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Modelling Heavy Vehicle Reforms in Australia using VURMTAX

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Abstract

This report uses VURMTAX, a dynamic multi-regional computable general equilibrium model of Australia, to assess the economy-wide effects of two heavy vehicle reform scenarios: (1) increasing heavy vehicle road access; and, (2) establishing a National Automated Access System (NAAS). The first scenario is modelled as a nationwide multifactor productivity improvement in the Road Freight sector, together with an increase in road wear costs, reflecting additional public expenditure required to maintain road infrastructure quality. The second scenario is modelled as a Road Freight multifactor productivity improvement applying to all Australian states and territories except Western Australia and the Northern Territory. Policy shock inputs for both scenarios are provided by the Productivity Commission based on estimates of BITRE (forthcoming). This report draws on database and model development work that disaggregates the use of different commercial vehicle classes across industries and regions within the economy, thereby improving the representation of heavy vehicles in VURMTAX. Results indicate that both reforms generate positive economy-wide gains, including higher real GDP, household consumption, investment, and output in road-freight-using industries, although the size and distribution of economic impacts vary across regions and sectors in each scenario.

JEL Codes: C68; E62; H2; H71; R38; R48

Keywords: CGE modelling; Transport policy; Heavy Vehicle; Road Freight

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Executive Summary

This report uses VURMTAX, a dynamic multi-regional computable general equilibrium model of Australia, to assess the economy-wide effects of two heavy vehicle reform scenarios requested by the Productivity Commission. The first scenario (Scenario 1) examines increasing heavy vehicle road access. It is modelled as a nationwide multifactor productivity improvement in the Road Freight sector, together with additional government expenditure on civil engineering construction to reflect higher road wear costs. The second scenario (Scenario 2) examines the establishment of a National Automated Access System (NAAS). It is modelled as a Road Freight productivity improvement applying to all states and territories except Western Australia and the Northern Territory. Policy shock inputs for both scenarios are provided by the Productivity Commission, based on estimates of these reform scenarios by the Bureau of Infrastructure and Transport Research Economics (BITRE, forthcoming). The modelling incorporates database development work that improves the representation of commercial vehicle use across industries and regions in VURMTAX.

The results indicate that both modelled reforms generate positive national economic effects.

Under Scenario 1, real GDP rises by 0.09 per cent above baseline on impact and 0.10 per cent by 2040. Real household consumption, investment and exports also rise. These gains reflect lower Road Freight costs supporting output in road-freight-using industries. The additional road-wear expenditure increases public demand for civil engineering construction, providing a boost to construction activity but weakening the government budget position.

Under Scenario 2, real GDP rises by 0.04 per cent above baseline on impact and 0.05 per cent by 2040. The economic benefits from the Road Freight productivity improvement are concentrated in the states and territories where the Road Freight productivity shock is applied.

Across both scenarios, the main sectoral beneficiaries are Road Freight and industries that rely relatively heavily on road freight services, such as agriculture, manufacturing, wholesale trade and retail trade. In Scenario 1, civil engineering construction also expands strongly because of the additional road-wear expenditure. Some sectors contract. Railway Freight contracts because it directly competes with Road Freight. Heavy Vehicle output contracts because higher Road Freight productivity reduces commercial vehicle input requirements per unit of freight output.

The regional impacts are uneven. Tasmania records the strongest gains in both scenarios, reflecting its relatively high Road Freight margin intensity and the resulting larger cost savings from lower Road Freight costs. The stronger Tasmanian economy also attracts interstate migration into Tasmania, supporting regional household consumption and employment. In Scenario 2, Western Australia and Northern Territory gain less than other regions because they are excluded from the direct Road Freight productivity shock. They are affected indirectly through relative cost changes and resource reallocation elsewhere in the national economy.

Government budget effects differ between the two scenarios. In Scenario 1, the additional road-wear expenditure is split between federal and state/local governments. For the federal government, revenue gains from federal taxes more than offset its share of the road-wear expenditure, leading to a positive net budget position. By contrast, state/local governments bear the larger share of the additional road-wear expenditure. The increase in state/local government revenue generated by stronger economic activity falls short of the rise in expenditure, leading to negative net budget positions relative to baseline.

In Scenario 2, the net budget position improves for the federal government. At the state level, budget outcomes broadly follow regional economic activity and generally improve for most regions. However, Tasmania's strong population inflow increases public expenditure obligations, as the model closure ties government consumption within a region to regional population levels, more than offsetting the revenue gain associated with stronger regional activities.

Overall, our modelling suggests that heavy vehicle reforms can improve economy-wide performance by reducing Road Freight costs and supporting freight-using sectors. The size and distribution of gains depend on reform design, regional coverage, regional and sectoral cost structures, and associated infrastructure costs.

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1. Introduction

Victoria University's Centre of Policy Studies (CoPS) was engaged by the Productivity Commission (PC) to conduct scenario analysis of the impacts of two heavy vehicle reforms using VURMTAX, a dynamic multi-regional computable general equilibrium model of Australia. The two scenarios examined are: (1) increasing heavy vehicle road access; and, (2) establishing a National Automated Access System (NAAS).

The first scenario considers the effects of increasing heavy vehicle road access. In the modelling, this is represented as a nationwide productivity improvement in the Road Freight sector, as well as an increase in road wear costs.

The second scenario considers the establishment of the NAAS. In the modelling, this is represented as a Road Freight productivity improvement applying only to the states and territories assumed to be covered by the NAAS scenario, namely all Australian states and territories except Western Australia and the Northern Territory.

The analysis reported here has been undertaken in accordance with the project requirements provided by the PC. Specifically, we run and report the results of two scenario analyses, with each scenario corresponding to a reform package. For each scenario, we include a core simulation and an alternative simulation, which differ only in the magnitude of the policy shock. While simulation results for the core and alternative simulations for each scenario are provided to the PC, this report focuses on the core simulation for each scenario only. For all simulations, policy shock inputs are provided by the PC based on estimates of BITRE (forthcoming), summarised in Table 3 of Section 3.2.

The remainder of this report is structured as follows. Section 2 provides an overview of VURMTAX, the economic model we use to conduct the scenario analyses. Section 3 describes our implementation of the policy shocks in VURMTAX for each scenario. Section 4 discusses simulation results of Scenario 1. Section 5 discusses simulation results of Scenario 2. Section 6 concludes.

2. Modelling framework

2.1 The VURMTAX model

VURMTAX is a multi-regional computable general equilibrium model of Australia based on the Victoria University Regional Model (VURM) described by Adams et al. (2015). The model is designed for detailed taxation analysis and is described in Nassios et al. (2019a). Herein, we use a six-region aggregation of the core eight-region database for Australia's states and territories. The six regions are Victoria (VIC), Queensland (QLD), South Australia (SA), Tasmania (TAS), New South Wales combined with the Australian Capital Territory (NSW&ACT), and Western Australia combined with the Northern Territory (WA&NT), consistent with the project requirements. Combining NSW with the ACT provides a parsimonious treatment of two closely linked economies, reflecting the ACT's strong economic integration with NSW. WA and NT are combined because they are the only two jurisdictions not to have adopted the Heavy Vehicle National Law and are therefore excluded from the NAAS reform in our scenario analysis.

To parameterise VURMTAX, CoPS relies on data from a variety of sources, including the Australian Bureau of Statistics (ABS) Census data, Agricultural Census data, State accounts data, and international trade data.

Each region in VURMTAX has a single representative household and a combined state and local government. The federal government also operates in each region. The foreign sector is described by export demand curves for the products of each region, and by supply curves for international imports to each region. Foreign currency prices of all imports are exogenous. Supply and demand for each regionally produced commodity is the outcome of optimising behaviour. Regional industries are assumed to use intermediate inputs, labour, capital and land in a cost-minimising way, while operating in competitive markets. Region-specific representative households purchase utility-maximising bundles of goods, subject to given prices and disposable income. Regions are linked via interregional trade, interregional migration and capital movements, and governments operate within a fiscal federal framework.

Investment in each regional industry is positively related to expected rates of return on capital in each regional industry. VURMTAX recognises two investor classes: local investors (i.e. domestic households and government) and foreign investors. Capital creators assemble, in a cost-minimising manner, units of industry-specific physical capital for each regional industry.

VURMTAX provides results for economic variables on a year-on-year basis. The results for a particular year are used to update the database for the commencement of the next year. More specifically, the model contains a series of equations that connect capital stocks to past-year capital stocks and net investment. Similarly, debt is linked to past and present borrowing/saving, and the regional population is related to natural growth and international and interstate migration [see Giesecke and Madden (2013)]. The model is solved with the GEMPACK economic modelling software [see Harrison and Pearson (1996) and Horridge et al. (2018)].

In solving VURMTAX, we undertake two parallel model runs: a baseline simulation and a policy simulation. The baseline simulation is a business-as-usual forecast for the period of interest. The policy simulation is identical to the baseline simulation in all respects, other than the addition of shocks describing the policy under investigation. Results are reported as deviations from the baseline forecast in each year of the policy simulation. For flow variables such as GDP, the result in a given year is the deviation from the baseline level in that same year. For stock variables such as population, the deviations reflect effects accumulated through the model's year-to-year dynamics.

Applications of VURMTAX include analyses of the GST [see Giesecke and Tran (2018) and Giesecke et al. (2021)], company tax [see Dixon and Nassios (2018)], tax mix swaps [see Nassios and Giesecke (2025)], oil supply shocks and fiscal policy responses [see Liu et al. (2024)], taxing export education [see Liu et al. (2025)] and land tax [see Nassios et al.

