

31 July 2019

Mr Tony Shepherd
Chair
Infrastructure SA
GPO Box 2343
Adelaide SA 5001

infrastructure.sa.gov.au/get-involved

Dear Tony,

20-YEAR STATE INFRASTRUCTURE STRATEGY DISCUSSION PAPER

Cement Concrete & Aggregates Australia (CCAA) welcomes the opportunity to provide a submission to infrastructure SA in response to your Strategy Discussion Paper.

CCAA is the peak industry body for the heavy construction materials industry in Australia including the cement, pre-mixed concrete and extractive industries. Our members operate cement distribution facilities, concrete batching plants, hard rock quarries and sand and gravel extraction operations throughout South Australia.

CCAA members nationally account for 80% of total industry output, with the industry generating \$15 billion per annum in revenue, employing 30,000 Australians directly (and supporting the employment of a further 80,000 people). CCAA members produce and supply the heavy construction materials that are used to construct South Australia's infrastructure. Providing both the raw material and finished product, heavy construction materials contribute to the construction of our roads, railways, bridges, ports, airports, hospitals and schools.

Most importantly, CCAA wishes to impress on the Board of Infrastructure SA, the need to recognise the critical nature of the supply of construction materials, both in terms of availability and cost (cost of production and cost of transport). At the present time, Adelaide has strategically located resources close to and even within the metropolitan area. This gives South Australia a competitive advantage that must be protected from the urban growth pressures that seek to displace these strategic resources. Other capital cities across Australia have often taken for granted the availability of materials and have failed to protect low cost strategically located materials. This, combined with the effect of increased traffic congestion, has significantly increased the cost of delivered raw and

manufactured construction materials. I commend the Victorian Extractive Resources Strategy and have attached it for your consideration.

The discussion paper reflects the fact that infrastructure has substantial cost, and whilst ensuring that infrastructure is properly considered, planned and financed, ultimately any piece of infrastructure is at the mercy of the cost structure that is imposed on the materials, labour and approvals. CCAA submits that if unnecessary cost imposts are removed from industry, the Government infrastructure budgets will be able to go further to provide more infrastructure.

CCAA has also addressed the relevant questions posed in the Discussion Paper as follows:

1. *What infrastructure investment would make the biggest impact to unlocking economic growth in South Australia in the next 0-5, 5-10 and 10-20 years?*

Attraction of large construction companies to South Australia is contingent on there being a continuous pipeline of projects to justify setting up in SA. This also ensures greater competition, lowering the cost of infrastructure and provides greater certainty to the heavy construction materials sector to invest in plant, equipment and people.

The following “Economic Infrastructure” will drive growth in a number of key sectors:

- A Cape Size Vessel Capable Bulk Commodities Port in the Upper Spencer Gulf to service the three iron ore regions in South Australia will open up otherwise uneconomic deposits and can also provide alternative export paths for grain producers;
- An electricity interconnector with NSW will also help reduce electricity costs by drawing on power supplies from other parts of the country and enable exports of renewable energy. The overall benefit of reducing power costs will enable large energy users in South Australia to remain competitive with other Australian states;
- Completion of the north/south corridor and lane duplication on key freight routes.
- Addressing communication blackspots, particularly bringing 4G cellular services to country areas where larger operations, such as quarries, need better telecommunications services to maximise the use of safer equipment that can be remotely operated; and
- Road, power and water networks that can unlock mining and quarrying projects.

In addition, it is critical that infrastructure expenditure remain constant or steadily increasing in the 0-5 year time frame, currently a 20-25% drop is expected in 2020 and 2021. This will harm the broader construction and heavy construction materials sector, people will lose jobs and investment will be stymied.

2. *How can South Australia better manage demand on current infrastructure?*

There are a number of ways to better manage demand on current infrastructure, including:

- Allowing and encouraging the utilisation of Performance-Based Standards (PBS) and other Heavy Mass Limit (HML) vehicles on a greater number of arterial roads in the metropolitan area. Transport for NSW (TfNSW) has recognised that utilising their road network in this way reduces the demand for the expansion of the road network and reduces congestion immediately, by reducing the number of heavy vehicles on the road. The cost to Government and industry is reduced and road users share the roads with fewer trucks.
- Protecting quarry sites within or close to the existing metropolitan area, to ensure truck travel is not increased to quarries further afield.
- Utilising breakdown lanes on freeways for additional lanes, such as the city bound hill west of the Hahndorf interchange, where freeway speeds regularly drop to 40km/hr or less thanks to slow moving traffic in the left lane. Whilst using breakdown lanes for this purpose is not ideal, it has been used quite successfully in other Australian cities. Breakdowns do cause congestion, but for the 95% of the time when there are no breakdowns, traffic flow is vastly improved.
- Many cities in the world encourage workers to start at staggered times. For example, Toronto, in Ontario Canada has shop trading hours typically starting at 10am for retail shopping and finishing at 7pm, which has the effect of delaying the driving times of retail workers in the morning and afternoon peaks. In addition, office workers needing to shop, commute later in the evening. Concrete is generally poured in the morning for technical and logistical reasons and hence concrete agitator trucks are navigating their way through the morning peak. Reducing the morning peak will reduce congestion and in turn reduce concrete delivery costs. Alternatively, encouraging night pours for multi storey commercial and residential as well as road infrastructure, reduces this truck traffic during morning peaks.

3. *How will technology change the transport system in South Australia?*

Technology should enhance the transport system rather than replace the infrastructure which forms the backbone of any living city. The former reversible southern expressway was an excellent example of technology ultimately not being able to cope with the demand on the infrastructure. A two-way southern expressway built in the first instance would have been much cheaper in the long run and even cheaper had it been built in concrete. (See comment below on lifecycle costings)

We must be careful NOT to try and use expensive technology with ongoing running costs to solve what a simple piece of infrastructure can do. For example, the State Government decided that the best way to fix the congestion at the Mount Barker interchange off ramp

was to introduce variable speed limit signs to warn drivers of impending danger of motor vehicles queued onto the South Eastern Freeway. The better solution was in fact, the building of the second interchange, which has eliminated queuing at the first interchange and negated the need for the variable speed limit signage. The new piece of infrastructure also brought other benefits.

4. *How can South Australia take the lead on reducing emissions from transport?*

Concrete roads deform less than asphalt and as a result have been demonstrated to reduce emissions in the vehicle using the road. Furthermore, concrete roads are more reflective meaning they are cooler than asphalt surfaces, helping to keep the overall city temperature down.

Regardless of vehicle technology (eg. Electric, hydrogen or traditional fuels), all vehicles use more energy when stuck in congested cities. The introduction of mass transit and more efficient road systems will both contribute to reduced energy consumption.

Eliminating stop starts and enabling higher consistent speeds to minimise fuel consumption should be the ultimate goal of infrastructure to reduce energy consumption and emissions.

5. *What options are there to establish a reliable, affordable, decarbonised energy system in South Australia?*

Countries or provinces with cheap reliable power AND low carbon emissions either use hydro power or nuclear energy. France (nuclear), Ontario (nuclear and hydro) and Paraguay (hydro) are excellent examples.

6. *How would Adelaide's infrastructure need to change if its population hit two million?*

Infrastructure is and must be seen as the arteries of any city. These arteries are the lifeline of the city. Just as clogged arteries in a human cause damage and ultimately lead to death, congested arterial roads (named that for a reason) will also lead to a slow and painful death for a city, where commuters, goods and services can no longer function.

Adelaide would almost certainly need to build infrastructure more similar to that seen in Sydney and Melbourne, with more tunnels, elevated freeways, underground rail and the planning for this should start early to alleviate congestion, reduce land acquisition costs and minimise disruption for users.

Most importantly, an infrastructure plan to accommodate this level of population should be developed now and infrastructure built to accommodate that, rather than building to a lesser standard and having to come back and re-build wider roads before they have reached their

economic life. Railway Terrace at Mile End was an example of providing for the width, but not aligning the earlier road for its ultimate width, resulting in greater cost to construct and having to remove sections of road that were not even a third of the way through their economic life.

7. *What strategies should be adopted to ensure Adelaide maintains its liveability as it grows?*

Sydneysiders and Melbournians were once jealous of Adelaide being a “20 minute city”. The aim to create infrastructure to meet this objective would once again drive interest from those living in congested cities to move to Adelaide. Adelaide has huge potential to be the place to raise a family with the main bread winner commuting to another city for a few days per week (combined with some telecommuting eg. working from home). The number of people doing this from Adelaide is growing and this should be embraced as a way to grow our population.

8. *How can technology and data be embraced to improve quality of life?*

Adelaide may not be able to offer the jobs required to attract people to move to Adelaide, however technology is giving more people the flexibility to live wherever they choose. If Adelaide can reduce congestion by building more infrastructure, then future telecommuting workers may see Adelaide as a great alternative place to live, with Adelaide providing the benefits of living in a city with all amenities, without the high costs associated with Australia’s most populous cities.

9. *How can South Australia best prepare its infrastructure to be able to adapt to and embrace future technological disruptions?*

We must not make the mistake of assuming that technological disruptions will mean less infrastructure. Whilst it may be the case, those cities with more infrastructure will not be disadvantaged. On the other hand, if it is not the case, those cities with less infrastructure WILL be more disadvantaged. Computers were expected to create the paperless office, but rather we use much more paper. As an example relevant to infrastructure, driverless cars may encourage people to live further from cities as they can commute greater distances safely, whilst sleeping OR being productive OR being entertained. Under this scenario, it would be feasible for an additional 100,000 people to live in Victor Harbor for example, and commute daily to Adelaide.

The moral here is to not use the spectre of the possible to be an excuse for inaction.

10. How should infrastructure be planned in increasingly urban environments with ageing populations?

Underground metro systems to enable all ages to get around quickly and conveniently transforms cities.

Fast rail services to rapidly growing centres, such as Mount Barker (and potentially the likes of Murray Bridge in the future) help decentralise the urban sprawl and help concentrate the development to a small number of areas where this convenience can be supplied.

11. How can infrastructure provide resilience against bushfires, drought, flooding, sea level rises and the like?

Concrete roads are more resilient to higher temperatures (they do not melt in Adelaide's heatwaves as asphalt does). They are cooler and therefore don't contribute to the warming of a city as Asphalt does. Concrete roads stand up better to bushfires (they do not melt), vehicle fires, floods and torrential rain events.

The second Mount Barker interchange on the South Eastern Freeway was a good example of a piece of infrastructure that was critical to enable the evacuation of large portions of Mount Barker and surrounding towns in the event of the threat of a bushfire. The Adelaide Hills in general needs greater capacity roads to ensure evacuations can be carried out without causing gridlock. A single accident at the Mount Barker interchange caused chaos to commuter traffic before the second interchange was built. Similarly, a closure of the freeway reduces the alternative roads to a snail's pace. Not ideal at the best of times, but a disaster waiting to happen in an extreme weather event.

12. What strategies should the Government adopt to ensure the necessary infrastructure is in place so our regions can thrive?

Road infrastructure is key to rural areas. Residents in rural areas need and want:

- Safer Roads, such as a duplication of the Dukes Highway and Highway One from Port Wakefield to Port Augusta. Safer and quicker "spines" enable goods and services to be delivered more quickly, more safely, and with greater assurance.
- Reduced time on roads, by increasing speed limits by building wider and safer roads to accommodate 130km/hr speed limits adopted in many countries around the world.
- Greater connectivity, ensuring digital connectivity keeps pace in the regions with the metropolitan areas.

13. What factors should be considered when making inevitable trade-offs about investment in public infrastructure in the context of funding constraints?

Trade-offs do not necessarily need to be inevitable, rather South Australia needs to shift its thinking and has begun to do so with the new Northern Connector which is being built in concrete. A 2017 Australian Life Cycle Cost Analysis found that compared to full depth asphalt, concrete roads delivered an 11-18% saving in construction cost and a massive 43-55% saving on maintenance costs over a 40 year life for common pavement design scenarios. Overall, the lifecycle of such a project would result in an overall saving in the order of 25%. This saving can then be put back into other infrastructure projects.

It is also critical to protect current resources within and close to the city from urban encroachment. A study by KPMG showed that approximately 32% of the cost of each infrastructure project is in the raw materials. Sydney and Melbourne have learnt the hard way, with the cost of raw materials growing significantly, ultimately making infrastructure less affordable.

In addition, CCAA makes the following two points:

- Firstly, infrastructure investment must be continuous and not be patchy, or up and down, to ensure certainty for business investment and continuity of jobs. This also enables South Australia to retain our best and brightest people.
- Secondly, investment that attracts economic activity should not be delayed, as it is more often than not, a false economy.

14. How can we best plan and accommodate the infrastructure needed to create vibrant and economically productive precincts?

Mass transit systems combined with high density living brings about enormous opportunity to reduce congestion on roads and enables workers to be attracted to jobs domiciled in close proximity to excellent public transport. To be “excellent”, commuters expect regular services not more than 15 minutes apart, preferably less.

15. What opportunities are there to better leverage private investment to drive public infrastructure development?

The State Government should be looking to leverage private investment if it means more infrastructure for South Australians.

16. What challenges and opportunities does South Australia have in supporting our cultural, sporting and tourism activities to ensure our global competitiveness and vibrancy as a location?

No comment.

17. What services are we likely to use in the future that will require supporting digital infrastructure?

Autonomous vehicles, automated delivery systems.

18. How will changing delivery models in education and training impact infrastructure requirements?

No comment.

19. What complementary infrastructure can be built to support better health outcomes across the population?

No comment.

