selling property. As a result, people may not live in the house they really want, or they may stay too long in a house that is better suited to somebody else
- discourages business from investing in productivity enhancements on existing property. Stamp duty is levied on the transaction of property, which includes the value added from any capital investment
- reduces labour mobility. By increasing the upfront cost of moving locations, stamp duty reduces the ability to move to find work, reducing economic productivity
- unfairly burdens those that frequently move. Those that need to move frequently for work or other commitments must pay stamp duty on every property transaction, penalising them unfairly
- makes it harder for credit constrained home buyers to enter the market. Stamp duty accounts for a significant percentage of the up-front cash costs of potential home buyers. Alternatively, those that can borrow to cover their stamp duty will also have to pay back the stamp duty plus the extra interest on their mortgage, compounded for the life of the mortgage.

A change from a conveyancing stamp duty to a broad based land tax provides an incentive to move land to 'best and most productive use' to create an income stream to cover the tax. Whereas a stamp duty can be avoided by retaining ownership, even if the land is being used inefficiently, a broad based land tax induces the owner to either use its full productive capacity or transfer it to an owner that will.¹³

For the purposes of this report, we have assumed that the switch from stamp duties to a broad based land tax will be revenue neutral (ie as with the current changes occurring in the ACT, the system would be specifically designed not to increase or decrease total collections). Therefore, the direct impact of this tax change would be the move of land to this 'best and most productive use', essentially a productivity increase for all land using industries (including dwellings). The size of this direct productivity impact has been calculated as the difference in the marginal excess burdens of the two types of tax (stamp duty versus land tax) as examined in the *Re:think tax discussion paper*.¹⁴ The marginal excess burden of the stamp duty was estimated to be 0.72 for stamp duty and -0.1 for land tax. In earlier work by the *Henry Tax Review*, stamp duty was estimated to have an average excess burden of 0.31 and land tax 0.06.¹⁵ While there is a considerable difference between these estimates, we

¹² For example, Infrastructure Australia, *Capturing Value: Advice on making value capture work in Australia*, December 2016 and Australian Government, *Re:think tax discussion paper*, March 2015.

¹³ Infrastructure Australia, *Capturing Value: Advice on making value capture work in Australia*, December 2016.

¹⁴ Australian Government, *Re:think tax discussion paper*, March 2015. The Treasury, *Understanding the economy-wide efficiency and incidence of major Australian taxes*, April 2015.

¹⁵ Australian Government, *Australia's future tax system*, December 2009.

have used the latest estimate available from the *Re:think* paper (we also undertake a sensitivity analysis using alternative, lower, assumptions about the potential gains in section 3.7). This equates to an average 3 per cent total capital productivity gain across the economy (higher in dwellings and high land use industries).

We have not taken a view of the best method of this policy implementation (although PwC has commented¹⁶ on one way in which this could be done). For the purposes of this analysis, we assume that the switch is phased gradually, to better reflect properties changing hands, rather than immediately. Therefore, the timing of a switch between these taxes is likely to be over a long timeframe (similar to the current ACT change for example, which is phased over 20 years). It is noted that an alternative model based on turnover of property would be similar, with the Reserve Bank calculating the average housing turnover is between 5-6 per cent per annum.¹⁷

While the phase in of the switch from a stamp duty to land tax may take a long time, it is likely that the efficiency benefits (the direct impact) will be realised quicker. This is because the inefficiency comes from preventing the optimisation of capital portfolios and it is the prospect of having to pay stamp duty that inhibits efficient reallocation of property, rather than the payment of the tax itself. Once the market is aware of the change and the stamp duty no longer applies to sales, that prevention (or tax wedge) is gone. The economy will adjust to a more productive allocation of resources, regardless of how much of the stock the new tax applies to. Treasury analysis has shown that half the adjustment to a capital tax occurs in ten years but taxes on consumption have a faster adjustment process than taxes on capital.¹⁸ As stamp duties are in part a tax on capital and also a tax on consumption, ten years is taken a reasonable adjustment period. Therefore, we have modelled the direct impact coming into effect over ten years, which allows time for the market to adjust but is quicker than the complete transition to the new tax.