(2019b)].

2.2 Representation of the heavy vehicle sector

To better capture the economic effects of heavy vehicle reform, this study involves database and model development work within VURMTAX. While the reforms examined in this report directly affect Road Freight productivity and the use of heavy vehicles, the standard VURMTAX database does not separately identify different classes of commercial vehicles used in freight-related activity across industries.

To address this, we undertook database development work to distinguish separate classes of commercial vehicles used by industries, including the Road Freight sector and the in-house use of commercial vehicles by other sectors. This allows the model to distinguish clearly between different types of commercial vehicle activity within freight-related production, rather than treating commercial vehicle use in a more aggregated way.

Specifically, we begin by identifying four classes of commercial vehicles used in production activities across the economy: light commercial vehicles (LCV), rigid trucks, articulated trucks, and buses.[5] We then create a mixing or "dummy" industry for each vehicle class within the database. The first three classes are associated with freight-related activity, while buses are associated with road passenger activity. This distinction is important for this study because the reforms examined in the scenario analysis directly affect Road Freight activity undertaken by industries, rather than road passenger activity.

The creation of these "dummy" sectors required the commercial transport structure in the database to be reworked so that commercial vehicle use could be represented explicitly by vehicle class. We reallocated benchmark flows associated with commercial vehicle activity across the four commercial transport dummy sectors, allowing separate representation of vehicle-related fuel use, repair use, capital use, investment, and taxation across regions. In this way, each commercial vehicle dummy sector has been assigned its own benchmark cost structure, consistent with the differing operating characteristics of LCVs, rigid trucks, articulated trucks and buses.

The commercial transport disaggregation draws on data from the ABS (2019) and BITRE (2024). Data on fuel use, business kilometres travelled, and new vehicle sales by vehicle type and region were used to inform the allocation of benchmark activity across vehicle classes and regions, while preserving consistency with the original database.

Additional treatments are necessary to ensure that the revised database reflected the use of different vehicle classes by industries in the economy in a realistic way. For example, the Road Freight sector was specified to use LCVs, rigid trucks and articulated trucks, while the Road Passenger sector was specified to use buses only. Similarly, the mining industries were

[5] These four industries operate in addition to *Private Transport*, which is an existing mixing or "dummy" transport sector that supplies entirely to households, and is substitutable against road passenger and rail passenger transport services by households. For further details, see Nassios et al. (2019a).

assigned a relatively heavier reliance on articulated trucks, with comparatively lower use of LCVs. The resulting structure allows industries in each region to use different mixes of vehicle classes in production.

One further refinement is the separation of off-road articulated truck activity from on-road articulated truck use. This is important because off-road usage of articulated trucks in sectors such as agriculture, mining and construction is not directly related to public-road freight movements and is therefore not relevant to the reforms examined in this study. To capture this distinction, we estimated off-road articulated truck use by calculating the share of fuel tax credit refunds to these relevant industries as a proxy for off-road vehicle activity. This treatment helps ensure that off-road commercial vehicle use is not directly affected by the simulated Road Freight multifactor productivity (MFP) improvements in our scenario analyses.

For reporting purposes, the dummy sectors for rigid trucks and on-road articulated trucks are aggregated into a Heavy Vehicle sector that produces a Heavy Vehicle commodity. This Heavy Vehicle commodity is used as an intermediate input by the Road Freight sector and by other non-dummy industries, excluding the Road Passenger sector.

Table 1 reports the summary of the composition breakdown on the use of commercial vehicles by vehicle class and region. It is worth noting that the relatively large share of heavy vehicles in Victoria reflects the state's relatively small mining sector and, therefore, its smaller share of off-road articulated trucks. Table 2 reports the input share of Heavy Vehicle in the Road Freight sector by region.

Table 1. Composition Breakdown on the Use of Commercial Vehicles, by Vehicle Class and Region

Commercial Vehicle Class	**NSW&ACT**	**VIC**	**QLD**	**SA**	**TAS**	**WA&NT**
LCVs	50.8%	48.2%	43.5%	50.1%	51.1%	30.3%
Heavy vehicles	38.5%	43.7%	38.8%	38.1%	35.9%	38.2%
Buses	5.3%	4.7%	4.7%	5.0%	6.0%	4.1%
Off-road articulated trucks	5.4%	3.4%	13.0%	6.9%	7.0%	27.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Overall, this refinement improves the modelling of heavy vehicle reform in two ways. First, it allows the model to better identify how the reforms affect the targeted vehicle classes within Road Freight and related activities. Second, it improves the model's capacity to trace how changes in Road Freight productivity flow through to other industries and regions via differences in commercial vehicle use across the economy. This is important because the overall economic effects of heavy vehicle reform depend not only on how industries use specialist road freight services in production, but also on how in-house freight-related vehicle use enters production and supply chains.

Table 2. Input Share of Heavy Vehicle in the Road Freight Sector

State	Heavy Vehicle Input Share in the Road Freight Sector
NSW&ACT	10.6%
VIC	10.7%
QLD	11.9%
SA	10.8%
TAS	7.7%
WA&NT	9.5%

3. Simulation design

3.1 Key elements of the policy closure

In solving VURMTAX, we undertake two parallel model runs: a baseline simulation and a policy simulation. The policy simulation is identical to the baseline simulation in all respects, other than the addition of shocks describing the scenarios under investigation. We report results as percentage, percentage point, or ordinary deviations in the values of variables in each year of the policy simulation, away from their baseline values. All policy simulations conducted herein are undertaken under the following model closure:

(1) Regional labour markets characterised by short-run wage stickiness, with endogenous regional unemployment rates, transitioning to a long-run environment of regional wage flexibility with exogenous regional unemployment rates.

(2) Rates of inter-regional migration are sticky in the short run, but adjust gradually in response to movements in inter-regional relativities in expected real consumer wages in order to ensure that such income relativities are gradually returned to baseline values [see Giesecke and Madden (2013)].

(3) Regional participation rates adjust to deviations in region-specific nominal wages, price levels, and non-labour incomes, as described by Giesecke et al. (2021).

(4) National private consumption spending is the sum across regions of regional private consumption. Within each region, private consumption spending is a given proportion of regional disposable income. The national average propensity to consume (APC) is fixed to its baseline level.

(5) Within each region, all levels of government consumption spending vary in proportion to the regional population deviation from its baseline forecast level, with one exception. In Scenario 1, federal and state/local government consumption on civil engineering and construction is allowed to deviate from baseline to accommodate the additional road wear expenditure.

(6) The federal government's budget constraint is maintained through an endogenous direct tax or transfer to households, levied on a per capita basis. State/local

government budgets are maintained through endogenous direct taxes or transfers to households within their jurisdiction.

(7) The numeraire price level is the national CPI in all scenarios.

3.2 Implementation of the policy shocks

We examine two scenarios. Scenario 1 models increased heavy vehicle road access. Scenario 2 models the establishment of a National Automated Access System (NAAS). For each scenario, we run two simulations: a core simulation and an alternative simulation. The alternative simulation differs from the core simulation only in the magnitude of the policy shock. Alternative simulation results are reported in tables and figures in sections 4 and 5 for comparison, but are not discussed herein. Results for both the core and alternative simulations are provided to the PC in spreadsheets that accompany this report.

The size of the shocks was provided by the Productivity Commission based on estimates of BITRE (forthcoming).

Scenario 1 models increased heavy vehicle road access, with two policy shocks imposed in this scenario. In our modelling, this is implemented as an MFP improvement that reduces the intermediate and primary factor inputs required per unit of Road Freight output. This shock reduces overall resource costs per unit of output, including the number of freight trips required, driver working hours, and vehicle operating costs. This treatment is consistent with the methodology in BITRE (forthcoming) which measures benefits on an MFP basis.

The second shock is an increase in government expenditure on road-related maintenance and repair activities, representing the additional road construction and maintenance expenditure required to offset road wear and maintain infrastructure quality. In the VURMTAX database, such expenditure is recorded under the government's spending on civil engineering and construction.[6]

Following advice from the PC, the additional road-wear expenditure is split between the federal and state/local governments using national road-related expenditure shares reported by BITRE (2025). Specifically, 24.1 per cent of the additional expenditure is allocated to federal government consumption and 75.9 per cent is allocated to state/local government consumption. The regional allocation of the 24.1 per cent additional federal government

[6] The 2022–23 ABS Input-Output Table records road-related repair and maintenance activities as intermediate use by industries under "IOPC 31010020 Repair and maintenance - roads and bridges" and "IOPC 31090020 Repair and maintenance - non-building construction n.e.c.", which includes tunnels. The data do not distinguish between publicly and privately funded activities. Our calculation excludes road-related repair and maintenance activities in sectors such as mining and electricity generation, where such expenditure is mainly associated with private roads and off-road vehicle use and is therefore assumed to be privately funded. We represent this expenditure as government consumption of civil engineering and construction in the database. The federal/state-local government split and regional allocation of this expenditure follow the shares advised by the PC for the additional road-wear expenditure shock.

road-wear expenditure follows the shares provided by the PC in Table 3. The 75.9 per cent uplift in state/local government consumption follows an identical regional distribution. As advised, these shares are based on the state-level distribution of heavy-vehicle-related road costs from BITRE.[7]

Table 3. Regional allocation shares of the additional government road-wear expenditure

State	Share
NSW&ACT	28.95%
VIC	20.69%
QLD	29.31%
SA	5.25%
TAS	2.39%
WA&NT	13.41%

Scenario 1 thus combines a Road Freight MFP improvement with an additional public demand shock for civil engineering and construction, allocated across levels of government and regions using the specified expenditure shares provided by the PC.