20. What infrastructure is required to support our justice system and emergency services across the state?

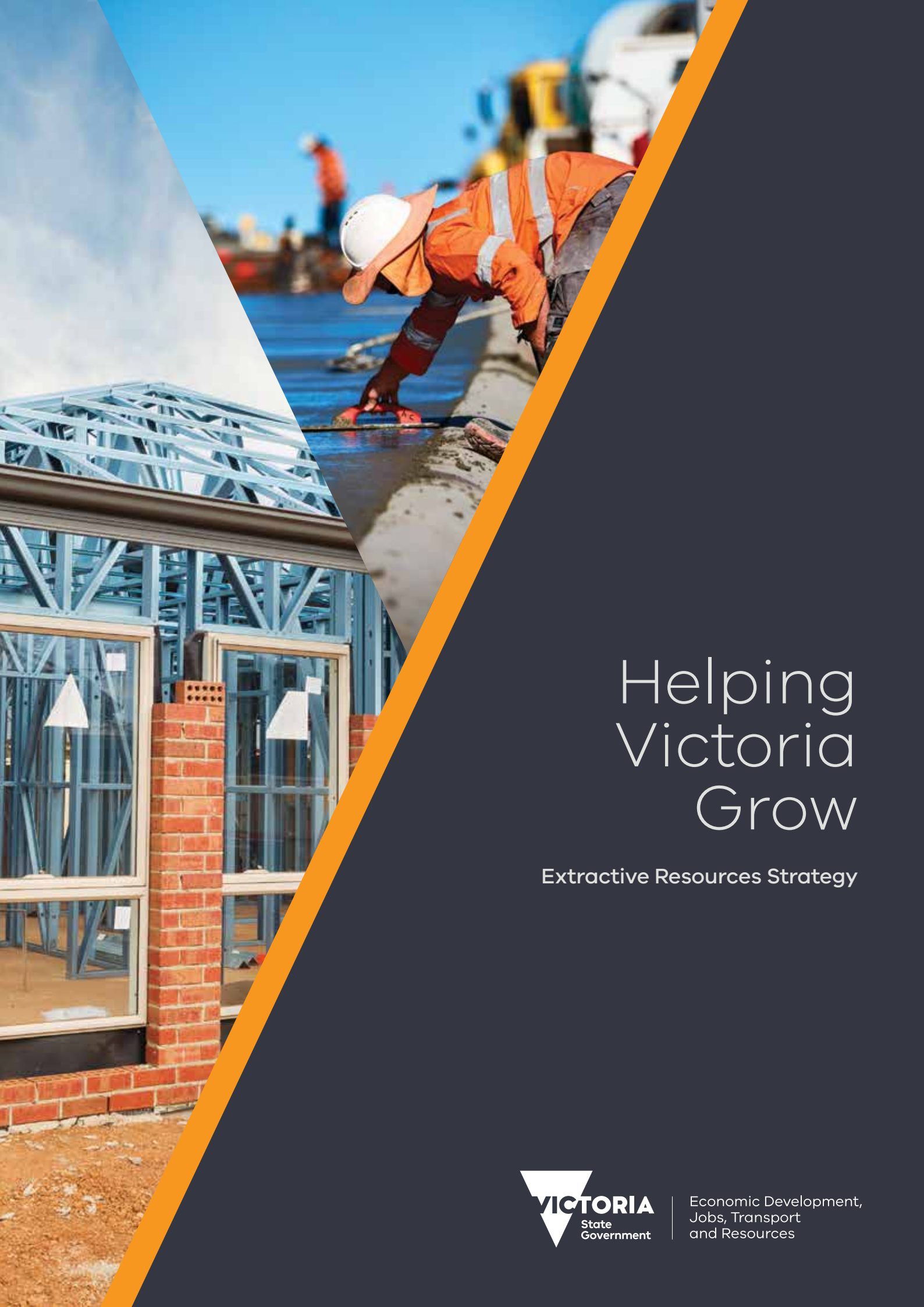
No comment.

Should you wish to discuss any aspect of this submission further, please do not hesitate to contact the undersigned on [DELETED]

Yours Sincerely,

[DELETED]

JASON KUCHEL
State Director NSW & SA



Helping Victoria Grow

Extractive Resources Strategy



Economic Development,
Jobs, Transport
and Resources



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MINISTERIAL FOREWORD

Victoria is growing fast.

More people also want to live in Victoria. Our population grew by 2.3 per cent last financial year – making Victoria the fastest growing state in the nation.

With this growth comes demand for services and pressure on our infrastructure. That's why we're building the projects both big and small that our state needs – and using local workers and products as we build.

A key ingredient for all this new infrastructure currently lies beneath our ground. We must act now to secure our extractive resources: the sand, rock, clay and gravel that will be used to make the bricks, concrete, buildings and better roads of tomorrow. Otherwise, we risk building over these crucial resources and they will become inaccessible.

Transportation of extractive resources is expensive. We need to plan ahead, now, to source quarry materials near to where they will be used, to keep down the cost of transportation and, consequently, the cost of construction. The last thing we want is to need to import our extractive resources from further afield in the future. This will raise the cost of housing and other infrastructure for all Victorians. Longer transportation distances increase the impact on our roads, our communities and our environment.

We need to secure Victoria's extractive resources now to ensure they are available for current and future generations. That's why we have developed Victoria's first Extractive Resources Strategy. The priorities of the strategy are to implement much-needed improvements to the Earth Resources Regulator and undertake long-term resource, land use and transport planning. We will also take actions to ensure local communities are better informed and engaged in quarry planning and able to participate in decision making. We are also planning for the long-term rehabilitation of quarry sites and their integration back into the community landscape.

This new strategic approach will help to secure access to critical materials to build our future homes and infrastructure affordably. We expect this will give more certainty for industry and communities as Victoria continues to grow.

Tim Pallas MP
Minister for Resources

OVERVIEW

Victoria is growing rapidly. Our population is forecast to exceed 10 million people by 2050. We need extractive resources to build new housing, roads, rail lines, hospitals, schools and other public infrastructure to accommodate and service this significant population growth.

The construction materials relied upon by Victorians such as concrete, bricks, asphalt, paving, road base and aggregates are made from stone, sand, clay and other resources extracted from quarries across Victoria. These raw resources are the foundation of our built environment, contributing to Victoria's economic development, liveability and the wellbeing of our communities.

The extractive resource sector underpins our \$23 billion building and construction industry. Maintaining cost competitiveness for construction is critically important for Victoria's future economic growth. Currently, our 535 quarries produce around 50 million tonnes of stone, limestone, sand and gravel each year, generating \$786 million at the 'quarry gate'.

In 2016, demand for extractive resources in Victoria was expected to double to 2050 as a result of ongoing growth in residential and commercial development, our community infrastructure, and transport and utilities infrastructure.

In 2018, demand for extractive resources in Victoria has been tracking at levels higher than previously forecast due to the ramp up in major transport infrastructure investment, while underlying housing demand remains strong. If this high demand trend persists, total extractives production is expected to increase to more than 100 million tonnes per annum by 2050, more than doubling annual production compared to 2016 levels.

While demand for extractive resources is at an all-time high, previously anticipated resource supplies have not all come to fruition or are restricted due to delays in approval processes, strong competition for land or restrictions on existing quarry operating conditions.

535 QUARRIES
PRODUCE

 **50** MILLION
TONNES

of stone, limestone, gypsum,
sand and gravel per year

\$786 
MILLION

GENERATED AT THE
QUARRY GATE

35% OF THE TOTAL
COSTS OF
MATERIALS



for Typical
Construction
Projects

2710 PEOPLE
DIRECTLY
EMPLOYED BY
THE SECTOR 

\$5.4 MILLION IN GOVERNMENT
ROYALTIES
GENERATED
BY THE SECTOR 

Victoria's high demand for extractive resources and emerging supply shortfalls are creating an urgent need for the Government to take immediate action to secure the high-quality resources needed to meet Victoria's current and future infrastructure and affordable housing requirements.

We need immediate action and a long-term approach to ensure supply and keep construction costs down

Extractive resources are high volume, heavy, low value materials that are ideally extracted close to where they are needed to minimise transport costs as well as social and environmental impacts.

High quality extractive resources are finite and only exist in areas of favourable geology.

If we fail to ensure that a sufficient supply of extractive resources is available within close proximity to our growth areas and infrastructure projects, the cost of constructing houses and infrastructure will likely rise. This can lead to more expensive and potentially fewer infrastructure projects for Victorians. Impacts on transport infrastructure will rise, and greenhouse gas emissions and other environmental impacts will increase.

The extractives sector is facing increasingly lengthy and complex approval processes, uncertain outcomes, and transition issues as new policy and reforms such as risk-based work plans are implemented. In the current context of high infrastructure investment and population growth in Victoria, there is a degree of urgency for the Government and industry to find better ways to streamline and expedite approval processes, without compromising environmental and community standards.

There is also evidence that land containing strategic extractive resources is being 'sterilised' by other competing land uses while production from some existing quarries is being restricted due to the encroachment of incompatible land uses into buffer areas.

Planning decisions made today that do not sufficiently consider the importance of securing strategic extractive resources are likely to mean increased costs on the community, industry and government for generations to come. Opportunities may also be missed to shape new post-quarry landforms that provide long term benefits for communities, such as water storages, artificial wetlands and outdoor recreational facilities.

Effective and integrated resource and land use planning is required to identify the areas that are most suitable for resource extraction, taking account of other complementary and competing land use values such as cultural heritage, biodiversity, landscapes and housing. This approach needs to be underpinned by the implementation of contemporary quarrying practices and robust regulation to safeguard public health and environmental quality, as well as building the confidence of the community.

We have an opportunity to proactively plan for the development of extractive resource projects to meet the future housing and the essential infrastructure needs of all Victorians.



The Government will invest \$15.7 million over 2 years to adopt a proactive approach to addressing Victoria's growing extractive resources needs for the Government's record infrastructure investment. This includes funding for the earth resources regulator to manage demand pressures and deliver regulatory reforms and funding for strategic resource assessments and land use planning in collaboration with local governments, an extractives geoscience program, and improved community and industry engagement.

This Extractive Resources Strategy

The Victorian Government has developed this *Helping Victoria Grow: Extractive Resources Strategy* ('Strategy') to help ensure that high quality extractive resources continue to be available at a competitive price to support Victoria's growth.

This Strategy builds upon key insights into challenges and opportunities for the extractives sector gleaned from extensive engagement with industry in 2016 and subsequent discussions with local councils and key stakeholders during 2017.

This Strategy looks 'beyond the quarry gate' to recognise the interactions between a quarrying operation and its surrounding landscape. It applies across the whole quarrying life cycle, from exploration for new extractive resources through to innovative end land uses for quarries. Applying a holistic view provides for an integrated approach to managing the social, environmental and economic impacts of the extractives industry.

The objectives of this Strategy are to:

- Take immediate short-term action to ensure a sufficient supply of extractive resources is available to meet Victoria's immediate infrastructure construction requirements

- Provide secure and long-term access to extractive resource areas of strategic importance to the State
- Maintain and improve Victoria's competitiveness and provide greater certainty for investors in the extractives sector
- Prioritise and implement improvements to streamline regulatory approval processes in the short-term
- Raise community understanding about the role of extractive resources in supporting Victoria's growing population and build confidence in the regulatory performance of the sector
- Encourage leading-practice approaches to sustainability, environmental management and community engagement
- Encourage and support innovation in exploration, extraction and the end use of landforms after quarrying.

This Strategy includes priority actions for implementation in the short, medium and longer term under six broad themes. It will be supported by an implementation plan setting out further detail, timelines and responsibilities to deliver this Strategy.



Themes of the *Helping Victoria Grow: Extractive Resources Strategy*

Resource and land use planning

Strengthening the security of future extractive resources through improved forward planning for resources and land use

Transport and local infrastructure planning

Informing freight transport and infrastructure planning for the delivery of quarry resources to market

Efficient regulation

Helping to build greater industry certainty, confidence and investment in the sector

Confident communities

Building community awareness and acceptance in the extractives sector

Environmental sustainability

Promoting sustainability and environmental stewardship in the sector

Innovative sector

Promoting innovation in the sector, including facilitating innovative end land use for quarries post-closure

Our top three actions

All of the actions outlined in this Strategy are important for achieving the overall objectives. The following three actions are prioritised for immediate attention so that other related actions may in turn proceed. These are:

1

Updating mapping to refine areas for future potential extractive industries, including implementing the Strategic Extractive Resource Areas Pilot Project

2

Implementing the recommendations set out in the Commissioner for Better Regulation's Report on Earth Resources Regulation – Continuous Improvement Project

3

Revising short term supply and demand forecasts to reflect the recent increase in population growth and the Government's investment in new infrastructure



KEY CHALLENGES AND OPPORTUNITIES

DEMAND FOR EXTRACTIVE RESOURCES

Demand for extractive resources in Victoria is growing rapidly

In 2016 the Victorian Government released the *Extractive Resources in Victoria, Demand and Supply Study 2015–2050* ('Demand and Supply Study'), which showed that the demand for extractive resources is expected to nearly double by 2050 (from 47 million tonnes in 2016 to 88 million tonnes in 2050) (Figure 1).

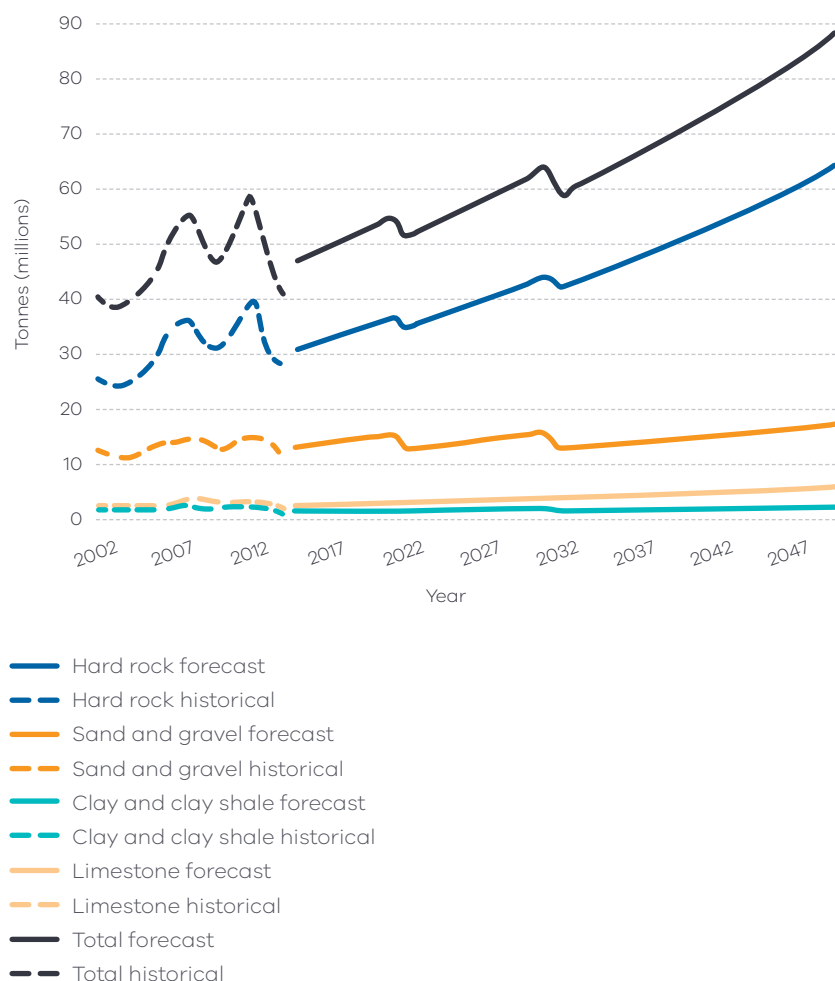


Figure 1: Projected demand for extractive resources to 2050: Baseline scenario (PwC, 2016)

Given the potential for significant year-on-year variations in the production and use of extractive resources across the construction industry, the Demand and Supply Study recommended a range of demand scenarios be taken into consideration in future policy decisions and planning (Figure 2).

