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Procurement Reform Report:

Recommendations & Strategies

September 2020

THE LEADER • THE COLLABORATOR • THE FACILITATOR • THE CHAMPION

Procurement Reform Report: Recommendations & Strategies
September 2020
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EXECUTIVE SUMMARY

There are significant opportunities for improvement with the procurement process, particularly given Australia's recent infrastructure boom. These must be addressed if governments are to get best value for money and industry is to get the best use of its capital and people.

It will require action by both industry and government. Indeed, one of the issues to emerge has been too little collaboration between industry and government, especially in the early stages of the procurement process.

The boom has uncovered weaknesses in the design and construct model that predominates the industry and the Report suggests alternatives that will improve outcomes for government, industry and the community more broadly.

The overarching recommendation in this Report is for Roads Australia (RA) to establish a collaborative partnership with the Victorian and Federal Government to pursue the other 20 recommendations set out in this Report.

Implementing those recommendations will help drive major change to procurement processes. It will improve planning and design of projects; more appropriately allocate and manage risk; give a more fulfilling role to medium and smaller contractors; and improve skills and capacity building.

The recommendations (and corresponding strategies) are split into seven groups, the first group being **Ownership and Accountability**, which focuses on a close Industry and Government collaboration as described above. The other six groups are summarised below.

Pipeline recommendations seek to improve the way government prioritises and publicises future infrastructure projects. It also encourages early engagement with industry.

Planning and Design recommendations focus on devoting additional time to planning and design. As above, it proposes early engagement with industry, as well as the separation of the design and construction stages, when appropriate.

Legal and Risk recommendations seek to better assign risk and streamline contracting processes for the benefit of both government and industry. Once again, it proposes early engagement with industry to help get ahead of project risks. It also advocates that risks should be allocated to the party best able to manage and mitigate those risks.

Capacity and Capability recommendations seek to broaden the range of firms which can participate in procurement, and improving overseas and interstate migration for people seeking positions in the industry. It recommends working closely with external training and education providers to better match their offerings with industry needs.

Governance recommendations seek improvements in quality control and to look at alternative governance models. It calls for a reassessment of the role of the Independent Review within the project assurance process, and establishing special purpose companies to oversee mega-projects.

Culture and Inclusion recommendations aim to ensure industry seeks to attract a wider pool of prospective talent. This includes supporting the Construction Industry Culture Taskforce (CICT) with the implementation of their Culture Standard, as well as developing a culture and inclusion performance framework.

These proposed strategies and recommendations are summarised in a table on the following page, split between each major issue area. However, a number of these are interrelated, and it will be the role of the collaborative group of stakeholders to prioritise and coordinate implementation.

RA acknowledges the support of many government agencies in the development of this Report. While this report will be presented initially to the Victorian Government, the development process has involved senior RA members from across Australia, and consequently the findings will have national relevance and application.

RA also recognises the work of the Construction Industry Leadership Forum, the joint forum of leaders from industry and the NSW and Victorian public sector and does not seek to replicate or replace that work.

SUMMARY: STRATEGIES AND RECOMMENDATIONS

The following table sets out the proposed strategies and corresponding recommendations to address the major procurement issues. Whilst it provides a quick snapshot of the proposals, they should not be read in isolation to the rest of the Report.

OWNERSHIP & ACCOUNTABILITY	
STRATEGY	RECOMMENDATIONS
1. Establish processes for a close and ongoing collaboration between Industry and Government	**Recommendation 1** RA establish a collaborative partnership with the Victorian and Federal Government to pursue the recommendations set out in this Report.

PIPELINE	
STRATEGY	RECOMMENDATIONS
1. Develop protocols for early industry engagement to help identify future infrastructure projects	**Recommendation 2** The Victorian Government (i) develop protocols and rules of engagement for early strategic involvement in infrastructure project development; and (ii) prepare a schedule for regular pipeline information and industry strategic engagement sessions for approval by the relevant Minister.
2. Develop a system that: (a) matches project packages with industry capability and risk profiles; and (b) encourages industry partnerships	**Recommendation 3** The Victorian Government: (i) develop a system for categorising capacity and risk profiles that can be applied to all infrastructure companies; (ii) develop a framework that promotes industry collaboration across all sizes of infrastructure projects; and (iii) establish a voluntary charter and register for companies who self-assess against the system and commit to the framework.
3. Seek commitment to a long-term pipeline of projects that should only be varied when infrastructure demands change	**Recommendation 4** The Victorian Government develop criteria upon which any significant changes to existing pipelines are made.

PLANNING & DESIGN	
STRATEGY	RECOMMENDATIONS
1. Devote additional time to the design phase to help foster innovation and improve project outcomes	**Recommendation 5** The Victorian Government investigate alternative engagement models which foster innovation and improve design outcomes.
2. Commit to improved collaboration and early engagement with industry	**Recommendation 6** The Victorian Government develop criteria for when it is appropriate to adopt Early Contractor Involvement (ECI), to improve innovation and design outcomes.
3. Where appropriate, split Design and Construct phases into separate tender processes	**Recommendation 7** The Victorian Government develop criteria for when it is appropriate to split traditional Design and Construct (D&C) projects into two tender phases.

LEGAL & RISK	
STRATEGY	RECOMMENDATIONS
1. Develop a national approach to procurement and contracting, including nationally consistent standard contracts	**Recommendation 8** The Transport and Infrastructure Council (TIC)[1] equivalent and other stakeholders (i) identify best practice approaches to procurement and contract standardisation for major government-funded infrastructure projects; and (ii) develop a framework to identify the optimal approach to adopt for each type of project.
2. Commit to early engagement of contractors to collaboratively assess risks and identify appropriate delivery models	**Recommendation 9** The Victorian Government to adopt procurement approaches that provide for early industry engagement and collaboration in project development, risk identification and delivery.
3. Review and improve client communications and transparency in project tendering	**Recommendation 10** The TIC equivalent develop a set of best practice principles for project tendering for endorsement by peak industry bodies and state and territory governments.
4. Develop a Government and Industry Risk Charter	**Recommendation 11** The TIC equivalent develop a Risk Charter that can promote a collaborative approach to project risk identification and management.

CAPACITY & CAPABILITY	
STRATEGY	RECOMMENDATIONS
1. Engage directly with small- and mid-tier firms during the tendering process	**Recommendation 12** The Victorian Government propose a series of engagement initiatives and guidelines to help small- and medium-sized firms participate directly in the tender process.
2. Ensure training and education programs provide appropriately skilled and qualified people to meet industry needs	**Recommendation 13** RA, in collaboration with other relevant infrastructure industry associations, engage with TAFE and other training and education providers to identify areas where their offerings can be changed or enhanced to better match industry requirements.
3. Remove barriers to international and interstate skills migration	**Recommendation 14** **Part A:** The National Cabinet: (i) consider proposing the removal of requirements for local content experience from tender processes; and (ii) accelerate work on the harmonisation of state and territory trade qualification recognition. **Part B:** RA, in collaboration with other relevant infrastructure industry associations, work with the Federal Government to ensure that when its skills migration program is regularly updated that it meets industry needs.
4. Expand industry recruitment opportunities	**Recommendation 15** RA form an industry working group to develop an approach for the coordinated promotion of the industry.
5. Invest in engineering and design skills (on the client side)	**Recommendation 16** The TIC equivalent work with state and territory government agencies, and other industry stakeholders, to participate in reviews of collaborative project implementation for a number of recently completed projects to help identify skills gaps.

1 On 29 May 2020, the Prime Minister announced the Council of Australian Governments (COAG) would cease and a new National Federation Reform Council (NFRC) be established in its place, with the National Cabinet at its centre. On 12 June 2020, National Cabinet announced six initial priority areas of reform, and the formation of six National Cabinet Reform Committees – one of which is Infrastructure and Transport. On 26 June 2020, National Cabinet announced a review of the former COAG Councils and Ministerial Forums with a view to rationalise and reset their work. Further information available **here**

GOVERNANCE	
STRATEGY	RECOMMENDATIONS
1. Reassess the role of Independent Review within project assurance processes	**Recommendation 17** The TIC equivalent reassess the role of Independent Reviewers, and if appropriate, work with industry and government stakeholders to develop alternative, more effective project quality control and assurance processes.
2. Investigate an incorporated model as an alternate governance model for major projects	**Recommendation 18** The TIC equivalent engage with senior State Government representatives to discuss alternate governance models (including the SPV concept), and if receptive, work with an independent corporate governance specialist to develop proposals that would help drive major improvements in governance for mega-projects.

CULTURE & INCLUSION	
STRATEGY	RECOMMENDATIONS
1. Support the Construction Industry Culture Taskforce (CICT) to develop its Culture Standard	**Recommendation 19** RA, in collaboration with other relevant infrastructure industry associations, work with CICT to further develop and refine its Culture Standard, and once developed, work with Government and industry to promote its adoption.
2. Develop a culture and inclusion performance framework	**Recommendation 20** RA, in collaboration with other relevant infrastructure industry associations, work with CICT and other stakeholders, to propose a framework to measure and enforce culture and inclusion performance, which can be embedded in the procurement process.
3. Invest in training and coaching to develop a more diverse workforce and better leaders	**Recommendation 21** **Part A:** RA, in collaboration with other relevant infrastructure industry associations, work with government agencies to oversee the creation of an industry-wide training and development program, targeted at improving leadership and culture. **Part B:** RA, in collaboration with other relevant infrastructure industry associations: (i) develop and provide employment information and strategies that encourage people of diverse backgrounds to seek employment in the industry and for industry to employ them; and (ii) point out to industry the advantages of a more diverse workforce.

BACKGROUND

Key Issues

The recent infrastructure boom in the number and size of transport projects has revealed major issues in the way projects are delivered. These must be remedied if Australians are to get best value for money and best project outcomes.

The main issues are:

- The process for risk definition and allocation, particularly on large projects;
- The size and complexity of projects has increased significantly and results in small to medium contractors unable to participate;
- Governments do not lay out a long-term pipeline of work so that companies can gear up;
- The time available during procurement is often not long enough to allow for sufficient risk assessment;
- The time available during the design phase for most big projects is often not adequate for design firms to innovate or explore better engineering solutions;
- Current procurement models which apply 'hard edged' risk transfer can often result in significant and complex legal disputes which ultimately create a lose-lose scenario;
- Governments do not engage with industry early enough in the design stage; and
- State and territory education systems and the Federal immigration model are not coping with the increased demand for skilled labour and industry does not do enough to encourage women and people from diverse backgrounds into the industry.

The Victorian Invitation

In May 2019, Victorian Premier Daniel Andrews met with RA and some CEOs from its membership. They expressed concerns about the delivery of major transport infrastructure projects in his state. The Premier encouraged RA to bring solutions for consideration. He acknowledged RA's unique membership across national industry and government organisations.

RA hosted an industry and government roundtable on 8 November 2019[2] on *'Financial Sustainability in Construction'*, with the Victorian Major Transport Infrastructure Authority (MTIA) and the Department of Treasury and Finance Victoria (DTF).

RA subsequently convened a major workshop in Melbourne on Thursday 5 March 2020[3] to discuss issues around five key themes:

- Issue 1: Work Pipeline
- Issue 2: Risk, Commercial & Contractual
- Issue 3: Capability & Capacity
- Issue 4: Design Process
- Issue 5: Culture & Inclusion

This Report is the result of that roundtable, workshop and subsequent industry and government consultation.

Roads Australia

RA is the peak body for roads within an integrated transport system, representing an industry that contributes $207 billion annually to the economy and supports 1.3 million jobs.[4] RA brings industry, government and communities together to lead the evolution of Australia's roads, integrated transport and mobility.[5]

RA members who have contributed to this Report represent a wide spectrum of national and regional players, across engineering and design consulting firms, project managers, legal and commercial advisors, government agencies, and construction and related services companies.

2 The outcomes from the 8 November 2019 MTIA DTF roundtable is included in the annexes.

3 The list of participants at the 05 March 2020 workshop is included in the annexes.

4 Refer to BIS Oxford Economics Report, *The Economic Impact of Australia's Roads, September 2019*, available **here**.

5 Refer to **RA Overview** for further details about RA and a list of current members.

THE REPORT

The solutions are presented as recommendations and proposed strategies, and are split into seven broad areas:

1. **Ownership and Accountability.**
2. **Pipeline Visibility.**
3. **Planning and Design.**
4. **Legal and Risk Framework.**
5. **Capacity and Capability.**
6. **Governance.**
7. **Culture and Inclusion.**

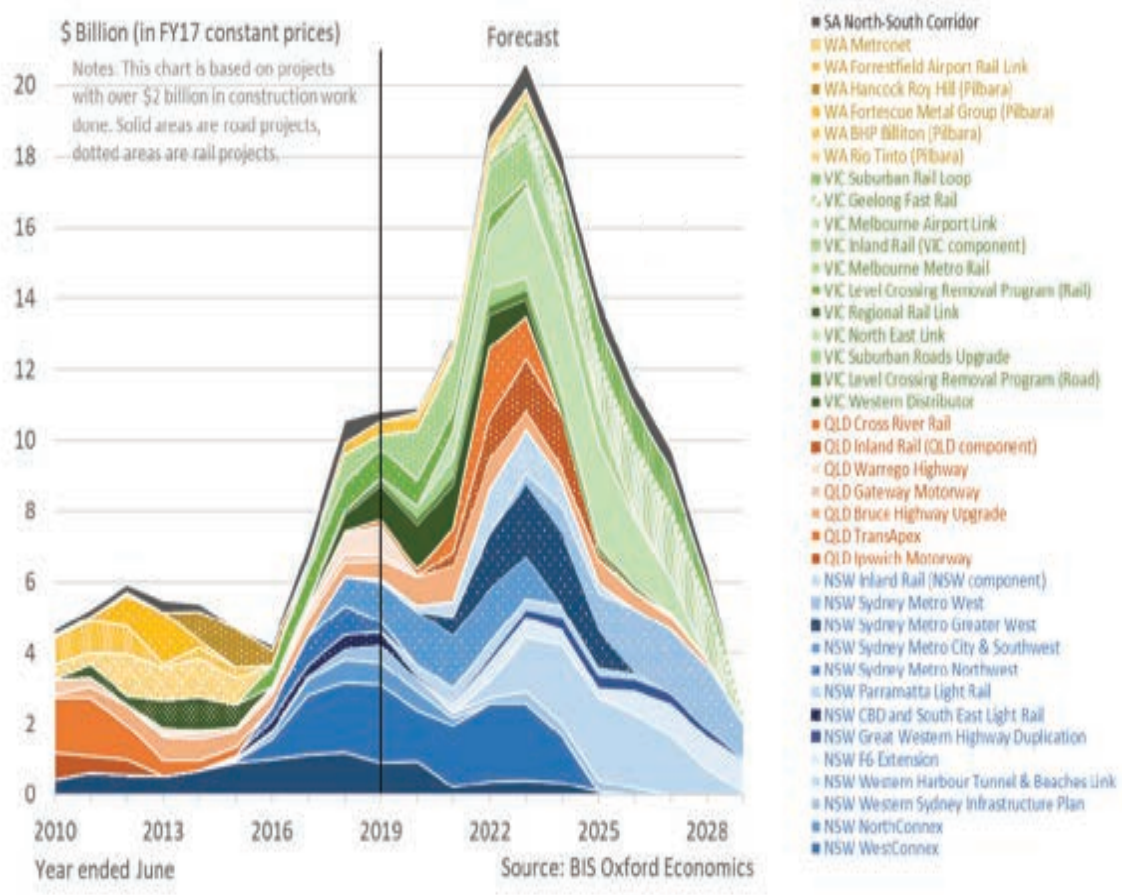
The Report concludes with suggested next steps.

The Current Position: Unprecedented Growth with Serious Issues

All levels of government are delivering or planning more transport projects than ever before. Infrastructure design and construction companies are often bidding for projects that stretches their capability. Some in the industry call it "a profitless boom".

The following graph, courtesy of BIS Oxford Economics, shows national transport infrastructure projects above $2 billion:[6]

Figure: 01 **Major Transport Projects Above $2bn**



6 Refer to BIS Oxford Economics Report, *Construction Industry Leadership Forum – Overseas Skilled Recruitment, July 2019*, available upon request.

Spending in major jurisdictions is projected to exceed $10 billion a year over the next decade. Infrastructure Australia's Australian Infrastructure Audit 2019 predicts that the national infrastructure pipeline will be at record levels for the next 15 years and possibly beyond. As such, visibility of project pipelines is critical to industry being able to plan and build capacity.

In recent years the emergence of "mega-projects" has resulted in:

- tier one contractors assuming risks that are often unknown and unquantifiable;[7]
- many small- and mid-tier companies having spare capacity and not winning their 'fair share' of projects; and
- design firms having inadequate access to information and exposure to unknown and unquantifiable risks.