Scenario 2 models the economic impact of establishing a National Automated Access System (NAAS), which is intended to streamline and automate road access decision-making for heavy vehicles. Consistent with the project specification, the NAAS is assumed to apply to all Australian states and territories except Western Australia and the Northern Territory. Hereafter, we refer to NSW&ACT, VIC, QLD, SA and TAS as the “NAAS states”.

In this scenario, we impose an MFP improvement in the Road Freight sector in the NAAS states only. The productivity benefit of establishing a NAAS is implemented as a Road Freight MFP shock, reflecting the expected impact of NAAS in reducing the overall resource cost per unit of output of Road Freight services through more efficient road access decision-making; once again, this approach is consistent with BITRE (forthcoming). The size of the state-level productivity shock is calibrated so that it matches the Australia-wide Road Freight productivity impacts provided by the PC based on BITRE (forthcoming).

The specific shocks applied in each simulation are summarised in Table 4. In the sections 4 and 5 herein, we discuss the economic impacts of each reform. Our discussion is focused on the core simulation for each scenario. Section 4 focuses on Scenario 1 (specifically, Simulation S1A), while Section 5 focuses on Scenario 2 (Simulation S2A). While the

[7] Informed by the PC, this distribution is based on heavy-vehicle-related maintenance expenditure plus 10 per cent of heavy-vehicle-related construction expenditure from 2018–19 and 2019–20. The regional allocation shares for the eight states are: NSW, 28.67 per cent; VIC, 20.69 per cent; QLD, 29.31 per cent; SA, 5.25 per cent; WA, 12.80 percent; TAS, 2.39 per cent; NT 0.61 per cent and ACT, 0.28 per cent. In the six-region VURMTAX aggregation, the NSW and ACT shares are combined into NSW&ACT, while the WA and NT shares are combined into WA&NT, as reported in Table 3.

discussion only focuses on the core simulations, key tables and figures also report results for the alternative simulations for comparison.

The policy shocks are imposed in financial year (FY) 2026, and the counterfactual simulations run to FY 2040, covering a 15-year time horizon.

Table 4. Policy Shocks by Simulation

Scenario 1: Increasing heavy vehicle road access	*Core Simulation* S1A	*Alternative Simulation* S1B
Road freight MFP improvement	3.2% Australia-wide	1% Australia-wide
Additional road wear expenditure	$1,118.7m	$377.8m
Scenario 2: Establishment of NAAS	*Core Simulation* S2A	*Alternative Simulation* S2B
Road freight MFP improvement	2.3% in NAAS states (calibrated to Australia-wide shock of 1.6%)	1.15% in NAAS states (calibrated to Australia-wide shock of 0.8%)

4. Results: Scenario 1

4.1 Impacts on Road Freight

Scenario 1 combines a nationwide MFP improvement in the Road Freight sector with additional government expenditure on road maintenance and repair to reflect higher road wear costs.

Table 5 summarises the industry output and price responses for Road Freight and Heavy Vehicle industries.

On impact, the MFP improvement reduces the basic price of Road Freight output by 3.5 per cent and raises Road Freight output by 0.69 per cent relative to baseline. Because fewer intermediate and primary factor inputs are required per unit of Road Freight output, labour use in the sector falls, with Road Freight employment in persons declining by 2.75 per cent on impact. The effect on capital stock is lagged by one period, because industry-specific capital is assumed to be fixed at baseline in the short run, that is, the first year of the shock. Over time, Road Freight output rises to 0.77 per cent above baseline by 2040, while its basic output price remains 3.33 per cent below baseline.

As Road Freight uses Heavy Vehicle as intermediate inputs, the cost-saving technical change reduces the demand for Heavy Vehicle inputs per unit of Road Freight output. This reduces national Heavy Vehicle output by 0.21 per cent on impact. The weaker demand for Heavy Vehicles from the Road Freight sector also reduces the cost of using heavy vehicle services, with the basic price of Heavy Vehicle output falling by 0.18 per cent on impact and remaining 0.1 per cent below baseline by 2040.

In Scenario 1, the additional road-related government expenditure is modelled as an increase in federal and state/local government consumption of civil engineering and construction. This represents additional public demand for road-related maintenance and repair, rather than a reallocation away from other government consumption categories. Specifically, the road-related expenditure is imposed as a separate increase in civil engineering construction demand, while other government consumption remains governed by the closure stated in Section 3.1, and is tied to regional population deviations from baseline.

In Scenario 1, civil engineering construction is the strongest-performing industry on impact, with output 0.8 per cent above baseline in 2026.

Table 5. Road Freight and Heavy Vehicle Output and Price Responses (Scenario 1)

	Scenario 1A		**Scenario 1B**	
Road Freight	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Sectoral output	0.69	0.77	0.21	0.24
Basic price of industry output	-3.50	-3.33	-1.10	-1.04
Heavy Vehicle	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Sectoral output	-0.21	-0.19	-0.06	-0.06
Basic price of industry output	-0.18	-0.10	-0.06	-0.03

4.2 National macroeconomic impacts

The combined effect of a nationwide Road Freight MFP improvement and higher public demand for civil engineering construction is positive for the Australian economy overall. Table 6 summarises the national macroeconomic results for Scenario 1.

On impact, real GDP rises by 0.09 per cent relative to baseline. Real household consumption, real investment, and real government consumption rise by 0.05 per cent, 0.03 per cent and 0.19 per cent respectively, reflecting stronger domestic demand. In particular, the rise in real federal and state/local government consumption reflects the federal and state share of additional public expenditure on road-related maintenance and repair. Real export volumes increase by 0.08 per cent as trade-exposed industries benefit from lower freight costs. Real import volumes increase by 0.03 per cent, which is driven by stronger domestic demand.

National labour market outcomes are also positive, as road-freight-using sectors expand and generate stronger labour demand across the economy. National employment rises by 0.037 per cent in persons in 2026 and remains 0.017 per cent above baseline by 2040. Wage-bill-weighted employment also rises, although by a slightly smaller amount. This gap reflects differences in wage-bill weights across industries when labour reallocates. Part of the labour released from the Road Freight sector, which has relatively higher wage rates, is absorbed by sectors with relatively lower wage-bill weights, such as agriculture. Relative to baseline, the unemployment rate falls by 0.04 percentage points in 2026 and gradually returns toward baseline over time.

Table 6. National Macroeconomic Variables (Scenario 1)

	Scenario 1A		**Scenario 1B**	
National macro variable	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Real GDP	0.09	0.10	0.03	0.03
Real investment	0.03	0.05	0.01	0.02
Real household consumption	0.05	0.05	0.01	0.01
Real export volumes	0.08	0.11	0.03	0.03
Real state/local gov. consumption	0.28	0.28	0.09	0.09
Real federal gov. consumption	0.10	0.10	0.03	0.03
Real government consumption (all levels)	0.19	0.20	0.07	0.07
Real import volumes	0.03	0.04	0.01	0.01
Capital stock	0.00	0.06	0.00	0.02
Employment (wage-bill weighted)	0.031	0.013	0.010	0.005
Employment (persons)	0.037	0.017	0.012	0.005
National population	0.00	0.00	0.00	0.00
Real consumer wage	0.005	0.081	0.002	0.026
Real cost of labour	0.005	0.092	0.001	0.029
GDP deflator	0.00	-0.01	0.00	0.00
CPI (numeraire)	0.00	0.00	0.00	0.00
National terms of trade	-0.02	-0.03	-0.01	-0.01
Real devaluation	-0.03	-0.02	-0.01	-0.01
Nominal exchange rate	-0.03	-0.03	-0.01	-0.01
	Percentage point deviation from baseline		*Percentage point deviation from baseline*	
Unemployment rate	-0.04	0.00	-0.01	0.00

Directly driven by stronger labour demand, the real cost of labour also rises. In addition, the aggregate output price falls relative to the CPI but only marginally, further increasing the real cost of labour to producers as the nominal producer wage is deflated by output prices. Real consumer wages also rise from 2026 onward, consistent with the model closure in which real wages are sticky in the short run and adjust positively to a short-run fall in the unemployment rate over time. The real consumer wage remains above baseline in 2040, supporting household income and consumption.

With CPI as the numeraire, CPI remains fixed at baseline by construction. The GDP deflator falls slightly below baseline over time, while the national terms of trade fall by 0.02 per cent on impact and 0.03 per cent by 2040. These movements reflect lower export prices associated with reduced freight costs, while import prices in foreign currency are fixed at baseline. In VURMTAX, the nominal exchange rate is defined as domestic currency per unit of foreign currency. Its fall below baseline therefore indicates a nominal appreciation. At the same time, stronger domestic activity and higher factor demand place some upward pressure on domestic costs, contributing to a small real appreciation that partly offsets the competitiveness gain from lower freight costs.

4.3 Sectoral impacts

Table 7 reports the top and bottom three performing industries on impact in Scenario 1. To present the broader sectoral pattern more clearly, we also aggregate the 95 industries in VURMTAX into 20 broad groups that align closely with the ABS ANZSIC level 1 classification. These results are reported for 2026, the shock year, and for 2040 in Figure 1 and Figure 2.

The sectoral results reflect the two imposed shocks in Scenario 1: lower freight costs from the Road Freight MFP improvement, and higher public demand for road repair and maintenance.