Scenarios analysis – Total demand for extractive resources in 2015, 2026 and 2050 (million tonnes)			
	2015	2026	2050
Baseline	46.4	55.8	87.8
High Demand Scenario	55.7	67.0	105.3
Low Demand Scenario	37.1	44.7	70.2

Figure 2: Low, high and baseline scenario forecasts (PwC, 2016)¹

In 2018 there is evidence that demand for extractive resources is tracking even higher than the previously forecast 'high' demand scenario (Figure 3). This unprecedented demand is due to the ramp up in major transport infrastructure investment while underlying housing demand remains strong.

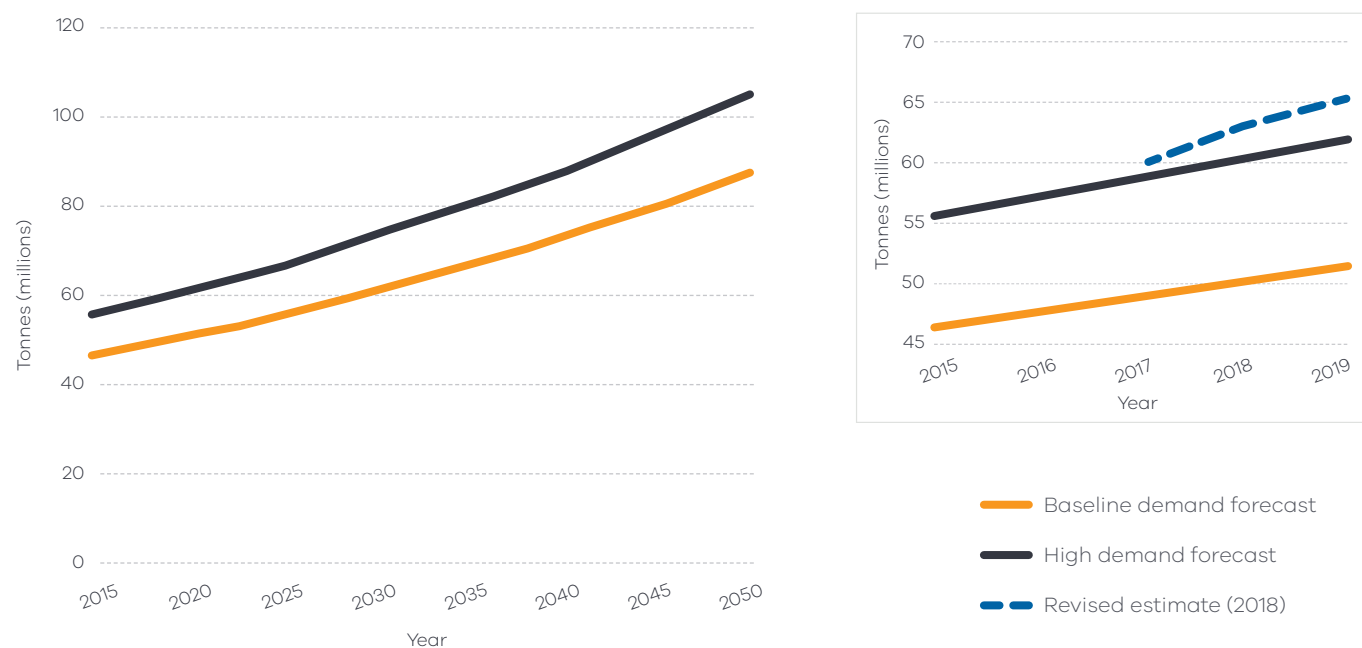


Figure 3: Demand forecasts for extractive resources 2015-2050 (PwC, 2016)
Inset: Revised demand estimate

¹ The high demand scenario assumed 20 per cent increase in demand drivers (population growth, Gross State Product) compared with available projections at the time of the data analysis (2015).

Registrations of trucks that transport resources in Victoria are also up, indicating extractive resources production and transportation is growing (Figure 4).

Truck registration as a leading indicator of demand for extractive resources

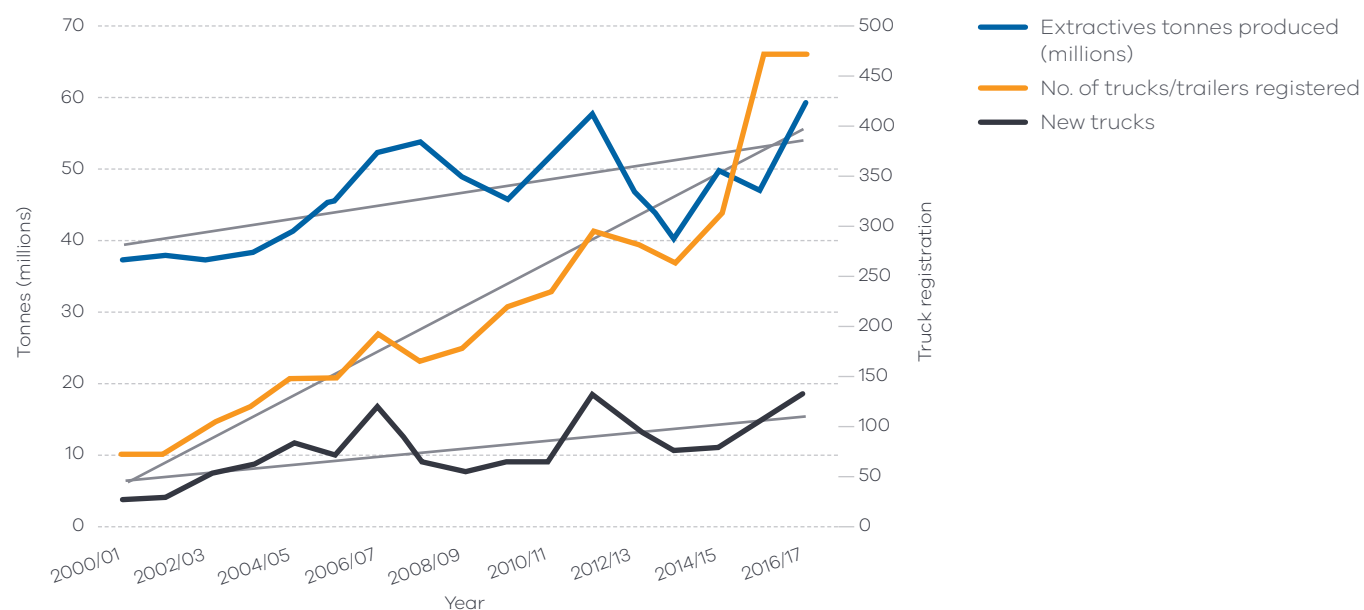


Figure 4: Truck registrations (VicRoads 2018)

If this high demand trend persists, total extractives production would be expected to increase to more than 100 million tonnes per annum by 2050, more than doubling the 2016 annual production levels.



Key drivers and locations of demand for extractive resources

Construction activities that drive the consumption of extractive resources are:

- Residential development, including suburban houses and inner-city apartments. This sector currently accounts for more than 50 per cent of Victoria's demand for extractive resources
- Non-residential development such as commercial, retail and industrial development, hospitals, schools and community buildings
- Transport infrastructure construction such as new roads, road maintenance and rehabilitation works, bridges, railways, cycle paths and airports
- Energy and utilities infrastructure construction such as water treatment plants and wind farms.

Plan Melbourne predicts that between now and 2050, 1.6 million new homes will need to be built in Melbourne alone to house our growing population.

Infill development across Melbourne is forecast to become the largest contributor to demand by 2050. This includes redevelopment sites for housing, as well as strategic urban renewal projects such as Fishermans Bend, the Arden Macaulay Precinct, and the Berwick Health and Education Precinct (Figure 5).

The Demand and Supply Study found that this demand will come from growth in central and fringe areas of metropolitan Melbourne (particularly in the local government areas of Melbourne, Wyndham, Casey, Whittlesea and Melton) and the growing regional centres such as Ballarat, Greater Geelong, Greater Bendigo and Wodonga (Figure 6).

Given this demand, Figure 7 shows areas with potential shortfalls in 2026, with darker-shaded regions representing local government areas with larger potential shortfalls. These shortfalls are expected to worsen by 2050 if appropriately located and sized resource deposits are not secured.

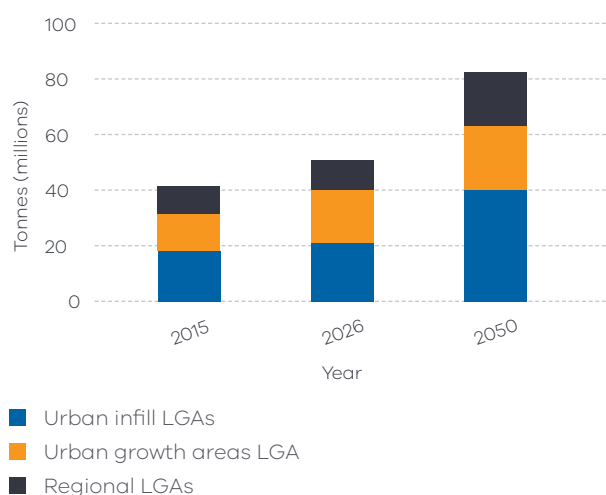
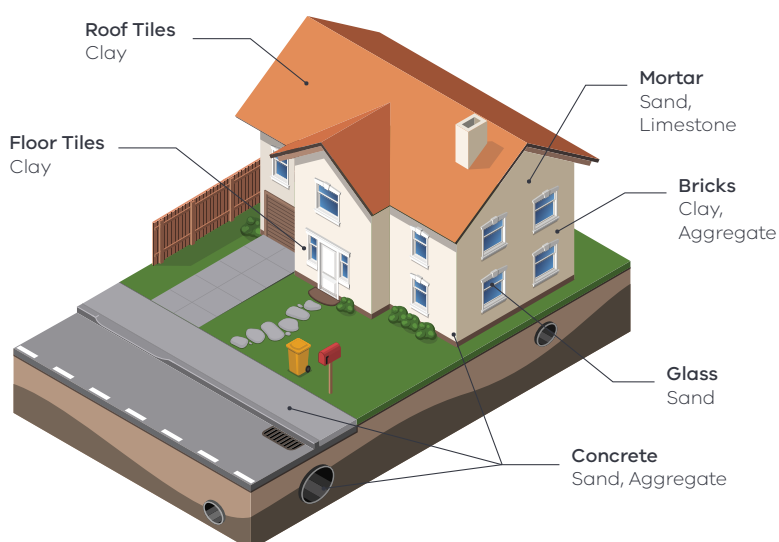


Figure 5: Demand forecast per local government area type (Reformatted from PwC, 2016)

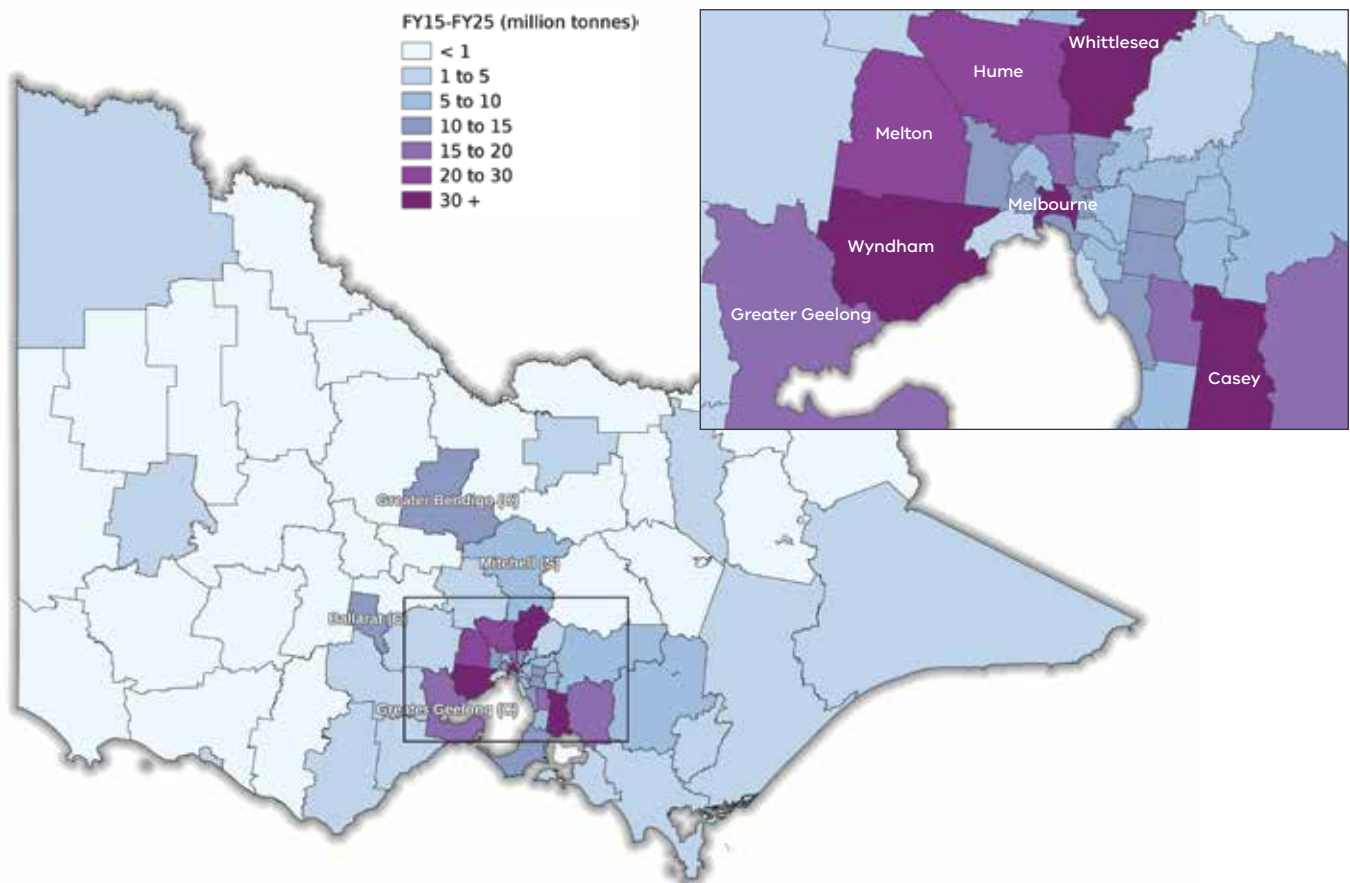


Figure 6: Total demand for extractives by local government area (2015 – 2026) (PwC, 2016)