There are specific considerations for the modelling of the impacts of this stamp duty reform on NT and ACT:

- The ACT is already in the process of making this transition. However, as it is not yet complete, it is still not fully incorporated in to the baseline. Therefore we have included ACT reforms in the policy change, not the baseline, for completeness.
- NT is currently the only state or territory that has no land tax system at all, only stamp duty, therefore the structural data available for industry spread is more limited. Therefore, we have assumed national average industry distribution for land owning industries.

Table 4: Summary of direct impact stamp duty reform

Sector	Sub-sector	Estimated direct impact	Timing	Change from previous report
Land use industries	Stamp duty reform	Average 3% total capital productivity gain across the economy (higher in dwellings and high land use industries)	From 2017 in ACT and 2019 for all other States and Territories, productivity gains build up over 10 years.	N/A

2.3 Modelling impact of reforms on government revenues

The focus of this report is to analyse the government revenue impacts of each policy scenario. This analysis is related to, but not directly taken from, the CGE analysis of the economy-wide impacts. Although the CGE models we have used for this analysis do have government budgets and taxation components, the relationships and trends of government finance are not as reflective of current budget projections as our IFEM model. Our IFEM model is purpose built to examine tax impacts and has the benefit, for this exercise, of having an

¹⁶ Paul Abbey as cited in Joanna Mather, *Let buyers choose stamp duty or land tax to fix affordability: PwC*, Australian Financial Review, 25 April 2017.

¹⁷ Reserve Bank of Australia, *Housing Market Turnover*, March 2017.

¹⁸ The Treasury, *Understanding the economy-wide efficiency and incidence of major Australian taxes*, April 2015.

established long term forecast reflecting relevant structural and population changes. Therefore, the tax impacts in this analysis are analysed using the CGE results as an input to the IFEM model.

To reflect the nuances and subtleties of the different taxation and income streams of each jurisdiction and level of government, this analysis was conducted separately for each of the State, Territory and Australian Governments in the following ways:

- Where revenue impact is set by the scenario (ie revenue neutral), the impact is modelled according to that scenario:
 - land tax and stamp duty are assumed to have a net revenue neutral impact in the stamp duty reform scenario
 - the proceeds of government-owned asset sales and subsequent loss of dividend income from assets that are privatised are captured in the energy and metropolitan water reform scenarios.
- For all other revenue items, the impact is modelled using the relevant indicator from the economy-wide modelling (ie payroll and personal income taxes will move with trends in employment and wages, GST and consumption based taxes will move with trends in household spending, and taxes on levels of economic activity such as company tax will move with GDP or gross state product (GSP)).
- A decrease in borrowing costs (as a result of improved balance sheets where governments privatise their assets) is not included in either tax revenue or total revenue analysis, as it represents a reduction in expenditure, not an increase in revenue. It is therefore outside the purview of this report.

Results are presented as both tax revenue and total revenue. Total revenue is predominantly made up of tax revenue, but also includes revenue from the sale of goods and services, dividends, royalties and, for the State and Territory Governments, grants and subsidies from the Australian Government. Note that while GST is tax revenue for the Australian Government, it is also a grant for each of the State and Territory Governments and so we do not present the combined total revenue of State and Territory and Commonwealth Governments so as to not double count GST. However, total revenue does capture the nuance of asset-sales income and lost dividends for the privatisation scenarios so it is presented for each level of government for these scenarios for that reason.

3 *Model results*

This chapter sets out the estimated economy-wide impacts of the proposed reforms. Results are estimated by applying the direct impact assumptions set out above, in a CGE model and then flowing these impacts through IFEM as described in section 2.3. These are presented as a deviation from baseline forecasts (either of GDP or revenue to the State, Territory and Australian Governments). Results are presented as annual changes in 2031 and 2047, as well as net present values where relevant.¹⁹

We present results for the Australian Government separately, with the States and Territories combined. While the previous PwC report provides an in depth discussion of the economic impacts on States and Territories individually, the attention of this report is on the Australian Government. This is predominantly because the focus of this report is to examine the impact of potential reforms on Australian Government income. Additionally, most of the revenue impacts accrue to the Australian Government and long term forecasts of the distribution of GST revenue amongst the State and Territory Governments is recognised as problematic and not actually flowing from the policies being examined.

As indicated in the previous PwC report, the distribution of impact between States and Territories can differ for each reform examined depending on:

- the direct impact inputs and the jurisdiction based data used for those
- relative size of the particular state economy and the relative size of the relevant sector
- the CGE model framework where by indirect impacts mean labour and capital will flow to where there is the highest return
- the level of reform already undertaken in that jurisdiction (in that there is likely to be less direct benefit if these reforms have already occurred, although there will still be benefits to governments from growth in the overall size of Australia's economy and from the redistribution of GST that flows from the national expansion).