At the ANZSIC level, Construction is the strongest-performing sector on impact, rising by 0.25 per cent in 2026. This reflects both the boost to civil engineering construction from additional government road-wear expenditure, and the benefit of lower freight costs. Agriculture, Forestry and Fishing also perform strongly, rising by 0.20 per cent in 2026, consistent with its relatively heavy reliance on road freight services. Manufacturing, wholesale trade and retail trade also expand, benefiting from lower freight costs.

At the disaggregated industry level, Civil Engineering Construction, Road Freight and Grains are the three strongest-performing industries on impact. Civil Engineering Construction benefits from higher government expenditure on road maintenance and repair, while Road Freight benefits directly from the imposed MFP improvement. Grains performs strongly because it is highly dependent on road freight services and therefore benefits from lower transport costs.

Among the weakest-performing industries, Railway Freight contracts by 0.46 per cent in 2026: the VURMTAX model allows for modal substitution in margin use, and the contraction of Railway Freight reflects this direct competition with Road Freight. Heavy Vehicle and LCV also contract because higher Road Freight productivity reduces the amount of commercial vehicle input required for a given freight task.

At the ANZSIC level, Other Services records the largest contraction, falling by 0.08 per cent in 2026. This is consistent with the broad sector including automotive repair services, which are adversely affected by lower commercial vehicle use and the associated reduction in demand for vehicle repair. Public Administration and Defence is little affected by the reform, as the additional public demand shock is imposed on civil engineering construction rather than public service provision.

The sectoral pattern in 2040 is broadly similar to that in 2026. One notable exception is Mining. Mining expands only modestly on impact, rising by 0.02 per cent in 2026, because it is highly capital intensive and therefore constrained in the short run. Over time, however, the benefit of lower freight costs becomes more apparent as capital adjusts, and Mining rises to 0.09 per cent above baseline by 2040.

Table 7. Top and Bottom Three Performing Industries in the shock year (Scenario 1)

	Scenario 1A	**Scenario 1B**
	% Deviation from baseline	
Top 3 performing industries		
Civil Engineering Construction	0.80	0.27
Road Freight	0.69	0.21
Grains	0.57	0.18
Bottom 3 performing industries		
Railway Freight	-0.46	-0.14
Heavy Vehicle	-0.21	-0.06
LCV	-0.18	-0.05

Figure 1. ANZSIC Industry Output (Scenario 1A)

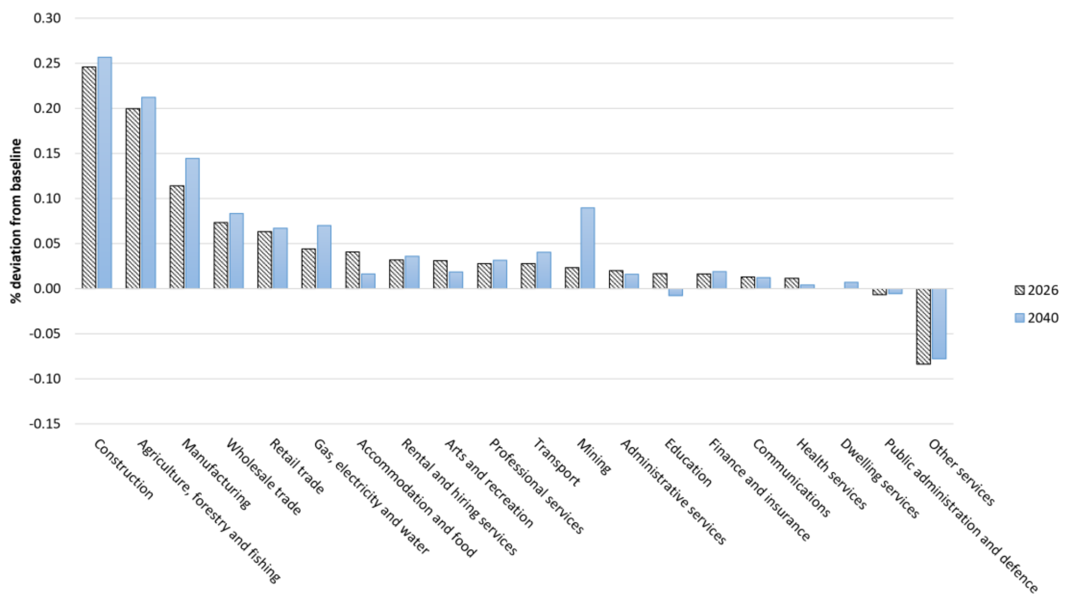
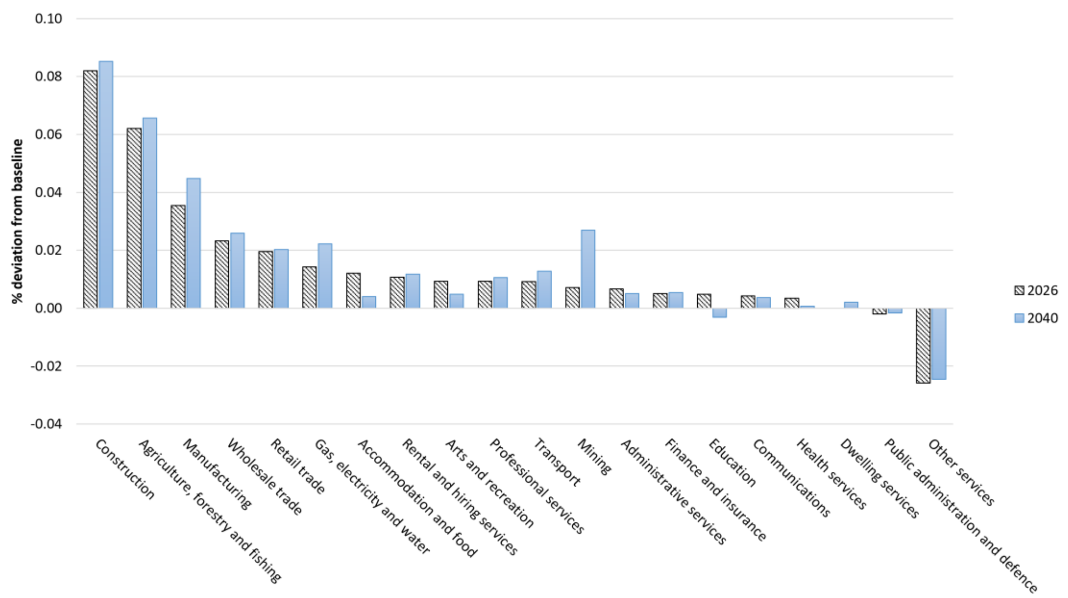


Figure 2. ANZSIC Industry Output (Scenario 1B)



4.4 Regional results

Table 8 reports the regional impact of Scenario 1. The Road Freight MFP improvement in this scenario is applied to all states, including WA&NT, which is excluded from the shock in Scenario 2.

To help with the explanation of the regional pattern of results, we calculate a measure of

Road Freight margin intensity by region, defined as the ratio of total Road Freight margin use to total basic flow value in each region. On this measure, Tasmania records the highest Road Freight margin intensity, followed by WA&NT, SA and QLD. NSW&ACT and VIC record the lowest Road Freight margin intensities.

Table 8. Road Freight Margin Intensity

State	**Road Freight Margin Intensity** *(Largest to Smallest)*
TAS	1.61%
WA&NT	1.46%
SA	1.34%
QLD	1.21%
VIC	0.83%
NSW&ACT	0.79%

These differences reflect regional trade structure. In constructing the VURMTAX regional database, we assume that states that source a larger share of goods from other regions, and are more remote from those sources, use relatively more Road Freight margin to facilitate sales.[8] As a result, a reduction in Road Freight costs generates larger impacts in those regions. Tasmania is the strongest-performing region, reflecting its high Road Freight margin intensity, geographic remoteness, reliance on interstate trade, and relatively small economic base. By contrast, NSW&ACT and VIC are much less dependent on interstate trade than other states and therefore have lower Road Freight margin intensity and smaller gains from the reform.

The ranking of Road Freight output responses across regions broadly follows the margin-intensity ranking. In the shock year, the Road Freight sector in TAS expands by 0.94 per cent, the strongest result across all regions. SA and WA&NT also perform strongly, with Road Freight output rising by 0.79 per cent and 0.8 per cent respectively. NSW&ACT records the smallest increase, at 0.5 per cent.

TAS experiences a smaller fall in Heavy Vehicle demand than other regions. As shown in Table 9, TAS has the lowest heavy vehicle input share for Road Freight across all regions. As a result, it records a relatively mild contraction in Heavy Vehicle activity, and a quicker rebound over time as the regional economy expands with inter-regional migration flowing in.

Table 10 reports the regional macroeconomic results for Scenario 1. TAS records the strongest gains, with real GSP rising by 0.15 per cent in 2026 and 0.22 per cent in 2040. By contrast, VIC and NSW&ACT gain less from the reform, with real GSP rising by only 0.07 per cent relative to baseline in 2026. WA&NT records a mid-range result in 2026, with real GSP 0.10 per cent above baseline, but rises to 0.15 per cent by 2040 and becomes the second

[8] The specific margin construction process of the database is detailed in Wittwer (2012).

strongest-performing region after Tasmania. This is consistent with the sectoral pattern discussed in the section above, in which capital-intensive mining sectors, concentrated in WA&NT, expand more strongly over time.

As the largest winner across the regions, TAS records strong increases in household consumption, investment and employment over time. This is consistent with Tasmania's high Road Freight margin intensity in the database, which means that lower freight costs generate larger delivered-cost savings there than in other regions. TAS also experiences the strongest increase in working-age population over time, reflecting inter-regional migration responses to stronger relative labour market outcomes. By contrast, VIC experiences population outflow, as labour moves towards regions with higher relative expected real wages, particularly TAS.