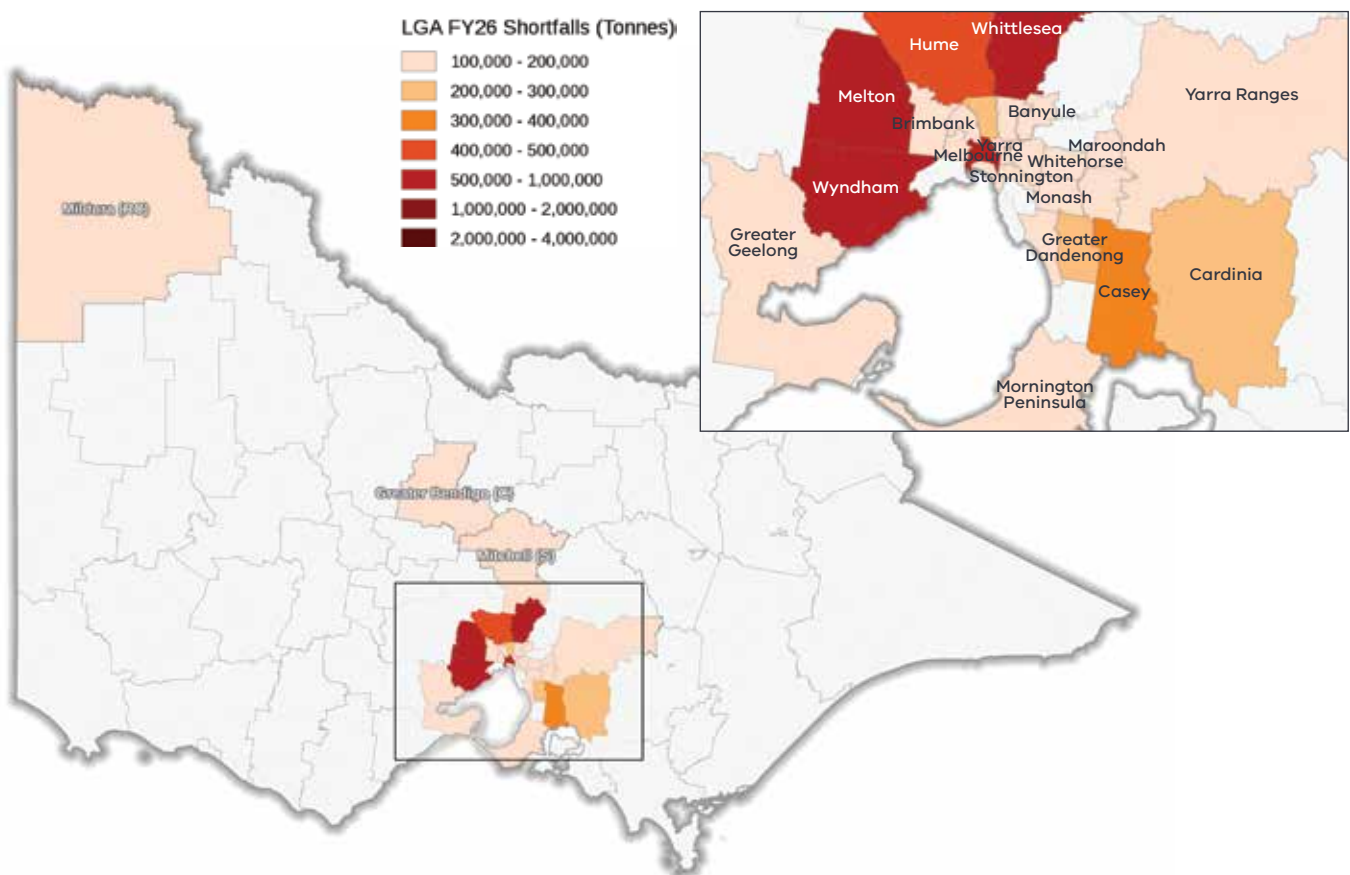


Figure 7: Supply shortfalls to 2026 (PwC, 2016)

Forecast drivers of demand for extractive resources over time

The Victorian Government's major infrastructure pipeline includes \$45 billion of investment to deliver the infrastructure that our growing state needs (Figure 8).

Victoria's current program of Major Infrastructure Projects

Key projects include:

- Metro Tunnel to run for nine kilometres beneath Melbourne's CBD and beyond, including five new underground stations to accommodate new high-capacity trains
- North East Link to create an essential freeway connection between Melbourne's north and east
- Level Crossing Removal Program to remove Melbourne's 50 most dangerous railway level crossings
- West Gate Tunnel Project to provide quicker and safer journeys to the western suburbs, Geelong and Ballarat, and to take thousands of trucks off residential streets
- Regional Rail Revival Program to improve infrastructure and services on regional rail lines across Victoria
- School buildings program, including 70 new schools for Victoria.

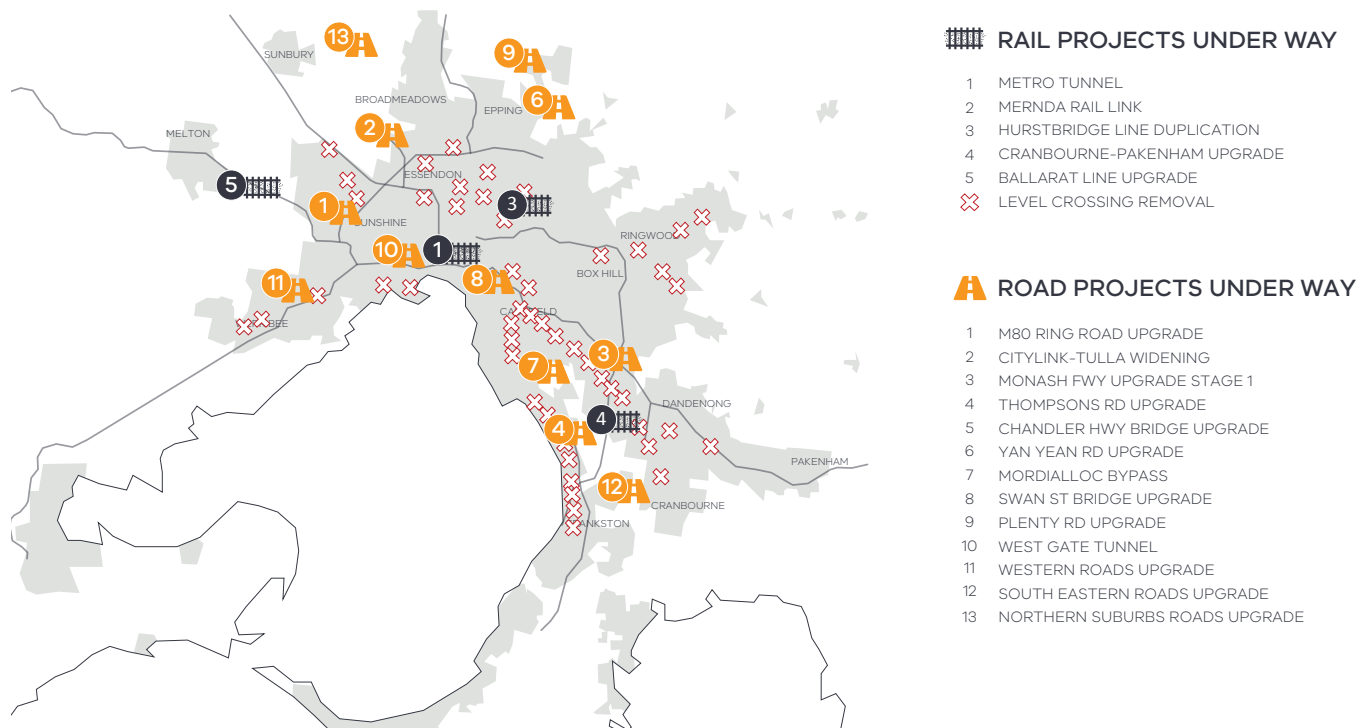


Extractive Resources required for the Metro Tunnel Project

The Metro Tunnel alone is expected to require more than:

- 480,000 cubic metres of ready-mix concrete
- 160,000 tonnes of other extractive materials
- More than 30,000 square metres of precast concrete panels

TRANSPORT INFRASTRUCTURE PROJECTS - GREATER MELBOURNE



TRANSPORT INFRASTRUCTURE PROJECTS - REGIONAL

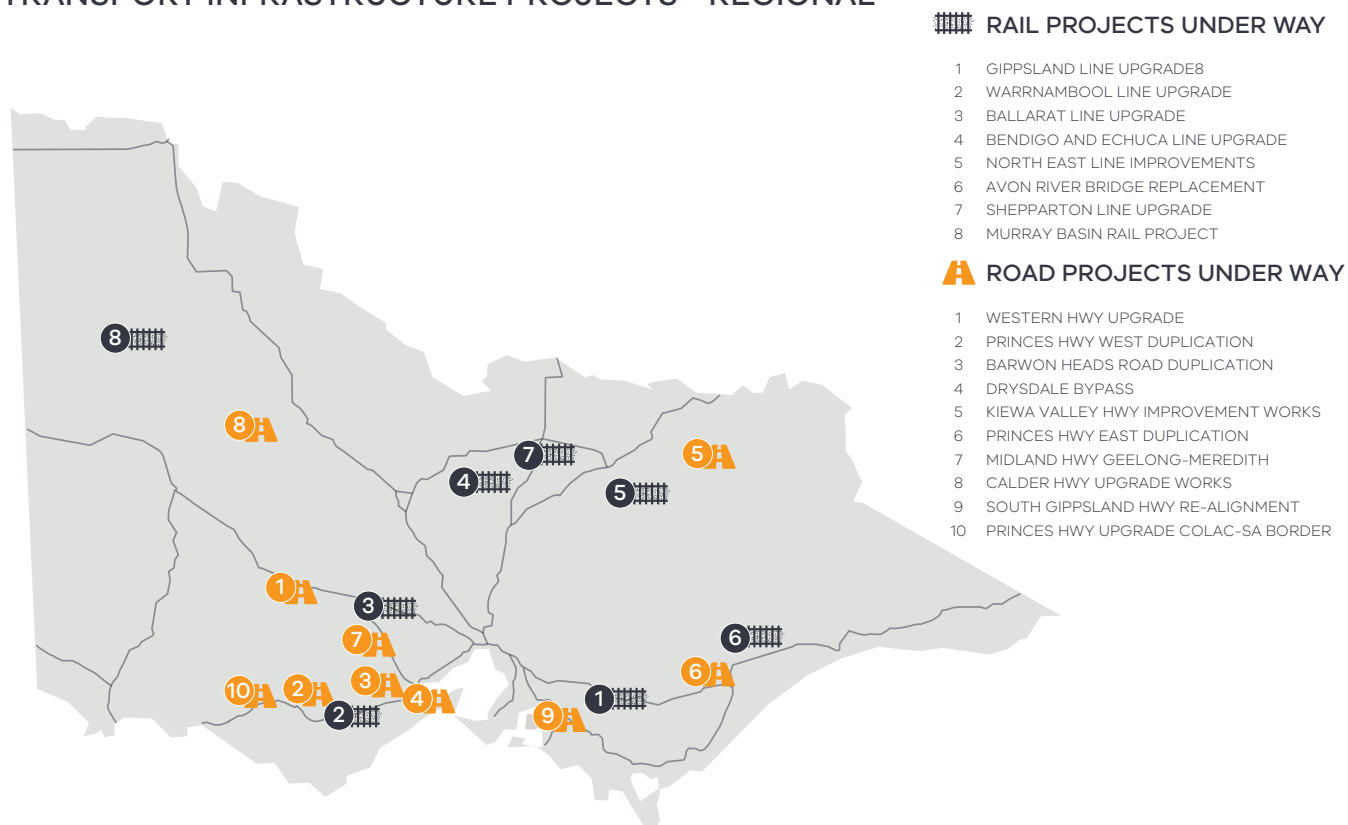


Figure 8: Victorian Government Major Transport Projects

Emerging trends that may impact extractive demand projections

By 2050, the proportion of overall consumption of extractives attributable to residential development is expected to drop from more than 50 per cent today to 39 per cent as commercial, transport, energy and utilities construction all increase their relative share of total extractives demand (Figure 9).

There are a range of factors that can affect demand projections over time, including changes in construction demands, growth in the use of recycled materials in construction and an increase in imported resources.

Changes in construction demands

The production of extractive resources relies on its relationship with construction activities and population and economic growth expectations. Changes in macro-economic demand drivers may influence construction demand, such as:

- Population and household growth influencing residential housing construction
- Employment growth influencing non-residential construction (such as office, retail and industrial)
- Public and private sector investment in the size and scale of large infrastructure projects.

Government policy direction strongly influences construction activity – particularly in the energy, utilities and transport sectors.

Victorian renewable energy commitments will contribute to the growing demand for construction materials in order to facilitate the installation of renewable energy infrastructure across the State.

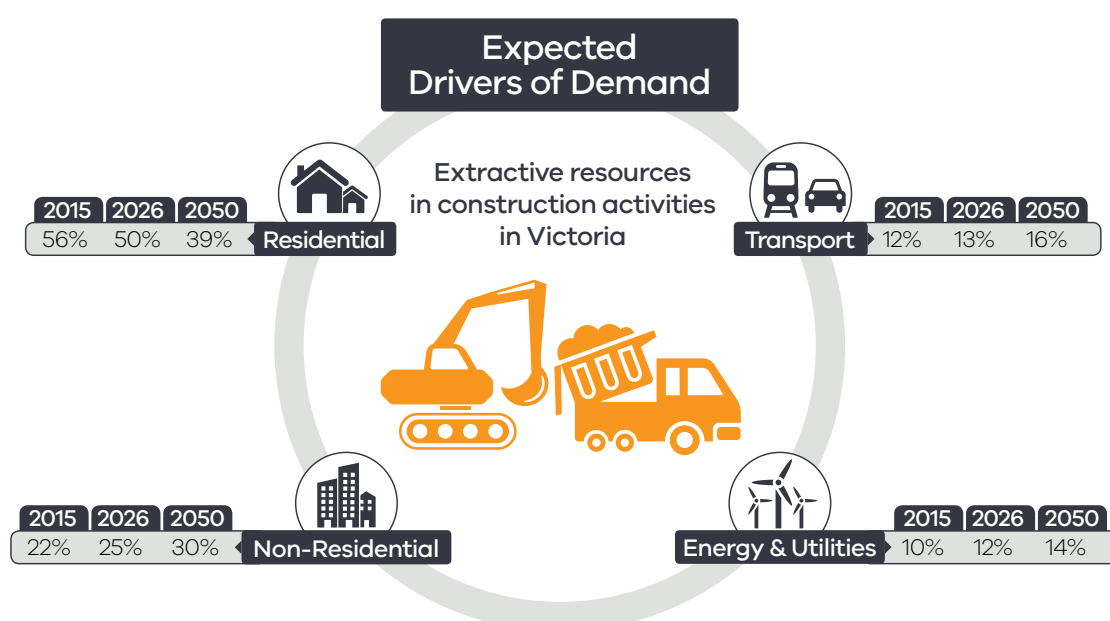


Figure 9: Consumption of extractive resources in construction activities in Victoria (PwC, 2016)

Renewable Energy

The Victorian Government has committed that by 2025, 40 per cent of our electricity will be generated from renewable energy. Renewable energy sources, such as windfarms, will increase demand for extractive resources – particularly in regional areas – as new wind farms and other new energy infrastructure is built.