Contract alignment between states and projects is also a key challenge. For example, project bidding in NSW is complicated by more than 100 versions of the standard General Conditions of Contract (GC21), making each project contract practically bespoke.

Governments expect best value for their community, however, the number of contractors (large and small) who have not survived in Australia, in an environment of strong infrastructure pipeline growth, shows something is wrong.

Projects have become so large and complex that a lack of information, or a small error or oversight in the tender or delivery phase, can destroy the commercial viability of a project and the company. Industry and government are harmed by the resulting litigation.

In the context of major projects in Victoria, it appears that traditional procurement models appear to work reasonably well for projects up to $1 billion in value. However, beyond this level, a re-think is required as such mega-projects stretch the capacity and capability of all parties.

Australia should have a period of unprecedented opportunity for new graduates and trainees. But, significant gaps in skills availability and development hold us back. Industry also faces historic cultural barriers and lack of workforce diversity, in particular the low engagement of women.

Mental health is also a serious concern, with the pressure to win, manage and take risks on projects seen as one of the major causes.[8]

Change is needed, particularly through collaboration between industry and government. Without it, the long-term sustainability of the industry and the ability for governments to have their projects delivered on time and on budget is at risk.

7 The general benchmark is that Tier 1 firms take on projects over $250m; Tier 2 between $50m and $250m and Tier 3 below $50m.

8 The report, *Measuring the psychological impact of work related stress and related occupational factors in the Australian infrastructure construction industry, 2018*, sets out some of these challenges and is available **here**.

Green Shoots to Build Upon

The Australian transport infrastructure industry has delivered many great projects that often go without fanfare. The green shoots of change are there, but we can do better.

The Construction Industry Leadership Forum (CILF), a joint forum of leaders from industry and the NSW and VIC public sector, focusses on mega projects and client-industry working relationships.[9] There has been solid progress, initially on formal arrangements in NSW and Victoria. Some excellent practice notes have been prepared, and many of the recommendations and strategies proposed in this Report build upon those, such as the section covering interface risks.[10]

A number of Victorian projects are examples of successful models. A single rail-crossing authority coordinated 75 individual projects delivered by a wide range of industry participants.

The North East Link[11] was a collaborative engagement of industry, government and community over three years. It separated critical early works from the major construction phase. A Public Private Partnership (PPP) was applied to the delivery phase. This collaborative approach, combined with development of transparent client-provider risk sharing agreements, is strongly supported by industry.

The *NSW Government Action Plan – a 10-point commitment to the construction sector* (known as the "10-Point Plan")[12] has been well received but is yet to be fully implemented. However, every project Cabinet paper must include a summary of the alignment with the 10-Point Plan objectives.

In the NSW Sydney Metro project,[13] working with industry has been a hallmark of the project since 2011. The consultation has helped define and refine the projects. Further engagement with industry in 2020 to further refine delivery and design strategies will provide an opportunity for collaborative risk management.

Bid fees are now gaining acceptance. They will help companies assess and understand project delivery risks.

Victoria's Bid Cost Reimbursement policy sets out the criteria for when reimbursement of part of the bid cost may be considered on Public Private Partnerships, Alliances, and High Value High Risk Projects as identified by Victoria's High Value High Risk Projects framework.[14]

But a lot more must be done.

9 Further information on the Construction Industry Leadership Forum (CILF) is available **here**.

10 The Practice Notes developed through CILF are available **here**.

11 An overview of the North East Link project is available **here**.

12 The NSW 10-Point Action Plan is available **here**.

13 An overview of the Sydney Metro project is available **here**.

14 The Victoria's Bid Cost Reimbursement policy is available **here**.

RECOMMENDATIONS AND STRATEGIES

KEY ISSUE AREA 1:
OWNERSHIP & ACCOUNTABILITY

PROPOSED STRATEGIES AND RECOMMENDATIONS

Industry and Government must collaborate to bring about change

RA should establish a collaborative partnership with the Victorian and Federal Government to pursue the recommendations set out in this Report.

1. Establish processes for a close and ongoing collaboration between Industry and Government

The Victorian Government has been a supporter of greater industry and government collaboration. As such, RA recommends that a collaborative partnership be established between Industry, and the Victorian and Federal Government.[15]

The proposed collaborative partnership would be responsible for the further analysis and implementation of the recommendations set out in this Report. The collaborative approach would ensure all key stakeholders took ownership of their relevant areas, and played their part in leading lasting changes to procurement processes.

Ensure Collaboration with CILF

RA will also need to work closely with the Construction Industry Leadership Forum (CILF),[16] and any other bodies, on the implementation of the recommendations and strategies included in the Report.

This may include helping to embed the appropriate principals already proposed by CILF, or using CILF to help develop any of this Report's recommendations and strategies.

Principles already proposed by CILF in the procurement processes[17] should be considered by the collaborative partnership of implementing stakeholders.

Recommendation 1

RA establish a collaborative partnership with the Victorian and Federal Government to pursue the recommendations set out in this Report.

15 It is acknowledged that such a concept has some similarities with the NSW Government **Construction Leadership Group**, which has been tasked with implementation of the ***NSW Government Action Plan: a ten point commitment to the construction sector*** and works with the Construction Industry Leadership Forum (CILF) to implement the plan in collaboration with industry.

16 For a detailed list of the existing principles proposed by CILF, **click here**.

17 For a detailed list of the existing principles proposed by CILF, **click here**.

KEY ISSUE AREA 2: PIPELINE VISIBILITY

CURRENT CHALLENGE

Visibility of the Infrastructure Pipeline

The 2019 Infrastructure Priority List, released by Infrastructure Australia, identifies a record $58bn project pipeline, so clear visibility of this pipeline will be critical.[18]

Improved pipeline visibility is essential for industry to plan for capacity, particularly for mid-tier contractors who have the capacity to take on more work, but are often locked out given the size of most new projects.

Industry welcomes the development in many jurisdictions of long-term ten and twenty-year infrastructure strategic plans. However, key projects are often not sufficiently scoped or funded, as they are outside the forward estimates period and are subject to political cycles. Therefore, governments should be regularly engaging with industry on these long-term plans to collaboratively 'test' the value of projects and to determine optimum design and delivery.

Pipeline visibility and industry engagement is essential to give industry the time to innovate in the procurement process to maximise efficiency and to deliver value for money. Detailed project scoping and delivery timelines, ideally out to two and three years ahead, would greatly improve the capacity of industry to deliver.

As a 'good practice' illustration, the *Queensland Transport and Roads Investment Program* (QTRIP)[19] lists every project, together with the proposed delivery model, project size, timeline, project-manager contact details, and the design stream for projects. For example, regional directors regularly present to industry in their regions on project opportunities and progress.

In Victoria, as a good first step, all agencies have been engaging with industry over the past few months on the detail they want to see in the pipeline information.

The Victorian Treasurer has committed to an interactive, on-line resource that will include procurement models and project timings, together with regular agency engagement sessions with industry.

More balance in the infrastructure pipeline

A balanced pipeline is key to long-term industry sustainability. However, mega-projects are now dominating.

Governments in Victoria and NSW have moved towards a mega-projects approach and have changed their agency structures accordingly. In some cases, this approach has taken the focus off smaller projects.

The dominance of larger-scale projects has locked out many small and mid-tier companies from direct participation because the complexity and risks involved are beyond their capability to manage. In Victoria, as a result of restructuring, it is perceived as difficult to get information about smaller (especially regional) projects (e.g. up to $50m).

Where possible, larger projects should be split up, or divided into smaller stages, to allow mid-tier firms to bid. There are good examples to follow. In Victoria, the Level Crossing Removal Project packaged works at a scale that provided opportunities for mid-tier firms.[20]

Better long-term certainty about project selection and timing would be welcome

Industry would greatly benefit from improved long-term certainly around project selection and timing. Furthermore, Industry encourages government to select projects on their overall value to an integrated national transport network.

18 The Infrastructure Priority List released by Infrastructure Australia is available is available **here**.

19 The Queensland Transport and Roads Investment Program is available **here**.

20 Further details regarding the Level Crossing Removal Project is available **here**.

PROPOSED RECOMMENDATIONS & STRATEGIES

Industry is seeking a reliable pipeline that supports better business planning and strategic investment decisions that allows industry to better respond to governments' needs.

1. Develop protocols for early industry engagement to help identify future infrastructure projects

Governments should hold regular pipeline information and industry engagement sessions. These would discuss key projects in greater detail in a pre-competitive, collaborative way to shape projects and to apply fit-for-purpose procurement.[21]

Governments should also review planning. Industry should be engaged early in shaping of projects, particularly before they go to the design phase and even before they make it into the pipeline. However, Industry recognise that there are risks for government in discussing projects before they have the full picture.

Pipeline sessions in an atmosphere of trust and partnership will reap benefits to all parties. Conversely, holding back because projects are not fully realised or funded will exclude the use of a significant body of industry experience that would result in a better long-term outcome.

Recommendation 2

The Victorian Government: (i) develop protocols and rules of engagement for early strategic involvement in infrastructure project development; and (ii) prepare a schedule for regular pipeline information and industry strategic engagement sessions for approval by the relevant Minister.

2. Develop a system that: (a) matches project packages with industry capability and risk profiles; and (b) encourages industry partnerships

Infrastructure companies should be transparent in defining their capacity and ability to take on balance-sheet risk. This would provide governments with the information to match project packaging with industry capability and risk profiles.

Industry would have to set aside natural competitiveness, as far as competition law allows. It is in industry's long-term interest to help find a sustainable future for all participants. More openness would create opportunities for partnering. Top-tier companies could take on smaller projects in collaboration with mid-tier companies. This would improve the skill bases of mid-tier companies and trigger future collaboration, including risk-sharing, on larger projects.

Governments would have to reassess contract pre-qualification rules and processes. Mid-tier companies should not be locked out if they can show how alliance or partnering arrangements can overcome pre-qualification shortcomings.

Recommendation 3

The Victorian Government: (i) develop a system for categorising capacity and risk profiles that can be applied to all infrastructure companies; (ii) develop a framework that promotes industry collaboration across all sizes of infrastructure projects; and (iii) establish a voluntary charter and register for companies who self-assess against the system and commit to the framework.

21 It has been noted by many industry stakeholders, that such sessions used to take place with NSW Roads and Maritime Services (RMS) and VicRoads, however with the recent restructuring, these no longer occur.

3. Seek commitment to a long-term pipeline of projects that should only be varied when infrastructure demands change

The advantages of early industry engagement in infrastructure project development and the development of a pipeline could be jeopardised if governments re-prioritise projects in the pipeline. Industry planning for capacity could be disrupted unnecessarily if the expected pipeline is altered for reasons other than changing infrastructure requirements.

Recommendation 4

The Victorian Government develop criteria upon which any significant changes to existing pipelines are made.

KEY ISSUE AREA 3: PLANNING & DESIGN

CURRENT CHALLENGES

More time for design and planning and more industry-government collaboration, will improve outcomes for all

The level of detailed design required in the short time available at the tender stage of most projects, hinders industry's ability to innovate and provide optimum solutions.

The vast majority of costs are incurred during construction. So, allowing more time to design and plan makes sense. It would result in more accurate contract pricing, reduce working capital requirements, and reduce balance-sheet risks.

More time in the design phase would enable consideration of a wider range of engineering solutions and stimulate innovation. It would also result in better identification of risk. The high level of detailed design required in most Request for Tenders (RFTs) removes opportunities for innovation. In contrast, engineering firms who are given access to projects early in the scoping phase can better identify design and delivery options.

Furthermore, there are too many stages for design approval and too many parties involved. This results in many costly, time-consuming, and often minor iterations.

PROPOSED RECOMMENDATIONS & STRATEGIES

1. Devote additional time to the design phase to help foster innovation and improve project outcomes

Governments should allow more time and devote more money to the early project design and tender phase. They should give extra weight to criteria that promote innovation. This would increase industry engagement and stimulate greater innovation, resulting in better quality and engineering outcomes. It would also result in more appropriate project KPIs.

Industry believes that giving project bidders more time and latitude in the tender process to come up with the best engineering solutions will achieve improved project outcomes. The typical approach of restricting bidders to tender on a reference design reduces the time available to innovate and often results in a sub-optimal project outcome or costly reworking and variations during construction to achieve the best solution.

Recommendation 5

The Victorian Government investigate alternative engagement models which foster innovation and improve design outcomes.

2. Commit to improved collaboration and early engagement with industry

It is time to embrace the Early Contractor Involvement (ECI) approach. It would shift design and engineering resources to the front of the process, in a collaborative effort with clients, to improve project design and final engineering outcomes.[22]

ECI has had significant success in meeting complex project challenges. ECI can promote partnerships between top- and mid-tier firms, employ local skills, improve risk management, and increase innovation.

Although ECI and associated alliance contracts are not appropriate for all projects, neither is the dominant Design and Construct (D&C) approach. Governments and industry should work together to share experiences and knowledge towards selection of fit-for-purpose procurement approaches for major projects.

Collaborative efforts to test, rationalise and modify the design, will help identify otherwise unforeseen risks and refine construction cost estimates, particularly for the very complex mega projects. This information will also help Treasury officials to decide to continue the project without further tendering, or with an option to use a limited or two-stage tender process. This is likely to lead to improved efficiency during construction.

Projects such as WestConnex[23] and Inland Rail[24], which have embraced ECI have resulted in higher quality design, improved clarity by all parties on project requirements, and increased confidence in successful outcomes.

Recommendation 6

The Victorian Government develop criteria for when it is appropriate to adopt Early Contractor Involvement (ECI), to improve innovation and design outcomes.

22 The CILF had already prepared some robust practice notes on this topic, *Collaborative procurement: Early contractor involvement,* available **here**.

23 Further information in the WestConnex Project can be found **here.**

24 Further information on the Inland Rail Project can be found **here.**

3. Where appropriate, split Design and Construct phases into separate tender processes

Where possible and appropriate, D&C projects should be separated into two tender processes. The first would be for design, and for complex projects, site evaluations, preliminary site investigation and preparation. This would result in more thorough and robust designs which could then be more accurately priced for the second (construction) tender stage.

This would require increased time and effort at the design phase, but it would result in time and cost savings during construction.

Recommendation 7

The Victorian Government develop criteria for when it is appropriate to split traditional Design and Construct (D&C) projects into two tender phases.

KEY ISSUE AREA 4: LEGAL & RISK FRAMEWORK

CURRENT CHALLENGES

Lack of flexibility in procurement arrangements and inappropriate risk allocation are holding us back

Insufficient consultation with industry during the initial project budgeting phase, results in business cases that lack robustness, work being priced below levels that industry can sustain, and delivery through sub-optimum procurement models.

Lack of up-front consultation by government clients with industry is resulting in declining profits for industry and greater risk of sub-optimal outcomes. Project outcomes, such as the NSW CBD and South East Light Rail Project[25], which result in major public and political dissatisfaction, and brand damage to the organisations involved, should be avoided. Some large established engineering and construction companies are struggling to survive despite the environment of strong demand growth[26].

In many cases, industry is frustrated by the limited options in the procurement process. The 'hard edged' risk transfer approach is not ideal in many circumstances, particularly for large complex projects. There are many examples, including Sydney Light Rail[27] where third-party risks, such as utility interfaces, were significantly underestimated through industry reliance on documents provided by government or insufficient time for independent due diligence in the tender stage.

The lack of standardisation in D&C contracts often results in, in effect, a "bespoke" contract whose terms are not transferable. This adds to legal costs.

These contracts often shift risks to the contractor, rather than adopting a collaborative approach to risk management and risk sharing. The current model results in adversarial behaviour because problems usually arise in project delivery during which the emphasis is on mitigating contractual liability rather than issue resolution.

These issues are making it virtually impossible for the small and mid-tier firms to bid.

Tendering processes are expensive, and too time-constrained to allow contractors to get the price right.

Many proposals are often incomplete at release. This results in project options being set before investigations are complete, leading to prescriptive scopes of works with insufficient detail and potential future problems not factored in. This stifles innovation and opportunities to develop designs fully. It reduces delivery times, putting unacceptable pressure and risk on contractors.

Risk definition and allocation is problematic and often inappropriate

The competitive nature of the market means contractors often accept risks without adequate investigation, mitigation or contingency in bid pricing. Governments are then compelled to accept tender bids, leading to risks of cost overruns, litigation and loss to contractors, and political risks to the client through project delays and budget overruns.

25 For further information on the South East Light Rail Project click **here**.

26 For a current example of the issue, refer to the article *Lendlease shares lose $2.3b in two days, with potential for more write-downs* available **here**.

27 For further information on Sydney Light Rail Project click **here**.

Risk identification conducted by clients or contractors in isolation is a major cause of many problems during construction. Time pressures, or lack of collaborative effort, can lead to risks not being fully understood or missed altogether.