SA also performs strongly in export terms. Export volumes rise by 0.36 per cent in SA and 0.08 per cent in WA&NT in 2026, with both effects strengthening over time. By contrast, NSW&ACT export volumes fall slightly below baseline throughout the simulation horizon. This reflects differences in regional production and trade structure: NSW&ACT gains primarily through stronger domestic activity and household consumption, while other regions benefit through expansion of margin-intensive, export-oriented industries.

Table 9. Industry Activities: Road Freight and Heavy Vehicle, by State (Scenario 1)

State Results		**Scenario 1A**		**Scenario 1B**	
		2026	2040	2026	2040
		% Deviation from baseline		% Deviation from baseline	
Road Freight	NSW&ACT	0.50	0.58	0.16	0.18
	VIC	0.69	0.74	0.21	0.23
	QLD	0.70	0.79	0.22	0.24
	SA	0.79	0.86	0.25	0.27
	TAS	0.94	1.03	0.29	0.32
	WA&NT	0.80	0.91	0.25	0.28
Heavy Vehicle	NSW&ACT	-0.19	-0.20	-0.06	-0.06
	VIC	-0.14	-0.16	-0.04	-0.05
	QLD	-0.25	-0.22	-0.08	-0.07
	SA	-0.27	-0.28	-0.08	-0.09
	TAS	-0.11	-0.03	-0.03	-0.01
	WA&NT	-0.26	-0.19	-0.08	-0.06

Table 10. State Macroeconomic Results (Scenario 1)

State Macro Results		Scenario 1A		Scenario 1B	
		2026	2040	2026	2040
		% Deviation from baseline		% Deviation from baseline	
Real GSP	NSW&ACT	0.07	0.07	0.02	0.02
	VIC	0.07	0.06	0.02	0.02
	QLD	0.11	0.12	0.03	0.04
	SA	0.10	0.10	0.03	0.03
	TAS	0.15	0.22	0.05	0.07
	WA&NT	0.10	0.15	0.03	0.05
Real household consumption	NSW&ACT	0.05	0.05	0.02	0.02
	VIC	0.05	0.03	0.02	0.01
	QLD	0.04	0.04	0.01	0.01
	SA	0.06	0.06	0.02	0.02
	TAS	0.05	0.13	0.01	0.04
	WA&NT	0.05	0.08	0.01	0.02
Real investment	NSW&ACT	0.02	0.04	0.01	0.01
	VIC	0.03	0.03	0.01	0.01
	QLD	0.02	0.06	0.01	0.02
	SA	0.04	0.05	0.01	0.01
	TAS	0.07	0.15	0.02	0.05
	WA&NT	0.09	0.09	0.03	0.03
Export volume	NSW&ACT	-0.01	-0.02	0.00	-0.01
	VIC	0.14	0.14	0.04	0.04
	QLD	0.11	0.11	0.03	0.03
	SA	0.36	0.39	0.11	0.12
	TAS	0.48	0.51	0.15	0.16
	WA&NT	0.08	0.16	0.02	0.05
Employment (person)	NSW&ACT	0.03	0.01	0.01	0.00
	VIC	0.02	-0.01	0.01	0.00
	QLD	0.04	0.04	0.01	0.01
	SA	0.04	0.01	0.01	0.00
	TAS	0.13	0.19	0.04	0.06
	WA&NT	0.04	0.05	0.01	0.02
Capital	NSW&ACT	0.00	0.04	0.00	0.01
	VIC	0.00	0.03	0.00	0.01
	QLD	0.00	0.05	0.00	0.02
	SA	0.00	0.04	0.00	0.01
	TAS	0.00	0.11	0.00	0.04
	WA&NT	0.00	0.10	0.00	0.03
Working population	NSW&ACT	0.00	-0.01	0.00	0.00
	VIC	0.00	-0.03	0.00	-0.01
	QLD	0.00	0.01	0.00	0.00
	SA	0.00	0.00	0.00	0.00
	TAS	0.00	0.18	0.00	0.06
	WA&NT	0.00	0.04	0.00	0.01
		Percentage point deviation from baseline		*Percentage point deviation from baseline*	
Unemployment rate	NSW&ACT	-0.03	0.00	-0.01	0.00
	VIC	-0.03	0.00	-0.01	0.00
	QLD	-0.04	0.00	-0.01	0.00
	SA	-0.04	0.00	-0.01	0.00
	TAS	-0.12	0.00	-0.04	0.00
	WA&NT	-0.05	0.00	-0.01	0.00

4.5 Government budget impacts

Table 11 reports the net budget position by level of government in Scenario 1. As described in Section 3.1, under the modelling closure, each government's budget constraint is maintained through an endogenous direct tax or transfer to households on a per capita basis. The government net budget position deviations reported in Table 11 measure the fiscal adjustment required to maintain budget neutrality in the given simulation year. A negative value represents a fiscal shortfall that is neutralised through higher direct taxes on households, while a positive value represents a fiscal improvement that is returned to households through direct transfers.

Table 12 separately reports the dollar value of additional road maintenance and repair expenditure by level of government in the shock year. As discussed in Section 3.2, the additional road-wear expenditure is split between the federal and state/local governments, with shares of 24.1 per cent and 75.9 per cent, respectively. In Scenario 1A, the direct road-related government expenditure increases total government expenditure by $1,118.7 million in 2026. Of this spending uplift, $269.6 million is attributed to federal government consumption and $849.1 million to state/local government consumption. The regional allocation follows the shares reported in Table 3.

Tables 11 and 12 are presented to allow comparison between the direct budget cost of the additional road-wear expenditure and the resulting net budget position, which also includes endogenous revenue effects generated by the broader economy-wide response to the reform. Detailed federal and state/local tax revenue results are reported in the spreadsheets "Summary_S1A" and "Summary_S1B".

The net budget results in Table 11 show that the federal government budget position improves in Scenario 1A, despite the additional federal road-wear expenditure. The productivity improvement, and its impact on the tax bases that affect the revenue side of the federal government balance sheet, more than offset the impact of additional road-wear expenditure at the federal level. Key federal revenue lines, such as GST, personal income tax and corporate income tax revenues, all rise; the GST rise is however matched by an associated rise in GST distributions, and therefore has no overall impact on the federal budget position. In Scenario 1A, personal income tax rises by $146 million in 2026 and corporate income tax rises by $390 million. By contrast, excises and levies fall by $37 million in 2026, consistent with reduced fuel use associated with improved Road Freight productivity and lower commercial vehicle input requirements.

By contrast, the state/local government net budget position deteriorates in all regions. This reflects the larger state/local government share of the additional road-wear expenditure. In Scenario 1A, the aggregate state/local government net budget position falls by $791.4 million in 2026. The largest negative state/local budget effects are recorded in QLD, NSW&ACT and VIC, reflecting the regional allocation of the additional road-wear expenditure in Table 3.

Across all levels of government, the combined net budget position is $412.89 million below baseline in 2026 and $940.76 million below baseline by 2040. These results indicate that, although the Road Freight productivity improvement generates positive tax revenue effects, these are not sufficient to fully offset the additional road maintenance and repair expenditure, particularly at the state/local government level. As discussed in Section 3.1, these shortfalls are fully funded via direct taxes on households. This fiscal adjustment partly offsets the positive income effect from the productivity gain, but does not completely offset this effect; national household consumption therefore remains above baseline, as shown in Table 6.

Table 11. Net Budget Position by Level of Government (Scenario 1)

Net budget position	Scenario 1A		Scenario 1B	
	2026	2040	2026	2040
	Ordinary deviation from baseline (nominal, A$m)		*Ordinary deviation from baseline (nominal, A$m)*	
Federal government	**378.52**	**194.31**	**119.05**	**55.71**
State/local government (total)	**-791.41**	**-1135.07**	**-273.63**	**-393.08**
of which:				
NSWACT	*-234.17*	*-312.82*	*-80.57*	*-108.41*
VIC	*-162.95*	*-215.08*	*-56.48*	*-75.42*
QLD	*-257.05*	*-379.24*	*-88.37*	*-130.12*
SA	*-37.52*	*-55.31*	*-13.22*	*-19.50*
TAS	*-21.56*	*-41.98*	*-7.36*	*-14.03*
WANT	*-78.15*	*-130.63*	*-27.63*	*-45.59*
Total *All levels of government*	**-412.89**	**-940.76**	**-154.58**	**-337.37**

Table 12. Breakdown: Additional Road Maintenance and Repair Expenditure by Level of Government in 2026 (Scenario 1)

	Scenario 1A	Scenario 1B
	Ordinary deviation from baseline (nominal, A$m)	
Federal government	**269.61**	**91.05**
State/local government (total)	**849.09**	**286.75**
of which:		
NSWACT	*245.81*	*83.01*
VIC	*175.68*	*59.33*
QLD	*248.87*	*84.05*
SA	*44.58*	*15.05*
TAS	*20.29*	*6.85*
WANT	*113.86*	*38.45*
Total *All levels of government*	**1118.70**	**377.80**

5. Results: Scenario 2

5.1 Impacts on Road Freight

Scenario 2 models the establishment of the National Automated Access System (NAAS). In the modelling, this is implemented as an MFP improvement in the Road Freight sector in the NAAS states only, namely NSW&ACT, VIC, QLD, SA and TAS.