A typical wind farm turbine requires around 586 cubic metres of concrete (sand, aggregate and cement) for its foundation. Additional concrete and gravel is required for access tracks, hardstand areas and substations (Figure 10). A 100-turbine wind farm could require over 490,000 tonnes of extractive resources.

Growth in the use of recycled materials in construction

Increases in the use of recycled materials as a substitute for extractive resources may reduce demand for virgin extractive resources. For example, reclaimed asphalt can be used in the required mix to manufacture asphalt. Approximately 15 per cent of the asphalt currently consumed today consists of reclaimed asphalt which could increase to 30 per cent within 20 to 30 years.

Road construction specifications may also change, allowing lower quality, but fit for purpose material to be used on certain light-use roads. This helps to conserve scarce, higher quality extractives for strategic projects requiring higher standards of material.

Technological development and trends in construction materials

Innovation and changes in construction materials may also affect demand. For example, plastic road materials are being trialled across the globe as an innovative and sustainable solution to replace concrete. Currently, plastic roads are mostly being considered for access surfaces such as bike lanes and footpaths. This may change as technological advancements are made.

Increase in imported resources

The importation of finished products may also reduce the demand for some extractive resources. Most building façade-related products are currently sourced from outside Australia. This may reduce the quantity of (glass) sand extracted in Victoria. This trend may also apply to other products, with some companies sourcing clinker (a raw material to produce cement) from China. Ultimately, this trend may impact the quantities of extractive resources required to produce cement in Australia.

Adapting to a changing climate

Increased or changing demand for extractive resources arises from the need to deal with impacts of a changing climate (for example, construction of sea walls in coastal areas and increased maintenance or early replacement of infrastructure).

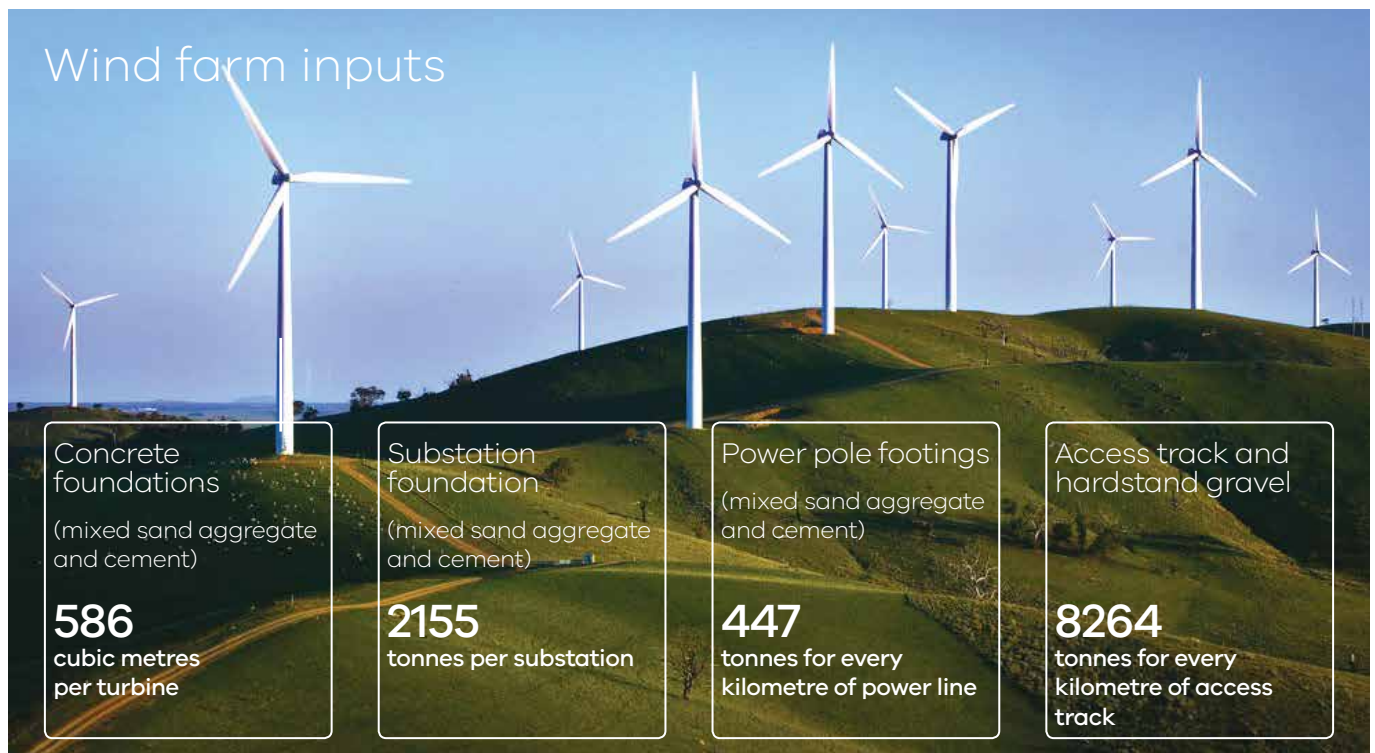


Figure 10: Indicative extractive resource windfarm inputs (figures derived from GHD, 2016)

SUPPLY OF EXTRACTIVE RESOURCES TO MEET CURRENT AND FUTURE DEMAND

The extractives supply industry in Victoria has a variety of participants. These include farmers quarrying small volumes for their day to day needs, small businesses supplying local markets and large multinational businesses producing specialist industrial material. The extractives industry in Victoria is generally considered to be competitive, with around 75 per cent of the State's production produced by 20 companies.

Victoria currently has a competitive advantage with access to high quality resources close to markets. This means public infrastructure, housing and private sector development can be built more cost efficiently. For example, Melbourne's extractive resources are

approximately one third cheaper than Sydney's supply, which flows through to cheaper development costs for Melburnians.

To meet demand in the future, we need to ensure that existing quarries continue to operate and that a substantial number of new quarries become operational in the short to long-term. The future supply of extractive resources close to where they are needed is important to keep transportation costs down for the materials used in public and private infrastructure projects and other economic development.

The Demand and Supply Study found that 34 per cent of demand for extractives in 2050 will need to be sourced from quarries not yet built or planned, due to forecast resource exhaustion. If demand remains at the current high levels, more quarries will be needed to address emerging shortfalls.

SNAPSHOT: EXTRACTIVES INDUSTRY STRUCTURE IN VICTORIA

The extractives industry in Victoria is generally considered to be competitive, with nearly 500 companies holding over 800 work authorities in the State. Around 75 per cent of the State's production comes from 20 companies, with around 55 per cent of production concentrated in four major companies and their subsidiaries. These larger producers tend to operate on a national scale, employing hundreds of people with millions of dollars in operating income generated from a large number of quarries. Smaller producers are often independent or family-owned businesses which may operate only a few quarries. They tend to focus on a local market and run on lower margins.



Resource supply locations across Victoria

Extractive Industry Interest Areas

Extractive Industry Interest Areas (EIAs) were established in the 1990s by the Geological Survey of Victoria. This followed an assessment of land where extractive industry operations were more likely to be established, both for reasons of resource availability and where there are potentially fewer land use planning constraints. EIAs are recognised in Plan Melbourne and Regional Growth Plans to signal the importance of stone and sand extraction to support growth areas.

The current system of EIAs, although identified in the land planning system, do not currently provide a clear mechanism to secure extractive resources of strategic importance to the State. EIAs also require ongoing review and refinement as demand for resources increases and other land use pressures emerge. In some cases, an area previously identified as an EIA has seen opportunities for extractive industries substantially reduced or eliminated altogether due to new housing developments or sterilisation by other land uses such as small farmlet subdivisions or other planning decisions and policy overlays.

Why were Extractive Industry Interest Areas established?

EIAs were established to raise awareness that extractive industry is a potential land use and facilitate the protection (from competing land uses) of stone resources within the Melbourne Supply Area and other regional centres around Greater Geelong, Ballarat, Latrobe and Bendigo.

EIAs sought to do this by:

- Providing a basis for the long-term protection of stone resources from sterilisation by inappropriate land uses
- Providing a basis for ensuring the long-term availability of stone resources for use by the community at a minimal detriment to the environment
- Assisting in considering extractive industry values in long term strategic planning as well as local strategy plans
- Ensuring that planning or responsible authorities consult with all relevant agencies about land use proposals which may impact on the reduction of stone resources within these areas
- Creating an awareness that extractive industry is a potential land use in these areas.

Critical Supply Local Government Areas

The Demand and Supply Study identified the most important local government areas to help ensure the cost-effective supply of extractive resources in Victoria. These local government areas were determined based on the following criteria:

1. Threatened resource type – resource types that are in short supply across the State
2. Resource depletion – supply of resources is unable to meet allocated demand due to exhaustion of reserves
3. Significant production – strong supply locations supporting the State's future development
4. Resources important to Melbourne – resource locations that support strong demand in Greater Melbourne.

Figure 11 shows resource locations critical to Victoria's future supply.

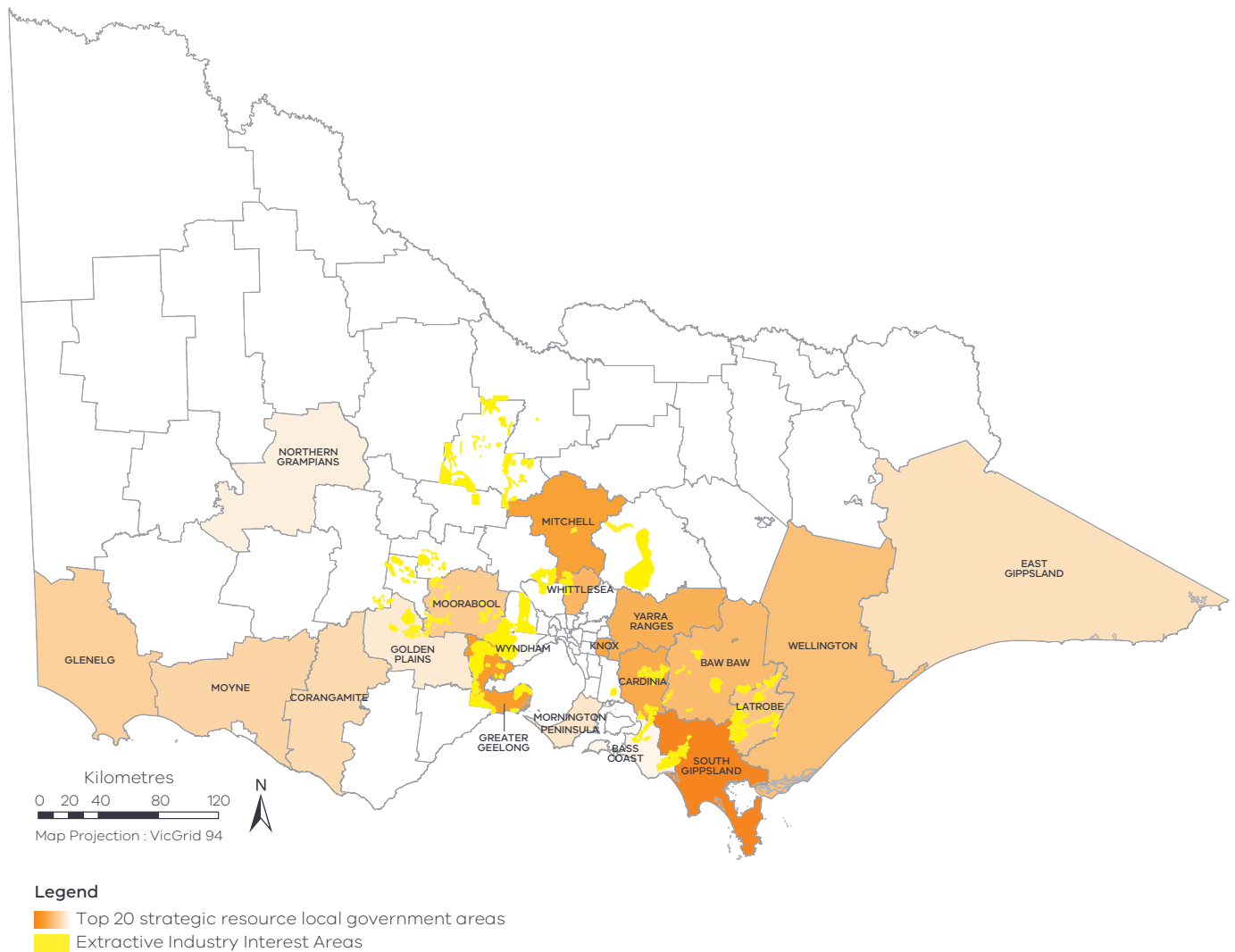


Figure 11: Extractive Industry Interest Areas and critical resource supply local government areas across Victoria. Higher ranked areas are represented by darker shades (PwC, 2016).

As Melbourne and Victoria's regional cities grow outwards, land that previously buffered quarry operations from local communities is increasingly being used for urban development. Many established operating quarries are now under pressure from incompatible land uses, hindering operations and ending extraction prior to planned resource exhaustion.

Development and land fragmentation has occurred over the top of as-yet undeveloped extractive resources, thereby preventing these resources against future exploration. Again, this issue limits state-wide supply of extractive materials.

An analysis undertaken in 2018 of quarry approvals has shown that only a quarter of quarry applicants have been able to secure necessary approvals in the past two years to carry out new production. This indicates there is likely to be even less supply coming on line in some critical districts over the next five years compared to what industry had been anticipating in 2015.



REGULATORY AND PLANNING CONTEXT

A robust suite of legislation is in place to regulate the extractives sector, with the *Mineral Resources (Sustainable Development) Act 1990* (MRSDA) providing the main legislative framework for the extractives industry in Victoria.