Further, the arbitrary and blanket allocation of risks during the tender stage, without adequate and thorough investigation, usually results in parties being unprepared to deal with issues that invariably arise during construction.

When risk is shifted to contracting parties, they often have to account for it in the bidding price. Usually this is done on an uncertain basis. A contractor might, for example, assess a worst-case overrun caused by unforeseen circumstances divided by the chance of it happening. If the overruns do not happen the contractor makes better than usual profit, at the expense of the government client. But if the overruns do happen, the contractor may not have the funds to cover them and go out of business, leaving the government client with a half-constructed business.

In short, when contractors are forced to factor in a price for risk, they almost invariably get it wrong in hindsight. Either the events do not happen at all and the contractor gets a windfall, or they do happen, and the amount factored in is rarely enough to pay for the event, putting the whole project in jeopardy.

So, although shifting the risk to contractors may appear to be the smart thing for governments to do, in the long run it may be more costly. It is better that the entity which can bear them take on the big risks. If that is done, projects and contractors do not fall over as often, and the government clients get lower bidding prices because contractors have not had to factor in a price for big risk.

Legal agreements are becoming increasingly complex, and in many cases are bespoke for every project

Governments' attempt to bulletproof contracts by shifting all risk on to the other party, particularly for large-scale projects, results in higher legal costs in both the lead up to contract signing and in administering the contracts.

Collaborative forms of contract which encourage risk sharing are increasingly rare. Where risks are identified and managed collaboratively it helps to avoid a "claims culture".

Collaboration in defining and pricing of risk at the start of the process, would allow government to set up project contingency funds to cover major risks. This would give industry greater confidence to price projects, allow for the more efficient allocation of resources and reduce contractual disputes.

PROPOSED RECOMMENDATIONS & STRATEGIES

1. Develop a national approach to procurement and contracting, including nationally consistent standard contracts

A standard suite of contracts should be drafted which could be used with minimal variation for a range of project approaches from collaborative through to D&C.

Government and industry could use international examples and successful local models to achieve best practice in procurement processes and contracting. Better practice examples, such as Defence in Australia and international NEC and FIDC models[28], can be used to develop a more structured and consistent approach to selection of project procurement models and contract forms.

Recommendation 8

The Transport and Infrastructure Council (TIC)[29] equivalent and other stakeholders: (i) identify best practice approaches to procurement and contract standardisation for major government-funded infrastructure projects; and (ii) develop a framework to identify the optimal approach to adopt for each type of project.

2. Commit to early engagement of contractors to collaboratively assess risks and identify appropriate delivery models

Engagement with industry at the project feasibility and business planning stage is essential. It will increase mutual understanding of risks and help determine the most appropriate delivery models. Regular communications will improve project outcomes and ensure fair risk allocation.

Early Contractor Involvement, Alliance, and other contract models which provide early engagement between parties should be given preference over Design & Construct, particularly for large-scale, complex projects. These approaches use the skills and experience of all parties to innovate collaboratively, more effectively assess risk, help ensure projects are priced correctly and are delivered using the most appropriate model. These approaches would increase confidence that projects will be delivered on time and within budget.

Recommendation 9

The Victorian Government to adopt procurement approaches that provide for early industry engagement and collaboration in project development, risk identification and delivery.

28 For an overview of NEC and FICD contracts, click **here**.

29 On 29 May 2020, the Prime Minister announced the Council of Australian Governments (COAG) would cease and a new National Federation Reform Council (NFRC) be established in its place, with the National Cabinet at its centre. On 12 June 2020, National Cabinet announced six initial priority areas of reform, and the formation of six National Cabinet Reform Committees – one of which is Infrastructure and Transport. On 26 June 2020, National Cabinet announced a review of the former COAG Councils and Ministerial Forums with a view to rationalise and reset their work. Further information available **here**

3. Review and improve client communications and transparency in project tendering

Industry is calling for more transparent tender processes. Government should provide clear criteria; more clarity on the assessment process and application of assessment criteria; and more comprehensive feedback for winning and losing tenderers. Where possible the definition of 'value for money' to meet government treasury requirements and other key non-financial project outcomes should be made available to tenderers.

Recommendation 10

The TIC equivalent develop a set of best practice principles for project tendering for endorsement by peak industry bodies and state and territory governments.

4. Develop a Government and Industry Risk Charter

A more effective approach to risk identification, assessment, pricing and allocation (including allocation of risk management responsibilities), will benefit all parties.

This will require greater disclosure by clients and industry of the risk assessments and information collected in the planning phase, so that proponents can better assess and cost their risks. Industry proponents are often excluded from the early discussions between government and community stakeholders and third-party services providers, such as utilities.

The relatively short tendering process makes it difficult for tenderers to devote enough time to better understand risk, and price accordingly. Commercial pressures can lead firms not to adequately assess risks, leaving them with potentially crippling exposure in order to win the work.

On the other hand, government clients are often compelled to accept tender prices that may not have adequately priced in major risks. This lays the foundation for significant cost overruns, delays due to contractual disputes, and significant losses for contractors in the delivery phase.

Collaborative efforts by industry and governments could prevent many of these traps, such as contamination and effects on third parties, such as utilities, who should be engaged at the beginning of the design stage.

More comprehensive early work will ensure a more complete and joint understanding of risks, enabling better provisions to fund risk and for better allocation of risk management between the parties.

The practice notes developed by CILF regarding Interface Risk Management should be used in developing the charter.[30] They provide a principles-based strategy with options for procuring agencies to deal with emerging risk.

The TIC equivalent should also address the tendency for principal contractors to push risk further down the chain to subcontractors. Those smaller firms often don't have the appropriate skillsets or balance-sheet capacity to accept those risks.

Allocation of risk to parties without the skills and financial capacity to manage them is a major risk in itself, and clearly short-sighted given the down-stream consequences. As a general principle, risks should be allocated to the party best able to manage and mitigate those risks.

Risk management expertise for smaller firms should be developed. Industry should pursue partnering opportunities with training providers for skills program development and delivery.

Recommendation 11

The TIC equivalent develop a Risk Charter that can promote a collaborative approach to project risk identification and management.

30 The practice notes from CILF regarding Interface Risk Management (available **here**) set out some sensible principles that could be applied in the proposed Charter.

KEY ISSUE AREA 5: CAPACITY & CAPABILITY

CURRENT CHALLENGES

Industry capability is stretched in some places, but not effectively utilised across the tiers

Government should engage more with all contractor tiers and industry should improve partnering between those tiers.

Small- and mid-tier contractors are missing out in this infrastructure boom. According to Australian Owned Contractors, *"Of the nearly $50 billion in construction contracts awarded over the country in the past five years, only 3% were won by mid-tier Australian-owned contractors"* (2019).[31]

Industry concedes that contractors, at all levels, have set up barriers to cooperation between firms, with each preferring to be in control as principal contractor.

Where smaller firms are treated as mere suppliers, they are often unable to add value through their experience or proprietary intellectual property, beyond the tasks they have been engaged to undertake.

Industry and Education providers should co-operate more.

The workforce has grown significantly to support the infrastructure boom, but the number of people gaining new skills and formal qualifications through traditional technical and further education providers has fallen significantly.

Government emphasises apprentices and trainees. However, the qualification process has become too broad to be of value to industry, as specialised skill requirements grow. Entrenched processes in the state education bureaucracies are causing them to lag well behind the needs of industry.

Taking on graduates, apprentices and trainees is a significant financial burden on companies. Closer industry engagement with education providers in the development of curriculum and training delivery is required. Industry associations could take the lead, possibly through a 'collaborative compact'.

International and interstate skilled migration is critical.

International skilled migration is continuously reviewed by the government. Industry input must ensure priority is given to local capacity shortfalls. More work is needed on recognition of overseas qualifications to get the best value from the costly visa process.

Skilled worker migration and qualification portability across state boundaries is equally important. States lack consistency in recognition of skills and qualifications. Often state governments apply local-content and experience requirements. Work-away-from-home costs are often prohibitive.

31 The is outlined further in the article, *Australian Owned Contractors – July* 2019, and available **here**.

Capacity and capability forecasting must be improved

Most government authorities model future capacity requirements, but this does not often extend beyond the very large contractors. Analysis of capacity needs to also take into consideration all parts of the supply chain.

Industry should look at skills transfers from other industries undergoing change. For example, highly skilled and experienced engineers from manufacturing could easily transfer to fill a need in construction. Industry will have to make the transfers attractive, which will require considerable work and cost.

A highly mobile workforce is a potential barrier to entry for the construction sector, particularly for women and others with young families. More work is needed here if industry is to tap into this underused talent pool. In addition, indigenous employment and engagement with indigenous businesses is a big opportunity. The mining industry is an example of where this has been done well.

PROPOSED RECOMMENDATIONS & STRATEGIES

1. Engage directly with small- and mid-tier firms during the tendering process

When small- and mid-tier contractors are engaged through a principal contractor rather than directly by government, it can cause under-utilisation of smaller firms and the inappropriate cascading of risk down the supply chain. These issues could be overcome with better engagement across the industry, better packaging of projects and improved risk processes as mentioned earlier.

Governments should encourage small and mid-tier contractors to engage in the tender process. They should have education sessions to help improve knowledge of specific projects and also provide detailed information about the pipeline. This would help inspire them with the confidence they need to make decisions about investing in capacity and capability development.

Recommendation 12

The Victorian Government propose a series of engagement initiatives and guidelines to help small- and medium-sized firms participate directly in the tender process.

2. Ensure training and education programs provide appropriately skilled and qualified people to meet industry needs

While the industry has grown significantly, overall participation in traditional technical education and training has fallen. The broadness of traineeship and apprenticeship packages and government programs are not keeping pace with industry needs. A review of practical alignment between training authorities and the needs of the construction industry is urgent.

Industry-government collaboration should ensure TAFE and RTO deliver competent people, proficient in the skills required by industry. Changes in technology require continuous upgrades of the skills of equipment users, so better collaboration between TAFE and equipment manufacturers is also needed.

Industry should engage with TAFE and other training and education providers to explore the reasons for industry dissatisfaction and to look at long-term improvement of education and training. Curriculum setting should take account of pipeline capacity and capacity requirements.

Recommendation 13

RA, in collaboration with other relevant infrastructure industry associations, actively engage with TAFE and other training and education providers to identify areas where their offerings can be changed or enhanced to better match industry requirements.

3. Remove barriers to international and interstate skills migration

Industry continues to work with government through the regular Commonwealth Skilled Migration Occupation Lists review processes. However, lack of skills recognition and consistency across state boundaries regarding local experience rules, continues to hinder skills mobility and should be addressed. It is acknowledged however that this landscape will change dramatically as a result of the COVID-19 pandemic, and may result in long-term structural change in the way that industry can engage workers from outside Australia.

Recommendation 14

Part A: The National Cabinet: (i) consider proposing the removal of requirements for local content experience from tender processes; and (ii) accelerate work on the harmonisation of state and territory trade qualification recognition.

Part B: RA, in collaboration with other relevant infrastructure industry associations, work with the Federal Government to ensure that when its skills migration program is regularly updated that it meets industry needs.

4. Expand industry recruitment opportunities

Industry thinking should change to accept more people with transferable skills from other industries. This is likely to include the mining sector, the military, the automotive industry, indigenous employees and businesses. While this may require flexibility and retraining, the long-term benefits will be realised through expanded capacity and capability.

Industry should promote successes and the overall economic and community benefits resulting from this work.

Recommendation 15

RA form an industry working group to develop an approach for the coordinated promotion of the industry.

5. Invest in engineering and design skills (on the client side)

Industry is concerned that organisational rationalisations have led to a lack of engineering expertise within government agencies. This 'de-engineering' is affecting agencies' ability to produce and interpret appropriate design documentation, and to respond to queries from design contractors. Furthermore, individuals without the necessary engineering expertise are becoming overly involved in the design process, and this is having unintended consequences on the quality of design outcomes.

Government agencies can improve project outcomes by investing in recruiting and development of appropriately qualified personnel within the engineering and design disciplines. The resulting increase in skills as an "informed client" will lead to more efficient and effective engagement with industry.

Recommendation 16

The TIC equivalent work with state and territory government agencies, and other industry stakeholders, to participate in reviews of collaborative project implementation for a number of recently completed projects to help identify skills gaps.

KEY ISSUE AREA 6: GOVERNANCE

CURRENT CHALLENGES

Some governance models are no longer fit-for-purpose - alternatives should be considered to achieve better project outcomes

The value of independent review processes is now questionable

Assurance processes applied to almost every government project, involving Independent Review (IR), are responsible for delays and extra costs. Industry questions the effectiveness and efficiency of appointing an Independent Reviewer to every project. The IR concept is a legacy of several decades ago, when there was a need to provide external quality and assurance oversight due to the lack of confidence in, or absence of, contractor quality control.

However, since the introduction of IR, pre-qualification processes by governments and significant work by contractors to develop quality assurance regimes (which are audited against a set of standards), makes the value of IR questionable for most projects.

We should consider a radical review of Governance for major projects

Project governance based upon Corporations Law and Australian Institute of Company Directors (AICD)[32] principles would improve project delivery on mega-projects. In this model, which is acknowledged as a radical departure from current client-contractor models, all related parties would form a separate board of directors, under an independent chair, with fiduciary duties to collectively deliver the best outcomes for the project.

The Hunter Valley Coal Chain Coordinator[33] is an example of this approach being applied with considerable success.

32 Further information on the AICD corporate governance can be found **here**.

33 Further information on the Hunter Valley Coal Chain Coordinator can be found **here**.

PROPOSED RECOMMENDATIONS & STRATEGIES

1. Reassess the role of Independent Review within project assurance processes

Efficient and effective assurance processes are essential. However, industry believes that the IR role may not be helping to achieve project-compliance outcomes. The IR role often replicates internal quality control and assurance processes employed by contractors under independently accredited and audited quality systems. This duplicated effort comes at additional cost and unnecessarily delays.

Recommendation 17

The TIC equivalent to assess the role of Independent Reviewers, and if appropriate, work with industry and government stakeholders to develop alternative, more effective project quality control and assurance processes.

2. Investigate an incorporated model as an alternate governance model for major projects

Alternate governance models should be investigated for improved project delivery on mega-projects, in particular methods based upon Corporations Law and the AICD principles.

While there are obvious conflict management issues to be addressed, this concept would see the formation of a special purpose vehicle (SPV) company for mega- long-term projects. This would be a logical extension of the close collaboration philosophy espoused in the ECI procurement model. The SPV would have a board of directors that included both government and industry stakeholders and continue throughout the delivery phase. It would have a united commitment to have the project succeed.

Recommendation 18

The TIC equivalent engage with senior State Government representatives to discuss alternate governance models (including the SPV concept), and if receptive, work with an independent corporate governance specialist to develop proposals that would help drive major improvements in governance for mega-projects

KEY ISSUE AREA 7: CULTURE & INCLUSION

CURRENT CHALLENGES

A culture of mistrust between industry and government is holding us back

Lack of mutual trust and transparency has reduced the willingness of all parties to share information. The alternative open and collaborative approach would see root causes of potential project failures identified in the early stages of a project. The current procurement process creates probity constraints and compliance pressures that impede collaborative effort.

Work-life balance and mental health challenges are an industry-wide issue

Unrealistic deadlines and timeframes are upsetting work-life balances. Addressing that would make the industry more attractive and broaden its talent pool. The construction industry's requirement for employees to move location for different jobs causes family, social and career disruption. This is especially true for those engaged through labour hire, which requires them to move to different jobs for short periods.

A paper by UTS Press, *Investigating the Factors Associated with Job Satisfaction of Construction Workers in South Australia*[34], says that construction workers are least satisfied with personal health, quality of life and personal development.

Overall, industry recognises it has a challenge with poor job security and job satisfaction leading to difficulty in retaining staff. Furthermore, mental health is a major issue within the industry, with stress levels and suicide rates are among the highest in the country. Clearly this is unacceptable.

The industry's workforce is not diverse nor inclusive enough

The lack of gender and cultural diversity gives the industry a poor image, making it difficult to attract talent from a diverse range of people. It would be to industry's advantage to change this. A 2018 Boston Consulting Group (BCG) study shows diverse workforces perform better.[35] Inclusion is being done well in some areas. This should be celebrated, and its advantages communicated.

34 The UTS Press document is available **here**.

35 The BCG report is available **here**.

PROPOSED RECOMMENDATIONS & STRATEGIES

1. Support the Construction Industry Culture Taskforce (CICT) to develop its Culture Standard

The Construction Industry Culture Taskforce (CICT) provides a forum for government and industry to address the culture challenges impacting industry.[36] According to CICT, the priority is to *'develop and set a cultural standards which will change the nature of the industry, give our workers back their quality of life and encourage more talented people to find great careers in construction and infrastructure'*.