Table 13 summarises the national Road Freight and Heavy Vehicle responses under Scenario 2. On impact, the Road Freight MFP improvement reduces the basic price of Road Freight output by 1.9 per cent and raises national Road Freight output by 0.34 per cent relative to baseline. By 2040, Road Freight output is 0.36 per cent above baseline, while its basic output price remains 1.8 per cent below baseline.

Like Scenario 1, as Road Freight uses Heavy Vehicle as an intermediate input, the productivity improvement reduces the demand for heavy vehicle inputs per unit of Road Freight output. National Heavy Vehicle output falls by 0.14 per cent in 2026 and remains 0.13 per cent below baseline by 2040. The basic price of Heavy Vehicle output falls by 0.12 per cent on impact and remains 0.07 per cent below baseline by 2040.

Table 13. Road Freight and Heavy Vehicle Output and Price Responses (Scenario 2)

	Scenario 2A		**Scenario 2B**	
Road Freight	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Sectoral output	0.34	0.36	0.17	0.18
Basic price of industry output	-1.90	-1.80	-0.95	-0.90
Heavy Vehicle	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Sectoral output	-0.14	-0.13	-0.07	-0.07
Basic price of industry output	-0.12	-0.07	-0.06	-0.03

5.2 National Macroeconomic Impacts

The national macroeconomic effects of Scenario 2 are positive but smaller than those in Scenario 1. This reflects the smaller Australia-wide Road Freight productivity effect in Scenario 2, as well as the fact that the productivity improvement is applied only to the NAAS states, excluding WA&NT.

Table 14 summarises the national macroeconomic results for Scenario 2. Real GDP rises by 0.04 per cent in 2026 and 0.05 per cent by 2040. Real household consumption rises by 0.04 per cent in 2026 and 0.06 per cent by 2040, while real investment rises by 0.02 per cent in 2026 and 0.03 per cent by 2040. Real export volumes rise by 0.05 per cent in 2026 and remain 0.05 per cent above baseline in 2040, while real import volumes are broadly unchanged on impact and rise slightly over time in response to the rise in general economic activity. Federal and state government consumption at the national level remains fixed at baseline, by assumption in Scenario 2.

Labour market effects are modest. Employment in persons rises by 0.005 per cent in 2026 and remains slightly above baseline throughout the simulation horizon. Wage-bill-weighted employment is approximately unchanged on impact but turns slightly negative over time, reaching -0.003 per cent by 2040. This difference between the two employment measures reflects the reallocation of labour across industries with different wage-bill weights. The unemployment rate falls by 0.010 percentage points in 2026 and gradually returns toward baseline.

Table 14. National Macroeconomic Variables (Scenario 2)

	Scenario 2A		**Scenario 2B**	
National macro variable	2026	2040	2026	2040
	% Deviation from baseline		*% Deviation from baseline*	
Real GDP	0.04	0.05	0.02	0.02
Real investment	0.02	0.03	0.01	0.01
Real household consumption	0.04	0.06	0.02	0.03
Real export volumes	0.05	0.05	0.03	0.02
Real state/local gov. consumption	0.00	0.00	0.00	0.00
Real federal gov. consumption	0.00	0.00	0.00	0.00
Real government consumption (all levels)	0.00	0.00	0.00	0.00
Real import volumes	0.00	0.01	0.00	0.01
Capital stock	0.00	0.02	0.00	0.01
Employment (wage-bill weighted)	0.000	-0.003	0.000	-0.001
Employment (persons)	0.005	0.003	0.003	0.002
National population	0.00	0.00	0.00	0.00
Real consumer wage	0.00	0.03	0.00	0.02
Real cost of labour	0.01	0.04	0.01	0.02
GDP deflator	-0.02	-0.01	-0.01	-0.01
CPI (numeraire)	0.00	0.00	0.00	0.00
National terms of trade	-0.01	-0.01	-0.01	-0.01
Real devaluation	0.00	-0.01	0.00	-0.01
Nominal exchange rate	-0.02	-0.02	-0.01	-0.01
	Percentage point deviation from baseline		*Percentage point deviation from baseline*	
Unemployment rate	-0.010	-0.003	-0.005	-0.001

Real consumer wages rise gradually and reach 0.03 per cent above baseline by 2040. The real cost of labour also rises, reaching 0.04 per cent above baseline by 2040, as stronger economic activity and lower output prices relative to the CPI raise the cost of labour to producers. With CPI used as the numeraire, CPI remains fixed at baseline. The GDP deflator falls by 0.016 per cent on impact and remains slightly below baseline thereafter. The national terms of trade fall by around 0.01 per cent, while the nominal exchange rate falls by around 0.02 per cent, indicating a small nominal appreciation. These price effects are modest and smaller than in Scenario 1.

5.3 Sectoral Impacts

The sectoral pattern in Scenario 2 reflects the same Road Freight productivity mechanism as Scenario 1, but without the additional public demand shock for civil engineering construction, and a regional reallocation away from mining- and export-intensive states like WA&NT. As a result, the industries that benefit most are those that either receive the direct Road Freight MFP improvement or use road freight services relatively intensively.

At the disaggregated industry level, Road Freight is the strongest-performing industry on impact, with output 0.34 per cent above baseline in 2026. Wood Products and Forestry are the next strongest-performing industries, rising by 0.22 per cent and 0.21 per cent respectively. These two industries benefit the most from lower Road Freight costs, reflecting the relatively high dependence of agriculture and manufacturing sectors on freight services in production and distribution.

At the ANZSIC level, Agriculture, Forestry and Fishing rises by 0.10 per cent in 2026 and 0.11 per cent by 2040. Manufacturing rises by 0.08 per cent in 2026 and 0.09 per cent by 2040. Retail trade and wholesale trade also expand, reflecting lower delivered costs and stronger household demand.

The weakest-performing industries are again those adversely affected by lower input requirements in Road Freight or by substitution away from competing freight modes, as shown in Table 15. Railway Freight contracts by 0.17 per cent in 2026, reflecting competition with Road Freight. Heavy Vehicle contracts by 0.14 per cent, as the productivity improvement reduces heavy vehicle input demand per unit of Road Freight output.

Non-metallic Mineral Mining contracts by 0.13 per cent on impact, which is a notable difference from Scenario 1. This reflects the sector's regional concentration and pattern of Road Freight margin use. The industry has low Road Freight margin intensity in domestic sales, while much of its Road Freight margin use is associated with exporting. A large share of national production and exports is concentrated in WA&NT. As WA&NT is excluded from the direct NAAS productivity shock, this sector in WA&NT does not receive direct Road Freight MFP improvement. Nevertheless, it is still indirectly affected through price and resource reallocation effects. Within the NAAS states, resources shift toward industries that benefit more strongly from the Road Freight MFP improvement, causing Non-metallic Mineral Mining in the NAAS states to contract.

At the ANZSIC level, Other Services falls by 0.05 per cent in 2026, consistent with lower commercial vehicle use directly reducing demand for vehicle repair services within this broad sector.

Two notable qualitative differences in the sectoral impacts relative to Scenario 1 are: (1) a smaller effect on Construction, as Scenario 2 does not include a public demand shock; and (2) a more modest expansion of the Mining sector over time, as WA&NT are excluded from the Road Freight MFP shock in Scenario 2.

Table 15. Top and Bottom Three Performing Industries in the Shock Year (Scenario 2)

	Scenario 2A	**Scenario 2B**
	% Deviation from baseline	
Top 3 performing industries		
Road Freight	0.34	0.17
Wood Products	0.22	0.11
Forestry	0.21	0.10
Bottom 3 performing industries		
Railway Freight	-0.17	-0.09
Heavy Vehicle	-0.14	-0.07
Non-metallic Mineral Mining	-0.13	-0.07

Figure 3. ANZSIC Industry Output (Scenario 2A)