The results from this modelling and the assumptions used should be interpreted as an indication of what is possible (and the rewards available from doing so), but not as an exact forecast or an expectation about what would happen.

3.1 *Energy reform*

The privatisation and price deregulation reforms in the energy sector are estimated to generate additional GDP per annum of \$1.7 billion in 2031, and \$2.1 billion in 2047 – as shown in Table 5.

Tax revenue to the State, Territory and Australian Governments is estimated to be \$360 million per annum higher by 2031 and \$798 million per annum higher by 2047, with the majority of this increased tax revenue coming from federal taxes; the Australian Government is estimated to receive \$291 million of tax revenue in 2031 and \$639 million in 2047 as a result of the reforms.

¹⁹ All net present values are calculated using a seven per cent discount rate over 30 years (2017 to 2047).

Table 5: Impacts on GDP and tax revenue in 2031 and 2047 from energy reforms

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)		NPV total revenue (\$m)
	2031	2047	2031	2047	2017-2047
States and Territories	n/a	n/a	69	160	51,877
Australian Government	n/a	n/a	291	639	2,999
Total Australia	1,692	2,075	360	798	n/a

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms. NPV is calculated using a seven per cent discount rate over 30 years and is stated in 2016-17 dollars. Note that the States and Territories cannot be added with the Australian Government when examining total revenue scenario as it double counts GST and other transfers.

Source: PwC analysis

Total revenue incorporates all forms of government revenue including tax revenue, dividends received from assets and the sale of goods and services. This means that while the impact to total revenue for States and Territory Governments may be small or even negative in a single year, reflecting the forgone dividends from sold assets, examining it over a longer timeframe includes the initial revenue received from privatisation. Therefore, net present value (NPV) of total revenue is significantly more positive when calculated over 30 years and is estimated to be \$51.9 billion for all the State and Territory Governments combined.

3.2 Metropolitan water reform

The privatisation of the water sector results in an estimated overall increase in GDP per annum of \$1.4 billion by 2031, and \$1.8 billion by 2047 (see Table 6). In total State, Territory and Australian Government tax revenue is estimated to be \$435 million per annum higher by 2031 and \$789 million per annum higher by 2047.

Table 6: Impacts on GDP and tax revenue in 2031 and 2047 from water reforms

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)		NPV total revenue (\$m)
	2031	2047	2031	2047	2017-2047
States and Territories	n/a	n/a	86	158	62,416
Australian Government	n/a	n/a	349	631	3,980
Total Australia	1,444	1,839	435	789	n/a

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms. NPV is calculated using a seven per cent discount rate over 30 years and is stated in 2016-17 dollars. Note that the States and Territories cannot be added with the Australian Government when examining total revenue scenario as it double counts GST and other transfers.

Source: PwC analysis

As with the energy reforms, total revenue has been analysed to incorporate tax revenue, the forgone dividends from sold government-owned assets and any initial revenue received from the privatisation. Where assets are relatively large compared to the sector in a particular jurisdiction, the impact of GSP can be larger, but the relative amount of foregone dividend can also be large. Overall the total State and Territory Governments NPV of total revenue is \$62.4 billion over 30 years.

3.3 Road reform

Overall, the suite of road reforms is estimated to increase GDP per annum by \$21.3 billion in 2031 and \$36.5 billion in 2047 (see Table 7). Government tax revenue is also estimated to increase by \$3.4 billion per annum in 2031 and \$8.6 billion per annum in 2047.

Table 7: Impacts on GDP and tax revenue in 2031 and 2047 from road reforms

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)	
	2031	2047	2031	2047
States and Territories	n/a	n/a	702	1,734
Australian Government	n/a	n/a	2,718	6,862
Total Australia	21,292	36,542	3,420	8,595

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms. May not sum due to rounding.

Source: PwC analysis.

The magnitude of this impact is influenced by the relative congestion cost savings in the direct impact calculations. These are driven by ACIL Allen Consulting's estimates of congestion costs.²⁰ These are noted to be higher than other estimates, as by 2031 the ACIL Allen estimate for national cost of congestion is \$53 billion,²¹ whereas BITRE estimates the costs of congestion in 2030 under a business as usual scenario to be \$30 billion.²² For consistency with our previous report we have retained the ACIL Allen estimate of congestion costs here.