The purpose of the MRSDA is to encourage economically viable extractive industries which make the best use of, and extract the most value from, resources in a way that is compatible with the economic, social and environmental objectives of the State.

Industry takes into consideration a range of factors that affect long-term investment decisions including the quality and the availability of the resource, demand, access, and the timing and costs associated with approvals and regulation.

Industry has reported that lengthy and complex approvals processes involved in licencing of new

resource reserves and variations of conditions of existing work authorities affects investment in new and expanded quarries. Though industry carries the immediate cost of lengthy and uncertain approvals processes, ultimately the Victorian community bares these costs through increased construction costs.

Industry has reported that currently, the average time taken to process a work plan approval (including time associated with approvals provided by various Government agencies) is 3.5 years. Whilst it is important that extraction is safe and sustainable, and approvals do not compromise these factors, excessive time delays limit industry's ability to respond to market demand and could give rise to localised resource shortfalls and subsequent price spikes.

Figure 12 illustrates the key stages for processing simple and straightforward quarry applications. Some extractive industry projects are assessed under the Environmental Effects Act 1978, which requires the proponent to prepare an Environmental Effects Statement for assessment by the Minister for Planning.



Figure 12: Key stages for processing simple quarry applications

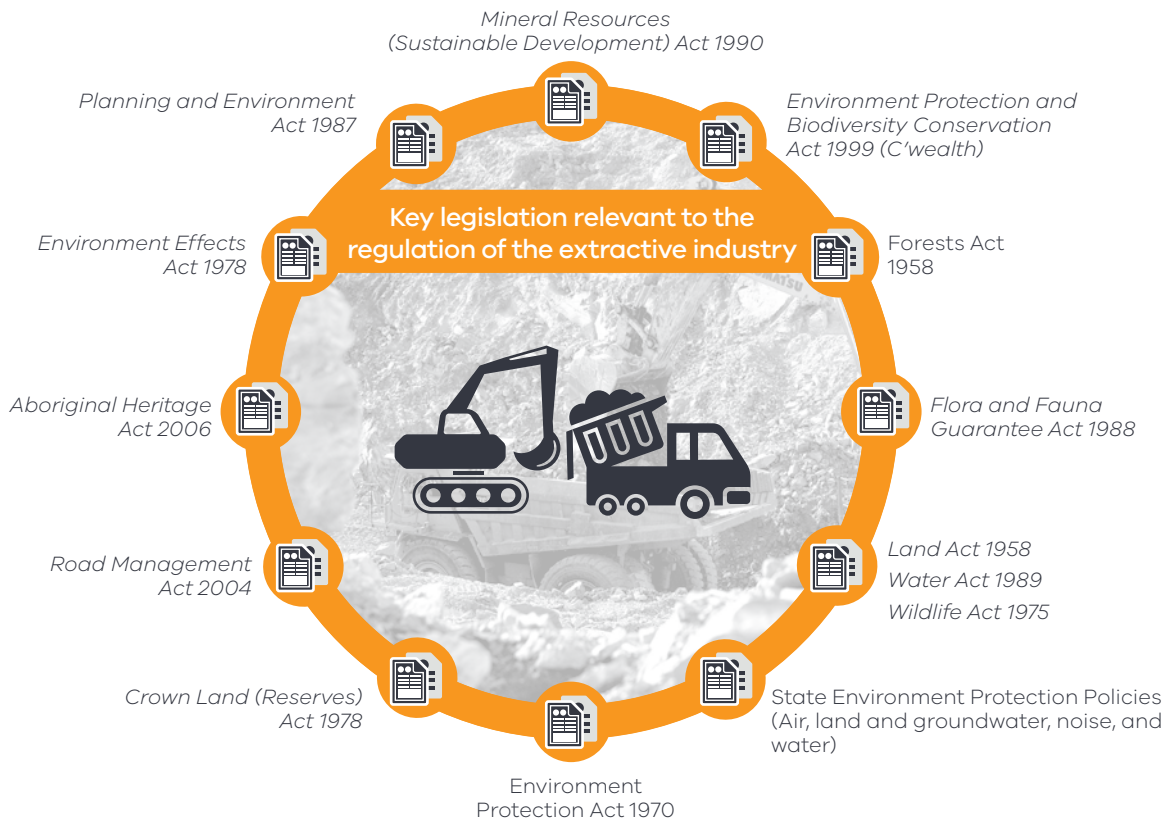


Figure 13: Key legislation relevant to the regulation of the extractives industry

As part of the Demand and Supply Study, industry operators were asked to nominate issues constraining expansion of existing work authorities. Over 14 per cent of respondents identified the Earth Resources Regulator work plan approval process as an issue limiting expansion of their work authorities.

The responses in Figure 14 illustrate the proportion of respondents that indicated the issue affected them – hence numbers do not total 100 per cent.

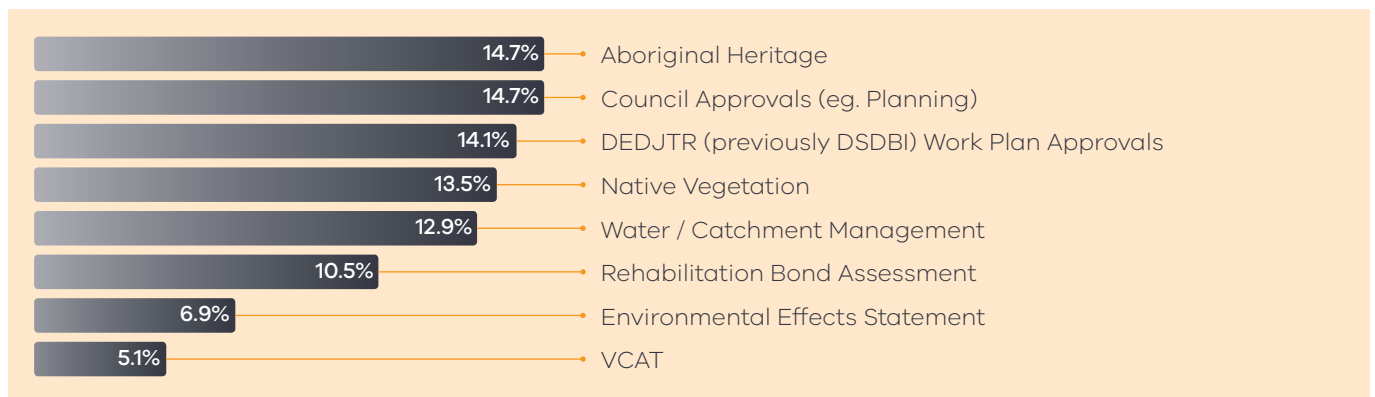


Figure 14: Issues limiting expansion of existing work authorities (PwC, 2016)

Planning

The importance of the extractive industry to Victoria is recognised in general terms in Victoria's planning schemes. The State Planning Policy Framework sets out:

- The need to secure resources and encourage exploration and extraction
- Where and how buffers should be applied
- The need to consider policy documents such as EIAs in planning decisions.

Despite acknowledgement in the planning system of the importance of extractive resources, the sterilisation of our extractive resources by the encroachment of urban development, rural subdivision, and establishment of other sensitive land uses can still occur. Some EIAs around Melbourne have been built over or are at risk of encroachment from urban development.

Strategic planning policy, decisions that facilitate urban development and other land uses also influence the performance of the extractive resources sector. Some of these constraints may reduce the availability of extractive resources in particular areas into the future.

Key strategic planning policies which balance the growth of our urban areas include:

Plan Melbourne

Plan Melbourne recognises the importance to the Victorian economy of the availability of a reliable supply of extractive resources within transport proximity of areas of high demand. Plan Melbourne recognises the need to identify and safeguard strategic extractive resources through the planning system from incompatible land use and development over preservation of extractive resources.

Growth Corridor Plans

These are high level integrated land use and transport plans for the development of Melbourne's Growth Corridors over the next 30 to 40 years. Planning for communities in the growth corridors is undertaken through the Precinct Structure Plan process. The Growth Corridor Plans recognise the role of existing extractive operations, but are silent regarding EIAs or proposed new quarries. This has led to some uncertainty regarding whether extractive industry or urban development should take precedence in some locations when a Precinct Structure Plan is undertaken.

Regional Growth Plans

Together with Plan Melbourne, Regional Growth Plans form the strategic land use plans for Victoria. EIAs were incorporated into the Regional Growth Plans with the aim to guide planning authorities' consideration of identified extractive resources during any future strategic planning.

Urban infill

Projects including Arden-Macaulay and Fishermans Bend Urban Renewal Areas and recent approvals in the growth areas such as the Rockbank Structure Plan and the Werribee Employment Precinct will contribute to future medium to high-density urban development.

Smart Planning

The Victorian Government through its Smart Planning program is simplifying and improving the operation of the planning system to make it more efficient and responsive for proponents.

The Victoria Planning Provisions are the planning policies and controls upon which all land use planning decisions are made.

Proponents of extractive industry projects will benefit from the Smart Planning program's aims to both simplify and improve the operation of the Victoria Planning Provisions. This, combined with the actions outlined in this Strategy such as the Strategic Extractive Resource Areas and the implementation of the Government's Continuous Improvement Program, will lead to a better business climate that supports investment in extractive industry projects.

SUMMARY OF KEY CHALLENGES

Land use planning decisions affecting locally sourced supplies of extractive resources can result in supply having to be imported from further afield. Resource production from quarries in Victoria may not be sufficient to supply future demand leading to ongoing upward pressure on prices. These factors have the potential to flow through to higher construction and road maintenance costs that ultimately affect all Victorians.

Regulatory performance in the sector has not met community and industry expectations. The length and complexity of processes to obtain a work plan limits industry's ability to respond to market demand and could give rise to localised resource shortfalls and subsequent price spikes.

Another consistent challenge for operating quarries and key resource areas is that, in most cases, significant quarry sites and resource areas are not adequately identified nor protected by Victoria's planning schemes. The current EIAs, while identified in the land planning system, do not provide a binding mechanism to secure extractive resources of strategic importance to the State.

Land encompassed by EIAs has also come under increasing pressure from competing uses, which in some instances has caused sterilisation of opportunities for development of extractive industries. A refresh of the EIAs would allow excision of areas considered unsuitable for development of extractive industries, while redefining the remaining areas based on resource characteristics that are of value to the Victoria.

Local councils often report that it is difficult to develop and maintain capabilities and corporate knowledge about the processes for assessing applications affecting quarrying activities because of the complexity of guidance around extractive resources in the planning system. Equally, applications for quarry planning permits are made less frequently than other application types in most councils.

The data currently available to land planners and decision makers also does not usually take into account regular updates and ongoing comprehensive analysis and reporting of the supply and demand balance. Having better data available would allow for better planning and prioritisation to ensure the supply of suitable quality and quantity of extractive resources is available.





Meeting the Challenge: Strategy Actions

This Strategy is structured around six broad areas for action.

Securing strategically important extractive resource areas is vital for Victoria's future growth. Together with major transport and infrastructure planning, efficient regulation and greater certainty in the approvals processes, community confidence in the sector and a new focus on environmental sustainability and innovation will be key.

Outcomes and priority actions under each theme are discussed in the following sections. A summary of Strategy Actions is located at Figure 16, with further details to inform the Implementation Plan for the Strategy in Appendix 1.

RESOURCE AND LAND USE PLANNING



Outcomes

Through better identification of strategic resources and better land use planning, we aim to:

- Identify and secure existing and future strategic extractive resources
- Facilitate open and transparent dialogue with local councils, industry communities and planning agencies
- Improve understanding of the extractive resources needed to support long-term growth within Victoria.

Priority Actions

We will help secure future extractive resources by taking immediate action to:

- Refresh the EIAs to delineate areas of importance to the State and recognise these within the planning system
- Conduct a pilot Strategic Extractive Resource Area project in partnership with local government
- Revise short-term supply and demand forecasts, including updated data on infrastructure investment, population growth forecasts and industry survey data
- Engage early and often with stakeholders on key strategic planning initiatives (e.g. Plan Melbourne, Land Use Framework Plans) to inform these processes about the location and importance of critical extractive resources
- Build a better understanding of the economic case for securing strategic extractive resources, including by developing a dynamic economic model that assesses the demand and supply of extractive resources on a spatial and temporal basis across the State.

Key Issues

Refresh Extractive Industry Interest Areas

EIAs remain an important and current evidence-base for informing planning decisions in relation to extractive industries and other land uses. By refreshing these areas and refocusing them on extractive resources of State importance, these resources will be afforded greater recognition in the planning system. This is an immediate action that will shorten the timeframe developers endure to identify suitable land and gain necessary approvals, with the aim of addressing short-term supply limitations.

Strategic Extractive Resource Areas – Concept and Pilot

Though the Victorian planning system recognises some important extractive resource areas, it has not always been possible to prioritise extraction and effectively prevent encroachment upon these resources to date. The current EIAs, as identified in the land use planning system, are too extensive, not consistent with other Government strategic planning documents, and do not provide a binding mechanism to secure extractive resources of strategic importance.

To help address this, the Victorian Government has developed the concept of Strategic Extractive Resource Areas, which it is currently piloting in two key extractive resource locations in partnership with Wyndham City Council and South Gippsland Shire Council (Figure 15).

SNAPSHOT: STRATEGIC EXTRACTIVE RESOURCE AREAS PILOT PROJECT

Purpose: The Strategic Extractive Resource Areas Pilot Project aims to trial mechanisms available within Victoria's existing planning system that could be applied to recognise and secure strategic extractive resource areas within local government areas.

Outcome: The Pilot Project will lead to securing extractive resources of strategic importance for the construction of public infrastructure, affordable housing and private sector development now and in the future.

Key Components: The Pilot Project will include:

- Conducting geological investigations to identify and map the highest quality rock and sand resources
- Preparing a landscape inventory to identify key natural, cultural and existing land use values, and transport networks, to inform the selection of areas suitable for resource development
- Undertake economic analysis to inform an overall 'net community benefit' assessment to determine the optimum or 'on balance' strategic resource area locations
- Examining and implementing suitable strategic land use planning instruments to secure access to the identified resource areas
- Engaging with local communities to inform the overall approach

Timing: The pilot project is expected to take 12 to 18 months to complete.

Initial pilot council partners:

- Wyndham City Council – peri urban Melbourne, hard rock
- South Gippsland Shire Council – regional pilot, sand



Figure 15: Components of a Strategic Extractive Resource Area

The partnership with Wyndham City Council aims to secure the supply of hard rock resources close to Melbourne. The Wyndham local government area is one of the largest producers of hard rock in Victoria with multiple stone quarries along its western growth front. The Wyndham City Council pilot project provides an immediate opportunity to test planning instruments for securing existing strategic extractive resources which interface with urban development.