Recommendation 19

RA, in collaboration with other relevant infrastructure industry associations, work with CICT to further develop and refine its Culture Standard, and once developed, work with government and industry to promote its adoption.

2. Develop a culture and inclusion performance framework

The selection criteria in the procurement process should be updated to mandate a certain level of performance in relation to culture and diversity. This should be linked to the Culture Standard being developed by CICT.

Contractors should be required to maintain a certain level of performance throughout the project-delivery phase in order to avoid penalties. If the culture and diversity performance exceed certain levels, however, the contractor should be rewarded and communicated to the broader industry.

Recommendation 20

RA, in collaboration with other relevant infrastructure industry associations, work with CICT and other stakeholders, to propose a framework to measure and enforce culture and inclusion performance, which can be embedded in the procurement process.

3. Invest in training and coaching to develop a more diverse workforce and better leaders

Industry and government must invest in training, coaching and mentoring of project leaders to help improve culture. This would help improve project management and delivery, with a focus on collaboration, transparency, inclusion, health and safety, and work-life balance.

Demonstration of these behaviours (which would be incorporated into the framework mentioned above) can then be rewarded and held up as an example of good culture. This would also lead to better mental health outcomes.

Industry and government will need to look to other industries to see where this is done well. This can then be used to establish a training and coaching program tailored to suit the needs of the infrastructure sector.

Recommendation 21

Part A: RA, in collaboration with other relevant infrastructure industry associations, work with government agencies to oversee the creation of an industry-wide training and development program, targeted at improving leadership and culture.

Part B: RA, in collaboration with other relevant infrastructure industry associations: (i) develop and provide employment information and strategies that encourage people of diverse backgrounds to seek employment in the industry and for industry to employ them; and (ii) point out to industry the advantages of a more diverse workforce.

36 Further details about CICT is available **here**.

CONCLUSION & NEXT STEPS

CONCLUSION

Based on the analysis of emerging difficulties faced by Industry, urgent action is required.

If industry and government can work together collaboratively, then governments will get better value for money and industry will get the best use of its capital and people.

However, this can only be achieved if the key stakeholders take collective ownership and accountability of the industry-wide challenges.

RA believes that the best way for this to happen is to establish a collaborative partnership with the Victorian and Federal Government to pursue the recommendations set out in this Report.

This collaborative approach will ensure all key stakeholders take ownership of their relevant areas, and play their part in leading lasting changes to procurement processes. The outcome would improve planning and design of projects; appropriately allocate risk; give a more fulfilling role to medium and smaller contractors; and improve skills and capacity building.

Although it may require considerable resources (effort, time and money), RA believes this should not be seen as a cost, but as an investment which will repay industry, government and the community more broadly.

When the environment changes – which it clearly has with the surge of transport infrastructure spending – it is folly not to change and adapt to those changes. Applying models developed to suit the old environments to new environments invites costly inefficiency.

Unfortunately, the costs of action must be budgeted for and be visible, whereas the costs of inaction can be written off as isolated incidents, unrelated to weak processes – at least until the compilation of this Report.

Overall, though, RA believes the costs of action will be more than repaid by avoiding the costs of inaction.

RA urges the Victorian Government to take a lead in collaborating with industry to adapt to the new environment.

Based on that anticipated success, Industry should then work with other governments to apply the results nationally.

NEXT STEPS

It is intended that this will be a public Report, open to discussion among and by all stakeholders.

This Report will be sent to:

- The Hon Daniel Andrews MP, Premier of Victoria (copied to The Hon Tim Pallas MP, Treasurer and The Hon Jacinta Allan MP, Minister for Transport Infrastructure) for discussion.
- The Hon Gladys Berejiklian MP, Premier of NSW (copied to The Hon Dominic Perrottet MP, Treasurer and The Hon Andrew Constance MP, Minister for Transport and Roads) for discussion, while drawing attention to the fact the narrative and recommendations of the Report have relevance nationally.

The Report will also be simultaneously sent to:

- National Cabinet;
- Board of Treasurers;
- Transport & Infrastructure Council;
- Transport & Infrastructure Senior Officials Committee; and
- CEOs of relevant Departments in Victoria and NSW.

Members of RA will be provided with the Report, including all:

- attendees at the November 2018 and March 2019 procurement workshops; and
- representatives of the 150+ RA members and key stakeholders.

Audit Project

Following this, RA will undertake a desktop audit of current Victorian and NSW policies and actions, against the recommendations in this Report.

ANNEXES

ANNEX 1 - Roundtable Meeting Note

CONFIDENTIAL MEETING NOTE

EVENT:	Roundtable on 'Financial Sustainability in Construction' with **Major Transport Infrastructure Authority and Department of Treasury and Finance Victoria**
DATE:	Friday 8 November, 2019 (Melbourne)
DISTRIBUTED TO:	Meeting Attendees (refer to Attachment 1)

SUMMARY

Roads Australia (RA) hosted a dinner with the Hon Daniel Andrews MP, Premier of Victoria on 14 May 2019, at which it was agreed to hold an industry/government meeting to discuss issues relating to procurement and risk.

An industry/government roundtable was held on 8 November 2019 to provide an opportunity for senior industry stakeholders to discuss such topics as financial sustainability, procurement and risk allocation with:

- **Corey Hannett, Director-General of the Major Transport Infrastructure Authority.**
- **Jason Loos, Deputy Secretary Commercial Division of the Department of Treasury and Finance Victoria.**
- **An Nguyen, Executive Director, Infrastructure Delivery Group**, Partnerships Victoria at Department of Treasury and Finance, Victoria.

At Attachment 1 is a full list of all industry and government participants.

A wide range of issues were discussed at the meeting, and a brief summary of those issues are presented below, together with some proposed next steps. At Attachment 2 is a full list of questions that were submitted by participants in advance of the roundtable event.

PROPOSED NEXT STEPS:

1. Incorporate feedback and circulate an appropriate version of the meeting note to the meeting participants (incorporate further feedback as required).
2. MTIA and DTF to brief Cabinet about the state of the Industry and the core issues that need to be addressed.
3. RA to conduct a one-day workshop in Q1 2020 with key stakeholders to develop an appropriate set of recommendations and strategy to address the core issues.
4. Recommendations and strategy to be presented to government.

Note: as part of strategy development, it will be necessary to coordinate / discuss with other state jurisdictions, in particular New South Wales (may also be appropriate to conduct case studies on those projects that have worked well (e.g. Victorian level-crossing removal), and those that have not (e.g. Sydney Light Rail Project)).

GENERAL COMMENTS

The following general comments and themes were identified:

» Corey Hannett made the initial point that the Premier was open to feedback from the Industry.

» It was recognised that major projects in VIC and NSW were not going well and more international participation did not mean increased industry capacity to deliver.

» As an overall outcome, it was agreed that significant improvements are needed, in terms of Industry being able to deliver on time and on budget, but in a commercially sustainable way.

» The involvement of the **Department of Treasury and Finance Victoria** in discussions is considered very positive by the event participants, given they are key players in the infrastructure development process.

» It was acknowledged that there are some industry cultural issues that impacted upon project delivery and addressing this needed to be a priority, as without change, any new strategies to address capacity / capability would likely fail.

» Government is working on establishing a new set of selection criteria and a VIC equivalent of the NSW Government's 10-point Commitment to the Construction Industry.

» In addition, ACA is also developing a '10-point plan' in response and may include it into a response to the Infrastructure Australia Infrastructure Audit.

» It was noted that price is not the primary consideration when selecting suppliers i.e. the lowest bidder did not always win the tender (A number of Industry stakeholders expressed a desire to be engaged in the process of setting those selection criteria).

KEY ISSUE: WORK PIPELINE / STRUCTURE

The following key issues were highlighted:

- Improvements are needed to the visibility of the pipeline (particularly for tier 2 and tier 3 contractors), including the level of detail and timing of information, as this will help Industry to more efficiently and effectively align its capability (including upskilling existing personnel within construction firms).
- Packaging of work needs to be improved in such a way that allows:
  - Improved visibility of the infrastructure pipeline (see above)
  - smaller tier 2 and 3 firms to bid for and win work ($30m-$250m), without having to take on a disproportionate amount of risk (see below issues relating to risk);
  - additional time to be able to focus on planning / designing work to maximise efficiency, including devoting time to innovation; and
  - projects to be split into phases, to enable smaller firms to bid and win work aligned to their capability (it was acknowledged that this would require an increased amount of government coordination).
- There is a perception that there is a need for improved transparency regarding Government expectations (for industry) and firm capability (for Government).
- There may still be a role for Major Road Projects Victoria, post VICRoads, in contracting and procurement of (relatively) minor transport infrastructure works.

KEY ISSUE: RISK PROFILE

The participants noted the significant issues surrounding risk and the need to better manage and share risk between Government and Industry / other stakeholders.

The following key issues were highlighted:

- Further discussion is needed around the concept of reliance on information provided by the client and the risks associated therewith
- Industry is often excluded from the upfront discussions between government and community stakeholders
- During the procurement process, some organisations tendering feel compelled to accept potentially unacceptable risks in order to win the work.
- Directly linked to the points above, if one or more tenderers during the procurement process are prepared to accept such risks, Government is often compelled to select one of those tenderers (usually resulting in that supplier over-promising and under-delivering).
- Given the relatively short length of the tendering process, it is often difficult for tenderers to devote sufficient time to better understand price and risk accordingly (this also ultimately has an impact upon efficiency and the ability to innovate).
- Risk is not appropriately allocated between the parties.
- 3rd parties (e.g. utilities) need to be engaged at the front-end of project design to remove uncertainty.
- Issues such as contamination become the problem for the contractor and government is unwilling to intervene and/or assist in resolving the issues.

Given these issues above, there is often significant cost overruns, which are either crippling to industry or causing Government to have to find additional resources to fund.

It is noted that with better definition and pricing of risk between Government and Industry at the start of the process, provisions could be established by Government in order to fund such risk, should it be necessary to do so (this will help give greater certainly to price and allow for the more efficient allocation of resources).

KEY ISSUE: LEGAL / COMMERCIAL

The following key issues were highlighted:

- There is a need to engage with the legal fraternity to help resolve the key issues and drive change e.g. reshaping contracts.
- Legal agreements governing projects are becoming increasingly complex (partly due to the higher value of such projects), and negotiations protracted due to such complexity (significant number of interactions, increasing legal costs and time).
- Through adding additional complexity and content to legal agreements, Government is shifting a greater proportion of risk back onto the Industry.
- Due to the complexities outlined above and a lack of standard form agreements, legal costs are becoming a significant project cost, and furthermore, it is becoming difficult for decisions to be taken without first obtaining legal sign-off (this is a significant issue for the smaller firms).
- There is insufficient consultation with industry stakeholders during the initial project budgeting phase, resulting in work being priced below levels that industry can accept / sustain.
- Government Budget estimates are often too low due to unforeseen issues, which then becomes the bottom line for tendering.
- It is questionable whether industry can realistically price significant mega projects.
- All of these issues mean it is getting harder for companies to obtain Professional Indemnity insurance.

KEY ISSUE: DESIGN PROCESS

The following key issues were highlighted:

- The design process has been slowed significantly, due to the increased number of changes being required during that process (often without due consideration to the overall impact upon the design), which industry feels is often not justified.
- Related to the above, it is felt that individuals without the necessary engineering expertise are becoming overly involved in the design process, and this is having unintended consequences on the quality of design outcomes.
- Linked to the points above, there are too many stages for design approval (including too many external parties involved in compliance assurance), including too many iterations seeking comments, which is onerous and time consuming. As such the approval process needs to be rationalised.

ATTACHMENT 1 – ATTENDEES

Company	First Name	Surname	Job Title
Acciona Infrastructure	Fernando	Fajardo	Regional Development Director, Asia Pacific
Bechtel Infrastructure	Ged	Silva	General Manager, Asia Pacific
BMD Constructions	Tony	Damiani	General Manager Southern Region
Bouygues Construction Australia	Seved	Robin	CEO
Capella Capital	Malcolm	Macintyre	Head of Origination
Civilex	Nabeel	Sadaka	CEO
Clough	Paul	Farris	Manager Infrastructure - East Coast
CPB Contractors	Juan	Santamaria	Managing Director
Decmil Group	Scott	Criddle	Managing Director
Department of Treasury & Finance	An	Nguyen	Executive Director, Infrastructure Delivery Group
Department of Treasury & Finance	Jason	Loos	Deputy Secretary Commercial Division
Downer Infrastructure	Sergio	Cinerari	CEO, Infrastructure Services
Fredon Industries Pty Ltd	Scott	Olsen	Chief Executive Officer
Fulton Hogan	David	Fisher	General Manager Southern Region - Construction
Gamuda (Australia) Branch	Yee	Yew Weng	Executive Director
John Holland Group	Larry	McGrath	EGM, Customer & Corporate Affairs
Lendlease	Hans	Dekker	Group Head of Engineering and Building
Lendlease Engineering	Craig	Laslett	CEO Engineering & Services
Macquarie Bank Limited	Andrew	Newman	Division Director
Major Transport Infrastructure Authority	Corey	Hannett	Director-General
Major Transport Infrastructure Authority	Tim	Picton	Director of Strategy
McConnell Dowell	Jeremy	Griggs	State Manager - Victoria / Tasmania
Plenary Group	Phil	Dreaver	Group Director
Roads Australia	Leslie	Najera	Policy Officer
Roads Australia	Michael	Kilgariff	CEO
Roads Australia	Quentin	Crombie	Director - Policy
Roads Australia	Hannah	Sauvarin	Director - Stakeholders
Salini Impregilo	Marco	Assorati	Executive Director Asia Pacific
Samsung C&T Corporation	Dennis	Cliche	President Australia Business & Operations
Seymour Whyte Constructions	John	Kirkwood	CEO and Managing Director
Transurban	Tony	Adams	Group Executive, Project Delivery
WBHO Infrastructure	David	McPadden	Executive General Manager- Eastern Region

ATTACHMENT 2 – PRELIMINARY QUESTIONS

Questions / topics submitted in advance of the meeting (anonymised):

Participant 1

- Government risk profile needs to change to allow broader sectors of market to compete i.e. Tier 2's and 3's.
- Local capability being compromised by constant awards to overseas based contractors.

Participant 2

- Procurement Contracting Models: How does the State aim to address the current in-balance of opportunities being offered to T2 / T3 Contractors as a result of the different procurement Contracting models (e.g. PPP) being adopted? Noting, that such Contracting models present an unmanageable risk profile for such businesses.
- Subcontractor Payment Protection: Will the State look to introducing new law, in addition to the SOPA, to provide greater protection of payments to Subcontractors / Secondary Subcontractors?

Participant 3

- What construction risks are causing losses and why?
- PPPs and sustainable risk transfers

Participant 4

- Is there an equivalent of the "10 Point Plan" in Victoria? It seems that quite a few of the large projects are suffering losses

Participant 5

- How do you see the private sector supporting the government to ensure the appropriate consideration of risk allocation to better value risk and assist with maintaining financial sustainability in the contractor environment?
- What do you consider contractors need to do differently to encourage better transparency and leadership in meeting and owning commitments made at time of tender?
- What are your thoughts on the depth of leadership in the industry and the knowledge and skills required to deliver mega projects?

Participant 6

- Tier 2 and Tier 3 Contractors are seemingly starved of work during the biggest infrastructure boom and biggest skills shortage in Victoria's history. Traditional Tier 2 projects are consistently being awarded to Tier 1 Contractors and treasury are dictating risk models that are unsustainable. At the moment, my organisation like many are becoming increasingly focussed on alternative sources of revenue to the traditional public infrastructure projects such as Energy, Defence and interstate markets taking our skilled staff with us. This is worsening the skills shortage in public infrastructure and our ability as an industry to respond to the challenges laid out by Government. Does the Government plan to address the work shortage and risk profiles in the Tier 2 market and if so how?

Participant 7

- We understand that Victorian government is looking at publishing guidelines around EPCM and CILF is looking to publish a practice note along the same lines. What potential projects is the Victorian government looking to trial an EPCM model on?
- Interested to see what the Victorian Government did on North East Link to try to create new teaming groups as a way try to open the market up. Has government assessed the level of risk government carries when the market is very concentrated and how does government mitigate this risk? What other steps is government looking doing in procurement to open up the market?

Participant 8

- Forward work program both metro and country on small/medium size road infrastructure.
- Service/utilities risk allocation

Participant 9

Sustainable tender price

Recent failures in the UK- and not only – have demonstrated that the lowest price is all but sustainable.

When construction companies and clients get it right – through project selection based on their ability to deliver, responsible tendering, diligent monitoring, and a proactive attitude to deal with issues such as cost and timetable overruns – they create contracts that are more profitable and provide more enduring value.

If construction businesses want to generate sustainable profits, they need to get the price right at the tendering stage.