It should be noted that these tax impacts include an assumption that the combined suite of road reforms would have no net tax impact, and the increased tax revenue would come from non-transport related taxes. This net impact takes into account only current taxes exclusively related to the level of road use (fuel excise and registration), not other transport related charges, such as stamp duties on vehicles purchases or GST on road related expenditure items, that are sometimes includes as transport tax revenue.²³ This net revenue neutral assumption is based on the following:

- It is assumed that the user charge would initially replace fuel excises and car registration fees. That is, the user charge revenue would be distributed to the State and Territory Governments equivalent to current registration collections and to the Commonwealth equivalent to fuel excises.
- However, the current fuel excises and registration fees are known to be insufficient on their own to meet the required level of road funding. This gap is currently funded from other consolidated revenue items. For example, BITRE data shows that in 2014-15, the gap between road-related expenditure (across all levels of government) and these two road-related revenue sources was almost \$7 billion, or 29 per cent of road-related expenditure.²⁴
- Over time, these road reforms are assumed to change behaviour on driving to reduce congestion. Therefore, it is assumed that this will require a higher cost on road users than current transport related taxes. This increased collection to change behaviour is assumed to offset the gap in road funding which will reduce the call on other tax revenues (assuming this particular reform will not be used to have a net impact on the

²⁰ ACIL Allen Consulting, *Urban transport infrastructure: National economic analysis for Infrastructure Australia*, December 2014.

²¹ Ibid, pages xiv and xviii.

²² BITRE, *Traffic and congestion cost trends for Australian Capital Cities*, November 2015, page 1.

²³ For example, in BITRE, *Yearbook 2016: Australian infrastructure statistics*, 2016.

²⁴ BITRE, *Yearbook 2016: Australian infrastructure statistics*, 2016. Even if all potential road-related revenue categories are included except those that are subsets of general revenue GST and fringe benefits tax (ie fuel excise, registration, luxury car tax, customs duty on vehicles, drivers licence fees, stamp duty and tolls are included) the gap in 2014-15 was still almost \$900 million, or 4 per cent of road-related expenditure.

budget balance or deficit forecast). Therefore, this additional revenue would be returned to taxpayers leaving government revenue unaffected in totality.

- This assumption has been taken as reasonable as the method and model of the congestion pricing were not a part of this report, which sets out to indicate the possible scale of impact on the Australian economy rather than determine the specific reform mechanics. Therefore, a direct quantification of revenue from congestion pricing was not possible.

Although the net impact is assumed to be revenue neutral, this may not hold for the distributional impact between the State, Territory and Australian Governments. For this distribution to be unaffected, it must be assumed that any decrease in the call on other taxes is shared in the same proportion between the State, Territory, and Australian Governments as the complex current mix of fuel excise, registration and call on consolidated revenue. Therefore, it should be noted that the distributional impacts might be different to what is in this report for these reasons but that the total tax impact across governments is sufficiently indicative of what is possible for these sorts of reforms.

3.4 Public transport franchising

Overall, the franchising of the relevant public transport businesses is estimated to increase GDP per annum by \$268 million in 2031 and \$372 million in 2047 (see Table 8). Government tax revenue is also estimated to increase by \$69 million per annum in 2031 and \$139 million per annum in 2047. The net present value over the 30 years modelled (2017 to 2047) of the tax impact to the Australian Government is \$421 million.

The distribution impact here is largely related to the public transport that exists in each jurisdiction that could be included in the productivity estimates of franchising as modelled in PwC’s report for IA, *Potential cost savings from rail and bus franchising: technical report*,²⁵ the assumptions from which have been used for the modelling of the results in this report. New South Wales and Queensland have both bus and train modes of public transport that would benefit relatively more from increased productivity, while the only jurisdiction that was not impacted in the modelling by public transport franchising of either bus or train transport was the Northern Territory.