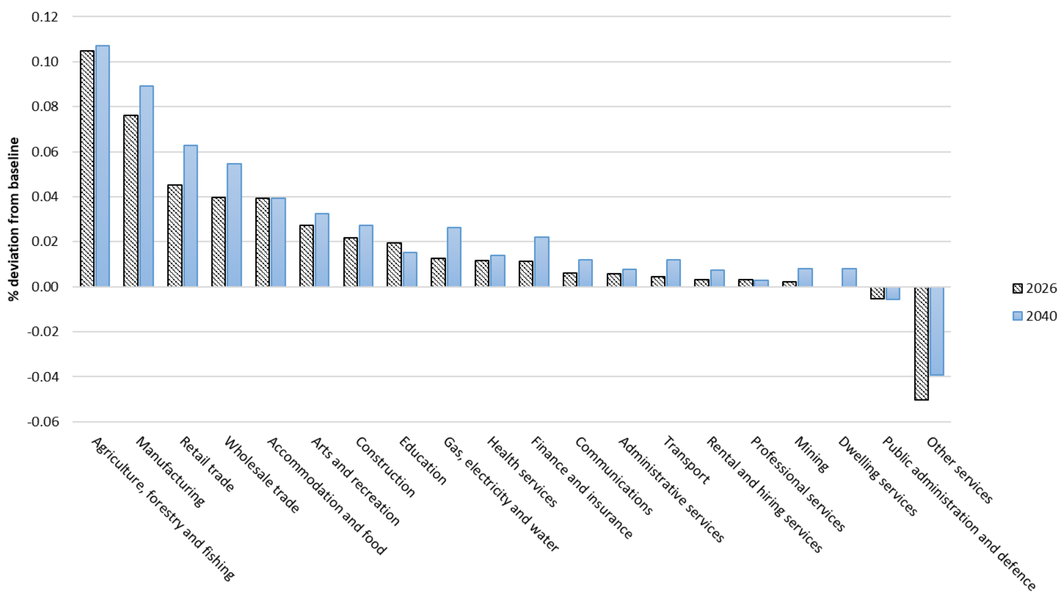
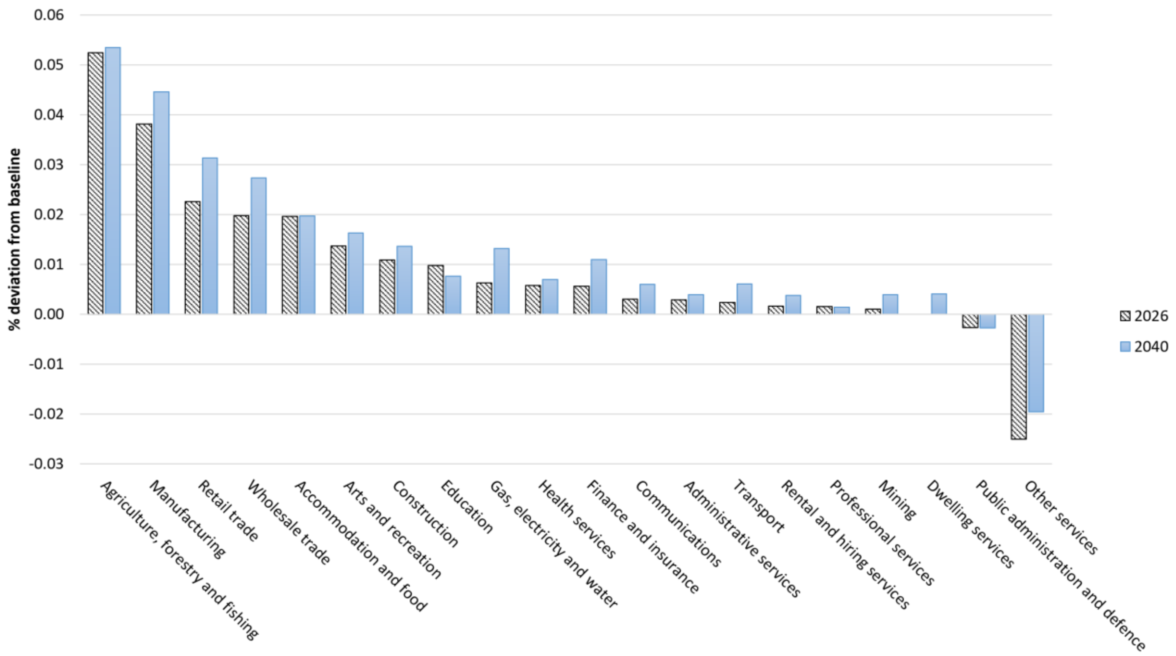


Figure 4. ANZSIC Industry Output (Scenario 2B)



5.4 Regional Impacts

The regional pattern in Scenario 2 is shaped by the geographic coverage of the NAAS productivity shock. The Road Freight MFP improvement is applied to NSW&ACT, VIC, QLD, SA and TAS, while WA&NT is excluded. As a result, the positive effects are concentrated in the NAAS states, while WA&NT records little gain on impact and a small decline over time.

As Table 16 reports, the Road Freight outcomes in the NAAS states are qualitatively similar to Scenario 1, except that Road Freight activities in WA&NT remain at baseline on impact. Road Freight output rises in all NAAS states, with the largest effects in Tasmania and South Australia. The lower demand for heavy vehicle inputs by the Road Freight sector in the NAAS states puts downward pressure on the price of heavy vehicle use, leading to slightly higher demand for Heavy Vehicle in WA&NT in the shock year. By 2040, both Road Freight and Heavy Vehicle output in WA&NT fall below baseline, reflecting its loss of relative competitiveness compared with the NAAS states.

Table 17 reports the regional macroeconomic results for Scenario 2. Among the NAAS states, TAS records the strongest macroeconomic response. Real GSP in TAS rises by 0.09 per cent in 2026 and 0.16 per cent by 2040 relative to baseline. TAS also records strong increases in household consumption, investment, exports, capital, employment and working population over time. This is consistent with the regional mechanism discussed in Scenario 1 and illustrated in Table 8: TAS has relatively high Road Freight margin intensity, so lower Road Freight costs generate larger cost savings. Stronger relative labour market outcomes also attract interstate migration into TAS, supporting population and household demand.

Table 16. Industry Activities: Road Freight and Heavy Vehicle, by State (Scenario 2)

State Results		**Scenario 2A**		**Scenario 2B**	
		2026	2040	2026	2040
		% Deviation from baseline		% Deviation from baseline	
Road Freight	NSW&ACT	0.36	0.42	0.18	0.21
	VIC	0.50	0.54	0.25	0.27
	QLD	0.47	0.55	0.24	0.28
	SA	0.57	0.63	0.28	0.31
	TAS	0.67	0.75	0.34	0.37
	WA&NT	0.00	-0.02	0.00	-0.01
Heavy Vehicle	NSW&ACT	-0.17	-0.16	-0.08	-0.08
	VIC	-0.13	-0.13	-0.06	-0.07
	QLD	-0.22	-0.19	-0.11	-0.10
	SA	-0.21	-0.21	-0.11	-0.10
	TAS	-0.11	-0.04	-0.06	-0.02
	WA&NT	0.01	-0.01	0.00	0.00

All other NAAS states also record positive economic outcomes. Real GSP rises by 0.07 per cent above baseline in SA in 2026 and remains at this level by 2040. QLD real GSP rises by 0.06 per cent in 2026 and 0.08 per cent by 2040. NSW&ACT and VIC record smaller but positive gains, with real GSP rising by around 0.04 per cent on impact. Like the discussion in Scenario 1, these differences reflect variation in regional freight intensity, industry structure and trade exposure of the NAAS states.

In WA&NT, real GSP remains at baseline in 2026 and falls to 0.02 per cent below baseline by 2040. Household consumption rises slightly above baseline, benefiting from lower output prices in the NAAS states. By contrast, WA&NT export volumes fall by 0.05 per cent in 2026 and 0.10 per cent by 2040. This reflects a loss of relative competitiveness compared with NAAS states, where Road Freight costs fall directly. In other words, WA&NT is affected indirectly through relative cost changes and resource reallocation elsewhere in the national economy. This negative spillover effect is also reflected in the reduced size of the working-age population, as labour moves to other states for higher relative wages.

Table 17. State Macroeconomic Results (Scenario 2)

State Macro Results		Scenario 2A		Scenario 2B	
		2026	2040	2026	2040
		% Deviation from baseline		% Deviation from baseline	
Real GSP	NSW&ACT	0.04	0.05	0.02	0.02
	VIC	0.04	0.04	0.02	0.02
	QLD	0.06	0.08	0.03	0.04
	SA	0.07	0.07	0.03	0.04
	TAS	0.09	0.16	0.05	0.08
	WA&NT	0.00	-0.02	0.00	-0.01
Real household consumption	NSW&ACT	0.04	0.06	0.02	0.03
	VIC	0.04	0.05	0.02	0.03
	QLD	0.05	0.08	0.02	0.04
	SA	0.05	0.08	0.03	0.04
	TAS	0.05	0.14	0.02	0.07
	WA&NT	0.01	0.01	0.01	0.00
Real investment	NSW&ACT	0.02	0.03	0.01	0.01
	VIC	0.02	0.02	0.01	0.01
	QLD	0.03	0.05	0.02	0.03
	SA	0.03	0.04	0.02	0.02
	TAS	0.06	0.12	0.03	0.06
	WA&NT	0.00	-0.02	0.00	-0.01
Export volume	NSW&ACT	0.06	0.06	0.03	0.03
	VIC	0.19	0.16	0.10	0.08
	QLD	0.11	0.15	0.06	0.08
	SA	0.34	0.34	0.17	0.17
	TAS	0.43	0.46	0.22	0.23
	WA&NT	-0.05	-0.10	-0.02	-0.05
Employment (person)	NSW&ACT	0.01	0.00	0.00	0.00
	VIC	0.00	-0.01	0.00	-0.01
	QLD	0.01	0.02	0.00	0.01
	SA	0.01	0.01	0.01	0.01
	TAS	0.07	0.15	0.04	0.07
	WA&NT	0.01	-0.02	0.00	-0.01
Capital	NSW&ACT	0.00	0.02	0.00	0.01
	VIC	0.00	0.02	0.00	0.01
	QLD	0.00	0.04	0.00	0.02
	SA	0.00	0.02	0.00	0.01
	TAS	0.00	0.08	0.00	0.04
	WA&NT	0.00	-0.01	0.00	0.00
Working population	NSW&ACT	0.00	0.00	0.00	0.00
	VIC	0.00	-0.01	0.00	-0.01
	QLD	0.00	0.02	0.00	0.01
	SA	0.00	0.01	0.00	0.01
	TAS	0.00	0.14	0.00	0.07
	WA&NT	0.00	-0.03	0.00	-0.01
		Percentage point deviation from baseline		*Percentage point deviation from baseline*	
Unemployment rate	NSW&ACT	-0.01	0.00	0.00	0.00
	VIC	0.00	0.00	0.00	0.00
	QLD	-0.01	0.00	-0.01	0.00
	SA	-0.02	0.00	-0.01	0.00
	TAS	-0.07	0.00	-0.04	0.00
	WA&NT	-0.01	0.00	0.00	0.00

5.5 Government Budget Impacts

Table 18 reports the net budget position by level of government in Scenario 2. More detailed federal and state taxation outcomes are reported in the accompanying spreadsheet; see "Summary_S2A" and "Summary_S2B".