Businesses bidding at too low a price for large complex contracts in the expectation that they will improve their profit margins because some aspect of the project will change is a risky strategy as unforeseen changes can quickly turn small profits into losses, and make it difficult to return to profitability. This is especially true for large PPPs.

» How do you make sure that price is not the main driver in awarding a contract and, if other factors are equally important as the price, wouldn't it be crucial to have them defined well at the beginning of the process and scored transparently at the evaluation stages?

» Is the PSC of large PPP projects taking into account this aspect, to avoid unrealistic expectations and push prices to the lowest side?

Productivity and financial sustainability

The insufficient planning, training and innovation affecting all players of the industry has been contributing to low productivity, with a consequent financial impact on projects.

Government can help to build confidence in the construction sector by showing more ambition and urgency in facilitating innovation through flexibility in technical specifications and contractual forms.

As well, Government can help a reasonable planning and training of resources by committing to a reliable pipeline of major infrastructure projects with guaranteed timing. Recently NSW Government has rolled out a plan for the next 3/5 years and a look ahead for the next 10/15 (not so firm though...).

» Is innovation a key point for the Victorian Government and how is it going to be committed?

» Can we expect a reliable road map for the next 10 years to be issued with committed timelines?

Participant 10

» Ensuring that there is a sustainable supply of midsize projects for Tier 2 Construction Companies rather than just mega projects where Tier 2 companies can't bid in their own right, and which history has proven the Tier 1 companies can't successfully deliver.

» The current D&C delivery model used for mid-sized projects is too expensive to bid and given level of design development typically completed is too high risk.

Participant 11

» Are the Delivery Agencies really interested in addressing the competition, giving a fair go (tender and delivery) to International Competitors with the proper 'Knowhow' and capabilities?

» How can we better engage with the community? We need the taxpayers support to develop quality infrastructure.

» Feasibility cases and PSC development: Are we using the right metrics? Is the construction budget forecast being completed by the people with the knowledge and capabilities to do so?

ANNEX 2 – March 05 Workshop Participants

The table below includes those that attended the workshop on 05 March 2020

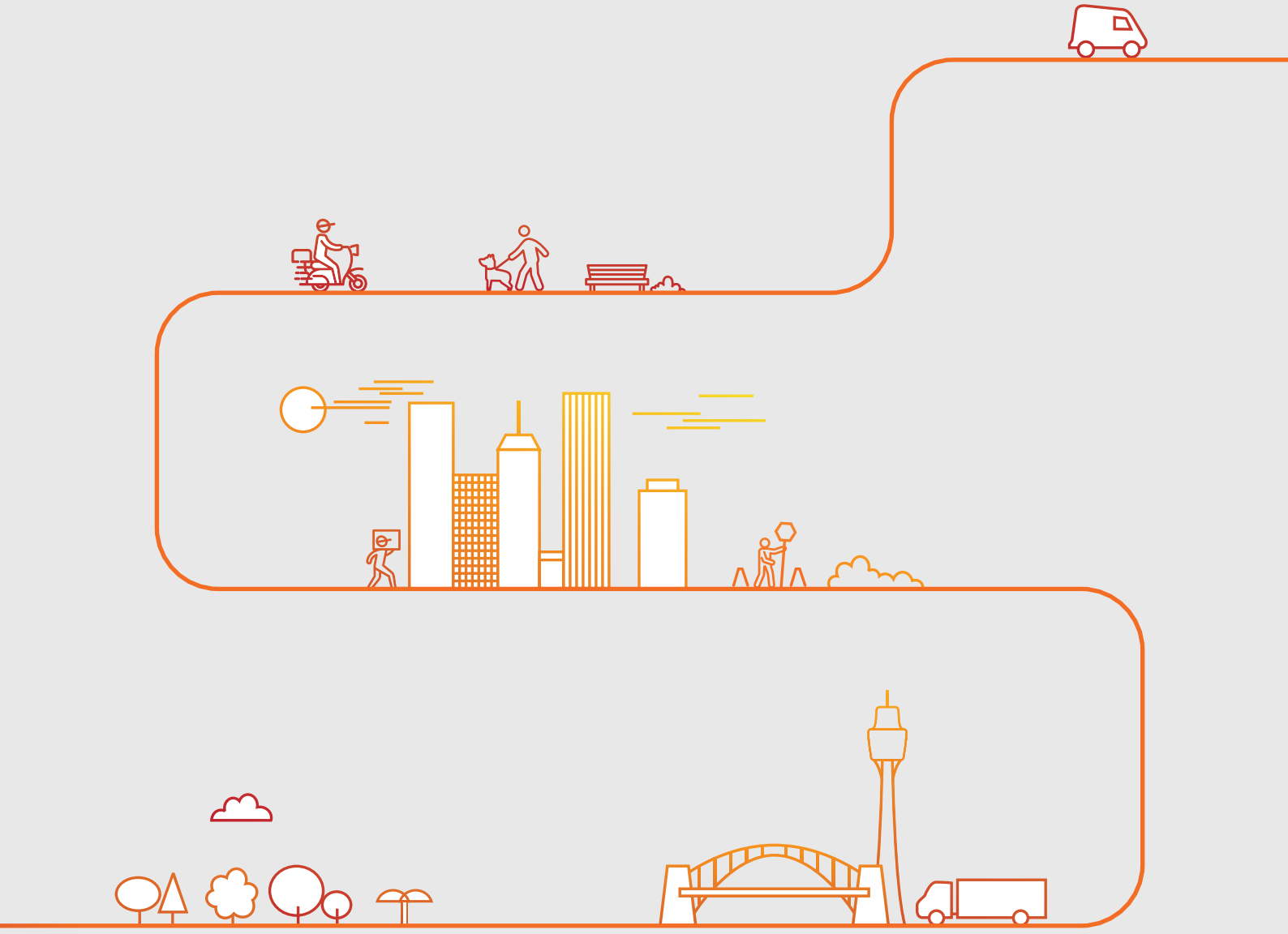
Company	First Name	Surname	Title
Acciona	Fernando	Fajardo	Regional Development Director, Asia Pacific & EMEA
AECOM	Richard	Barrett	Executive GM - Operations
Arup	Ross	Campbell	Executive Director Consulting
Aurecon	Aneetha	De Silva	Managing Director - Government - Australia & New Zealand
Aurecon	John	Henderson	Government Leader, Victoria
Australian Constructors Association	Lindsay	Le Compte	Executive Director
Bechtel Infrastructure	Tresna	Tunbridge	Regional Contracts & Commercial Manager
BMD Constructions	Scott	Power	Group Executive Director - Operations
BMD Constructions	Tony	Damiani	General Manager Southern Region
Bouygues Construction Australia	Seved	Robin	CEO
Capella Capital	Malcolm	Macintyre	Managing Director
Civil Contractors Federation	John	Kilgour	CEO Victoria
Civil Contractors Federation	David	Castledine	CEO
Civilex	Ben	Virtue	Group Manager of New Business and Strategy
Clayton Utz	Andrew	Fry	Partner
CPB Contractors	Roberto	Gallardo	EGM VIC, SA & NZ
Department of Infrastructure, Transport, Cities and Regional Development	Alex	Tokarczyk	A/g Director | Strategy Unit
Downer Infrastructure	Sergio	Cinerari	Chief Operating Officer Australian Operations
Ferrovial Construction	David	Fanjul	Operations Director
Ferrovial Construction	Michael	Branscombe	National Commercial Manager
Fredon Industries Pty Ltd	Scott	Olsen	Chief Executive Officer
Fulton Hogan	David	Fisher	General Manager Southern Region - Construction
Fulton Hogan	Sarah	Marshall	General Manager - Operational Support
Gamuda (Australia) Branch	Yee	Yew Weng	Executive Director
GHD	Warren	Harrison	Transport Market Leader, Victoria
Hatch	David	Moran	Managing Director Infrastructure - Australia & Asia
HDR	Mark	Fairweather	Managing Director
HKA	Dafydd	Wyn Owen	Partner
HWL Ebsworth Lawyers	Marko	Misko	Partner
Infrastructure NSW	Clare	Gardiner-Barnes	Head of Strategy, Planning & Innovation
Jacobs Group	Nick	Monaghan	Director - Major Projects (Southern)

Company	First Name	Surname	Title
Laing O'Rourke Australia	Annabel	Crookes	General Counsel, Executive Director
Lendlease	Craig	Laslett	Executive Director
Main Roads WA	Leo	Coci	Executive Director, Infrastructure Delivery
Major Transport Infrastructure Authority	Corey	Hannett	Director-General
Major Transport Infrastructure Authority	Dominic	Ciancio	Deputy Director, Commercial and Legal Program
Major Transport Infrastructure Authority	Kieran	McIvor	Director
McConnell Dowell	Jeremy	Griggs	State Manager - Victoria / Tasmania
MinterEllison	Kay	Salvair Smith	Partner
Monash University	Madeleine	McManus OAM	Director Industry Engagement
NSW Treasury	Sonya	Campbell	Executive Director - Structured Finance Unit
Office of Projects Victoria (OPV)	Kevin	Doherty	Chief Executive Officer
pitt&sherry	Kate	McDonald	Transport Infrastructure Sector Leader
Plenary Group	Paul	Crowe	Head of Origination
QLD Dept of Transport and Main Roads (TMR)	Gavin	Massingham	Manager (Program Development & Performance)
Ranbury Management Group	Peter	Driml	Principal Transport
Roads Australia	Quentin	Crombie	Director - Policy
Roads Australia	Michael	Kilgariff	CEO
Roads Australia	Sophie	Chalmers	Policy Officer
Roads Australia	Norm	McIlfatrick	Consultant
Roads Australia	Mark	Bowmer	Communications Director
Roads Australia	Emily	McLean	Senior Policy Officer
RPS Group	Robert	Fields	Executive General Manager
Samsung C&T Australia	Dennis	Cliche	President Australia Business & Operations
Seymour Whyte Constructions	Steve	Davies-Evans	National Precontracts Manager
SMEC Australia	David	Collett	State Manager VIC/TAS
VIC Department of Treasury & Finance	An	Nguyen	Head of Partnerships Victoria
VIC Department of Treasury & Finance	David	Noble	Director, Partnerships Victoria
Webuild Group	Marco	Assorati	Executive Director Asia Pacific
WSP	David	Stuart-Watt	Client Director Transport ANZ
WSP	Michael	Bushby	Strategic Advisor, Asset & Network Performance
WSP	Kate	Borg	Major Project Executive

ANNEX 3 – BIS Oxford Economics Report

A copy of the BIS Oxford Economics Report, *The Economic Impact of Australia's Roads, September 2019*, accompanies this Report.

roads australia



The value that roads deliver to the Australian community

roadsaustralia

$206.8bn
Added economic value (GDP) due to roads

1.3m
Jobs supported

$22.7bn
of road projects funded in next 5 years

$25.4bn
in the following 5 years

We know roads are a vital part of all our lives and a huge enabler of economic activity in Australia.

But how can we measure the positive contribution they make to the community?

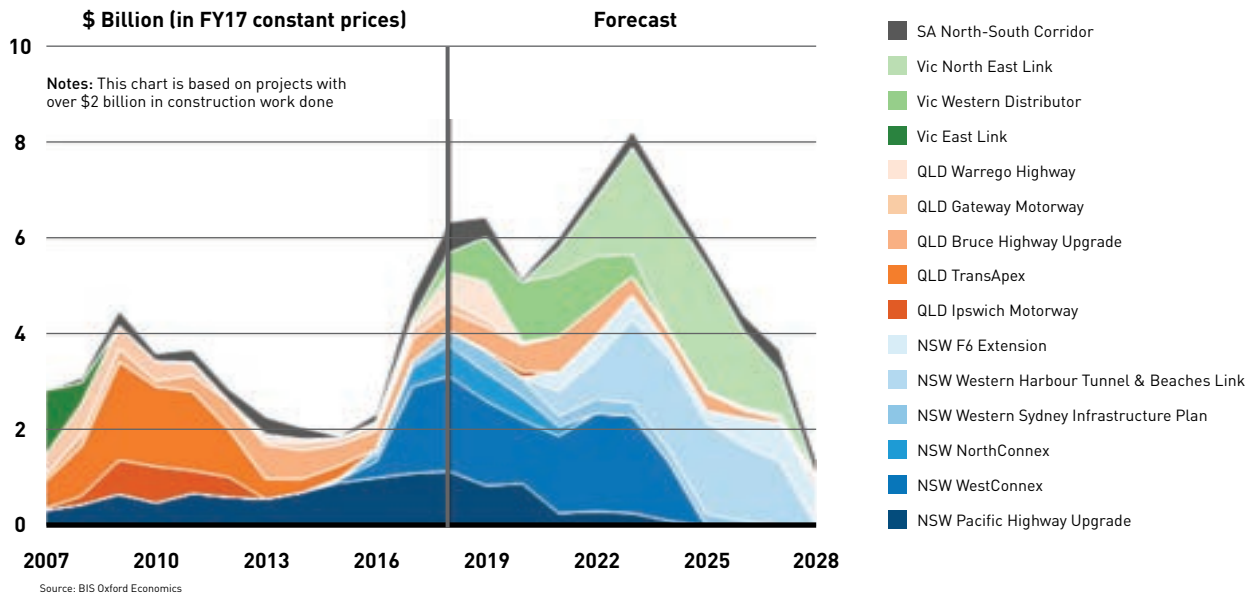
New research, commissioned by Roads Australia, seeks to quantify this massive economic and social value. It finds that activity associated with the roads industry contributes **$206.8 billion per year** worth of economic value to the economy and supports almost **1.3 million jobs**.

This impact is set to grow over the coming decade, with **$22.7 billion of roads projects funded** in the next five years, and $25.4 billion for the five years after that.

Australia's vast road network is a vital social and economic resource that underpins Australia's economic activity and makes our lives better in ways that are as powerful as they are often invisible. Roads are an essential part of an integrated transport system, which includes the safe and efficient movement of people and freight by all modes of transport.

Research undertaken by BIS Oxford Economics for RA quantifies the massive benefits that roads provide and will continue to provide across the economy and community well into the coming decade.

F1. Major Road Projects above A$2bn



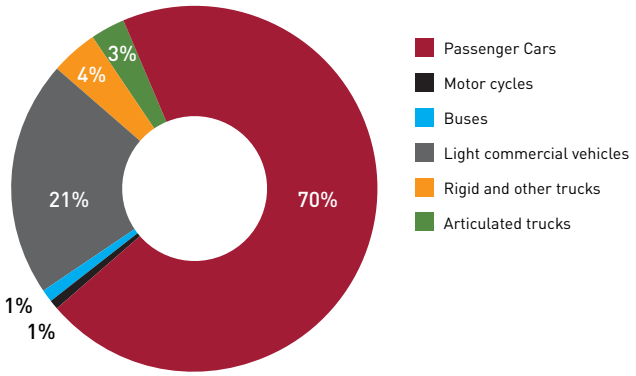
Source: BIS Oxford Economics

roads australia

Included in this analysis are positives provided by roads that are not generally well understood in the community.

This includes enabling improved health outcomes and other essential services; facilitating low emission transport options like light rail and bike paths (which often use the road network) and providing people with the option of improving quality of life by living away from major cities.

F2. Mode share of road kilometres, 2017/18



In terms of the broader value, the report uses Economic Impact Analysis to estimate that the roads industry underpins employment to the tune of **1,295,000 full time equivalent positions and contributes $206.8 billion a year to the economy.**

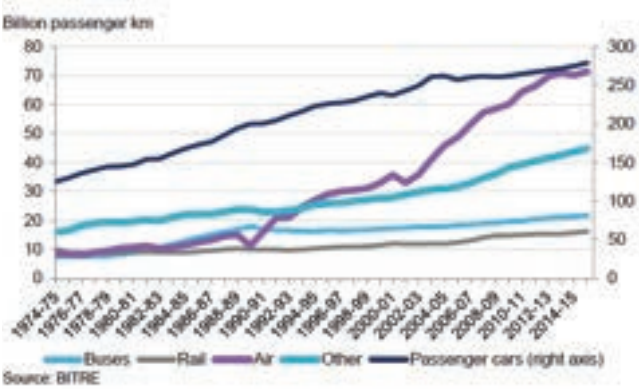
Or to put it another way, **one dollar out of every $25 generated in the economy spins out of the roads industry**. And when the broader freight logistics industry is factored in, that figure doubles.

The report indicates these benefits will continue to flow over the next decade, with a boom in road projects providing much needed stimulus to an economy that is currently beset by low business investment and sluggish consumer spending.