Table 8: Impacts on GDP and tax revenue in 2031 and 2047 from public transport reforms

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)	
	2031	2047	2031	2047
States and Territories	n/a	n/a	18	40
Australian Government	n/a	n/a	51	99
Total Australia	268	372	69	139

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

This impact analysis is intended to be complementary and not alternative to the modelling results presented in PwC’s report for IA, *Potential cost savings from rail and bus franchising: technical report*. While the same operational saving assumptions and applicable jurisdictions have been used for the modelling presented in this report, the purpose of the reports, the nature of results presented and the modelling methods are fundamentally different. This report shows the economy-wide impacts to GDP and taxation revenue resulting from the productivity benefits possible from public transport franchising while PwC’s franchising technical report is a cost benefit analysis which presents the potential operational cost savings that could be achieved by the reform. As the purpose of this report is to identify the broad scale of benefits of the proposed reforms, the procurement costs which were identified in PwC’s technical report have not been included in the modelling of these results.

²⁵ PwC, *Potential cost savings from rail and bus franchising: technical report*, April 2017, page 6.

3.5 Stamp duty reform

The reform of a switch from conveyancing stamp duties to a broad based land tax, compared to the other policies examined here, has an impact on almost every industry across the country, not just a specific sector. Therefore, by removing the tax wedge and encouraging a movement of land to the most productive use (whether for industry or to bring employees closer to the location where they would prefer to live given the location of their employer) there is a positive effect across the economy.

Overall, this transition from stamp duty to a broad based land tax increases GDP per annum by \$20.8 billion in 2031 and \$24.3 billion in 2047. Although we assume this is a revenue neutral change, through the expansion of the economy via the productivity improving reallocation of capital, government tax revenue is also estimated to increase by \$7 billion per annum in 2031 and \$11.2 billion per annum in 2047. The Australian Government is estimated to receive \$60.1 billion in tax revenue in net present value by 2047.

Table 9: Impacts on GDP and tax revenue in 2031 and 2047 from stamp duty reforms

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)	
	2031	2047	2031	2047
States and Territories	n/a	n/a	1,139	1,809
Australian Government	n/a	n/a	5,818	9,349
Total Australia	20,802	24,252	6,957	11,158

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

3.6 Impact of implementing the full IA reform package

The impact of implementing the full IA reform package results in a GDP increase above baseline of \$46.0 billion in 2031 (1.91 per cent of GDP) and \$66.0 billion in 2047 (1.93 per cent of GDP). Tax revenue received by the State, Territory and Australian Governments in total increases above baseline by \$10.0 billion in 2031 and \$19.0 billion in 2047 as a result of the reforms. The net present value of tax revenue received by the Australian Government alone is \$85.9 billion to 2047.

Table 10: Impact of reforms on real GDP and tax revenue in 2031 and 2047

Indicator	2031	2047
Increase in GDP above baseline (\$m)	46,006	66,021
Increase in tax revenue above baseline (\$m)	10,033	19,032

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

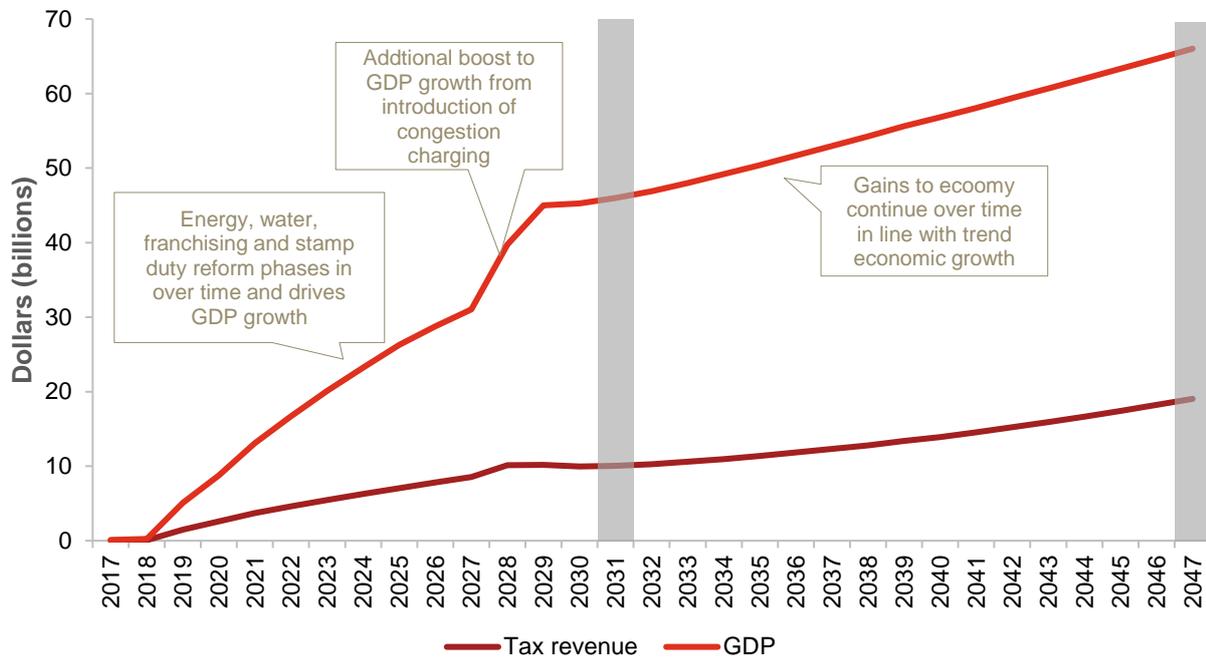
Figure 3 shows the annual change in GDP and tax revenue relative to the baseline due to the reforms. GDP is in real 2016-17 dollars (but undiscounted), while tax revenue is in nominal terms. The area under the line shows the cumulative GDP and tax revenue. This shows there is a steady growth in GDP and tax revenue until 2027. In 2027, there is a significant increase in GDP primarily attributed to the transport sector reform of congestion pricing. This subsequently leads to an annual change of \$66 billion by 2047.