Like Scenario 1, GST, personal income tax and corporate income tax revenues all rise relative to baseline, reflecting overall stronger economic activity and incomes. GST revenue rises gradually over time, from $0.5 million in 2026 to $22.9 million by 2040. The rise in GST is however accompanied by a rise in GST distributions from the federal government to the states, and thus has no net impact on the federal budget position relative to baseline.

Personal income tax receipts rise by $6.8 million in 2026 and $137.9 million by 2040. Corporate income tax rises by $110.9 million in 2026 and remains $75.4 million above baseline by 2040.

By contrast, excises and levies fall by $25.8 million in 2026 and remain below baseline throughout the simulation horizon. This reflects reduced fuel use associated with improved Road Freight productivity and lower commercial vehicle input requirements per unit of freight output at the national level.

Overall, the net budget position improves at both the federal and aggregate state/local government levels in the shock year. As discussed in Section 4.5, this represents a fiscal improvement that is returned to households through direct transfers, providing a small positive income effect that contributes to the positive household consumption deviation, reinforcing the direct effect of the Road Freight MFP improvement.

TAS experiences strong population inflow that raises public expenditure obligations, offsetting a larger part of revenue gains from the productivity improvement over time. By 2040, this effect dominates the revenue gains at the state/local government level, leading to a shortfall in state government budgets for TAS. WA&NT also records a modest improvement in its fiscal position, despite not being part of the NAAS states where the Road Freight MFP shock is applied in Scenario 2. This indicates that WA&NT still benefits fiscally from the broader national expansion.

Table 18. Net Budget Position by Level of Government (Scenario 2)

Net budget position	Scenario 2A		Scenario 2B	
	2026	2040	2026	2040
	Ordinary deviation from baseline (nominal, A$m)		*Ordinary deviation from baseline (nominal, A$m)*	
Federal government	**185.17**	**189.38**	**92.56**	**94.85**
State/local governments (total)	**136.77**	**181.99**	**68.37**	**91.02**
of which:				
NSWACT	*38.03*	*59.71*	*19.01*	*29.83*
VIC	*36.11*	*58.55*	*18.04*	*29.23*
QLD	*45.13*	*48.50*	*22.57*	*24.37*
SA	*14.78*	*18.79*	*7.39*	*9.36*
TAS	*2.21*	*-4.68*	*1.10*	*-2.34*
WANT	*0.51*	*1.11*	*0.26*	*0.57*
Total *All levels of government*	**321.94**	**371.37**	**160.93**	**185.87**

6. Conclusion

This report uses VURMTAX to assess the economy-wide effects of two heavy vehicle reforms in Australia: increasing heavy vehicle road access (Scenario 1) and establishing a National Automated Access System (Scenario 2). The modelling incorporates database development work that improves the representation of commercial vehicle use in the economy, with shocks informed by BITRE (forthcoming) and discussions with the Productivity Commission.

The results suggest that both reforms generate positive national economic effects overall. In Scenario 1, the national Road Freight MFP shock, together with higher public road-wear expenditure, raises GDP, household consumption, investment and exports. Scenario 2 also raises national activity, although the economic gains are concentrated in the NAAS states where the productivity shock is applied.

Across both scenarios, the main beneficiaries are Road Freight and road-freight-using industries, including agriculture, manufacturing, wholesale trade and retail trade. Some sectors contract, including Railway Freight, which directly competes with Road Freight, and Heavy Vehicle, where higher Road Freight productivity reduces vehicle input requirements per unit of freight output.

The regional results show that gains are unevenly distributed across states. Tasmania records the strongest gains, reflecting its relatively high Road Freight margin intensity and the interstate migration response to its higher relative wages in both scenarios.

Overall, the modelling indicates that heavy vehicle reform can improve economy-wide performance, but the size and distribution of gains depend on reform design, regional coverage, regional and sectoral structures and associated infrastructure costs.

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Appendix: Accessible descriptions of figures

The descriptions in this appendix support accessibility. They present the key information shown in each figure in text form.

Figure 5. ANZSIC Industry Output (Scenario 1A)

Figure 1 is a grouped bar chart showing percentage deviations from baseline in output for broad industry groups aligned closely with ANZSIC level 1 in 2026 and 2040 under Scenario 1A. The vertical axis shows percentage deviations from baseline. The horizontal axis lists industry groups in descending order of their 2026 percentage deviation from baseline. Each industry group has one bar for 2026 and one bar for 2040.

Overall, most industry groups record output above baseline in both years. Construction records the largest increase, followed by Agriculture, Forestry and Fishing, and Manufacturing. Other Services records the largest decline in both years. Mining shows a relatively small increase in 2026 but a larger increase by 2040.

More specifically, the strongest output gains occur in Construction, up 0.25 per cent in 2026 and 0.26 per cent in 2040; Agriculture, Forestry and Fishing, up 0.20 and 0.21 per cent; and Manufacturing, up 0.11 and 0.14 per cent. Wholesale Trade and Retail Trade also expand, by 0.07 and 0.06 per cent respectively in 2026, increasing to 0.08 and 0.07 per cent by 2040. Gas, Electricity and Water rises from 0.04 per cent to 0.07 per cent.

Several industries record smaller positive deviations. Accommodation and Food rises by 0.04 per cent in 2026, easing to 0.02 per cent in 2040. Rental and Hiring Services increases from 0.03 per cent to 0.04 per cent, while Arts and Recreation increases by 0.03 per cent in 2026 and 0.02 per cent in 2040. Professional Services rises by about 0.03 per cent in both years, and Transport increases from 0.03 per cent to 0.04 per cent. Mining shows the largest longer-run increase among these industries, rising from 0.02 per cent in 2026 to 0.09 per cent in 2040. Administrative Services, Finance and Insurance, Communications, and Health Services all record small positive deviations, generally between zero and 0.02 per cent.

At the lower end, Education rises by 0.02 per cent in 2026 but falls slightly below baseline in 2040. Dwelling Services is unchanged in 2026 and rises by less than 0.01 per cent in 2040. Public Administration and Defence is slightly below baseline in both years. Other Services records the only material decline, falling by about 0.08 per cent in both 2026 and 2040.

Figure 2. ANZSIC Industry Output (Scenario 1B)

Figure 2 shows the same industry groups, in the same order, for 2026 and 2040 as Figure 1. It is effectively a lower-magnitude version of Figure 1: the pattern of industry gains and losses is broadly unchanged, but the deviations are generally around one-third as large.

Construction again records the largest increase, rising by 0.08 per cent in 2026 and 0.09 per cent in 2040. Agriculture, Forestry and Fishing follows, rising by 0.06 per cent in 2026 and

0.07 per cent in 2040, while Manufacturing rises by about 0.04 per cent in both years. Wholesale Trade, Retail Trade, and Gas, Electricity and Water also record small positive deviations. Mining again shows a stronger longer-run response, increasing from about 0.01 per cent in 2026 to 0.03 per cent in 2040. Most remaining industries are close to baseline or record only very small positive changes. Other Services remains the main declining industry, falling by 0.03 per cent in 2026 and 0.02 per cent in 2040.

Figure 3. ANZSIC Industry Output (Scenario 2A)

Figure 3 is a grouped bar chart showing percentage deviations from baseline in output for broad industry group aligned with ANZSIC level 1 in 2026 and 2040 under Scenario 2A. The vertical axis shows percentage deviations from baseline. The horizontal axis lists industry groups in descending order of their 2026 percentage deviation from baseline. Each industry group has one bar for 2026 and one bar for 2040. The format is the same as Figures 1 and 2 but the industry ordering in the horizontal axis differs.

Specifically, Agriculture, Forestry and Fishing records the largest increase, at about 0.11 per cent in both years. Manufacturing rises from 0.08 per cent in 2026 to 0.09 per cent in 2040. Retail Trade and Wholesale Trade also expand, from 0.05 and 0.04 per cent in 2026 to 0.06 per cent by 2040. Accommodation and Food rises by about 0.04 per cent in both years.

Arts and Recreation, Construction, Education, Gas, Electricity and Water, Health Services, and Finance and Insurance record smaller positive deviations. Communications, Administrative Services, Transport, Rental and Hiring Services, Professional Services, Mining and Dwelling Services are close to baseline in 2026, with small positive movements by 2040. Public Administration and Defence is slightly below baseline in both years. Other Services records the largest decline, falling by 0.05 per cent in 2026 and 0.04 per cent in 2040.

Figure 4. ANZSIC Industry Output (Scenario 2B)

Figure 4 shows the same industry groups, in the same order, for 2026 and 2040 as Figure 3. It is effectively a lower-magnitude version of Figure 3: the pattern of industry gains and losses is broadly unchanged, but the deviations are generally half as large.

Agriculture, Forestry and Fishing again records the largest increase, rising by about 0.05 per cent in both years. Manufacturing follows, rising from 0.04 per cent in 2026 to 0.05 per cent in 2040. Retail Trade and Wholesale Trade increase from about 0.02 per cent in 2026 to 0.03 per cent in 2040, while Accommodation and Food rises by about 0.02 per cent in both years.

Arts and Recreation, Construction, Education, Gas, Electricity and Water, Health Services, and Finance and Insurance record smaller positive deviations. Communications, Administrative Services, Transport, Rental and Hiring Services, Professional Services, Mining and Dwelling Services remain close to baseline, with generally small positive movements by 2040.

Public Administration and Defence is slightly below baseline in both years. Other Services again records the largest decline, falling by about 0.03 per cent in 2026 and 0.02 per cent in 2040.