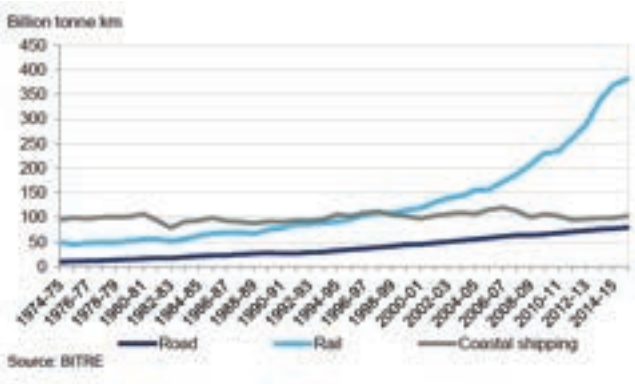
The transport infrastructure pipeline is worth $22.7 billion over the years to 2022/23 and $25.4 billion over the following five years.

This investment in the road network will help accommodate a growing population and increased urban density, and help make our cities more productive and less congested.

F3. Australian domestic passenger task, by mode of transport



F4. Australian domestic freight task, by mode of transport



BIS OXFORD ECONOMICS

roadsaustralia

THE ECONOMIC IMPACT OF AUSTRALIA'S ROADS

SEPTEMBER 2019

BIS Oxford Economics

Effective March 1 2017, UK-headquartered **Oxford Economics,** one of the world's foremost independent global advisory firms acquired a controlling stake in **BIS Shrapnel**. BIS Shrapnel, which had been in continuous operation since July 1, 1964 as a completely independent Australian owned firm with no vested interests of any kind — providing industry research, analysis and forecasting services — merged with the Australian operation of Oxford Economics. The new organisation is now known as BIS Oxford Economics.

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. Our best-of-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

Headquartered in Oxford, England, with regional centres in London, New York, and Singapore, Oxford Economics has offices across the globe in Belfast, Chicago, Dubai, Miami, Milan, Paris, Philadelphia, San Francisco, and Washington DC. We employ over 300 full-time people, including more than 200 professional economists, industry experts and business editors—one of the largest teams of macroeconomists and thought leadership specialists. Our global team is highly skilled in a full range of research techniques and thought leadership capabilities, from econometric modelling, scenario framing, and economic impact analysis to market surveys, case studies, expert panels, and web analytics. Underpinning our in-house expertise is a contributor network of over 500 economists, analysts and journalists around the world.

Oxford Economics is a key adviser to corporate, financial and government decision-makers and thought leaders. Our worldwide client base now comprises over 1000 international organisations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks.

Date of publication

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The modelling and results presented here are based on information provided by third parties, upon which BIS Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

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EXECUTIVE SUMMARY

$133.0 bn

Total economic *welfare* value of road availability

Derived using a community welfare approach, based on willingness to pay for roads

Australian roads ensure the smooth-running of our daily lives while making a valuable contribution to our economy. The roads network is also an integral part of Australia's multi-modal transport network, although the extent of this is not commonly understood. Indeed, the road network's economic and social value is comprised of a wide range of benefits, with examples including:

- Flexibility in facilitating additional (marginal) journeys that would not have otherwise been taken for business or pleasure
- Enabling improved health outcomes and other essential services
- Connecting rail, sea, air and inland port facilities to markets

Other benefits include enabling light rail services and active transport. Light rail services are only able to offer low emission connectivity, place-making and agglomeration benefits due to the road network on which they operate. Similarly, the proliferation of bike networks and the health and environmental benefits they provide are also facilitated by the road network.

Roads also have a so-called "option value", since they provide people with the option to reside away from a major population hub with a rail network and to travel when the rail network is not operating. This option value offers up both gains in productivity, and social welfare ("consumer surplus").

"Roads make a valuable contribution to Australia's economic growth, jobs and social welfare. This ultimately enhances the well-being and livelihoods of all Australians."

$206.8 bn

Added economic value (GDP) due to roads

Based on economic impact approach using input-output analysis and satellite data

In 2017/18 it is estimated there were 529,000 persons directly employed on a full-time equivalent[1] (FTE) basis in the roads industry, of which 313,000 were in the for-hire industry and 215,000 were in-house. This includes both workers involved in the physical transportation of people or goods and workers that directly support these operations.

The roads industry is also a major contributor to economic activity. In 2017/18, the roads industry was directly responsible for around 4 per cent of Australian gross value-added, of which 2.5 per cent was accounted for by the in-house roads industry.

The total economic value added associated with the roads industry was estimated at $206.8 bn in 2017/18 prices, while total employment is estimated at 1,295,000 FTEs.

The roads industry share of gross value-added is comparable to that of the wholesale trade industry. The broader logistics industry which comprises the activity of the transport, postal and warehousing industry, as well as all in-house transport modes, makes up around 8 per cent of gross value-added.

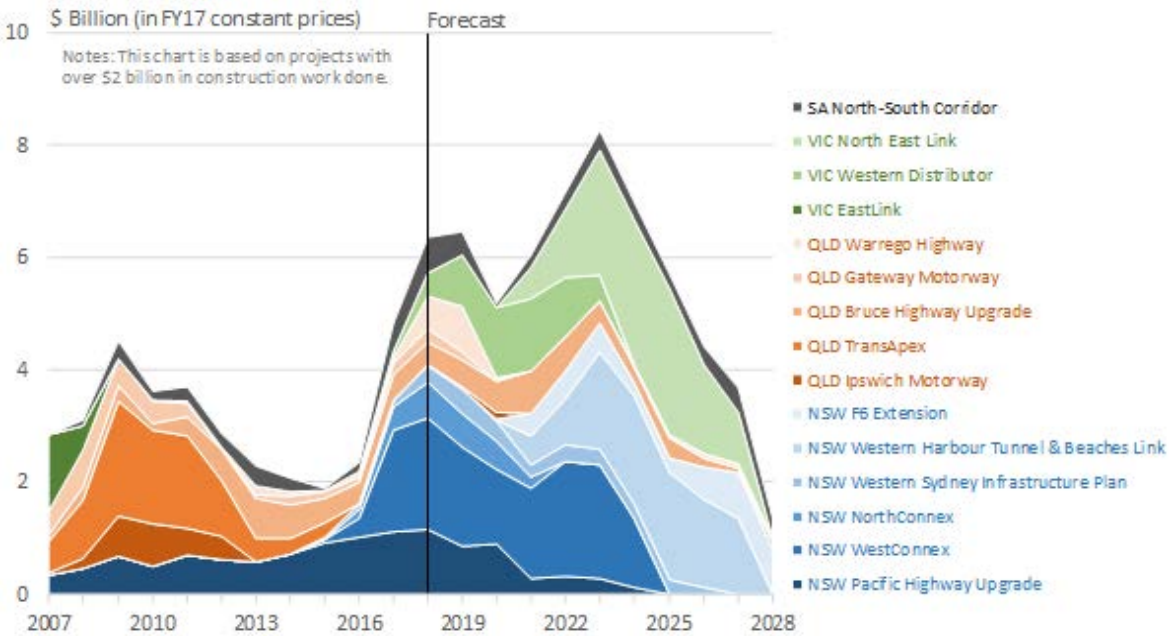
[1] A part-time worker is assumed as 50% of a full-time worker

The total road network coverage in Australia is estimated at 877,651km[2] of which 73 per cent is classified as local roads controlled by local governments.

Looking ahead, there is a strong pipeline of roads activity underway, with total roads, highways and subdivisions activity expected to average $22.7bn over the five years to 2022/23 and $25.4bn over the five years to 2027/28 (in 2016/17 prices).

In the short term, this activity will provide a significant fillip to employment and activity at a time when business investment and consumer spending are sluggish. In the longer run, the increase in the road network will help accommodate a growing population, increased urban density and support the modal-shift required to make our cities more productive.

Major Road Projects above A$2bn



Source: BIS Oxford Economics

In terms of the road network's contribution to economic activity, the for-hire industry is counted as part of the transport, postal and warehousing industry division (Division I) in the National Accounts. However, in-house activities by industries (for all transport modes) are not currently separately identified.

Two well-established and robust approaches were used to undertake analysis into the economic value of the road network:

1. **Economic impact (input-output) analysis**, which involves estimating the road network's contribution to *economic activity (growth)* and *employment*. This approach uses the Transport Satellite Account data[3] published by ABS as a basis for determining GDP contributions. Indirect effects are also included, relating to employment and activity levels required by suppliers to

[2] The Bureau of Infrastructure, Transport and Regional Economics (BTIRE) Statistical Yearbook 2018

[3] Australian Bureau of Statistics (2018), Cat. No. 5270.0

support the current level of roads activity. Meanwhile, induced effects relate to demand from higher household income due to this related employment.

2. **Economic welfare analysis**, which is focussed on "consumer surplus": the benefit that the community receives due to proposed road developments. Technically speaking, consumer surplus measures the (net) willingness to pay for goods and services, after allowing for commodity cost. A welfare approach can also allow for the estimation of "externalities" (or third-party effects) which arise even when no goods or services are directly traded.

The results from these distinctive approaches are summarised in Figure 1.

Fig. 1. Value of roads, 2017/18

Economic impact approach	Value
Economic value	*$billion*
For-hire roads industry	79.9
In-house roads industry	126.9
Total economic value	**206.8**
Employment	*000 persons*
For-hire roads industry	737
In-house roads industry	558
Total employment	**1,295**
Economic welfare approach	**Value**
Consumer surplus	*$billion*
Passenger car and motorcycle	86.5
Road freight	41.4
Bus	3.2
Sub-total consumer surplus	*131.1*
Option value (bus only)	1.9
Total economic welfare value	**133.0**

Source: BIS Oxford Economics

Using alternative approaches gives a fuller picture of value, though it is important to note the distinctions between approaches. The input-output approach, for instance, considers employment and economic activity attributable to the roads industry (for-hire and in-house). It does not therefore cover roads trips made by households for either work or pleasure. The welfare approach on the other hand considers consumer surplus from across all road trip purposes. Thus, it does not consider the cost of journey time and other data limitations suggest that the welfare figure is likely to be conservative.

Crucially, the economic impact results obtained from each approach cannot be added to give a larger impact figure. This arises for several reasons: the bases of each analysis are not directly comparable; the approaches have different methodologies and assumptions; there is an indirect overlap in economic values; and this would result in an inflated figure subject to "double counting". We therefore report each impact measure individually.

1. INTRODUCTION

1.1 BACKGROUND TO STUDY

BIS Oxford Economics has been engaged by Roads Australia to undertake analysis into the economic value of the road network.

The strategic importance of the road network in facilitating a multi-modal network are not well understood. The economic and social value of the road network includes its:

- 'Last mile' role in connecting rail, sea, air and inland port facilities to markets
- Flexibility in facilitating marginal journeys that would not have otherwise been taken for business
- Flexibility in facilitating marginal journeys that would not have otherwise been taken for pleasure
- Important enabling role for health and other essential services
- Agglomeration benefits and other wider economic benefits from overcoming imperfections in secondary markets
- Enabling of light rail, coach and bus services which are intrinsic to public transport provision
- Enabling of active transport including walking and cycling
- Providing connectivity to areas where rail is not feasible, including regional and remote communities

A road does not produce economic output by itself but is an input to economic activity. The marginal contribution of the road network to economic production varies by industry but is on the whole a comparatively small component.

1.2 AUSTRALIA'S ROAD NETWORK

The total road network coverage in Australia is estimated at 877,651km[4] of which 73 per cent is classified as local roads controlled by local governments.

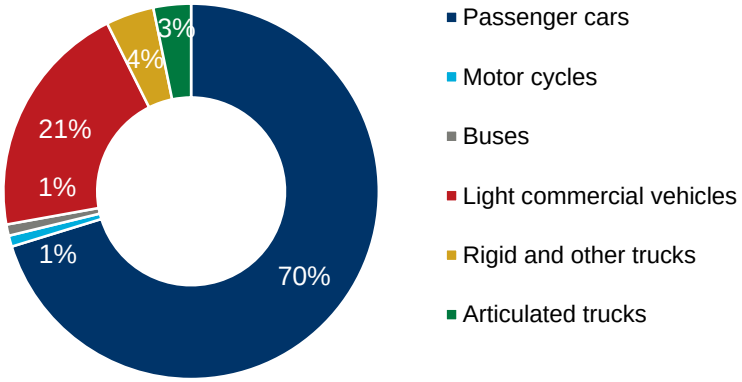
The Australian Bureau of Statistics annual Survey of Motor Vehicle Use, Australia (cat. no. 9208.0) reported 19 million motor vehicles in use for the 12 months ending 2017/18 with an average distance travelled of 13.4 thousand kilometres.

Passenger vehicles accounted for 70.5 per cent of total kilometres travelled and were mostly driven for personal and other use (54 per cent) followed by travel to and from work (25 per cent) and travel for business purposes (21 per cent).

[4] The Bureau of Infrastructure, Transport and Regional Economics (BTIRE) Statistical Yearbook 2018

On average passenger vehicles were reported to have travelled 12.6 thousand kilometres. In comparison, articulated trucks were reported to have travelled 79.4 thousand kilometres on average.

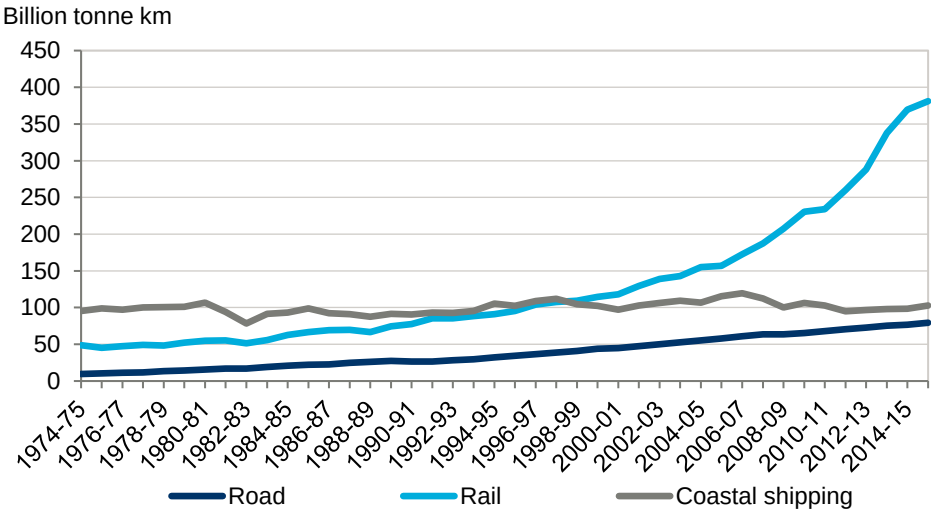
Fig. 2. Mode share of road kilometres, 2017/18



Source: BITRE Statistical Yearbook 2018

The rail network is responsible for moving the bulk of the domestic freight task, with its role have increased significantly over the past two decades. However, the road network plays a crucial role in facilitating this task by providing the 'last mile' role in connecting the freight to its markets.

Fig. 3. Australian domestic freight task, by mode of transport



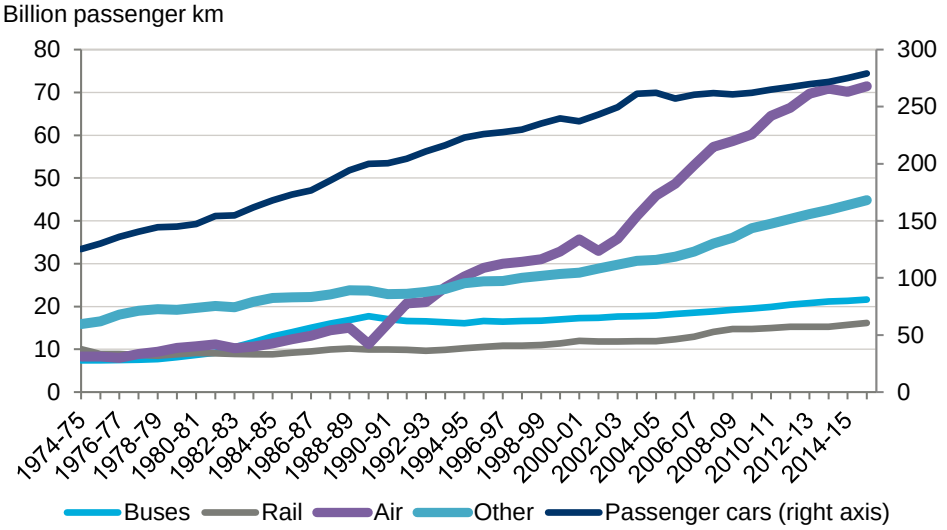
Source: BITRE

In contrast, the road network accounts for the bulk of the domestic passenger task (Fig 3). This includes passenger cars, buses and other non-business use of light commercial vehicles, motorcycles etc.

It should be noted that the transport task figures exclude the increasing use of active transport (e.g. bikes and walking) both for commuting and personal purposes, which are facilitated by the road network. Also, the increasing presence of light rail in major cities and its contribution to the passenger task

are counted under rail, although parts of the route – particularly through the cities – is facilitated by the road network.