Compared to implementing the reforms individually, this concurrent package reflects a small additional increase in GDP. GDP in the concurrent package of reforms is 1-2 per cent larger than the sum of the individual reform GDP impacts. This shows some capacity for earlier reforms to increase the total size of the economy which allows later reforms to have a larger overall impact.

However, it should be noted that, due to net revenue neutral assumptions for the stamp duty and road reforms, the tax revenue in the combined concurrent reform package is less than the individual components modelled separately. This is because in the concurrent reforms both these tax items were held at no change, where as in the unrelated reforms, one or both may be growing (ie there is an increase in stamp duty and land tax in all the

individual reforms except the stamp duty reform scenario, but this is held at zero for all parts of the combined concurrent scenario).

Figure 3: Incremental change in real GDP and tax revenue



Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

The relative distribution of the total impact across the particular States and Territories depends on whether or not a jurisdiction is involved in more of the reforms, or have larger size sectors that are subject to the particular reforms. However, the more remarkable distribution is in tax revenue between the Australian Government compared to State and Territory Governments. The largest increase in tax revenue is to the Australian Government, which is estimated to receive \$17.1 billion in tax revenue in 2047. In NPV terms over the 30 years modelled (2017 to 2047) the tax impact to the Australian Government is an increase of \$85.9 billion. In 2047, \$6.8 billion of the Australian Government revenue is GST collections to be distributed to the State and Territory Governments, but the majority, \$10.3 billion is in other Commonwealth collections.

Table 11: Impacts on GDP and tax revenue in 2031 and 2047

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)	
	2031	2047	2031	2047
States and Territories	n/a	n/a	1,038	1,920
Australian Government	n/a	n/a	8,995	17,112
Total Australia	46,006	66,021	10,033	19,032

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

3.7 Sensitivity tests

Given that the focus of this report is to examine the impact of potential reforms on Australian Government tax revenue, sensitivity tests have been conducted to test the downside risk to that income. Sensitivities have been examined where there is the most potential for this downside risk, in regards to the two reforms that have the largest tax revenue impacts in the core scenarios – road reforms and stamp duty reforms.

For road reform, the core scenario (as above) was modelled on a productivity increase of 10 per cent to the road transport sector from heavy vehicles user pricing and a 15 per cent reduction in congestion costs from the rest of fleet user pricing. These inputs were sensitivity tested at 5 per cent and 10 per cent based on direct impacts from literature with more conservative outcomes.²⁶ However, it should be noted that while these examples are useful for comparison in a sensitivity scenario, they have not been used in the core scenario as, especially in regards to the congestion pricing, the charging models they examine is more limited in scope than the reforms outlined in IA's *Australian Infrastructure Plan*.²⁷

This is a relatively large reduction in inputs (of a third for one and half for the other) and the results of this road reform sensitivity scenario, shown in Table 12, reflect this substantial impact. The results shows that by 2047, the sensitivity scenario results in an impact on GDP and tax revenue that is 37 per cent smaller than the core scenario.