The South Gippsland pilot project will help secure the Nyora sand resource in the north-western area of the South Gippsland local government area. The pilot is expected to involve collaboration with adjacent councils that share the strategic sand resources (Cardinia and Bass Coast).

Strategic Extractive Resource Areas will be identified based on geological studies showing significant resources, an assessment of surrounding natural, cultural and existing land uses, supporting transport networks and proximity to markets. Once identified, they will be built into the land planning system to ensure that consideration is given to Strategic Extractive Resource Areas in planning decisions. Identification of these areas may happen alongside similar Government projects to identify and secure other strategic resources such as agricultural land.

The pilot project will involve engagement with local communities, industry and government stakeholders to develop an understanding of natural, cultural and existing land use values and transport networks to inform the selection of areas suitable for resource development. State and local governments will work together to research and map the geology of selected areas and determine suitable land planning mechanisms to recognise Strategic Extractive Resource Areas that will appropriately secure the resource.

Informed by the pilot project, the Government will progressively roll out Strategic Extractive Resource Areas in suitable areas across Victoria. The establishment of Strategic Extractive Resource Areas will be underpinned by quality data which is easily accessible by state and local governments, industry and the community.

Strategic engagement

Engaging with strategic planning processes that set future directions for land use, such as that done during the Plan Melbourne implementation and development of regional growth plans, will help to ensure that the state-significant strategic extractive resources are recognised and can be secured for future use. Through all these processes, we need to make sure we are engaging early and with the best available information to inform decisions that will impact on the future availability of strategic extractive resources.

This will include not only engaging in the development of specific Strategic Extractive Resource Areas, but also continuing to ensure land planners are aware of identified key extractive resources (such as those located in EIAs and in critical supply local government areas) so as to avoid sterilisation of significant and limited resources.

Up to date supply and demand data needs to be available to inform land planning decisions

By improving knowledge about the sector, including the provision of accurate supply and demand data and economic information, we will be in a better position to inform planning and regulatory decisions.

To better predict and adjust forecasts according to changes in the demand and supply of extractive resources, we will partner with industry to implement improvements in the way we collect, report and account for the resources available or planned for future use. This will allow the Government and planners to make better and more timely decisions on priorities and approvals.

To inform future planning decisions, the Government will also build a better understanding of the economic case for securing strategic extractive resources, including by developing a dynamic economic model to assess the demand and supply of extractive resources on a spatial and temporal basis across the State.

Once in place, Strategic Extractive Resource Areas will help to provide certainty to industry, local and state governments and the community.

TRANSPORT AND LOCAL INFRASTRUCTURE PLANNING



Outcomes

By informing transport and local infrastructure planning, we aim to:

- Determine transport impacts and network development needs to support the forecasted significant growth in the extractive resources industry
- Improve the efficiency of transporting heavy construction materials
- Improve network capacity, access and productivity of heavy vehicles transporting construction materials.

Priority Actions

To better inform transport and local infrastructure planning for extractive resources, we will:

- Improve data collection and sharing to better inform the development of transport strategies and plans to recognise critical transport networks of extractive resources
- Encourage development of dedicated quarries close to new major regional infrastructure projects
- Review existing contributions made by the extractives industry to address local infrastructure impacts.

Key Issues

Improve data collection and sharing to better inform extractive resource transport networks in transport and infrastructure plans

Transportation of extractive resources is expensive. The greater the distance between a quarry and the point of use, the higher the cost to the construction industry and ultimately to Victorians.

Additional travel distances also have social and environmental impacts on the broader community. Benefits from reducing travel distances include increased road safety, reduced traffic congestion and road damage, protection of amenity in local areas, and fewer greenhouse gas emissions.

Proactive transport planning is needed to ensure efficient routes from quarries to market. As quarries are exhausted close to current areas of demand and new areas of demand emerge in the future, new road infrastructure or upgrades may be required to enable prompt and reliable delivery of these materials.

LOCAL QUARRIES FOR LOCAL INFRASTRUCTURE

The Mount Mercer Wind Farm in Western Victoria utilised materials of a small co-located quarry for wind turbine foundations and access tracks.

The Stockyard Hill Wind farm – also in Western Victoria – will also utilise materials from a small co-located quarry.

Encourage development of dedicated quarries close to new major regional infrastructure projects

Extensive transport distances can also be managed by encouraging development of dedicated quarries to support new major regional infrastructure projects. Quarries that are co-located with construction projects can minimise negative impacts associated with long distance travel. They also help to mitigate against local shortages of materials being available for other local projects or infrastructure programs. Major infrastructure projects in regional areas present the greatest opportunities for co-located quarries.

Review existing contributions made by the extractives industry to address local infrastructure impacts

Vehicles carrying extractive resources have an impact on roads. Freight transport vehicles contribute to road maintenance through a number of government fees. Where regional roads are frequented by trucks carrying extractives, particularly for major projects, costs borne by industry (for example, developer fees and road contributions embedded in planning decisions) vary considerably and at times may be below those borne by local communities. A more consistent and fair collection and distribution of funds based on the actual use of the transport network is required.

The Demand and Supply Study found that between now and 2050, Victoria will incur an additional \$2 billion in costs for every additional 25 kilometres that extractive resources will need to travel to reach their destination.

The heavy construction materials industry is a key player in Victoria's transport industry with quarry materials, cement and premixed concrete making up 10 per cent of the tonne-kilometres travelled by freight vehicles on Victoria's roads.



EFFICIENT REGULATION



Outcomes

By implementing the Commissioner for Better Regulation's *Report on Earth Resources Regulation – Continuous Improvement Project*, we aim to:

- Ensure that the extractive resources regulatory framework is transparent, consistent, efficient and outcomes-focused
- Increase regulatory certainty for investors and reduce timelines for approvals.

Priority Actions

The Government has developed the Getting the Groundwork Right – Better Regulation of mines and quarries: Implementation Plan to implement the recommendations of the Commissioner for Better Regulation. The Implementation Plan aims to:

- Simplify the assessment processes for proposed quarries, while strengthening the regulatory focus on the most complex risks
- Provide clearer information to industry and the community about regulatory processes and decisions
- Improve coordination across the regulatory system, including through better engagement between the regulator and other regulatory authorities
- Deliver modern approval and internal processes to enable timely and consistent decision making, and support industry compliance
- Ensure laws and regulations governing the earth resources sector are fit for purpose, based on modern technologies and best practice regulatory and governance frameworks

- Implement any regulatory changes needed to support the identification and protection of strategic extractive resources.

Key Issues

In recent years, the Victorian Government has taken steps to streamline the quarry operations approvals process without compromising social, economic and environmental outcomes. However, there is more to be done to give industry the confidence to make long-term investments for the benefit of all Victorians.

The Government's new Implementation Plan will deliver much needed reform to Earth Resources Regulation. The Implementation Plan responds to ongoing feedback from industry that delays and uncertainty in regulatory approvals processes hindered production and supply of extractive resources.

By reforming our regulatory system, we can promote the attractiveness of the extractives sector and give operators the certainty they need for making investment decisions through administering a transparent, consistent and efficient regulatory framework. This promotes development and provides the community with confidence in decision making.

The security of strategic extractive resources can be bolstered by an efficient and responsive regulatory system. The Victorian Government is committed to creating an environment that enables industry to operate sustainably – both individually and as part the Victorian community.

CONFIDENT COMMUNITIES



Outcomes

By engaging with and supporting communities, we aim to enhance community awareness and acceptance of the extractive resources sector.

Priority Actions

We will:

- Engage with communities to raise awareness of the importance of quarries and ensure all stakeholders have easier access to earth resources information
- Support community capacity-building services to better enable participation in decision-making about quarries
- Help build the capacity of industry and councils to better engage with their communities.

Key Issues

Engage with communities

For extractive resources to continue to be available as Victoria grows, the extractives industry should work with the community to build a social licence to operate. The industry will be best placed to conduct extraction activities if it has the acceptance of local communities and affected stakeholders. To achieve this, Victorian communities should be engaged on the importance of extractives throughout all stages of the quarry lifecycle, and gain the confidence that quarry operations will be well managed. Strong and enduring relationships between industry and communities will be key to ensuring that supply of extractives meets demand.

Support community participation in decision-making

Engagement between communities, government and the extractives industry needs to be strengthened to ensure that each group has sufficient information about local projects to make informed decisions. Industry, state and local governments all have a distinct role to play in building communities' understanding of the importance of extractive resources to daily lives.

Build industry and council capacity to better engage with communities

The extractive resources sector has the potential to bring economic, social and environmental benefits to local communities. Industry and the Government together must take a lead in fostering two-way communication with the community.

ENVIRONMENTAL SUSTAINABILITY



Outcomes

By taking an environmentally sustainable approach to the extractive resources industry, we aim to:

- Support industry operators to be recognised as leaders in the sustainable development of resources
- Reduce demand on virgin extractive resources by substituting them with recycled products where appropriate
- Achieve zero net greenhouse gas emissions by 2050.

Priority Actions

To support environmental sustainability in the extractives sector, we will:

- Establish measures to help guide industry to continuously improve its environmental management to reflect leading practice
- Work with the extractives sector to reduce net greenhouse gas emissions consistent with the Victorian Government emission reduction and sustainability initiatives
- Improve the management of waste across the industry
- Develop a strategic approach to securing biodiversity offsets.

Key Issues

Leading practice in environmental management and sustainability

A healthy environment is the foundation of many of the productive activities that underpin our economy. In Victoria, a number of laws, policies and initiatives exist which set ambitious targets to ensure Victoria is on the path to sustainability. The Victorian Government is committed to improving the care and protection of the State's environment, including through a number of interconnected initiatives focused on protecting biodiversity. Through this Strategy the Government will continue working across its departments and with industry to develop and implement innovative and meaningful approaches to biodiversity offsets, and environmental management more generally, for the extractives sector.

Reducing Emissions

The Victorian Government has committed to a target of zero net greenhouse gas emissions by 2050 for Victoria. This means that our greenhouse gas emissions will be reduced as far as possible. Any remaining emissions will be counteracted through activities such as planting more trees or capturing more carbon in the ocean and coastal ecosystems.

Every Victorian, including businesses operating in Victoria, has a part to play.

The extractive resource industry can play its part in achieving net zero emissions and improving Victoria's environment by:

- Reducing consumption of energy, water and other auxiliaries in extraction and transportation
- Reducing emissions directly caused by extractive operations
- Reducing waste, maximising reuse, and where feasible playing a role in materials recycling
- Closing the loop on the quarry lifecycle by implementing innovative end land uses for exhausted quarries
- Continually striving towards better conservation of biodiversity and cultural heritage.

The falling costs of renewable energy technologies presents an opportunity for quarries with plants powered by electricity to reduce costs and emissions. Biofuels represent another potential opportunity for quarries as an alternative to diesel fuel used in operating plants, machinery and in transportation.

Waste reduction

Quarry wastes are a largely unavoidable by-product of the extraction and processing of aggregates. Minimising waste through improved quarry design and operation can lead to greater productivity and supply of product to the market.

Quarries can also play an important role in supporting materials recycling in Victoria by supplementing their product lines with recovered construction materials from demolished buildings and infrastructure. Victoria's *Market Development Strategy for Recovered Resources* aims to support increased recycling by stimulating markets for recycled materials such as recycled concrete and bricks.

NEW ROAD SPECIFICATIONS USE RECYCLED MATERIALS

VicRoads has recently amended a range of product specifications to allow for the inclusion of recycled products such as crushed concrete and brick, glass fines and reclaimed asphalt pavement.

In December 2017 VicRoads announced it will invest \$1 million towards identifying new opportunities to use recycled products.



INNOVATIVE SECTOR



Royal Botanic Gardens in Cranbourne – a former quarry site

Outcomes

By promoting an innovative extractives sector, we aim to:

- Facilitate innovative end land use for quarries during operation and post-closure
- Encourage innovative approaches to achieving environmental best-practices
- Engage with industry and Victorian communities on the benefits of post-quarrying land uses that can be achieved through innovative planning and progressive rehabilitation
- Capitalise on Victoria's technology and innovation advancements.

Priority Actions

To support innovation in the extractives sector, we will:

- Investigate the feasibility of short-life quarries
- Investigate the feasibility of different innovative end-land use opportunities for quarries
- Develop and deliver an innovative post-quarrying land use flagship project.

Key Issues

A healthy extractives sector requires continual innovation to respond to demand and to remain viable and successful.

Innovation and collaboration between operators, customers, end-users and research organisations will assist the sector to identify new opportunities, build on emerging capabilities and adopt new technologies to ensure it continues to grow and prosper into the future.

Investigate the feasibility of short-life quarries

In areas where future urban development is likely to extend, there is opportunity for strategic resources to be extracted ahead of urban development. Short life quarries coupled with innovative rehabilitation may assist in orderly sequencing of land uses.

Innovative end-land use opportunities for quarries

Innovation also has a central role in planning, design and implementing safe, stable and beneficial post-quarrying land forms and land uses. Post-quarrying land uses can enhance amenity and lifestyle for local communities, and also help to provide habitat for threatened species.

Quarries can make a valuable contribution towards enhancing networks of open space for use by local communities. This can be encouraged through long term open space planning coupled with quarry approvals that consider innovative end land use options.

This has been achieved already in significant cases both in Australia and overseas. For example, in New South Wales in the 1980s, the Government embarked upon an ambitious plan to transition old quarry sites in Penrith into major water-based recreational parklands. This delivered public and social benefits, including through the hosting of the 2000 Sydney Olympic Games rowing events.

We will support industry to plan for and implement innovative end land uses that are beneficial for the local community.



CASE STUDY: FROM QUARRY TO HOUSING DEVELOPMENT

Valley Lake is a 48 hectare residential housing estate in Melbourne's north western suburbs which was completed in 2017. The site was formerly the Niddrie Quarry, which had supplied Melbourne with basalt since the 1940s. In 2000 redevelopment of the quarry site began. Today, the site comprises a new lake edge reserve featuring a 600 metre boardwalk and community barbeques and seating areas, sustainable wetlands, roads and other services for more than 500 homes. Valley Lake demonstrates that innovative planning can transform formerly valuable quarries into places that continue to meet Melbourne's future housing and other community needs.