Fig. 4. Australian domestic passenger task, by mode of transport

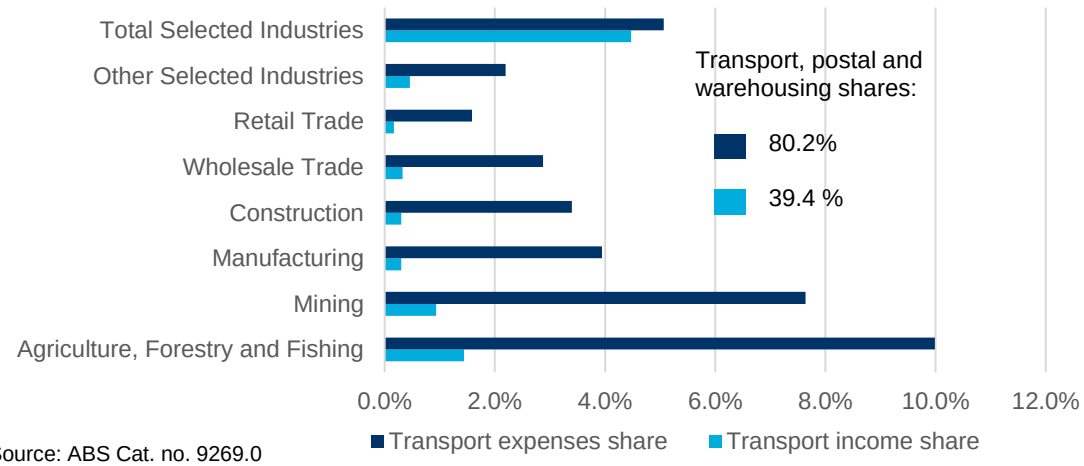


Source: BITRE

In terms of the road network's contribution to economic activity, the for-hire industry is counted as part of the transport, postal and warehousing industry division (Division I) in the National Accounts. However, in-house activities by industries (for all transport modes) are not currently separately identified.

The ABS collected economic and financial data for transport activity undertaken by business during 2010-11[5], which showed that for some non-transport industries transport expenses were a significant part of total expenses. Some non-transport industries also earned a small part of their income from transport activities.

Fig. 5. Business transport shares of activity, 2010-11



Source: ABS Cat. no. 9269.0

[5] ABS, Business Transport Activity, Australia, 2010-11 (Cat. no. 9269.0). The data excludes entities classified as SISCA Sector 3 General Government except for Division D and entities classified to Division K

1.3 REPORT COVERAGE

While the focus of this report is on the contribution of the roads sector to economic activity and employment, one of the key benefits of roads is their 'option value'. For instance, they provide people with the option to reside away from a major population hub with a rail network and they provide the option for people to travel when the rail network is not operating, i.e. at night and off-peak when there are fewer services. This option value offers up both productivity gains and increases in consumer surplus.

Other benefits which can be quantified include the benefits from enabling light rail services and active transport. Whether it is Sydney Light Rail or Brisbane Metro, these projects are only able to offer the low emission connectivity, place-making and agglomeration benefits they do as a result of the road network on which they operate. Similarly, the proliferation of bike networks and the health and environmental benefits they provide are also facilitated by the road network.

Additional research will be required to identify the extent to which the role that roads plays in facilitating the delivery of essential services and potential other social benefits.

We have adopted two approaches to estimating the economic impact of Australia's road network. In Section 2 we consider an input-output based approach to estimating the road network's contribution to economic activity and employment using as a basis the Transport Satellite Account published by the Australian Bureau of Statistics (cat. no. 5270.0). In Section 3 we consider an alternative way of measuring the value of the roads using a welfare economics approach.

2. AN INPUT-OUTPUT APPROACH

2.1 THE ABS EXPERIMENTAL TRANSPORT SATELITTE ACCOUNT

In October 2018, the Australian Bureau of Statistics released An Experimental Transport Satellite Account, 2010-11 to 2015-16 (cat. no. 5270.0). The Transport Satellite Account extends the focus of the core National Accounts to provide a more detailed analysis of transport activity. It includes both transport activities conducted on a for-hire basis (primarily undertaken by businesses classified under the transport, postal and warehousing industry division in the National Accounts) as well as activity conducted by businesses for their own use.

The ABS created four new 'in-house' transport industries, one each for road, rail, air and sea transportation. Using data relating to transport activity undertaken in non-transport industries from Business Transport Activity, Australia, 2010-11 (cat. no. 9269.0) and detailed employment information from the Labour Account, the ABS was able to build up a profile for the inputs and use of the four new in-house industries and adjust the supply-use tables incorporated in the National Accounts to explicitly capture the supply and use relating to in-house transport activity. Each of the new industries was assumed to only produce a single output, being in-house transport relating to the specific mode (road, rail, air, sea).

The Transport Satellite Account assumes that the in-house transport industries exhibit the same input structure and production functions as the equivalent for-hire industries. There are three components identified as inputs in the production of in-house road transport: transport related (e.g. fuel, repairs, parts and rental, registration and insurance costs); non-transport related (e.g. other intermediate inputs such as accounting and support services) and value-added components (e.g. taxes, gross operating surplus and compensation of employees).

In-house transport activity is assumed to either be for own use (ancillary production) or for supplying to another institutional unit (secondary production). It is assumed that all activity within the transport, postal and warehousing industry division is for-hire and no products from this industry have been used as input to the in-house industries.

We have used the Transport Satellite Account data as the base for estimating the current size of the roads industry (for-hire and in-house) and establishing an input-output approach to assessing the industry's broader impacts on economic activity and employment. See Appendix A for more details on approach used.

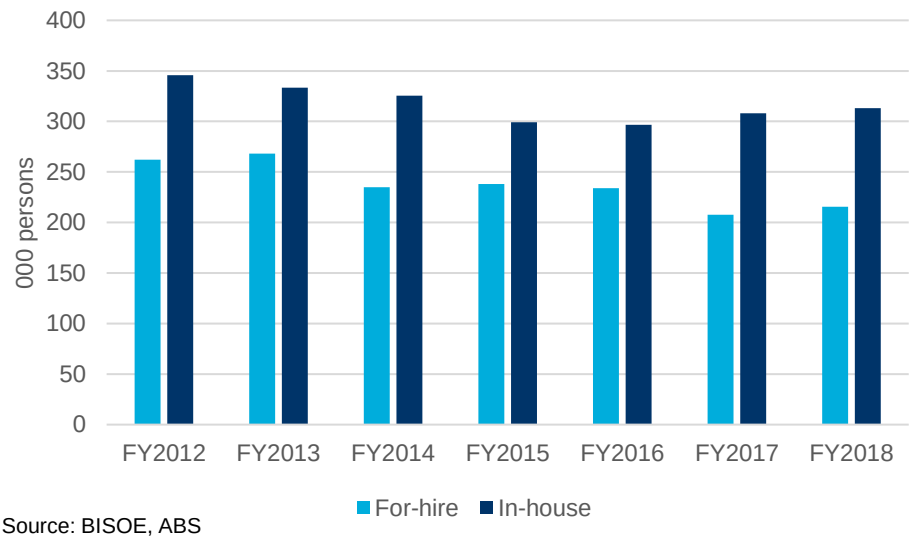
2.2 CURRENT SIZE OF THE ROADS INDUSTRY

In 2017/18 it is estimated there were 529,000 persons directly employed on a full-time equivalent[6] (FTE) basis in the roads industry, of which 313,000 were in the for-hire industry and 215,000 were in-house. This includes both workers

[6] A part-time worker is assumed as 50% of a full-time worker

involved in the physical transportation of people or goods and workers that directly support these operations.

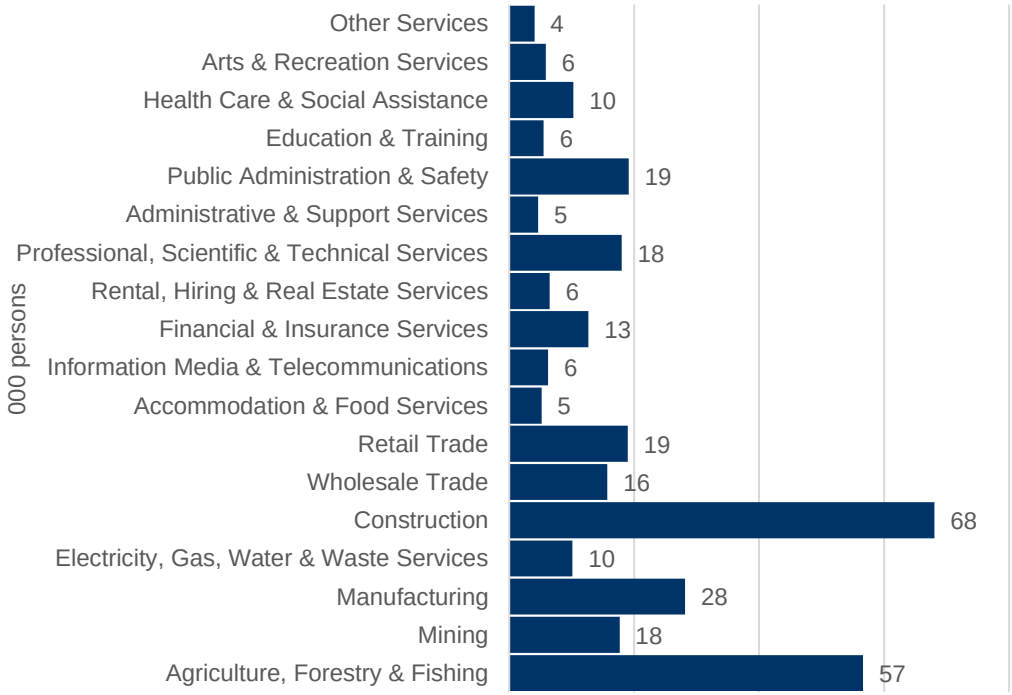
Fig. 6. Roads industry employment by sector (FTEs), 2017/18



Source: BISOE, ABS

For in-house road transportation, the largest employing industry is estimated to be construction with 68,000 full-time equivalent workers in 2017/18, followed by agriculture, forestry and fishing with 57,000 full-time equivalent workers. In total, the road transport industry (for-hire and in-house combined) was estimated to account for 5 per cent of all full-time equivalent employees in 2017/18.

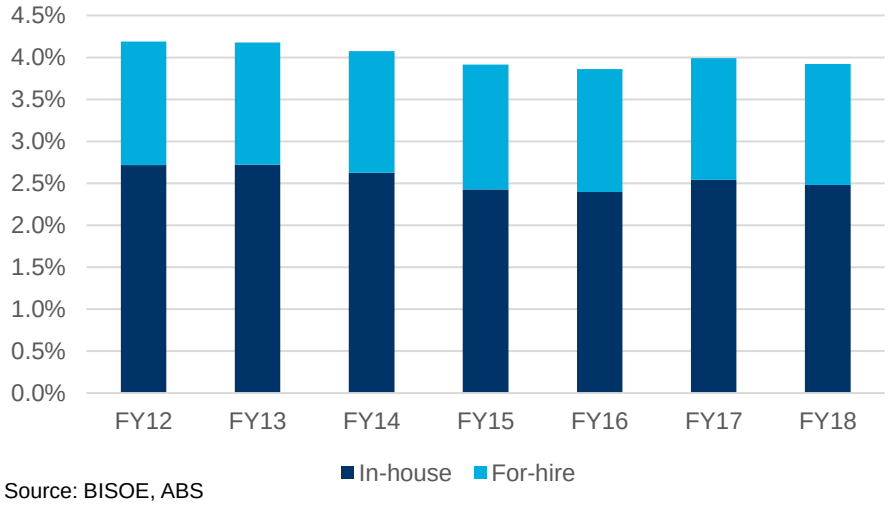
Fig. 7. In-house road industry employment by industry (FTEs), 2017/18



Source: BISOE, ABS

The roads industry is also a major contributor to economic activity. Fig. 7 shows that the roads industry is currently directly responsible for around 4 per cent of Australian gross value-added, of which 2.5 per cent is accounted for by the in-house roads industry. This figure highlights the extent to which the value of the roads industry to gross value-added is underestimated by only considering the for-hire industry.

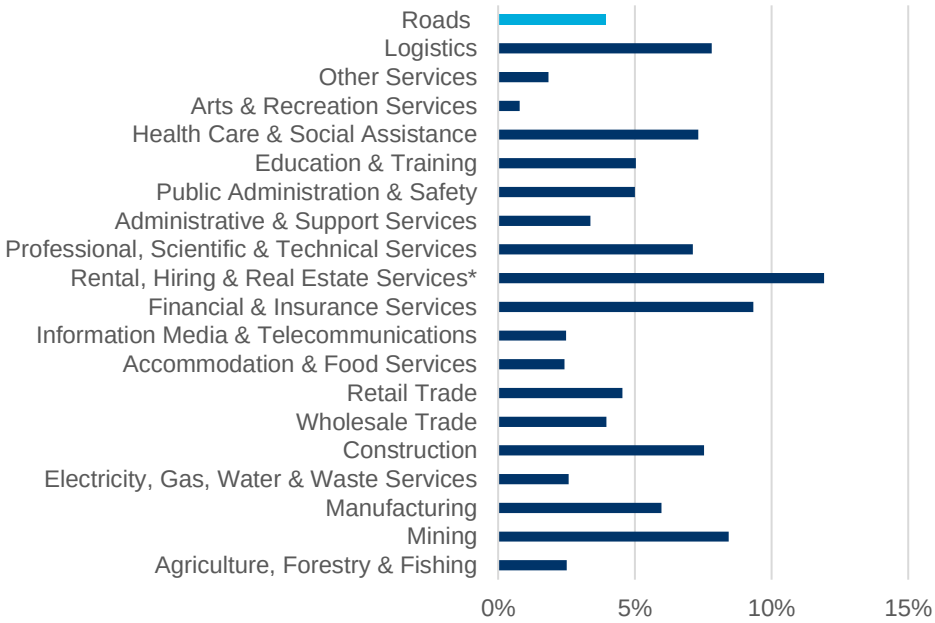
Fig. 8. Roads industry share of total gross value-added



Source: BISOE, ABS

Fig. 8 shows that the roads industry share of gross value-added is comparable to that of the wholesale trade industry. The broader logistics industry which comprises the activity of the transport, postal and warehousing industry, as well as all in-house transport modes, makes up around 8 per cent of gross value added or contributes around the same to value added as both the mining and construction sectors.

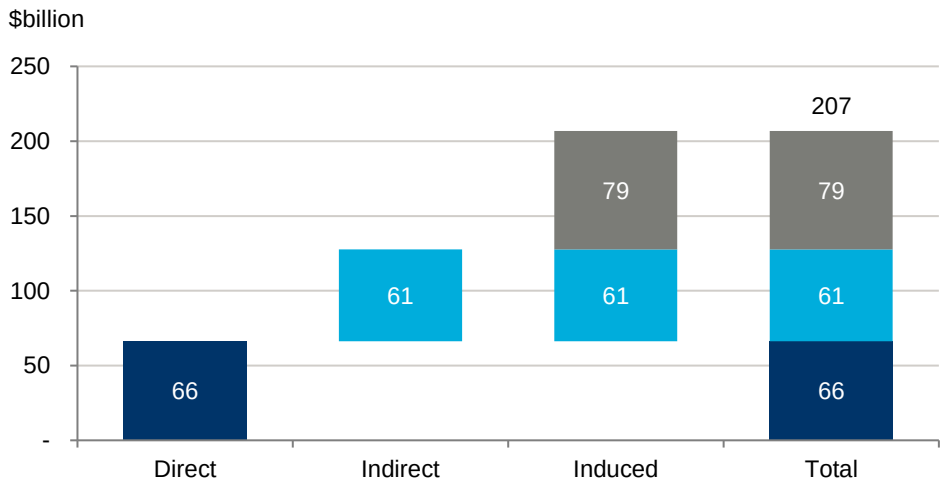
Fig. 9. Roads industry share (%) of total gross value-added, 2017/18



Source: BISOE, ABS (* includes ownership of dwellings)

In addition to the direct employment and value-added contribution of the roads industry, there are broader benefits to the economy, namely the indirect and induced effects. Indirect effects relate to the employment and activity levels required by suppliers to facilitate the current level of roads activity and induced effects relate to demand from increased household income associated with employment (direct and indirect), a proportion of which will be re-spent on goods and services.