Table 12: Impacts on GDP and tax revenue from road reforms sensitivity scenario

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)		Difference in tax revenue from core scenario (\$m, p.a.)	
	2031	2047	2031	2047	2031	2047
States and Territories	n/a	n/a	443	1,100	259	634
Australian Government	n/a	n/a	1,716	4,344	1,002	2,517
Total Australia	13,405	23,115	2,159	5,444	1,261	3,151

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.
Source: PwC analysis.

For the stamp duty reform, the core scenario (as above) was modelled using the difference between the marginal excess burden of stamp duty (0.72) and land tax (-0.1) from the *Re:think tax discussion paper*.²⁸ These inputs were sensitivity tested using alternate outcomes from the technical modelling behind that discussion paper. For the stamp duty marginal excess burden, the input for the sensitivity test chosen was the outcome using imperfect capital mobility (0.66),²⁹ as it demonstrates a key downside risk of lack of responsiveness to the change. For the land tax marginal excess burden, the input for the sensitivity test was chosen was the outcome using low foreign ownership (0.0),³⁰ as foreign ownership in that analysis was the

²⁶ The 5 per cent productivity for heavy vehicles is taken from the low reform base case scenario in Productivity Commission, *Road and rail Freight Infrastructure Pricing*, 2006. The 10 per cent cost reduction for congestion pricing is informed by the low end of the peak delay reduction in Gothenburg (examined in Borjesson, M. and Kristoffersson, I., *The Gothenburg congestion charge. Effects, design and politics*, Transport and Research Part A, Vol. 75, 2015) and the low end of the congestion reduction in Singapore (examined in Infrastructure Partnerships Australia, *Urban transport challenge: A discussion paper on a role for road pricing in the Australian context*, 2010).

²⁷ The *Australian Infrastructure Plan* outlines a whole-of-network approach (with distance-location-time metrics) which is designed to solving the joint challenges of congestion and falling revenue, as opposed to the cordon-based charge in the Gothenburg and Singapore examples. Although the tax impact analysis in this reports assumes a revenue-neutral approach, a whole-of-network system could achieve higher efficiency gains through wider reduction of congestion, and potentially some benefits through greater efficiency of revenue collection and capital expenditure on roads over time.

²⁸ Australian Government, *Re:think tax discussion paper*, March 2015, page 25. The Treasury, *Understanding the economy-wide efficiency and incidence of major Australian taxes*, April 2015.

²⁹ The Treasury, *Understanding the economy-wide efficiency and incidence of major Australian taxes*, April 2015, page 51.

³⁰ Ibid, page 45.

driver behind the negative excess burden result of -0.1. These two combine to make a sensitivity scenario that has inputs that are 20 per cent lower than in the core scenario.

The results of this stamp duty reform sensitivity scenario are shown in Table 13. This shows that by 2047, the sensitivity scenario results in an impact on GDP that is 20 per cent smaller than the core scenario and a tax revenue impact that is reduced by 19 per cent. This shows a broadly linear relationship to a change in inputs within the same order of magnitude.

Table 13: Impacts on GDP and tax revenue from stamp duty sensitivity scenario

Year	GDP (\$m, p.a.)		Tax revenue (\$m, p.a.)		Difference in tax revenue from core scenario (\$m, p.a.)	
	2031	2047	2031	2047	2031	2047
States and Territories	n/a	n/a	924	1,461	215	348
Australian Government	n/a	n/a	4,703	7,545	1,115	1,804
Total Australia	16,808	19,497	5,627	9,006	1,330	2,152

Note: GDP is stated in real 2016-17 dollars. Tax revenue is in nominal terms.

Source: PwC analysis.

These sensitivity tests were modelling as individual reforms, but indicatively including them in the combined concurrent reform package would result in an overall tax revenue impact in 2047 that is approximately 25 per cent lower than in the core scenario.

© 2017 PricewaterhouseCoopers Consulting (Australia) Pty Ltd. All rights reserved.
PwC refers to the Australian member firm, and may sometimes refer to the PwC network.
Each member firm is a separate legal entity. Please see www.pwc.com/structure for further details.

At PwC Australia our purpose is to build trust in society and solve important problems. We're a network of firms in 157 countries with more than 208,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.com.au

Liability limited by a scheme approved under Professional Standards Legislation.