STRATEGY ACTIONS

TIMEFRAME	0-2 YRS	2-5 YRS	5 YRS+
Resource and Land Use Planning	<ul style="list-style-type: none"> • Pilot Strategic Extractive Resource Area project in partnership with local government • Interim protections and engagement on key strategic planning initiatives • Promote critical resource local government areas and existing Extractive Industry Interest Areas • Revise short term supply and demand forecasts impacted by infrastructure investment and population growth • Build understanding of economic case for securing strategic extractive resources • Improve data collection and sharing by improving the availability of, and access to, critical data on current and forecast production and available reserves, in order to inform strategic resource planning • Continue to improve Victoria's approach to strategic resource planning and management • Progressively identify Strategic Extractive Resource Areas in priority local government areas 	<ul style="list-style-type: none"> • Develop decision- makers' knowledge and capabilities • Update Victorian extractive resource demand and supply forecasts every five years 	<ul style="list-style-type: none"> • Ongoing engagement to ensure recognition of strategic extractive resources in critical state and regional plans and strategies
Transport and Local Infrastructure Planning	<ul style="list-style-type: none"> • Recognise critical extractive resource transport networks in Victorian Government transport and infrastructure plans • Improve data collection and sharing • Conduct an initial study into transport impacts and network development needs • Encourage development of dedicated quarries close to new major regional infrastructure projects 	<ul style="list-style-type: none"> • Review existing contributions made by the extractives industry to address local infrastructure impacts • Conduct further studies into transport impacts and network development needs in priority extractive resource area and supply regions 	<ul style="list-style-type: none"> • Ongoing planning for freight transport and local infrastructure

Figure 16: Summary of short, medium and long term actions

TIMEFRAME	0-2 YRS	2-5 YRS	5 YRS+
Efficient Regulation	<ul style="list-style-type: none"> • Implement short and medium-term actions in the <i>Getting the Groundwork Right – Better Regulation of mines and quarries: Implementation Plan</i> • Improve work approvals processes • Inform the development and review of the Victorian Government's planning and environment policies • Assess the implications of Strategic Extractive Resource Areas to the regulatory approval process 	<ul style="list-style-type: none"> • Implement the longer-term recommendations set out in the <i>Getting the Groundwork Right – Better Regulation of mines and quarries: Implementation Plan</i> 	<ul style="list-style-type: none"> • Continue to increase regulatory certainty for investors
Confident Communities	<ul style="list-style-type: none"> • Engage with communities to raise awareness of the importance of quarries • Support community capacity-building services to better enable participation in decision-making about quarries • Help build the capacity of industry to better engage with their communities, including by sponsoring industry community leadership awards 	<ul style="list-style-type: none"> • Ongoing support to industry and communities 	
Environmental Sustainability	<ul style="list-style-type: none"> • Establish measures to ensure industry continuously improves its environmental management • Work with the extractives sector to reduce net greenhouse gas emissions 	<ul style="list-style-type: none"> • Improve the management of waste across the industry, including by incorporating use of recycled materials • Develop a strategic approach to securing biodiversity offsets, to make it more efficient for quarry proponents to use offsets 	<ul style="list-style-type: none"> • Continue to support environmental sustainability within industry
Innovative Sector	<ul style="list-style-type: none"> • Investigate the feasibility of short-life quarries • Inform Melbourne's open space planning • Investigate the feasibility of different innovative end-land opportunities for quarries 	<ul style="list-style-type: none"> • Develop and deliver an innovative post-quarrying land use flagship project 	<ul style="list-style-type: none"> • Promote innovation in the extractives industry



MONITORING AND EVALUATION

This Strategy will be implemented in partnership with industry, local councils and the Victorian community.

A complimentary implementation plan including key performance indicators will ensure this Strategy remains on track to meet its objectives. The implementation plan will assign key responsibilities for specific outputs to be produced with due dates, and will include measurable objectives against each outcome. Progress against the implementation plan will be monitored and reported on.

'Health of the sector' performance indicators will be used to monitor, evaluate and inform progressive refinements to the implementation plan to ensure that progress is made based on practical experience.

FURTHER INFORMATION

Commissioner for Better Regulation, 2017, *Getting the Groundwork Right – Better Regulation of mines and quarries*
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Department of Environment, Land, Water and Planning, 2017, *Plan Melbourne 2017-2050, Metropolitan Planning Strategy*
<http://www.planmelbourne.vic.gov.au/>

Department of Primary Industries, 2003, *Melbourne Supply Area – Extractive Industry Interest Areas Review*
<http://earthresources.efirst.com.au/product.asp?plD=677&cID=37>

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<http://earthresources.vic.gov.au/earth-resources/industry-and-investment/minerals-development-victoria/helping-victoria-grow-extractive-resources-in-victoria,-demand-and-supply-2015-2050>

PricewaterhouseCoopers, 2016, *Extractive Resources in Victoria: Demand and Supply Study 2015-2050*
<http://earthresources.vic.gov.au/earth-resources/industry-and-investment/minerals-development-victoria/helping-victoria-grow-extractive-resources-in-victoria,-demand-and-supply-2015-2050>





Appendix 1: Detailed Action Plan

RESOURCE AND LAND USE PLANNING

TIMEFRAME	Actions to secure future extractive resources through strategic resource and land use planning
0-2 YRS	Pilot Strategic Extractive Resource Area project in partnership with local government The pilot project aims to secure extractive resources for the future in two local government areas identified as having extractive resources of strategic importance to the State.
	Interim protections and engagement on key strategic planning initiatives As well as the pilot, we will engage early and often with stakeholders implementing planning initiatives such as priority precinct structure plans, Plan Melbourne and regional growth plans, to help ensure that the State's strategic extractive resources are recognised and can be secured for future use.
	Promote critical resource local government areas and existing EIAs
	Revise short term supply and demand forecasts impacted by infrastructure investment and population growth Update and publish supply and demand forecasts to identify immediate impacts from the roll out of significant public infrastructure investment and revised population growth in order to facilitate additional supplies of extractive resources into the market.
	Build understanding of economic case for securing strategic extractive resources Develop a dynamic economic model to assess the demand and supply of extractive resources on a spatial and temporal basis across the State, including geographical clusters of strategic importance for construction
	Improve data collection and sharing by improving the availability of and access to critical data on current and forecast production and available reserves, in order to inform strategic resource planning Review and implement options to improve the reporting by industry of reserve and production levels within existing work authorities as part of the annual reporting to the Earth Resources Regulator.
	Continue to improve Victoria's approach to strategic resource planning and management Identify and review good practice policy frameworks across Australia and internationally to inform continual improvement of Victoria's strategic resource planning and management.
	Progressively identify Strategic Extractive Resource Areas in priority local government areas We will progressively introduce Strategic Extractive Resource Areas in suitable locations within key extractive resource supply councils around the State. The implementation and roll out approach will be informed by findings of the pilot project, the Demand and Supply Study, updated data and ongoing engagement with industry, local governments and the community.
2-5 YRS	Develop decision-makers' knowledge and capabilities We will develop educational material and deliver workshops for local government and Victorian agencies to increase knowledge and skills for assessing and determining quarry applications.
	Update Victorian extractive resources demand and supply forecasts every five years We will update Victoria's extractive resources demand and supply forecasts every five years, and monitor key factors influencing resource demand and supply to ensure our Extractive Resources Strategy responds to changes in the market. Where there is justification for an intermediate review of demand and supply forecasts, we will conduct these reviews sooner than every five years.
5 YRS +	Ongoing engagement to ensure recognition of strategic extractive resources in critical State and Regional Plans and Strategies We will work to ensure that strategic extractive resources are recognised in future updates to relevant state and regional plans (for example, future revisions of Plan Melbourne).

TRANSPORT AND LOCAL INFRASTRUCTURE PLANNING

TIMEFRAME	Priority Actions for better transport and local infrastructure planning
0-2 YRS	Recognise critical extractive resource transport networks in Victorian Government transport and infrastructure plans We will inform the development of transport strategies and plans to recognise critical transport networks. The connectivity needed between Strategic Extractive Resource Areas and end-users will be used as a basis for determining critical transport routes and modes.
	Improve data collection and sharing We will improve data collection and sharing regarding the timing, frequency, volume and routes (actual and preferred) for transporting quarrying materials and products. This will be used to identify opportunities to improve transport efficiency and network performance.
	Conduct an initial study into transport impacts and network development needs We will undertake an initial study into the transport impacts and network development needs required to support the forecast significant growth in the extractive resources industry.
	Encourage development of dedicated quarries close to new major regional infrastructure projects We will consider a decision-making framework to expedite the approval process for short-term use quarries to support major regional infrastructure projects in order to reduce costs and other impacts upon local communities.
2-5 YRS	Review existing contributions made by the extractives industry to address local infrastructure impacts We will evaluate the collection and distribution of fees and charges paid by transporters of extractive materials to inform a potential review of how extractive transportation vehicles contribute to the cost of local road maintenance and safety.
	Conduct further studies into transport impacts and network development needs in priority extractive resource area and supply regions Building on the initial transport study, we will undertake further studies into the transport impacts and network development needs required to support the forecast significant growth in the extractive resources industry.
5 YRS +	Ongoing planning for freight transport and local infrastructure We will continue to inform transport and infrastructure planning for the efficient delivery of quarry resources to where they are needed.

EFFICIENT REGULATION

TIMEFRAME	Priority Actions for improving the efficiency of regulation
0-2 YRS	<p>Implement short and medium-term recommendations set out in the Commissioner for Better Regulation's <i>Report on Earth Resources Regulation – Continuous Improvement Project</i></p> <p>We will establish a Continuous Improvement Implementation Taskforce to improve the efficiency of the approvals process for two years to lead the development of cross-government decision making processes to ensure high priority quarrying projects are assessed efficiently and deliver timely benefits to Victorians.</p> <p>We will also establish the Earth Resources Approvals Coordination Group to better streamline the approval process for quarries. The Group will:</p> <ul style="list-style-type: none"> • Act as a clearing house for complex proposals and identify opportunities to tailor processes for strategically significant projects Increase regulatory certainty for investors and reduce timelines for approvals. • Examine the need to better incorporate into the planning system the strategic aspects of supply and demand for construction materials and the need for enhancing engagement across Government. <p>Improve work approvals processes</p> <p>We will investigate options to streamline works approvals. In particular, we will improve alignment between the <i>Mineral Resources (Sustainable Development) Act</i> and planning approval.</p> <p>We will also support industry's to transition to risk-based work plans (where applicable), including by publishing updated environmental safety performance standards, amongst other initiatives, as they become available.</p> <p>Inform the development and review of the Victorian Government's planning and environment policies</p> <p>We will take a proactive approach in informing the development and review of the Victorian Government's planning and environment policies in areas such as planning, water and native vegetation.</p> <p>We will investigate options to amend planning definitions to better account for the inherent variability in the operation of quarries over time associated with care and maintenance periods, variable market demand to supply of resources for construction projects, and the lead time to develop new quarries or a portfolio of quarries to meet future demand.</p> <p>Assess the implications of Strategic Extractive Resource Areas to the regulatory approval process</p> <p>We will use the findings of the Strategic Extractive Resource Areas pilot project to assess whether the regulatory approval process (new and existing Work Authorities) can be further streamlined.</p>
2-5 YRS	<p>Implement the longer-term recommendations set out in the <i>Getting the Groundwork Right – Better Regulation of mines and quarries: Implementation Plan</i></p>
5 YRS +	<p>Continue to increase regulatory certainty for investors</p> <p>We will continue to look for and implement ways to increase regulatory certainty for investors in the extractives industry in Victoria.</p>

CONFIDENT COMMUNITIES

TIMEFRAME	Priority Actions to help build confident communities
0-2 YRS	<p>Engage with communities to raise awareness of the importance of quarries</p> <p>We will use the Strategic Extractive Resource Areas pilot project to test a range of different approaches to engaging with and communicating to local communities on the importance of quarrying operations.</p> <p>We will help build the sector and councils' capability to engage with communities regarding quarry operations by sharing engagement techniques and key messages that foster greater community confidence.</p> <p>We will support industry operators and local community members by improving the governance arrangements for environmental review committees, including open forums.</p> <p>We will also redevelop Victorian Government Earth Resources website to provide stakeholders with easier access to earth resources information.</p>
	<p>Support community capacity-building services to better enable participation in decision-making about quarries</p> <p>We will continue to help communities to actively engage in the process of approving quarrying projects. We will commence in the Bunyip North area to give the community a better understanding of the processes involved with quarry proposals and to participate in the assessment process.</p>
	<p>Help build the capacity of industry to better engage with their community</p> <p>We will sponsor industry community leadership awards in extractive resources. This will recognise and reward leading practice and innovation in community engagement and continue to invest in building the capacity of the industry to better engage with their community.</p>
2-5 YRS	Ongoing support to industry and community
5 YRS +	We will continue to support industry and the community to build community awareness and acceptance of extractive industries.

ENVIRONMENTAL SUSTAINABILITY

TIMEFRAME	Priority Actions
0-2 YRS	Establish measures to ensure industry continuously improves its environmental management We will review and update guidelines for quarrying projects, in consultation with industry, to reflect leading practice management of water and environmental resources and impacts.
	Work with the extractives sector to reduce net greenhouse gas emissions We will work with the quarrying sector to identify and apply Victorian Government emission reduction and sustainability initiatives.
2-5 YRS	Improve the management of waste across the industry, including incorporating use of recycled materials We will support industry to adopt best practice approaches to minimising generation of extractive resource waste, and to play a role in supporting the recycling of recovered construction materials where feasible. We will investigate the business case for co-location of recycling facilities within quarry operations.
	Develop a strategic approach to securing biodiversity offsets to make it more efficient for quarry proponents to use offsets
5 YRS +	Continue to support environmental sustainability within industry We will continue to work with industry and consumers of extractive resources to develop the environmental sustainability of the extractives industry.

INNOVATIVE SECTOR

TIMEFRAME	Priority Actions to promote an innovative sector
0-2 YRS	Investigate the feasibility of short-life quarries We will conduct a study into the feasibility of short-life quarries in consideration of the costs and benefits they bring to industry and the community. The study will include consideration of issues such as fixed and mobile infrastructure and end-of-life quarry opportunities for improved long-term social benefits.
	Inform Melbourne's open space planning We will inform the development of Melbourne's forthcoming open space strategy to recognise opportunities to develop exhausted quarries as part of liveable open spaces for local communities.
	Investigate the feasibility of different innovative end use opportunities for quarries We will conduct a study into the feasibility of various innovative end uses for quarries in consideration of their costs and benefits to industry and the community. We will then engage communities and industry on innovative end-land use opportunities for quarries.
2-5 YRS	Develop and deliver an innovative post quarrying land use flagship project We will develop and deliver a post-quarrying innovative land use flagship project. In partnership with industry, we will support research for a demonstration project to show how beneficial and productive post-quarrying land uses can be achieved through innovative planning and progressive rehabilitation.
5 YRS +	Promote innovation We will continue to work with industry to develop and achieve innovative approaches to industry practice.



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