Fig. 10. Total Economic Effects of Roads Industry, 2017/2018

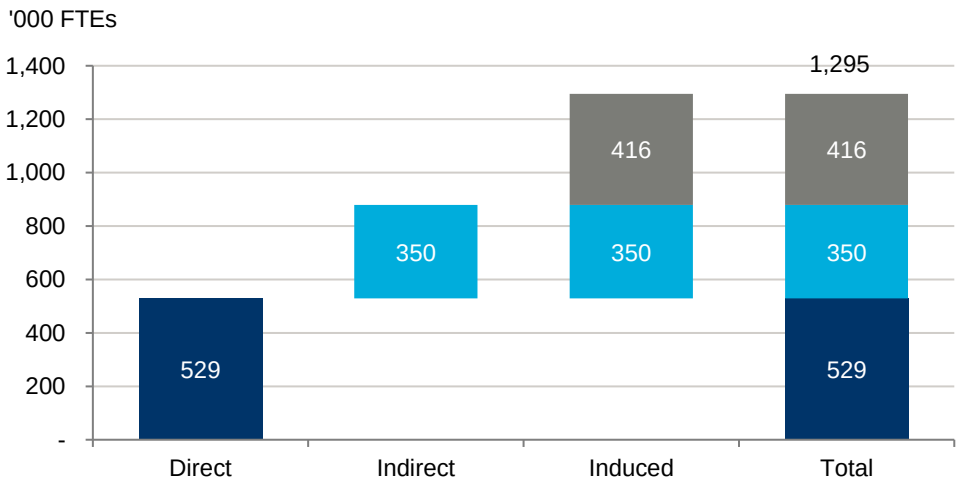


Source: BISOE, ABS

The total economic value of the roads industry in 2017/18 was valued at $207 billion, comprising $66billion in direct effects, $61billion in indirect effects and $79billion in induced effects.

The broader employment effects are illustrated in Fig. 7. In total it is estimated that the roads industry supports around 1.3 million jobs nationally.

Fig. 11. Total Employment Effects of Roads Industry, 2017/2018



Source: BISOE, ABS

The figures above relate to employment and economic activity attributable to the roads industry (for-hire and in-house). The Transport Satellite Account is linked to the supply-use tables incorporated in the National Accounts. It does not therefore cover roads trips made by households for either work or pleasure. The consumer surplus associated with private car trips is measured in the next section.

3. ECONOMIC WELFARE APPROACH

3.1 BACKGROUND

An alternative to the economic impact (or GDP focused) approach to the valuation of roads is the use of an economic welfare approach. Unlike a GDP focussed approach, an economic welfare approach is focussed on "consumer surplus", as measured by the (net) willingness to pay for goods and services, after allowing for the cost of those commodities. In addition, a welfare approach can also allow for the estimation of "externalities" (or third-party effects) which arise even when no goods or services are directly traded. We discuss a key externality (option value) in a later section of this chapter.

3.2 CONSUMER SURPLUS

Consumer surplus is a key measure in assessing the value of commodities to society in an economic welfare sense. Consumer surplus refers to the difference between what users pay for a good or service and what they are willing to pay (WTP) for it. For example, a private road user may be WTP $30 for a trip which only costs her $10. Her consumer surplus is $20. Consumer surplus therefore effectively represents a consumer's "profit" – how much they gain from using a commodity in net terms. The sum of all of the consumer surpluses for individual users adds up to the total consumer surplus for society as a whole for road usage. This allows analysts to measure the net benefit to society from usage.

Consumer surplus (CS) can be estimated using a demand curve relating prices and quantities consumed and data on "price elasticities"[7]. Price elasticities measure the responsiveness of a good or service to a change in price. For example, a price elasticity of 1.0 for road usage means that a 1% increase in the road usage price is associated with a 1% decrease in demand for usage. An elasticity of 0.5 means a 1% increase in price is associated with a 0.5% decrease in demand (known as inelastic demand) while an elasticity of 1.5 means a 1% increase in price is associated with an 1.5% increase in usage.

In essence, a simplified formula for assessing the value of consumer surplus using a linear (straight line) demand curve is:

CS = (Total cost*0.5)/(Elasticity)

While this is likely to form a lower bound value for consumer surplus, it is nonetheless useful in getting a first order approximation of the consumer surplus associated with a given good or service.[8]

[7] For a technical discussion of this see Chapter 4 of Boardman, A., Greenberg, D., Vining, A. and Weimer, D., Cost Benefit Analysis: Concepts and Practice, Fifth Edition, 2018

[8] Technically speaking, models specified in logs (e.g. double log models) can often yield closer approximations to industry demand curves and higher values for CS. However, analysis can "linearise the demand curve" in order to develop a lower bound estimate for consumer surplus values. This is effectively what has been done here.

In the case of valuing Australians' usage of the road network, this approach therefore requires assessing:

1. Total costs of usage
2. The elasticity of demand
3. The values of 1. and 2.for passenger cars and motorcycles, bus and road freight transport.

Note that in assessing item 1, we have limited our valuations to the estimated operating costs of road transport (e.g. fuel, operating costs, fares, fees etc.)[9].

Estimations of the CS value of Australia road transport are described for private vehicles, bus transport and freight below.

Values have been expressed in 2018 dollars.

3.2.1 Passenger cars and motorcycles

Estimates of the cost of passenger car and motorcycle transport in Australia can be derived from multiplying:

1. the number of kilometers traveled per year; and
2. the average cost per kilometer

Item 1. is readily available from the ABS' *Survey of Motor Vehicle Use, Australia.*[10] This indicates passenger car km travelled (179.8m km) and motorcycle km travelled (2.1m km) in the year up to 30 June 2018. This publication also disaggregates km travelled into urban and rural environments which is of use for the calculation below.

Estimates for the car costs per km were based on medium car operating costs provided in the *NSW Principles and Guidelines for Economic Appraisal 2018*, with an assumed average speed of 40 kph in urban areas and 90 kph in rural ones.[11] Separate operating costs for motorcycles were not available, however small car costs for these speeds were used as a proxy. While this may overestimate motorcycle operating costs to some extent, given the relatively small motorcycle km travelled this is unlikely to be material.

This process suggested operating cost of 46.9c/km for urban areas and 29.9/km for rural ones. The equivalent motorcycle costs were 0.34c/km for urban areas and 23.3c/km for rural ones. These estimates produced an average cost of 42.8c/km for passenger vehicles and motorcycles. Given a combined total of some 182million km travelled in the year to 30 June 2018, this implies total expenditure of $77.9 billion. [12]

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[9] While it might be possible to extend the analysis to include the cost of journey time, this poses additional complications given the lack of data on typical journey times and comprehensive value of time elasticities. This also means that our assessments are likely to be relatively conservative.

[10] ABS (2019) Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2018, Cat No. 9208.0

[11] Transport for NSW, (2018) Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, June 2018. These are resource costs including fuel, oil, vehicle capital costs, repair and maintenance.

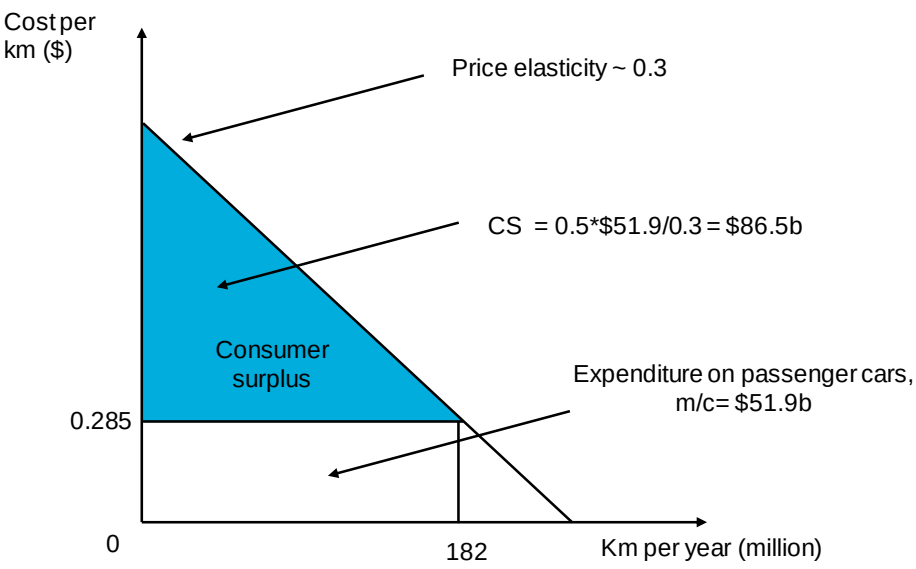
[12] This value is very similar to the figure of $ 82.7 billion for 2015-16 for Australian household expenditure on owning and operating vehicles estimated in Bureau of Infrastructure, Transport and regional Economics (BITRE)

However, this figure includes vehicle capital costs, whereas our interest is in actual road usage activity. Accordingly, the percentage of vehicle purchase costs within total spending on passenger vehicles and motorcycles was estimated based on BITRE data.[13] This was then excluded from the calculations.

This produced a revised operating cost figure (excluding capital costs) of $51.9 billion. A vehicle operating cost elasticity of 0.3 was estimated. based on the extensive international work of Wallis and Schmidt.[14]

This produced an estimated consumer surplus of $86.5 billion for passenger cars and motorcycles, based on the formula given above. The figure below provides a diagrammatic illustration of this figure.

Fig. 12. Passenger car and motorcycle consumer surplus



3.2.2 Road freight

Estimation of a consumer surplus figure for road freight proceeded along broadly similar lines to the estimation for passenger cars and motorcycles above. However, in this case the cost of road freight services can be estimated

(2017) Spending by Australian households on owning and operating vehicles in 2015-16. This alternative estimate provides a cross check to the calculations. Though the figures have some differences (e.g. reference years are slightly different, some passenger cars and motorcycles would be commercially owned) the closeness of the figures is notable.

[13] BITRE (2017) ibid, Table 2

[14] Wallis, I and Schmidt, N.(2003), *Australasian travel demand elasticities: An update of the evidence.,* 6th Australasian Transport Research Forum, Wellington, New Zealand. This figure is also consistent with fuel price elasticities which are more commonly estimated across the literature – see Litman, T 2019 Transit Price Elasticities and Cross Elasticities and de Jong, G. and Gunn, H.F. (2001) "Recent evidence on car cost and time elasticities of travel demand in Europe". *Journal of Transport Economics and Policy*, 35 (2).

from ABS (2012) *Business Transport Activity, Australia, 2010-11* which disaggregates road freight transport services income.[15] The income from road transport effectively constitutes the road freight costs to the broader community for these services and therefore can be used as a total expenditure estimate. This document was a one-off publication, with subsequent published ABS information omitting a precise road freight transport income estimate. However, the estimated costs can be indexed to the broader growth in road transport Sales and Service Income since 2010-11 using the ABS's *Australian Industry 2017-18* publication.[16]

This produces a figure of $35.7 billion in 2017-18 (up from $30.1 billion in 2010-11).

A price elasticity of 0.43 was used for road freight based on extensive past modelling work by the Productivity Commission.[17]

This yielded a road freight consumer surplus of $41.4 billion (i.e. $35.7*0.5/0.43)

3.2.3 Bus transport

As is the case for road freight, a one-off supplement to an ABS publication, (ABS 2011, *Australian Industry, 2009-10)* provides income for both urban and interurban/rural bus transport income from passenger fares. This income effectively constitutes the user cost of bus transport.

As this data:

1. Included tram fares; and
2. Related to income in 2009-10

it was necessary to make adjustments to derive a "pure" bus fares updated figure.

In order to address the first issue above, tram fare income was excluded based on estimates for 2009-10 for the Melbourne tram network.[18] The second issue was addressed by indexing the 2009-10 figures to RBA estimates of the growth in CPI to 2018.[19] This produced an estimated $3.1 billion in bus transport costs in 2017-18 (of which $2.1 billion relates to urban bus transport and $1 billion to interurban and rural transport).

[15] ABS (2012) Business Transport Activity, Australia, 2010-11, Cat. No. 9269.0.

[16] ABS (2019), Australian Industry 2017-18, Cat. No. 8155.0

[17] Productivity Commission (2006) Road and Rail Freight Infrastructure Pricing

[18] Stone, J. (2015), Melbourne's public transport: performance and prospects after 15 years of 'privatisation' Australian Cities Conference 2015. While trams obviously also run on roads, they have been excluded due to the mixed mode nature of light rail (e.g. some routes also run along a dedicated right of way). Only Melbourne tram revenue has been deducted, however this would constitute the great majority of Australian farebox revenue

[19] Reserve Bank of Australia (RBA) "Inflation calculator" https://www.rba.gov.au/calculator/ accessed 16 August 2019

An elasticity of 0.4 was used for urban bus transport – this figure is consistent with estimates from a variety of sources.[20] As there is little Australian evidence for non-urban bus transport, a non-urban bus transport elasticity of 0.9 was based on Dargay and Hanly's major UK study of non-urban buses.[21]

These figures were then used to derive a consumer surplus estimate of $3.2 billion for buses.

3.3 OPTION VALUE

As indicated above, the externalities associated with road transport may also be considered. One such externality is option value. This is essentially the value associated with the option of having access to a good or service without necessarily using it. In a sense it is akin to a kind of insurance value. Accordingly, having the option of using the road network (or aspects of it) may be of importance to Australians whether or not they make extensive use of large parts of that network and/or network services.

While often discussed, there is little quantification of option value in the Australian or international literature. While there appears to be no generic estimation of the value of accessing the road network *per se*, option values are sometimes estimated for forms of road-using public transport such as bus transport. Even here there appear to be a lack of Australian evidence, though publications such as the ATAP Guidelines recognize the importance of option value in this context.[22].

A way forward may be found in the bus transport option value estimates developed by the UK Department for Transport (DfT). These draw on extensive UK research and suggest a bus transport figure of £73 per household, expressed in 2010 terms.[23]

Adjusting these figures to 2018 Australian dollars (allowing for both inflation and purchasing power parity (PPP) exchange rates) yields a figure of $188 per household.[24] Allowing for some 9.9 million Australian households, this suggests a total option value figure for bus services of $1.9 billion in 2017-18.[25]

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[20] Transport for NSW op. cit; Wallis and Schmidt, op. cit ; Australian Transport Assessment and Planning (ATAP) Guidelines (2018) M1 Public Transport

[21] As cited in Litman, op. cit.

[22] ATAP op. cit.

[23] UK Department for Transport (2019), TAG Data Book, May 2019. Table A4.1.8 at https://www.gov.uk/government/publications/tag-data-book accessed 16 August 2019

[24] Allowing for UK inflation calculated using Bank of England, Inflation Calculator https://www.bankofengland.co.uk/monetary-policy/inflation/inflation-calculator accessed 16 August 2019 and OECD Purchasing Power Parities at https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm accessed 16 August 2019

[25] Australian Bureau of Statistics 2016 Census Quickstats https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/036 accessed 16 August 2019

3.4 TOTAL VALUE

The consumer surplus and option value figures estimated above can be combined to derive a total economic welfare estimate for the value of road transport services. This figure represents an alternative to a GDP based approach to the estimation of the value of roads to the Australian community. Using a welfare-based approach the economic value of roads to Australians was estimated as $133 billion in 2017-18.

As indicated above, data limitations suggest that this figure is likely to be conservative.

Fig. 13. Value of roads: economic welfare basis

	$ billion
Consumer surplus	
Passenger car and motorcycle	86.5
Road freight	41.4
Bus	3.2
Sub-total consumer surplus	*131.1*
Option value (bus only)	1.9
Total economic welfare value	**133.0**

Source: BIS Oxford Economics analysis

4. APPENDIX A – METHODOLOGY

Transport Satellite Accounts

- The tables from the Transport Satellite Account were used to expand the supply-use tables associated with the 2015-16 National Accounts to include the in-house transport industries for road, rail, sea and air. Employment and gross value-added for the in-house industries in 2016-17 and 2017-18 were estimated by projecting forward the productivity trends for in-house industries from the Transport Satellite Account using industry employment and value-added movements from the annual National Accounts and Labour Force releases.

- Input-output analysis is conducted using symmetric tables (industry by industry) which are constructed from the supply-use tables (industry by product group). However, converting the supply-use tables to consistent symmetric input-output tables is a nontrivial process and it would not be possible to replicate the approach used by the ABS. A simplifying assumption that outside of the in-house transport industries there is no secondary production was used, so that the supply-use table was considered to represent industry by industry flows.

- An adjustment was made to the 2015-16 supply-use table (with the added in-house industries) to switch the treatment of imports from an indirect to a direct allocation as the area of interest is domestic employment and production.

- The multipliers were then estimated using the expanded 2015-16 supply-use tables and applied to the 2017-18 estimates of employment and gross value-added for the for-hire and in-house roads industries. While the 2016-17 supply-use tables are available, technologies are unlikely to have changed significantly in this time and therefore the 2015-16 multipliers are considered appropriate for use.

- In using an input-output approach no counterfactual is assumed. Obviously, there is some scope with both for-hire and in-house transport movements to be switched to rail, air or sea and therefore alternative uses to be found for resources currently dedicated to roads activity. However, the focus of this analysis is on the currently usage of transport, particularly the road network, and the analytical approach used reflects that.

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